



# Technical Assistance Consultant's Report

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Project Number: 42322  
October 2014

## Mongolia: Food and Nutrition Social Welfare Program and Project (Financed by the ADB's Special Funds resources)

Prepared by Oxford Policy Management  
Mongolia

For the Government of Mongolia's Ministry of Population Development and Social  
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Asian Development Bank

# FOOD STAMPS AND MEDICAID

## Impact evaluation report

FINAL REPORT

October 2014

## Acknowledgements

This report is based on a quantitative survey funded by the Asian Development Bank (ADB) under the Food Nutrition and Social Welfare Project and Programme (FNSWPP), which is operated jointly with the Government of Mongolia's Ministry of Population Development and Social Protection. Thanks are due to Wendy Walker and Claude Bodart at the ADB and Altansukh M. at the FNSWPP.

The survey carried out by Oxford Policy Management (OPM) and the Population Training and Research Centre (PTRC). The survey was conducted by the following PTRC staff:

Survey coordinator: B. Enkhtsetseg

Questionnaire development and training: B. Enkhtsetseg, Ts. Amartuvshin (HSES module), and R. Erdenetungalag (Medicaid)

Data entry programmer: D. Lkagvatseren

Baseline data collection team leaders: T.Navch, B.Munkhjargal, Ch.Tsogtbayar

Baseline data collection enumerators: U.Badamgarav, N. Batsukh, Ch.Byambadorj, E.Galbadrakh, D.Gansukh, O.Itgel, J.Jargalmaa, T.Jargalsaikhan, Z.Munkhtsetseg, N.Otgon, and N.Soyol-Erdene

Baseline data entry team supervisor: B.Munkhjargal

Baseline data entry operators: N.Batsukh, D.Gansukh, J.Jargalmaa, T.Jargalsaikhan, Z.Munkhtsetseg, T.Oyun-Undrakh, Tungalagtamir, Ch.Tsogtbayar

Endline data collection team leaders: Ts.Amartuvshin, U.Badamgarav, N.Batsukh, D.Gansukh,  
Endline data collection enumerators: N.Batmagnai, B.Batsuuri, B.Bolormaa, P.Gantuya, Sh.Davaa, J.Jargalmaa, M.Munkhnaran, Ya.Munkhtuya, P.Myagmarsuren, E.Nandintsetseg, B.Naransolongo, N.Otgon, N.Soyol-Erdene, D.Jinjidgarav, S.Turiinbileg

Endline Data entry team supervisor: D.Gansukh

Endline Data entry operators: E.Adiya, Ts.Erdenemaa, B.Gereltuya, J.Jargalmaa, Z.Munkhtsetseg, E.Nandintsetseg, B.Naransolongo

The following OPM staff were involved in training, supervision and analysis: Aly Visram, Felix Schmieding, Maham Farhat, Lucrezia Tincani, and Sebastian Silva-Leader. This report was written by Maham Farhat, Alex Hurrell, Ian MacAuslan, Felix Schmieding, Lucrezia Tincani, Michele Binci and Radhika Goyal. It was peer reviewed by Luca Pellerano, Sean O'Leary and Zoltan Tiba, and checks on data files were made by Cora Mezger.

## Executive summary

### Purpose

The purpose of the impact evaluation is to provide evidence to the Government of Mongolia (GoM) on the impact of the Food Stamps Programme (FSP) and Medicaid Programme. The impact evaluation is based on the comparison of a quantitative survey of recipients of the FSP and Medicaid in Selenge, Orkhon and Ulaan Baatar, with similar households in the same areas that did not receive the FSP or Medicaid. These households were interviewed in November 2011 (when 564 recipient and 559 non-recipient households were interviewed) and November 2012 (when 762 recipient and 762 non-recipient households were interviewed). Due to technical issues with the Baseline data, which are explained in detail in section 2.2 on the survey sample, this evaluation only takes into account the results obtained with the analysis of Follow-up survey data.

The report has been written specifically to cater for the needs of policy-makers in the GoM.

This impact evaluation aims to:

- provide the government with a good indication of whether or not the programmes achieved the expected outcomes or results;
- enable policy makers in the Ministry of Health (MoH), Ministry of Finance (MoF), Ministry of Population Development and Social Protection (MoPDSP) and others to take important decisions as to whether the programmes are investments that should be continued and funded within and beyond the current scheduled timeframe; and,
- provide information for policy makers to review the overall design or some specific components of the programme, should they continue to fund it in the future or institutionalise the programme.

This report draws on and complements four other assessments of the FSP:

- a qualitative assessment of the FSP's impact and operations in 2011 (Attah et al 2011)
- a qualitative assessment of the FSP's impact and operations in 2012 (Attah et al 2013)
- a qualitative assessment of the FSP's operations in 2013 (Tincani et al 2014)
- an assessment of FSP/Medicaid targeting using Household Socio-Economic Survey (HSES).

### Methodology

The impact of the FSP and Medicaid is evaluated in this study using a quasi-experimental approach, which has been rigorously designed with the aim of obtaining robust findings. Specifically, since it was not possible to identify a randomised control group given the FSP's targeting approach, it was not possible to adopt an experimental design and it was therefore decided to employ a quasi-experimental Regression Discontinuity Design (RDD), which is particularly suitable for the type of data and parameters that inform this evaluation. The targeting systems of both the FSP and Medicaid were based on a Proxy Means Test (PMT), which ordered households according to their PMT score (constructed to represent an indicative proxy of households' living standards). Treatment was given to all households placed under a specific PMT score. The latter represents the cut-off point for our RDD design and the continuous range of PMT scores represents our rating variable. The RDD approach exploits the fact that in the close neighbourhood of the cut-off point being eligible (just under the cut-off) or non-eligible (just above

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the cut-off) is the result of an almost random process and households are comparable in all respect apart from having or not having received the treatment.<sup>1</sup>

It should be noted that the ‘treatment’ in the case of this study comprises of actually two treatments: food stamps and Medicaid. Given that both programmes were administered via the exact same eligibility criteria (PMT assessment), and there is perfect overlap in the treatment selection, disentangling the individual effects of the two programmes for the purposes of impact evaluation is difficult. Therefore, any detected impact should technically be considered the “combined impact” of both programmes. However, due to the very different nature of the two types of support, it seems reasonable to interpret more specifically some of the impacts found in certain areas of interest.<sup>2</sup>

## Impact

Overall, the impacts of receiving Food Stamps/Medicaid were **positive and significant** on:

- food security (having adequate food and diverse diets);
- reduced financial reliance on others and on credit; and
- self-assessment of households’ living standards.

These findings echo the positive impacts on food security, financial dependence and self-assessment found in qualitative work and reported in Attah et al 2013.

Given that these impacts are mostly focused around food security, we have reason to believe that these could be attributed to Food Stamps rather than Medicaid. Medicaid appeared to have some operational problems caused by factors outside Medicaid’s control before and at the time at which this evaluation took place. For example, there was a shortage of funds from the Government to fund the discounted drug programme, which have probably reduced its impact. Further data collection would be required to demonstrate Medicaid’s impact.

### Key Impacts

#### Food security

There was a **substantial positive impact** on food security and related domains. Compared to non-recipients, households receiving Food Stamps and Medicaid:

- had more diverse diets (both adults and children) as measured by a dietary diversity score;
- experienced two fewer months of inadequate food provisioning;
- were less likely to have to borrow or use credit to buy food;
- were less likely to borrow food from friends or relatives; and
- were less likely to eat less-favourite foods.

### Secondary Impacts

#### Health and Education

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<sup>1</sup> As explained in the Report and the Annex, we are employing a local linear strategy as our main estimation strategy and a parametric cubic strategy as a sensitivity test.

<sup>2</sup> In particular, key impacts on food security, which appear to be the most significant and robust emerging from this evaluation, are reasonably attributable to FSP.

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There was very limited impact on health indicators and no impact on education indicators.

This lack of impact is not entirely unexpected. Although education outcomes could have improved due to lower levels of malnutrition, it was not realistic to expect that receiving food stamps should affect school attendance or education related spending. In fact, while households struggle with costs, this does not prevent school enrolment, and Mongolia's net primary enrolment rate is close to 100%.

Medicaid's limited impact on health indicators has two possible explanations. First, Medicaid's objective was to improve the utilisation of health services and reductions in out-of-pocket health expenditures. No significant impact on health outcome indicators was expected, as this takes longer to occur and depends on many other factors (e.g. lifestyle, diet and the quality of health services). Second, various operational problems may have reduced Medicaid's impact. Data collected on the operational aspects of Medicaid reveals that a vast majority of beneficiary households were not sufficiently informed about the Medicaid programme and of those that were informed, a large proportion experienced problems in accessing services such as purchasing discounted drugs.

## **Employment**

There was no negative impact on employment. This result is interesting because it seems to demonstrate that the programmes did not create dependency, so there was no disincentive effect on labour supply.

## **Transfers**

There was minimal impact on receiving other transfers. The only transfer that programme recipients were more likely than non-recipients to receive were other poverty-targeted subsidies, which reflects their condition of poverty.

## **Self-reported well-being**

Finally, there was a positive and significant impact on recipients' self-reported well-being, especially in terms of household food adequacy. This is a particularly encouraging finding, as it seems to confirm the positive effects detected on food security reported above.

## **Operations**

### **Food stamps**

Broadly, the FSP functioned well and recipients were satisfied:

- A vast majority (90%) of respondent households cited satisfaction with the variety of food items they could purchase using food stamps and with the shopkeeper's behaviour.
- Average waiting times to collect stamps were low and there were no reports of bribery or unofficial payments.
- Overall satisfaction with the disbursement process was high for both paper and electronic stamp households. 98% of respondents reported being satisfied with the process of buying using food stamps.

Most recipients spent their stamps immediately:

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- An overwhelming majority (84%) of households reported redeeming food stamps on the day of the receipt
- A vast majority (92%) of respondent households redeemed the entire value of their food stamps in one instance. Of these, 18% reported redeeming food stamps at once because of shopkeepers' request.

There are some areas where payment systems need to be improved:

- A sizeable percentage (32%) of respondents cited paying higher prices or receiving lower quality items in comparison to those who pay with cash at their designated food stamps store.
- Most recipients (90%) had to ask shopkeepers when electronic payments were made.
- Some recipients were unaware that they could save on the electronic cards.
- 55% of households receiving electronic stamps and 53% of households receiving paper stamps reported receiving a value of food stamps that did not match their household size as reported in the household survey (though it usually matched the FSOU database). For recipients of electronic stamps this was more likely to be an under-payment, but for recipients of paper stamps this was more often an over-payment. These differences are likely to be mostly due to addition of household members to these food stamps beneficiary households resulting in a change in the amount the household is entitled to. This highlights the need for regular updating of the inter-sectoral database to ensure that the records are up to date.

## **Medicaid**

Medicaid appeared to function much less well than food stamps. As of November 2012:

- just under half (48%) were satisfied with the programme;
- only around a half (52%) of the recipients felt sufficiently informed about the Medicaid programme;
- the most commonly accessed service under Medicaid was the discounted drugs programme, with around 25% of those who accessed this service encountering problems during the process.

It was intended that these findings would be cross-checked with available expenditure data related to Medicaid provided by the ADB JFPR 9136-MON project. Unfortunately, however, these data were inadequate for this purpose, as data from the Health Insurance Fund (which funds most of the Medicaid claims) was not available.

The limited functioning of the Medicaid was potentially due to a number of factors, including:

- shortage of funds from the government to fund the discounted drug program, which hampered the Medicaid programme before and at the time of the evaluation survey in November 2012;
- reluctance on part of the Medicaid team to promote the programme because of uncertainties regarding the funding of the drug programme; and
- low awareness and uptake of the various services which are covered by the programme, because the programme was still in roll-out stage at the time of the evaluation survey (Medicaid services were made available in evaluation areas in May 2012), .

Despite these concerns, it is important to note that Medicaid utilisation has gained momentum since the period in which this evaluation took place.

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## Conclusions

The results emerging from this evaluation of the Food Stamps/Medicaid effects can be divided in two categories: key impacts and secondary impacts. On the one hand, our evaluation model's estimates show strong and robust impacts produced by the programmes on key indicators of interest related to food security and coping strategies. On the other hand, limited or no impacts were detected across sectors as diverse as health, education and employment, which represent our secondary impacts.

The interpretation of the key impacts suggests that Food Stamps are an appropriate and effective tool for reducing vulnerability to food insecurity of poor Mongolian households. The data indicate positive and significant impacts in the areas of dietary diversity, food adequacy and food related coping strategies. Besides, the programme had no adverse effects on employment, thus excluding the existence of a disincentive effect on labour supply. Based on these results and considerations, we **recommend the FSP to be fully adopted and funded by the GoM.**

The electronic food stamps work well in urban areas and should be continued. However, some recipients are unaware that they can save, and some shops appear to be over-charging. Careful monitoring and effective grievance systems are required to ensure the FSP continues to work well, particularly in the transition to full GoM management that began after fieldwork for this assessment.

The value of the food stamps risks being eroded by inflation, currently running at 10%. An annual review of the value is required to correct for inflation and maintain the FSP's impact. The FSP could also be used to respond to shocks, by temporarily increasing the frequency, value or coverage of payment. Further external evaluation of the FSP is not essential in the short-term, though strengthening and implementing the monitoring system is.

Medicaid is not showing similar positive impacts yet. This is probably due to short-comings in implementation at the time of assessment, rather than weaknesses in the design. Medicaid was not functioning well in evaluation areas as of November 2012, with low awareness, uptake and satisfaction. Given that people must be aware of (and trust) health services in order to use them, it is not surprising that low awareness and low impacts are found together.

