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Impact Evaluation Study for Egypt's *Takaful and Karama* Cash Transfer Program

Part 1: Quantitative Report

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Ministry of Social Solidarity

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ACRONYMS

AEU	adult equivalent unit
BMI	body mass index
CCT	conditional cash transfer
DHS	Demographic and Health Survey
EGP	Egyptian pound (currency)
HIECS	Household Income, Expenditure, and Consumption Survey
IFPRI	International Food Policy Research Institute
IRB	Internal Review Board
IV	instrumental variable
IYCF	infant and young child feeding
IYCN	infant and young child nutrition
MoSS	Ministry of Social Solidarity
PCA	principal component analysis
PMT	proxy means test
RD	regression discontinuity
TKP	*Takaful and Karama* Program

EXECUTIVE SUMMARY

Background and methodology

1. **As part of a series of economic reforms that began in 2014, the Government of Egypt initiated a social protection scheme in 2015 involving targeted cash transfers to poor households called the *Takaful* (Solidarity) *and Karama* (Dignity) program**. Takaful and Karama program is implemented by the Ministry of Social Solidarity (MoSS), and co-financed by the Government of Egypt and the World Bank. Takaful is designed as a conditional cash transfer program that provides income support to poor families with children under 18 years of age. Transfers under Takaful start with a basic amount of EBP 325 per household per month, which increases depending on the number of children in the households and their education level. Conditionalities for school attendance and health care utilization have yet to be implemented. Meanwhile, Karama is designed as an unconditional cash transfer program for poor elderly (aged 65 years and above) and persons with severe disability. Transfers under Karama are given on an individual level, with a benefit size of between EBP 350 and EBP 450 per beneficiary depending on the beneficiary's condition[1], with a maximum of three beneficiaries per household (World Bank, 2015).

2. **The poverty rate in Egypt in 2015 was 27.8 percent. While an official update of the poverty rate will not be available until the 2017 HIECS, poverty has likely increased in the period following the economic reforms due to sharply higher price levels after the devaluation**. Our consumption survey likely under-reports consumption compared to the HIECS. In our nationally representative survey of households with children, 40 percent of the sample has consumption measured below the 2015 poverty line of EGP 482 per capita per month. We estimate that the under-reporting of consumption in our survey is roughly equivalent to the percentage by which the poverty line would need to be adjusted to account for inflation, and so continue to use the un-adjusted poverty line in this analysis.

3. **To assess the impact of the Takaful and Karama program, a household survey was conducted from July 15 – August 30, 2017**. The survey collected information on outcomes related to household expenditure and poverty, well-being and income, schooling, child dietary diversity and anthropometry, child morbidity, household dietary diversity, health care utilization, infant and young child nutrition knowledge and practices, women's decision making, shocks, and illness and disability. The surveys were carried out by trained enumerators using a computer-assisted personal interview system. The sample for the evaluation includes 6,541 households in the impact evaluation sample plus an additional 1,692 households in a nationally representative sample for targeting analysis.

4. **The impact evaluation was conducted using a regression discontinuity (RD) design, the most scientifically rigorous methodology given the program's approach to targeting and timing of the evaluation**. The program was targeted by selecting households who fell below a threshold level on a proxy means test (PMT) score using data collected during three waves of registration. The RD approach compares outcomes for beneficiaries below each threshold for eligibility to outcomes for non-beneficiaries above the threshold. The available impact evaluation data were well suited to conducting the analysis using the RD approach: there is a large number of households with a PMT score near the eligibility thresholds (except for the first threshold) and

[1] When the program was first launched, Karama transfers were EGP350 per beneficiary, for poor elderly and person with severe disability. By the beginning of 2017, orphaned children were added to Karama, with a benefit size of EGP350 per beneficiary. Starting July 2017, the transfer amount for poor elderly and persons with disability was increased to EGP450.

the PMT score is continuous at the eligibility threshold. To account for there being three thresholds of the PMT score that determined eligibility, we estimate impacts of the program using two methods: a generalized IV methodology and a more conventional fuzzy RD approach applied to the final threshold only.[2] The two methods produce broadly similar results, though there are some differences in the size of estimated impacts. Other impact evaluation methods like matching were ruled out because a core assumption of matching methods – that, conditional on their observable characteristics, all registrants have some chance of being eligible for the program – is violated when targeting relies primarily on use of a threshold level of a PMT score. Matching methods were also not feasible for evaluating Takaful and Karama because the program began nearly two years before the evaluation and no pre-program baseline data are available. This makes it infeasible to match on preprogram characteristics.

Takaful impact results

5. **Takaful has helped the poor to significantly increase their household consumption.** The Takaful program increased the value of household consumption for beneficiaries by between 7.3 and 8.4 percent compared to non-beneficiaries[3], which is roughly equivalent to one third of the value of the average Takaful transfer. Adjusting for the fact that the household survey likely underestimates the value of consumption, this suggests that roughly one third to one half of Takaful transfers show up directly in the form of higher consumption.

6. **Impact are at a scale comparable to successful cash transfer programs in other countries.** This positive impact on household consumption is comparable to the impact of other well-known social protection programs. A review of seven conditional cash transfer programs in Latin America (Fizbein et al, 2009) found that impacts on household expenditure ranged from 7 to 10 percent among four programs in Brazil, Mexico, Colombia, and Honduras. Thus, the Takaful program has performed well compared to other well-known CCT programs, which were very successful. In the impact evaluation sample, average Takaful transfers represented 23 percent of monthly household expenditure, which is similar to other CCT programs with this level of impact.

7. **Takaful has significantly reduced the prevalence of poverty among beneficiaries in our sample.** The evaluation assessed the impact of the Takaful program on the probability of a household being poor, relative to three poverty lines: USD 1.90 per person per day and USD 1.25 per person per day (the World Bank definitions of poverty and extreme poverty), and the Egyptian regional poverty lines. The Takaful program reduced the probability of a beneficiary household living in poverty (below USD 1.90 per day) by about 11 percent and this effect is statistically significant. The Takaful program reduced the probability of a beneficiary household living under the regional poverty line by 8 percent. The impact of the Takaful program on the national poverty rate is substantially smaller because the program, while substantial, covers only a fraction of poor households.

8. **Takaful beneficiaries increased their food consumption and improved the quality of their diets.** The Takaful program caused a statistically significant increase in the value of monthly food

[2] Generalized IV and fuzzy RD are motivated by the fact that there are some households below the threshold not receiving the program and some households above the threshold who are receiving the program Thus, the threshold is a very strong predictor of participation, but is not a perfect predictor. The generalized IV method uses two stages. In the first stage, indicators for household eligibility for the program at each threshold and by registration period are used to predict household participation in the program. In the second stage, predicted participation is used to estimate impacts on outcomes. The fuzzy RD method uses a similar two-stage approach to estimate impacts at a particular threshold, correcting for the fact that the threshold is not a perfect predictor (but is still the main predictor) of participation in the program. Further details are provided in Section 3.2.

[3] Estimates from generalized IV and fuzzy RD.

consumption per adult equivalent unit (AEU) by 8.3 to 8.9 percent. This is a substantial effect and somewhat lower than the average impact of several social protection programs on food consumption of 13 percent as reported in a recent review by IFPRI (Hidrobo et al., 2017). Disaggregating the effects on household food consumption, there is some evidence that households use the transfers to improve the quality of their diet as the programs caused a significant increase in the value of fruit consumption and a weakly significant increase in the value of meat consumption. Despite this evidence of changing food expenditure patterns, there is no significant impact of the Takaful program on any measure of dietary diversity -- the number of 14 unique food categories consumed in the past seven days -- including household dietary diversity or the diversity of diets for women and children. The lack of impact on dietary diversity derives in part from the fact that households near the Takaful eligibility thresholds already have substantially diverse diets. Most households report consuming foods in 7-8 out of 14 food groups in the last week. This is consistent with households consuming greater quantities or higher quality of higher valued foods such as fruit and meat even if they are not diversifying their diets into new food categories.

9. **The evaluation also finds some evidence of positive impact of Takaful on child nutritional status.** Estimates show that the Takaful program has increased weight-for-height z-scores, an indicator of short term nutritional status, for children under age 2 years. This is a meaningful effect, although the data we collected show no evidence of substantial acute child malnutrition. Therefore, it is not surprising that this increase in average weight-for-height z-scores does not correspond to a significant change in the already very low rate of wasting. Given that the population is relatively healthy, there could be a potential concern about too much weight gain, although we see no evidence of this in our data. Finally, we find that the Takaful program led to a reduction of 3.7 percentage points in the probability that a child under age 5 years was ever treated for malnourishment, which may imply less need for treatment due to better health status. There was no impact on child stunting prevalence (a measure of chronic malnutrition) for children under 2 years of age or between 2 and 5 years of age.

10. **Takaful may not have the intended effect on women's control over decision making.** Ninety percent of Takaful beneficiaries were female as of June 2017. Estimates show a negative and significant impact of the program on women's control over decision making, which is driven primarily by households in Lower Egypt and by women with less than primary education. Women's control over decision making is based on the reported ability of a woman to influence a variety of types of household decisions. This pattern is the opposite of effects found in several other countries (e.g., Ecuador, Mali) and opposite to the intended impact of the program.

11. **There were no significant impacts on school enrollment and heath care utilization, which is likely explained by the absence of conditionalities at the time of the evaluation.** There is no impact so far of the Takaful program on the probability that children or girls specifically are enrolled in school or conditional on attending school, whether they were absent for one week or more during the past year. There was also no significant impact on private tuition or tutoring, but we do find significant increased spending on school supplies and transportation of EBP 211 per household per year in households with at least one secondary school age student and EBP 123 per household per year in households with at least one primary school age student. There were no impacts on health service utilization including on whether women received antenatal care during pregnancy, the number of antenatal care visits, or postnatal health facility utilization.

Karama impact results

12. **The RD approach to estimation of impacts faced greater challenges in the Karama sample.** Not only is the sample size smaller due to the smaller size of the program, but the threshold for inclusion in the program shifted between the time of sample selection and the time of data collection. The efficiency and speed of the program in enrolling these newly eligible households was impressive and unexpected. As a result, we lost more than half of the intended sample of Karama comparison group due to their inclusion in the program.

13. **This evaluation was unable to measure impacts of the Karama transfers on the outcome variables examined.** All of the outcome variables considered for Takaful were additionally analysed for the Karama sample, but there are no results of interest to report. We believe the lack of measured impact is likely due to the challenges described above, as the Karama transfers represented a larger share of household expenditure per person (28 percent) than the Takaful expenditures.

Satisfaction and targeting

14. **The large majority of beneficiaries are satisfied with Takaful and Karama and the delivery of transfer payments is smooth.** Sixty eight percent of the program beneficiaries in the sample are very satisfied with the program, and about 90 percent are either very satisfied or somewhat satisfied with the program. In terms of receiving the transfers, about 93 percent of transfer recipients have not faced any challenges in receiving the transfers.

15. **Targeting efficiency met the program's set goal.** Sixty-seven percent of beneficiary households have consumption levels (net of program transfers) that place them in the lowest 2 quintiles of the population of households with children; which is higher than the goal of 60 percent.

16. **Self-selection and geographic targeting via the rollout were crucial to targeting efficiency.** The PMT scores, as expected theoretically and known from other international experience, provide a rough approximation of the true level of household expenditure level. Conditional on applying, 13 percent of households in the highest quintile were accepted into the program, and only 41 percent of households in the lowest quintile are accepted. The fact that overall targeting efficiency is acceptable is due to much higher probability of application in the lower quintiles.

17. **A large share of poor households with children remain uncovered by Takaful, particularly government workers and urban households.** Seventeen percent of households in the poorest quintile are excluded due to factors other than the PMT, primarily receiving another government pension or having a government job. Coverage is also particularly low in urban areas, where only 9 percent of households in the poorest two quintiles are Takaful beneficiaries.

Recommendations

18. **Continue to fund the program and expand coverage**, as we find that the transfers are being received well and have helped households increase spending in categories that contribute to health, education, and overall wellbeing. The program is making a difference in the lives of some of the poor, but many of the ultra-poor are not being reached. Expanding coverage to reach these ultra-poor households should be the focus.

19. **Improve targeting by focusing on including excluded poor households rather than by raising the threshold.** The main reason the ultra-poor are not being reached is because they are not applying; strategies should focus on how to get the poorest households to apply for the program. Excluded poor households can be brought in via outreach for registration in poor

areas, particularly urban areas, updating and improving the use of the PMT formula, and reconsideration of the exclusion restrictions since they often affect the poorest applicants.

20. **Improve communication** regarding conditionality, program length, and recertification so that expectations are clear among beneficiaries, as well as those applying. This will improve trust in the government and among communities.

21. **Work towards a comprehensive social protection strategy** that helps to continue protecting the poor as well as contributes to achieving longer-term developmental goals, such as improved health and educational outcomes. Coordinating with both the Ministry of Education and with the Ministry of Health to provide high quality public service delivery in both sectors is likely to have more of an impact on education and health outcomes if improving quality is combined with the conditionalities.

1. INTRODUCTION

1.1 Context for the initiation of the *Takaful and Karama* Program

"Over the past year, Egypt has embarked on one of the most ambitious economic transformations in our modern history… These structural reforms are critical to the Egyptian economy and the reforms will consolidate the country's transition to a dynamic and more attractive economy, driving national and regional growth… The reforms will help attract foreign investment, generate economic opportunities for the country's citizens, create employment for the youth, and build the diversified economic foundation that Egypt needs for its long-term growth" (El-Garhy, A., 2017).

This statement by Egypt's Minister of Finance, Amr El-Garhy, acknowledges the historical scale of Egypt's recent reforms and underlines Egypt's longer-term ambitions to become a "…new Egypt… that will possess a competitive, balanced and diversified economy, dependent on innovation and knowledge, based on justice, social integrity and participation, characterized by a balanced and diversified ecological collaboration system, investing the ingenuity of place and humans to achieve sustainable development and to improve Egyptians' quality of life" (Egypt Vision 2030).

International experience shows that the type of macroeconomic reforms that Egypt has implemented since 2014 – gradual reductions in energy subsidies, imposition of a value added tax, and liberalization of the exchange rate leading to a 50 percent devaluation of the Egyptian pound – are critical to addressing the severe economic imbalances in Egypt's macroeconomy. These reforms have the potential to initiate a process of longer-term economic growth and diversification (IMF, 2015). Indeed, there are signs that the reforms are working in Egypt. By the end of 2017, the balance of payments and the fiscal balances have improved. There are also early positive signs that economic growth is picking up, inflation is easing and unemployment is starting to fall (Ministry of Finance, 2017).

International experience also shows that functioning social safety nets[4] play an important role in protecting the poor from the negative impacts that often result from such ambitious reform packages during the first few years of adjustment. In addition, evidence from Mexico, Brazil, and Ethiopia (among others) shows that targeted social safety nets play an important role in economic development, bolstering incomes and food security for the poor and, in some cases, improving investments by poor households in education and productive assets (Hidrobo et al. 2017). As a result, social safety nets can play an important role for medium- to long-term economic and social development (Alderman 2017) as envisaged in Egypt's Vision 2030.

Thus, along with the macroeconomic reforms, the Government of Egypt began to reform and expand its social protection schemes in 2014. Egypt has a long history of providing social support, notably the long-standing subsidization of food and social solidarity pension system, but the redistributive benefits of these programs have been mixed. The food subsidy system goes back to the 1940s and currently covers about 70 percent of the Egyptian population and makes up about 1.6 percent of the gross domestic product with an average annual allocation of EBP 610 per capita (Ministry of Finance, 2017). Since 2014, the system has been transformed from a generalized subsidy to a voucher-based system (Moselhy, 2017; Ecker et al. 2016). During the macroeconomic reforms,

[4] Social safety nets are targeted, non-contributory programs and policies (i.e., interventions) that transfer resources to poor households that are deprived due to their income or social, physical, or nutritional status. include cash transfers through welfare payments, in-kind transfers and voucher programs, emergency response assistance (e.g., food aid), school feeding programs, public works schemes, and subsidies, quotas, and conditions for products that are consumed or produced primarily by poor populations (Drimie & Yosef, 2016).

the government increased the size of voucher payments, which is likely to have played an important role in protecting people from the short-term negative impacts of reform (Breisinger et al. 2018).

In addition, Egypt launched the Takaful and Karama Program, a pair of targeted cash transfer schemes in March 2015. Takaful and Karama is a conditional[5] cash transfer program that seeks to provide income support to the poor and most vulnerable; namely poor families with children (under 18 years of age), poor elderly (aged 65 years and above) and persons with severe disability. The introduction of the program represents a significant step on behalf of the Egyptian government to increase the share of social spending reaching poor households. It is implemented by the Ministry of Social Solidarity (MoSS), and co-financed by the Government of Egypt and the World Bank, with plans to increase government funds to reach 100 percent of the cost by fiscal year 2017.

The program is divided into two subprograms: "Takaful" and "Karama". "Takaful" (Solidarity) is a family income support scheme, conditioned on school attendance and health outcomes. Cash transfers are conditioned on attendance of at least 80 percent of the school days by children aged 6 to 18 years, and on conducting two visits per year to the health clinics by mothers and children below 6 years; in addition to maintaining child growth monitoring records, and attending nutrition awareness sessions. Takaful transfers start from a basic amount of EBP 325 per household, per month, which increases depending on the number of children in the households and their educational level. At the beginning of the program, the household received EBP 60 for each child in primary education, EBP 80 for each child in preparatory education and EBP 100 in secondary education. Yet, starting July 2017, households receive EBP 60 for each child under 6 years old, EBP 80 for each child n primary education, EBP 100 for children in preparatory education, and EBP 140 for secondary education. Households can receive benefits for up to three children only, who are usually the oldest three children in the households.

"Karama" (Dignity) is an unconditional income support scheme targeted at the poor elderly and persons with severe disability, and orphans. Orphans have been added as Karama beneficiaries in 2017 and receive EBP 350 per beneficiary. Meanwhile, Karama monthly transfers for poor elderly and person with disability started at EBP 350 per beneficiary, but was then increased in July 2017 to EBP 450 per beneficiary. Karama also has a maximum of three beneficiaries per household (World Bank, 2015). Families can be entitled to both "Takaful" and "Karama" benefits. As of June 2017, 90 percent of Takaful and Karama Program (TKP) beneficiaries were women.

The Takaful and Karama Program was rapidly rolled out in three phases starting in March 2015 and now reaches more people than originally planned. The program has expanded more than originally planned both geographically, and in terms of number of beneficiaries. By December 2017, 1.9 million beneficiaries have been benefiting from Takaful, and nearly 317,990 have been benefiting from Karama, exceeding the original target of reaching 1.5 million households in 2017. The programs currently cover 8.6 million individuals in beneficiary households (Aide Memoire, December 2017). Although a major step forward in redistributing government resources toward the poor, limited funding means that many poor households are not included. Currently, the Takaful and Karama Program aims to reach 20 percent of all poor households in Egypt, and to have 60 percent of its target beneficiaries as households under the poverty line.

1.2 The *Takaful and Karama* Program impact evaluation

In conjunction with the Ministry of Social Solidarity and with funding from the United Kingdom Foreign and Commonwealth Office (UK FCO), the World Bank contracted the International Food

[5] The conditionalities have not yet been implemented, however.

Policy Research Institute (IFPRI) to conduct an impact evaluation of the Takaful and Karama Program. The main objective of the impact evaluation is to provide rigorous evidence on the impacts of the program on household consumption, poverty and other measures of well-being including child education, health and food security, and the prevalence of overweight and obesity in adult women. The program was targeted using a combination of geographical targeting and application of a Proxy Means Test (PMT), an index of well-being based on household demographics, income, housing quality, assets and other characteristics. In poor districts, potentially eligible households were registered and interviewed to collect information for the PMT. Households with a PMT score below a preset threshold were considered eligible for the program and would begin receiving transfers. IFPRI researchers designed the evaluation using this approach to targeting based on the PMT to develop a rigorous evaluation design. Data from a household survey conducted in July-August 2017 and administrative data on registrants for the program are used to conduct the impact analysis.

Through agreement with the Ministry of Social Solidarity and the World Bank, the impact evaluation study seeks to answer *five evaluation questions*: one *primary* evaluation question and four *secondary* evaluation/research questions. The primary evaluation question directly relates to the primary program objective.

1. What is the impact of Takaful and Karama on total household expenditure (used as proxy for household income and poverty measurement) and household poverty?

The secondary evaluation questions relate to assessing program impact on secondary outcomes and generating a better understanding of the pathways of impact:

2. What is the impact of Takaful and Karama on child schooling attainment?
3. What is the impact of Takaful and Karama on child nutrition and health outcomes such as linear growth and immunization rates?
4. What is the program's impact on intermediary outcomes, such as household dietary diversity, health care utilization, and nutrition and health knowledge and practices?
5. What is Takaful's impact on undesirable increases in body weight in mothers and children?

Another objective of this report is to provide information on the beneficiary experience with the Takaful and Karama program as well as initial findings on the targeting of the program. Specifically, the report, provides initial answers to the following three questions:

1. How poor are Takaful and Karama beneficiary households compared to average household in Egypt?
2. What it is the prevalence of errors of inclusion (households that receive Takaful in spite of being relatively well-off) and errors of exclusion (households do not receive Takaful in spite of being relatively badly off)?
3. What characteristics of households and program implementation are associated with errors of inclusion and errors of exclusion?

This report of the evaluation study provides a greater focus on measuring the impact of the larger Takaful program and also attempts to measure the impact of the much smaller Karama program. In addition, IFPRI will conduct a qualitative assessment of the Takaful and Karama program focused on learning about the experience with the program among the poorest beneficiary households. This qualitative assessment will also draw lessons from the quantitative survey to provide another report on the experience of very poor households.

1.3 Outline of report

The remainder of this report is organized as follows Chapter 2 provides an overview of the Takaful and Karama Program. Chapter 3 summarizes the impact evaluation design. Chapter 4 describes the evaluation survey and sample. Chapter 5 provides context for the program by using the survey data to summarize the characteristics of beneficiary and non-beneficiary households and describe beneficiaries' experience with program implementation. Chapter 6 presents the impact estimates for Takaful and Chapter 7 the estimates for Karama. Chapter 8 uses data from a separate representative sample of households collected during the survey to assess the targeting performance of the program. Chapter 9 concludes and discusses implications for social policy in Egypt.

2. *TAKAFUL AND KARAMA* PROGRAM

2.1 Program description

The main objective of designing the Takaful and Karama program is to improve the targeting efficiency and effectiveness of social protection programs in Egypt (World Bank, 2015). The program aims to reach 20 percent of all poor households in Egypt, and to have 60 percent of its target beneficiaries as households under the poverty line. The program has two main sub-programs: Takaful, and Karama.

"Takaful" (Solidarity) is a family income support scheme, conditioned on school attendance and health outcomes. Cash transfers are conditioned on attendance of at least 85 percent of the school days by children aged 6–18 years, and on conducting two visits per year to the health clinics by mothers and children below 6 years; in addition to maintaining child growth monitoring records, and attending nutrition awareness sessions. Note that these conditionalities have not yet begun. Takaful transfers start from a basic amount of EBP 325 per household, per month, which increases depending on the number of children in the households and their educational level. When the program was first designed, each household used to receive EBP 60 for each child in primary education, EBP 80 for each child in preparatory education and EBP 100 in secondary education. Households can receive benefits for up to three children only.[6]

Meanwhile, "Karama" (Dignity) is an unconditional income support scheme targeted at the poor elderly, persons with severe disability, and orphans. The program was originally developed to cover poor elderly and persons with disability. Karama transfers are given on an individual level. The original benefit size for elderly and persons with disability was EBP 350 per beneficiary, with a maximum of three beneficiaries per household (World Bank, 2015).[7]

Since the start of the program and until the end of 2016, transfers have been delivered on quarterly basis for Takaful and monthly in Karama. But starting 2017, transfers for Takaful became monthly.

2.2 Targeting

To avoid inefficient targeting, the program combined geographical targeting with a Proxy Means Test (PMT) mechanism. With respect to the geographical targeting, the program was first launched in the poorest districts within the poorest governorates in Egypt. The PMT has been used to identify the poor within the selected districts, based on selection criteria and a set cutoff score, based on the poverty line derived from Egypt's Household Income, Expenditure and Consumption Survey (HIECS) for 2012/13. In addition to the PMT, both Takaful and Karama have other categorical selection criteria; Takaful requires that beneficiaries have children and Karama requires that beneficiaries be elderly and/or disabled, or (added later) orphaned.

The PMT uses poverty predictors from the 2012–2013 Household, Income, Expenditure and Consumption Survey (HIECS). A PMT formula was developed based on the following criteria:

- Household head characteristics (e.g., gender, marital status, age, education, work status)
- Household members characteristics (e.g., number of elderly, children, members enrolled in education, illiterate, employment situation)

[6] Starting July 2017, households receive EGP60 for each child under 6 years old, EGP80 for each child in primary education, EGP100 for preparatory education, and EGP140 for secondary education; again with a maximum of three children.

[7] The program now covers cover orphaned children, as well, with a benefit size of EGP350 per beneficiary. Starting July 2017, the size of the transfer for elderly and disabled individuals has increased to EGP450 per beneficiary.

- Money transfers received by household (e.g., pensions, remittances, allowances)
- Housing unit characteristics (e.g., type of unit, ownership, ceiling, flooring, water connection)
- Ownership of assets (e.g., private car, internet connection, refrigerator)

The PMT formula is based on a regression with the logarithm of per capita annual expenditure (adjusted to regional differences, price variations and age differences of household members) as the dependent variable (El-Sheneity, 2014). Different PMT models are used for the different geographic regions in Egypt; namely urban Upper Egypt, rural Upper Egypt, urban Lower Egypt, rural Lower Egypt, Metropolitan, and Frontier governorates, however the same PMT eligibility threshold is used for all regions. The original eligibility threshold was 5.003, but it has subsequently been adjusted several times. The current threshold for Takaful is 4.500.

The program was rolled out in a phased approach, across Egypt's districts and governorates. The original plan was to roll out over three waves, to enroll 1.5 million households by the end of 2017. However, TKP managed to accelerate rolling out to the originally planned three waves, enrolling more people than targeted in a shorter duration.

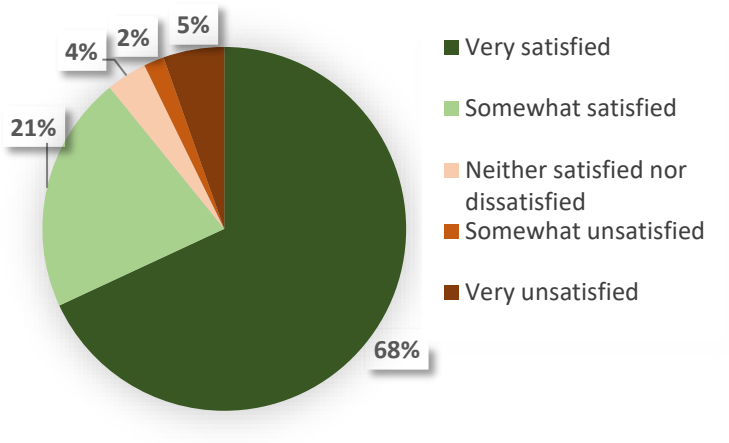
The roll out phases are as follows: The first wave was launched in the poorest 19 districts of 6 governorates in Upper Egypt (Suhag, Assiut, Luxor, Qena, Aswan, and Giza); where poverty rate is 50 percent and above. Through the second wave, the program expanded to districts where poverty rate is 30 percent and above. In the third wave, the program was expanded further, covering districts where poverty rate goes down to 17.9 percent and above. Finally, wave four opened registration to all districts (MoSS biannual report, Dec 2016).

2.3 Program experience

TKP beneficiaries' experience with the program seems to have improved over time. In 2016, an independent process evaluation was conducted to evaluate the program's implementation, and several issues were identified during the early phases of the program. However, our analysis shows that even though some of these issues are still present, improvements have been made since the majority of program registrants and applicants had a positive experience with the program.

Within the nationally representative sample of households with children that we surveyed (total number of households 1,692), we found 166 Takaful and Karama beneficiaries. We report on the program experience of this group which is representative of the program population. Sixty-eight percent of the program beneficiaries in our sample are very satisfied with the program, and about 90 percent are either very satisfied or somewhat satisfied with the program (Figure 2.3.1). The average transfer amount in the past year is EGP 634, but the average beneficiary has only received 7 transfers, as many beneficiaries were added to the program recently (average values do not include zeros for household that did not receive transfers). There were very few difficulties with receiving the transfers: out of 166 beneficiary households, only 14 mentioned difficulty with the transfer receipt.

Figure 2.3.1 Program satisfaction for both *Takaful and Karama* beneficiaries



A separate process evaluation was conducted that concluded that program communication needed improvements, particularly with non-beneficiaries. As per the process evaluation, the reasons for rejection were not communicated clearly to non-beneficiary applicants. Proper communication was also needed when some cards were cancelled, following the secondary check for eligibility that the program conducts, as the beneficiaries were not informed why their cards stopped. Our impact evaluation data affirm those issues raised in the process evaluation, as 85 percent of those who were rejected did not know the reason for which they were rejected.

Furthermore, the process evaluation also studied the registration process and the enrollment of beneficiaries. The study concluded that the application process is long and that households face delays in the issuing of their cards. The verification documents for the eligibility are numerous, and some of them were difficult to get, such as getting medical certificates. Determining which households own land was also one of the difficulties met by MoSS. Sometimes the lack of resources would also delay the process, while issuing the cards. Some of these issues have been reported too in our survey. However, our survey data shows that 63 percent of program applicants did not face any challenges while applying. Households that ended up being beneficiaries had somewhat more challenges than households that did not end up as beneficiaries, which may be because the non-beneficiaries were excluded or gave up early in the application process. Applicants who did not end up as beneficiaries, however, were more likely (about 8 percent of applicants) to say that there was insufficient explanation of the process. (Table 2.3.2).

The program experience in terms of transfers is also positive. There were almost no reports of problems with the transfers in our survey.

Table 2.3.1 *Takaful and Karama* program transfer amounts and number, nationally representative sample

	Mean	Standard deviation
Average amount (EGP) of TKP payment since March 2015	666.5	289.9
Total value (EGP) of TKP payments since March 2015	4,419.9	2,861.3
Total number of TKP payments received since March 2015	6.884	3.812
Average amount (EGP) of TKP payment since July 2016	633.9	264.9
Total value (EGP) of TKP payments since July 2016	3,689.8	2,006.5
Total number of TKP payments received since July 2016	6.297	3.274
TKP income from most recent monthly payment per AEU	135.4	69.78
Observations	166	

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; TKP = Takaful and Karama Program.

Table 2.3.2 *Takaful and Karama* program application experience, nationally representative sample

	Non-beneficiary applicants		Beneficiaries	
	Mean	Standard deviation	Mean	Standard deviation
Social workers not helpful in explaining the needed documents	0.0787	0.270	0.0542	0.227
Getting the needed documents requires a lot of money	0.0787	0.270	0.0723	0.260
Getting the needed documents requires traveling	0.0305	0.172	0.0422	0.202
Getting the needed documents is difficult and time consuming	0.0812	0.274	0.0843	0.279
There were long queues for the program application	0.2310	0.422	0.3430	0.476
The application is time consuming	0.0863	0.281	0.0904	0.288
Other challenges	0.0228	0.150	0	0
No challenges met during application to TKP	0.6520	0.477	0.5720	0.496
Observations	394		166	

Note: TKP = Takaful and Karama Program.

3. IMPACT EVALUATION DESIGN

3.1 Overview

Impact evaluation in general faces the challenge of trying to rigorously separate out the amount of difference caused by the program being evaluated from differences caused by other factors. This is what we refer to strictly as the "impact" of the program. It is not possible to simply compare Takaful and Karama beneficiaries to non-beneficiaries to measure this impact, as we know that the beneficiaries are generally poorer than non-beneficiaries.

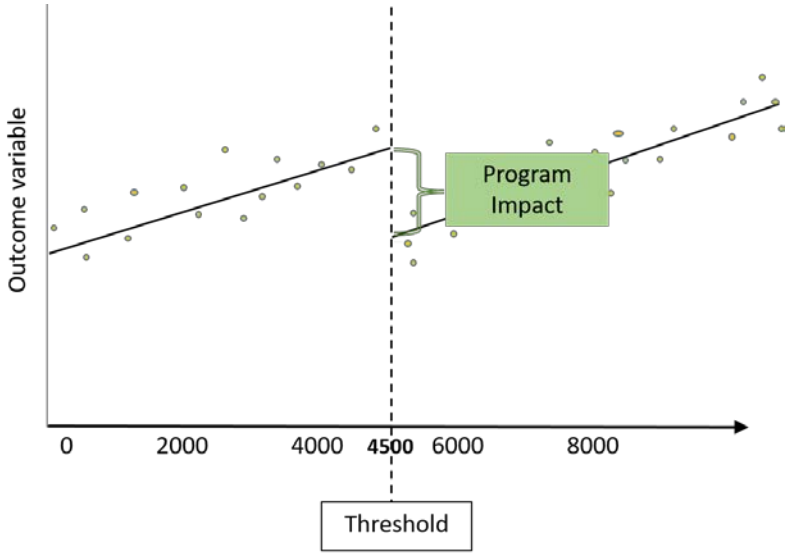
There are several common strategies that economists use to identify impact. Ideally, we would randomly assign some households during a pilot period to receive the program and a similar set of households not to receive the program (Randomized Control Trial). The households which do not receive the program represent our control group to which the treated households can be compared, and since the two groups were initially similar, any difference will be caused only by the program. Another common approach is to survey households before starting the program and then compare beneficiary outcomes before the intervention to beneficiary outcomes after the intervention, controlling for a time trend established in non-beneficiary households (Differences-in-Differences). Because Takaful and Karama had already started by the time we designed the impact evaluation strategy, neither of these first two approaches was feasible.

A third common approach is to try to find a group of non-beneficiary households that are similar to beneficiary households as far as a set of observable characteristics (Matching). Matching techniques work best when we are confident that households in the beneficiary and non-beneficiary groups are also similar with regards to non-observable characteristics. In Takaful and Karama, we expect that households that registered for the program are likely to be quite different from households that did not register in both observable and non-observable ways. For example, between two women who look similar on paper, the fact that one woman went to the effort to get the documents together and apply for the program means that she may be more organized and have more initiative than the woman who did not apply, so we do not know if her family is better-off because of the program or because she does a better job in general at managing her household.

This concern about unobservable differences led us to concentrate on comparing non-beneficiary households to beneficiary households only among households that registered for Takaful and Karama. Having decided to concentrate on registrants, we notice that a very large number of observable variables are already used in the PMT score and that the PMT score is the primary factor determining if a household is in the program. This implies that it is not feasible to find a set of non-beneficiary households that registered for the program and are similar to beneficiary households in terms of having identical observable characteristics because if they were similar enough to use for matching, they would have PMT scores similar to beneficiary households and they would be in the program.

There is a fourth strategy for impact evaluation, regression discontinuity (RD), that works well in the situation described. The basic idea is that, while it is hard to find non-beneficiary registrant households that are similar to all beneficiary households, we can compare households just below and just above the cutoff score. Figure 3.1.1 shows the intuition behind this strategy. While this strategy is very effective at determining the true impact of the program as distinct from the influence of any other factors, and in the case of this impact evaluation was our only option, the disadvantage is that it estimates that impact only among households near the cutoff.

Figure 3.1.1 Intuition behind regression discontinuity design



Source: Authors' illustration.

The remainder of this chapter provides details about the RD specifications used for this impact evaluation and tests used to ensure that the comparison between households just above and just below the threshold is valid for estimating an impact in this particular case. Readers less interested in the technical details may skip to chapter 4.

3.2 Justification for regression discontinuity design

As explained above, the Takaful and Karama program was targeted using a household-level Proxy Means Test based on responses to questions on a registration form verified using government administrative data. The use of a Proxy Means Test to create an indicator of well-being for program registrants and use of a threshold PMT score to determine program eligibility should provide the conditions needed to measure impact using an RD design and related methods. Furthermore, the PMT score is continuous and our sample was designed to include a lot of observations on either side of the threshold. These characteristics also ensure the right conditions for RD. Regression discontinuity designs construct a counterfactual for program beneficiaries' outcomes by comparing treated households just above the threshold to control households just below the threshold.

In some cases (including TKP), the PMT score is not a perfect predictor of participation in the program. That is, some households above the threshold may end up participating in the program and some households below the threshold may not end up participating in the program. In these cases, instead of using a "sharp" RD design (where the score perfectly predicts participation), a "fuzzy" RD design is used. Provided that the use of a threshold PMT score is a substantial determinant of program eligibility, even a fuzzy RD design is a more effective methodology for measuring program impact than other methods, such as matching. In fact, strict use of the PMT renders matching methods invalid because program eligibility becomes a deterministic function of observable variables, violating the "overlap" identifying assumption of matching methods (Heckman, Ichimura, and Todd 1997). Even an imperfect application of a PMT threshold score for determining eligibility can render matching unreliable. The RD approach should be feasible under two conditions: (i) that determination of eligibility for the TKP program based on the threshold PMT score is a substantial determinant of actual beneficiary status and (ii) that household level data on the components of the PMT, the PMT score, the eligibility determination made by MoSS, and identifying information for applicant households are available from MoSS or can be reliably captured during the

baseline survey. Each of these conditions is met for this impact evaluation. Additionally, other methods such as matching would require data on household characteristics before the program began. In this evaluation there was no baseline, so the data required for matching are not available.

As described above, the components of the PMT include housing characteristics, asset ownership, number and ages of household members, and education level and employment status of the household head and household members. The formula relies on 85 different variables, some of which could be checked using administrative data and others of which were randomly verified with field visits, so it is unlikely that applicants just above the cutoff had manipulated their answers to get over the eligibility threshold. The exact formula for calculating the PMT differed by region, but the cutoff values were constant for all regions. Households with higher scores are better off, so households with a PMT score below the threshold selected by MoSS were determined to be eligible for the program. The thresholds for eligibility in Takaful and Karama were revised several times as follows:

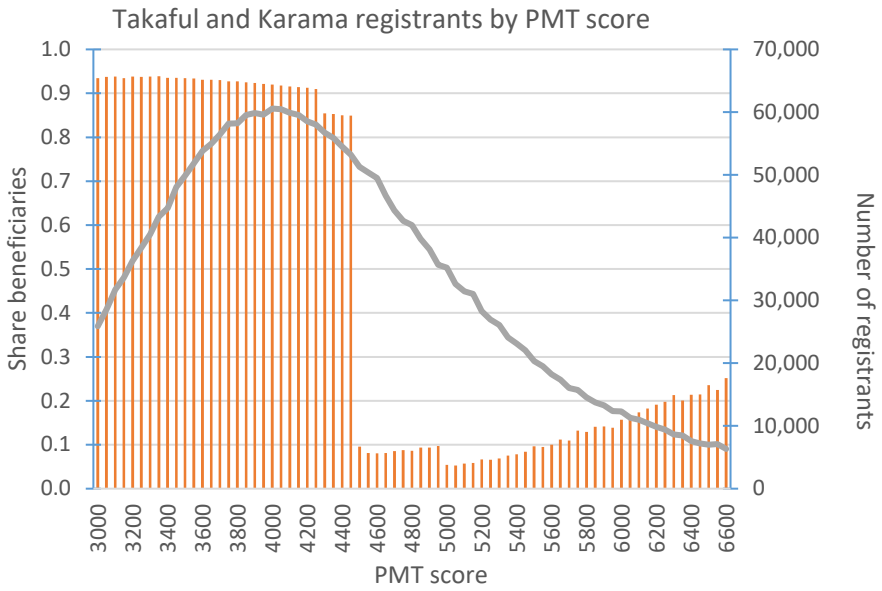
Table 3.2.1 *Takaful* proxy means test score thresholds

Registration period	Dates	Takaful threshold
1	March to November 2015	5003
2	November 2015 to September 2016	4296
3	September 2016 to April 2017	4500
4	April 2017 to present	4500 for male-headed households; 6500 for female-headed households

Table 3.2.2 *Karama* proxy means test score thresholds

Registration period	Dates	Karama threshold
1	March to November 2015	5003
2	November 2015 to May 2016	5063
3	May 2016 to April 2017	7203
4	April 2017 to present	8500

Figure 3.2.1 Beneficiary status in the proxy means test score distribution



Source: Administrative data from MoSS, received June 2017. Includes only registrants up to April 2017 due to time required to update the database after receiving registration forms.

The grey line in Figure 3.2.1 shows the distribution of Takaful and Karama registrants as of April 2017 by PMT score (the top and bottom 5 percent of registrants are excluded for presentation purposes). The majority of registrants have scores between 3000 and 6600, with a median score of 4313. The orange bars show the proportion of registrants in each bin who were Takaful and Karama beneficiaries. We can visually see that there are sharp drops in the percentage of registrants who were accepted to the program and that these drops correspond to the eligibility thresholds, with the most significant drop in probability of participation being the current threshold of 4500.

In addition to the drop at the current threshold, we also see small but sharp changes in the probability of participation at the previous thresholds of 4296 and 4003. MoSS officials explained that when the threshold was updated, the new threshold was retroactively applied to all households that had registered previously. In the administrative data shown above, all households with PMT scores below 4500 are eligible for program participation. The fact that the 4296 threshold and the 5003 threshold still have an impact on the probability of participation can be explained by the fact that applying the threshold retroactively is not as easy in practice as applying the threshold to new registrants. The household may be difficult for social unit workers to locate if there were errors in recording the household address and contacts, and the applicant may be resigned to not participating and not follow up on their status as actively as they would if they had just applied.

With these changes in the thresholds and eligibility over time, there is slightly more complexity in estimating treatment effects. We thus generalize the fuzzy RD into an instrumental variables (IV) approach following Angrist and Lavy (1999). This instrumental variable approach is a generalization of fuzzy RD. It is a two-step estimation strategy whereby in the first step, program participation is predicted using the PMT score and the thresholds and then, in the second step, the predicted participation is used to estimate impacts on outcome variables (see more details below). The fuzzy RD and IV approaches used here share many similarities and will provide similar impact estimates if impacts are driven primarily by households whose PMT score is around the 4500 threshold. The IV method is more effective at measuring impacts on beneficiaries registered in all

three waves of enrollment and whose beneficiary status was determined at any of the three thresholds.

3.3 Generalized instrumental variables (IV) estimation strategy

Generalizing from the approach of Angrist and Lavy (1999), we use the multiple regression discontinuities as instruments for program participation. This approach provides an estimate of the average impact of the program on beneficiaries near the threshold in each of the enrollment periods.

The first-stage estimating equation is:

$$P_{ics} = \alpha_1 elig1_{ics} + \alpha_{b2} eligB2_{ics} + \alpha_2 elig2_{ics} + \alpha_{b3} eligB3_{ics} + \alpha_3 elig3_{ics} + \alpha_4 eligB4_{ics} + \gamma Score_{ics} + \delta_s + \epsilon_{isc} \quad (1)$$

Observations are indexed by household (*i*), community (*c*), and strata (*s*).

The second stage estimating equation is:[8]

$$Y_{ics} = \hat{P}_{ics} + \partial_s + \eta_s \quad (2)$$

The dependent variable *P* in the first stage equation (1), is program-participation-based administrative data (see detailed discussion below). The six eligibility indicators *elig1, eligB2, elig2, eligB3, elig3,* and *eligB4* are binary variables referring to the household score relative to the threshold at different points in time, and we include a linear trend of the running variable (*Score)* which is the initial PMT score that the household was assigned. Approximately 2 percent of our sample also have updated PMT scores due to a verification or appeals procedure. Because this updating might be endogenous to participation status, we concentrate on the initial PMT score for our regressions. ∂_s are strata dummy variables that account for the nature of the stratified sampling of the data and are included in both the first and second stages.

elig1 is a binary variable indicating that the household registered in time period 1 and was eligible according to the active threshold at the time of registration. Likewise, for *elig2* and *elig3.* However, because thresholds were applied retroactively, we also have *eligB2* which indicates eligibility according to the period 2 threshold for households that applied in period 1, *eligB3* which indicates eligibility according to the period 3 threshold for households that applied in period 1 or 2, and *eligB4* which indicates eligibility according to the period 4 threshold for households that applied in period 1, 2, or 3. Since the threshold actually moved down (becoming more restrictive), between period 1 and period 2, we do not expect to find a positive coefficient on *eligB2.* In fact, we find a negative coefficient, reflecting that, compared to households with similar PMT scores, households that enrolled in period 1 were less likely overall to participate in the program than households that enrolled in later periods.

[8] Note that we do not include household characteristics in the regression for several reasons. First, the PMT score is included (and must be for the model to be correctly specified) and captures many of the household characteristics we may wish to include already, so these would be highly correlated. Additionally, the PMT score includes household characteristics before the program began; our survey data are contemporaneous with the outcome variables and would thus be endogenous. Finally, a key assumption for our estimation strategy is that the households just above and just below the threshold are similar in household characteristics. Annex II Tables A2.1 – A2.6 provide evidence that this is indeed the case. Household characteristics may help control for differences between beneficiaries and non-beneficiaries as we move away from the threshold, and they may improve precision if they are correlated with the outcome variable (as in any treatment effects model). However, as Imbens and Lemieux (2008) discuss, they very rarely change treatment effects estimates in the RD context. We add a limited number (20) household characteristics that can be plausibly considered unrelated to program participation (for example, size of the household, education level of household head) as controls to the regression and find that there are no differences in impact estimates. Annex II Tables A2.16 – A2.19 provide these estimates.

We experimented with different specifications for the first stage, such as including second and third order polynomials for the relationship with the running variable (PMT score), adding interactions between the running variable and the eligibility cutoffs and adding separate controls for time of registration. Since these additional instruments were not found to be statistically significant predictors of participation and did not change the overall fit of the first stage regression, our preferred specification is restricted to a linear relationship with the running variable plus the six eligibility indicators as mentioned above.

The dependent variable in the first stage is program participation. Because there was some movement into and out of the program during the period of data collection, we need to define program participation for the purpose of this analysis. Table 3.3.1 shows the difference in program participation status from the initial administrative data used for sampling when compared to the household survey self-report and the final administrative data. Since there are delays in updating the administrative data, we decided to use the final administrative data as a guide, and adjust based on the household survey as follows: if the household is marked as suspended in the final administrative data but had received a Takaful and Karama payment in May or later of 2017 according to the household survey, it is treated as a participant for the analysis. If the household is marked as a beneficiary in the final administrative data but did not receive a first payment until July of 2017 or later according to the household survey data, it is treated as a non-participant for the analysis. The final column in Table 3.3.1 shows the number of Takaful beneficiary and non-beneficiary households according to the definition used for the analysis. Table 3.3.2 provides further details on the Takaful beneficiary and non-beneficiary samples used in the analysis. Table 3.3.3 shows the number of Karama beneficiary and non-beneficiary households according to the definition used for the analysis. Table 3.3.4 provides further details on the Takaful beneficiary and non-beneficiary samples used in the analysis.

Table 3.3.1 Program participation within the *Takaful* impact analysis sample

	Initial administrative data, April 2017	According to household survey	Final administrative data, Nov. 2017
Beneficiary	2,827	Confirm: 2,606	Remain in: 2,206 Suspended: 621
		Do not self-report as beneficiary: 221	
Non-beneficiary	2,901	Confirm: 2,367	Remain out: 2,206 Join: 71
		Self-report as beneficiary: 534	

Table 3.3.2 Number of beneficiary and non-beneficiary households in *Takaful* analysis

	Number of households	Details
Beneficiary	2,190	• 1,917 consistently considered beneficiary • 227 originally in administrative data and suspended but self-report as still receiving payments in June • 24 consistently in administrative data but do not self-report as beneficiary • 16 added in administrative data and self-report as receiving payments • 6 missing in November administrative data but self-report as receiving payments • 4 added and suspended in administrative data but self-report as receiving payments
Non-beneficiary	3,813	• 2,827 consistently not a beneficiary • 499 self-report as beneficiary but not receiving payments and never in the administrative data (probably confused about their status) • 298 dropped according to November administrative data and do not self-report as receiving payments • 165 considered beneficiary in administrative data but self-report no payments or payments only started • 43 added in the administrative data but self-report as not receiving payments yet

Table 3.3.3 Program participation within the *Karama* impact analysis sample

	Initial administrative data, April 2017	According to household survey	Final administrative data, Nov. 2017
Beneficiary	261	Confirm: 199	Remain in: 205 Suspended: 28
		Do not self-report as beneficiary: 34	
Non-beneficiary	233	Confirm: 78	Remain out: 103 Join: 158
		Self-report as beneficiary: 183	

Table 3.3.4 Number of beneficiary and non-beneficiary households in *Karama* analysis

	Number of households	Details
Beneficiary	223	• 168 consistently considered beneficiary • 5 originally in administrative data and suspended but self-report as still receiving payments in June • 4 consistently in administrative data and report as not member but list payments • 43 added in administrative data and self-report as receiving payments • 2 added and suspended in administrative data and self-report as receiving payments • 1 added in administrative data and missing report on payments
Non-beneficiary	289	• 57 consistently not a beneficiary • 50 do not self-report and only listed in Nov administrative data • 91 self-report as beneficiary but not receiving payments • 62 consistently not in the administrative data and self-report as beneficiary but without payment (probably mistaken) • 11 dropped in administrative data and do not self-report payments • 18 consistently in administrative data but do not report beneficiary status or payments

Table 3.3.5 displays the results of the first stage of the IV estimation process for Takaful. We see that all of the eligibility variables are strong predictors of participation in the Takaful program, with the exception of female-headed households eligible for Takaful in t4. The first-stage equation is thus very strong and has a high first-stage F-statistic. Table 3.3.6 displays the result of the first stage

of the IV estimation process for Karama. Here as well, the eligibility variables are strong predictors of participation in the Karama program. The first stage is also strong and also has a high F-statistic. We use two eligibility indicators as valid instruments: first, households that were eligible for Karama in time period 3 (May 2016-April 2017 when the threshold was 7203, the longest window of enrollment of any PMT threshold for Karama) and also registered in time period 3; and second, households that were eligible for Karama in time period 3, yet registered before May 2016. These two instruments are the strongest predictors of participation in the Karama program. Moreover, our sampling procedure for Karama assigned greater weight in random selection to households near the 7203 threshold, such that the final Karama sample includes households with PMT scores between 7000 and 7400.

Table 3.3.5 First stage regression – participation in the *Takaful* program

	Household is Takaful beneficiary
Eligible for Takaful in t1 and registered in t1	0.187***
	(0.037)
Eligible for Takaful in t2 and registered in t1	-0.131***
	(0.048)
Eligible for Takaful in t2 and registered in t2	0.058**
	(0.025)
Eligible for Takaful in t3 and registered in t1 or t2	0.538***
	(0.022)
Eligible for Takaful in t3 and registered in t3	0.610***
	(0.023)
Female-headed household eligible for Takaful in t4	0.007
	(0.012)
Proxy means test (PMT) score (*1,000)	-0.032
	(0.033)
Constant	0.167
	(0.157)
Observations	6,003
R^2	0.381

Note: ** p < 0.01, *** p < 0.001.

Table 3.3.6 First stage regression – participation in the *Karama* program

	Household is Karama beneficiary
Eligible for Karama in t3 and registered in t3	0.352***
	(0.066)
Eligible for Karama in t3 and registered in t1 or t2	0.176***
	(0.060)
Proxy means test (PMT) score (*1,000)	-0.001***
	(0.000)
Female-headed household (admin data)	-0.010
	(0.036)
Constant	5.368**
	(2.089)
Observations	512

Note: ** p < 0.01, *** p < 0.001.

3.4 Fuzzy regression discontinuity (RD) estimation strategy

The RD estimation strategy, as described above, is a local linear regression model that identifies impacts around the threshold of participation in the program. The estimating equation is as follows:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 PMTN_i + \beta_3 T_i * PMTN_i + \delta_s + \epsilon_i \quad (3)$$

where Y_i is the outcome variable, *i* indexes individuals, T_i is the treatment indicator, and $PMTN_i$ is the PMT score normalized to equal zero at the threshold $PMTN_i = PMT_i - c$. δ_s are the strata dummy variables. In this specification, β_1 is the parameter that measures the impact of the program. It represents the difference in the intercepts at the threshold of the two lines on either side of it. To estimate this equation, we use the "rdrobust" package in Stata, developed by Calonico, Cattaneo, and Titiunik (2014).

There were two main decisions to be made when estimating this equation. The first is one that all RD designs must make: the bandwidth, or the distance between the threshold and the minimum and maximum PMT score to include in the estimation sample. The narrower the bandwidth, the more "credible" is the estimated parameter because households closer to the threshold on either side will be more similar. However, the narrower the bandwidth, the less power your estimation has to detect effects due to small sample sizes, and the less representative (more local) they are.

The command *rdrobust* in the Stata statistical software used for this analysis automatically selects bandwidth by minimizing the mean squared error of the regression. It is also possible in this command, however, to specify a particular bandwidth. We examined a number of different bandwidths. The automatic bandwidth selected by rdrobust was extremely narrow. This was because our sampling strategy oversampled households near the threshold, so the maximum bandwidth was already fairly narrow. When rdrobust was selecting the "optimal" bandwidth, it was extremely narrow and results were not robust to minor changes in the bandwidth. This indicated that the automatic selection of the bandwidth was not the right method since our sample was already narrow (most studies do not have the option to oversample near the threshold, but instead must use administrative data with many households all across the whole PMT score). As a result of the unstable and thus unreliable results, we decided to specify our own bandwidth of 600 (that is, PMT scores 600 above and below the threshold). This approach uses the entire sample, but because it is such a narrow sample already, this was a sensible approach. We did test sensitivity to changes in bandwidth (for example, 550, 500), and the results were robust and stable. This means that the selection of a bandwidth of 600 is valid.

The second decision, which was particular to this case, was at which threshold(s) to estimate impacts. As shown in Table 3.2.1, the thresholds changed over time. One option was to estimate impacts at all three thresholds and that would allow us to gain insight into whether the impacts were the same or differed across the PMT score. To perform this procedure correctly, we would need to have non-overlapping samples (the sample included to the left of the 4500 threshold could not be included in the sample to the right of the 4296 threshold, for example). However, with the three thresholds (4296, 4500, and 5003) quite close together, we had extremely small sample sizes particularly for the 4296 and 5003 thresholds. Therefore, we would not have been able to draw conclusions from those. Furthermore, Figure 3.2.1 shows that the majority of the jump in program participation occurs at the 4500 (most recent) threshold. In our sample, this makes sense because the survey was done when this was the valid threshold. As a result, we decided not to run multiple RD regressions with different thresholds and to focus on the 4500 threshold to maximize on both power and accuracy.

Annex IV gives the results of specification tests which demonstrate the validity of the RD regression by ensuring that households on either side of the cutoff are sufficiently similar and that there is no evidence that anything other than probability of program participation varies at the cutoff. Tables A2.1-A2.6 show that of 20 household characteristics all but one show a statistically significant difference for beneficiaries versus non-beneficiaries. Therefore, the households on either side of the cutoff are extremely similar and provide valid comparison groups.

4. SAMPLE AND SURVEY DATA

4.1 Impact analysis sample

The sampling strategy for the TKP Impact Evaluation was designed to provide a representative sample of Takaful and Karama households with PMT scores near the thresholds for a RD approach to impact analysis. The number of households in the sample near the two program thresholds by region is captured in the Appendix in Table A1.2.

Stratification for the sample selection was based primarily on region: Metropolitan (greater Cairo and Alexandria), Upper Rural, Upper Urban, Lower Rural, and Lower Urban. These regions were used in the process of PMT eligibility determination for Takaful and Karama, and the PMT formula used differed by region. In the case of the Upper Rural region of Egypt, we also stratified by governorate (9 governorates in Upper Rural). This is because two thirds of the Takaful and Karama registrants resided in the Upper Rural region. As such, we define 14 strata: five strata for each region excluding Upper Rural and nine strata for Upper Rural.

We sampled village clusters within the 14 region-governorate strata using simple random sampling, where the number of clusters per stratum was proportional to the share of registrants in each stratum, and restricting our selection to clusters in which there were a sufficient number of registrants near the threshold. The clusters were defined as either Takaful-only clusters (325) or mixed Takaful and Karama clusters (75), so that our Karama analysis subsample would be as concentrated as possible geographically in spite of the small number of households participating in this program.

Within each village, 20 households were randomly selected for inclusion in the survey if they were within 600 points of the current Takaful threshold score of 4500 or 200 points of the Karama threshold of 7203. On average, we selected 10 eligible and 10 ineligible households, and for Takaful households, we weighted the probability of selection such that households within 200 points of the current threshold of 4500 are 2.5 times more likely, and households within 200-400 points of the cutoff are 1.5 times more likely to be selected than those that are 400 to 600 points from the cutoff.

We purposefully selected more households than the 16 households per cluster that our power calculations had suggested would be necessary, knowing that there was a risk of not being able to locate all the households in the registrant sample.

Table 4.2.1 shows the distribution of our sample of beneficiaries by region and by enrollment period.

Table 4.2.1 Profile of beneficiaries by region and registration date

	Registration period			
Region	**Household registered in T1 (by Nov. 2015)**	**Household registered in T2 (Nov. 2015 to Sept. 2016)**	**Household registered in T3 (after Sept. 2016)**	**Total**
Metropolitan	5	15	55	75
Lower Urban	0	5	38	43
Lower Rural	0	2	166	168
Upper Urban	52	167	48	267
Upper Rural	243	960	420	1,623
Frontier	0	0	14	14
Total	300	1,149	741	2,190

4.2 Targeting analysis sample

In addition to the impact analysis sample, approximately 16 households per community (meaning village) were surveyed in 100 randomly selected communities across Egypt to construct a nationally representative sample of households with children in Egypt. The purpose of this nationally representative sample is (i) for targeting analysis and (ii) to identify where the local average treatment affect that we measure is located within the distribution of consumption of the Egyptian population. The second objective will be more fully realized through upcoming (early 2018) qualitative data collection from within this sample.

For this nationally representative sample, we took advantage of access to the demographic household survey (DHS) sampling frame from 2014. We stratified a governorate proportional to share of the population and then drew a random sample of clusters from the DHS frame primary sampling units in this governorate. We then randomly sampled sufficient households per cluster to arrive at an expected 16 households with children under 18 in our sample. Households that were selected but did not include children under 18 were not surveyed.

4.3 Data collection

Data was collected by the survey firm El-Zanaty and Associates between July 15 and August 31, 2017, with some revisits of households that could not be reached in early September. The field staff consisted of 8 teams, of 1 male interviewer and 4 female interviewers each. Households were interviewed by female interviewers, with male interviewers collecting the community questionnaire.

Our intended sample for the Takaful and Karama analysis components consisted of 7,996 households. Of these, 1,144 households could not be located based on the address data in the Takaful and Karama registration form, even with the help of local MoSS social unit staff (14.3 percent). An additional 261 households were visited but no household members could be located, and 70 households were not surveyed due to other reasons including declining to participate in the survey, no capable respondent being identified, being part of another household already in the sample, or the registrant having passed away. Considering only households for which there was no error in the location information, the overall response rate was 95.2 percent.

Table 4.3.1 Final sample size

	Takaful sample	Karama sample	Nationally representative sample
Purpose	Measuring the impact of Takaful transfers	Measuring the impact of Karama transfers	Targeting analysis
Sample selection	Households in the registrant database with PMT scores from 3900-5100	Households in the registrant database with PMT scores from 7000 to 7400 and at least one elderly or disabled member	Random selection of households with at least one child under 18 years of age from communities in the DHS sampling frame
Households	5,326	1,215	1,692

Note: DHS = Demographic and Health Survey; PMT = proxy means test.

4.4 Survey

Data was collected between July 15 and August 30, 2017 by the El-Zanaty and Associates survey firm. There was a household survey and a community survey. Data was captured using a computer-assisted personal interview system.

The household survey instrument consisted of the following modules:

A. Household roster	– including ages, educational attainment, and disability status
B. Children's schooling	– including enrollment, grade level, school type, and tuition payments
C. Employment	– including time spent in small business or agriculture, unemployment, time spent in wage employment, sector, and average monthly wage
D. Housing conditions	– including number of rooms, building materials, water and sanitation facilities
E. Household assets, debt, and income from sources other than wages	
F. Household program participation	– including both Takaful and Karama participation and transfers from other government programs
G. Agriculture	– area of land owned and cultivated
H. Shocks	– description of type and severity of shocks in past three years and coping strategy employed
I. Food consumption	– seven-day recall period
J. Non-food consumption	– thirty-day recall period
K. Dietary diversity	– for mother/caretaker, one child ages 6-23 months, and one child ages 24-59 months
L. Health	– capabilities module for household members with a disability – healthcare utilization for any members who were ill or injured in the past 30 days – immunization status for children under five years – fever and diarrhea in past four weeks for children under six years
M. Women's use of antenatal and postnatal care	– only for women with children under five years
N. Infant and child feeding knowledge	– for all women with children under 18 years
O. Infant and young child feeding practices	– only for women with child under two years
P. Subjective perceptions of welfare and aspirations	– includes ladder question, module on self-efficacy, and module on locus of control
Q. Intrahousehold decision-making	– who makes decisions on various aspects of household affairs
R. Anthropometry	– for woman or caretaker of children under 18, one child 6-23 months, and one child 24-59 months
S. Ravens test	– for one randomly selected child aged 5-18 years

Households were read an informed consent statement which emphasized that individual-level data will not be shared with MoSS or have any impact on their program participation.

The community questionnaire included responses from an informed community leader on shocks faced recently by the community as a whole as well as travel time to the nearest social unit at which Takaful and Karama registrations are processed. An enumerator also visited this social unit to record open hours, time needed for processing applications, and a description of the registration campaign from social unit officers.

As this research involved human subjects, Internal Review Board approval was sought and received through the International Food Policy Research Institute's Internal Review Board. Questionnaires and a protocol for data collection and protection were submitted along with certificates in data collection from human subjects for all principal investigators and researchers involved.

5. SUMMARY STATISTICS FOR THE IMPACT ANALYSIS SAMPLE

This chapter serves to provide a picture of the impact evaluation sample. We describe the sample in terms of people's experience with the program, program implementation and transfer payments, basic household demographics, transfers, and experience with the Takaful and Karama program and provide summary statistics on the outcome variables included in this report.

5.1 Program experience and transfers

Most beneficiaries have joined the program recently, which is reflected in the average length of program experience for households in our sample. It is important to keep this in mind, when looking at the impact results, as long-term impacts may be not evident yet. The average number of payments received from March 2015 to the time of the survey by Takaful beneficiaries is 7.88 and the total number for Karama beneficiaries is 6.18 (Table 5.1.1). The average amount of the payment since March 2015 is EBP 558 for Takaful beneficiaries and about EBP 441 for Karama beneficiaries. The total value of payments since March 2015 is EBP 4,506 per household for Takaful beneficiaries and EBP 2,592 per household for Karama beneficiaries. Similar statistics are also reported for the number and amount of payments since July 2016. These statistics show that Takaful beneficiaries get more transfers of higher value than do Karama beneficiaries. Takaful beneficiaries have been in the program for about 11 months on average, and Karama beneficiaries have been in the program for about 8 months on average. According to the administrative data, the average duration (in months) in the program is only slightly lower than the self-reported results from the household survey.

Table 5.1.2 shows Takaful and transfer income received by Takaful beneficiaries and non-beneficiaries, as well as Karama beneficiaries and non-beneficiaries. As expected, the income from the most recent monthly payment, both total and per adult equivalent (AEU), is substantially higher among beneficiaries than non-beneficiaries for both programs. The reason that the non-beneficiaries have some income from TKP may be because of recall error or errors of inclusion into the programs. As described below, we prioritized administrative data when there was a discrepancy between household reporting and administrative reporting of beneficiary status. There are not large differences between Takaful and Karama beneficiaries and Takaful non-beneficiaries in terms of transfer income received from other sources. However, Karama beneficiaries do report much higher transfer income from other sources. Note that Takaful non-beneficiaries can potentially include Karama beneficiaries and vice versa, which explains the TKP income received by non-beneficiary groups.

Table 5.1.1 Summary statistics of *Takaful and Karama* transfer amounts

Variable	Takaful beneficiaries	Karama beneficiaries
Total number of TKP payments received per household since March 2015	7.88	6.18
	(3.45)	(3.99)
Average amount (EGP) of TKP payment since March 2015	558.23	440.90
	(188.18)	(171.07)
Total value (EGP) of TKP payments since March 2015	4,506.20	2,592.30
	(2,808.66)	(1,765.87)
Total number of TKP payments received since July 2016	7.18	5.92
	(2.44)	(3.49)
Average amount (EGP) of TKP payment per household since July 2016	529.20	437.89
	(166.15)	(167.42)
Total value (EGP) of TKP payments per household since July 2016	3,761.16	2,453.01
	(1,600.44)	(1,480.04)
Number of months in TKP since first acceptance (as at September 1, 2017, from household survey)	11.24	8.04
	(6.27)	(4.60)
Number of months in TKP since first payment (as at September 1, 2017, from household Survey)	10.76	7.84
	(6.23)	(4.72)
Number of months in TKP since first payment - Administrative data	9.68	7.75
	(5.77)	(4.26)
Number of households	2,190	223

Note: EGP = Egyptian pounds; TKP = Takaful and Karama Program. Standard deviations are reported in parentheses.

Table 5.1.2 Summary statistics of *Takaful* and other public/private transfer income

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
TKP income from most recent payment as a share of monthly expenditure	0.233	0.056	0.284	0.182
	(0.124)	(0.146)	(0.190)	(0.266)
TKP income (EGP) from most recent monthly payment	432.51	102.26	419.04	279.64
	(132.48)	(252.77)	(241.92)	(381.90)
TKP income from most recent monthly payment per AEU	147.03	35.78	172.15	119.33
	(44.59)	(98.72)	(109.82)	(193.70)
Monthly transfer income (EGP) from private sources	30.09	29.94	44.93	54.67
	(149.02)	(136.98)	(180.85)	(160.15)
Monthly transfer income from private sources per AEU	9.56	10.56	16.51	27.39
	(47.60)	(48.91)	(61.41)	(86.67)
Monthly transfer income from public transfer programs (except TKP)	49.74	49.48	272.07	384.77
	(460.62)	(327.08)	(629.80)	(685.93)
Monthly transfer income from public transfer programs per AEU (except TKP)	17.03	15.86	95.87	188.27
	(161.94)	(104.93)	(208.01)	(333.24)
Number of households	2,190	3,813	223	289

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; TKP = Takaful and Karama Program; Standard deviations are reported in parentheses.

Most people were satisfied with the registration process. About two-thirds of applicants report no problems at all in the registration process, as shown in Table 5.1.3. The largest problems faced were long lines for registration and, second but far less prevalent, difficulty in getting the correct documentation. Overall, however, the difficulties faced in the registration process were not prohibitive.

About 93 percent of program beneficiaries in our sample have not faced any challenges in receiving the transfers. As Table 5.1.4 shows, among those who did face challenges, most do not

report having to travel for long distances to receive their transfers nor that travel costs are very high. Almost nobody reports that informal facilitation fees need to be paid to receive their payments, nor that they do not know where or how to receive their payments, nor that payments are regularly delayed. Very few were unaware of when the payment should be received or reported that the working hours are inconvenient. Similarly, very few beneficiaries lost their ID card or pin code and had difficulty renewing it, nor did they report any other challenges. Given that very few beneficiaries reported any major challenges since enrollment into Takaful and Karama, it is not surprising that satisfaction with both programs is high. Further, there are no differences in satisfaction or challenges faced between households in Upper Egypt versus Lower Egypt. Table 5.1.5 shows that households in Upper and Lower Egypt had very similar experiences with the Takaful program.

Table 5.1.3 Summary statistics of challenges faced in registration process

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
The social workers were not helpful in explaining the needed documents	0.057	0.047	0.054	0.021
	(0.231)	(0.213)	(0.226)	(0.143)
Getting the needed documents require a lot of money	0.054	0.051	0.058	0.017
	(0.226)	(0.219)	(0.235)	(0.131)
Getting the needed documents require traveling	0.024	0.021	0.022	0.003
	(0.152)	(0.142)	(0.148)	(0.059)
Getting the needed documents is difficult and time consuming	0.111	0.088	0.099	0.076
	(0.314)	(0.283)	(0.299)	(0.266)
There were long queues for program application	0.298	0.291	0.265	0.280
	(0.458)	(0.454)	(0.442)	(0.450)
The application is time consuming	0.082	0.082.	0.063	0.097
	(0.275)	(0.275)	(0.243)	(0.296)
Other challenges	0.002	0.003	0.004	0.000
	(0.043)	(0.054)	(0.067)	(0.000)
No challenges met during application to TKP	0.630	0.647	0.673	0.675
	(0.483)	(0.478)	(0.470)	(0.469)
Number of households	2,190	3,813	223	289

Note: TKP = Takaful and Karama Program. Standard deviations are reported in parentheses.

Table 5.1.4 Summary statistics of challenges faced in receiving transfers

Variable	Takaful beneficiaries	Karama beneficiaries
Requires traveling for long distances	0.004	0.018
	(0.060)	(0.133)
Travel costs are high	0.002	0.004
	(0.048)	(0.067)
Informal facilitation fees need to be paid to receive payment	0.001	0.000
	(0.037)	(0.000)
Did not know where or how to receive it	0.001	0.000
	(0.037)	(0.000)
Payments are regularly delayed	0.004	0.000
	(0.060)	(0.000)
Do not know when the payment should be received	0.001	0.000
	(0.030)	(0.000)
Lost the card and found difficulty in renewing it	0.002	0.000
	(0.043)	(0.000)
Lost the pin code and found difficulty in renewing it	0.001	0.004
	(0.030)	(0.067)
Working hours at payment delivery units are not convenient	0.007	0.000
	(0.085)	(0.000)
Other challenges	0.005	0.004
	(0.074)	(0.067)
Number of households	2,190	223

Note: Standard deviations are reported in parentheses.

Table 5.1.5 Summary statistics disaggregated by region: Program satisfaction and registration

Variable	Lower Egypt	Upper Egypt
Beneficiaries are satisfied with the program	0.721	0.733
	(0.449)	(0.443)
Requires traveling for long distances	0.004	0.005
	(0.064)	(0.069)
Travel costs are costly	0.004	0.002
	(0.064)	(0.044)
Informal facilitation fees need to be paid to receive payment	0.000	0.000
	(0.000)	(0.022)
Did not know where or how to receive it	0.000	0.001
	(0.000)	(0.031)
Payments are regularly delayed	0.000	0.002
	(0.000)	(0.044)
Do not know when the payment should be received	0.000	0.000
	(0.000)	(0.022)
Lost the card and found difficulty in renewing it	0.004	0.001
	(0.064)	(0.031)
Lost the pin code and found difficulty in renewing it	0.004	0.000
	(0.064)	(0.022)
Working hours at payment delivery units are not convenient	0.008	0.007
	(0.090)	(0.082)
Other challenges	0.008	0.005
	(0.090)	(0.073)
Number of households	244	2,077

Note: Standard deviations are reported in parentheses.

5.2 Household characteristics

This section examines household demographic characteristics among the impact evaluation sample. Tables 5.2.1 and 5.2.2 provide the means of household demographic characteristics, grouped by four types of household (Takaful beneficiaries, Takaful non-beneficiaries, Karama beneficiaries, and Karama non-beneficiaries), and characteristics for all survey participants by region, respectively.

In the Takaful sample, households have an average of 2.6 children and about two adults. In the Karama sample, households are smaller and household heads are older, as is expected because the Karama program includes many elderly recipients living separately from their grown children.

The PMT scores of course fall into the expected ranges for the type of participant and our sample of Karama households is generally better off than our sample of Takaful households, in accordance with our sample being selected from a higher point in the PMT distribution.

Tables 5.2.3 and 5.2.4 report average household expenditures for households in our sample. When we disaggregate these characteristics by region, it appears that urban areas are slightly better off than rural areas. These regional differences may be potentially important in interpreting the impact estimates.

Table 5.2.1 Summary statistics of household demographic characteristics

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Number of household members	4.88	4.63	3.52	3.22
	(1.20)	(1.20)	(1.87)	(1.91)
Total children age 0 to 18 years in household	2.67	2.38	0.81	0.68
	(1.14)	(1.16)	(1.29)	(1.24)
Proxy means test (PMT) score	4,261.34	4,572.30	7,137.36	7,238.59
	(187.48)	(278.93)	(97.62)	(104.31)
Index of household assets[a]	-0.03	0.02	0.00	-0.06
	(0.99)	(2.02)	(1.17)	(0.98)
Index of livestock assets[a]	-0.02	0.02	-0.08	-0.07
	(0.83)	(1.72)	(0.70)	(0.70)
Index of household + livestock assets[a]	-0.04	0.03	-0.03	-0.08
	(0.94)	(2.54)	(1.05)	(0.77)
Age of household head, years	38.54	39.13	58.11	61.36
	(9.00)	(10.20)	(14.99)	(13.83)
Share of households in the sample where:				
Household head is male	0.985	0.970	0.857	0.772
	(0.120)	(0.170)	(0.351)	(0.421)
Household head did not attain any education	0.300	0.260	0.587	0.571
	(0.458)	(0.439)	(0.493)	(0.496)
Household head attained primary education	0.175	0.181	0.202	0.215
	(0.380)	(0.385)	(0.402)	(0.411)
Household head attained preparatory education	0.093	0.090	0.031	0.055
	(0.291)	(0.287)	(0.175)	(0.229)
Household head attained secondary education	0.379	0.418	0.121	0.118
	(0.485)	(0.493)	(0.327)	(0.323)
Spouse did not attain any education	0.384	0.318	0.538	0.471
	(0.486)	(0.466)	(0.500)	(0.500)
Spouse attained primary education	0.106	0.115	0.090	0.111
	(0.308)	(0.320)	(0.286)	(0.314)
Spouse attained preparatory education	0.141	0.137	0.036	0.035
	(0.348)	(0.344)	(0.186)	(0.183)

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Spouse attained secondary education	0.316	0.354	0.085	0.083
	(0.465)	(0.478)	(0.280)	(0.276)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.
[a] Asset index is based on principal component analysis of reported household assets, segregated into household durable goods and livestock.

Table 5.2.2: Summary statistics disaggregated by region: household demographic characteristics

Variable	Metro-politan	Lower Urban	Lower Rural	Upper Urban	Upper Rural	Frontier
Resident members in the household	4.75	4.78	4.65	4.56	4.60	5.13
	(1.16)	(1.12)	(1.07)	(1.35)	(1.37)	(1.49)
Total children 0-18 in household	2.54	2.58	2.42	2.25	2.33	2.76
	(1.17)	(1.07)	(1.04)	(1.24)	(1.30)	(1.44)
Proxy means test (PMT) score - Old	4,635.08	4,775.34	4,746.67	4,661.59	4,663.59	4,493.79
	(698.41)	(846.09)	(745.64)	(804.65)	(797.06)	(319.12)
Index of household assets	-0.04	-0.06	0.13	0.01	-0.02	-0.10
	(0.18)	(0.18)	(1.96)	(0.45)	(1.82)	(0.30)
Index of livestock assets	-0.26	-0.23	0.03	-0.13	0.03	1.28
	(0.09)	(0.19)	(0.92)	(0.58)	(1.61)	(2.50)
Index of household + livestock assets	-0.18	-0.18	0.10	-0.07	0.01	0.55
	(0.11)	(0.13)	(1.64)	(0.50)	(2.32)	(1.20)
Age of household head	42.09	40.81	40.84	40.85	40.41	39.71
	(10.02)	(9.91)	(10.48)	(10.89)	(12.12)	(10.73)
Share of households in the sample where:						
Household head is male	0.966	0.955	0.988	0.964	0.959	0.974
	(0.181)	(0.208)	(0.110)	(0.186)	(0.199)	(0.162)
Household head did not attain any education	0.378	0.174	0.273	0.196	0.318	0.526
	(0.486)	(0.381)	(0.446)	(0.397)	(0.466)	(0.506)
Household head attained primary education	0.214	0.329	0.224	0.181	0.168	0.184
	(0.411)	(0.471)	(0.418)	(0.386)	(0.374)	(0.393)
Household head attained preparatory education	0.101	0.116	0.112	0.097	0.081	0.079
	(0.302)	(0.321)	(0.315)	(0.297)	(0.273)	(0.273)
Household head attained secondary education	0.269	0.342	0.343	0.452	0.385	0.211
	(0.444)	(0.476)	(0.475)	(0.498)	(0.487)	(0.413)
Spouse did not attain any education	0.324	0.239	0.310	0.224	0.387	0.553
	(0.469)	(0.428)	(0.463)	(0.417)	(0.487)	(0.504)
Spouse attained primary education	0.147	0.142	0.146	0.093	0.106	0.132
	(0.355)	(0.350)	(0.353)	(0.291)	(0.308)	(0.343)
Spouse attained preparatory education	0.130	0.084	0.112	0.141	0.134	0.053
	(0.337)	(0.278)	(0.315)	(0.349)	(0.340)	(0.226)
Spouse attained secondary education	0.311	0.368	0.385	0.424	0.293	0.211
	(0.464)	(0.484)	(0.487)	(0.495)	(0.455)	(0.413)
Number of households	238	155	735	750	4,605	38

Note: Standard deviations are reported in parentheses.