Awareness, use and impact of Medicaid will almost certainly improve just with time. However, to maximise effectiveness, Medicaid must urgently address these operational issues. This involves ensuring that:

- Service providers are clear about their responsibilities and citizens' entitlements.
- Medicaid holders are clear about their entitlements and responsibilities.
- Accredited health providers have adequate supplies of drugs and can undertake consultations.
- Budgets for reimbursing health facilities and recipients are always available, throughout the year.
- Grievances related to the programme are dealt with swiftly and fairly.

A further round of external evaluation (both qualitative and quantitative) on Medicaid is recommended in the short-term, in order to reassure funders and implementers of Medicaid's positive impacts and to identify and help address immediate operational issues.

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## Abbreviations

ADB	Asian Development Bank
FNSWPP	Food Nutrition and Social Welfare Project and Programme
FSOU	Food Stamps Operating Unit
FSP	Food stamps programme
GoM	Government of Mongolia
HDF	Human Development Fund
HIF	Health Insurance Fund
HSES	Household Socio-Economic Survey
IE	Impact Evaluation
ISDB	Intersectoral Database
JICA	Japanese International Cooperation Agency
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MNT	Mongolian Tugrug
MoF	Ministry of Finance
MoH	Ministry of Health
MPDSP	Ministry of Population Development and Social Protection
MSWL	Ministry of Social Welfare and Labour
NGOs	Non-governmental organisations
NSO	National Statistical Office
OB	Optimal Bandwidth
OPM	Oxford Policy Management
PIU	Project Implementation Unit
PMT	Proxy Means Test
RDD	Regression Discontinuity Design

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# 1 Introduction

## 1.1 Purpose of the impact evaluation

The purpose of the impact evaluation is to provide evidence to the Government of Mongolia (GoM) on the impact of the Food Stamps Programme (FSP) and Medicaid Programme. The impact evaluation is based on a quantitative survey of recipients of the FSP and Medicaid in Selenge, Orkhon and selected districts of Ulaan Baatar. These areas were selected due to the timing of targeting (August to October 2011): a random sample of recipient (treatment) households were interviewed in a Baseline survey following targeting but prior to receiving any food stamps. The Baseline survey also covered similar households in the same areas that did not receive the FSP or Medicaid – the control group. All households were interviewed in November 2011 for the Baseline survey, and again in November 2012 once the treatment group had been receiving food stamps for a year. However, due to technical issues related to the Baseline data, which are discussed in section 2.2 regarding the survey sample, this evaluation focuses on the analysis of Follow-up survey data.

The report has been written specifically with the needs of policy-makers in the GoM in mind.

This impact evaluation aims to:

- provide the government with good indications of whether or not the programs had achieved the expected outcomes or results;
- enable policy makers in the Ministry of Health (MoH), Ministry of Finance (MoF), Ministry of Population Development and Social Protection (MoPDSP) and others to take important decisions as to whether the programs are investments that should be continued and funded within and beyond the current programme durations; and,
- provide information for policy makers to review programme design or components should policy makers continue to fund it in the future or institutionalize the programme.

Beyond this immediate value to the GoM, the impact evaluation also provides information useful to the Asian Development Bank (ADB), which provided technical assistance and co-funded the FSP and Medicaid with the GoM, and other stakeholders in the social protection and health sectors. The evaluation:

- will be useful to confirm that ADB financing is having positive impacts for Mongolian households and to help inform future funding decisions; and
- has wider relevance for those seeking to design and implement other social protection and health programs.

This report complements three other assessments of the FSP:

- a qualitative assessment of the FSP's impact and operations in 2011 (Attah et al 2011)
- a qualitative assessment of the FSP's impact and operations in 2012 (Attah et al 2013)
- a qualitative assessment of the FSP's operations in 2013 (Tincani et al 2014)
- an assessment of FSP/Medicaid targeting using Household Socio-Economic Survey (HSES)

The rest of this report provides background to and descriptions of the two programmes (sections 1.2, 1.3, 1.4 and 1.5 on theories of change). Section 2 explains the study

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methodology (Regression Discontinuity Design method). Section 3 presents findings on key impacts and secondary impacts. Sections 4 and 5 present findings on the operations of the FSP and Medicaid respectively. Section **Error! Reference source not found.** concludes. Annexes provide robustness checks and further details on the methodology employed and the estimation strategies adapted.

## 1.2 Background: food security and health services in Mongolia

The 2008-09 food and financial crisis hit Mongolia hard, as mine revenues decreased dramatically while the price of food and other essential goods skyrocketed. Prevalent poverty left many households in Mongolia highly exposed to the impact of the food (2008) and financial crises (2008-09).<sup>3</sup> Using data from the Household Socio-Economic Survey (HSES) from 2007 to 2009, and qualitative data collected in July 2011, Attah et al (2011a) found that following the crises vulnerable households were compelled to:

- eat cheaper, lower quality but higher calorie food, and to further reduce the quantity of food consumed, resulting in a less nutritious diet (despite the fact that even before the crisis, in 2006, caloric intake among the poorest was already just 65% of the recommended amount);
- allocate a higher share of expenditure to food;
- buy lower quality clothing;
- incur more debt; and
- experience higher stress and poor quality social relations and status.

In addition, adjusting to the crises meant:

- households were exposed to lower nutrition over a sustained period;
- children were less well prepared for school;
- illnesses went untreated, partially treated or treated with less effective methods; and,
- distress sale of productive assets.

Mongolia's economy was structured such that, despite significant GDP growth through mining revenues, most poor households were unable to respond to price increases by working more hours or bargaining for higher wages. Low income Mongolians were at significant risk of unavoidable, long-term and irreversible damage caused by higher prices. This underscored the rationale for public policy intervention to support poor households' food consumption and health status.

The GoM with support from international organisations such as the ADB, JICA, the World Bank and others, put in place several programmes to protect people during the crisis and the impact of the necessary economic adjustment. These programmes included (i) the Food Stamps Programme (FSP) initiated on a pilot basis in 2008 with ADB financing support, and (ii) the Medicaid programme, which was introduced in a joint ADB-JICA loan operation "Protecting the Health Status of the Poor during the Financial Crisis, JFPR 9136-MON Project" in 2009. The programmes are described below.

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<sup>3</sup> National Statistics Office published recently poverty data showing national average poverty rate at 27.4% for 2012

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Both programmes use the same targeting approach. The initial phases of the FSP used existing government targeting systems to identify recipients of Food Stamps but suffered large inclusion and exclusion errors (ADB, 2008). The programme then adopted a Proxy Means Test (PMT) targeting approach which aims to identify the poorest 5% of households. The PMT methodology was approved by the Ministry of Population Development and Social Protection (MPDSP) and the National Statistical Office in April 2010.

The test involves questions on household size, age, work status, insurance status and characteristics (such as roof material). These questions are derived from an analysis of the Household Socio-Economic Survey (HSES) and designed to be reasonable predictors of consumption expenditure that are at the same time quite easily verified by an enumerator (e.g. because they can see the roof material) and therefore difficult to 'game' or falsify. Each answer is converted to a numerical score, and these scores are combined to generate a single PMT score for each household which is taken as a measure of their living standards. Households are then ranked by their PMT score. Programmes can then select households based on their objectives and budget. The food stamps and Medicaid initially aimed to select the poorest 5%, meaning that the eligibility cut-off point was set at 5%.

PMT targeting was rolled out nationally in four phases, starting in 2010 and reaching national coverage by early 2012. The objective of the roll-out was to identify all poor households in Mongolia in order to provide a national database that could be used to target social benefits and programmes. In some areas, a census-based approach was taken (i.e. every household in the area was interviewed and added to the database). In other areas, targeting teams visited just the poorest locations with poor households outside these areas encouraged to apply on demand. In January 2013, the 'Inter-Sectoral Database' or ISDB contained 516,956 households and 1,738,648 people.<sup>4</sup> An assessment of this targeting using qualitative data (see Attah et al 2011b and Attah et al 2012) has found its quality level to be reasonably good.

### **1.3 Overview of the Food Stamps Programme**

The FSP aimed to support the consumption of basic foods by extremely poor families, initially during the food crisis of 2008/2009, and then subsequently for the longer-term. The programme's key expected impact, in line with the current monitoring and evaluation framework, is that of '[r]educed vulnerability to food insecurity of poor households'. The FSP is also expected to improve recipient households' diet, quality of food, and access to social services. Other possible positive impacts include a reduction in stress and social status.

The FSP distributes stamps to selected eligible households that can be redeemed for a specified list of ten high protein foods and staples at specified shops. The MoPDSP issued revised guidelines for the FSP in March 2013, following the revised Social Welfare Law in January 2012 that provided the FSP's legal foundation.

Recipients receive stamps to a value of MNT10,000 per month for each adult and MNT5,000 per month for each child in the household. This was expected to deliver an average of MNT7250 per capita per month, compared to a predicted monthly per capita consumption of MNT76,000 for the poorest 5% of households.<sup>5</sup>

In rural areas, paper stamps are distributed every two months by social workers, and recipients have to spend each stamp within two months in a range of shops. In urban areas

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<sup>4</sup> L Carraro Mission Report January 2013.

<sup>5</sup> L Carraro Mission Report October 2013

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(Ulaan Baatar and aimag centres), electronic stamps distribution was rolled out between November 2011 and mid-2012. In this system, bank cards are topped up monthly and recipients can save value on the card, but they are tied to a specific shop.

By December 2012, paper and electronic food stamps had been delivered to 98,270 recipients (in 16,335 households) from 21 aimags and nine districts, against a target of 100,000 people. The total monetary amount of food stamps distributed in 2012 was MNT 5,609,885,000. According to administrative data, 49.31% of all food stamp recipient household members were 0-to-16-year-old children, and 20.46% of all household heads were women. A total of 1,691 food shops/markets were selected via aimag/district Governor offices, of which 93.9% operated using paper food stamps with the using electronic food stamps (e-cards). Beneficiaries of the FSP in the selected aimags in this analysis (Selenge and Orkhon) received roughly 19.7% of the total monetary amount of food stamps distributed in December 2012.

## **1.4 Overview of the Medicaid Programme**

The specific objectives of the Medicaid programme are to improve access to health services for the poor by reducing the amount of out-of-pocket expenditure on the purchase of medicines, laboratory and diagnostic services, in-patient care and ambulatory services. The programme was seen as an interim measure to fill the gaps of the social health insurance system. A large proportion of the uninsured population includes vulnerable segments, and the current system results in high out-of-pocket expenditures.

Medicaid ensures free care at selected health centres for card holders, and covers: (i) ambulatory services, including diagnostics and laboratory tests; (ii) in-patient services at designated secondary-level health care facilities; and (iii) free access to discounted drugs at accredited pharmacies. It also reimburses transportation costs for eligible patients from the countryside to the provincial centres given the long distances one has to travel to seek health care in Mongolia. Claims for reimbursement submitted by accredited health facilities and pharmacies are reviewed and cleared for payment by the administration of the social health insurance system.

With the passage of the revised Social Welfare Law in January 2012, the parliament established a legal foundation for the Medicaid programme's institutionalisation. The government is preparing regulations (by-laws) to allocate financial resources, and assign implementation and reporting responsibilities. The results of this impact evaluation will inform the institutionalisation process of the Medicaid programme.

Medicaid coverage was extended to the entire country in four phases between April 2011 and November 2012. As of November 2012, the Medicaid programme covered 15,262 households (95,822 individuals). The programme has accredited 422 health care facilities and pharmacies. As of end of December 2012, the Medicaid programme had served 38,856 beneficiaries (about 90% received pharmaceutical benefits in urban centres and about 10% of patients received in-patient care). The use of the Medicaid programme benefits is accelerating over time with the largest expansion in the first quarter of 2013.

In the areas covered by this evaluation (Selenge, Orkhon and selected districts of Ulaan Baatar<sup>6</sup>), Medicaid started providing access to health care services from May 2012. In these areas there were 2,334 households, containing 14,876 individuals, enrolled in the Medicaid programme.

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<sup>6</sup> Baganuur, Bayangol, Bayanzurkh, Nalaikh, Sukhbaatar, Khan-Uul, and Chingeltei districts in Ulaan Baatar.



Data relating to Medicaid expenditure and service provision proved difficult to pin down. Some Medicaid claims are funded by the ADB JFPR 9136-MON project, but most (virtually all the ambulatory, laboratory and diagnostic services, 90% of in-patient services and 50-80% of discounted drug services) are funded by the Health Insurance Fund (HIF). Data on expenditure and service provision on Medicaid recipients by the ADB JFPR 9136-MON project were made available to the evaluation team, but not HIF expenditures. Expenditure data from May to December 2012 are in Table 1.1. Total expenditures were MNT 23,858,030 or USD 16,684. These expenditures correspond to services provided through this project (but not HIF). Up to May 2013<sup>7</sup>, these were:

- 12 cases of in-patient services,
- one ambulatory case,
- two laboratory and diagnostic cases, and
- 9,706 cases of discounted drug services

**Table 1.1 Medicaid expenditures (in MNT) in evaluation areas, May-December 2012**

	Ulaan Baatar	Selenge	Orkhon	Total
Ambulatory services				
Lab & diagnostics				
In-patient	342,868			342,868
Discounted drug services (DDS)	14,062,561	7,241,572	2,211,029	23,515,162
Total	14405429	7241572	2211029	23,858,030

Source: Data provided by R.Erdenetungalag, M&E consultant, JFPR - 9136 - MON project. These data refer to JFPR - 9136 - MON project expenditure only, and not HIF.

## 1.5 Programme theories of change

The FSP and Medicaid programmes' theories of change set out the critical design assumptions and connect the design of the two programmes with their expected impacts.