Table 5.2.3 Summary statistics of outcome variables: household expenditure and poverty level

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Monthly expenditures per adult equivalent				
Total	745.90	736.95	693.22	722.35
	(502.78)	(359.54)	(335.59)	(364.88)
Food only	432.44	426.04	397.39	405.62
	(195.51)	(211.81)	(197.99)	(209.47)
Non-food only	313.45	310.91	295.83	316.73
	(447.08)	(246.88)	(224.31)	(272.15)
Poverty rate, for various poverty lines				
US$1.90/day	0.429	0.410	0.256	0.232
	(0.495)	(0.492)	(0.437)	(0.423)
US$1.25/day	0.120	0.135	0.040	0.052
	(0.325)	(0.342)	(0.197)	(0.222)
Regional poverty line	0.614	0.587	0.381	0.349
	(0.487)	(0.492)	(0.487)	(0.478)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Table 5.2.4 Summary statistics disaggregated by region: household expenditure and poverty level

Variable	Metro-politan	Lower Urban	Lower Rural	Upper Urban	Upper Rural	Frontier
Monthly expenditures per adult equivalent						
Total	776.15	788.77	813.73	740.76	721.49	740.13
	(1,227.69)	(283.56)	(346.06)	(333.75)	(348.13)	(389.25)
Food only	313.91	398.74	462.93	418.05	427.94	499.94
	(168.68)	(180.01)	(190.46)	(195.84)	(209.87)	(250.11)
Non-food only	462.24	390.03	350.80	322.71	293.55	240.19
	(1,207.45)	(186.73)	(255.27)	(239.37)	(233.37)	(164.91)
Poverty rate, for various poverty lines						
US$1.90/day	0.487	0.368	0.286	0.384	0.422	0.421
	(0.501)	(0.484)	(0.452)	(0.487)	(0.494)	(0.500)
US$1.25/day	0.206	0.090	0.082	0.107	0.129	0.237
	(0.405)	(0.288)	(0.274)	(0.309)	(0.335)	(0.431)
Regional poverty line	0.710	0.523	0.463	0.637	0.583	0.579
	(0.455)	(0.501)	(0.499)	(0.481)	(0.493)	(0.500)
Number of households	238	155	735	750	4,605	38

Note: Standard deviations are reported in parentheses

6. IMPACT OF THE *TAKAFUL* PROGRAM

In this chapter, we report the impact estimates of the Takaful program. For each outcome, we report instrumental variable (IV) and regression discontinuity (RD) impact estimates together for comparison. The two methods yield very similar results, with some differences in the magnitude of measured effects or in the significance level, but the main findings remain unchanged. We report on household expenditure, poverty, and perceptions of well-being; assets and debt; child schooling; child anthropometry, dietary diversity, morbidity and overweight prevalence; household dietary diversity, health care utilization, and infant and young child feeding (IYCF) knowledge and practices; maternal overweight and obesity; women's control over decision making; and shocks and coping strategies.

For the IV specification tables, the estimated impact of the program can be read as in the row titled "Takaful Beneficiary, June 2017," while in the RD specification, the estimated impact is reported in the row titled "RD impact." Estimates marked with stars are statistically significant, meaning that we are confident that there is a non-zero impact for these results. For other results, the estimate is not measured precisely enough to tell whether there is an impact.

Because we are using an RD impact evaluation strategy, all results should be interpreted as the program impact on a household near the cutoff point.

6.1 Household total expenditure and poverty

We find statistically significant and relatively substantial in magnitude impacts of Takaful and Karama on household expenditure and on moving some households over the poverty line. This is the major short-term expected result of the program and a very positive finding.

To put the rest of our results in context, we estimate the change in Takaful transfer income during the past month that our impact evaluation strategy identifies. Non-beneficiary households are recorded as receiving zero income. We find that the estimated impact on Takaful transfers is EBP 455 using the IV model and EBP 466 using the RD model (Table 6.1.1 and Table 6.1.2). These estimates are actually slightly higher than the average transfer of EBP 432 among Takaful beneficiaries in our sample, which is likely because there is still some error in our measure of Takaful beneficiary status. In general, the fact that the estimated impact is approximately the full value of the transfer with both specifications gives us confidence that our other estimates also identify the program impact. Takaful beneficiaries have no statistically significant differences in the amount of other types of transfers received, which confirms that Takaful does not substitute for other government transfer programs. We present results at the household level and adjust for household composition in terms of adult equivalent units.[9]

We estimate that the Takaful program caused a statistically significant increase in the value of total monthly household expenditure per adult equivalent unit (AEU) of 7.3 percent (column 1 of Table 6.1.3), based on the estimates from the IV model. The RD model shows a statistically significant impact on the value of monthly household consumption per adult equivalent unit (AEU) of 8.4 percent (column 1 of Table 6.1.4). [10]

[9] Adult equivalent units in our analysis are defined as giving a weight of 1 to adults and 0.3 to children under age 18.

[10] The variables for the value of household consumption, food consumption and nonfood consumption are expressed in log value for the impact analysis so that extreme outliers do not affect the impact estimates as much. These estimates on consumption are also "screened" in that the highest and lowest 3% of observations on household consumption are replaced with the 97th percentile and 3rd percentile, respectively. If we do not screen the measures of total household consumption and food consumption, the impact estimates are larger (for example 11.6% on food consumption); we believe this higher estimate is mostly due to the inclusion of several non-beneficiary households with zero reported food

Figure 6.1.1 shows the RD impact estimate by graphing the relationship between the value of the outcome variable, consumption, and the PMT score, as separate fitted lines on each side of the eligibility threshold. The size of the impact is the difference in the intercepts of the two fitted lines at the eligibility threshold of 4500. The IV and RD estimates provide the range of impacts, though the IV model better represents the average impact of the program among beneficiaries with PMT score near the three eligibility thresholds.

To get a sense of magnitude using the IV estimate, a 7.3 percent increase in household consumption is equivalent to EBP 54 per person or EBP 156 per household. This amounts to roughly one third of the value of the average Takaful transfer in the last month, which was EBP 455 per household. However, the household survey is likely to have underestimated the value of consumption; we expect that a conservative estimate is that the true value of consumption may be 50 percent higher on average than reported in the survey. If so, then a 7.3 percent increase in consumption is EBP 233, which is equal to roughly half of the value of the average transfer. Households are likely to be using the remainder of the transfer in ways that are not captured well by our survey, including saving or paying debts.

To put these numbers into context, we can compare these effect sizes to other similar programs described in a review of seven conditional cash transfer programs in Latin America (Fizbein et al. 2009). The Takaful average transfer value in our sample was EBP 455 per month, and the average monthly expenditure in our sample was EBP 2,193 per month. Inflating monthly expenditure by 1.5 to account for underreporting, this implies that transfers account for 14 percent of monthly expenditure among households in our sample. Comparatively, in Brazil, the corresponding amount was 6.1 percent, in Columbia 17 percent, in Ecuador 6 percent, in Honduras 7 percent, and in Nicaragua 29.3 percent. Takaful thus accounts for a proportion of monthly expenditure comparable to that in other national CCT programs. Impact on household expenditure ranged from 7-10 percent in Brazil, Mexico, Colombia, and Honduras. Nicaragua increased consumption by more than 25 percent but also had transfers that represented an exceptionally large share of consumption relative to the other programs. Overall, we can say that Takaful program has performed very well compared to these well-regarded CCT programs in Latin America.

Next, we turn to poverty. Tables 6.1.5 and 6.1.6 show the IV and RD impact estimates on poverty outcomes, respectively. We examine whether the household is living under USD1.90 per day and under USD1.25 per day (the World Bank definitions of poverty and extreme poverty). We also examine whether the household is under the Egypt 2015 poverty line (defined at the regional level). We also examine the poverty gap for USD1.90 per day and for the poverty line.[11]

In interpreting our results on poverty, it is necessary to keep in mind first that our results are sensitive to the exact poverty line chosen and second that we are looking at a population which is already near the poverty line. The Egypt 2015 poverty line (denoted regional poverty line in our tables) is our choice as the most reasonable poverty line to use, in spite of the fact that it is out of date after the floating of the Egyptian pound in late 2016 and consequent inflation. Our attempts to update the 2015 poverty line using the consumer price index would imply an unrealistically large level of poverty in Egypt in general based on our targeting sample. We believe that this unrealistically large level of poverty is due to two factors. First, the actual increase in prices faced by the poor is lower than inflation in the national consumer price index that would be used to update

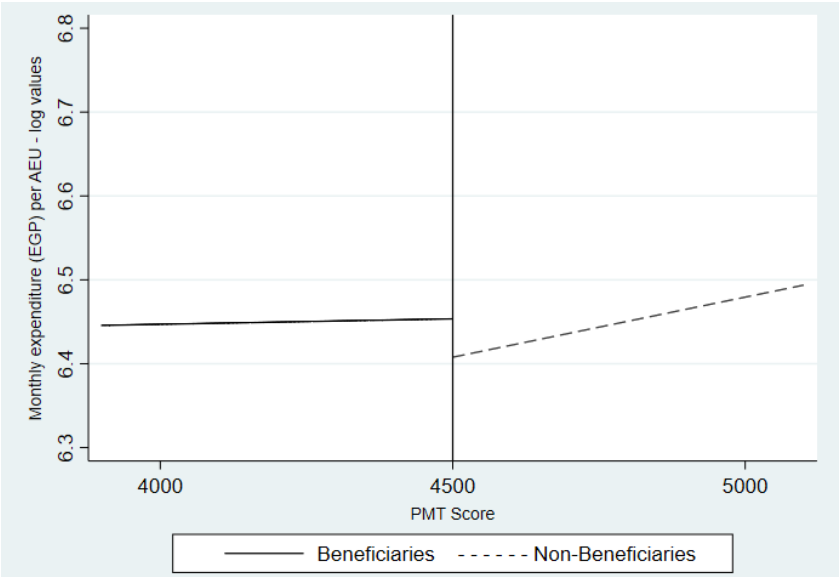
expenditure during the past month, so our preferred result relies on the screened data to reduce the impact of what is likely enumerator error in the case of zero reported food expenditure.

[11] The poverty gap is the mean shortfall of the total population from the poverty line (counting the nonpoor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence.

the poverty line. Poor households consume a smaller bundle of less expensive goods, and fewer imported products, all of which means that they faced a lower increase in prices from 2015–2017. This would cause an inflation-adjusted 2017 poverty line to overstate poverty. Second, consumption is under-reported in our survey compared to the HIECS survey, which is used to establish the poverty line. This under-reporting is not surprising due to our consumption module being shorter than the HIECS module and it is not a problem for estimating program impacts since we compare otherwise similar households just above and just below the PMT threshold.

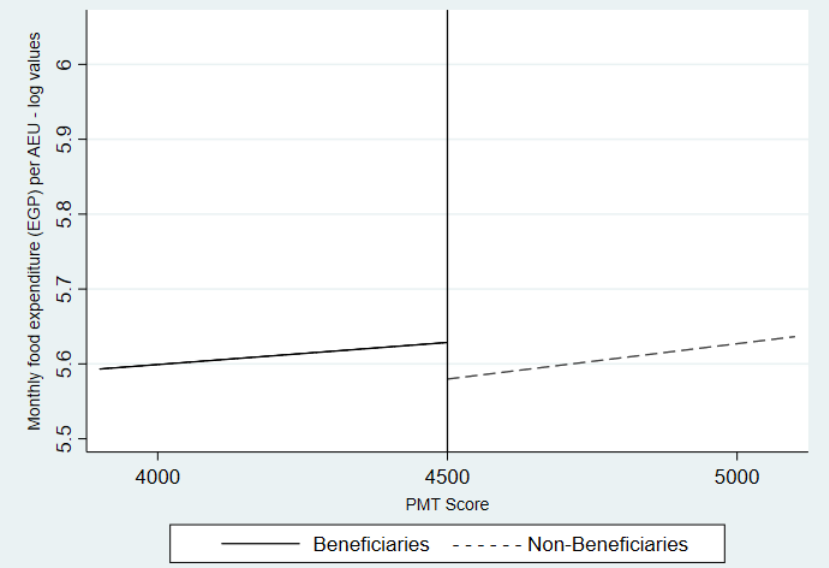
The Takaful program reduced the probability of a household living in poverty, as measured by the international poverty line, by about 11 percent and this effect is statistically significant (see Figure 6.1.3). It also reduced the probability of a household living under the Egyptian regional poverty line by 8 percent (see Figure 6.1.4). There were also significant impacts in the narrowing of the extreme poverty gap and the poverty gap for the regional poverty line. If we assume that the 7.3 percent increase in consumption applied to all beneficiaries and about 9.5 percent of households with children in Egypt (1.8 million out of 19 million) are Takaful beneficiaries, this implies that Takaful reduced the national poverty rate among families with children by about 0.7 percent. Alternatively, we can use our targeting sample to adjust for our analysis oversampling from households near the poverty line and model a counterfactual poverty rate assuming that all beneficiary households would have consumed 7.3 percent less without Takaful. The counterfactual poverty rate without Takaful of 41.6 percent versus the actual poverty rate in the sample of 41.2 percent implies that Takaful reduced the overall poverty rate in Egypt by 0.4 percent percentage points. As both of these approaches rely on different assumptions, we present both figures as an indication of the range of likely impacts on a national scale.

Figure 6.1.1 Regression discontinuity model impact estimate of the *Takaful* program on log monthly expenditure per adult equivalent unit



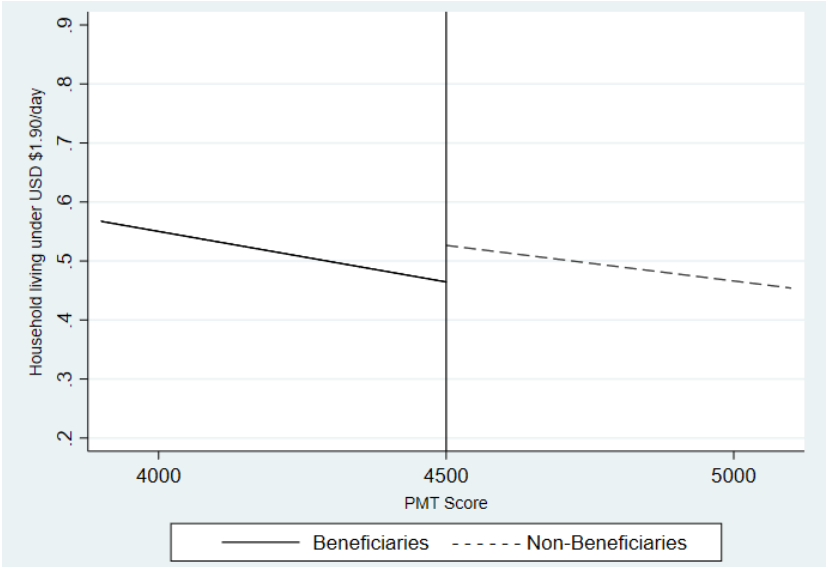
Note: AEU = adult equivalent unit; EGP = Egyptian pounds; PMT = proxy means test.

Figure 6.1.2 Regression discontinuity model impact estimates of *Takaful* program on log monthly food expenditure per adult equivalent unit



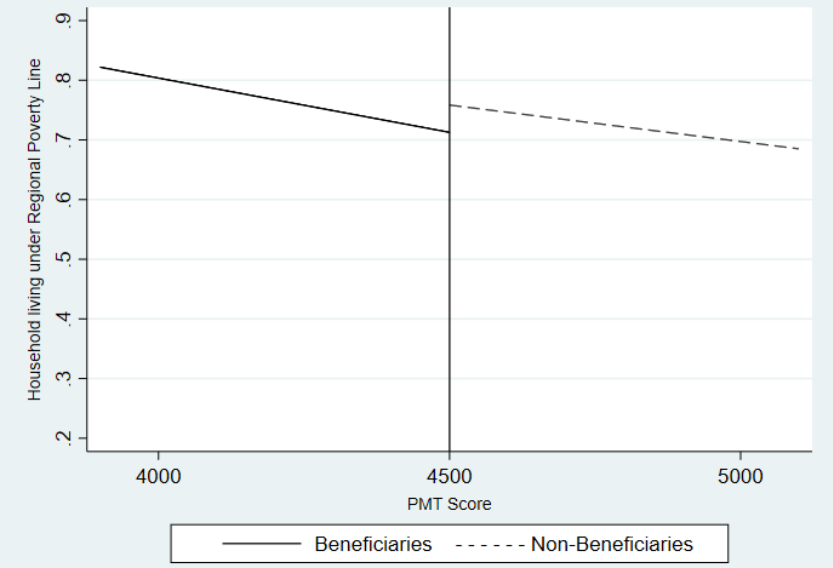
Note: AEU = adult equivalent unit; EGP = Egyptian pounds; PMT = proxy means test.

Figure 6.1.3 Regression discontinuity model impact estimates of *Takaful* program on poverty (US$1.90/day)



Note: PMT = proxy means test.

Figure 6.1.4 Regression discontinuity model impact estimates of *Takaful* program on poverty (regional poverty line)



Note: PMT = proxy means test.

Table 6.1.1 Impact of *Takaful* program on *Takaful* and other transfer income indicators, instrumental variables model

	(1) TKP income from most recent monthly payment	(2) TKP income from most recent monthly payment per AEU	(3) Monthly transfer income (EGP) from private sources	(4) Monthly transfer income from public transfer programs (except TKP)
Takaful beneficiary, June 2017	454.967***	160.199***	2.124	20.002
	(21.815)	(8.216)	(12.243)	(21.261)
Observations	6,003	6,003	6,003	6,003
R^2	0.308	0.247	0.013	0.032
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	222.739	76.368	29.995	49.572

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; TKP = Takaful and Karama Program. Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01,

Table 6.1.2 Impact of *Takaful* program on *Takaful* and other transfer income indicators, regression discontinuity model

	(1) TKP income from most recent monthly payment	(2) TKP income from most recent monthly payment per AEU	(3) Monthly transfer income (EGP) from private sources	(4) Monthly transfer income from public transfer programs (except TKP)
RD estimate	465.883***	166.939***	-3.764	22.308
	(24.991)	(9.797)	(14.319)	(26.380)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity; TKP = Takaful and Karama Program. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.1.3 Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1) Monthly food + non-food expenditure (EGP) per AEU - log values	(2) Monthly total food expenditure (EGP) per AEU - log values	(3) Monthly non-food expenditure per AEU - log values
Takaful beneficiary, June 2017	0.073**	0.083**	0.058
	(0.032)	(0.033)	(0.043)
Observations	6,003	6,003	6,003
R^2	0.102	0.123	0.068
First stage F-statistic	170.012	170.012	170.012
Mean dependent variable	6.514	5.957	5.572

Note: AEU = adult equivalent unit; EGP = Egyptian pounds. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.1.4 Impact of *Takaful* program on expenditure indicators, regression discontinuity model

	(1) Monthly food + non-food expenditure (EGP) per AEU - log values	(2) Monthly total food expenditure (EGP) per AEU - log values	(3) Monthly non-food expenditure per AEU- log values
RD estimate	0.084**	0.089**	0.062
	(0.037)	(0.040)	(0.049)
Observations	6,003	6,003	6,003

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.1.5 Impact of *Takaful* program on poverty indicators, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Takaful beneficiary, June 2017	-0.116***	-0.028	-0.079**	-0.048*	-18.218**
	(0.039)	(0.026)	(0.040)	(0.026)	(7.831)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.057	0.063	0.063	0.094	0.097
First stage F-statistic	170.012	170.012	170.012	170.012	170.012
Mean dependent variable	0.417	0.130	0.597	0.204	83.586

Note: Standard errors in parentheses. Estimates from instrumental variables model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6.1.6 Impact of *Takaful* program on poverty indicators, regression discontinuity model

	(1) Household living under US $1.90/day	(2) Household living under US $1.25/day	(3) Household living under Regional Poverty Line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
RD estimate	-0.114**	-0.031	-0.084*	-0.049*	-18.377**
	(0.045)	(0.030)	(0.046)	(0.029)	(8.887)
Observations	6,003	6,003	6,003	6,003	6,003

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01.

Table 6.1.7 Poverty lines and prevalence of poverty

Poverty line	Per capita expenditure per month in EGP	Takaful and Karama households under poverty line, %	All households under poverty line, %
Egypt 2017	732-793 by region	92.2 (2.1)	74.3 (2.0)
Egypt 2015	469-514 by region	67.4 (3.8)	41.2 (2.1)
International poverty $1.90/day PPP 2016 USD 1.00 = EBP 2.54	405	47.6 (4.3)	25.9 (1.8)
International severe poverty, $1.25/day PPP 2016 USD 1.00 = EBP 2.54	265	8.5 (1.0)	19.9 (3.2)

Note: EGP = Egyptian pounds; PPP = purchasing power parity. Standard errors in parentheses. Egypt 2017 is the Egypt 2015 poverty line inflated to account for a decrease in purchasing power as measured by the percentage change in the consumer price index.

6.2 Components of household consumption

Turning to column 2 of Tables 6.1.3 and 6.1.4, we see that the Takaful program caused a significant increase in the value of monthly food consumption per AEU by 8.3 percent (IV) or 8.9 percent (RD), and this is also statistically significant at the 5 percent level (see Figure 7.1.2). This is only slightly lower than the average impact of social protection programs on food consumption of 13 percent, as reported in a recent review by IFPRI (Hidrobo et al., 2017).

The estimate for non-food expenditures is not statistically significant, implying that it is not possible to confirm whether there was an impact on non-food expenditures (see column (3) of Tables 6.1.3 and 6.1.4).

We next examine the impact of the Takaful program on the value of (log) expenditure on specific food groups. There are 12 food groups (grains, potatoes, vegetables, fruits, meat, eggs, fish, legumes, dairy, oils and fats, sweets, and other foods). Tables 6.2.1 - 6.2.6 display the impact estimates, alternating between IV and RD impact estimates, which are very consistent.

There are statistically significant impacts on households spending more on higher-value food groups, in particular fruits and meat (this includes both meat and poultry). There are no statistically significant impacts on any of the other food-group outcomes.

We also examine the impact of the Takaful program on the log expenditure on specific non-food groups. Tables 6.2.7 - 6.2.12 display the impact estimates, alternating between IV and RD impact estimates, which again are very consistent. We also examine 12 categories of expenditure here (total expenditure on schooling, as well as monthly expenditure on transportation, rent and utilities, communications and entertainment, personal care and hygiene items, smoking, clothes, house construction, household durables, occasions, health care, and expenditures outside of the household).

There is some evidence (albeit relatively imprecisely measured) that monthly expenditures on smoking increased, and there is evidence that monthly expenditures on clothing increased (this impact is statistically significant at the 5 percent level). The other measures of non-food expenditure show no significant impacts.

We have also examined the share of food consumption in total consumption expenditure, and the share of non-food consumption in total consumption expenditure. In addition, we look at the share of the 9 food groups in overall food expenditure and the share of the 11 non-food items in overall non-food expenditure. These results are reported in Annex II, Tables A2.1 to A2.14. These also alternate between IV and RD specifications, and once again the results are very consistent over the two estimation strategies. There are no significant impacts on the share of food or non-food

expenditure in total expenditure. The share of expenditure on fruits in total food expenditure is positive and significant, but none of the other food groups have significant impacts. There are no significant impacts on any of the shares of non-food categories in overall non-food expenditure.

We find no impact of the Takaful program on monthly income for all household measures. This is important because it means that there is no evidence that households are reducing their labor supply as a result of receiving Takaful and Karama transfers.

Table 6.2.1 Impact of *Takaful* program on log expenditure of food groups 1-4 indicators, instrumental variables model

	(1) Monthly expenditures on grains per AEU - Log values	(2) Monthly expenditures on potatoes per AEU - Log values	(3) Monthly expenditures on vegetables per AEU - Log values	(4) Monthly expenditures on fruits per AEU - Log values
Takaful beneficiary, June 2017	0.063	0.057	0.060	0.252**
	(0.058)	(0.062)	(0.047)	(0.107)
Observations	6,003	6,003	6,003	6,003
R^2	0.057	0.043	0.045	0.055
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	3.888	2.616	3.978	2.129

Note: AEU = adult equivalent unit. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01.

Table 6.2.2 Impact of *Takaful* program on log expenditure of food groups 1-4 indicators, regression discontinuity model

	(1) Monthly expenditures on grains per AEU- Log values	(2) Monthly expenditures on potatoes per AEU - Log values	(3) Monthly expenditures on vegetables per AEU - Log values	(4) Monthly expenditures on fruits per AEU- Log values
RD estimate	0.065	0.033	0.063	0.189
	(0.068)	(0.073)	(0.057)	(0.141)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test (PMT) threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01.

Table 6.2.3 Impact of *Takaful* program on log expenditure of food groups 5-8 indicators, instrumental variables model

	(1) Monthly expenditures on meat per AEU - Log values	(2) Monthly expenditures on eggs per AEU- Log values	(3) Monthly expenditures on fish per AEU -Log values	(4) Monthly expenditures on legumes per AEU - Log values
Takaful beneficiary, June 2017	0.284*	0.021	0.167	0.030
	(0.159)	(0.113)	(0.108)	(0.107)
Observations	6,003	6,003	6,003	6,003
R^2	0.039	0.035	0.090	0.123
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	3.523	1.269	0.656	2.369

Note: AEU = adult equivalent unit. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 6.2.4 Impact of *Takaful* program on log expenditure of food groups 5-8 indicators, regression discontinuity model

	(1) Monthly expenditures on meat per AEU - log values	(2) Monthly expenditures on eggs per AEU- log values	(3) Monthly expenditures on fish per AEU -log values	(4) Monthly expenditures on legumes per AEU - log values
RD estimate	0.395**	0.002	0.136	-0.044
	(0.178)	(0.129)	(0.130)	(0.125)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.5 Impact of *Takaful* program on log expenditure of food groups 9-12 indicators, instrumental variables model

	(1) Monthly expenditures on dairy per AEU - log values	(2) Monthly expenditures on oils and fats per AEU- log values	(3) Monthly expenditures on sweets per AEU- log values	(4) Monthly expenditures on other per AEU- log values
Takaful beneficiary, June 2017	0.001	0.131	0.026	0.094
	(0.110)	(0.082)	(0.055)	(0.059)
Observations	6,003	6,003	6,003	6,003
R^2	0.052	0.068	0.105	0.113
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	2.529	3.278	3.501	2.896

Note: AEU = adult equivalent unit. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.6 Impact of *Takaful* program on log expenditure of food groups 9-12 indicators, regression discontinuity model

	(1) Monthly expenditures on dairy per AEU - log values	(2) Monthly expenditures on oils and fats per AEU - log values	(3) Monthly expenditures on sweets per AEU - log values	(4) Monthly expenditures on other per AEU - log values
RD estimate	0.150	0.029	0.009	0.035
	(0.128)	(0.096)	(0.066)	(0.070)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.7 Impact of *Takaful* program on log of non-food expenditure (A) indicators, instrumental variables model

	(1) Log of total expenditure on school including tuition fees (school and private tuition)	(2) Monthly expenditures on transportation per AEU - log values	(3) Monthly expenditures on rent and utilities per AEU - log values	(4) Monthly expenditures on communications and entertainment per AEU - log values
Takaful beneficiary, June 2017	0.071	0.100	0.033	0.096
	(0.116)	(0.111)	(0.059)	(0.072)
Observations	3,735	6,003	6,003	6,003
R^2	0.099	0.055	0.047	0.081
First stage F-statistic	105.352	170.012	170.012	170.012
Mean dependent variable	6.804	3.151	3.981	2.003

Note: AEU = adult equivalent unit. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.8 Impact of *Takaful* program on log of non-food expenditure (A) indicators, regression discontinuity model

	(1) Log of total expenditure on school including tuition fees (school and private tuition)	(2) Monthly expenditures on transportation per AEU - log values	(3) Monthly expenditures on rent and utilities per AEU - log values	(4) Monthly expenditures on communications and entertainment per AEU - log values
RD estimate	-0.034	0.048	-0.001	0.145
	(0.139)	(0.131)	(0.069)	(0.090)
Observations	3,735	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.9 Impact of *Takaful* program on log of non-food expenditure (B) indicators, instrumental variables model

	(1) Monthly expenditures on personal care and hygiene items per AEU - log values	(2) Monthly expenditures on smoking per AEU - log values	(3) Monthly expenditures on clothes per AEU - log values	(4) Household monthly spending house construction per AEU – log values
Takaful beneficiary, June 2017	0.054	0.288*	0.199**	-0.041
	(0.047)	(0.169)	(0.088)	(0.053)
Observations	6,003	6,003	6,003	6,003
R^2	0.068	0.019	0.133	0.034
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	3.570	1.699	2.562	0.199

Note: AEU = adult equivalent unit. Standard errors in parentheses.
Estimates from instrumental variables model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.2.10 Impact of *Takaful* program on log of non-food expenditure (B) indicators, regression discontinuity model

	(1) Monthly expenditures on personal care and hygiene items per AEU - log values	(2) Monthly expenditures on smoking per AEU - log values	(3) Monthly expenditures on clothes per AEU - log values	(4) Household monthly spending house construction per AEU - log values
RD estimate	0.051	0.158	0.173	-0.081
	(0.054)	(0.197)	(0.117)	(0.063)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.11 Impact of *Takaful* program on log of non-food expenditure (C) indicators, instrumental variables model

	(1) Monthly expenditures on household durables per AEU - log values	(2) Monthly expenditures on occasions per AEU- log values	(3) Monthly expenditures on healthcare per AEU - log values	(4) Monthly expenditures outside the household per AEU- log values
Takaful beneficiary, June 2017	-0.032	-4.150	0.125	0.182
	(0.052)	(6.814)	(0.097)	(0.150)
Observations	6,003	6,003	6,003	6,003
R^2	0.035	0.004	0.069	0.123
First stage F-statistic	170.012	170.012	170.012	170.012
Mean dependent variable	0.251	6.583	2.391	1.469

Note: AEU = adult equivalent unit; Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.2.12 Impact of *Takaful* program on log of non-food expenditure (C) indicators, regression discontinuity model

	(1) Monthly expenditures on household durables per AEU - log values	(2) Monthly expenditures on occasions per AEU - log values	(3) Monthly expenditures on healthcare per AEU - log values	(4) Monthly expenditures outside the household per AEU - log values
RD estimate	0.019	5.405	0.121	0.195
	(0.065)	(5.199)	(0.120)	(0.181)
Observations	6,003	6,003	6,003	6,003

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.3 Subjective well-being

We do not find any significant results on our measures of subjective well-being. These may be poorly captured by the quantitative instrument and should be supplemented by results from the qualitative component.

The first question displays a ladder with 9 steps, with the lowest step being the lowest life satisfaction and the highest step being the highest satisfaction. Households report which rung on the

ladder they feel they stand on at the moment, as well as which rung on the ladder they feel they will stand on in five years. This allows us to get a sense of how satisfied they are at the moment and whether they are hopeful about the future. The third question asks if the household believes that their income will be higher in the next five years. The IV impact results are displayed in Table 6.3.1 and the RD impact results are displayed in Table 6.3.2. There are no significant impacts on wage income (or its log), nor on current or future life satisfaction, nor on the household believing their income will be higher in the next five years.

Table 6.3.1 Impact of *Takaful* program on well-being and income indicators, instrumental variables model

	(1) Total monthly wage income (EGP) all household members	(2) Log of total wage income	(3) Where on the ladder do you feel you stand at the moment	(4) Where on the ladder do you feel you stand at after five years	(5) Household believes their income will be higher in the next five years
Takaful beneficiary, June 2017	-9.018	-0.021	0.042	0.086	0.048
	(44.908)	(0.039)	(0.140)	(0.156)	(0.034)
Observations	5389	5320	6001	6001	6001
R^2	0.023	0.052	0.124	0.120	0.023
First stage F-statistic	166.882	163.823	170.049	170.049	170.049
Mean dependent variable	980.289	6.774	3.002	3.467	0.255

Note: EGP = Egyptian pounds; Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.3.2 Impact of *Takaful* program on well-being and income indicators, regression discontinuity model

	(1) Total monthly wage income (EGP) all household members	(2) Log of total wage income	(3) Where on the ladder do you feel you stand now	(4) Where on the ladder do you feel you stand at after five years	(5) Household believes their income will be higher in the next five years
RD Estimate	55.384	-0.006	-0.004	0.111	0.075**
	(61.826)	(0.049)	(0.162)	(0.170)	(0.037)
Observations	5,389	5,320	6,001	6,001	6,001

Note: EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.4 Assets and debt

In this section, we will estimate the impact of the Takaful program on assets and debt, since transfer income may have been invested in assets or used to pay off debts. We do not find any significant impacts.

In order to assess the impact on asset ownership, we construct an index of household durable assets, comprising 28 items; an index of livestock assets, comprising nine types of livestock; and an index comprising both household durable assets and livestock assets with 37 assets in total. Table 6.4.1 displays the IV impact estimates of these outcomes and Table 6.4.2 displays the RD

impact estimates of these outcomes. There are no statistically significant impacts on any of the asset outcomes.[12]

For looking at debts, we examine whether households experienced an increase in the amount owed on formal loans since last year, an increase in the amount owed to friends and relatives since last year, whether a household has owed money to a formal lender in the past year, and whether a household has owed money to family and friends in the past year. Tables 6.4.3 and 6.4.4 display the IV and RD impact estimates, respectively.

Table 6.4.1 Impact of *Takaful* program on asset indicators, instrumental variables model

	(1) Index of household assets	(2) Index of livestock assets	(3) Index of household + livestock assets
Takaful beneficiary, June 2017	-0.223	-0.129	-0.271
	(0.231)	(0.186)	(0.288)
Observations	6,003	6,003	6,003
R^2	0.005	0.013	0.007
First stage F-statistic	170.012	170.012	170.012
Mean dependent variable	0.003	0.005	0.004

Note: Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.2 Impact of *Takaful* program on asset indicators, regression discontinuity model

	(1) Index of household assets	(2) Index of livestock assets	(3) Index of household + livestock assets
RD estimate	-0.324	-0.251	-0.420
	(0.284)	(0.210)	(0.338)
Observations	6,003	6,003	6,003

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.4.3 Impact of *Takaful* program on debt indicators, instrumental variables model

	(1) Increase in amount owed on formal loans since last year	(2) Increase in amount owed to friends and relatives since last year	(3) Household has owed money to formal lender during last year	(4) Household has owed money to friends and family during last year
Takaful beneficiary, June 2017	-59.187	38.869	0.024	-0.017
	(293.096)	(386.024)	(0.022)	(0.039)
Observations	5,997	5,982	6,003	6,003
R^2	0.002	0.004	0.013	0.020
First stage F-statistic	171.753	168.986	170.012	170.012
Mean dependent variable	19.224	429.714	0.090	0.462

Note: Standard errors in parentheses. Estimates from instrumental variables model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[12] We also separated household and livestock assets into categories (such as large and small appliances, fans and air conditioners, irrigation materials, etc.). There were a couple of marginally significant effects, but they were not consistent over the IV and RD models and were exactly what we would expect, by random chance, when checking that many outcomes. Consequently, there are no significant impacts on assets of different types either.

Table 6.4.4 Impact of *Takaful* program on debt indicators, regression discontinuity model

	(1) Increase in amount owed on formal loans since last year	(2) Increase in amount owed to friends and relatives since last year	(3) Household has owed money to formal lender during last year	(4) Household has owed money to friends and family during last year
RD estimate	-115.047	573.440	0.001	-0.017
	(244.008)	(475.342)	(0.026)	(0.048)
Observations	5,997	5,982	6,003	6,003

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.5 Child schooling and child labor

In this section, we examine the impact of the Takaful program on children's schooling and labor. We do not find impacts on enrollment or attendance so far but do find increased education-related spending. There is weak evidence that Takaful beneficiaries have a lower incidence of child labor.

We look at both enrollment and at educational spending, as at least part of the Takaful transfer may have been put towards education, and school attendance will soon become a conditionality.

We measure the impact on the enrollment of children ages 6-12 of both genders, as well as the enrollment of girls aged 6-18 (representing primary and secondary school) and the enrollment of girls aged 12-18 (representing secondary school only). Tables 6.5.1 and 6.5.2 present the IV and RD impact estimates of these outcomes, respectively. There is no statistically significant impact on enrollment in general, nor on enrollment of girls, including in secondary school. This is likely because enrollment rates are already quite high, and the conditionality of school attendance has not yet begun. It is noteworthy that the enrollment rates of the up-to-three Takaful-registered children are higher than those of Takaful beneficiary households in general. This evidence is presented in Appendix III Table A3.2.

Although the school attendance conditionality is not yet in place, we do examine school attendance at both the primary and at the secondary level, for all children, for male children, and for female children. The variable we use is a dummy variable that the child *did not* miss school for more than one week in the past academic year. Tables 6.5.3 - 6.5.6 display the results for both IV and RD specifications. Overall, there is no statistically significant impact. However, it appears that boys in beneficiary households had better attendance than in non-beneficiary households and that girls in beneficiary households had worse attendance than in non-beneficiary households at the primary level. There are no differences between genders at the secondary level. It is possible that the households know that this conditionality is coming and thus are already encouraging boys to attend school more but, while they are not penalized, are asking girls to stay home more.

We also measure the impact of household spending on education (on transportation and school supplies) at all levels and at the primary and secondary levels. These impact estimates are contained in Table 6.5.7 (IV impact estimates) and 6.5.8 (RD impact estimates). Both tables show that the Takaful program did result in an increase in educational spending at both the primary and secondary levels, although the RD results are less precisely measured. These results suggest that the effects of Takaful on education were more on the intensive margin than the extensive margin.