### 1.5.1 Food Stamps Programme

The FSP aims to reduce poor households' vulnerability to food insecurity. Food security exists when 'all people at all times have access to sufficient, safe, and nutritious food to maintain a healthy and active life'.<sup>8</sup> This in turn implies:

1. having sufficient quantity and quality of food supplied on a consistent basis (*food availability*);
2. having sufficient resources to obtain appropriate foods for a nutritious diet (*food access*); and
3. having appropriate usage-based knowledge of food, including storage, processing, preparation and distribution (*food utilisation*)

<sup>7</sup> Data up to December 2012 only were not available. Note that the timeframes do not match, which is why there is no expenditure recorded for ambulatory and lab and diagnostic services, though some (three) were provided.

<sup>8</sup> [www.who.int/trade/glossary/story028/en/](http://www.who.int/trade/glossary/story028/en/)



4. having an ability to absorb and metabolise nutrients, which can be affected by sanitation or hygiene, disease and malnutrition.

The FSP aims primarily to address *food access* constraints by providing recipients with additional resources to spend on food. Crucially, the regularity of the food stamps (monthly for electronic stamps, and every two months for paper stamps) allows recipient households to access food on a continuous and predictable basis. By limiting eligible food to ten specific food types, the FSP is also intended to have a positive influence on households' diet. Fully addressing *food availability* constraints is beyond the scope of the programme, but it does seek to do what it can in this regard by engaging with participating shop-keepers to ensure that quality food is always available at shops serving recipient communities. However, the programme is not designed to address *food utilisation* constraints, although in theory there could be indirect effects if positive programme impacts on recipients' health status in turn improves their ability to absorb and metabolise nutrients.

This discussion therefore highlights that there are a number of key assumptions that underpin FSP theory of change. At a basic level, the programme's focus on the poorest households requires that the FSP can successfully identify and register poor households through the PMT targeting process. Once identified, recipients' ability to access food is improved by providing them with regular food stamps: the transfer and redemption process. The FSP theory of change therefore assumes that these key operational processes work effectively, which in turn requires that recipients and shopkeepers have good information about their entitlements and responsibilities.

However, even if these conditions hold, the programme will only reduce food insecurity through improvements in food access if:

- recipients do not reduce their food consumption from other sources by the same or more, either because they choose to earn less or spend more on other items (i.e. substitution effects);
- recipients use the stamps to increase the diversity of their diet;
- shop-keepers do not raise prices significantly (and thereby cancel out the additional purchasing power that the food stamps are supposed to provide);
- recipients do not sell the food they obtain with the stamps; and
- recipients actually use the stamps for food.

Receiving regular food stamps could also be expected to have the following secondary impacts:

- Reduced dependence on emergency borrowing for food of recipient households as they are guaranteed some regular transfer, and better terms for borrowing because the regular transfer could operate as collateral;
  - Improved social status of recipient households as a result;
  - Improved educational outcomes for children in recipient households, as a result of a) lower levels of hunger and malnutrition, b) higher expenditure on educational materials, and c) children having greater confidence from improved school materials and social status;
  - Lower levels of stress and tension within recipient households resulting from greater confidence in being able to provide food; and,
-

- Possible tension between recipient and non-recipient households as a result of the targeting process.

## 1.5.2 Medicaid

The Medicaid programme aims to improve access to health services for the poor. This means that poor households are more likely to obtain formal health services when they are unwell. It should in turn reduce their out-of-pocket expenditure on health care, and improve, over time, their health status.

This objective assumes that Medicaid can successfully identify and register poor households (targeting), and improve their access to health services by setting up a system that reimburses health centres for providing them with certain types of health care. This further assumes that recipients and health centres both know and act on their entitlements and responsibilities, and that budget is available for reimbursing health centres. This has not always been the case with Medicaid, which significantly affected its functioning in 2011 and 2012.

Seeking to improve access to health care by providing reimbursement for direct health costs incurred at formal health centres and also covering transport costs implies that the major barriers to health care for poor households are addressed. This assumes that:

- Poor households will seek formal health care when their members are unwell, and are not put off by a belief that:
  - formal health care is low quality;
  - formal health care is unnecessary;
  - they will be discriminated against at the health centre;
  - informal health treatments are preferred;
- Poor households are physically able to reach health centres

The Medicaid programme's theory of change also assumes that receiving formal health care will actually improve poor households' health status, shortening the time spent unwell and acting to prevent illness. In other words, it assumes that the formal healthcare being accessed via the Medicaid programme is of adequate quality.

The Medicaid programme may also have some secondary, non-health impacts. If healthcare is provided for free, poor households should spend less on healthcare (unless they now purchase additional healthcare items), particularly if household members' health status improves. If households do spend less on healthcare, and there are no other negative impacts on their income, they may be able to spend more on other items.

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## 2 Methodology

### 2.1 Impact evaluation methodology: Regression Discontinuity Design

The impact of the FSP and Medicaid is evaluated in this study using a quasi-experimental approach, which is rigorously designed with the aim of obtaining robust impact estimates by comparing beneficiaries' conditions with those of a credible counterfactual. Specifically since it was not possible to identify a randomised control group given the FSP's targeting approach, it was not possible to adopt an experimental design and it was therefore decided to employ a quasi-experimental Regression Discontinuity Design (RDD), which is particularly suitable for the type of data and parameters that inform this evaluation. As there were no conditions for the programmes to be randomly assigned to fit an experimental design, we exploit the programmes' targeting rule to determine a credible control group *ex post*. The targeting systems of both the FSP and Medicaid were based on a Proxy Means Test (PMT), which ordered households according to their PMT score. Treatment was given to all households located under a specific PMT score. The latter represents the cut-off point in our RDD design, with the continuous range of PMT scores representing our rating variable. The RDD approach exploits the fact that in the close neighbourhood of the cut-off point being eligible (just under the cut-off) or non-eligible (just above the cut-off) is the result of an almost random process and households are comparable in all respect apart from having or not having received the treatment.

The RDD approach enables us to determine whether there exists a 'discontinuity' between households that did receive the treatment (FSP and Medicaid) and those that did not (control group) with respect to a number of relevant outcome indicators that are expected to be affected by the programme under examination. Evidence of this discontinuity is graphically represented by a 'jump' at the cut-off point (graphical representations are included in the Annex for selected outcomes). As mentioned above, in the case of both FSP and Medicaid a PMT targeting system was employed to assign the treatment to households that fell under a pre-determined PMT score, which was set at the level of 38,100.

As both programmes were administered according to this identical eligibility criterion (PMT assessment), and there is therefore perfect overlap in the treatment selection, it is not technically possible for an impact evaluation to disentangle the effects of the two programmes. As a consequence, any impact found must be considered as the "combined impact" of both programmes. However, more specific interpretations related to how the two programmes might have affected different areas of interest can be useful and will be discussed as appropriate in the relevant sections.

In order to obtain robust and significant estimates of treatment effects the RDD approach needs to respect five crucial assumptions, which are presented in detail in the Annex. Once the internal validity of the approach is confirmed, the implementation of the estimation model can be carried out through different strategies. The two main strategies indicated by the literature on RDD are the parametric strategy and the non-parametric local strategy. The latter will be employed in this evaluation to estimate the causal effect of being treated by comparing observations that lie within a bandwidth in close vicinity to either side of the cut-off point. The main methodological reason behind our choice is that by limiting the analysis to a restricted sub-sample of observations close to the cut-point, the local strategy is expected to produce less biased results than a parametric strategy. Within the selected bandwidth the relationship between outcome and treatment variables is closer to linear and can be

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estimated with the use of a local linear regression capable of producing consistent estimates. The use of a sample of observations close to the cut-off point can however give rise to serious issues related to the external validity of our estimation model, which is a common problem associated with the RDD approach. We discuss this in the next section below.

A more thorough explanation of the characteristics of the two types of strategy is included in the Annex. The latter also contains a number of sensitivity checks, which are performed with the use of a parametric polynomial (cubic) strategy for selected outcome indicators. This is intended to confirm the validity and robustness of the estimates obtained with the local linear strategy. Finally, the Annex includes a further test focusing on discontinuities away from the cut-off. This is performed to ensure that any observed discontinuity at the cut-off point reflects a genuine change in the outcome variable linked to the treatment and is not due to lumpiness. These several robustness checks were undertaken also to partially counteract the absence of Baseline analysis and make us more confident in the robustness and reliability of our results.

## 2.2 Survey sample

The survey was conducted in five soums in Selenge, two soums in Orkhon, and seven districts in Ulaan Baatar (Baganuur, Bayangol, Bayanzurkh, Nalaikh, Sukhbaatar, Khan-Uul, and Chingeltei). Most of these areas, with the exception of the soums in Selenge, are urban or close to towns. The areas selected to collect primary data correspond to the areas where the programmes' targeting was carried out between August and October 2011. As mentioned above, the data used in this evaluation is derived from the Follow-up survey undertaken in November and December 2012.

Although a Baseline survey was conducted in November 2011, a technical issue related to the use of the assignment variable renders the use of Baseline data not advisable. Specifically, the PMT score that was initially used as the threshold to differentiate between treatment and control groups was subsequently raised by the programme. The Baseline sample was planned to contain 500 households that were expected to receive treatment, and 500 households that were expected not to. As a consequence of the PMT score threshold for eligibility being raised after the end of the Baseline survey, over 70% of the Baseline sample ended up eventually receiving the treatment.

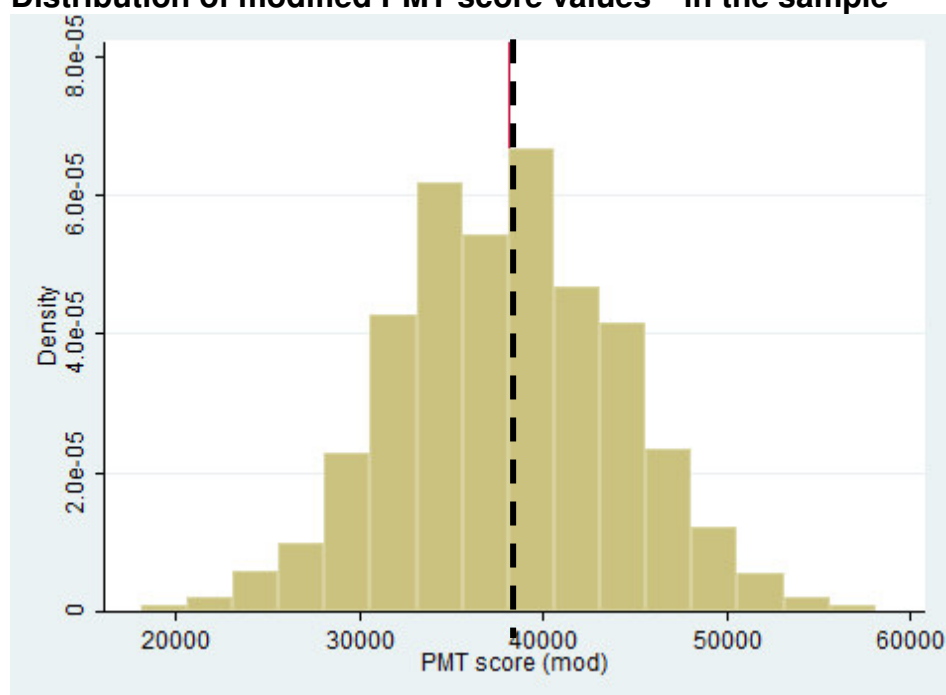
The Follow-up survey conducted for the evaluation of Food Stamps and Medicaid's impact on recipient households interviewed 1,515 households. Amongst the sampled households, 760 were administered the treatment, whilst the remaining 755 did not receive the treatment and were used as control households. The numbers of sample households and individuals therein are presented in the table below.

**Table 2.1      Sample size of Follow-up survey**

	Treatment	Control	Total
No. of Households	760	755	1,515
No. of Individuals	5,189	4,527	9,716
Male	2,519	2,173	4,692
Female	2,670	2,354	5,024

As required by the RDD approach, the sample for the evaluation survey was selected from around the eligibility cut-off point. Within the evaluation areas 47 geographical sub-units ('clusters') were randomly selected to be covered by the survey.<sup>9</sup> The selected number of treatment and control households varied per cluster, depending on the availability of treatment households in these clusters. For treatment households, those households in the cluster closest to the eligibility cut-off were selected. Every sample treatment household was then matched with a control household from the same cluster that had the most similar distance to the eligibility cut-off, resulting in an approximately symmetric distribution around the cut-off point, as shown in the figure below. This distribution provides us with a good indication of the internal validity of our RDD approach. In fact, the absence of noticeable discontinuity in the density of observations close to either side of the cut-off point demonstrates that there was no deliberate manipulation of the PMT score values or of the placement of the cut-off point.

**Figure 2.1 Distribution of modified PMT score values<sup>10</sup> in the sample**



Note: Dashed line represents PMT score cut-off

It should be noted that this sample was selected only from three aimags and by using a purposive selection around the cut-off point. Hence, the sample is not representative of the whole population – neither the treated population nor the non-treated control population. However, although the point estimates in this report are only representative for households right below and above the cut-off point, the point estimate for the *treatment* group are indicative of treatment households in the three surveyed aimags. Due to the clustered sample design, the PMT score range for sampled treatment households covers almost the entire PMT range below the cut-off and follows a similar distribution, as shown in Figure 2.2.