There is some weak evidence that Takaful beneficiary households had a lower incidence of child labor than non-beneficiary households. We define child labor as any participation in unpaid

agricultural, family business, or other type of work, as well as any paid labor. We separate by gender and by age group. The International Labour Organization defines child labor as either of these types of labor (that is, unpaid or paid) performed by children 17 years of age and under. We separate into ages 5-12 and ages 12-17 (children and adolescents). Tables 6.5.9 and 6.5.10 show that all the coefficients are negative, suggesting that perhaps the incidence of child and adolescent labor is lower among beneficiaries. There is only one marginally statistically significant effect, however, and that is for younger girls. We would not interpret this as strong evidence for declines in child labor as a result of the program, but the results suggest that this is a possibility.

Table 6.5.1 Impact of *Takaful* program on enrollment indicators, instrumental variables model

	(1) Enrollment of children ages 7-12	(2) Enrollment of females ages 7-18	(3) Enrollment of females ages 12-18
Takaful beneficiary, June 2017	-0.007	-0.029	-0.065
	(0.019)	(0.035)	(0.061)
Observations	4,207	3,245	1,473
R^2	0.012	0.019	0.028
First stage F-statistic	70.328	57.843	34.442
Mean dependent variable	0.969	0.912	0.843

Note: RD = regression discontinuity. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.2: Impact of *Takaful* program on enrollment indicators, regression discontinuity model

	(1) Enrollment of children ages 7-12	(2) Enrollment of females ages 7-18	(3) Enrollment of females ages 12-18
RD estimate	-0.033	-0.043	-0.098
	(0.021)	(0.043)	(0.079)
Observations	4,207	3,245	1,473

Note: RD = regression discontinuity, Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.3 Impact of *Takaful* program on primary school attendance indicators, instrumental variables model

	(1) School attendance at primary level for all children	(2) School attendance at primary level for girls	(3) School attendance at primary level for boys
Takaful beneficiary, June 2017	0.010	0.014	0.005
	(0.033)	(0.040)	(0.044)
Observations	4,076	1,942	2,134
R^2	0.015	0.017	0.017
First stage F-statistic	65.627	40.252	43.660
Mean dependent variable	0.918	0.925	0.911

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.4 Impact of *Takaful* program on primary school attendance indicators, regression discontinuity model

	(1) School attendance at primary level for all children	(2) School attendance at primary level for girls	(3) School attendance at primary level for boys
RD estimate	0.010	0.023	0.000
	(0.038)	(0.047)	(0.055)
Observations	4,076	1,942	2,134

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.5 Impact of *Takaful* program on secondary school attendance indicators, instrumental variables model

	(1) School attendance at secondary level for all children	(2) School attendance at secondary level for girls	(3) School attendance at secondary level for boys
Takaful beneficiary, June 2017	-0.052	0.015	-0.086
	(0.048)	(0.068)	(0.062)
Observations	2,680	1,242	1,438
R^2	0.039	0.038	0.061
First stage F-statistic	55.769	34.793	36.072
Mean dependent variable	0.852	0.876	0.831

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.6 Impact of *Takaful* program on secondary school attendance indicators, regression discontinuity model

	(1) School attendance at secondary level for all children	(2) School attendance at secondary level for girls	(3) School attendance at secondary level for boys
RD estimate	-0.092*	-0.070	-0.110*
	(0.053)	(0.080)	(0.067)
Observations	2,680	1,242	1,438

Note; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.7 Impact of *Takaful* program on education spending indicators, instrumental variables model

	(1) Household education spending	(2) Household education spending on secondary level	(3) Household education spending on primary level
Takaful beneficiary, June 2017	77.190*	211.354*	123.040**
	(46.221)	(117.184)	(61.167)
Observations	6,003	1,821	3,293
R^2	0.017	0.023	0.033
First stage F-statistic	170.012	60.174	92.606
Mean dependent variable	306.383	608.838	404.361

Note: Standard errors in parentheses. Estimates from instrumental variables model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.5.8 Impact of *Takaful* program on education spending indicators, regression discontinuity model

	(1) Household education spending	(2) Household education spending on secondary level	(3) Household education spending on primary level
RD estimate	56.663	216.489	68.716
	(57.115)	(157.200)	(77.331)
Observations	6,003	1,821	3,293

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.9 Impact of *Takaful* program on child and adolescent labor indicators, instrumental variables model

	(1) Labour – boys ages 5-12	(2) Labour – girls ages 5-12	(3) Labour – boys ages 12-17	(4) Labour – girls ages 12-17
Takaful beneficiary, June 2017	-0.025	-0.081*	-0.099	-0.039
	(0.041)	(0.046)	(0.073)	(0.082)
Observations	4,457	4,141	1,527	1,342
R^2	0.053	0.046	0.067	0.068
First stage F-statistic	72.020	74.640	38.547	34.056
Mean dependent variable	0.164	0.278	0.284	0.545

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.5.10 Impact of *Takaful* program on child and adolescent labor indicators, regression discontinuity model

	(1) Labour – boys ages 5-12	(2) Labour – girls ages 5-12	(3) Labour – boys ages 12-17	(4) Labour – girls ages 12-17
RD Estimate	-0.018	-0.083	-0.070	-0.051
	(0.044)	(0.058)	(0.082)	(0.109)
Observations	4,457	4,141	1,527	1,342

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.6 Child dietary diversity, anthropometry, overweight and wasting, and morbidity and treatment

In this section, we examine child health outcomes. We first look at child dietary diversity, then at child anthropometry, including overweight and wasting, and finally we look at child morbidity (illness) and subsequent treatment.

Table 6.6.1 and Table 6.6.2 display the IV and RD impacts on child dietary diversity, respectively. Child dietary diversity is the number of food groups out of 7 that were consumed in the past 24 hours.[13] We look at children aged 6-23 months old and at children aged 24-59 months old. There was no significant impact of the Takaful program on children's dietary diversity.

[13] The seven food groups are: grains, roots, and tubers; legumes, nuts, and seeds; dairy products; flesh foods (meat/fish); eggs; vitamin A rich fruits and vegetables; and other fruits and vegetables.

We then look at children's anthropometry for children aged 6-23 months old (child 1) and children aged 24-59 months (child 2). We examine the height-for-age z-score and the weight-for-height z-score for the two randomly selected children in the household.[14] Tables 6.6.3 and 6.6.4 show the IV and RD impact estimates, respectively. For child 1 there is no statistically significant effect. For older children (24-59 months old) there is a positive and statistically significant effect for weight-for-height.[15]

Next, we examine wasting and overweight. Our measure of wasting is the standard World Health Organization definition of a weight-for-height z-score two standard deviations below the population mean. Our measure of overweight is also the World Health Organization definition of a weight-for-age z-score between 1 and 2 standard deviations above the population mean. There are no obese children in the sample, so we do not examine this outcome. Tables 6.6.5 and 6.6.6 display the impact estimates of these outcomes for IV and RD specifications, respectively. There are no statistically significant impacts on either wasting or overweight due to the Takaful program.

An important caveat is that the household survey measured considerably lower rates of stunting and wasting than past estimates. For example, in the DHS survey, stunting among children aged 6-23 months is estimated at 7.8 percent and among children 24-59 months is estimated at 6.6 percent. The DHS survey also estimates wasting among children aged 6-23 months at 2.7 percent and among children 24-59 months at 1.7 percent. The DHS may be an overestimate, as they may be using a definition of a weight-for-height z-score two standard deviations above and below and more than 5 percent of their anthropometric data is problematic. Our estimates, however, may be an underestimate.

We then look at child morbidity. We examine two morbidity indicators for all children under 5 years of age: whether the child had diarrhea in the past four weeks and whether the child had a fever in the past four weeks. Tables 6.6.7 and 6.6.8 contain the impact estimates of these outcomes for the IV and RD specifications, respectively. There are no statistically significant impacts on either of these two outcomes.

We then examine whether children have been treated for both of the above morbidity indicators, as well as whether the child has been treated for malnourishment (again for all children under 5 years old). Tables 6.6.9 and 6.6.10 contain the IV and RD impact estimates for these outcomes, respectively. There are no statistically significant impacts on whether advice or treatment was sought for a child with diarrhea or fever. There is a negative and statistically significant impact on whether a child was ever treated for malnourishment. Takaful beneficiaries are 4% less likely to have had their children treated for malnourishment; this effect is likely because it is less likely that Takaful beneficiary children have suffered from malnourishment.

[15] We examine whether using only the first measurement results in a different impact estimate. It does not, however.

Table 6.6.1 Impact of *Takaful* program on child dietary diversity and anthropometry indicators, instrumental variables model

	(1) Child 1's (6-23 months) dietary diversity score (Range: 0-7)	(2) Child 2's (24-59 months) dietary diversity score (Range: 0-7)
Takaful beneficiary, June 2017	-0.342	-0.057
	(0.209)	(0.144)
Observations	1,684	3,202
R^2	0.078	0.076
First stage F-statistic	71.147	97.295
Mean dependent variable	3.375	4.966

Note: RD = regression discontinuity. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.2 Impact of *Takaful* program on child dietary diversity and anthropometry indicators, regression discontinuity model

	(1) Child 1's (6-23 months) dietary diversity score (Range: 0-7)	(2) Child 2's (24-59 months) dietary diversity score (Range: 0-7)
RD estimate	-0.461*	-0.202
	(0.245)	(0.174)
Observations	1,684	3,202

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test (PMT) threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.3 Impact of *Takaful* program on child anthropometry indicators, instrumental variables model

	(1) Child 1 length/height-for-age z-score screened	(2) Child 2 length/height-for-age z-score screened	(3) Child 1 weight-for-length/height z-score screened	(4) Child 2 weight-for-length/height z-score screened
Takaful beneficiary, June 2017	-0.217	-0.105	0.313**	-0.021
	(0.158)	(0.112)	(0.138)	(0.091)
Observations	1,642	3,115	1,648	3,112
R^2	0.060	0.055	0.024	0.031
First stage F-statistic	66.826	93.789	67.266	93.657
Mean dependent variable	-0.387	-0.659	-0.160	-0.154

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.4 Impact of *Takaful* program on child anthropometry indicators, regression discontinuity model

	(1) Child 1 length/height-for-age z-score screened	(2) Child 2 length/height-for-age z-score screened	(3) Child 1 weight-for-length/height z-score screened	(4) Child 2 weight-for-length/height z-score screened
RD estimate	-0.342	-0.169	0.401**	0.027
	(0.214)	(0.143)	(0.163)	(0.120)
Observations	1,642	3,115	1,648	3,112

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.5 Impact of *Takaful* program on child overweight and wasting indicators, instrumental variables model

	(1) Child 1 wasted - From screened z-scores	(2) Child 2 wasted - From screened z-scores	(3) Child 1 overweight - Screened z-scores	(4) Child 2 overweight - Screened z-scores
Takaful beneficiary, June 2017	-0.026	0.010	0.005	0.002
	(0.021)	(0.014)	(0.005)	(0.007)
Observations	1,648	3,112	6,003	6,003
R^2	0.015	0.007	0.005	0.007
First stage F-statistic	67.266	93.657	170.012	170.012
Mean dependent variable	0.026	0.020	0.005	0.008

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.6 Impact of *Takaful* program on child overweight and wasting indicators, regression discontinuity model

	(1) Child 1 wasted - From screened z-scores	(2) Child 2 wasted - From screened z-scores	(3) Child 1 overweight - Screened z-scores	(4) Child 2 overweight – Screened z-scores
RD estimate	-0.041	-0.002	0.006	0.002
	(0.026)	(0.018)	(0.006)	(0.008)
Observations	1,648	3,112	6,003	6,003

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.7 Impact of *Takaful* program on child morbidity indicators, instrumental variables model

	(1) Child had diarrhea in past four weeks (for children under five years of age)	(2) Child had fever in past four weeks (for children under five years of age)
Takaful beneficiary, June 2017	-0.004	0.002
	(0.030)	(0.037)
Observations	6,019	6,019
R^2	0.009	0.023
First stage F-statistic	109.594	109.594
Mean dependent variable	0.177	0.317

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.8 Impact of *Takaful* program on child morbidity indicators, regression discontinuity model

	(1) Child had diarrhea in past four weeks (for children under five years of age)	(2) Child had fever in past four weeks (for children under five years of age)
RD estimate	0.007	0.022
	(0.036)	(0.044)
Observations	6,019	6,019

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.9 Impact of *Takaful* program on child health treatment indicators, instrumental variables model

	(1) Advice or treatment sought for child with diarrhea (for children under five years of age)	(2) Advice or treatment sought for child with fever (for children under five years of age)	(3) Child ever treated from malnourishment (for children under five years of age)
Takaful beneficiary, June 2017	-0.009	-0.057	-0.038**
	(0.059)	(0.051)	(0.015)
Observations	1,068	1,907	6,019
R^2	0.023	0.037	0.006
First stage F-statistic	53.567	58.530	109.594
Mean dependent variable	0.805	0.834	0.035

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.6.10 Impact of *Takaful* program on child health treatment indicators, regression discontinuity model

	(1) Advice or treatment sought for child with diarrhea (for children under five years of age)	(2) Advice or treatment sought for child with fever (for children under five years of age)	(3) Child ever treated from malnourishment (for children under five years of age)
RD estimate	-0.026	-0.049	-0.034*
	(0.072)	(0.061)	(0.018)
Observations	1,068	1,907	6,019

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.7 Household dietary diversity, health care utilization, infant and young child feeding (IYCF) knowledge and practices

This section discusses health outcomes related to diet, health care utilization, and infant and young child nutrition (IYCN) knowledge and practices. We begin with dietary diversity. Two measures are calculated: a household dietary diversity score and a dietary diversity score of the mother of the index child. Both measures are based on seven-day recall. The household dietary diversity score is

the number of food groups out of 12 consumed by the household in the past seven days.[16] The mother's dietary diversity score is the number of food groups out of 9 consumed by the household in the past seven days.[17] The IV impact estimates of these two measures are contained in Table 6.7.1 and the RD impact estimates of these measures are contained in Table 6.7.2. Both tables show that that the Takaful program had no statistically significant impact on either household or mother's dietary diversity. Because there are no specific patterns in food expenditures, this result is not surprising. As Table 6.7.9 shows, household dietary diversity is already high among the Takaful sample, for both beneficiaries and non-beneficiaries. About 92.2 percent of the households in our sample consume 8 food groups or more, and around 69.6 percent consume fruits and vegetables.

Next, we turn to health care utilization. At some point, use of health facilities will become a conditionality in the Takaful program. It is important that proper treatment for illnesses and accidents be sought to prevent further damage both to the person and, if the person contributes to household income, to the family. However, it is often considered either too expensive or that the quality of care would not be sufficient. Here, we look at whether individuals visited a health facility if they were ill or injured in the past 30 days, whether the person did not visit a facility because it was considered too expensive, and whether the health facility visited was a public facility rather than a private facility. The IV impact estimates for these measures are contained in Table 6.7.3, and the RD impact estimates for these measures are contained in Table 6.7.4. Both tables demonstrate that the Takaful program did not have any statistically significant impacts on any of these measures. These results are also unsurprising because there was no increase due to the program on spending on health or medicine.

Another important aspect of health care utilization is antenatal and postnatal care for mothers. We also examine whether the program caused more mothers to get antenatal and postnatal care during their last pregnancy (only for those pregnancies since the Takaful program began). The IV results for these outcomes are in Table 6.7.5 and the RD results for these outcomes are contained in Table 6.7.6. These impact estimates show that the Takaful program did not cause a significant increase in mothers obtaining antenatal or postnatal care.

Finally, we examine IYCN knowledge and practices. The survey administered a knowledge test on 10 IYCN knowledge questions.[18] We construct a score out of the number of these questions answered correctly. To examine practices, we look at whether someone helped put the baby to breast just after birth, whether the baby was given the colostrum, whether anything but breast milk was given to the baby within the first three days, and the age at which complementary foods (anything but breast milk) were introduced. Table 6.7.7 contains the IV impact estimates and Table 6.7.8 contains the RD impact estimates. Both tables show that there was no significant impact of the Takaful program on these outcomes.

[16] The 12 food groups are cereals; potatoes and tubers; vegetables; fruits; meat; eggs; fish; legumes nuts and seeds; dairy; oils and fats; sweets; and spices, condiments, and beverages.

[17] The 9 food groups are starchy foods, dark green leafy vegetables, vitamin-A rich fruits, other fruits and vegetables, organ meat, meat and fish, eggs, legumes nuts and seeds, and milk and milk products.

[18] The questions pertained to colostrum, when to initiate breastfeeding, when to introduce complementary foods, the vitamin contents of various foods, and water and sanitation.

Table 6.7.1 Impact of *Takaful* program on household dietary diversity indicators, instrumental variables model

	(1) Household dietary diversity score (seven-day recall based on consumption module)	(2) Mother's dietary diversity score (range: 0–9)
Takaful beneficiary, June 2017	0.160	0.011
	(0.117)	(0.100)
Observations	6,003	5,799
R^2	0.050	0.070
First stage F-statistic	170.012	169.683
Mean dependent variable	9.517	4.104

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.2 Impact of *Takaful* program on household dietary diversity indicators, regression discontinuity model

	(1) Household dietary diversity score (seven-day recall based on consumption module)	(2) Mother's dietary diversity score (range: 0-9)
RD Estimate	0.191	-0.070
	(0.133)	(0.120)
Observations	6,003	5,799

Note: RD = regression discontinuity. Standard errors in parentheses
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.3 Impact of *Takaful* program on health care utilization indicators, instrumental variables model

	(1) Visited a health facility (if had illness or injury in past 30 days)	(2) Whether facility was not visited because it was too expensive	(3) Public health facility utilization
Takaful beneficiary, June 2017	0.053	-0.104	-0.030
	(0.046)	(0.097)	(0.062)
Observations	3,648	873	2,775
R^2	0.027	0.054	0.085
First stage F-statistic	88.325	28.778	70.908
Mean dependent variable	0.761	0.564	0.373

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.4 Impact of *Takaful* program on health care utilization indicators, regression discontinuity model

	(1) Visited a health facility (if had illness or injury in past 30 days)	(2) Whether facility was not visited because it was too expensive	(3) Public health facility utilization
RD estimate	0.026	-0.143	0.041
	(0.057)	(0.115)	(0.076)
Observations	3,648	873	2,775

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.5 Impact of *Takaful* program on mother's health care utilization indicators, instrumental variables model

	(1)	(2)
	Mother received antenatal care during last pregnancy (only for pregnancies since program began)	Received postnatal care within two days of giving birth (only for pregnancies since program began)
Takaful beneficiary, June 2017	0.025	-0.013
	(0.038)	(0.053)
Observations	2,598	2,598
R^2	0.038	0.065
First stage F-statistic	92.566	92.566
Mean dependent variable	0.860	0.491

Note: RD = regression discontinuity. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.6 Impact of *Takaful* program on mother's health care utilization indicators, regression discontinuity model

	(1)	(2)
	Mother received antenatal care during last pregnancy (only for pregnancies since program began)	Received postnatal care within two days of giving birth (only for pregnancies since program began)
RD estimate	0.031	0.030
	(0.045)	(0.064)
Observations	2,598	2,598

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.7 Impact of *Takaful* program on infant and young child feeding knowledge and practices indicators, instrumental variables model

	(1)	(2)	(3)	(4)	(5)
	Number correct (out of 10) on IYCN knowledge questions	Someone helped put baby to breast after birth	Whether the baby was given colostrum	Whether anything but breast milk was given to baby within first 3 days	Age at which anything but breastmilk was given to baby
Takaful beneficiary, June 2017	-0.086	-0.093*	0.003	-0.046	-0.033
	(0.084)	(0.053)	(0.031)	(0.057)	(0.044)
Observations	5,782	2,113	2,113	2,113	2,113
R^2	0.087	0.083	0.023	0.149	0.013
First stage F-statistic	168.587	87.023	87.023	87.023	87.023
Mean dependent variable	5.772	0.496	0.918	0.466	0.841

Note: IYCN = infant and young child nutrition. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.8 Impact of *Takaful* program on infant and young child feeding knowledge and practices indicators, regression discontinuity model

	(1) Number correct (out of 10) on IYCN knowledge questions	(2) Someone helped put baby to breast after birth	(3) Whether the baby was given colostrum	(4) Whether anything but breast milk was given to baby within first three days	(5) Age at which anything but breastmilk was given to baby
RD estimate	-0.090	-0.018	-0.026	0.011	-0.096*
	(0.104)	(0.063)	(0.033)	(0.067)	(0.052)
Observations	5,782	2,113	2,113	2,113	2,113

Note: IYCN = infant and young child nutrition; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.7.9 Food groups consumed in past week by *Takaful* households

Consuming less than 8 food groups	Consuming 8 food groups	Consuming 9 food groups	Consuming 10 food groups	Consuming more than 10 food groups
7.8% of households	14.2% of households	22.6% of households	28.7% of households	26.7% of households
Cereals	Cereals	Cereals	Cereals	Cereals
Potatoes	Potatoes	Potatoes	Potatoes	Potatoes
Vegetables	Vegetables	Vegetables	Vegetables	Vegetables
Oils and fats	Oils and fats	Oils and fats	Oils and fats	Oils and fats
Sweets	Sweets	Sweets	Sweets	Sweets
Condiments	Condiments	Condiments	Condiments	Condiments
	Legumes	Legumes	Legumes	Legumes
	Dairy products	Dairy products	Dairy products	Dairy products
		Fruits	Fruits	Fruits
		Meat	Meat	Meat
				Eggs

6.8 Maternal overweight and obesity

In this section, we discuss maternal and child overweight and obesity. We first calculate the mother's body mass index (BMI).[19] Overweight among adults is defined by the World Health Organization as a BMI between 25 and 30 and obese is defined as a BMI over 30. Table 6.8.1 reports the IV impact results for these outcomes and Table 6.8.2 reports the RD impact results for these outcomes. Both tables show that there was no statistically significant impact of the Takaful program on mother's BMI or rates of overweight and obesity.

[19] The formula for calculating BMI is: (weight in kilograms) / (height in meters)^2

Table 6.8.1 Impact of *Takaful* program on maternal overweight and obesity indicators, instrumental variables model

	(1) Mother's body mass index (BMI)	(2) Mother is overweight (BMI between 25 and 30)	(3) Mother is obese (BMI above 30)
Takaful beneficiary, June 2017	0.257	0.008	-0.012
	(0.452)	(0.037)	(0.037)
Observations	5,738	5,738	5,738
R^2	0.049	0.037	0.046
First stage F-statistic	168.761	168.761	168.761
Mean dependent variable	28.367	0.407	0.324

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.8.2 Impact of *Takaful* program on maternal overweight and obesity indicators, regression discontinuity model

	(1) Mother's body mass index (BMI)	(2) Mother is overweight (BMI between 25 and 30)	(3) Mother is obese (BMI above 30)
RD estimate	0.565	0.000	0.010
	(0.506)	(0.045)	(0.043)
Observations	5,738	5,738	5,738

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.9 Women's decision making

Women's control over decision making within the household was measured using a series of nine questions asking women to describe their ability to influence decisions on a scale of 1-4, corresponding to ability to influence decisions "to a great extent" (4), "a medium extent" (3), "a small extent" (2), or "not at all" (1). The total score is the average of the numerical values for the responses for all nine questions.

In addition, an index for women's control over decision making was constructed using principal component analysis (PCA). PCA is a data reduction method in which the first principal component of a set of variables is the linear index of all variables that capture the largest variance or the largest amount of information common to all variables. In addition to the question of women's ability to influence each decision, the PCA also includes a question about whether the husband only, woman only, or husband and wife jointly participate in each decision and whether the woman needs to receive permission to do some activities.

Surprisingly, in spite of the program being designed to empower women by requiring that Takaful registrants be the mother or caretaker of the children, we find negative and significant program impacts on this aspect of women's empowerment—primarily control over decision making. Tables 6.9.1, 6.9.2, 6.9.3, and 6.9.4 present the IV and RD impact estimates on the nine questions that were asked of women regarding decision making within the household. Many estimates are not statistically significant, but many are negative, and some are negative and statistically significant.

If we look at regional heterogeneity, women from the region of Lower Egypt, and particularly women from rural areas, have significantly higher decision-making power (Table 6.9.5).

Our negative impacts on women's control over decision making, however, are driven by this group, as seen in the regression results disaggregated by region.

Table 6.9.1 Impact of *Takaful* program on women's decision-making (A) indicators, instrumental variables model

	(1)	(2)	(3)	(4)
	Woman can make own decisions on agriculture to a great extent	Woman can make own decisions on participating in wage employment to a great extent	Woman can make own decisions on major household expenditures to a great extent	Woman can make own decisions on minor household expenditures to a great extent
Takaful beneficiary, June 2017	-0.034	-0.058**	-0.062**	-0.002
	(0.042)	(0.025)	(0.029)	(0.036)
Observations	1,529	6,001	6,001	6,001
R^2	0.122	0.055	0.057	0.052
First stage F-statistic	71.934	170.049	170.049	170.049
Mean dependent variable	0.134	0.142	0.198	0.491

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.9.2 Impact of *Takaful* program on women's decision-making (A) indicators, regression discontinuity model

	(1)	(2)	(3)	(4)
	Woman can make own decisions on agriculture to a great extent	Woman can make own decisions on participating in wage employment to a great extent	Woman can make own decisions on major household expenditures to a great extent	Woman can make own decisions on minor household expenditures to a great extent
RD estimate	-0.015	-0.049	-0.043	-0.007
	(0.052)	(0.031)	(0.034)	(0.044)
Observations	1,529	6,001	6,001	6,001

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test (PMT) threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.9.3 Impact of *Takaful* program on women's decision-making (B) indicators, instrumental variables model

	(1)	(2)	(3)	(4)	(5)
	Woman can make own decisions on how to use cash transfers to a great extent	Woman can make own decisions on what food can be cooked every day to a great extent	Woman can make own decisions on getting medical treatment for herself to a great extent	Woman can make own decisions on taking a child to a doctor to a great extent	Woman can make own decisions on children's schooling to a great extent
Takaful beneficiary, June 2017	-0.051	0.022	-0.052	-0.068*	-0.070**
	(0.035)	(0.036)	(0.037)	(0.035)	(0.033)
Observations	6,001	6,001	6,001	6,001	6,001
R^2	0.045	0.078	0.062	0.065	0.052
First stage F-statistic	170.049	170.049	170.049	170.049	170.049
Mean dependent variable	0.340	0.675	0.383	0.395	0.325

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.9.4 Impact of *Takaful* program on women's decision-making (B) indicators, regression discontinuity model

	(1)	(2)	(3)	(4)	(5)
	Woman can make own decisions on how to use cash transfers to a great extent	Woman can make own decisions on what food can be cooked every day to a great extent	Woman can make own decisions on getting medical treatment for herself to a great extent	Woman can make own decisions on taking a child to a doctor to a great extent	Woman can make own decisions on children's schooling to a great extent
RD estimate	-0.054	0.017	-0.011	-0.075*	-0.073*
	(0.044)	(0.042)	(0.044)	(0.042)	(0.041)
Observations	6,001	6,001	6,001	6,001	6,001

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.9.5 Results from t-test comparing Lower Egypt with other regions

	Difference (other regions – Lower Egypt)	
Women's decision-making score	-1.569***	(-7.27)
Women's "strong" decision-making score	-0.949***	(-8.86)
Index of women's control over decision making	-0.816***	(-9.78)
Observations	6,003	

Note: t statistics in parentheses. * p<0.05; ** p<0.01; *** p<0.001

The negative impact on women's control over decision making is surprising, as it is opposite to the intended and expected impact of the program and to the impact of similar programs in other countries. A plausible interpretation of this result is that the Takaful cash payments to women caused them to report a change in the balance of decision making in the household. It may be that men responded to this new source of women's income by asserting greater control over decision making in the areas of women's work, major household expenditures, and child healthcare and child schooling decisions. Alternatively, the presence of the cash transfers may have prompted greater discussion between women and men in the household about these expenditures and activities and these conversations may have led to men playing a greater role in related decisions.

From the complementary qualitative report on this impact evaluation, on the other hand, there is very limited evidence that Takaful is perceived as negatively affecting women's role in the household. On the contrary, there is evidence of some positive impacts on decision making, though underlying decision dynamics in the household are more often unchanged.

It was also apparent in the qualitative evaluation that women responded to questions not only about their ability to influence decisions through their intra-household bargaining power but also about whether the decision was feasible at all due to the household's financial ability (ElDidi et al., 2018). A potential hypothesis that could explain the difference in results is that the module on women's decision making, unlike the modules on consumption, came after the module on program participation in the survey, so women's responses on these subjective questions could have been colored by their desire to show their household's need for the additional income.

6.10 Shocks and coping strategies

In this section we examine the impact of the Takaful program on shocks experienced by households, and the types of ways that households cope with shocks. This type of social protection program may help shield households from certain types of shocks, may help households to better cope with

shocks, or both. We first look at the number of shocks experienced by the household in the past three years. We then look at three common, but potentially detrimental ways that households tend to cope with shocks: a reduction in the amount or quality of food consumed, a reduction in educational spending or health spending, and selling off assets (land, durables). The IV impact estimates for these outcomes are reported in Table 6.10.1, and the RD impact estimates for these outcomes are reported in Table 6.10.2. There are no statistically significant impacts on any of these outcomes: Takaful households neither experienced more shocks than non-Takaful households nor did they cope with shocks in a more detrimental way than other households.

Table 6.10.1 Impact of *Takaful* program on shocks indicators, instrumental variables model

	(1)	(2)	(3)	(4)
	Number of shocks experienced by the household in past three years	Household used a reduction in amount or quality of food to cope with shock	Household reduced spending on education or health to cope with shock	Household sold assets to cope with the effects of shocks
Takaful beneficiary, June 2017	-0.020	0.022	0.029	-0.017
	(0.058)	(0.035)	(0.022)	(0.015)
Observations	5,990	6,003	6,003	6,003
R^2	0.060	0.056	0.033	0.012
First stage F-statistic	169.067	170.012	170.012	170.012
Mean dependent variable	1.066	0.517	0.084	0.036

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.10.2 Impact of *Takaful* program on shocks indicators, regression discontinuity model

	(1)	(2)	(3)	(4)
	Number of shocks experienced by the household in past three years	Household used a reduction in amount or quality of food to cope with shock	Household reduced spending on education or health to cope with shock	Household sold assets to cope with the effects of shocks
RD estimate	-0.083	0.014	0.024	-0.012
	(0.066)	(0.043)	(0.026)	(0.018)
Observations	5,990	6,003	6,003	6,003

Note; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program at 4500, the current proxy means test (PMT) threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

6.11 Heterogeneity in treatment effects

It is often informative to consider whether impacts of a cash transfer program are heterogeneous, that is, whether some program beneficiaries benefitted more from the program than others. Such evidence can help to identify limitations in the program design or in market, social, and cultural constraints or other contextual factors that make it harder for the program to improve outcomes for some people. In such cases, compensating measures may be taken to improve the impact of the program on beneficiaries with those characteristics or to expand the program's effects by better targeting the program to those who are most likely to benefit.

We explore first whether impacts of Takaful differ between rural and urban areas. Table 6.11.1 (IV model) and Table 6.11.2 (RD model) show that estimated impacts on household consumption were smaller in rural areas than in the sample on average (shown in Table 6.1.3 and Table 6.1.4, respectively). Estimated impacts of Takaful on consumption are numerically larger in urban areas than rural areas. These impact estimates are not statistically significant in the IV model,

but they are weakly significant in the RD model for total consumption and food consumption. The lack of significance may be due in part to the smaller urban sample. Also, there is no statistically significant difference in impacts on consumption between rural and urban areas for any of the measures of total household consumption, food consumption, or non-food consumption. The Takaful program reduced the probability of falling below the poverty line for beneficiaries in rural area, by 11.4-12.7 percent, as shown in Table 6.11.3 and 6.11.4. This is similar to the impact estimated for the sample overall (Table 6.1.5 and Table 6.1.6). Takaful also reduced the poverty gap under the regional poverty line for rural beneficiaries in the IV model but not in the RD model. In urban areas, there is no significant impact on poverty indicators except for a 20.2 percent reduction in the probability of being poor using the regional poverty line.

Next, we examine differences in impact in male headed households by the education level of the household head, comparing households whose male head has some secondary education (37 percent) to households with a male head with less than a secondary education (Tables 6.11.5-6.11.8). Impact on household total consumption, non-food consumption, and poverty are numerically larger among households without a secondary education, but this difference is not statistically significant. Impact on food consumption are mixed across the models presented, but again the difference in impacts between male household heads with and without a secondary education is not significant. It is tempting to conclude from the total consumption and poverty results that the impact of the program may be larger than estimated here for poorer households with less education, but the evidence here is not strong enough to support that conclusion.

We also examine whether impacts differ by the education level of female decision-makers in the household, focusing on the female spouse of the household head and female household heads. The education level of these women may have a greater effect than the education level of male household heads on outcomes such as education spending, expenditures on certain food groups, dietary diversity, and women's decision-making power in the household. Tables 6.11.9-6.11.16 show that there are no differences between households in which the female spouse of the head of the household or a female head of the household completed primary education in terms of total expenditure, food expenditure, non-food expenditure, or spending on education at the primary or secondary levels. Tables 6.11.17 and 6.11.18 show that there are no significant differences between households in which the spouse of the head of the household or a female head of the household completed primary education in terms of household dietary diversity or mother's dietary diversity. There is one significant difference in the dietary diversity of the younger child; for Takaful beneficiaries, households in which the spouse of the head of the household or a female head of the household completed primary education had lower dietary diversity scores for the younger child. However, this is one significant difference out of a very large number of tests, so this finding could very well be just by chance and we should not put too much emphasis on it. Finally, Tables 6.11.19-6.11.22 show that there are no significant differences in many dimensions of women's decision-making power in households in which the spouse of the household head or the female head of the household had completed primary education versus households where the spouse or female head of the household had not completed primary education. Overall, there is very little heterogeneity in treatment effects of the Takaful program.

Testing variation in Takaful impacts by the probability of being in the program

As part of our investigation into how impacts of the Takaful program varied by beneficiaries' characteristics, we explored whether impacts varied with the probability of participation in the Takaful program using the marginal treatment effects (MTE) model of Heckman and Vytlacil (2007). This approach tests whether the estimated relationship between the outcome variable and the

probability of participation in the Takaful program is non-linear. If so, this indicates that the potential impacts of the program are not constant but vary with the probability of being selected as a beneficiary – an increasing measure of poverty. We apply this approach to the impact estimates from the generalized IV models for several outcomes.

We estimate the MTE using a two-step model related to the generalized IV model used to estimate the impact of Takaful throughout this report. The first step involves estimating the probability that a household in the data is a Takaful beneficiary as a function of variables Z_i, the eligibility indicators used as instruments in the IV model, as well as other variables X_i, that include the PMT score and indicators for the strata used in sampling. The second step involves estimating a nonparametric regression of outcome Y_i on a continuous, differentiable non-parametric function *f* of the predicted probability of household *i* being a Takaful beneficiary, $\hat{P}(Z_i)$, from the first-step model. The second-step outcome regression has the form:

$$Y_i = f[\hat{P}(Z_i)] + \pi X_i + \varepsilon_i \quad (4)$$

The function *f* can include a non-linear specification of $\hat{P}(Z_i)$, such as entering both linear and quadratic terms. This model is a further generalization of the IV model used to conduct the main impact analysis because when *f* includes just a linear term for the predicted propensity score, this model is exactly the IV model already estimated. The slope of the function *f* in this equation provides an estimate of the marginal impact at each data point. This slope then represents the MTE. Estimating the MTE makes it possible to test whether the impact of Takaful varies with the level of the propensity score – the probability of a household being a beneficiary of the program. If the function *f* is linear, we conclude that impact is constant across the distribution of the propensity score. If *f* is non-linear, then the impact of the program will vary with the probability of being in the program, a decreasing measure of wellbeing.

We implement the MTE model by estimating equation (3) above, including both linear and quadratic terms for the predicted probability of being in the program and comparing the estimates from that model to the original IV model, which includes only a linear term for the predicted probability of being in the program. We conduct two tests of the MTE model to determine whether the linear or quadratic specification is preferred: (i) test whether the quadratic term is significant in the MTE model and (ii) conduct the Ramsey specification test to determine which model is a better fit for the data. The Ramsey regression specification error test (Wooldridge 2013) is conducted by adding squared and cubed terms of the fitted values of the outcome from the original model and conducting an F test to determine if these higher-order functions of the fitted values are significant. If so, the original model is mis-specified. Generally, when comparing two specifications such as the linear and quadratic versions of the MTE model, the model with the lower F statistic from the Ramsey test is the one that better fits the data, which indicates that this is the preferred model.

We estimated the linear and quadratic forms of the MTE model for the following outcomes: household log expenditure per adult equivalent unit, household log food expenditure per adult equivalent unit, and household education spending. Results are presented in Table 6.11.23. For household expenditure per adult equivalent unit, column (1) shows the prior result that the Takaful program increased household expenditure per adult equivalent unit by roughly 7 percentage points. This result corresponds to the linear MTE model. The quadratic MTE model is presented in column (2). The estimates in this model suggest that the impact of Takaful may be increasing with the probability of being in the program (a positive estimate for the probability of being in the program), but at a decreasing rate (a negative estimate for the squared probability of being in the program). However, the squared term is not significant at the conventional 5 percent level. Moreover, the

Ramsey test gives a lower F statistic for the linear model than the quadratic model. Both of these results suggest that the linear model is preferred and that the impact of Takaful on household expenditure does not vary with the probability of being in the program.

To further demonstrate this result, in Figure 6.11.1 we graph the relationship between household expenditure and the predicted probability of being in the Takaful program from the quadratic model in column (2) of Table 6.11.23. The graph shows that this relationship is quite flat, suggesting very little variation in household expenditure across the entire distribution of the predicted propensity score.

For household food consumption, we obtain a similar result for the MTE model as shown in columns (3) and (4) of Table 6.11.23. The quadratic term for the probability of being a Takaful beneficiary is not significant in column (4) and the Ramsey F statistic is lower in the linear model than in the quadratic model. This confirms that impacts of Takaful are homogenous with respect to the predicted propensity score. Figure 6.11.2 shows the graph of this relationship from the quadratic MTE model in column (4) and confirms that it is quite flat. For household education spending, neither the linear nor the quadratic terms in the quadratic MTE model (column 6) are significant, suggesting that the quadratic model does not fit the data well. Although the Ramsey test indicates that the quadratic model is slightly preferred to the linear model, when combined with the t-statistics on the parameter estimates from the regression, we conclude that the quadratic model is not a good fit for the data. Figure 6.11.3 confirms that the relationship between household education spending and the probability of being a Takaful beneficiary is quite flat.