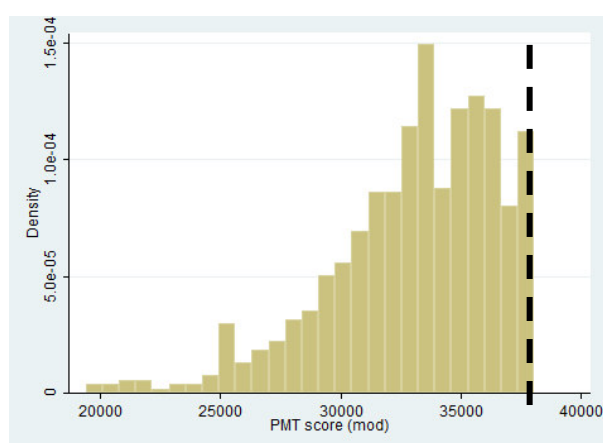
<sup>9</sup> A cluster corresponds to a khoroo (in Ulaanbaatar), a bag (in aimag centres outside Ulaanbaatar) or a soum (outside the aimag centres). Certain clusters were excluded from selection when only a small number of beneficiaries were available. Combining such “undersized” clusters was not practical given geographic dispersion.

<sup>10</sup> Modified PMT score values are the estimated consumption expenditures at 2007-08 prices, as predicted by the PMT score method.

As a result of the above, the point estimates cannot be technically defined as being representative of all Food Stamps and Medicaid beneficiaries.

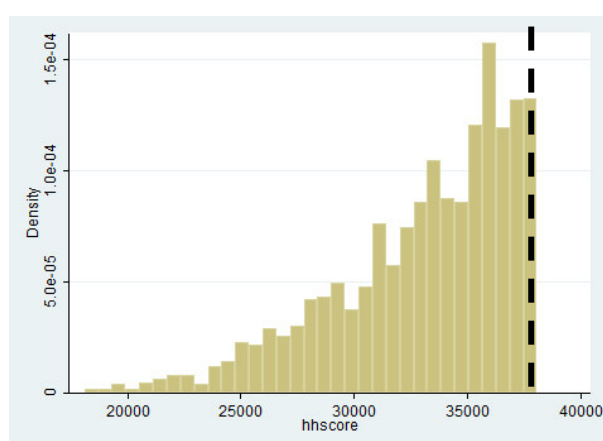
This problem concerning the generalisability of the RDD impact estimates has been widely discussed in the literature. The local effect identified at the cut-off point as the mean impact of the programme could be very different from the effect occurring at a further distance from the cut-off point. However, Lee (2008) shows that when the rating variable is affected by random errors the observations at the cut-off point are not necessarily part of a homogeneous group in terms of true scores on the rating variable. As a result, the impact estimates obtained with the RDD approach can be more generalisable if it is assumed that the scoring variable contains random errors, which is likely to be the case for a PMT targeting system like the one used in this project. In any case, the specific focus of our approach is on evaluating the impact of the Food Stamps and Medicaid treatment and we are not aiming at generating representative point estimates for the whole population.

**Figure 2.2 Comparison of modified PMT score distribution<sup>11</sup> in the sample and the population (recipient households only)**



*Treatment sample, n=760*

*Treatment population, N=2034*



<sup>11</sup> Modified PMT score values are the estimated consumption expenditures at 2007-08 prices, as predicted by the PMT score method.

## 2.3 Presentation of results

Using data from the Follow-up survey (post-treatment), the tables in the main body of this report present the key results emerging from our RDD model, for a range of selected outcome indicators. The first column in the report body tables describes the indicator. The second column presents the point estimate for the treated sample households. The subsequent columns present the estimated coefficient and its significance level, standard errors and number of observations of the treatment indicator. As discussed in the section on methodology, the main estimation strategy chosen for our RDD model is the local linear regression strategy. Results are displayed for calculations carried out within the optimal bandwidth<sup>12</sup>. As sensitivity tests the Annex includes estimations with larger bandwidths (150% and 200% larger) and additional estimations on a number of selected indicators (key impacts), which were performed by employing a parametric strategy (polynomial cubic). The results from the two different specifications can be used to validate and cross-check the robustness of the findings. Significance in the estimated coefficient for the treatment variable indicates the existence of programme impact for the outcome indicator under examination that is statistically different from zero with a certain degree of confidence.

Finally, the tables included in the Annex also present point estimates for the control group.

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<sup>12</sup> The optimal bandwidth calculation is based on the technique developed in Calonico, S., Cattaneo, M.D. and Titiunik (2014). Robust Data-Driven Inference in the Regression Discontinuity Design. *The Stata Journal*, pp. 1-37

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## 3 Programme impact (Food Stamps and Medicaid)

### 3.1 Food security

#### Recipients of food stamps:

- **Ate more diverse diets, for both adults and in particular children, (but did not eat more meals per day);**
- **Had fewer months when there was not enough to eat;**
- **Were less likely to resort to negative coping strategies;**
- **Were less likely to borrow for food.**

The core objective of the Food Stamps programme is to support the consumption of basic foods by extremely poor households (i.e. those among the poorest 5% of Mongolian households). This focus on supporting the food security of the very poorest Mongolian households came in response to the international food crisis of 2008-09. The food stamps distributed by the programme enable recipient households to purchase a specific range of high protein foods. To assess the programme's impact on food security, the impact evaluation survey recorded information on dietary diversity, meal frequency, food adequacy, incidence of hunger, coping strategies and food sharing practices.<sup>13</sup> Although, as explained above, the RDD design detects the impact of the treatment as a combined effect of Food Stamps and Medicaid, it is reasonable to assume that effects clearly related to food security can be attributed to the Food Stamps programme. In this respect, the analysis on consumption expenditure shows that Food Stamps were indeed used by households in the treatment group to obtain consumable goods, as envisaged by this programme.

#### 3.1.1 Dietary diversity and meal frequency

Table 3.1 below relates to food security impact measures that are recorded at the individual-level: dietary diversity and meal frequency. Dietary diversity has been measured as a simple count of number of food types out of the 14 different food types listed in the survey questionnaire consumed by each individual in the past 24 hours.<sup>14</sup> A higher dietary diversity score therefore reflects a wider range of food consumed which is indicative of better nutrition. Meal frequency is calculated as the number of meals consumed by each individual person in the last 24 hours, based on asking respondents about six different meals: morning meal, food between morning and midday, midday meal, food between midday and evening, evening meal, food after evening meal. The impact analysis assessed both of these measures separately for adults and children.

The results show that the programme has had a significant positive impact on dietary diversity for both adults and children. These impacts are shown in Table 3.1 below, with a positive significant effect detected with our main RDD local linear strategy. Besides, this result holds for our other RDD model specification (parametric cubic) shown as a sensitivity

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<sup>13</sup> Initial proposals to measure individual calorific intake were dropped due to the complexities involved.

<sup>14</sup> The 14 listed food types were: (1) flour, bread, biscuits, or any other foods made from wheat, millet, sorghum, maize, or barley; (2) rice, rice noodles or other rice products; (3) flesh meats (mutton, beef, horse, etc.); (4) organ meats (liver, lung, etc.); (5) cheese, yoghurt, milk or other milk products; (6) potatoes, carrots, turnips, yams or any other foods made from roots or tubers; (7) vegetables (e.g. cabbage, tomato, etc); (8) fruits; (9) eggs; (10) fresh or dried fish or shellfish; (11) foods made from beans, peas, lentils or nuts; (12) oil, fat, or butter; (13) sugar or honey; (14) any other foods such as condiments, coffee or tea.

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test in the Appendix together with a graphical representation of the discontinuity at the cut-off point (jump). We can therefore be confident in the validity of these findings. In other words, there is clear and robust evidence that the programme is having a positive impact on the dietary diversity of adults and especially children living in households benefiting from the Food Stamps programme. This is a positive and encouraging result.

The evidence of the programme's impact on meal frequency is less conclusive, however. Although significant (positive) impacts are observed for some of the RDD specifications originally performed, this is not the case for our main strategy (RDD local linear) and sensitivity test (parametric cubic) that we are confident produce the most reliable results. Therefore we cannot conclude that the programme is having any significant impact on the number of meals consumed.

**Table 3.1 Individuals' dietary diversity and meal frequency (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
<b>Adults</b>				
Mean dietary diversity score <sup>1</sup>	5.9	0.452*	(0.248)	4,534
Mean meal frequency <sup>2</sup>	3.4	-0.071	(0.210)	4,547
<b>Children</b>				
Mean dietary diversity score <sup>1</sup>	5.7	0.679***	(0.244)	4,339
Mean meal frequency <sup>2</sup>	3.7	-0.042	(0.183)	4,345

Source: Food Stamps IE survey. Notes: (1) Dietary diversity score is calculated as the number of different food types (e.g. vegetables, milk products, etc.) consumed by a person in the last 24 hours. 14 food types were listed in the questionnaire. (2) Meal frequency is calculated as the number of meals consumed by a person in the last 24 hours (respondents were asked about six different meals: morning meal, food between morning and midday, midday meal, food between midday and evening, evening meal, food after evening meal).

### 3.1.2 Food adequacy and hunger

Table 3.2 below shows the impact results for two food security impact indicators that relate to food adequacy and hunger. Both these indicators are measured at the household level:

1. The first measure is the number of months in the previous year when the household did not have enough food to meet their family's needs. In other words, the number of months during which the family had inadequate food provisioning.
2. The second measure captures the degree to which household experienced episodes of acute hunger in the past month. This *household hunger scale score* is constructed on the basis of three sets of questions in the evaluation questionnaire relating to the frequency of periods in which the household was affected by hunger in various ways: (i) having no food to eat of any kind in your house because of lack of resources to get food; (ii) having at least one household member going to sleep hungry due to lack of food; (iii) having at least one household member going a whole day and night without eating anything at all due to lack of food. The score is constructed as follows: for each of the three hunger impacts the household gets a score of zero if it was never experienced, a score of one if it was rarely or sometimes experienced, and a score of two if it was often experienced.

The final score is the sum of these scores across the three the three hunger impacts, i.e. results in score with a value between zero and six.

The results show that the programme is having a significant impact in reducing the number of months during which households did not have an adequate quantity of food to eat. Table 3.2 below shows this result for the RDD local linear strategy, whilst in the Appendix the result is confirmed by the parametric specification as well as a graphical representation. A possible interpretation of these positive results could be that the programme had a sort of cushioning effect, mitigating the negative impact of potentially adverse factors affecting food availability.

The results relating to the household hunger scale score are less conclusive as our main estimation strategy shows no significant impact, whilst the sensitivity test points towards a negative impact on frequency of acute hunger but with a low significance level attached to the relevant coefficient. This may partly because the survey is conducted at the start of winter when food stocks are likely to be comparatively plentiful, so the mean household hunger score is quite low (0.5 on average). Hence, the evidence on the programme effect on the frequency of acute hunger as measured by the hunger scale score is not conclusive.

**Table 3.2 Household-level indicators of food adequacy and hunger (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Mean number of months without adequate food provisioning <sup>1</sup>	5.9	-2.073***	(0.737)	1,157
Mean household hunger scale score <sup>2</sup>	0.53	-0.073	(0.286)	1,515

Source: Food Stamps IE survey. Notes: (1) In past 12 months (2) Household hunger scale score is a value between 0 and 6. It is calculated from responses to three HHS questions relating to food availability, going to sleep hungry and going an entire day and night without food; responses to each of the three questions score 0 (never), 1 (rarely or sometimes) or 2 points (often).

### 3.1.3 Coping strategies

Households will commonly respond to food insecurity by engaging in a range of coping strategies. These often involve making negative trade-offs in order to ensure a minimum level of food consumption, with children in the household often prioritised. By increasing the ability of recipient households to purchase food, the programme is expected to reduce food insecurity and therefore the need for food stamps households to undertake damaging coping strategies.

The survey questionnaire collected information on a range of possible coping strategies: purchasing food on credit or borrowing money to buy food (including the source of this credit); consumed less preferable foods; reducing the usual quantity of food served to men, women or children (under 18); and, finally, selling household assets to be able to purchase food.

Table 3.3 below reveals that recipients of food stamps were significantly less likely to resort to most of these coping strategies. All local linear results are confirmed by the parametric strategy presented in the Annex. Recipient households are less likely to have to buy food on credit or borrow money to buy food. They are also less likely to have consumed less

preferable foods or reduced the usual quantity of food served to women or children in the past week. The only coping strategy on which the programme does not appear to have an impact is selling assets to buy food, but this coping strategy appears to be undertaken by a small proportion of treatment and control households (around 5%). The programme appears to be reducing the need for recipient households to engage in potentially damaging coping strategies, which is a positive finding.

**Table 3.3 Coping strategies (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Purchase food on credit or borrow money to purchase food sometimes	48	-15.654**	(7.510)	1,515
Consumed less preferred foods <sup>1</sup>	21	-20.645***	(6.666)	1,515
Reduced usual quantity of food served to men <sup>1</sup>	25	-27.521***	(7.785)	1,412
Reduced usual quantity of food served to women <sup>1</sup>	25	-25.083***	(7.310)	1,508
Reduced usual quantity of food served to children (under 18) <sup>1</sup>	16	-16.214**	(6.367)	1,503
Sold household assets to be able to purchase food <sup>1</sup>	4.3	8.487	(5.176)	1,515

Source: Food Stamps IE survey. Notes: (1) Defined as households that used respective coping strategy “rarely”, “from time to time”, or “often” in last 7 days.

### 3.1.4 Food sharing practices

The programme may also be expected to affect food sharing practices. By increasing the ability of food stamps households to purchase food, this may reduce their need to receive food (or money for food) from others, either as a gift or borrowed. Furthermore, food stamps households may become more likely to lend or give food (or money for food) to others, with implications for their social status. To assess this, the survey questionnaire captured information on whether households had given, received, borrowed or lent food (or money for food) in the last month.

Table 3.4 below shows that the only sharing practice the programme is having a significant impact on is borrowing from others. Food stamps households are significantly less likely to have borrowed food (or money for food) from others in the last month, a result that holds for both our main RDD strategy and sensitivity test displaying a solid significance level. Provided this reflects reduced food insecurity among Food Stamps households, and since borrowing places burdens on other households and may place obligations on those borrowing, this should be seen as a positive result. However, it is also possible that recipient households are in no less need of borrowing food, but are less likely to be lent food because they are observed to be supported by the programme. But given all the other results presented in this section, suggesting the programme is having a significant impact on reducing food insecurity among food stamps households, the former interpretation (i.e. that the programme is reducing the *need* for recipients to borrow) appears more likely.

**Table 3.4 Food transfers (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Percentage of households that (in the last month):				
Gave food / money for food as a gift to others	2.6	3.669	(4.383)	1,515
Received food / money for food as a gift	9.9	1.725	(5.895)	1,515
Lent food / money for food to others	1.7	4.634	(3.187)	1,515
Borrowed food / money for food from others	46	-17.635**	(7.693)	1,515

Source: Food Stamps IE survey.

## 3.2 Consumption

### Recipients of food stamps:

- **Consumed more food from food stamps;**
- **Did not consume less food from other sources;**
- **Did not have higher total consumption expenditure;**
- **Did not have higher consumption expenditure in any specific category of food;**

As mentioned above, the specific objective of the Food Stamps programme is to support the consumption of basic foods by extremely poor households (i.e. those among the poorest 5% of Mongolian households). In the M&E framework and impact evaluation outline, this is proxied by real household food consumption expenditure in targeted households. The target is that this should increase by 10% as a direct result of the programme. The impact evaluation survey contained a consumption expenditure module covering food and non-food consumption expenditure, in order to test whether receiving FSP had an impact on this.

At follow up in November 2012, there is no statistically significant impact on total food consumption though the direction is positive. The data do show a substantial positive impact on food from food stamps, confirming that food stamps recipients obtained food from the food stamps. More interestingly, the data do not detect a statistically significant impact on food from non-food stamps sources. This positive result reflects the finding in section 0, which showed that households receiving food stamps had adequate food in more months than households not receiving food stamps, and the finding in section 3.7, which shows that food stamp recipients thought they had more adequate food consumption after receiving food stamps.

However, the data suggest no other impact on consumption overall. This is probably for two reasons:

- First, the value of the food stamps is quite small relative to households' total consumption, so the impact may be too small for the survey to detect. The food stamps provided 10,000MNT/month for adults and 5,000 MNT/month for children, or

on average 7663MNT/month according to the data for treatment at follow up. Per capita consumption for households in the poorest 5% is around 60,000/month, according to follow up data. This means the value of food stamps is just over 10% of total consumption, and statistically significant impacts on consumption are expected to be limited.

- Second, households receiving food stamps may have slightly reduced their consumption from other sources, such as borrowing (see section 0), even though this was not sufficient to show up in the results. If correct, this would mean that total consumption did not increase by the value of the food stamps.

The data also suggest no statistically significant impact on the consumption of any individual food item (such as carbohydrates). This is again likely to be because of the comparatively small value of the stamps, especially when divided into spending on different types of food, and because households may slightly substitute consumption from other sources. However, whilst there was no detectable impact on consumption expenditure, we know from questions on diet that receiving the food stamps had a positive and statistically significant impact on dietary diversity. Table 3.5 below summarises the impact estimates from the RDD local linear strategy for household consumption. The expected positive and statistically significant – albeit small – impact on consumables discussed above is also confirmed by the parametric cubic model in the Annex.

**Table 3.5 Consumption expenditure**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Total household consumption per capita per/month (excl. rent)	56441	17.105	(21.533)	1,515
Breakdown of total by type of consumption: <sup>1</sup>				
Durable goods	18232	-0.234	(2.051)	1,515
Health expenditures	1754	-0.982	(0.991)	1,515
Education expenditures	2707	-0.890	(1.147)	1,515
Consumables (using food stamp)	7663	7.973***	(1.163)	1,515
Consumables (not from food stamps)	26085	10.369	(21.879)	1,515
Consumables (all)	33748	19.285	(22.091)	1,515
Breakdown of consumables by type of good: <sup>2</sup>				
Carbohydrates	6672	0.613	(1.056)	1,515
Meat/ fish	10358	-1.654	(1.373)	1,515
Dairy products	1637	0.474	(0.602)	1,515
Oil	1250	0.108	(0.241)	1,515
Fruit	202	0.117	(0.208)	1,515
Vegetables	1782	0.093	(0.428)	1,515
Other food /drink	3427	9.771	(8.552)	1,515
Alcohol and tobacco	8420	14.373	(21.679)	1,515

Source: Food Stamps IE survey. Notes: prices have been expressed in constant 2010 December prices (thousands of Tugruk per capita per month) and have been adjusted using the monthly inflation figures contained in the HSES.

### 3.3 Health

**Impacts on health were limited:**

- **No significant impact was found on health seeking behaviour or coverage of health insurance.**
- **Households enrolled in the FS /Medicaid programme were more likely to cover all health expenditures with their own funds and not more likely to need assistance.**

The Follow-up survey asked respondents about their health status and health-seeking behaviour. The Medicaid programme acts as a medical insurance cover which entitles the household to receiving free health care services, irrespective of their coverage by other types of health insurance. Any impact found on health related indicators, would therefore include the combined impact of the Food Stamps and Medicaid programmes.

Table 3.6 shows that there was no significant programme effect on the reported satisfaction with health services provided by the government nor on the proportion of households covered by health insurance. This lack of impact can be attributed to the existing high levels

of coverage (over 80% for sampled individuals), as well as the Medicaid programme roll-out being in its initial stages in evaluation areas from May 2012 (see Section 1.4).

No significant impact was reported on children having ever received micronutrient powders from a health care provider. This is not surprising because the micronutrient programme is not targeted (so should be independent of receiving other benefits) and is not directly related to the Medicaid programme. Only around half of surveyed children received micronutrients, presumably because the micronutrient programme has not scaled up to all areas of the country.

**Table 3.6 Coverage and satisfaction with health services**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Percentage of households generally satisfied with government health services	58	2.405	(7.631)	1,515
Percentage of individuals covered by health insurance	85	1.790	(3.149)	9,218
Percentage of children aged 5-24 months that ever received any micronutrient powder	49	-6.857	(12.846)	566

Source: Food Stamps IE survey.

Estimates presented in Table 3.7 suggest that households in the treatment group were no more likely to report suffering from acute illness than those in the control group. This result is not unusual: improved food security and dietary diversity from Food Stamps may not translate into better nutritional outcomes (and hence less reported acute illness) in the short-term.

Recipients are no more likely to report themselves ill after receiving food stamps, despite some literature arguing that reporting morbidity should rise with income.<sup>15</sup> However, this lack of impact is perhaps not surprising because receipt of food stamps/Medicaid represents a very small share of consumption expenditure, and in fact the sections above show negligible impact of Food Stamps and Medicaid on household consumption expenditure and assets. In addition, health expenditure is normally very lumpy as it is associated with illness episodes and does not follow a regular pattern.

In terms of health seeking behaviour, there was no statistically significant difference between treatment and control households seeking health treatment if reporting an illness. When prompted to explain the reasons for not seeking treatment, no clear patterns emerged: treatment households were more likely than control households to report poor quality of health care as a reason for not seeking treatment. This implies that treatment households have yet to fully benefit from the services provided under the Medicaid programme. At the same time treatment households were less likely to report 'illness not serious enough' as a reason for not seeking treatment (and this was by far the most common reason overall). There was no significant difference in those reporting that healthcare was too expensive to seek treatment, and therefore it is reasonable to conclude that there is no detectable programme impact on affordability of health care.

<sup>15</sup> Das, J., Hammer, J., Sánchez-Paramo, C., 2012. The impact of recall periods on reported morbidity and health seeking behavior. *Journal of Development Economics* 98, 76–88.

**Table 3.7 Use of and payment for health services (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Percentage of individuals suffering from acute illness last month	11	2.280	(2.623)	9,218
Of these, percentage that sought treatment last month	81	-7.143	(8.625)	999
Main reason not seeking treatment: <sup>1</sup>				
Health care not good quality	5.8	15.961*	(8.425)	209
Healthcare too expensive	7.7	6.056	(7.525)	209
Not serious enough/self-treatment	82	-27.679**	(12.597)	209
Other	4.8	1.008	(6.368)	209
Of households prescribed medicines, percentage that didn't buy the full dose	47	-4.174	(8.797)	1,039
Main reason for not buying full dose: <sup>2</sup>				
Quality-related reasons	2.6	-13.147***	(4.078)	3,920
Cost-related reasons	92	0.236	(3.710)	3,920
Not serious enough/no need	1.5	1.036***	(0.289)	10,157
Other reasons	1.5	3.600**	(1.628)	3,920
Main source of payment for health treatment last month:				
No expenditure on health in last month	53	-0.908	(3.529)	9,716
All expenses from own earnings	38	7.134*	(3.704)	9,716
All expenses by borrowing or assistance from others	4.6	-0.951	(2.415)	9,716
Some part of expenses by borrowing or assistance from others	2.9	-0.431	(0.509)	9,716
Sold or pawned assets	.25	0.633***	(0.200)	9,716

Source: Food Stamps IE survey. Notes: (1) Quality-related reasons include medical staff unfriendly, health care not good quality, health care access is not good, health facility is too far. Money-related reasons include health care too expensive, and no money. Other reasons include not serious enough, treated myself, treated traditional healers/chiropractors, didn't know from where to get treatment, and other. (2) Quality-related reasons include not available at pharmacy, far distance to pharmacy. Money-related reasons include no money/too expensive. Other reasons include no time to go to pharmacy, not necessary, other.



### 3.4 Education

**The programme had no significant impact on attendance for children in primary or secondary schools.**

Although the Food Stamps and Medicaid programmes are intended to directly impact food security in poor households, it is possible that these programmes could relieve pressure on households' disposable income and thus allow greater expenditure on schooling. Our survey collected data on key education characteristics of sample households and on indicators relating to school attendance. Table 3.8 reveals there was no significant impact on educational attainment or school attendance at the primary, secondary and vocational level.

**Table 3.8 Attendance and qualification (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Percentage of persons 6-17 years currently attending any type of school	93	-2.390	(3.158)	2,969
Percentage of persons 6-11 years currently attending primary school <sup>1</sup>	95	5.548	(3.709)	1,536
Percentage of persons 12-15 years currently attending secondary-1 school <sup>2</sup>	79	11.350	(7.795)	951
Percentage of persons 16-17 years currently attending secondary-2 school <sup>2</sup>	46	-19.560	(17.290)	307
Highest level of education obtained by adults 18+:				
None	7.5	2.510	(3.208)	4,394
Completed primary	9.7	-2.250	(2.548)	4,394
Completed secondary- 1	35	-2.758	(4.651)	4,394
Completed secondary-2	37	-4.439	(4.828)	4,394
Vocational	5.7	0.157	(2.261)	4,394

Source: Food Stamps IE survey. Notes: (1) Primary school is defined as grades 1-5 of General School. (2) Secondary school 1 is defined as grades 6-9 and secondary school 2 is defined as grades 10 to 11

These results are not surprising: National Net Attendance Ratios for primary schooling are above 90% and for secondary schooling are above 80% for 2005-2010<sup>16</sup>. There is only a five percentage point difference in attendance rates between the poorest 20% and richest 20% nationally. Our sample should be covering the poorest 5%, which explains the lower secondary-2 attendance. The limited impact on school attendance is also down to generally high attendance rates in Mongolia, and at secondary level the value is probably too small to overcome financial barriers.

Table 3.9 shows that although children generally attended school, most households faced financial barriers, which may not be surprising considering the overall poverty status of the sample. There was no statistically significant difference between treatment and control

<sup>16</sup> [http://www.unicef.org/infobycountry/mongolia\\_statistics.html](http://www.unicef.org/infobycountry/mongolia_statistics.html)

households in responses to whether they had had encountered any problems in paying school costs.

However, indicators related to attendance and financial access cannot detect the potential positive psychosocial effects and positive learning outcomes for children who are better fed and better positioned to concentrate in class. These positive impacts were detected in the qualitative assessment (Attah et al 2013). Moreover, evidence from other long term studies suggest a positive impact of better nutrition on learning ability, learning outcomes and productivity. However these long-term impacts cannot be expected to be detected in quantitative data at such an early stage of programme implementation.

**Table 3.9 Barriers to education (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Of children attending primary school, percentage encountering difficulties in paying school costs	94	4.248	(5.252)	1,441
Of children attending secondary-1 school, percentage encountering difficulties in paying school costs	94	5.564	(6.502)	738
Of children attending secondary-2 school, percentage encountering difficulties in paying school costs	93	-3.460	(2.947)	143
Number of days in last week that child missed classes <sup>1</sup>	2.6	0.692	(1.147)	189

Source: Food Stamps IE survey. Notes: (1) This includes full and partial days missed.

## 3.5 Employment

**The programme is not having a negative impact on employment, so there is no detectable ‘disincentive effect’.**

Although the level of support provided by the Food Stamps and Medicaid programme is not enough to cover all household needs, there is often a concern that social support programmes such as this will discourage recipients from working because they provide financial resources that have not been earned through their own efforts. This disincentive to work can, it is argued, create dependency, whereby recipients have less incentive to enter or progress in work because their basic needs are already being covered, in part at least, by social programmes. To assess whether this was a relevant concern for this programme, the evaluation survey asked whether individuals were working in the October (winter season) or August (summer season) prior to the survey.

Table 3.10 below shows that the programme did not generate any labour disincentive effect. Our local linear results point to a positive impact on the percentage of adults that were in work in the winter season, though the significance level attached to the relevant coefficient is low. Besides, given that employment is a key variable for the construction of the PMT score, it is also possible that the results here are confounded. Although further research is required to disentangle the effects on specific labour patterns, the lack of a disincentive effect on employment is in line with most international evidence.