This analysis sought to determine whether the impact of the Takaful program differed with the probability of being in the program, to see if there was any evidence that poorer households appeared to have larger benefits from being in the program, for example. We conclude that there is no evidence, for the impact evaluation sample, for differences in the impact of the Takaful program for these outcomes. We acknowledge that the impact evaluation sample does not include the poorest households in the program, so we cannot conclude whether impacts would differ for those households.

Table 6.11.1 Impact of *Takaful* program on expenditure indicators by rural and urban location, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditure per AEU - Log values
Rural sample					
Takaful beneficiary, June 2017	0.063*	0.067*	0.101*	0.071**	0.060
	(0.037)	(0.035)	(0.054)	(0.036)	(0.048)
Observations	4,936	4,936	4,936	4,936	4,936
R^2	0.099	0.123	0.054	0.123	0.067
First stage F-statistic	134.330	134.330	134.330	134.330	134.330
Mean dependent variable	6.510	6.512	5.958	5.976	5.548
Urban sample					
Takaful beneficiary, June 2017	0.109	0.109	0.173	0.136	0.062
	(0.078)	(0.077)	(0.115)	(0.084)	(0.091)
Observations	1,067	1,067	1,067	1,067	1,067
R^2	0.011	0.010	0.056	0.088	0.037
First stage F-statistic	44.459	44.459	44.459	44.459	44.459
Mean dependent variable	6.522	6.520	5.858	5.872	5.681
Test of equal impacts in rural and urban areas (p-value)[a]	0.5948	0.6163	0.5802	0.4767	0.9791

Note: AEU = adult equivalent unit; EGP = Egyptian pounds. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between rural and urban households.

Table 6.11.2 Impact of *Takaful* program on expenditure indicators by rural and urban location, regression discontinuity model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditures per AEU - Log values
Rural sample					
RD estimate	0.079*	0.074*	0.098	0.070	0.059
	(0.043)	(0.042)	(0.062)	(0.043)	(0.056)
Observations	4,936	4,936	4,936	4,936	4,936
Urban sample					
RD estimate	0.141*	0.137*	0.254*	0.182*	0.091
	(0.082)	(0.081)	(0.148)	(0.099)	(0.098)
Observations	1,067	1,067	1,067	1,067	1,067

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.3 Impact of *Takaful* program on poverty indicators by rural and urban location, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Rural sample					
Takaful beneficiary, June 2017	-0.127***	-0.033	-0.061	-0.052*	-17.336**
	(0.043)	(0.028)	(0.044)	(0.028)	(8.286)
Observations	4,936	4,936	4,936	4,936	4,936
R^2	0.071	0.074	0.071	0.111	0.110
First stage F-statistic	134.330	134.330	134.330	134.330	134.330
Mean dependent variable	0.417	0.130	0.583	0.205	80.085
Urban sample					
Takaful beneficiary, June 2017	-0.085	-0.008	-0.145	-0.032	-19.899
	(0.096)	(0.069)	(0.093)	(0.067)	(21.457)
Observations	1,067	1,067	1,067	1,067	1,067
R^2	0.005	0.021	0.005	0.022	0.028
First stage F-statistic	44.459	44.459	44.459	44.459	44.459
Mean dependent variable	0.417	0.128	0.660	0.200	99.785
Test of equal impacts in rural and urban areas (p-value)[a]	0.6937	0.7411	0.4186	0.7720	0.9115

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between rural and urban households.

Table 6.11.4 Impact of *Takaful* program on poverty indicators by rural and urban location, regression discontinuity model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Rural sample					
RD estimate	-0.117**	-0.031	-0.057	-0.047	-15.267
	(0.050)	(0.033)	(0.051)	(0.033)	(9.664)
Observations	4,936	4,936	4,936	4,936	4,936
Urban sample					
RD estimate	-0.115	-0.040	-0.207**	-0.070	-33.246
	(0.111)	(0.072)	(0.105)	(0.069)	(22.401)
Observations	1,067	1,067	1,067	1,067	1,067

Note: RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.5 Impact of *Takaful* program on expenditure indicators by male household head education, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditure per AEU- Log values
Male household head completed secondary education					
Takaful beneficiary, June 2017	0.041	0.046	0.169*	0.052	0.023
	(0.055)	(0.049)	(0.088)	(0.051)	(0.070)
Observations	2,395	2,395	2,395	2,395	2,395
R^2	0.088	0.116	0.052	0.128	0.066
First stage F-statistic	75.023	75.023	75.023	75.023	75.023
Mean dependent variable	6.535	6.538	5.964	5.989	5.590
Male household head did not complete secondary education					
Takaful beneficiary, June 2017	0.096**	0.096**	0.101*	0.106**	0.089
	(0.043)	(0.042)	(0.059)	(0.043)	(0.056)
Observations	3,463	3,463	3,463	3,463	3,463
R^2	0.091	0.104	0.073	0.129	0.075
First stage F-statistic	108.234	108.234	108.234	108.234	108.234
Mean dependent variable	6.493	6.492	5.918	5.927	5.559
Test of equal impacts when male household head did or did not complete secondary education (p-value)[a]	0.4377	0.4334	0.5149	0.4227	0.4576

Note: AEU = adult equivalent unit; EGP = Egyptian pounds. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between households where male household head completed secondary education and households where the male household head did not complete secondary education.

Table 6.11.6 Impact of *Takaful* program on expenditure indicators by male household head education, regression discontinuity model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditure per AEU - Log values
Male household head completed secondary education					
RD estimate	0.029	0.029	0.142	0.041	-0.011
	(0.057)	(0.055)	(0.093)	(0.060)	(0.077)
Observations	2,395	2,395	2,395	2,395	2,395
Male household head did not complete secondary education					
RD estimate	0.142***	0.135***	0.133*	0.137***	0.124**
	(0.048)	(0.047)	(0.071)	(0.050)	(0.063)
Observations	3,463	3,463	3,463	3,463	3,463

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.7 Impact of *Takaful* program on poverty indicators by male household head education, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Male household head completed secondary education					
Takaful beneficiary, June 2017	-0.140**	-0.024	-0.075	-0.047	-20.785*
	(0.066)	(0.042)	(0.065)	(0.040)	(12.532)
Observations	2,395	2,395	2,395	2,395	2,395
R^2	0.065	0.076	0.075	0.106	0.109
First stage F-statistic	75.023	75.023	75.023	75.023	75.023
Mean dependent variable	0.404	0.130	0.589	0.198	81.868
Male household head did not complete secondary education					
Takaful beneficiary, June 2017	-0.097*	-0.030	-0.084*	-0.047	-16.432*
	(0.049)	(0.033)	(0.050)	(0.032)	(9.708)
Observations	3,463	3,463	3,463	3,463	3,463
R^2	0.057	0.064	0.058	0.093	0.096
First stage F-statistic	108.234	108.234	108.234	108.234	108.234
Mean dependent variable	0.427	0.130	0.602	0.209	84.929
Test of equal impacts when male household head did or did not complete secondary education (p-value)[a]	0.5969	0.9045	0.9139	0.9995	0.7774

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from chow test of difference in coefficient between households where the male household head completed secondary education and households where the male household head did not complete secondary education.

Table 6.11.8 Impact of *Takaful* program on poverty indicators by male household head education, regression discontinuity model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Male household head completed secondary education					
RD estimate	-0.154**	-0.039	-0.092	-0.052	-23.295*
	(0.074)	(0.048)	(0.074)	(0.045)	(13.826)
Observations	2,395	2,395	2,395	2,395	2,395
Male household head did not complete secondary education					
RD estimate	-0.097*	-0.031	-0.090	-0.055	-17.977
	(0.057)	(0.038)	(0.056)	(0.037)	(11.217)
Observations	3,463	3,463	3,463	3,463	3,463

Note: Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences. RD model impact estimates of the Takaful program are at 4500, the current proxy means test (PMT) threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.9: Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food expenditure per AEU - Log values	(3) Monthly non-Food Expenditures per AEU - Log values	(4) Household education spending on primary level	(5) Household education spending on secondary level
Spouse/female household head completed primary education					
Takaful beneficiary, June 2017	0.091	0.202**	-0.009	210.571	392.519
	(0.091)	(0.092)	(0.118)	(187.612)	(431.298)
Observations	702	702	702	396	254
R^2	0.107	0.085	0.091	0.077	0.049
First stage F-statistic	34.181	34.181	34.181	21.583	13.202
Mean dependent variable	6.523	5.963	5.577	453.051	778.787
Spouse/female household head did not complete primary education					
Takaful beneficiary, June 2017	0.065*	0.103*	0.064	111.391*	204.298*
	(0.035)	(0.055)	(0.045)	(64.869)	(121.499)
Observations	5,301	5,301	5,301	2,897	1,567
R^2	0.082	0.050	0.062	0.030	0.044
First stage F-statistic	151.811	151.811	151.811	81.157	54.893
Mean dependent variable	6.511	5.937	5.571	397.705	581.290
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.8326	0.4336	0.5981	0.4012	0.3672

Note: AEU = adult equivalent unit; Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.10: Impact of *Takaful* program on expenditure indicators, regression discontinuity model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food expenditure per AEU - Log values	(3) Monthly non-food expenditures per AEU - Log values	(4) Household education spending on primary level	(5) Household education spending on secondary level
Spouse/female household head completed primary education					
RD estimate	0.246**	0.377***	-0.001	-120.306	663.770
	(0.123)	(0.140)	(0.171)	(257.967)	(846.782)
Observations	702	702	702	396	254
Spouse/female household head did not complete primary education					
RD estimate	0.075*	0.107*	0.065	93.088	133.454
	(0.039)	(0.061)	(0.051)	(80.525)	(132.953)
Observations	5,301	5,301	5,301	2,897	1,567

Note: AEU = adult equivalent unit; RD = regression discontinuity; Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.11 Impact of *Takaful* program on log expenditure of food groups 1-4 indicators, instrumental variables model

	(1) Monthly expenditures on grains per AEU - Log values	(2) Monthly expenditures on potatoes per AEU - Log values	(3) Monthly expenditures on vegetables per AEU - Log values	(4) Monthly expenditures on fruits per AEU - Log values
Spouse/female household head completed primary education				
Takaful beneficiary, June 2017	0.083	0.008	0.080	0.390
	(0.159)	(0.166)	(0.118)	(0.306)
Observations	702	702	702	702
R^2	0.099	0.060	0.036	0.068
First stage F-statistic	34.181	34.181	34.181	34.181
Mean dependent variable	3.944	2.658	3.998	2.144
Spouse/female household head did not complete primary education				
Takaful beneficiary, June 2017	0.061	0.056	0.057	0.223*
	(0.060)	(0.068)	(0.049)	(0.115)
Observations	5,301	5,301	5,301	5,301
R^2	0.051	0.037	0.042	0.053
First stage F-statistic	151.811	151.811	151.811	151.811
Mean dependent variable	3.881	2.610	3.975	2.127
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.9364	0.7270	0.9150	0.6825

Note: AEU = adult equivalent unit; Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.12 Impact of *Takaful* program on log expenditure of food groups 1-4 indicators, regression discontinuity model

	(1) Monthly expenditures on grains per AEU - Log values	(2) Monthly expenditures on potatoes per AEU - Log values	(3) Monthly expenditures on vegetables per AEU - Log values	(4) Monthly expenditures on fruits per AEU - Log values
Spouse/female household head completed primary education				
RD estimate	0.073	0.173	0.333	0.334
	(0.243)	(0.238)	(0.220)	(0.474)
Observations	702	702	702	702
Spouse/female household head did not complete primary education				
RD estimate	0.070	0.032	0.044	0.186
	(0.071)	(0.078)	(0.059)	(0.144)
Observations	5,301	5,301	5,301	5,301

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.13 Impact of *Takaful* program on log expenditure of food groups 5-8 indicators, instrumental variables model

	(1) Monthly expenditures on meat per AEU - Log values	(2) Monthly expenditures on eggs per AEU - Log values	(3) Monthly expenditures on fish per AEU - Log values	(4) Monthly expenditures on legumes per AEU - Log values
Spouse/female household head completed primary education				
Takaful beneficiary, June 2017	0.649	0.342	0.303	-0.202
	(0.420)	(0.315)	(0.273)	(0.296)
Observations	702	702	702	702
R^2	0.067	0.027	0.155	0.073
First stage F-statistic	34.181	34.181	34.181	34.181
Mean dependent variable	3.495	1.131	0.764	2.414
Spouse/female household head did not complete primary education				
Takaful beneficiary, June 2017	0.222	-0.042	0.191*	0.064
	(0.166)	(0.118)	(0.111)	(0.109)
Observations	5,301	5,301	5,301	5,301
R^2	0.038	0.036	0.080	0.131
First stage F-statistic	151.811	151.811	151.811	151.811
Mean dependent variable	3.527	1.287	0.642	2.363
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.3756	0.2758	0.6853	0.3311

Note: AEU = adult equivalent unit; Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.14 Impact of *Takaful* program on log expenditure of food groups 5-8 indicators, regression discontinuity model

	(1) Monthly expenditures on meat per AEU - Log values	(2) Monthly expenditures on eggs per AEU - Log values	(3) Monthly expenditures on fish per AEU - Log values	(4) Monthly expenditures on legumes per AEU - Log values
Spouse/female household head completed primary education				
RD estimate	0.815	0.553	0.297	-0.248
	(0.638)	(0.495)	(0.493)	(0.455)
Observations	702	702	702	702
Spouse/female household head did not complete primary education				
RD estimate	0.341*	-0.044	0.159	-0.023
	(0.183)	(0.131)	(0.135)	(0.128)
Observations	5,301	5,301	5,301	5,301

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.15 Impact of *Takaful* program on log expenditure of food groups 9-12 indicators, instrumental variables model

	(1) Monthly expenditures on dairy per AEU - Log values	(2) Monthly expenditures on oils and fats per AEU - Log values	(3) Monthly expenditures on sweets per AEU - Log values	(4) Monthly expenditures on other per AEU - Log values
Spouse/female household head completed primary education				
Takaful beneficiary, June 2017	-0.283	0.254	0.121	0.134
	(0.262)	(0.210)	(0.155)	(0.141)
Observations	702	702	702	702
R^2	0.125	0.075	0.082	0.134
First stage F-statistic	34.181	34.181	34.181	34.181
Mean dependent variable	2.441	3.319	3.515	2.873
Spouse/female household head did not complete primary education				
Takaful beneficiary, June 2017	0.044	0.127	0.013	0.084
	(0.116)	(0.086)	(0.059)	(0.063)
Observations	5,301	5,301	5,301	5,301
R^2	0.045	0.065	0.098	0.102
First stage F-statistic	151.811	151.811	151.811	151.811
Mean dependent variable	2.541	3.273	3.499	2.899
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.2402	0.6231	0.6394	0.8445

Note: AEU = adult equivalent unit; Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.16 Impact of *Takaful* program on log expenditure of food groups 9-12 indicators, regression discontinuity model

	(1) Monthly expenditures on dairy per AEU - Log values	(2) Monthly expenditures on oils and fats per AEU - Log values	(3) Monthly expenditures on sweets per AEU - Log values	(4) Monthly expenditures on other per AEU - Log values
Spouse/female household head completed primary education				
RD estimate	0.100	-0.143	0.250	0.227
	(0.455)	(0.342)	(0.234)	(0.239)
Observations	702	702	702	702
Spouse/female household head did not complete primary education				
RD estimate	0.142	0.050	-0.002	0.022
	(0.131)	(0.100)	(0.069)	(0.072)
Observations	5,301	5,301	5,301	5,301

Note: AEU = adult equivalent unit; RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.17 Impact of *Takaful* program on dietary diversity indicators, instrumental variables model

	(1) Household dietary diversity score (seven-day recall)	(2) Mother's dietary diversity score (Range: 0-9)	(3) Child 1's (6-23 months) dietary diversity score (Range: 0-7)	(4) Child 2's (24-59 months) dietary diversity score (Range: 0-7)
Spouse/female household head completed primary education				
Takaful beneficiary, June 2017	0.196	-0.082	-1.522***	0.290
	(0.281)	(0.258)	(0.420)	(0.290)
Observations	702	666	187	319
R^2	0.077	0.062	0.199	0.136
First stage F-statistic	34.181	35.781	18.325	28.398
Mean dependent variable	9.520	4.056	3.460	4.881
Spouse/female household head did not complete primary education				
Takaful beneficiary, June 2017	0.157	0.028	-0.322	-0.117
	(0.126)	(0.101)	(0.216)	(0.154)
Observations	5,301	5,133	1,497	2,883
R^2	0.047	0.072	0.077	0.072
First stage F-statistic	151.811	152.612	59.633	84.218
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.9646	0.6314	0.0244	0.1454

Note: Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.18 Impact of *Takaful* program on dietary diversity indicators, regression discontinuity model

	(1) Household dietary diversity score (seven-day recall)	(2) Mother's dietary diversity score (Range: 0-9)	(3) Child 1's (6-23 months) dietary diversity score (Range: 0-7)	(4) Child 2's (24-59 months) dietary diversity score (Range: 0-7)
Spouse/female household head completed primary education				
RD estimate	0.249	-0.120	-0.869	0.264
	(0.502)	(0.458)	(0.920)	(0.483)
Observations	702	666	187	319
Spouse/female household head did not complete primary education				
RD estimate	0.194	-0.079	-0.502**	-0.258
	(0.139)	(0.121)	(0.246)	(0.181)
Observations	5,301	5,133	1,497	2,883

Note: RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.19 Impact of *Takaful* program on women's decision-making (A) indicators, instrumental variables model

	(1) Woman can make own decisions on agriculture to a great extent	(2) Woman can make own decisions on participating in wage employment to a great extent	(3) Woman can make own decisions on major household expenditures to a great extent	(4) Woman can make own decisions on minor household expenditures to a great extent
Spouse/female household head completed primary education				
Takaful beneficiary, June 2017	0.066	0.087	-0.026	-0.141
	(0.105)	(0.081)	(0.088)	(0.109)
Observations	192	702	702	702
R^2	0.091	0.064	0.081	0.059
First stage F-statistic	20.861	34.181	34.181	34.181
Mean dependent variable	0.141	0.157	0.215	0.516
Spouse/female household head did not complete primary education				
Takaful beneficiary, June 2017	-0.019	-0.074***	-0.063**	0.009
	(0.045)	(0.027)	(0.031)	(0.038)
Observations	1,337	5,299	5,299	5,299
R^2	0.129	0.054	0.055	0.052
First stage F-statistic	64.101	151.796	151.796	151.796
Test of equal impacts when wife of household head or female household head did or did not complete primary education (p-value)[a]	0.133	0.140	0.196	0.488

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.20 Impact of *Takaful* program on women's decision-making (A) indicators, regression discontinuity model

	(1) Woman can make own decisions on agriculture to a great extent	(2) Woman can make own decisions on participating in wage employment	(3) Woman can make own decisions on major household expenditures to a great extent	(4) Woman can make own decisions on minor household expenditures to a great extent
Spouse/female household head completed primary education				
RD estimate	-0.170	0.116	-0.101	-0.039
	(0.209)	(0.122)	(0.139)	(0.158)
Observations	192	702	702	702
Spouse/female household head did not complete primary education				
RD estimate	0.002	-0.064**	-0.039	-0.001
	(0.054)	(0.032)	(0.036)	(0.045)
Observations	1,337	5,299	5,299	5,299

Note: RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.21 Impact of *Takaful* program on women's decision-making (B) indicators, instrumental variables model

	(1) Woman can make own decisions on how to use cash transfers to a great extent	(2) Woman can make own decisions on what food can be cooked every day to a great extent	(3) Woman can make own decisions on getting medical treatment for herself to a great extent	(4) Woman can make own decisions on taking a child to a doctor to a great extent	(5) Woman can make own decisions on children's schooling to a great extent
Spouse/female household head completed primary education					
Takaful beneficiary, June 2017	-0.052	0.085	-0.045	-0.011	0.052
	(0.105)	(0.104)	(0.106)	(0.106)	(0.102)
Observations	702	702	702	702	702
R^2	0.069	0.041	0.097	0.098	0.089
First stage F-statistic	34.181	34.181	34.181	34.181	34.181
Mean dependent variable	0.356	0.699	0.400	0.415	0.326
Spouse/female household head did not complete primary education					
Takaful beneficiary, June 2017	-0.057	0.004	-0.057	-0.075**	-0.081**
	(0.037)	(0.037)	(0.038)	(0.036)	(0.035)
Observations	5,299	5,299	5,299	5,299	5,299
R^2	0.043	0.081	0.060	0.062	0.051
First stage F-statistic	151.796	151.796	151.796	151.796	151.796
Mean dependent variable	0.338	0.672	0.380	0.393	0.325
P-value from Chow test[a]	0.9989	0.4721	0.9027	0.5234	0.1954

Note: Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01
[a] p-value from Chow test of difference in coefficient between households where spouse/female household head completed primary education and households where spouse/female household head did not complete primary education.

Table 6.11.22 Impact of *Takaful* program on women's decision-making (B) indicators, regression discontinuity model

	(1) Woman can make own decisions on how to use cash transfers to a great extent	(2) Woman can make own decisions on what food can be cooked every day to a great extent	(3) Woman can make own decisions on getting medical treatment for herself to a great extent	(4) Woman can make own decisions on taking a child to a doctor to a great extent	(5) Woman can make own decisions on children's schooling to a great extent
Spouse/female household head completed primary education					
RD estimate	-0.096	0.205	0.034	-0.117	-0.232
	(0.163)	(0.157)	(0.160)	(0.165)	(0.160)
Observations	702	702	702	702	702
Spouse/female household head did not complete primary education					
RD estimate	-0.056	-0.001	-0.019	-0.076*	-0.066
	(0.044)	(0.043)	(0.045)	(0.043)	(0.042)
Observations	5,299	5,299	5,299	5,299	5,299

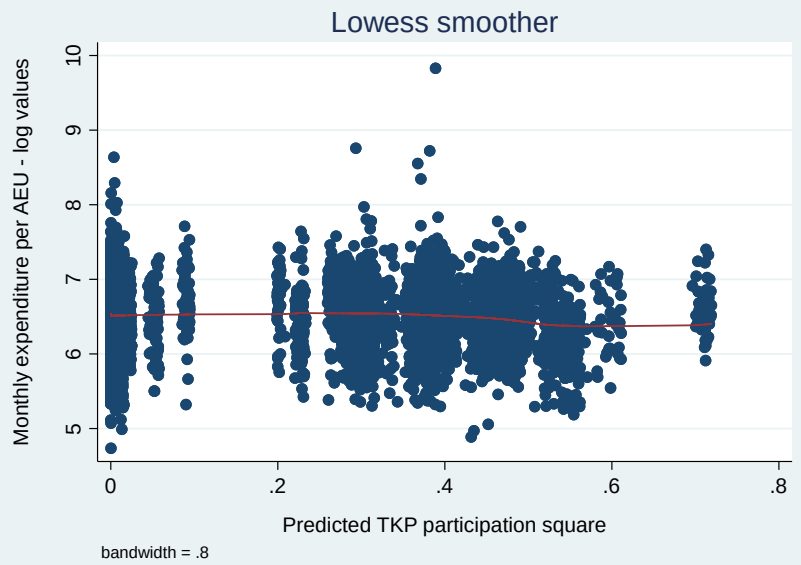
Note: RD = regression discontinuity. Standard errors in parentheses. No p-value of a test of differences in the RD estimate between the samples is provided because it is not possible to correctly estimate the regressions together in order to obtain the test of differences.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 6.11.23 Test of heterogeneity of impact of *Takaful* program by probability of being a *Takaful* beneficiary, instrumental variables model

	(1) Monthly expenditure per AEU - log values	(2) Monthly expenditure per AEU - log values	(3) Monthly food expenditure per AEU - log values	(4) Monthly food expenditure per AEU - log values	(5) Household education spending	(6) Household education spending
Predicted probability of being a Takaful beneficiary	0.073**	0.207**	0.083**	0.147	77.190	38.11
	(0.032)	(0.084)	(0.033)	(0.090)	(46.31)	(106.09)
Predicted probability of being a Takaful beneficiary, squared		-0.206*		-0.100		59.98
		(0.117)		(0.127)		(147.45)
Observations	6,003	6,003	6,003	6,003	6,003	6,003
R^2	0.1024	0.084	0.123	0.123	0.020	0.020
Ramsey F-statistic [a]	0.35	0.70	1.10	0.74	2.12	2.27

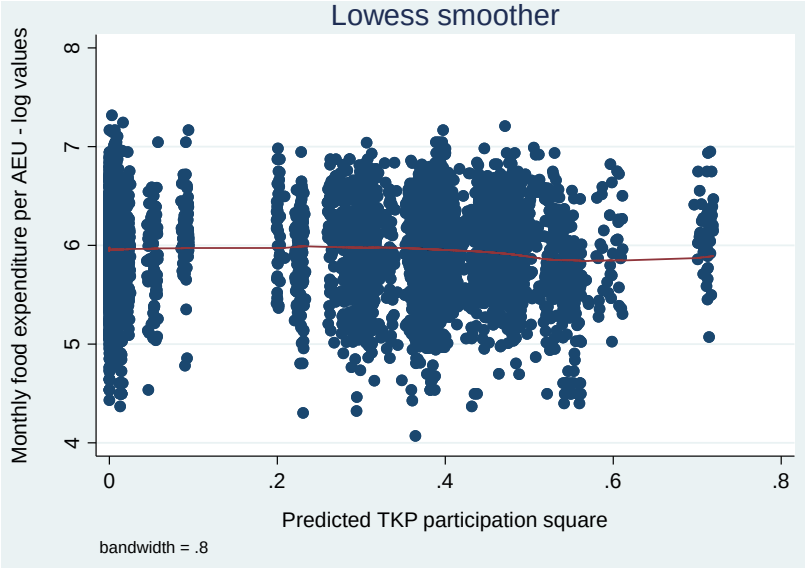
Note: AEU = adult equivalent unit. Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01
[a] The Ramsey F statistic is from the Ramsey test of model specification. A lower Ramsey F statistic indicates a better fit of the model to the data.

Figure 6.11.1 Monthly expenditure per adult equivalent unit (logged) by predicted participation in the *Takaful and Karama* programs, quadratic marginal treatment effects model



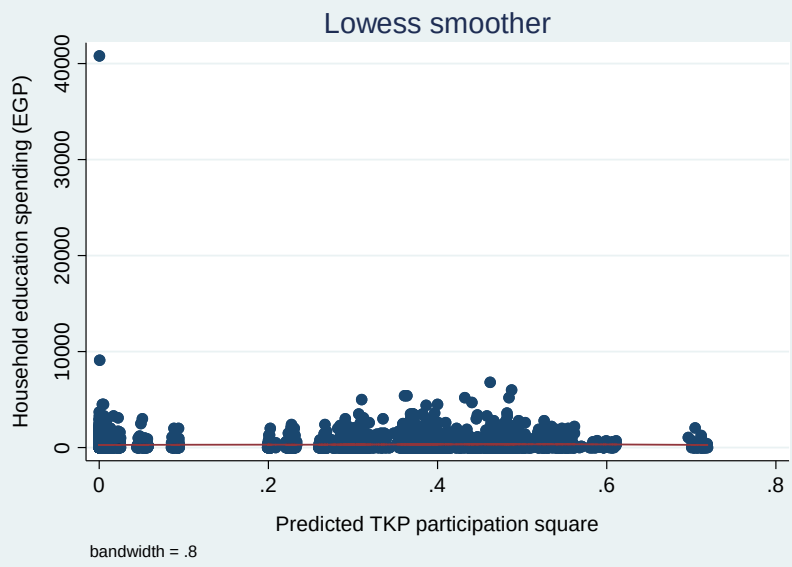
Note: AEU = adult equivalent unit; MTE = marginal treatment effects; TKP = Takaful and Karama Program.

Figure 6.11.2 Monthly food expenditure per adult equivalent unit (logged) by predicted participation in the *Takaful and Karama* programs, quadratic marginal treatment effects model



Note: AEU = adult equivalent unit; MTE = marginal treatment effects; TKP = Takaful and Karama Program.

Figure 6.11.3 Monthly household education spending by predicted participation in the *Takaful and Karama* programs, quadratic marginal treatment effects model



Note: EGP = Egyptian pounds; MTE = marginal treatment effects; TKP = Takaful and Karama Program.

7. IMPACT OF THE *KARAMA* PROGRAM

In this chapter, we report the impact estimates of the Karama program. For each outcome, we report IV and RD impact estimates together for comparison. The two methods yield very similar results, with some differences in the magnitude of measure effects or in significance level, but the main findings remain unchanged. We report on household expenditure, poverty, and perceptions of well-being; Karama income and other program income; health care spending and utilization. These are the outcomes that we expect would be affected by the Karama program. Other outcomes examined for the Takaful program (such as household or child dietary diversity, IYCN knowledge, etc.) are not very relevant for Karama because the transfers are aimed at individuals who are disabled or elderly. It is for this reason that we focus on the outcomes listed above.

As with Chapter 6, in the IV specification tables, the estimated impact of the program can be read as in the row titled "Takaful Beneficiary, June 2017," while in the RD specification, the estimated impact is reported in the row titled "RD impact." Estimates marked with stars are statistically significant, meaning that we are confident that there is a non-zero impact for these results. For other results, the estimate is not measured precisely enough to tell whether there is an impact.

Because we are using an RD impact evaluation strategy, all results should be interpreted as the program impact on a household near the cutoff point.

7.1 Household expenditure, poverty, transfers, and well-being

In terms of household expenditure, in Table 7.1.1 and 7.1.2 we examine the impact of the Karama program (through IV and RD, respectively) on total household monthly expenditure per AEU, household monthly food expenditure, and household monthly non-food expenditure. These are presented in logs, and food and non-food expenditures are presented with screened values (removing the top and bottom 3 percent of observations as outliers) and non-screened values (all observations). These tables show that the Karama program did not have a statistically significant impact on overall expenditure, food expenditure, or non-food expenditure. The IV and RD results are quite consistent. This result is not entirely surprising. The Karama transfers are not very large, compared to the Takaful transfers.

The Karama program also does not have statistically significant impacts on poverty. In Tables 7.1.3 and 7.1.4 (IV and RD respectively), we examine the impact of the Karama program on whether a household is living in extreme poverty (under US$1.25 per day), poverty (US$1.90 per day), and below the regional poverty line, as well as the poverty gaps for US$1.90 per day and the regional poverty line. Because Karama households are not among the extremely poor, it is not surprising that the Karama program is not moving people out of poverty. Karama certainly provides important support to these households in other ways, but it is not shifting poverty.

There is not a statistically significant difference between households just below and just above the Karama threshold in terms of the amount of Karama transfers received. This implies that the threshold does not work as well as an instrument for program participation for Karama as it did for Takaful, likely due to a combination of changes in the threshold around the time of the survey, self-selection into the program having more influence, and more reporting errors regarding transfer amounts. For example, in the household survey, there are 170 households reporting that they are Karama beneficiaries even though their PMT score is above 7203. Fifty-four of these households are also Takaful beneficiaries in the household survey data. As a result, the lack of a strong difference in the amount of transfers received by Karama could be due to households mistakenly reporting amounts that they received from Takaful instead of Karama. There is a marginally significant

difference between beneficiary and non-beneficiary households that both receive other types of transfers, with Karama beneficiaries receiving higher amounts of transfers from other sources. It is possible that the Karama program provided information about other programs for which they were eligible or that they were already part of these programs before Karama began.

Karama beneficiaries are no different (statistically) from non-beneficiaries when it comes to their perceptions of their well-being. Tables 7.1.5 and 7.1.6 (IV and RD impacts, respectively) examine outcomes related to perceptions of well-being. We examine where on a "ladder" (out of nine rungs, with 1 being the lowest and 9 being the highest) the household perceives that they stand at the moment with regards to its overall well-being. We also consider where on the ladder the household believes it will be in five years. Last, we also ask the household whether it believes its income will be higher in five years. There are no statistically significant differences between Karama beneficiary households and non-beneficiary households in these aspects of well-being.

Table 7.1.1 Impact of *Karama* program on expenditure indicators, instrumental variables model

	(1)	(2)	(3)	(4)	(5)
	Monthly expenditure per AEU - Log values	Monthly food + non-food expenditure (EGP) per AEU - Log screened values	Monthly food expenditure per AEU - Log values	Monthly total food expenditure (EGP) per AEU - Log screened values	Monthly non-food expenditure per AEU - Log values
Karama beneficiary, June 2017	-0.171	-0.170	-0.132	-0.153	-0.118
	(0.172)	(0.171)	(0.215)	(0.159)	(0.271)
Observations	512	512	512	512	512
R^2	0.027	0.038	0.049	0.087	0.055
First stage F-statistic	14.503	14.503	14.503	14.503	14.503
Mean dependent variable	6.461	6.471	5.853	5.898	5.522

Note: AEU = adult expenditure unit; EGP = Egyptian pounds. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.2 Impact of *Karama* program on expenditure indicators, regression discontinuity model

	(1)	(2)	(3)	(4)	(5)
	Monthly expenditure per AEU - Log values	Monthly food + non-food expenditure (EGP) per AEU - Log screened values	Monthly food expenditure per AEU - Log values	Monthly total food expenditure (EGP) per AEU - Log screened values	Monthly non-food expenditures per AEU - Log values
RD estimate	-0.924	-0.753	-1.573	-1.331	-0.321
	(1.455)	(1.316)	(1.778)	(1.549)	(0.693)
Observations	512	512	512	512	512

Note: AEU = adult expenditure unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016-April 2017.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.3 Impact of *Karama* program on poverty indicators, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Karama beneficiary, June 2017	0.237	0.039	0.211	0.065	32.540
	(0.165)	(0.067)	(0.193)	(0.082)	(28.878)
Observations	512	512	512	512	512
R^2	0.017	0.020	0.022	0.009	0.007
First stage F-statistic	14.503	14.503	14.503	14.503	14.503
Mean dependent variable	0.242	0.047	0.363	0.097	44.201

Note: Standard errors in parentheses. Estimates from instrumental variables model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.4 Impact of *Karama* program on poverty indicators, regression discontinuity model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
RD estimate	0.765	0.122	0.140	0.271	69.119
	(1.281)	(0.389)	(1.074)	(0.506)	(205.411)
Observations	512	512	512	512	512

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016 to April 2017.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.5 Impact of *Karama* program on *Takaful* and other transfer income indicators, instrumental variables model

	(1) TKP income from most recent monthly payment	(2) TKP income from most recent monthly payment per AEU	(3) Transfer income from other sources in the last 12 months	(4) Transfer income from other sources in the last 12 months per AEU
Karama beneficiary, June 2017	96.456	60.875	1143.254*	466.422*
	(127.225)	(62.796)	(597.836)	(252.076)
Observations	512	512	512	512
R^2	0.098	0.087	-0.025	-0.005
First stage F-statistic	14.503	14.503	14.503	14.503
Mean dependent variable	340.354	142.337	605.127	271.819

Note: AEU = adult equivalent unit; TKP = Takaful and Karama Program. Standard errors in parentheses.
Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.6 Impact of *Karama* program on *Takaful* and other transfer income indicators, regression discontinuity model

	(1) TKP income from most recent monthly payment	(2) TKP income from most recent monthly payment per AEU	(3) Transfer income from other sources in the last 12 months	(4) Transfer income from other sources in the last 12 months per AEU
RD estimate	270.384	259.369	429.473	268.420
	(567.087)	(363.617)	(2005.775)	(680.163)
Observations	512	512	512	512

Note: AEU = adult equivalent unit; RD = regression discontinuity; TKP = Takaful and Karama Program. Standard errors in parentheses.
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016-April 2017.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.7 Impact of *Karama* program on well-being and income indicators, instrumental variables model

	(1) Where on the ladder do you feel you stand at the moment?	(2) Where on the ladder do you feel you will stand at after five years?	(3) Household believes their income will be higher in the next five years
Karama beneficiary, June 2017	-0.309	-0.226	-0.029
	(0.685)	(0.632)	(0.124)
Observations	512	512	512
R^2	0.172	0.210	0.059
First stage F-statistic	14.503	14.503	14.503
Mean dependent variable	2.777	3.141	0.174

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.1.8 Impact of *Karama* program on well-being and income indicators, regression discontinuity model

	(1) Where on the ladder do you feel you stand at the moment?	(2) Where on the ladder do you feel you will stand at after five years?	(3) Household believes their income will be higher in the next five years
RD estimate	-0.027	1.607	0.397
	(1.992)	(3.212)	(0.646)
Observations	512	512	512

Note: RD = regression discontinuity. Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016-April 2017.

7.2 Health care spending and utilization

In this subsection, we examine outcomes related to health care and medical spending, as well as health facility utilization. We focus on these outcomes because the Karama eligible households include individuals who are disabled, elderly, or both, who generally tend to have higher-than-average spending on medicine and health care in general, as well as more frequent health facility utilization for checkups, any problems arising, and other needs.

Health care spending does not differ substantially between Karama beneficiary and non-beneficiary households. Tables 7.2.1 and 7.2.2 (IV and RD impacts, respectively) show that for outcomes of household monthly spending on medicine and pharmaceuticals, doctor appointments, and health insurance; the share of medicine expenditures in total non-food expenditure; and the share of spending on pharmaceuticals, doctor appointments, and health insurance in total non-food expenditure, there are no significant impact estimates. It tends to be quite difficult to accurately measure these variables and, as mentioned earlier in the report, expenditures also tend to be underreported. This may be especially true with health expenditures since they are relatively infrequent, and in this case also because either the respondent is elderly or disabled and has trouble with recall questions or the person making the expenditures is not answering the expenditure questions in the survey.

Health care visits and utilization also do not differ substantially between Karama beneficiary and non-beneficiary households, as shown in Tables 7.2.3 and 7.2.4 (IV and RD impacts, respectively). There are no statistically significant differences between beneficiaries and non-beneficiaries in whether they have visited a health facility in the past 30 days or whether this facility (if visited) was a public health facility. Again, this could be because the respondent has trouble with recall questions or because the survey respondent is answering questions on behalf of another person.