**Table 3.10 Employment (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
<b>Winter season</b>				
Percentage of persons 16+ working in October <sup>1</sup>	23	6.386*	(3.770)	6,301
Of those, mean hours worked during regular working day	10	-0.297	(0.639)	1,510
Of those, main job:				
Wage job	80	11.384*	(6.633)	1,510
Unpaid job	2.1	0.277	(2.077)	1,510
Self-employed: Herding	6.6	-7.296*	(4.114)	1,510
Self-employed: Agriculture	.94	-2.220	(3.646)	1,510
Self-employed: Other	10	-1.323	(5.773)	1,510
<b>Summer season</b>				
Percentage of persons 16+ working in August <sup>1</sup>	25	2.823	(3.661)	6,301
Of those, mean hours worked during regular working day	9.9	0.147	(0.586)	1,635
Of those, main job:				
Wage job	77	17.196**	(7.162)	1,635
Unpaid job	2.9	-0.285	(2.514)	1,635
Self-employed: Herding	6.5	-5.926	(3.774)	1,635
Self-employed: Agriculture	2.7	-10.454*	(5.947)	1,635
Self-employed: Other	11	-4.990	(5.454)	1,635

Source: Food Stamps IE survey. Notes: (1) This includes full-time and temporary work.

### 3.6 Transfers

**The receipt of food stamps did not affect the likelihood of receiving other formal transfers (universal government support programmes and support by non-government organisations) or remittances from other households, though recipients were more likely to receive other poverty-targeted government support programmes.**

Food Stamps were not the only government support received by households at the time of the survey. Eligible households also received a pension, child money (from November 2012 onwards) Human Development Fund (until July 2012) and other benefits in the 12 months preceding the survey. In addition to government support, some household also received support from non-government organisations and remittances from friends and relatives.

Table 3.11 below shows the change in transfers for the treatment group. There was no effect on pension coverage or child money coverage.

There was no significant effect on receiving remittances from other households, and very few treatment households received remittances. The fact that there was no drop in the receipt of remittances, despite the improved financial situation thanks to the receipt of food stamps, suggests that social norms maintain risk-sharing through remittances regardless of slight changes in the household's financial situation.

**Table 3.11 Household transfers (follow-up)**

	Treatment	RDD (local linear)		
Percentage of households receiving (in last 12 months)...		Optimal bandwidth	SEs	Obs
Pension from the government	14	-3.982	(5.459)	1,515
Child money programme	96	0.342	(3.370)	1,515
Other allowances or benefits from Government (except food stamps)	58	22.445***	(8.694)	1,515
Allowance/benefit/pension from any non-government organization	9.6	2.553	(5.760)	1,515
Remittances from other household(s) <sup>1</sup>	13	4.807	(4.815)	1,515

Source: Food Stamps IE survey. Notes: (1) Includes transfers in cash and in-kind.

### 3.7 Self-reported wellbeing

**Subjective assessment of the impact of Food Stamps showed that respondents perceived them to have a significant effect on their food consumption.**

**Recipients expect to be less poor than non-recipients in the future.**

Other sections of this impact evaluation assessed the impact of Food Stamps on objective measures of food security, health, education, employment, consumption and multi-dimensional poverty. This conclusive section examines the impact on subjective measures of poverty and standard of living.

Table 3.12 shows that the treatment group expected themselves to be better-off five years after the Follow-up survey, whilst there was no effect on the immediate and near future.

This result probably reflects positive expectations for a better standard of living in the future, which shows that respondents expected the benefits of the FS programme to be sustained, which is a positive finding. However, their current situation of poverty and its related monetary constraints are still predominant in respondents' assessment of their near future.

**Table 3.12 Self-assessed poverty (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
On which step does household stand? (1 poorest through 6 richest; mean value)				
Today	2.3	0.301	(0.215)	1,515
One year ago	1.8	-0.350	(0.231)	1,515
In two years (expectation)	3.2	0.319	(0.213)	1,515
In five years (expectation)	4	0.418*	(0.239)	1,515

Source: Food Stamps IE survey.

When asked about their standard of living, programme recipients indicated a more positive assessment of their food adequacy, with fewer households reporting to having inadequate food consumption (see Table 3.13 below). This seems to confirm the improvement in food security documented in the previous sections on the key impacts of the programme. It is a particularly encouraging result since the impact detected with our RDD local linear strategy on households' self-assessed food adequacy is shown to be very significant.

In contrast, no perceived improvement occurred in the adequacy of clothing or schooling. This suggests that potential savings made on food purchases thanks to the food stamps were not reinvested into clothing and schooling, but spent in a different manner.

**Table 3.13 Self-assessed standard of living (follow-up)**

	Treatment	RDD (local linear)		
		Optimal bandwidth	SEs	Obs
Family food consumption less than adequate	44	-35.175***	(7.248)	1,515
Family housing less than adequate	53	-13.618*	(7.594)	1,515
Family clothing less than adequate	85	1.665	(5.666)	1,515
Children's schooling less than adequate <sup>1</sup>	51	-12.906	(8.781)	1,323

Source: Food Stamps IE survey. Notes: (1) Calculation excludes households that answered "No child in education/not applicable".

## 4 Operations of the Food Stamps programme

### 4.1 Introduction to FSP operations

Broadly, the FSP functioned well and recipients were satisfied.

- Waiting times were low and there were no reports of bribery; however, some recipients of paper Food Stamps were asked to perform community service.
- Overall satisfaction with the disbursement process was high for both paper and electronic stamp households;
- A vast majority of respondent households cited satisfaction with the variety of food items they could purchase using food stamps and with the shopkeeper's behaviour;
- Most recipients spent their stamps immediately;
- One third of respondents cited paying higher prices or lower quality in comparison to those who pay with cash at their designated food stamps store;
- A vast majority of households received the correct value of food stamps from an administrative point of view. However, the household composition found at the time of the survey suggests that the process in place for registering joiners or leavers of beneficiary households might not be fully functional.

This section analyses data collected on the operations of the food stamps programme. The questionnaire was designed to ask food stamp recipients about their experience of receiving food stamps, redeeming stamps and the purchases made. The sample included a total of 760 treatment households, of which 126 (or 17%) were currently paper stamp beneficiaries; 617 (or 81%) were receiving electronic stamps; and 17 (or 2%) eligible households were not or no longer receiving food stamps. Paper stamps were distributed in rural areas and soum centres, and electronic stamps in urban areas.

**Table 4.1 Paper and electronic food stamp receipt**

	Capital	Aimag	Soum	Rural	Total
Currently receives food stamps	388	223	112	20	743
Of which are paper-based	0	1	112	13	126
Of which are electronic	388	222	0	7	617

### 4.2 Use of Food Stamps (paper and electronic)

Table 4.2 below presents information on usage patterns of food stamps recipient households. An overwhelming majority of households (84%) reported redeeming food stamps on the day of the receipt. The data below shows that 90% or more of households reported using food stamps to purchase flour, rice and cooking oil – essential staple items. 41% of households reported purchasing meat and 39% reported purchasing vegetables.

Respondents were also asked about the frequency of redemption. Paper stamp beneficiaries are paid every two months and need to redeem all of the value within the two month window. On the other hand electronic food stamp beneficiaries are paid monthly and can save any

unused credit on their bank cards. However, they need to redeem part of this credit within a four month window. 92% of the respondent households redeemed the entire value of their food stamps in one instance, and this includes 12% that reported redeeming food stamps at once because of the shopkeeper's request. This demanding behaviour from the shop-keeper is concerning because electronic stamp holders are tied to a single shop. It underlines the need for an effective grievance system.

Some shopkeepers may be incentivised to encourage purchases from recipients in one instance, e.g. to reduce the number of transactions per customer. This might especially be the case if there are delays in payments between The Savings Bank and shopkeepers, with shopkeepers requesting food stamp recipients for immediate purchases as they face the risk of adverse cash flows. In general, the widespread practice of redeeming the entire value of food stamps in one instance validates the finding of low saving rates in the qualitative assessment: most households are either unaware that they can save on electronic food stamp cards or simply need the entire amount to purchase sufficient food supplies.

**Table 4.2 Usage patterns**

	Estimate	Sample size
Percentage of households who redeemed food stamps:		
On the day of receipt food stamps	84.3	743
Within the first 1 week of receiving food stamps	12.2	743
Within the first 2 weeks of receiving food stamps	3.0	743
Within the first 16 weeks of receiving food stamps	0.5	743
Percentage of households that purchased the following from last set of food stamps: <sup>1</sup>		
Meat	40.9	743
Milk	45.4	743
Flour	90.4	743
Butter	26.5	743
Vegetables	38.8	743
Rice	89.9	743
Cooking oil	94.5	743
Eggs	14.8	743
Fruit	8.3	743
Households redeeming entire value of Food Stamps at once:		
Yes, because I wanted to	80.2	743
Yes, because the shopkeeper asked me to	11.7	743
No, did not redeem it in one go	8.1	743

Source: Food Stamps IE survey. Notes: (1) Totals of the various items don't sum up to 100% because households can buy more than one item from last set of Food Stamps.

Table 4.3 presents indicators relating to the experience of making purchases using food stamps. 33% of the respondents cited paying higher prices or lower quality in comparison to those who pay with cash at their designated food stamps store. The qualitative assessment of the FSP also highlighted this as a concern for recipient households. Shopkeepers who enrol into the FSP are in many ways protected from competitive pressures which would force

them to keep prices down or sell better quality products. Although it appears that the practice of raising prices or selling poor quality for food stamp beneficiaries is not widespread, there is perhaps, a need for quality and price checks at food stamps stores.

Overall, a vast majority (90%) of respondent households cited satisfaction with the variety of food items they could purchase using food stamps and with the shopkeeper's behaviour. Moreover, 81% of the respondents were able to purchase the items they needed at designated food shops on their last visit. Given this and the fact that the average time taken and distance travelled to reach food stamp stores was low (by Mongolian comparisons), the satisfaction rate of respondents was consequently very high (98%).

**Table 4.3 Buying with Food Stamps in the shop**

	Estimate	Sample size
Percentage of respondents citing getting higher prices or lower quality than people who pay in cash at food stamps store	32.6	743
Percentage of respondents that think the variety of food items they can purchase is sufficient	90.4	743
Percentage of respondents satisfied with shop keeper behaviour	86.4	743
Percentage of respondents who were able to purchase the eligible food items they wanted at last visit to food shop	81.0	743
Average distance travelled to reach food stamps store from home (km)	2.6	743
Average time taken to reach food stamps store from home (mins)	22.8	743
Percentage of respondents satisfied with process of buying with food stamps	98.0	743

Source: Food Stamps IE survey.

## 4.3 Disbursement of paper Food Stamps

Indicators relating to disbursement of food stamps were analysed separately for paper stamps and electronic stamps owing to differences in the disbursement process. This section presents the results for paper stamps. The sample size for households receiving paper stamps is small (126) so results should be treated with caution.

The first two indicators presented in Table 4.4 matches the value of food stamps a household is entitled to with the amount they reported to have received. The first of these compares the reported value of Food Stamps with the value found in the FSOU beneficiary database at the time of the survey, i.e. compares with what recipients should have received from an administrative point of view. This shows that 93% of recipients received the amount they should have received, whereas 1% state that they received less and 6% state that they received more than what is recorded in the FSOU database. This might have various explanations, including response error or cases where paper Food Stamps were delivered by the social worker late and therefore more than one set had accrued. Overall this finding is reassuring however, and suggests that the disbursement was in line with the amounts that should be administered according to the administrative data.



What is more interesting, however, is the information presented in the second indicator below. This compares the received Food Stamps value with the actual household composition at the time of the survey. This shows that the disbursed amount is rather out of line with the household composition as measured by the impact evaluation survey. 9% of households are receiving less than they would receive if their food stamps amount had been re-assessed at the time of the survey. Likewise, 44% of households are receiving more than their composition at the time of the survey justifies. There are various possible explanations for this (including methodological differences between the PMT interviews and this impact evaluation survey as to what defines a household member) but it suggests that the systems in place for adjusting the Food Stamps value when a household grows or reduces might not be working as they are expected to and should be reviewed.

Among inconsistencies in paper stamps, more households receive a higher amount than expected, but for electronic stamps (see below), more households receive a lower amount than expected. There is no obvious reason for this, though one hypothesis is that individuals are more likely to migrate into households in urban areas (where electronic food stamps operate).

All households reported picking up their paper stamps at the local welfare office or a designated collection point. The time taken and distance covered to travel to these collection points did not seem to have imposed serious costs on beneficiaries. The average transport cost for a one-way trip amounts to 344 Tugrugs. However, it should be noted that this is driven by a very small part of the sample which stated they paid between 1000 and 20,000 Tugrugs, whereas the vast majority of respondents (116 out of the 126) didn't incur any transportation costs at all. The majority of the respondents also reported a waiting time of under-30 minutes at the collection point. 18% of the interviewed households reported having to conduct community service to access their paper stamps, but none reported having to bribe.

The data also indicates that none of the interviewed households reported losing the full value of food stamps due to expiration – as the data presented earlier shows most recipients tend to redeem the full value of food stamps on the day of receipt. All of the respondents cited general satisfaction with the disbursement process. This coincides with the findings on satisfaction of food stamp recipients in the qualitative assessment. In general, however, recipients of these unconditional programmes often report satisfaction – which makes dissatisfaction with Medicaid (see next chapter) even more striking.