Table 7.2.1 Impact of *Karama* program on medical and health spending indicators, instrumental variables model

	(1)	(2)	(3)	(4)
	Household monthly spending on medicine	Household monthly spending on pharma-ceuticals, doctor appointments, and health insurance	Share of medicine in total non-food expenditure	Share of pharmaceuticals, doctor visits, health insurance, etc. in total non-food expenditure
Karama beneficiary, June 2017	67.416	70.074	-0.014	0.038
	(109.982)	(154.068)	(0.074)	(0.048)
Observations	504	512	504	512
R^2	0.039	0.049	0.062	0.045
First stage F-statistic	13.752	14.503	13.752	14.503
Mean dependent variable	192.847	89.448	0.242	0.087

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.2.2 Impact of *Karama* program on medical and health spending indicators, regression discontinuity model

	(1)	(2)	(3)	(4)
	Household monthly spending on medicine	Household monthly spending on pharma-ceuticals, doctor appointments, and health insurance	Share of medicine in total non-food expenditure	Share of pharmaceuticals, doctor visits, health insurance, etc. in total non-food expenditure
RD estimate	440.354	786.882	0.369	0.427
	(638.380)	(818.509)	(0.411)	(0.547)
Observations	504	512	504	512

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016-April 2017.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7.2.3 Impact of *Karama* program on health care utilization indicators, instrumental variables model

	(1) Visited a health facility (if had illness or injury in past 30 days)	(2) Public health facility utilization
Karama beneficiary, June 2017	-0.004	-0.404
	(0.176)	(0.311)
Observations	345	229
R^2	0.184	0.078
First stage F-statistic	17.770	14.691
Mean dependent variable	0.664	0.319

Note: Standard errors in parentheses. Estimates from instrumental variables model.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7.2.4 Impact of *Karama* program on health care utilization indicators, regression discontinuity model

	(1) Visited a health facility (if had illness or injury in past 30 days)	(2) Public health facility utilization
RD estimate	0.434	-1.223
	(0.924)	(1.486)
Observations	345	229

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Karama program are at 7203, the proxy means test threshold of eligibility from May 2016-April 2017.
* p < 0.10, ** p < 0.05, *** p < 0.01

8. ANALYSIS OF TAKAFUL PROGRAM TARGETING

In this chapter, we provide a short analysis of the targeting of Takaful, considered as part of Egypt's national social safety net for families with children. We use a nationally representative sample of households with children to examine how effective the program is at registering the poor, and how well the PMT score distinguishes between poor and non-poor registrants.

The targeting objective of the program according to the 2015 World Bank Project Appraisal document was to reach 1.5 million households, with a predicted targeting accuracy of 60 percent, implying that 0.9 million poor households or 22 percent of all poor households would be included in the program. At the time, using the 2012/2013 HIECS, the poverty line was set such that it included the poorest 26.3 percent of Egyptian households (World Bank 2015). When the PMT targeting mechanism was designed and the threshold level of the PMT score was set at 4500, this was based on a poverty cut-off of the poorest 40 percent of households (personal communication, Dr. Heba El-Laithy). Thus, by design and as a result of the limited budget, the program is accepting a large amount of exclusion error. This is typical of many early CCT programs; as the budget and program expands, exclusion error is reduced. We provide some recommendations in this regard after analyzing the sources and degree of targeting error.

8.1 The targeting analysis sample

To conduct the targeting analysis, we make use of the nationally representative sample of households with children under 18 years of age collected for this study. While the impact analysis sample only includes households near the eligibility thresholds of the PMT score who have applied to Takaful, the nationally representative sample includes better-off households and ultra-poor households, as well as households across the income distribution who for whatever reason did not apply to Takaful. This allows us to use the nationally representative sample to draw conclusions about the degree to which Takaful reaches the households most in need in Egypt.

Table 8.1.1 Households with children in the national population

Decile of expenditure per AEU	Share of households with children	Decile of expenditure per AEU	Share of households with children
Poorest	68.4	6	77.9
2	71.0	7	75.8
3	76.2	8	74.8
4	75.3	9	67.3
5	79.8	Wealthiest	55.3

Note: AEU = adult equivalent unit. Data from the 2015 HIECS.

The nationally representative sample was selected using a randomly selected subsample of the communities used in the DHS (stratified at the governorate level and excluding the frontier governorates due to security concerns). Within each community, approximately 20 households were surveyed from among households with children under 18 years of age so as to focus on households that met the demographic eligibility criteria for the program. As shown in Table 8.1.1, the share of households with children is not strongly correlated with household expenditure per AEU, although there are slightly fewer households with children in the very poorest and richest deciles. Our targeting analysis would therefore not be expected to change greatly if we had looked at all households rather than restricting only to households with children. Table A4.15 in the Annex shows the characteristics of the nationally representative sample compared to our impact analysis sample.

By construction, the nationally representative sample is nearly proportional to the population of households with children under 18 years of age within each governorate. We use sampling weights to ensure that the sample is exactly proportional to the population of households with children under 18.

The nationally representative sample comprises 1,692 households. Of these, most households (1,370 or 80 percent of households) either know about the Takaful program or recall hearing about it. Of those who had heard of the program, 41 percent tried to apply to the program, but the majority did not. Of those who applied, 30 percent self-reported as beneficiaries of the program, but only 26 percent of those who applied are currently active beneficiaries (based on reporting receiving transfers in the past three months). This is shown in Table 8.1.2.

Table 8.1.2 Nationally representative sample for analysis of the targeting of *Takaful*

Nationally representative sample	**1,692**	**Don't know the program**	**322**			
		Know the program or recall hearing about it	**1,370**	Did not try to apply	810	
				Tried to apply	560	Beneficiaries 143
						Self-report beneficiaries, but no recent transfers 23
						Non-beneficiaries 394

8.2 Effectiveness of program registration

We perform the analysis in this chapter by examining various statistics by quintile of household expenditure per AEU. We use quintiles as this allows us to directly examine the program's goal of reaching the poorest 40 percent of households (the bottom two quintiles).

Table 8.2.1 shows the nationally representative sample split into five quintiles. We first summarize average expenditure per AEU of the households in each of the quintiles. This represents expenditure without the Takaful transfers (via subtracting 7.3 percent of expenditure based on our impact estimates).

We can see that most people have heard about Takaful. The outreach regarding the existence of the program appears to have been very successful, with 82 percent of the sample having heard about Takaful, and this is relatively evenly distributed among the quintile groups. In terms of applying to the program, we see that a higher proportion of the poorest two quintiles apply for Takaful compared to the higher quintiles. This is the result of both self-selection within communities and the geographical roll-out which started with campaigns in the poorest areas of the country. We also see that much of the exclusion of poor households occurs at the level of registration, as less than half of households in the poorest 40 percent applied to Takaful.

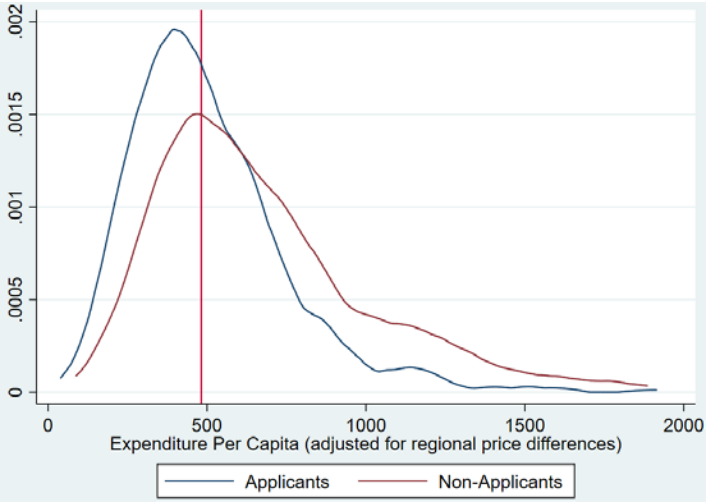
Table 8.2.1. Reach of the *Takaful* program, by expenditure quintile

	Poorest 20%	20-40%	40-60%	60-80%	Richest 20%	All
Expenditure per AEU (without Takaful)	421.9	669.1	846.0	1101.9	1984.1	995.3
	(7.1)	(3.0)	(3.4)	(6.1)	(74.5)	(29.4)
Heard of Takaful, share	0.85	0.82	0.84	0.82	0.79	0.82
	(0.026)	(0.027)	(0.026)	(0.024)	(0.038)	(0.019)
Applied to Takaful, share	0.50	0.42	0.33	0.30	0.17	0.35
	(0.033)	(0.037)	(0.034)	(0.031)	(0.027)	(0.023)
Observations	339	338	339	338	338	1,692

Note: AEU = adult equivalent unit. Standard errors presented in parentheses. Data is from the weighted nationally representative sample of households with children using the counterfactual based on subtraction of the transfer amount.

Figure 8.2.1 presents the same findings graphically by showing the distribution of expenditure per capita among those who applied to Takaful (registrants) and those who did not apply to Takaful (non-registrants). The vertical line represents the Egyptian poverty line which is expressed in per capita terms. Consistent with other chapters in this report, the poverty line we are using is EGP 482 per capita per month, which is defined by the 2015 national poverty line.[20] Household expenditure is adjusted for price differences between the regions using the same factor as in the 2015 regional poverty lines. Note that the ranking of households changes slightly when we use expenditure per capita compared to expenditure per AEU; however, the overall story is similar, and the figures would not have changed substantially if we had chosen to show the distribution of expenditure per AEU. Again, we see that overall, households who applied to Takaful are poorer than those who did not apply and that there are a substantial number of households who fall under the poverty line who did not apply to the program.

Figure 8.2.1 Expenditure for *Takaful* applicants vs. non-applicants



Note: Data is from the weighted nationally representative sample of households with children. Expenditure is net of Takaful transfer amounts. The vertical line is the Egyptian poverty line. In this figure, the relative sizes of the applicant and non-applicant sample are normalized to concentrate on the shape of the distributions. However, actually there are about twice as many non-applicants as applicants.

[20] According to this line, the poorest 40 percent of households are defined as poor. In the absence of an official updated poverty line, this is a working definition of poverty that seems reasonable and coincides conveniently with the targeting goal of the program. We attempted to inflate this poverty line to account for inflation between June 2015 and June 2017. However, this resulted in a proportion of Egyptians under the poverty line of 78 percent, which is not sensible. We believe that our consumption module underrepresents actual consumption by approximately one-third (the same amount by which the 2015 poverty line should have been inflated to account for increased prices). During presentations at the Ministry of Social Solidarity, it was agreed that of the several poverty lines presented, this was the one that seemed qualitatively most reasonable.

8.3 Effectiveness of proxy means test (PMT) targeting

In this section, we examine the effectiveness of the PMT score at targeting poor households within the nationally representative sample, look at heterogeneity of effectiveness geographically and over time, and present figures showing visually the degree to which the PMT score predicts household expenditure.

Table 8.3.1 shows the acceptance rate among those who applied for Takaful by expenditure quintile. More than half of registrants in the lowest quintile of expenditure are rejected, while 13 percent of registrants in the highest quintile are accepted. If all households were automatically registered, these acceptance rates would imply that 46 percent of program beneficiaries were non-poor. Due to self-selection and geographical roll-out, the actual targeting rate was somewhat better as described below. This is not a-typical of targeting using a PMT score. In a cross-country test of PMT methodological effectiveness, Brown, Ravallion, and van de Walle (2016) found that constructing a PMT to try to identify the poorest 40 percent using an extensive set of variables, as in the Egyptian case, resulted in an average of 30 percent of non-poor being included even in an idealized setting with perfect implementation. The PMT score, while predictive on average of household expenditure, is expected to be imperfect at judging individual cases. Additionally, the PMT score does not capture changes in expenditure due to transitory shocks (Alatas et al., 2012). For example, if a household owns a house made of concrete that was inherited decades ago, they may appear as if they own a large asset that would disqualify them from the program. However, that household may not have the option to liquidate that asset and may have just as limited earning opportunities compared to a household who is counted as poor because they do not have this asset.

In the final row of Table 8.3.1, we present a counterfactual conjecture about how effective targeting would have been based on these acceptance rates if households in all quintiles had applied to the program at equal rates (in other words, without the geographic rollout and self-selection). Based on acceptance rates alone, only 55 percent of beneficiaries would have been in the first two quintiles.

Table 8.3.1 Acceptance rate among applicants, by quintile of expenditure

	Poorest 20%	20-40%	40-60%	60-80%	Richest 20%	All
Acceptance rate of applicants	0.41	0.23	0.22	0.18	0.13	0.27
	(0.036)	(0.044)	(0.042)	(0.046)	(0.050)	(0.035)
Observations	165	137	107	99	52	560
Counterfactual: Share of Takaful beneficiaries in this quintile if all households applied, %	35	20	19	16	11	100

Note: Data is from the weighted nationally representative sample of households with children using the counterfactual based on subtraction (for ranking by quintile). The acceptance rate indicates the current beneficiary status is conditional on being an applicant.

In Table 8.3.2, we present the share of households in each quintile who are actually Takaful beneficiaries. This share is influenced by both the probability of registering for Takaful, and the probability of being accepted conditional on registering. As indicated by the share of Takaful beneficiaries in the lowest two quintiles, the overall targeting effectiveness is considerably better than the targeting effectiveness conditional on registration: 67 percent of the households in the program are from the lowest two quintiles.

We also see clearly that a very large proportion of the poor are not benefiting from the program: only 20 percent of households in the poorest quintile and 10 percent of households in the second quintile are beneficiaries. This is largely a budgetary matter as, given the scale of the

program, it would not be possible to include all poor households. The government has included more than 1.9 million households in the program, but unless the program expands, millions of poor households are necessarily excluded.

Neglected in the above discussion is that the post-registration selection of beneficiaries is actually a combination of PMT targeting and exclusion factors. In addition to the PMT-score-based targeting, households were excluded from participating in Takaful if they met one of six exclusion criteria: owned a car, owned more than 1 feddan of land, had a government job or pension, received transfers from abroad, or had a formal private sector job with insurance. The first five types of exclusion can be checked in our dataset. We find that overall 31 percent of Egyptian households with children meet at least one of these exclusion criteria. In particular, among households in the first quintile, 17 percent of households would not have been eligible for Takaful due to these exclusion factors (some households applied and were rejected while others may have decided not to apply knowing that they would not qualify). The leading exclusion factor for the poorest quintile was receiving a government pension or having a government job. Many households are excluded from the program even though they are very poor and their PMT score may be lower than the threshold. This suggests that the exclusion criteria are ineffective, unduly penalizing poor households.

Table 8.3.2 *Takaful* beneficiaries and exclusions by quintile of expenditure

	Poorest 20%	20-40%	40-60%	60-80%	Richest 20%	Total
Households self-reporting in Takaful, share	0.24 (0.027)	0.13 (0.027)	0.08 (0.019)	0.06 (0.020)	0.02 (0.009)	0.11 (0.015)
Households receiving benefits from Takaful currently, share	0.20 (0.023)	0.10 (0.022)	0.07 (0.016)	0.06 (0.016)	0.02 (0.009)	0.09 (0.013)
Households meet at least one exclusion criteria, share	0.17 (0.021)	0.29 (0.027)	0.25 (0.030)	0.35 (0.028)	0.51 (0.040)	0.31 (0.018)
Takaful beneficiaries in this quintile (currently receiving benefits), %	45	22	16	12	5	100
Takaful beneficiaries in this quintile (self-report), %	45	25	15	11	4	100
Takaful benefits received by this quintile, %	46	18	17	13	5	100
Observations	339	338	339	338	338	1,692

Note: Data is from the weighted nationally representative sample of households with children using the counterfactual based on subtraction of the transfer. Standard errors are in parentheses.

Finally, Table 8.3.2 speaks directly to the question of targeting efficiency by showing the share of all Takaful beneficiaries in our sample who are in each quintile of the distribution. Forty-five percent are in the first quintile, and 22 percent or 25 percent are in the second quintile (depending on whether self-reported beneficiaries who seem to have stopped receiving benefits are included). If we concentrate on the cash received rather than number of households, the distribution is quite similar, with 46 percent of cash received by households in the first quintile and 18 percent received by households in the second quintile.

In Table 8.3.3, we examine the heterogeneity of targeting effectiveness by urban as compared to rural areas. Takaful beneficiaries are disproportionately rural, reflecting the geography of poverty in Egypt as well as the geographical targeting during rollout. However, there are still significant numbers of urban poor: approximately one-third of our sample in the lowest two quintiles located in urban areas. Urban households were somewhat less likely to have heard of Takaful or applied to Takaful. More dramatically, however, 18 percent of urban poor are accepted to Takaful if they apply, compared to 31 percent of rural poor. As a result of both lower application rates and lower acceptance rates, only 9 percent of poor households in urban areas are Takaful beneficiaries, compared to 18 percent in rural areas. This suggests room for improvement in both

outreach efforts in urban areas, and particularly in the way that the PMT and exclusion factors act to screen urban beneficiaries.

Table 8.3.3 *Takaful* beneficiaries, urban and rural

	Urban households in poorest 40%	Rural households in poorest 40%
Heard of Takaful	0.78 (0.04)	0.86 (0.03)
Applied to Takaful	0.37 (0.04)	0.50 (0.04)
Takaful beneficiary (currently receiving benefits)	0.09 (0.03)	0.18 (0.03)
Observations (all)	229	448
Share of applicants accepted	0.18 (0.05)	0.31 (0.03)
Observations (applicants)	181	379

Note: Standard errors are in parentheses.

We also look at how targeting effectiveness was impacted by the roll-out of the program. Table 8.3.4 presents the probability of acceptance conditional on registration date for applicants in four different registration periods. Because only current beneficiaries are counted, this analysis does not fully capture how targeting changed over time, since some early beneficiaries were later excluded. During the early period, there was a high degree of geographical targeting, reflected in the high probability of enrollment, including accepting one-third of beneficiaries from the highest quintile. This type of inclusion error is much lower for applicants who registered later and almost zero among applicants who registered since September 2016. On the other hand, poor applicants who registered later are also much less likely to be included. This may be due to the stricter application of exclusion restrictions to later participants.

Table 8.3.4 Applicants by registration period

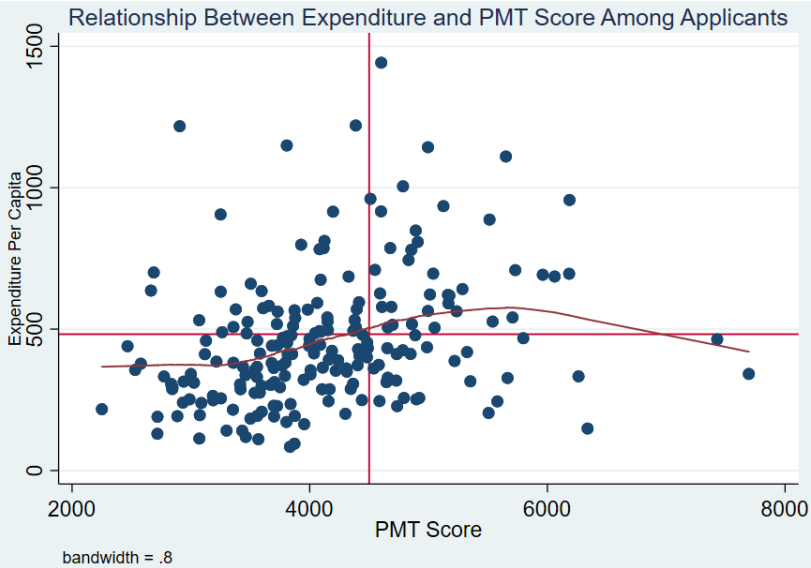
Registration period	All	Poorest 20%	Richest 20%	Obser-vations
March-November 2015 (PMT score threshold = 5003)	0.51	0.73	0.33	68
	(0.08)	(0.11)	(0.13)	
December 2015 – September 2016 (PMT score threshold = 4296)	0.33	0.47	0.17	234
	(0.04)	(0.05)	(0.09)	
September 2016 – July 2017 (PMT score threshold = 4500)	0.16	0.25	0	220
	(0.03)	(0.06)		
Total				522

Note: Data is from the weighted nationally representative sample of households with children, restricted only to registrants for which the registration date is non-missing in the survey. Standard errors are in parentheses. PMT = proxy means test.

To visually get a picture of how the PMT works, Figure 8.3.1 plots expenditure per capita (net of the Takaful transfer) against the PMT score for households who applied to Takaful in the impact analysis sample. This is not a representative sample, as we were not able to confirm all registrants who self-reported in our survey as having applied with records in the national database, but it gives a general impression. The vertical line is the current PMT cutoff score to qualify for Takaful (4500) and the horizontal line is the poverty line. We see that the underlying function that the PMT is based on (here reflected by a non-parametric regression which is locally linear near the center of the distribution) correctly predicts that households with higher scores have higher expenditure per capita, until crossing the poverty line approximately at the threshold. However, the

unavoidable imprecision of the PMT is also clearly visible. Households in the north-east and south-west quadrants are correctly sorted by the PMT, while households in the north-west quadrant represent inclusion errors (non-poor households included by the PMT in Takaful) and households in the south-east quadrant represent one form of exclusion errors (poor applicants excluded by the PMT from Takaful).

Figure 8.3.1 Expenditure and the proxy means test score among applicants



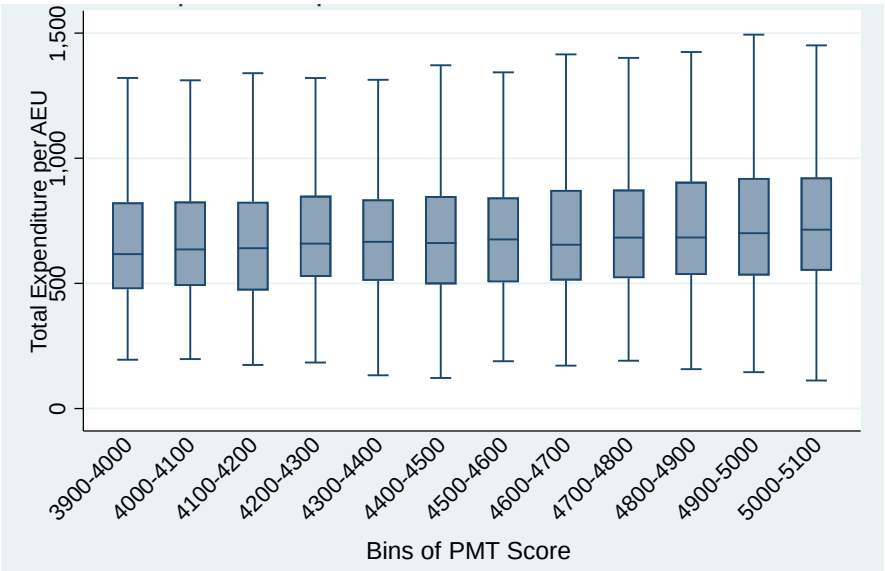
Note: PMT = proxy means test. This figure uses the nationally representative sample, with per capita expenditure calculated after subtracting the impact of 7.3 percent on consumption.

The imprecision of PMT targeting is not unique to Takaful and Karama, but it is important to keep in mind that because of the large amount of noise in the data, small differences in PMT scores are not very predictive of differences in household expenditure.

As described in other chapters of this report, our impact analysis sample was drawn from households with PMT scores in the range of 3900-5100. This range includes the top 40 percent of Takaful beneficiaries, and the PMT threshold has moved several times within the range. Intuitively, this would seem to be significant for program targeting; however, in practice, there is so much variation of expenditure within households at a single PMT score that small movements of the threshold do not make much difference in the composition of the households included.

In Figure 8.3.2, we divide the PMT score into bins of 100 units each, from 3900 to 5100 (which was the range of the PMT score along which the impact evaluation sample was drawn), making 12 bins. We then plot the median expenditure (the horizontal line within each box), the 25th percentile (the bottom of the box) and the 75th percentile (the top of the box), as well as the top and bottom adjacent values (the lines sticking out of the box). We see that along the PMT score, the expenditure per AEU is quite stable.

Figure 8.3.2 Total expenditure per AEU within proxy means test score bins



Note: AEU = adult equivalent unit; PMT = proxy means test.

From the point of view of households anywhere in this range, the PMT scoring process appears quite random. During the household survey of the impact evaluation sample, we asked households if they knew why they were rejected by the program. The overwhelming majority of households (90 percent) said they did not know why they were not accepted.

8.4 Discussion

Overall, the targeting of the Takaful program has performed reasonably well given budgetary restrictions and the general accuracy of PMT scores to reflect true poverty. Targeting efficiency met the goal of 60 percent of beneficiaries being poor households. Considering poor households to be defined by the lowest two quintiles, 67 percent of Takaful beneficiaries are poor.

PMT-based targeting is unavoidably imprecise; however, there are some ways that targeting could be improved.

At the level of selecting beneficiaries, the use of exclusion factors could be reconsidered and the PMT weighting function used for urban households could be explored to understand why it excludes so many poor households. The PMT score would benefit from updating to account for changes in the economy. A technical improvement suggested by Brown, Ravallion, and Van de Walle (2016) is to use a quantile regression rather than a linear regression when defining the weights for the PMT scoring equation.

The geographical targeting and self-selection were positive contributors to the overall targeting effectiveness, so expanding enrollment via focusing outreach on areas where poverty rates are high, rather than increasing the program threshold, would help to increase targeting effectiveness.

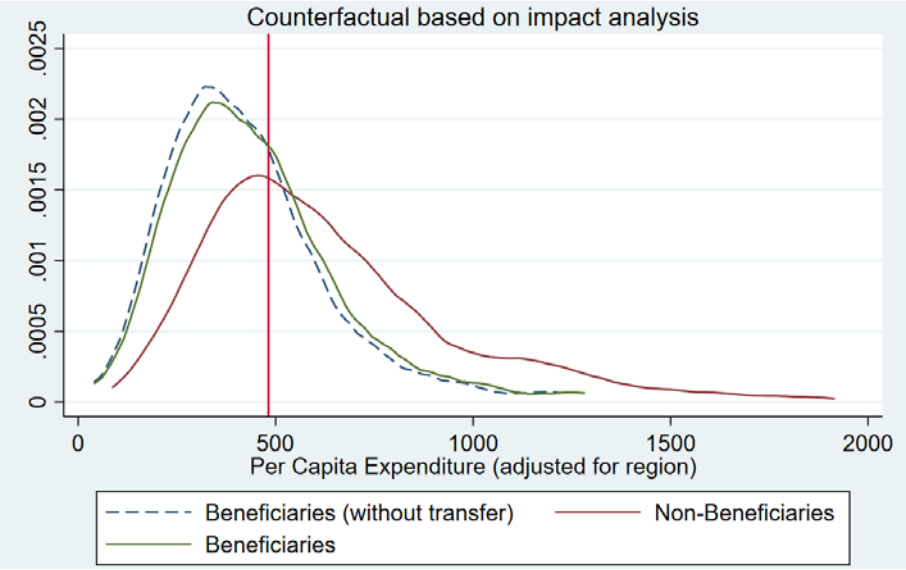
The PMT score's complexity is certainly an advantage as far as avoiding gaming of the system. However, the disadvantage is that there is a lack of transparency and, compared to a simpler set of criteria, there is more room for error due to data entry errors and intentional or unintentional mis-reporting of assets. Our attempts to attempts to recreate the PMT score despite having almost all the necessary variables available in our household survey was very far off, which suggests that there could be discrepancies between the data reported to the program and the data collected during the survey. Including some form of community-based feedback could potentially help address

this potential for mis-reporting and increase trust in the system. For targeting its Productive Safety Net Program, the government of Ethiopia sets quotas on the number of households at the district that can be included in the program based on regional poverty estimates. Then a committee of local leaders works with the communities to target the program. Another method is to incorporate some form of community feedback or appeals mechanism rather than only using the PMT. This has been successful in Indonesia. However, it does require a great deal of trust among communities to ensure that elite capture does not prevail.

While the targeting rate met the modest goal of 60 percent being poor, improving targeting would have positive benefits for the program as a whole.

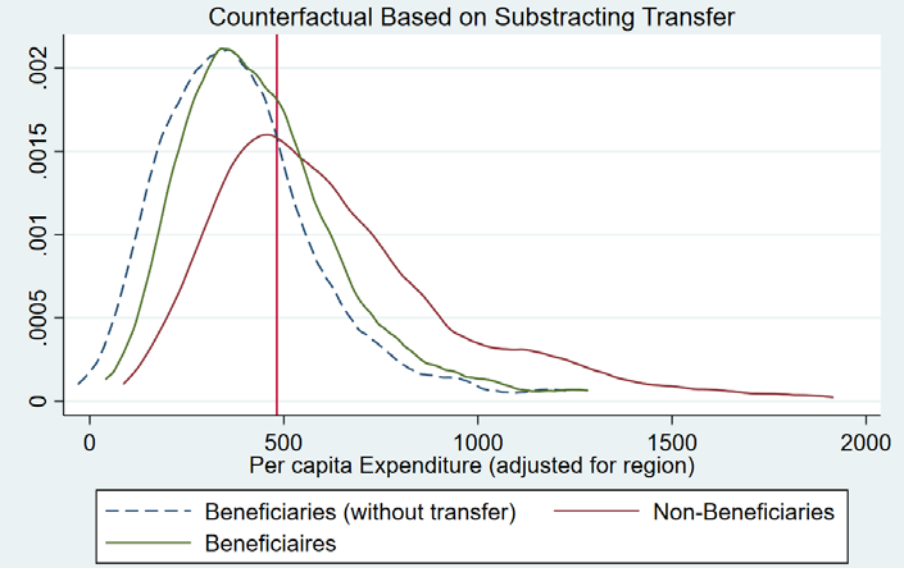
Figures 8.4.1 and 8.4.2 show the distribution of per capita expenditure for beneficiaries and non-beneficiaries. For beneficiaries, the dashed line shows the counterfactual distribution if they had not received the transfer based on our estimated impact from households near the threshold. On a per capita basis, the transfer's impact on consumption is not very high, but it is sufficient to move a small share of households across the poverty line.

Figure 8.4.1 Distribution of expenditure by beneficiary status for applicant households based on impact analysis



Note: Data in figure is from the weighted nationally representative sample of households with children.

Figure 8.4.2 Distribution of expenditure by beneficiary status for applicant households based on subtracting transfer



Note: Data in figure is from the weighted nationally representative sample of households with children.

However, our estimated impact on average households near the threshold likely underestimates the impact of the program on the poorest households. In Table 8.4.1, we examine the share of the Takaful transfer in the total expenditure of beneficiaries. Because we are concerned about under-reporting in household consumption, the shares in the table are likely to be somewhat exaggerated. The pattern across quintiles, however, is important. For the average beneficiary, the transfer represents only 17 percent of household expenditures, while for the poorest quintile, the size of the transfer is at 25 percent of expenditures if we ignore concerns about under-reporting of consumption. However, recall from above that less than half of Takaful beneficiaries are in this poorest quintile. This points to how an improvement in targeting would increase program impacts.

Table 8.4.1 *Takaful* transfer as a share of expenditure

	Poorest 20%	20-40%	40-60%	60-80%	Richest 20%	Total
Share of Takaful transfer in expenditure for beneficiaries	0.25 (0.03)	0.13 (0.01)	0.11 (0.01)	0.15 (0.01)	0.09 (0.003)	0.17 (0.02)
Observations	76	39	26	17	8	137

Note: Data is from the weighted nationally representative sample of households with children using the counterfactual based on subtraction (for ranking households into quintiles). Transfer amount is also reduced by one-third to account for under-reporting of consumption. Standard errors are in parentheses.

Another way to look at how targeting affects program impact on poverty reduction is to estimate the program impact on poverty indirectly in our nationally representative sample. Unlike the estimates in the impact analysis section, this estimate takes into account the full distribution of incomes of program beneficiaries. Because many beneficiaries are far below the 40th percentile, the Takaful transfers move only about one percent of the population over the poverty line (Table 8.4.2). This limited impact on poverty is due primarily to the relatively high poverty line and imperfect targeting, rather than to the size of the transfers. For example, even doubling the size of the transfers would decrease national poverty by only 1.6 percentage points.

Table 8.4.2 Poverty reduction by *Takaful* transfer

Poverty rate without Takaful (subtracting transfer)	0.416	(0.022)
Current poverty rate	0.406	(0.021)
Poverty rate with Takaful transfer size doubled	0.400	(0.021)

Note: Standard errors are in parentheses.

9. CONCLUSIONS AND RECOMMENDATIONS

As part of a series of economic reforms begun in 2014, the Government of Egypt initiated a social protection scheme in March 2015 involving targeted cash transfers to poor households called the Takaful and Karama program. Takaful and Karama is a conditional cash transfer program that provides income support to the poor and most vulnerable: namely, poor families with children (under 18 years of age), poor elderly (aged 65 years and above), persons with severe disabilities, and most recently, orphaned children. It is implemented by the Ministry of Social Solidarity (MoSS) and co-financed by the Government of Egypt and the World Bank. The program is divided into two subprograms: Takaful and Karama. Takaful (Solidarity) is a family income support scheme, which is designed to be conditioned on school attendance and health service utilization although the conditionalities have not yet been implemented. Karama (Dignity) is an unconditional income support scheme targeted at the poor elderly, persons with severe disabilities, and most recently orphaned children. Targeting for the program used a combination of geographical targeting and application of a Proxy Means Test (PMT), an index of well-being based on household demographics, income, housing quality, assets, and other characteristics. In poor districts, potentially eligible households were registered and interviewed to collect information for the PMT. Households with a PMT score below a preset threshold were considered eligible for the program and would begin receiving transfers.

A household survey for the impact evaluation was conducted from July 15—August 30, 2017 by the firm El-Zanaty and Associates. The survey collected information on outcomes related to household expenditure and poverty, well-being and income, schooling, child dietary diversity and anthropometry, child morbidity, household dietary diversity, health care utilization, infant and young child nutrition knowledge and practices, women's decision making, shocks, and illness and disability. The sample for the evaluation includes 6,541 households in the impact evaluation sample plus an additional 1,692 households in a nationally representative sample for targeting analysis. The evaluation sample was selected from the administrative database of registrants for the program in intervals of the PMT score around the relevant thresholds for each program.

The impact evaluation was designed using a regression discontinuity (RD) methodology. The RD methodology is effective for measuring the impact of programs that are targeted using a threshold level of a continuous measure of well-being, such as a PMT score. The RD approach compares outcomes for beneficiaries just below the threshold for eligibility to outcomes for non-beneficiaries just above the threshold. Because the specific level of the eligibility threshold is not within the control of program applicants, whether households near the threshold end up below it or above is nearly random and cannot be affected by their actions. As a result, the application of the threshold PMT score creates a quasi-experiment locally around the threshold that is used to measure the program impact. In this setting, the RD approach is more rigorous and reliable than non-experimental approaches such as matching. In particular, a core assumption of matching methods – that, conditional on their observable characteristics, all registrants have some chance of being eligible for the program – is violated when targeting relies primarily on the use of a threshold level of a PMT score, because eligibility becomes a deterministic function of the observable variables in the PMT score. That is, if one can write down a formula that sharply increases the probability that a registrant household is eligible, matching methods will not work because non-beneficiary households with the same characteristics as beneficiaries are not available to form a comparison group. Matching methods were also not feasible for evaluating Takaful and Karama because the program began nearly two years before the evaluation and no pre-program baseline data are available. This makes it infeasible to match on pre-program characteristics.

The impact evaluation data are well suited to conducting the analysis using the RD approach: there is a large number of households with a PMT score near the eligibility thresholds (except for the first threshold) and the PMT score is continuous at the threshold. Because the PMT score is not a perfect predictor of program participation (some households above the threshold participate in the program and some households below the threshold do not participate) we use a "fuzzy" regression discontinuity design. The fuzzy RD adjusts for the fact that the threshold PMT score does not perfectly predict participation by estimating the model in two stages: the first stage predicts the probability of program participation as a function of being below the eligibility threshold on the PMT score and the second stage measures impact as the change in the level of the outcome variable that is due to the difference in predicted probability of program participation as a result of the use of the threshold level of the PMT score. The fuzzy RD approach is identical in structure to another two-step method of measuring impact: instrumental variables (IV). To account for there being three thresholds of the PMT score that determined eligibility, we estimate impacts of the program using two methods: a generalized IV methodology that accounts for all changes in the threshold and a more conventional fuzzy RD approach estimated only at the current eligibility threshold of 4500, which is the threshold that causes the greatest change in the probability of being in the program. The generalized IV and fuzzy RD approaches share many similarities and will provide similar impact estimates if impacts are driven primarily by households whose PMT score is around the 4500 threshold. The IV method is more effective at measuring impacts on beneficiaries registered in all three waves of enrollment, whose beneficiary status was determined at any of the three thresholds.

The impact evaluation results show that the Takaful program has helped the poor to significantly increase their household consumption, at a scale comparable to successful cash transfer programs in other countries. The Takaful program increased the value of consumption spending by 7.3 percent. This is equivalent to EBP 56 per person and EBP 156 per household, or roughly one-third of the value of the average Takaful transfer. This positive impact on household consumption is comparable to the impact of other well-known social protection programs. A review of seven conditional cash transfer programs in Latin America (Fizbein et al. 2009) found that impacts on household expenditure ranged from 7-10 person among four programs in Brazil, Mexico, Colombia, and Honduras. Thus, the Takaful program has performed well compared to other well-known CCT programs, which were very successful.

Takaful has also significantly contributed to poverty reduction. The evaluation assessed the impact of the Takaful program on the probability of a household being poor and found that the Takaful program reduced the probability of a household living in poverty (below US$1.90 per day) by about 11 percent and this effect is statistically significant. The Takaful program reduced the probability of a household living under the national poverty line by 8 percent. If we very conservatively assume that the 7.3 percent increase in consumption applied to all beneficiaries, including those further from the threshold, and model this in our nationally representative targeting sample, then Takaful would be reducing the overall poverty rate by 0.4 percentage points. In other words, our conservative estimate is that of approximately 19.4 million households with children in Egypt, Takaful would move at least 77,600 households across the poverty line. Alternatively, we estimate that 59.7 percent of the 19.4 million households with children in Egypt are poor and that 16 percent of these poor households are enrolled in TKP (Table 8.3). Next, we apply the 8 percent reduction in probability of being poor for beneficiaries of TKP and this yields an estimate that TKP moved 153,427 households out of poverty, which is equivalent to more than 720,000 individuals.

In addition, Takaful beneficiaries have increased their food consumption and improved the quality of their diets. The Takaful program caused a statistically significant increase in the value of

monthly food consumption per AEU by 8.3—8.9 percent. This is slightly lower than the average impact of social protection programs on food consumption of 13 percent as reported in a recent review by IFPRI (Hidrobo et al. 2017). Disaggregating the effects on household food consumption, there is modest evidence that households use the transfers to improve the quality of their diet as the programs caused a significant increase in the value of fruit consumption and a weakly significant increase in the value of meat consumption. Despite this evidence of changing food expenditure patterns, there is no significant impact of the Takaful program on dietary diversity including household dietary diversity or the diversity of diets for women and children.

The evaluation also finds some evidence of positive impacts of Takaful on child nutritional status. Estimates show that the Takaful program has improved weight-for-height z-scores for children under two years of age. This is a meaningful effect, although the data we collected show no evidence of substantial malnutrition in children, and therefore it is not surprising that this increase in z-scores does not correspond to a significant change in the already very low rate of wasting. We also find low rates of overweight and no program impact on the probability of being overweight in our sample. Finally, we find that the Takaful program led to a reduction of 3.7 percentage points in the probability that a child under five years of age was ever treated for malnourishment, which may imply less need for treatment due to better health status. There was no impact on child stunting (a measure of chronic malnutrition) prevalence for children in either under-two- or two-to-five-year-old age groups.

Meanwhile, Takaful may not have the intended effect on women's empowerment, particularly as it relates to a woman's control over household decisions. Estimates show a negative and significant impact on one important measure of women's empowerment – women's control over decision making—which is driven primarily by households in Lower Egypt. These results are based on the reported ability of a woman to influence a variety of types of household decisions. This pattern is the opposite of effects found in several other countries (e.g., Ecuador, Mali) and opposite to the intended impact of the program.

Furthermore, the study shows that there were no significant impacts on school enrollment and heath care utilization, which might be explained by the absence of conditionalities at the time of the evaluation. There is no impact so far of the Takaful program on the probability that children or girls specifically are enrolled in school, or conditional on attending school, whether they were absent for one week or more during the past year. There was also no significant impact on private tuition or tutoring, but we do find significant increased spending on school supplies and transportation of EBP 211 per household per year in households with at least one secondary-school-age student and EBP 123 per household per year in households with at least one primary-school-age student. There were no impacts on health service utilization, including no impacts on whether women received antenatal care during pregnancy, the number of antenatal care visits, or postnatal health facility utilization.

In terms of program experience, the large majority of beneficiaries is satisfied with Takaful and Karama. Sixty-eight percent of the program beneficiaries in our sample are very satisfied with the program, and about 90 percent are either very satisfied or somewhat satisfied with the program. In terms of receiving the transfers, about 93 percent of transfer recipients have not faced any challenges in receiving the transfers.

Finally, by looking at TKP's targeting performance, it can be inferred that targeting has improved over time, but there is room for further improvements. The early wave of registration was not very precise and included a large number of households from the top quartile of the expenditure distribution. On the other hand, only 20 percent of households in the poorest quintile of the

expenditure distribution are covered by the program. Excluded poor households are disproportionately in urban areas, which may be due either to the way PMT is calculated or a difference in registration rate. Fewer than half of the sample of the poorest households attempted to apply to TKP. This is one area in which improvements can be made: encouraging potentially eligible households to apply via information campaigns and other methods, or making it easier to apply using methods such as enrollment drives and subsidies, is likely to increase the proportion of the poor who need the program to apply. Additionally, a large proportion of the poor (more than half) are not beneficiaries of the program, and there are many households in the richest quartile who are beneficiaries of the program, even if we are only considering those who applied. Targeting specific governorates could be a good strategy as there are vast differences among them. Ensuring that the richest quartile of households in certain governorates do not gain access to the program could free up resources for the poorest households who do need it.

In conclusion, we recommend starting to communicate that Takaful transfers are conditional on school attendance and compliance with health conditionalities. It is also important to start implementing the school enrollment and attendance conditionalities, with a focus on secondary schools. Given the mixed results of Takaful on nutrition, we also recommend adding a nutrition campaign to the health component of Takaful. For example, nutrition counseling and informational handouts could be involved during the child growth monitoring or prenatal and postnatal checkups. It is also advised to review the current targeting mechanism and facilitate application procedures. Transparency regarding program eligibility conditions is also important. In addition, it would be useful to build synergies between Takaful and Karama and the Food Voucher system, along with other social protection strategies to develop a comprehensive social safety net, with better joint targeting, a monitoring system that allows people to graduate from the programs, and a stronger focus on nutrition.

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ANNEXES

Annex I: *Takaful and Karama* Program impact evaluation – sampling strategy for baseline survey

Originally prepared 10 July 2017

The sampling strategy for the TKP Impact Evaluation has been designed to provide a representative sample of the TKP program. This document outlines the process the evaluation team undertook for selecting both the villages and households for the baseline questionnaire. We used stratified cluster sampling to select registrant households, where the number of clusters in each stratum was proportional to the share of registrants in each stratum.

Overview of Sampling Parameters

Based on the power calculations that the evaluation team conducted to determine the sample size required for the TKP impact evaluation, we estimated that the study would require a sample size of 8,016 households spread across 501 clusters (villages), with 16 households per cluster.

Stratification of Registrant Sample

Stratification was based primarily on region. The six regions are Metropolitan (greater Cairo and Alexandria), Upper Rural, Upper Urban, Lower Rural, and Lower Urban. These regions were used in the process of PMT eligibility determination for Takaful and Karama, and the PMT formula used differed by region. In the case of the Upper Rural region of Egypt, we also stratified by governorate (9 governorates in Upper Rural). This is because two-thirds of the Takaful and Karama registrants resided in the Upper Rural region. As such, we define 14 strata: five strata for each region excluding Upper Rural and nine strata for Upper Rural.

Eligibility Criteria

The eligibility criteria used for identifying governorates and clusters from which to sample registrant households was as follows:

1. Eligible governorates: Eligible governates are those where the share of Takaful-eligible households (household eligibility defined as having a PMT score<=4500) in the governorate is greater than or equal to 0.5 percent. Therefore, governorates that have a very small share of eligible households in TKP are excluded, in part to help manage survey costs. The only exception to this rule are governorates in the Frontier region, where the share of eligible households is less than 0.5 percent. We keep these governorates so that the Frontier region, which may have different sources of poverty and food insecurity, is represented in the evaluation sample.
2. Eligible village clusters for Takaful: Eligible village clusters for Takaful are those that have at least seven Takaful eligible households.
3. Eligible village clusters for Karama: Eligible village clusters for Karama are those that have at least 6 Karama eligible households with a PMT score between 7000 and 7400 and have at least one elderly (65 and above) or disabled member.

Selection of Registrant Village Clusters

We sampled village clusters within the 14 region-governorate strata using simple random sampling, where the number of clusters per stratum was proportional to the share of registrants in each stratum.

Selection of Registrant Households

After randomly selecting village clusters within each stratum, we randomly select 16 households within each Takaful and Karama village cluster, attaching higher sampling probabilities to households with PMT scores closer to the main threshold for each program.

The following RD windows were defined for each program and used to sample households:

- Takaful RD Window 1: 4300<=PMT<=4700
- Takaful RD Window 2: 4100<=PMT<4300 | 4700<PMT<=4900
- Takaful RD Window 3: 3900<=PMT<4100 | 4900<PMT<=5100
- Karama RD Window: 7000<=PMT<7400 & at least one elderly/disabled member.

These intervals or "windows" of the PMT score were selected in order to provide a sample of beneficiaries and non-beneficiaries around the current Takaful eligibility threshold of 4500 and the Karama eligibility threshold of 7203. Within the Takaful village clusters, households are randomly selected for sampling conditional on being in one of the Takaful RD windows. However, households with PMT scores closer to the main threshold of 4500 are given a higher weight/probability of being included among the 16 households per cluster. This is particularly valuable from the perspective of our analysis and evaluation strategy, which relies on a RD design. The RD design will measure impact by comparing outcomes between households just above and just below the 4500 threshold. There is also some indication of discontinuity of probability of enrolling in the program at the previous threshold of 4296, likely due to the delay between time of registration and time of becoming eligible, so we make our full window broad enough to include this threshold and will also take account of this discontinuity in the analysis. As households below the earlier threshold were eligible to begin receiving transfers at an earlier date, there is also scope for analysis of the impact of a longer duration of receiving the transfers.

Within the Takaful village clusters, households in Takaful RD Window 1 receive a relative weight of 5, households in Takaful RD Window 2 receive a relative weight of 3, and households in Takaful RD Window 3 receive a relative weight of 2, in order to provide for oversampling of households nearer to the threshold. Thus, on average, we will have 8 eligible Takaful households, and 8 ineligible Takaful households, distributed such that 10 are within 200 points of the current threshold of 4500, 6 are within 200-400 points, and 4 are within 400-600 points.

Within the Karama village clusters, we sample 8 households in the Karama RD window and 8 households from the Takaful RD Windows using the same weighting procedure used to sample Takaful households in the Takaful village clusters. In cases where there are less than 8 households in the Karama RD window, we replace the missing sample with households from the Takaful eligibility windows.

Table A1.1 and A1.2 provide a breakdown of clusters and beneficiary status of our final sample of registrant households within each program after completing the sampling procedure outlined above.

Table A1.1 Sample size of registrant clusters and households

	Takaful only clusters	Karama and Takaful clusters	Registrant clusters
Clusters	325	75	400
Beneficiaries	2,857	289	3,525
Non-beneficiaries	2,343	281	2,875
Total households	5,200	1,200	6,400

Table A1.2 Sample size of registrant clusters and households, by strata

		Sample			
Strata	Total registrants	Takaful beneficiaries near Takaful threshold	Takaful non-beneficiaries near Takaful threshold	Karama beneficiaries near Karama threshold	Karama non-beneficiaries near Karama threshold
Metropolitan	125,177	109	113	15	7
Lower Urban	64,956	51	66	11	3
Lower Rural	312,790	205	395	26	29
Upper Urban	376,253	409	375	36	44
Upper Rural Governorate 21	202,104	234	140	25	14
Upper Rural Governorate 22	236,361	236	243	28	17
Upper Rural Governorate 23	149,602	178	144	8	6
Upper Rural Governorate 24	289,087	298	264	31	28
Upper Rural Governorate 25	334,602	374	304	25	43
Upper Rural Governorate 26	320,274	325	317	30	39
Upper Rural Governorate 27	188,626	168	217	18	26
Upper Rural Governorate 28	75,794	69	81	7	7
Upper Rural Governorate 29	86,338	79	96	6	18
Frontier	9,495	14	17		
Total	2,771,459	2,768	2,782	266	281

Sample Selection of Non-Registrant Households

For our non-registrant sample, we take advantage of access to the nationally representative DHS sampling frame from 2014 to choose a complementary sample of 1,616 households to which the Takaful and Karama registrants in our sample can be compared: (i) for targeting analysis and (ii) to identify where the local average treatment affect that we measure is located within the distribution of consumption of the Egyptian population.

To reach this sample, we stratify on governorate proportional to share of the population and then draw a random sample of clusters from the DHS frame primary sampling units in this governorate. We then sample households with any children under 18 from within each cluster using the DHS household listing. This provides a nationally representative sample of non-registrant households comparable to Takaful registrants. To reach only households with children, we oversample from the household listing and then during the fieldwork will exclude households that are visited if they do not have any children.

Table A1.3 Total sample size

	Registrant clusters	Non-registrant clusters	Total
Clusters	400	101	501
Households	6,400	1,616	8,016

Annex II: Specification tests for regression discontinuity (RD) model and robustness checks for instrumental variable (IV) and RD models

A2.1 Specification tests

In this section, we demonstrate the validity of our RD estimates to ensure that the impact estimate results are robust. We begin by investigating a key underlying assumption of the RD approach, which is that households just above the PMT threshold are similar on average to households just below the PMT threshold. This implies that all observable and unobservable characteristics of households should be similar near the threshold, irrespective of which side of the cutoff households fall on. More specifically, all relevant observed covariates should be continuous as we move from just below the PMT threshold to just above. If they are, then it is also likely that any unobserved characteristics will also be continuous. This is important to verify because we want to ensure that any changes in outcomes at the threshold are attributed specifically to participation in the Takaful and Karama program and not to any other potential differences between households.

McCrary (2008) also introduced a second important concern that might cast doubt on the assumptions underlying the RD design—if subjects (either households themselves or program officials) became aware of the treatment assignment rule and were able to manipulate the forcing variable, the PMT score in this case, thereby influencing eligibility and enrollment in the program. This type of selective sorting would violate the continuity/no-manipulation assumption of RD designs. Visually, we would then expect a discontinuity at the cutoff in the density function of the forcing variable, implying that a disproportionately larger number of households became "just" eligible. We therefore test for this self-selection or endogenous sorting along a known treatment assignment rule.

A2.2 Regression discontinuity (RD) specification tests involving covariates

Following protocol suggested by Imbens and Lemieux (2008) and Lee, Moretti, and Butler (2004), we present evidence that a series of covariates are continuous along the threshold and are unaffected by treatment status. Annex II Tables A2.1-A2.6 specifically test the null hypothesis that there is no significant discontinuity in the average value of covariates such as household size, number of children, household head and spouse education levels, dwelling characteristics or even proxies for influence within the local community at the current RD threshold of 4500. Apart from the household's main source of drinking water (tap inside the dwelling), we find no significant effect of program participation on any of the other 20 covariates on which these falsification tests were conducted. Given that our research design relies critically on similarity between households just above and just below the treatment threshold, we can be reasonably confident that this underlying assumption of RD is met.

A2.3 Test continuity of proxy means test (PMT) at the threshold

To test whether there was any systematic manipulation of the PMT score, we provide both visual and formal confirmation from an RD manipulation test using local polynomial density estimation (Cattaneo, Jansson, and Ma 2017). This test requires us to first estimate the density of households near the cutoff and then conduct a hypothesis test to check whether the density is discontinuous. The manipulation test returns a test statistic of 0.5388 with a p-value of 0.59 (Table A2.7). Therefore, we find no statistical evidence of any systematic manipulation of the forcing variable. Moreover, Figure A2.1 visually depicts that there is no discontinuity in the density of households near the RD threshold of 4500.

A2.4 Regression discontinuity (RD) estimate robustness to the choice of bandwidth

RD estimates can occasionally be sensitive to the choice of bandwidth (the width of the bin). The process of selecting the appropriate bandwidth requires a degree of balancing between precision and bias. A larger bandwidth often yields more precise estimates, since more data points are used in the regression, while a narrow bandwidth will have lower bias, since more observations are closer to the cutoff, and higher variance because of a smaller number of observations (Lee and Lemieux, 2010). In general, this requires selecting a bandwidth that makes the bins wide enough to reduce the amount of noise, yet narrow enough to compare observations that are close to the RD threshold on both sides. In our RD specifications, we set a bandwidth of 600 to ensure that the model utilizes the full range of observations available. Moreover, because our sampling procedure was designed to oversample households closer to the cutoff and provide a reliable local average treatment effect, the bandwidth of 600 essentially reflects our sampling window. Nevertheless, if the results were critically dependent on a particular bandwidth choice, including this 600, they would be less reliable than if they were robust to variations in the bandwidths.

We therefore test the sensitivity of our results to changes in the bandwidth and provide visual confirmation that the RD estimates for a series of outcomes including consumption, poverty, and women's control over decision making are stable across the range of bandwidths. Figures A2.2 - A2.4 plot the relationship between the bandwidth and the RD estimate and include the 95 percent confidence interval for the estimates on consumption and poverty. In Figure A2.3, for example, we can see that the RD estimate of Monthly Consumption Expenditure (EGP) per AEU – log values hovers around 0.1 percentage points and is significant at the 95 percent confidence level for all bandwidths between 250 and 600. The RD estimates in Figure A2.4 for poverty (Household living under USD$1.90/day) are also very stable and remain near -0.1 for the range of bandwidths selected.

A2.5 Instrumental variable (IV) and regression discontinuity (RD) robustness checks

In this section, we first conduct some robustness checks on the IV specification. In the IV specifications, we use a dummy variable for participation in the program to estimate impacts. We now check whether it is not simply participation but the amount of participation (dose response) that is important. First, we check whether the duration of time a household has been a beneficiary in the Takaful program affects our impact estimates. We do this by using the number of months that a household has been a beneficiary of the program as the participation variable in the first stage. We test both number of months in the program and find that there are no statistically significant effects on our main outcomes of expenditures and poverty (results not reported). This is unsurprising, however, as one additional month in the program would not be expected to have a large effect. We also test whether a household being in the Takaful program for six months or more changes our estimates. We do so by using a dummy variable for a household being in the program for six months or more as the participation variable in the first stage. This specification shows that duration does matter: those who have been in the program longer experience larger differences in consumption and smaller incidences of poverty compared to non-beneficiaries. Tables A2.8 and A2.9 demonstrate these impacts for consumption and poverty, respectively.

Next, we check whether impact estimates are affected by the total amount of transfers received (in EGP). We use this as the first-stage participation variable. Tables A2.10 and A2.11 show that the amount does matter. Receiving more transfer income results in larger differences in consumption and larger decreases in poverty between beneficiaries and non-beneficiaries. It appears that the does response is important, in terms of both the dimensions of duration of participation in the program and amount of transfers received.

We also check whether including dummy variables for the registration period in our models affects our impact estimates. We do this for both IV and RD models in Tables A2.12 – A2.15. These tables show that our impacts are not much affected by the inclusion of these variables; both levels of significance and magnitudes of coefficients hardly change. Because in the IV model in particular, the inclusion of these variables is highly correlated with the eligibility variables, our preferred model does not include these variables for the registration period.

Finally, we check whether adding some household characteristics to the specifications affects our impact estimates. Rather than include all of the variables in the PMT score (which would be endogenous and also highly correlated with the PMT score, which is a requirement for inclusion in the generalized IV and RD models), we include a subset of potentially exogenous household characteristics (such as household size, education level of the household head) as controls in the specification. Once again, both statistical significance and magnitude of coefficients do not change very much (shown in Tables A2.16 – A2.19), and as such, our preferred specification is still the model without these controls.

Table A2.1 Regression discontinuity falsification tests: Household characteristics

	(1) Number of resident members in the household	(2) Total children 0-18 in household	(3) Age of household head	(4) Household head is male
RD estimate	0.005	0.073	0.625	0.006
	(0.110)	(0.100)	(0.968)	(0.015)
Observations	6,003	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.2 Regression discontinuity falsification tests: Household head education

	(1) Household head did not attain any education	(2) Household head attained primary education level	(3) Household head attained preparatory education level	(4) Household head attained secondary education level
RD estimate	0.037	-0.021	0.004	-0.048
	(0.042)	(0.036)	(0.027)	(0.046)
Observations	6,003	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.3 Regression discontinuity falsification tests: Spouse education

	(1) Spouse did not attain any education	(2) Spouse attained primary education level	(3) Spouse attained preparatory education level	(4) Spouse attained secondary education level
RD estimate	0.005	-0.011	-0.010	-0.013
	(0.047)	(0.029)	(0.032)	(0.045)
Observations	6,003	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.4 Regression discontinuity falsification tests: Social networks

	(1)	(2)	(3)
	You / member of household is government official	You / member of household know any political leader	You / member of household know someone who works in local office
RD estimate	0.003	-0.002	0.002
	(0.004)	(0.002)	(0.007)
Observations	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.5 Regression discontinuity falsification tests: Dwelling characteristics (A)

	(1)	(2)	(3)
	House walls made of brick, cement, concrete, or stone	House roof made of brick, cement, concrete, or stone	House floors made of tiles, marble, cement, or concrete
RD estimate	0.015	-0.022	-0.011
	(0.026)	(0.043)	(0.039)
Observations	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.6 Regression discontinuity falsification tests: Dwelling characteristics (B)

	(1)	(2)	(3)
	Total rooms used by household (January 2015)	Main source of drinking water is tap inside the dwelling	Household has a flushable toilet facility
RD estimate	0.018	-0.054**	-0.029
	(0.075)	(0.026)	(0.033)
Observations	6,003	6,003	6,003

Note: RD = regression discontinuity. RD model falsification test is at 4500, the current proxy means test threshold of eligibility. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.7 Regression discontinuity manipulation test using local polynomial density estimation

	Value
Manipulation test statistic	0.5388
Manipulation test p-value	0.5900
Observations	6,003

Note: RD = regression discontinuity. RD manipulation test statistic is calculated using the robust bias-corrected approach suggested by Cattaneo, Jansson, and Ma (2017).

Table A2.8 Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditure per AEU - Log values
Takaful household > 6 months	0.050	0.058*	0.093*	0.068**	0.040
	(0.036)	(0.033)	(0.051)	(0.034)	(0.044)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.083	0.100	0.055	0.119	0.067
First stage F-statistic	129.767	129.767	129.767	129.767	129.767
Mean dependent variable	6.513	6.514	5.940	5.957	5.572

Note: AEU = adult equivalent unit; EGP = Egyptian pound; Standard errors in parentheses.
Estimates from instrumental variables model. First-stage dependent variable: Household has been in Takaful and Karama program for six months or more.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.9 Impact of *Takaful* program on poverty indicators, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Takaful household > 6 months	-0.054	-0.028	-0.028	-0.026	-8.406
	(0.039)	(0.025)	(0.039)	(0.025)	(7.753)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.059	0.061	0.065	0.092	0.097
First stage F-statistic	129.767	129.767	129.767	129.767	129.767
Mean dependent variable	0.417	0.130	0.597	0.204	83.586

Note: Standard errors in parentheses.
Estimates from instrumental variables model. First stage dependent variable: Household has been in Takaful and Karama Program for six months or more.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.10 Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditures per AEU - Log values
Log total value of TKP payments since March 2015	0.007*	0.008**	0.013**	0.009**	0.006
	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.082	0.100	0.054	0.119	0.067
First stage F-statistic	137.047	137.047	137.047	137.047	137.047
Mean dependent variable	6.513	6.514	5.940	5.957	5.572

Note: AEU = adult equivalent unit; EGP = Egyptian pounds; TKP = Takaful and Karama Program. Standard errors in parentheses.
Estimates from instrumental variables model. First stage dependent variable: log total value of TKP payments since March 2015.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.11 Impact of *Takaful* program on poverty indicators, instrumental variables model

	(1) Household living under US $1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Log total value of TKP payments since March 2015	-0.010**	-0.003	-0.007	-0.004	-1.672*
	(0.005)	(0.003)	(0.005)	(0.003)	(0.930)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.057	0.061	0.063	0.091	0.095
First stage F-statistic	137.047	137.047	137.047	137.047	137.047
Mean dependent variable	0.417	0.130	0.597	0.204	83.586

Note: TKP = Takaful and Karama Program. Standard errors in parentheses.
Estimates from instrumental variables model. First stage dependent variable: log total value of TKP Payments since March 2015.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.12 Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU - Log screened values	(5) Monthly non-food expenditure per AEU - Log values
Takaful beneficiary, June 2017	0.077**	0.079**	0.114**	0.084**	0.062
	(0.035)	(0.033)	(0.053)	(0.035)	(0.044)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.084	0.102	0.058	0.123	0.068
First stage F-statistic	155.123	155.123	155.123	155.123	155.123
Mean dependent variable	6.513	6.514	5.940	5.957	5.572

Note: AEU = adult equivalent unit; EGP = Egyptian pounds. Standard errors in parentheses.
Estimates from instrumental variables model. Fixed effects for registration period included.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.13 Impact of *Takaful* program on poverty indicators, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Takaful beneficiary, June 2017	-0.135***	-0.030	-0.088**	-0.054**	-20.317**
	(0.040)	(0.027)	(0.041)	(0.027)	(8.083)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.057	0.063	0.064	0.095	0.098
First stage F-statistic	155.123	155.123	155.123	155.123	155.123
Mean dependent variable	0.417	0.130	0.597	0.204	83.586

Note: Standard errors in parentheses. Estimates from instrumental variables model. Fixed effects for registration period included. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.14 Impact of *Takaful* program on expenditure indicators, regression discontinuity model

	(1)	(2)	(3)	(4)	(5)
	Monthly expenditure per AEU - Log values	Monthly food + non-food expenditure (EGP) per AEU - Log screened values	Monthly food expenditure per AEU - Log values	Monthly total food expenditure (EGP) per AEU - Log screened values	Monthly non-food expenditure per AEU - Log values
RD estimate	0.088**	0.083**	0.125**	0.089**	0.062
	(0.038)	(0.037)	(0.057)	(0.040)	(0.049)
Observations	6,003	6,003	6,003	6,003	6,003

Note: AEU = adult expenditure unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses. RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility. Fixed effects for registration period included.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.15 Impact of *Takaful* program on poverty indicators, regression discontinuity model

	(1)	(2)	(3)	(4)	(5)
	Household living under US$1.90/day	Household living under US$1.25/day	Household living under regional poverty line	Poverty gap for US$1.90 per day	Poverty gap for regional poverty line
RD estimate	-0.113**	-0.031	-0.083*	-0.049*	-18.244**
	(0.045)	(0.030)	(0.046)	(0.029)	(8.874)
Observations	6,003	6,003	6,003	6,003	6,003

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility. Fixed effects for registration period included.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.16 Impact of *Takaful* program on expenditure indicators, instrumental variables model

	(1)	(2)	(3)	(4)	(5)
	Monthly expenditure per AEU - Log values	Monthly food + non-food expenditure (EGP) per AEU - Log screened values	Monthly food expenditure per AEU - Log values	Monthly total food expenditure (EGP) per AEU - Log screened values	Monthly non-food expenditure per AEU - Log values
Takaful beneficiary, June 2017	0.065**	0.069**	0.107**	0.076**	0.056
	(0.033)	(0.031)	(0.050)	(0.032)	(0.042)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.143	0.174	0.095	0.201	0.101
First stage F-statistic	169.400	169.400	169.400	169.400	169.400
Mean dependent variable	6.513	6.514	5.940	5.957	5.572

Note: AEU = adult equivalent unit; EGP = Egyptian pounds. Standard errors in parentheses. Estimates from instrumental variables model.
Controls including household size, number of children 0-18, household head age, household head gender, household head education, spouse education, whether respondent/household member is a government official, whether respondent/household member knows any political leader, whether respondent/household member knows someone in the local public office, house wall made of good material in 2015 (brick, cement, concrete, or stone), house roof made of good material in 2015 (brick, cement, concrete, or stone), house floors made of good material (tiles, marble, cement, or concrete), total rooms used by household, main source of drinking water in the household is tap inside dwelling, and household has a flushable toilet, are all included in the model.
* p < 0.10, ** p < 0.05, *** p < 0.01.

Table A2.17 Impact of *Takaful* program on poverty indicators, instrumental variables model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
Takaful beneficiary, June 2017	-0.129***	-0.036	-0.090**	-0.058**	-21.297***
	(0.036)	(0.025)	(0.037)	(0.023)	(6.975)
Observations	6,003	6,003	6,003	6,003	6,003
R^2	0.163	0.116	0.164	0.195	0.222
First stage F-statistic	169.400	169.400	169.400	169.400	169.400
Mean dependent variable	0.417	0.130	0.597	0.204	83.586

Note: Standard errors in parentheses. Estimates from instrumental variables model.
Controls including household size, number of children 0-18, household head age, household head gender, household head education, spouse education, whether respondent/household member is a government official, whether respondent/household member knows any political leader, whether respondent/household member knows someone in the local public office, house wall made of good material in 2015 (brick, cement, concrete, or stone), house roof made of good material in 2015 (brick, cement, concrete, or stone), house floors made of good material (tiles, marble, cement, or concrete), total rooms used by household, main source of drinking water in the household is tap inside dwelling, and household has a flushable toilet, are all included in the model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.18 Impact of *Takaful* program on expenditure indicators, regression discontinuity model

	(1) Monthly expenditure per AEU - Log values	(2) Monthly food + non-food expenditure (EGP) per AEU - Log screened values	(3) Monthly food expenditure per AEU - Log values	(4) Monthly total food expenditure (EGP) per AEU – Log screened values	(5) Monthly non-food expenditures per AEU - Log values
RD estimate	0.077**	0.072**	0.109*	0.077**	0.051
	(0.036)	(0.035)	(0.056)	(0.038)	(0.049)
Observations	6,003	6,003	6,003	6,003	6,003

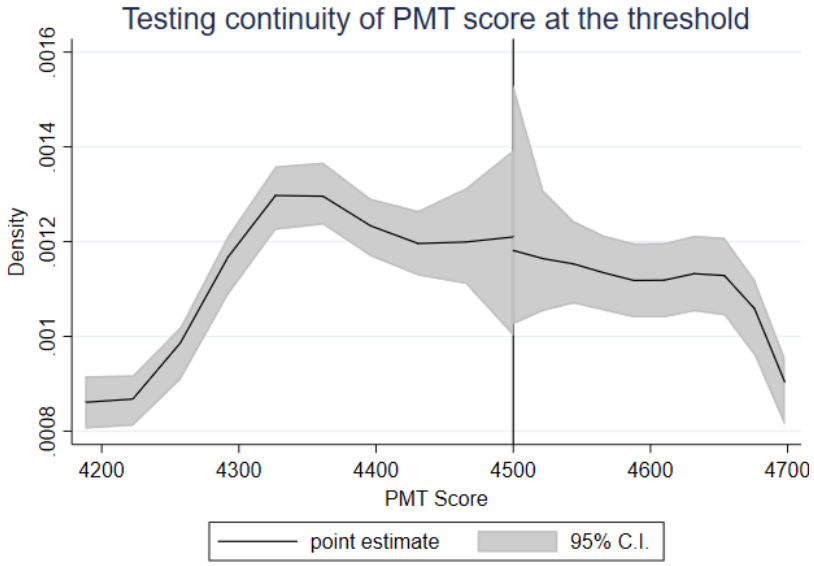
Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at PMT score threshold of 4500, the current proxy means test threshold of eligibility.
Controls including household size, number of children 0-18, household head age, household head gender, household head education, spouse education, whether respondent/household member is a government official, whether respondent/household member knows any political leader, whether respondent/household member knows someone in the local public office, house wall made of good material in 2015 (brick, cement, concrete, or stone), house roof made of good material in 2015 (brick, cement, concrete, or stone), house floors made of good material (tiles, marble, cement, or concrete), total rooms used by household, main source of drinking water in the household is tap inside dwelling, and household has a flushable toilet, are all included in the model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A2.19 Impact of *Takaful* program on poverty indicators, regression discontinuity model

	(1) Household living under US$1.90/day	(2) Household living under US$1.25/day	(3) Household living under regional poverty line	(4) Poverty gap for US$1.90 per day	(5) Poverty gap for regional poverty line
RD estimate	-0.115***	-0.035	-0.082*	-0.052*	-18.937**
	(0.042)	(0.029)	(0.043)	(0.027)	(8.029)
Observations	6,003	6,003	6,003	6,003	6,003

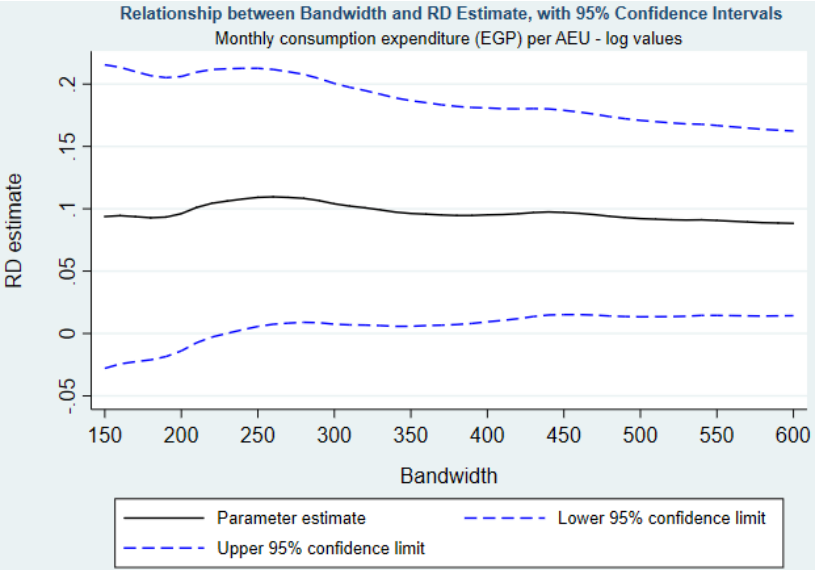
Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at PMT score threshold of 4500, the current proxy means test threshold of eligibility.
Controls including household size, number of children 0-18, household head age, household head gender, household head education, spouse education, whether respondent/household member is a government official, whether respondent/household member knows any political leader, whether respondent/household member knows someone in the local public office, house wall made of good material in 2015 (brick, cement, concrete, or stone), house roof made of good material in 2015 (brick, cement, concrete, or stone), house floors made of good material (tiles, marble, cement, or concrete), total rooms used by household, main source of drinking water in the household is tap inside dwelling, and household has a flushable toilet, are all included in the model.
* p < 0.10, ** p < 0.05, *** p < 0.01

Figure A2.1 Graph and test of continuity of the proxy means test score at the threshold



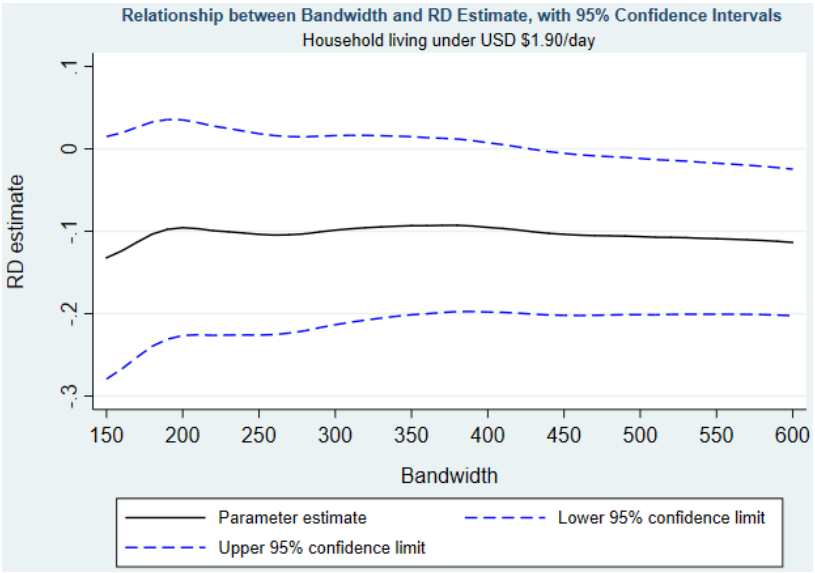
Note: C.I. = confidence interval; PMT = proxy means test.

Figure A2.2 Sensitivity of regression discontinuity impact estimate to bandwidth selection around the threshold for monthly total household consumption expenditure per adult equivalent unit



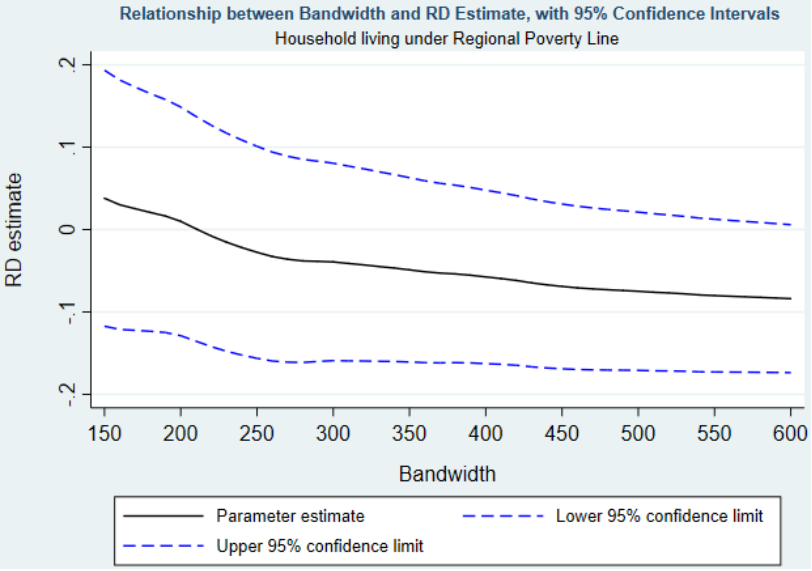
Note: AEU = adult equivalent unit; EGP = Egyptian pounds; RD = regression discontinuity.

Figure A2.3 Sensitivity of regression discontinuity impact estimate to bandwidth selection around the threshold for probability that a household is living on less than US$1.90 per day



Note: RD = regression discontinuity.

Figure A2.4 Sensitivity of regression discontinuity impact estimate to bandwidth selection around the threshold for probability that household is living under the regional poverty line



Note: RD = regression discontinuity.

Annex III: Summary statistics for outcome variables

The tables in this section present summary statistics on outcome variables for which impact estimates are estimated in this report. Note that the differences between the Takaful sample and the Karama sample are due to the fact that the Karama program has a higher cutoff PMT score than the Takaful sample, and the analysis sample for each program is selected from among households near to the relevant cutoff.

- Table A3.1 reports indicators of income and well-being for the four different groups.
- Table A3.2 reports outcomes on children's schooling, particularly enrollment, which is reported at the individual level. It also reports outcomes of children's enrollment especially for the up-to-three Takaful registrant children. Table A3.3 reports school enrollment disaggregated by region. Table A3.4 also reports outcomes on children's schooling, particularly attendance. The outcome variable is whether the child had "high" attendance in that they did not miss school for more than a week during the past school year. This is also reported at the individual level.
- Table A3.5 reports child dietary diversity and anthropometric measures for each household as represented by a randomly selected child in each of two age groups: child 1 is aged 6-23 months and child 2 is aged 24-59 months. We look at the dietary diversity score (of seven food groups), the height-for-age z-score, and the weight-for-height z-score.
- Table A3.6 examines child stunting and wasting based on the z-scores summarized above.
- Table A3.7 examines outcomes regarding child morbidity. We examine whether a child in the household under five years of age had diarrhea or fever in the past four weeks, whether advice or treatment was then sought for the diarrhea or fever, and whether the child had ever been treated for malnutrition.
- Table A3.8 reports the household dietary diversity score across 12 food groups from a seven-day recall, and the mother's dietary diversity score across 9 food groups from a seven-day recall. We also report the number correct out of 10 IYCN knowledge questions. In terms of IYCN practices, we report whether someone helped put the baby to breast, whether the baby was given colostrum, whether anything but breast milk was given to the baby within the first three days, and the age at which anything but breastmilk was given to the baby.
- Table A3.9 reports summary statistics pertaining to health facility utilization. We report whether someone in the household visited a health facility (if they had experienced an illness or injury in the past 30 days), whether a facility was not visited because it was considered too expensive, whether the facility used was a public health facility, and whether the mother received antenatal and postnatal care during her last pregnancy (only for pregnancies since the program began).
- Table A3.10 focuses on women's decision-making capabilities as one important measure of women's empowerment. The household survey asked women to what extent they could make their own decisions in the spheres of agriculture, participating in wage employment, major and minor household expenditures, how to use cash transfers, what food can be cooked every day, getting medical treatment for herself, taking a child to a doctor, and children's schooling. We report the proportion of women who report that they can make their own decisions in these spheres to a great extent. In Table A3.11 we disaggregate these outcomes by region.