**Table 4.4 Disbursement of paper Food Stamps**

	Estimate	Sample size
Households receiving the correct value of paper Food Stamps the last time they received them (compared to FSOU database):		
Less than expected amount	0.8	126
Exact amount	92.8	126
More than expected amount	6.4	126
Households receiving the correct value of paper Food Stamps the last time they received them (compared to household composition at time of survey):		
Less than expected amount	8.7	126
Exact amount	47.7	126
More than expected amount	43.7	126
Location of disbursement of paper stamps:		
Went to pick it up	100.0	126
Received at home	0.0	126
Average distance to reach collection point (km)	3.5	126
Average time taken to reach collection point (mins)	24.4	126
Average transport cost incurred to reach collection point (Tugrugs)	344	126
Waiting time at collection point:		
None (or less than 30 minutes)	65.0	126
Between 30-60 mins	33.3	126
Over 60 mins	1.6	126
Percentage of respondents making any un-official payments (in cash, kind or community service) to access paper stamps	18.3	126
Percentage of respondents who lost use of food stamps due to expiration	0.0	126
Percentage of respondents who lost use of food stamps due to other reasons (lost, stolen or damaged)	0.8	126
Percentage of respondents satisfied with the disbursement process	100.0	126

Source: Food Stamps IE survey.

## 4.4 Disbursement of electronic Food Stamps

The first two indicators presented in Table 4.5, again, match the value of food stamps a household is entitled to with what they reported to have received. The first of these again compares the reported value of Food Stamps with the value found in the FSOU beneficiary database at the time of the survey, i.e. compares with what recipients should have received. Again, a vast majority of beneficiaries (90%) received the amount they should have from an administrative point of view. 6% received less and 4% received more than that, but the nature of distribution of the electronic stamps, whereby recipients are not immediately aware of the amount until they go to a store with the necessary equipment might explain this.

Again it is interesting to compare the received amount with the current household composition at the time of the survey. This is presented in the second indicator below. As with paper Food Stamps, the disbursed amount is rather out of line with the household composition as measured by the impact evaluation survey. 35% of households received less than their current composition and 19% received more. This is contrary to the finding for paper stamps above, and might suggest additional persons joining the household as a result of the food security offered by the Food Stamps programme. Again, the findings suggest that the systems in place for adjusting the Food Stamps value when a household grows or reduces in size would benefit from a review. Again, it is not clear from this survey what exactly is driving this, and other possible explanations include methodological differences between the PMT interviews and this impact evaluation survey as to what defines a household member.

90% of sampled households reported calling or asking the shopkeeper for information on the time of disbursement. Only 3% received text messages from the Saving Bank and 5% reported relying on word-of-mouth information. This indicates that households are faced with a degree of uncertainty about the date of disbursement and may incur some costs in trying to access accurate information about the release of payments. The issue of inadequate information on data of disbursement was also highlighted in the qualitative assessment of the programme's operations.

The data also indicates that only a small percentage of interviewed households (2%) reported losing the full value of food stamps due to expiration. 5% of the households also reported experiencing problems such as losing, misplacing, damaging their e-stamps card or getting it stolen. Although these problems do not appear to be widespread, only 38% of the respondents knew where to complain in case of a problem with their e-stamps. The programme includes training of both shopkeepers and electronic stamp beneficiaries on how to use POS devices and bank cards. As the grievance mechanism is finalised, this training could also include information on the process of registering complaints. This information could also be provided through social workers at the community level.

In general, a vast majority of the respondents (99%) cited satisfaction with the disbursement process of electronic food stamps. This coincides largely with the findings on satisfaction of food stamp recipients in the qualitative assessment.

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**Table 4.5      Disbursement of electronic Food Stamps**

	Estimate	Sample size
Households receiving the correct value of paper Food Stamps the last time they received them (compared to FSOU database):		
Less than expected amount	6.3	617
Exact amount	89.8	617
More than expected amount	3.9	617
Households receiving the correct value of paper Food Stamps the last time they received them (compared to household composition at time of survey):		
Less than expected amount	34.9	617
Exact amount	46.5	617
More than expected amount	18.6	617
Method of knowing if e-stamps payment has been disbursed:		
The date of disbursement is fixed	2.6	617
Call/ask shopkeeper or check at shop	89.8	617
Other people who receive food stamps	4.5	617
Receive text message from bank	3.1	617
Percentage of respondents who know where to complain in case of problem with card	38.2	617
Percentage of respondents who lost use of food stamps due to expiration	1.8	617
Percentage of respondents who lost use of food stamps due to other reasons (lost, stolen or damaged)	4.9	617
Percentage of respondents satisfied with the disbursement process	99.2	617

Source: Food Stamps IE survey.

## 5 Operations of the Medicaid programme

### 5.1 Introduction to Medicaid operations

Medicaid appeared to function much less well, as of November 2012.

- Just over half of the recipients felt sufficiently informed about the Medicaid programme;
- Just under half were satisfied with the programme.
- The most commonly accessed service under Medicaid was the discounted drugs programme. Around a quarter of those who accessed this service encountered problems during the process.
- As the programme is still at the roll out stage, there was overall low awareness of the various services which are covered by the programme, and consequently lower usage.

The Medicaid programme targets poor households irrespective on their health insurance status. For uninsured poor households the programme pays for outpatient, laboratory and diagnostic tests, inpatient care at the secondary level of medical care and discounted medicines. For insured poor households it pays for co-payments for most of medical care and for the cost of discounted medicines.

### 5.2 Overall satisfaction with Medicaid

Our survey sampled 705 households who possessed a Medicaid. For some reason, not all of the 743 treatment households receiving food stamps possessed a Medicaid, though they use the same targeting system. Of these 99% (695 households) were identified as treatment households and 1% (10 households) were identified as control households. This may be because adjustments to the targeting process were not adequately communicate to Medicaid. Further investigation is required to understand this better. The following data is based on the 695 treatment households who possessed a Medicaid.

Table 5.1 below shows that only 52% of the respondents felt sufficiently informed about how to use Medicaid. This translates into the low percentage of households reporting overall satisfaction with the programme. Although this is partly due to Medicaid being a programme people only use when ill (and therefore infrequently and irregularly compared to food stamps), this low level of satisfaction for an unconditional programme (i.e. a programme in which recipients do not need to do anything to obtain the benefit) is striking and suggests that Medicaid needs urgent attention.

**Table 5.1      Satisfaction with Medicaid among recipients**

	Estimate	Sample size
Percentage of recipient households feeling sufficiently informed about how to use Medicaid	52.3741	695
Percentage of recipient households generally satisfied with Medicaid	48.48921	695

Source: Food Stamps IE survey.

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## 5.3 Various services available through Medicaid

The Medicaid programme acts as medical insurance which covers households for various health services provided at government health facilities.

Data was collected on whether enrolled households were informed of these services; if they had tried to access them; and if they had encountered any problems relating to these services. Table 5.2 shows that less than half of the recipient households interviewed were informed about ambulatory service provision through Medicaid. Of those who were informed only 33% tried to access it. Fewer respondents were informed about diagnostic and laboratory services (41%) and in-patient services (37%). Only 22% of informed households tried to access diagnostic services. A small percentage of households (10%) reported trying to access in-patient services. In comparison to other services, a larger percentage of households (69%) were informed of discounted drug services. Almost two-thirds of the sampled households tried to access this service.

It was difficult to assess the success of these Medicaid services as the same services are also provided by another government programme, the Health Insurance Fund. As a result, it is unclear if the percentage encountering problems in accessing the above services (24%, 19%, 27% and 25% respectively) were due to issues with the Medicaid programme, or the Health Insurance Fund programme. More data is needed to better evaluate the Medicaid programme.

This analysis confirms the incomplete roll-out of Medicaid on eligible households. The data points to a two-fold issue:

- eligible households have not been informed about the programme and;
- of those who have been informed and are utilising these services, a large proportion reported encountering problems, which included stock outs at drug stores and pharmacists being unaware of the Medicaid programme.

The low levels of satisfaction reported with this programme are therefore, understandable.

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**Table 5.2      Various services available through Medicaid**

	Estimate	Sample size
Ambulatory services:		
Percentage of beneficiary households informed about it	47.19424	695
Of those, percentage that tried to access it	33.23171	328
Of those, percentage that encountered any problems	23.85321	109
Diagnostics and laboratory services:		
Percentage of beneficiary households informed about it	41.43885	695
Of those, percentage that tried to access it	21.875	288
Of those, percentage that encountered any problems	19.04762	63
In-patient services:		
Percentage of beneficiary households informed about it	36.83453	695
Of those, percentage that tried to access it	10.15625	256
Of those, percentage that encountered any problems	26.92308	26
Discounted drug services:		
Percentage of beneficiary households informed about it	68.77698	695
Of those, percentage that tried to access it	66.7364	478
Of those, percentage that encountered any problems	25.39185	319

Source: Food Stamps IE survey.



## 6 Conclusions

### 6.1 Summary of findings

This section briefly recaps the headline findings on the FSP and Medicaid. The findings are categorised as key impacts and secondary impacts, in line with expected and observed programme effects. Key impacts include a range of aspects related to food security, whilst secondary impacts include health, education, employment and transfers as well as measures of self-assessment of wellbeing. The latter also seem to confirm some of our key impacts.

#### Key Impacts

##### Food security, coping strategies and consumption

There was a **substantial positive impact on food security** and related domains.

Compared to non-recipients, households receiving Food Stamps and Medicaid:

- Had more diverse diets, for adults and children in particular
- Experienced fewer months of inadequate food provisioning
- Were less likely to resort to negative coping strategies
- Were less likely to have to borrow or use credit to buy food
- Were less likely to borrow food from friends or relatives; and
- Used food stamps to acquire consumable goods.

#### Secondary Impacts

##### Health and education

Impacts on health and education were limited:

- No significant impact was found on health seeking behaviour or coverage of health services.
- Households enrolled in the FS /Medicaid programme were more likely to cover all health expenditures with their own funds and not more likely to need assistance.
- The programme had no significant impact on attendance for children in primary or secondary schools.

Although education outcomes could have improved due to lower levels of malnutrition, the observed lack of impact is not surprising, as it was not realistic to expect that receiving food stamps should affect school attendance or education related spending.

As far as health indicators are concerned, various operational problems reduced Medicaid's impact. Data collected on the operational aspects of Medicaid reveals that a vast majority of beneficiary households were not sufficiently informed about the Medicaid programme and of those that were informed, a large proportion experienced problems in accessing services such as purchasing discounted drugs. Moreover, Medicaid's declared objective was to

improve the utilisation of health services and reduce catastrophic out-of-pocket health expenditures. Hence, no significant impact on health outcome indicators was expected.

## Employment

- The programme had no negative impact on employment. This can be interpreted as a positive result in itself, as it shows that there was no disincentive effect on beneficiaries' willingness to work. Hence, receiving Food Stamps/Medicaid did not create dependency.

## Transfers

- The receipt of food stamps did not affect the likelihood of receiving other formal transfers (universal government support programmes and support by non-government organisations) or remittances from other households.
- Recipients were more likely to receive other poverty-targeted government support programmes. This is likely to reflect their pre-treatment condition of poverty, as at this point other programmes were not using the inter-sectoral database to target.

## Self-reported wellbeing

- Subjective assessment of the impact of food stamps showed that respondents perceived them to have a significant effect on their food consumption.
- Recipients expected to be less poor than non-recipients in the future.

The fact that fewer recipient households reported having inadequate food consumption is an encouraging finding, as it seems to confirm the positive effects detected on food security.

## 6.2 Discussion

The impacts and operations of these two programmes need to be assessed in the context of a continued difficult period for many poor Mongolian households. While national GDP growth has been very strong, this is almost entirely due to mining, and this has not substantially affected the rest of the economy, and particularly not poor households. Many of the indicators presented above suggest trends of a generally worsening situation cushioned by the FSP. The worsening situation partly reflects the ending of the HDF – a sensible policy decision that had short-term costs for very poor households. This cushioning is therefore doubly vital, and paves the foundations for human capital accumulation and economic participation by currently poor Mongolian households in years to come.

In the short-term, this function can be fulfilled if the value of the FSP is regularly reviewed to ensure that it keeps in line with inflation, and if the FSP responds to other unexpected shocks by increasing frequency, value, and/or coverage.

In the long-run, however, the FSP is unlikely to be sufficient on its own to cushion very poor households against further shocks, particularly if the benefits of economic growth are not widely distributed. To unleash the potential of low income Mongolian households, the government will need to invest some of the revenues from mining into other services targeted on the poor, particularly strengthening the functioning of other social welfare services and social worker management (see e.g. MacAuslan et al 2012), and ensuring that households have access to services that can enhance their skills.

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## 6.3 Implications

This report tells a tale of two programmes. The FSP is longer-established, functioning well, with satisfied recipients and positive impacts in key desired outcome areas, especially in terms of dietary diversity and months of adequate food consumption (see section 0). At the same time, the evaluation did not detect any negative impacts on employment, which is in itself a positive result indicating that the programme did not have any perverse incentive on employment (see section 3.5). This has been confirmed now by three external evaluations using qualitative and quantitative data. As discussed in the report, given that these impacts are mostly focused around food security and related domains, we have reason to believe that these could be attributed to Food Stamps rather than Medicaid. These findings also echo qualitative assessments of the FSP (Attah et al 2013).

On the basis of the above we recommend the FSP to be fully adopted and funded by the GoM, though cost effectiveness and operational efficiency should be regularly monitored. The major challenges for the FSP are now in implementation through MPDSP and agency systems, particularly regarding monitoring, mechanisms to respond to grievances that are now being collected, re-targeting, and updating the value of the stamps to match inflation. Between June 2009 and June 2012, an increase of over 40% was estimated in the price of basic food basket. While the exact increase and while the real value of the food stamps is dependent on the specific items that a household purchases, this simple analysis indicates that the cost of food commonly purchased with food stamps is increasing, which suggests a decrease in the real value of food stamps. There is no significant need for substantial external evaluation of impacts in the short-term, but operations should be more strongly monitored.

Medicaid is a much newer programme and is still suffering from teething problems. It has been less easy to provide information about the impacts of the Medicaid programme. This may partly relate to the design of the evaluation, and in particular to the changing sample size resulting from the shift in the PMT threshold. However, it is more likely that the low levels of knowledge and recipient satisfaction with Medicaid (see section 5.2) and some funding problems experienced in 2012, the period of the evaluation, are the most substantive reasons why no impact was detected.