- Table A3.12 reports on the number of shocks experienced by the household in the past three years, and whether, in order to cope with the shock, the household reduced the amount or quality of food consumed or reduced spending on education or health. Households on average across the four groups experienced just over one shock on average. Half of households across all four groups reported reducing the amount or quality of food, and about 10 percent report reducing expenditures on health or education.
- Table A3.13 reports on whether the household has an elderly adult over 65 years of age, whether the household has a disabled member, whether the household has a member with an auditory disability, a visual disability, a mental illness disability, physical illness or disability, and a chronic illness or disability. It also reports whether a household has an adult with a disability who cannot walk for more than 50 meters, climb two stairs, shop or handle money without assistance, whether the household adult with a disability loses consciousness more than once a month, needs supervision more than half the time, and whether the household member with a disability has difficulty hearing, speaking, or with eyesight. These statistics are particularly relevant for households in the Karama sample. There are not large differences between Karama beneficiaries and non-beneficiaries, which is as expected given that our sample is restricted to Karama registrants and the non-beneficiaries were excluded based on PMT score, rather than lack of disability.

Table A3.1 Summary statistics of outcome variables: Well-being and income

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Total monthly wage income (EGP) all household members	989.05	975.18	1,004.91	962.70
	(723.41)	(667.99)	(534.42)	(544.02)
Log of total wage income	6.77	6.77	6.78	6.74
	(0.51)	(0.50)	(0.52)	(0.58)
Where on the ladder do you feel you stand at?	3.02	2.99	2.78	2.78
	(1.91)	(1.82)	(2.00)	(1.81)
Where on the ladder do you feel you stand at after five years?	3.57	3.40	3.10	3.17
	(1.92)	(1.88)	(1.98)	(2.00)
Household believes their income will be higher in the next five years	0.285	0.238	0.179	0.170
	(0.452)	(0.426)	(0.385)	(0.376)
Number of households	2,190	3,813	223	289

Note: EGP = Egyptian pounds; Standard deviations are reported in parentheses.

Table A3.2 Summary statistics of outcome variables at individual level: School enrollment

Variable	Takaful beneficiaries	Takaful registered children (maximum three per household)	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Enrollment of children ages 7-12 years	0.961	0.985	0.974	0.925	0.864
	(0.195)	(0.122)	(0.158)	(0.267)	(0.345)
Enrollment of girls ages 7-12 years	0.963	0.989	0.972	1.000	0.906
	(0.189)	(0.106)	(0.165)	(0.000)	(0.296)
Enrollment of boys ages 7-12 years	0.959	0.982	0.977	0.867	0.815
	(0.200)	(0.135)	(0.151)	(0.346)	(0.396)
Enrollment of children ages 12-18 years	0.845	0.950	0.848	0.723	0.620
	(0.362)	(0.218)	(0.359)	(0.450)	(0.488)
Enrollment of girls ages 12-18 years	0.848	0.950	0.840	0.757	0.789
	(0.360)	(0.219)	(0.366)	(0.435)	(0.413)
Enrollment of boys ages 12-18 years	0.843	0.950	0.854	0.696	0.516
	(0.364)	(0.219)	(0.353)	(0.465)	(0.504)
Number of children 7-18 years	5,841	604	9,073	180	196

Note: Standard deviations are reported in parentheses.

Table A3.3 Summary statistics disaggregated by region: School enrollment

Variable	Metro-politan	Lower Urban	Lower Rural	Upper Urban	Upper Rural	Frontier
Enrollment of children ages 7-12 years	0.968	0.987	0.982	0.973	0.962	0.960
	(0.176)	(0.114)	(0.133)	(0.163)	(0.192)	(0.200)
Enrollment of females ages 7-18 years	0.952	0.940	0.963	0.934	0.889	0.947
	(0.214)	(0.238)	(0.190)	(0.248)	(0.315)	(0.229)
Enrollment of females ages 12-18 years	0.912	0.889	0.925	0.898	0.806	0.900
	(0.286)	(0.317)	(0.265)	(0.303)	(0.396)	(0.316)
Number of children aged 0-18 years	604	400	1,778	1,685	10,730	105

Note: Standard deviations are reported in parentheses.

Table A3.4 Summary statistics of outcome variables at individual level: School attendance

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
School attendance at primary level for all children	0.602	0.599	0.422	0.450
	(0.490)	(0.490)	(0.496)	(0.500)
School attendance at primary level for girls	0.277	0.296	0.216	0.243
	(0.447)	(0.457)	(0.413)	(0.431)
School attendance at primary level for boys	0.325	0.303	0.206	0.207
	(0.469)	(0.460)	(0.406)	(0.407)
School attendance at secondary level for all children	0.090	0.092	0.157	0.153
	(0.287)	(0.288)	(0.365)	(0.362)
School attendance at secondary level for girls	0.043	0.042	0.098	0.099
	(0.204)	(0.201)	(0.299)	(0.300)
School attendance at secondary level for boys	0.047	0.049	0.059	0.054
	(0.212)	(0.216)	(0.236)	(0.227)
Number of children aged 0-18 years	5,841	9,073	180	196

Note: Standard deviations are reported in parentheses.

Table A3.5 Summary statistics of outcome variables: Child dietary diversity and anthropometry

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Child 1's (6-23 months) dietary diversity score (Range: 0-7)	3.35	3.39	3.33	3.38
	(1.73)	(1.61)	(0.87)	(1.41)
Child 2's (24-59 months) dietary diversity score (Range: 0-7)	5.09	4.89	5.20	4.58
	(1.37)	(1.40)	(1.38)	(1.64)
Child 1 length/height-for-age z-score screened	-0.35	-0.41	-0.01	-0.92
	(1.32)	(1.22)	(0.79)	(1.95)
Child 2 length/height-for-age z-score screened	-0.69	-0.64	-0.69	-0.93
	(1.02)	(1.01)	(0.66)	(1.43)
Child 1 weight-for-length/height z-score screened	-0.16	-0.16	0.25	-0.16
	(0.98)	(1.05)	(1.34)	(0.64)
Child 2 weight-for-length/height z-score screened	-0.18	-0.14	-0.32	-0.15
	(0.90)	(0.95)	(1.17)	(0.73)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Table A3.6 Summary statistics of outcome variables: Child stunting and wasting

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Child 1 stunted - From screened z-scores	0.078	0.075	0.000	0.250
	(0.268)	(0.264)	(0.000)	(0.463)
Child 2 stunted - From screened z-scores	0.068	0.058	0.000	0.118
	(0.252)	(0.233)	(0.000)	(0.332)
Child 1 wasted - From screened z-scores	0.027	0.026	0.000	0.000
	(0.161)	(0.159)	(0.000)	(0.000)
Child 2 wasted - From screened z-scores	0.022	0.018	0.087	0.000
	(0.147)	(0.133)	(0.288)	(0.000)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Table A3.7 Summary statistics of outcome variables at individual level: Child morbidity

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Child had diarrhea in past four weeks (for children under five years of age)	0.176	0.178	0.105	0.059
	(0.381)	(0.383)	(0.311)	(0.239)
Child had fever in past four weeks (for children under five years of age)	0.297	0.329	0.263	0.176
	(0.457)	(0.470)	(0.446)	(0.387)
Advice or treatment sought for child with diarrhea (for children under five years of age)	0.790	0.814	1.000	1.000
	(0.408)	(0.389)	(0.000)	(0.000)
Advice or treatment sought for child with fever (for children under five years of age)	0.806	0.850	1.000	0.833
	(0.396)	(0.358)	(0.000)	(0.408)
Child ever treated from malnourishment (for children under five years of age)	0.030	0.038	0.079	0.029
	(0.169)	(0.190)	(0.273)	(0.171)
Number of children aged 0-18	5,841	9,073	180	196

Note: Standard deviations are reported in parentheses.

Table A3.8 Summary statistics of outcome variables: Household dietary diversity and infant and young child feeding knowledge and practices

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Household dietary diversity score (seven-day recall based on consumption module)	9.58	9.48	9.30	9.22
	(1.38)	(1.55)	(1.61)	(1.67)
Mother's dietary diversity score (Range: 0-9)	4.21	4.04	4.21	4.18
	(1.28)	(1.26)	(1.20)	(1.26)
Number correct (out of 10) on IYCN knowledge questions	5.81	5.75	6.14	5.76
	(1.10)	(1.15)	(1.17)	(1.25)
Someone helped put baby to breast after birth	0.502	0.492	0.444	0.538
	(0.500)	(0.500)	(0.527)	(0.519)
Whether the baby was given colostrum	0.923	0.915	0.889	0.769
	(0.267)	(0.279)	(0.333)	(0.439)
Whether anything but breast milk was given to baby within first three days	0.448	0.477	0.667	0.462
	(0.498)	(0.500)	(0.500)	(0.519)
Age at which anything but breastmilk was given to baby	0.849	0.836	0.889	0.692
	(0.358)	(0.371)	(0.333)	(0.480)
Number of households	2,190	3,813	223	289

Note: IYCN = infant and young child nutrition. Standard deviations are reported in parentheses.

Table A3.9 Summary statistics of outcome variables at individual level: Health care utilization

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Visited a health facility (if had illness or injury in past 30 days)	0.748	0.767	0.696	0.640
	(0.434)	(0.423)	(0.462)	(0.481)
Whether facility was not visited because it was too expensive	0.555	0.568	0.600	0.521
	(0.498)	(0.496)	(0.495)	(0.503)
Public health facility utilization	0.371	0.374	0.320	0.317
	(0.483)	(0.484)	(0.469)	(0.467)
Mother received antenatal care during last pregnancy (only for pregnancies since program started)	0.872	0.851	1.000	0.846
	(0.334)	(0.356)	(0.000)	(0.376)
Received postnatal care within two days of giving birth (only for pregnancies since program started)	0.458	0.513	0.545	0.615
	(0.498)	(0.500)	(0.522)	(0.506)
Number of household members	10,688	17,668	786	932

Note: Standard deviations are reported in parentheses.

Table A3.10 Summary statistics of outcome variables: Women's decision making

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Woman can make own decisions on agriculture to a great extent	0.119	0.143	0.180	0.308
	(0.325)	(0.350)	(0.388)	(0.466)
Woman can make own decisions on participating in wage employment to a great extent	0.128	0.150	0.318	0.291
	(0.335)	(0.357)	(0.467)	(0.455)
Woman can make own decisions on major household expenditures to a great extent	0.189	0.204	0.332	0.377
	(0.392)	(0.403)	(0.472)	(0.486)
Woman can make own decisions on minor household expenditures to a great extent	0.507	0.482	0.547	0.516
	(0.500)	(0.500)	(0.499)	(0.501)
Woman can make own decisions on how to use cash transfers to a great extent	0.348	0.335	0.462	0.433
	(0.476)	(0.472)	(0.500)	(0.496)
Woman can make own decisions on what food can be cooked every day to a great extent	0.692	0.665	0.659	0.630
	(0.462)	(0.472)	(0.475)	(0.484)
Woman can make own decisions on getting medical treatment for herself to a great extent	0.372	0.389	0.534	0.484
	(0.484)	(0.488)	(0.500)	(0.501)
Woman can make own decisions on taking a child to a doctor to a great extent	0.389	0.398	0.489	0.446
	(0.488)	(0.490)	(0.501)	(0.498)
Woman can make own decisions on children's schooling to a great extent	0.327	0.324	0.359	0.363
	(0.469)	(0.468)	(0.481)	(0.482)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Table A3.11 Summary statistics disaggregated by region: Women's decision making

Variable	Metro-politan	Lower Urban	Lower Rural	Upper Urban	Upper Rural	Frontier
Woman can make own decisions on agriculture to a great extent	0.000	0.152	0.224	0.145	0.126	0.500
	(0.000)	(0.364)	(0.418)	(0.353)	(0.332)	(0.707)
Woman can make own decisions on participating in wage employment to a great extent	0.109	0.155	0.199	0.148	0.151	0.184
	(0.313)	(0.363)	(0.399)	(0.356)	(0.358)	(0.393)
Woman can make own decisions on major household expenditures to a great extent	0.168	0.174	0.264	0.202	0.207	0.263
	(0.375)	(0.381)	(0.441)	(0.401)	(0.405)	(0.446)
Woman can make own decisions on minor household expenditures to a great extent	0.445	0.542	0.578	0.445	0.489	0.526
	(0.498)	(0.500)	(0.494)	(0.497)	(0.500)	(0.506)
Woman can make own decisions on how to use cash transfers to a great extent	0.319	0.400	0.400	0.344	0.339	0.474
	(0.467)	(0.491)	(0.490)	(0.476)	(0.473)	(0.506)
Woman can make own decisions on what food can be cooked every day to a great extent	0.630	0.748	0.767	0.619	0.666	0.579
	(0.484)	(0.435)	(0.423)	(0.486)	(0.472)	(0.500)
Woman can make own decisions on getting medical treatment for herself to a great extent	0.412	0.419	0.529	0.368	0.373	0.342
	(0.493)	(0.495)	(0.499)	(0.483)	(0.484)	(0.481)
Woman can make own decisions on taking a child to a doctor to a great extent	0.450	0.452	0.565	0.394	0.372	0.342
	(0.498)	(0.499)	(0.496)	(0.489)	(0.483)	(0.481)
Woman can make own decisions on children's schooling to a great extent	0.450	0.374	0.416	0.303	0.310	0.237
	(0.498)	(0.485)	(0.493)	(0.460)	(0.463)	(0.431)
Number of households	238	155	735	750	4,605	38

Note: Standard deviations are reported in parentheses.

Table A3.12 Summary statistics of outcome variables: Shocks

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Number of shocks experienced by the household in past three years	1.03	1.09	1.15	1.18
	(0.71)	(0.77)	(0.91)	(0.86)
Household used a reduction in amount or quality of food to cope with shock	0.538	0.504	0.417	0.446
	(0.499)	(0.500)	(0.494)	(0.498)
Household reduced spending on education or health to cope with shock	0.092	0.080	0.103	0.104
	(0.289)	(0.272)	(0.305)	(0.306)
Household sold assets to cope with shock	1.074	0.510	0.086	0.036
	(0.758)	(0.499)	(0.280)	(0.186)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Table A3.13 Summary statistics of illness/disability

Variable	Takaful beneficiaries	Takaful non-beneficiaries	Karama beneficiaries	Karama non-beneficiaries
Household has elderly adult 65+	0.010	0.034	0.435	0.484
	(0.100)	(0.181)	(0.497)	(0.501)
Household has a disabled member	0.297	0.340	0.852	0.834
	(0.457)	(0.474)	(0.356)	(0.373)
Household has member with auditory illness/disability	0.016	0.013	0.045	0.066
	(0.127)	(0.114)	(0.207)	(0.248)
Household has member with visual illness/disability	0.026	0.029	0.148	0.104
	(0.158)	(0.167)	(0.356)	(0.306)
Household has member with mental illness/disability	0.019	0.026	0.157	0.142
	(0.137)	(0.160)	(0.365)	(0.350)
Household has member with physical illness/disability	0.048	0.063	0.202	0.256
	(0.214)	(0.243)	(0.402)	(0.437)
Household has member with chronic illness/disability	0.226	0.266	0.574	0.557
	(0.418)	(0.442)	(0.496)	(0.498)
Household adult with disability cannot walk for more than 50 meters without assistance	0.117	0.205	0.427	0.460
	(0.321)	(0.404)	(0.496)	(0.499)
Household adult with disability cannot climb two stairs without assistance	0.105	0.170	0.382	0.375
	(0.307)	(0.376)	(0.487)	(0.485)
Household adult with disability cannot handle money or shop for himself	0.068	0.108	0.315	0.272
	(0.252)	(0.310)	(0.466)	(0.446)
Household adult with disability loses consciousness more than once a month	0.103	0.130	0.140	0.152
	(0.304)	(0.337)	(0.348)	(0.360)
Household adult with disability needs supervision more than 50 percent of the time	0.103	0.181	0.348	0.402
	(0.304)	(0.385)	(0.478)	(0.491)
Household member with disability has some difficulty with hearing	0.103	0.085	0.200	0.207
	(0.305)	(0.279)	(0.401)	(0.406)
Household member with disability has some difficulty with speaking	0.089	0.095	0.132	0.141
	(0.285)	(0.293)	(0.339)	(0.349)
Household member with disability has some difficulty with eyesight	0.182	0.196	0.326	0.344
	(0.386)	(0.397)	(0.470)	(0.476)
Number of households	2,190	3,813	223	289

Note: Standard deviations are reported in parentheses.

Annex IV: Additional impact analysis tables

Table A4.1 Impact of *Takaful* program on shares of food expenditure in total (A) indicators, instrumental variables model

	(1) Share of food consumption in total consumption expenditure	(2) Share of grains in total food expenditure	(3) Share of potatoes in total food expenditure	(4) Share of vegetables in total food expenditure
Takaful beneficiary, June 2017	0.006	-0.008	-0.000	-0.004
	(0.010)	(0.006)	(0.002)	(0.005)
Observations	6,002	5,985	5,985	5,985
R^2	0.069	0.048	0.047	0.016
First stage F-statistic	169.865	170.029	170.029	170.029
Mean dependent variable	0.588	0.145	0.041	0.148

Note: Standard errors in parentheses. Estimates from instrumental variables model. * p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.2 Impact of *Takaful* program on shares of food expenditure in total (A) indicators, regression discontinuity model

	(1) Share of food consumption in total consumption expenditure	(2) Share of grains in total food expenditure	(3) Share of potatoes in total food expenditure	(4) Share of vegetables in total food expenditure
RD estimate	0.008	-0.009	-0.002	-0.005
	(0.012)	(0.007)	(0.002)	(0.006)
Observations	6,002	5,985	5,985	5,985

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program is at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.3 Impact of *Takaful* program on shares of food expenditure in total (B) indicators, instrumental variables model

	(1) Share of fruits in total food expenditure	(2) Share of meat in total food expenditure	(3) Share of eggs in total food expenditure
Takaful beneficiary, June 2017	0.006**	0.008	-0.000
	(0.003)	(0.011)	(0.002)
Observations	5,985	5,985	5,985
R^2	0.025	0.048	0.023
First stage F-statistic	170.029	170.029	170.029
Mean dependent variable	0.038	0.189	0.020

Note: Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.4 Impact of *Takaful* program on shares of food expenditure in total (B) indicators, regression discontinuity model

	(1) Share of fruits in total food expenditure	(2) Share of meat in total food expenditure	(3) Share of eggs in total food expenditure
RD estimate	0.003	0.016	-0.001
	(0.004)	(0.012)	(0.003)
Observations	5,985	5,985	5,985

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.5 Impact of *Takaful* program on shares of food expenditure in total (C) indicators, instrumental variables model

	(1) Share of fish in total food expenditure	(2) Share of legumes in total food expenditure	(3) Share of dairy in total food expenditure
Takaful beneficiary, June 2017	0.004	-0.005	-0.004
	(0.004)	(0.003)	(0.005)
Observations	5,985	5,985	5,985
R^2	0.090	0.091	0.046
First stage F-statistic	170.029	170.029	170.029
Mean dependent variable	0.020	0.048	0.058

Note: Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.6 Impact of *Takaful* program on shares of food expenditure in total (C) indicators, regression discontinuity model

	(1) Share of fish in total food expenditure	(2) Share of legumes in total food expenditure	(3) Share of dairy in total food expenditure
RD estimate	0.003	-0.007*	0.001
	(0.005)	(0.004)	(0.006)
Observations	5,985	5,985	5,985

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.7 Impact of *Takaful* program on shares of food expenditure in total (D) indicators, instrumental variables model

	(1) Share of sweets in total food expenditure	(2) Share of oils and fats in total food expenditure	(3) Share of other in total food expenditure	(4) Share of outside household expenditure in total food expenditure
Takaful beneficiary, June 2017	-0.004	0.003	-0.001	0.005
	(0.005)	(0.004)	(0.004)	(0.007)
Observations	5,985	5,985	5,985	5,985
R^2	0.070	0.016	0.050	0.071
First stage F-statistic	170.029	170.029	170.029	170.029
Mean dependent variable	0.101	0.087	0.056	0.049

Note: Standard errors in parentheses.
Regression discontinuity model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.8 Impact of *Takaful* program on shares of food expenditure in total (D) indicators, regression discontinuity model

	(1) Share of sweets in total food expenditure	(2) Share of oils and fats in total food expenditure	(3) Share of other in total food expenditure	(4) Share of outside household expenditure in total food expenditure
RD estimate	-0.001	-0.000	-0.006	0.009
	(0.006)	(0.005)	(0.005)	(0.008)
Observations	5,985	5,985	5,985	5,985

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.9 Impact of *Takaful* program on shares of non-food expenditure in total (A) indicators, instrumental variables model

	(1) Share of non-food consumption in total consumption expenditure	(2) Share of transportation & vehicles in total non-food expenditure	(3) Share of rent and utilities in total non-food expenditure	(4) Share of internet, satellite, cinema, newspapers in total non-food expenditure
Takaful beneficiary, June 2017	-0.006	0.005	-0.013	0.002
	(0.010)	(0.009)	(0.011)	(0.002)
Observations	6,002	6,001	6,001	6,001
R^2	0.069	0.061	0.065	0.050
First stage F-statistic	169.865	169.977	169.977	169.977
Mean dependent variable	0.412	0.147	0.243	0.037

Note: Standard errors in parentheses.
Regression discontinuity model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.10 Impact of *Takaful* program on shares of non-food expenditure in total (A) indicators, regression discontinuity model

	(1)	(2)	(3)	(4)
	Share of non-food consumption in total consumption expenditure	Share of transportation & vehicles in total non-food expenditure	Share of rent and utilities in total non-food expenditure	Share of internet, satellite, cinema, newspapers in total non-food expenditure
RD estimate	-0.008	-0.005	-0.017	0.004
	(0.012)	(0.011)	(0.013)	(0.003)
Observations	6,002	6,001	6,001	6,001

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.11 Impact of *Takaful* program on shares of non-food expenditure in total (B) indicators, instrumental variables model

	(1)	(2)	(3)	(4)
	Share of home, personal care, and hygiene in total non-food expenditure	Share of tobacco, shisha, etc. in total non-food expenditure	Share of clothing, bedding, and bags in total non-food expenditure	Share of house construction works and material in total non-food expenditure
Takaful beneficiary, June 2017	0.004	0.009	0.006	-0.001
	(0.007)	(0.013)	(0.005)	(0.003)
Observations	6,001	6,001	6,001	6,001
R^2	0.036	0.016	0.091	0.005
First stage F-statistic	169.977	169.977	169.977	169.977
Mean dependent variable	0.156	0.112	0.082	0.004

Note: Standard errors in parentheses.
Regression discontinuity model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.12 Impact of *Takaful* program on shares of non-food expenditure in total (B) indicators, regression discontinuity model

	(1)	(2)	(3)	(4)
	Share of home, personal care, and hygiene in total non-food expenditure	Share of tobacco, shisha, etc. in total non-food expenditure	Share of clothing, bedding, and bags in total non-food expenditure	Share of house construction works and material in total non-food expenditure
RD estimate	0.007	0.006	0.003	-0.003
	(0.008)	(0.015)	(0.006)	(0.003)
Observations	6,001	6,001	6,001	6,001

Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.13 Impact of *Takaful* program on shares of non-food expenditure in total (C) indicators, instrumental variables model

	(1) Share of durable goods, including TV, devices, etc. in total non-food expenditure	(2) Share of dowry, weddings, pilgrimage, and events in total non-food expenditure	(3) Share of pharmaceuticals, doctor visits, health ins, etc. in total non-food expenditure	(4) Share of medicine in total non-food expenditure
Takaful beneficiary, June 2017	-0.001	-0.002	-0.001	-0.008
	(0.002)	(0.004)	(0.006)	(0.009)
Observations	6,001	6,001	6,001	5,817
R^2	0.007	0.004	0.040	0.042
First stage F-statistic	169.977	169.977	169.977	167.177
Mean dependent variable	0.004	0.007	0.068	0.143

Note: Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.14 Impact of *Takaful* program on shares of non-food expenditure in total (C) indicators, regression discontinuity model

	(1) Share of durable goods, including TV, devices, etc., in total non-food expenditure	(2) Share of dowry, weddings, pilgrimage, and events in total non-food expenditure	(3) Share of pharmaceuticals, doctor visits, health ins, etc., in total non-food expenditure	(4) Share of medicine in total non-food expenditure
RD estimate	0.001	0.002	0.003	-0.001
	(0.002)	(0.004)	(0.008)	(0.011)
Observations	6,001	6,001	6,001	5,817

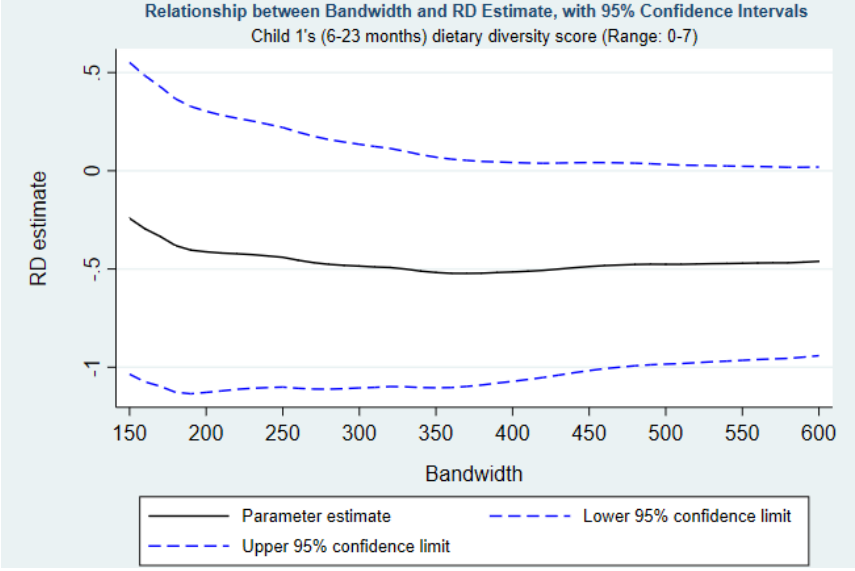
Note: RD = regression discontinuity. Standard errors in parentheses.
RD model impact estimates of the Takaful program are at 4500, the current proxy means test threshold of eligibility.
* p < 0.10, ** p < 0.05, *** p < 0.01

Table A4.15 Summary statistics of household demographic characteristics of *Takaful* sample and national representative sample

Variable	Impact analysis sample for Takaful beneficiaries	Impact analysis sample for Takaful non-beneficiaries	Nationally representative beneficiaries	Nationally representative non-beneficiaries
Number of resident members in household	4.88	4.63	5.58	4.67
	(1.20)	(1.20)	(1.44)	(1.22)
Total children 0-18 in household	2.67	2.38	3.21	2.36
	(1.14)	(1.16)	(1.31)	(1.09)
Proxy means test (PMT) score - Old	4,261.34	4,572.30		
	(187.48)	(278.93)		
Monthly food + non-food expenditure (EGP) per AEU - Screened values	742.00	732.42	719.53	1,025.06
	(496.65)	(343.02)	(343.50)	(707.66)
Household living under regional poverty line	0.61	0.59	0.68	0.38
	(0.49)	(0.49)	(0.47)	(0.49)
Index of household assets	-0.03	0.02	-0.03	0.00
	(0.99)	(2.02)	(0.48)	(2.00)
Index of livestock assets	-0.02	0.02	0.28	-0.03
	(0.83)	(1.72)	(1.49)	(1.36)
Index of household + livestock assets	-0.04	0.03	0.29	-0.03
	(0.94)	(2.54)	(0.97)	(2.03)
Age of household head	38.54	39.13	41.72	42.11
	(9.00)	(10.20)	(9.29)	(10.58)
Household head is male	0.985	0.970	0.976	0.921
	(0.120)	(0.170)	(0.154)	(0.269)
Household head did not attain any education	0.300	0.260	0.327	0.179
	(0.458)	(0.439)	(0.471)	(0.383)
Household head attained primary education level	0.175	0.181	0.236	0.136
	(0.380)	(0.385)	(0.426)	(0.343)
Household head attained preparatory education level	0.093	0.090	0.067	0.104
	(0.291)	(0.287)	(0.250)	(0.306)
Household head attained secondary education level	0.379	0.418	0.339	0.370
	(0.485)	(0.493)	(0.475)	(0.483)
Spouse did not attain any education	0.384	0.318	0.455	0.192
	(0.486)	(0.466)	(0.499)	(0.396)
Spouse attained primary education level	0.106	0.115	0.127	0.092
	(0.308)	(0.320)	(0.334)	(0.289)
Spouse attained preparatory education level	0.141	0.137	0.109	0.109
	(0.348)	(0.344)	(0.313)	(0.312)
Spouse attained secondary education level	0.316	0.354	0.261	0.346
	(0.465)	(0.478)	(0.440)	(0.476)
Number of households	2,190	3,813	165	1,527

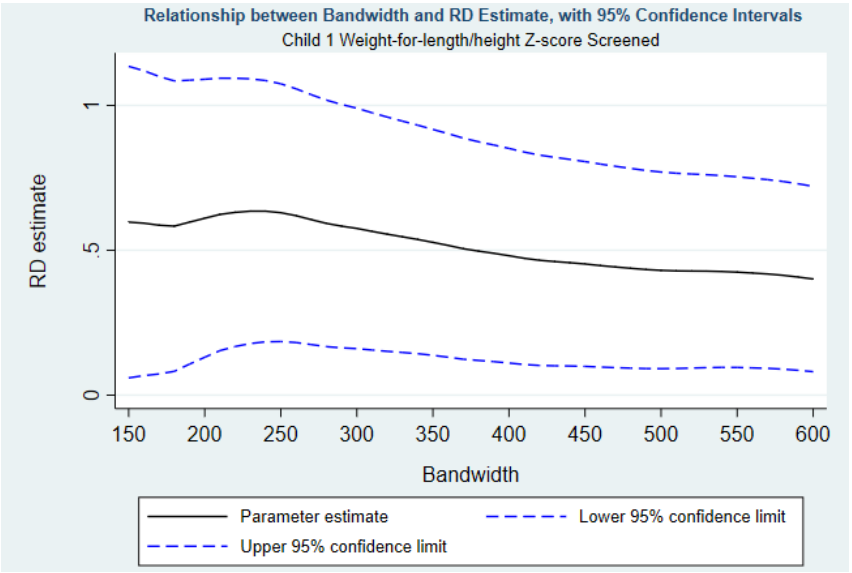
Note: AEU = adult equivalent unit; EGP = Egyptian pounds; Household = household; PMT = proxy means test. Standard deviations are reported in parentheses.

Figure A4.1 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Child 1's (6-23 months) dietary diversity score (Range 0-7)



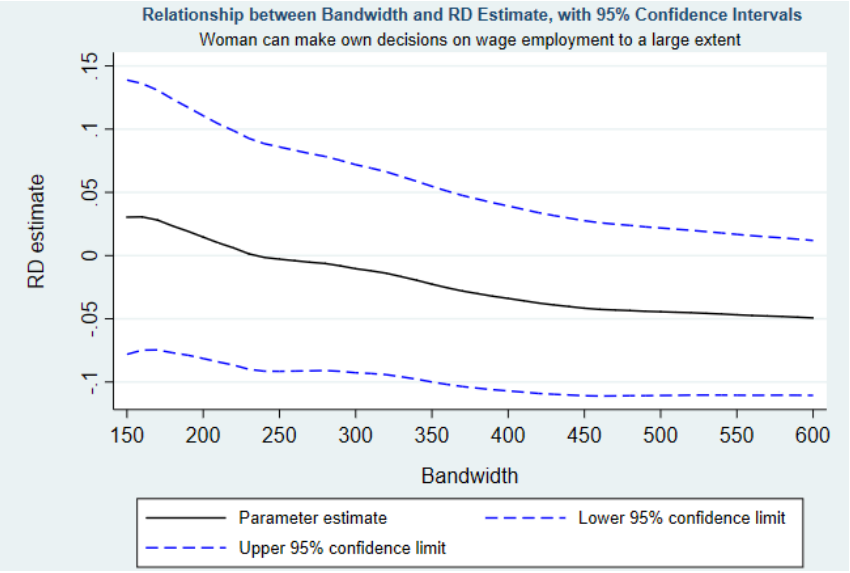
Note: RD = regression discontinuity.

Figure A4.2 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Child 1 Weight-for-length/height z-score screened



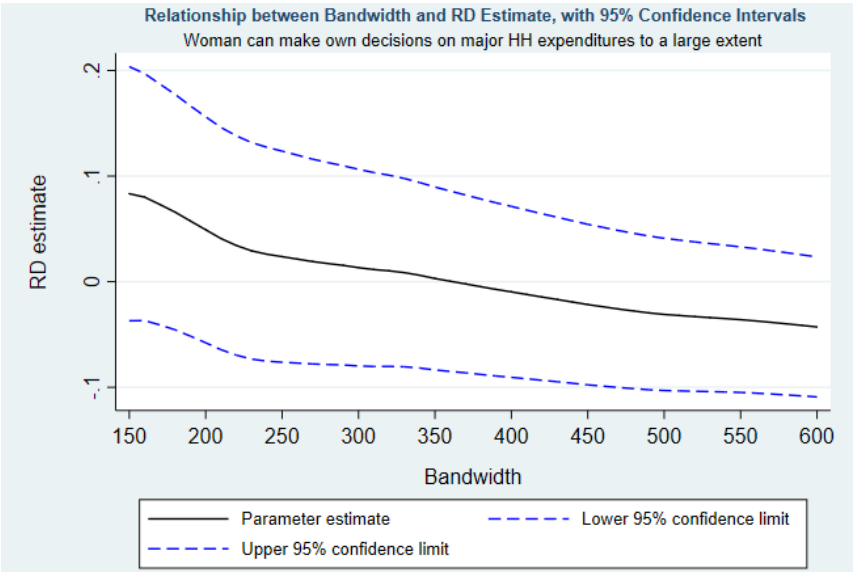
Note: RD = regression discontinuity.

Figure A4.3 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Woman can make own decisions on wage employment to a large extent



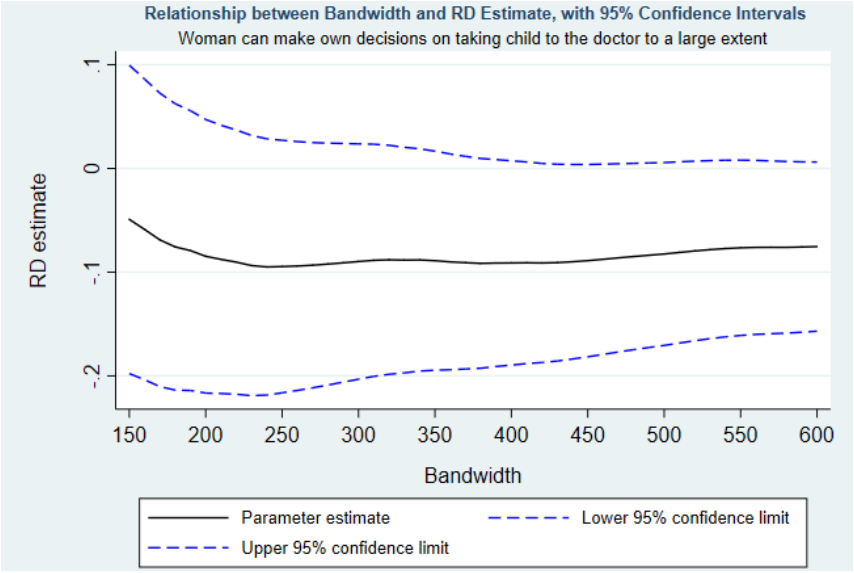
Note: RD = regression discontinuity.

Figure A4.4 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Woman can make own decisions on major household expenditures to a large extent



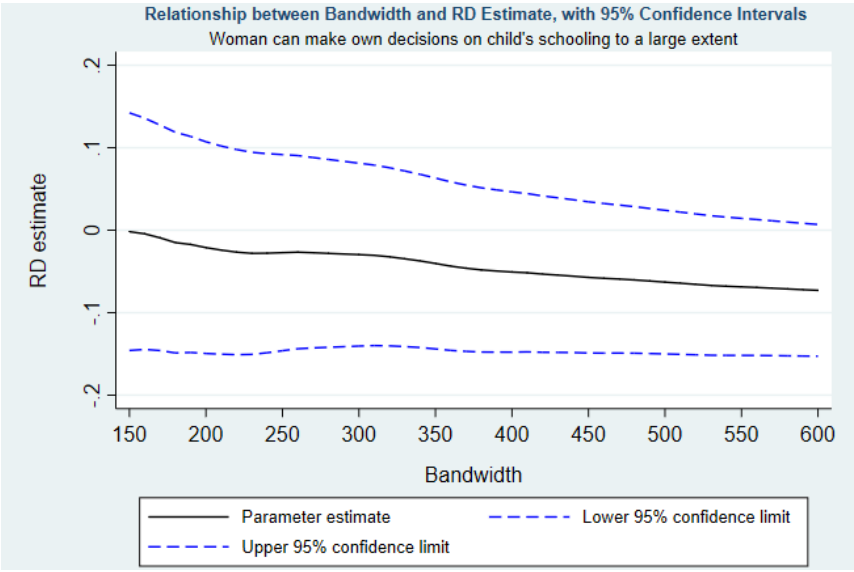
Note: RD = regression discontinuity.

Figure A4.5 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Woman can make own decisions on taking child to the doctor to a large extent



Note: RD = regression discontinuity.

Figure A4.6 Relationship between bandwidth and regression discontinuity estimate, with 95% confidence intervals—Woman can make own decisions on child's schooling to a large extent



Note: RD = regression discontinuity.

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