Given that Medicaid is in its initial stages, this negative finding does not provide a rationale for altering support to the programme. Medicaid's operations, and the awareness and understanding of both recipients and service providers, should naturally improve over time. However, urgent programme action is also required in the short-term to ensure that:

- Service providers are clear about their responsibilities and citizens' entitlements
- Medicaid holders are clear about their entitlements and responsibilities
- Accredited health providers have adequate supplies of drugs and can undertake consultations
- Budgets for reimbursing health facilities and recipients are always available, throughout the year
- Grievances related to the programme are dealt with swiftly and fairly.

A further round of external evaluation (both qualitative and quantitative) on Medicaid is recommended in the short-term, so as to reassure funders and implementers of Medicaid's positive impacts and to identify and help to address immediate operational issues.

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## Annex A – Robustness Checks

This section includes tables containing the sensitivity tests performed with the aim of confirming the robustness of our impact estimates. In particular, estimates obtained with a parametric polynomial (cubic) strategy are compared to the estimates obtained with our main estimation strategy, the RDD local linear regression. Additionally, results obtained within two larger bandwidths are also compared to the original local linear estimates obtained within the optimal bandwidth. The tables below include in the first column the point estimates for the control, in the second column the point estimates for the treatment, in the third, fourth and fifth columns the coefficients, standard errors and observations associated with the RDD parametric cubic specification and in the sixth, seventh and eighth columns the RDD local linear estimates within the optimal bandwidth and the two larger bandwidths at 150% and 200% the size of the optimal bandwidth.

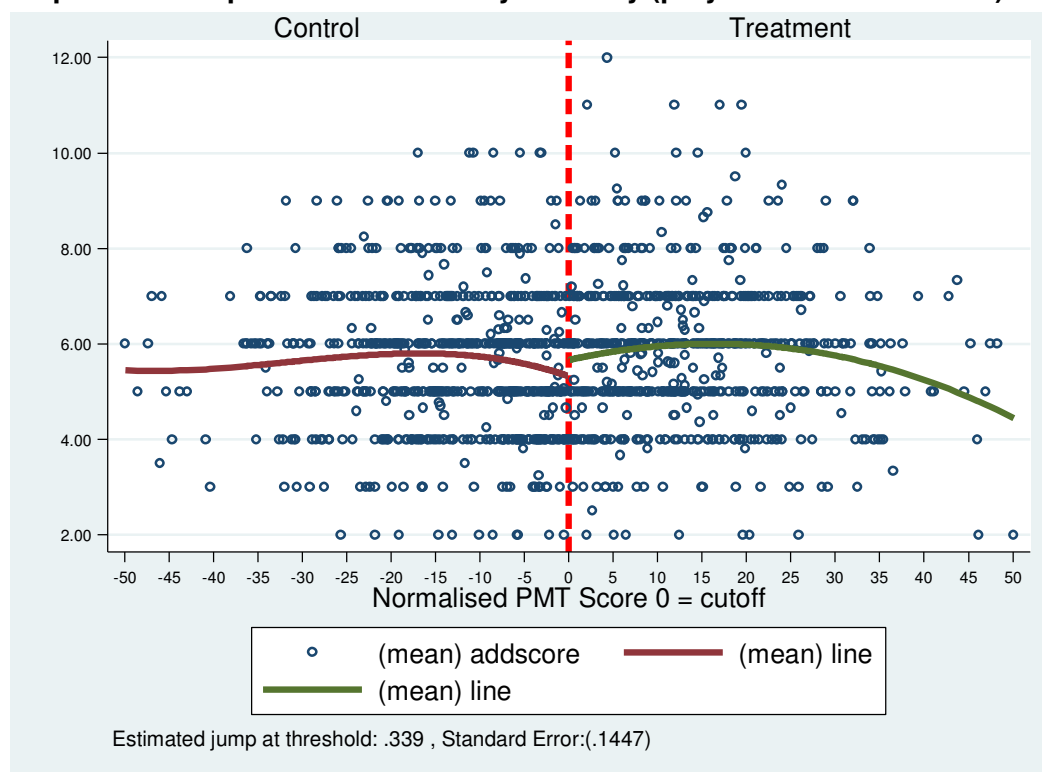
As explained in the report, when direction, magnitude and significance level of the coefficients associated with the different estimation strategies are consistent with each other, the robustness of our estimates are strengthened. The sensitivity tests presented here focus on the key impacts of the programme, which are the ones showing the most significant results. We are also presenting three graphical representations derived from the parametric cubic estimations so as to provide a visual idea of the ‘jump’ generated by a discontinuity between outcome and rating variable at the cut-off point. The most interesting considerations emerging from these robustness checks are discussed in the main text of the report.

**Table A.1 - Individuals’ dietary diversity and meal frequency (follow-up)**

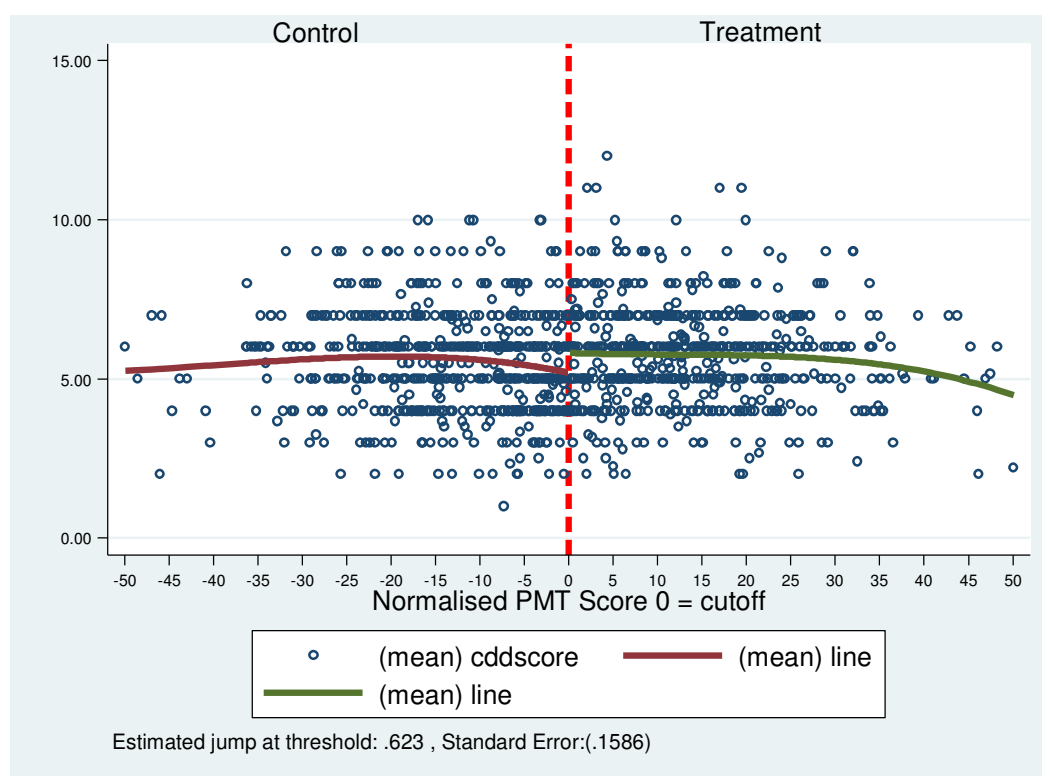
	Control	Treatment	RDD (polynomial)			RDD (local linear)		
			Cubic coeff	SEs	Obs	Optimal band width	150% of O.B	200% of O.B
<b>Adults</b>								
Mean dietary diversity score <sup>1</sup>	5.7	5.9	0.339**	(0.145)	4,534	0.452*	0.404*	0.256
Mean meal frequency <sup>2</sup>	3.4	3.4	0.133	(0.101)	4,547	-0.071	-0.036	0.03
<b>Children</b>								
Mean dietary diversity score <sup>1</sup>	5.5	5.7	0.623***	(0.159)	4,339	0.679***	0.620***	0.606***
Mean meal frequency <sup>2</sup>	3.7	3.7	0.091	(0.114)	4,345	-0.042	-0.035	0.041

Source: Food Stamps IE survey. Notes: (1) Dietary diversity score is calculated as the number of different food types (e.g. vegetables, milk products, etc.) consumed by a person in the last 24 hours. 14 food types were listed in the questionnaire. (2) Meal frequency is calculated as the number of meals consumed by a person in the last 24 hours (respondents were asked about six different meals: morning meal, food between morning and midday, midday meal, food between midday and evening, evening meal, food after evening meal).

**Graph A.1.1 - Impact on adult dietary diversity (polynomial cubic model)**



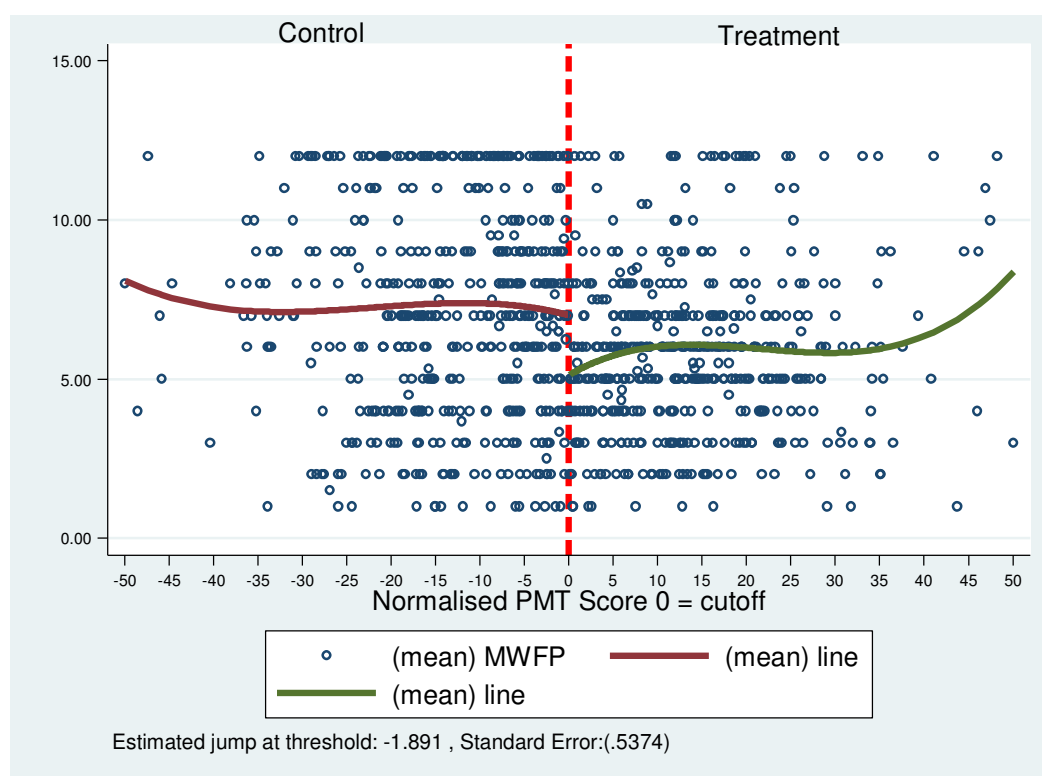
**Graph A.1.2 - Impact on child dietary diversity (polynomial cubic model)**



**Table A.2 - Household-level indicators of food adequacy and hunger (follow-up)**

	Control	Treatment	RDD (polynomial)			RDD (local linear)		
			Cubic coeff	SEs	Obs	Optimal band width	150% of O.B.	200% of O.B.
Mean number of months without adequate food provisioning <sup>1</sup>	7.3	5.9	-1.891** *	(0.537)	1,157	-2.073***	-1.780***	-1.491***
Mean household hunger scale score <sup>2</sup>	0.78	0.53	-0.385**	(0.155)	1,515	-0.073	-0.3	-0.34

Source: Food Stamps IE survey. Notes: (1) In past 12 months (2) Household hunger scale score is a value between 0 and 6. It is calculated from responses to three HHS questions relating to food availability, going to sleep hungry and going an entire day and night without food; responses to each of the three questions score 0 (never), 1 (rarely or sometimes) or 2 points (often).

**Graph A.2 - Impact on mean months without adequate food provisioning (cubic model)**

**Table A.3 - Coping strategies (follow-up)**

	Control	Treatment	RDD (polynomial)			RDD (local linear)		
			Cubic coeff	SEs	Obs	Optimal band width	150% of O.B.	200% of O.B.
Purchase food on credit or borrow money to purchase food sometimes	56	48	-15.298**	(7.621)	1,515	15.654*	13.719**	11.313**
Consumed less preferred foods <sup>1</sup>	32	21	-21.129***	(6.711)	1,515	20.645**	19.626***	19.552***
Reduced usual quantity of food served to men <sup>1</sup>	39	25	-22.314***	(7.237)	1,412	27.521**	23.666***	22.042***
Reduced usual quantity of food served to women <sup>1</sup>	40	25	-21.938***	(7.101)	1,508	25.083**	22.366***	21.280***
Reduced usual quantity of food served to children (under 18) <sup>1</sup>	27	16	-16.784***	(6.260)	1,503	16.214*	16.19***	15.947***
Sold household assets to be able to purchase food <sup>1</sup>	5.3	4.3	2.117	(3.283)	1,515	8.487	5.511	2.683

Source: Food Stamps IE survey. Notes: (1) Defined as households that used respective coping strategy “rarely”, “from time to time”, or “often” in last 7 days.

**Table A.4 - Food transfers (follow-up)**

	Control	Treatment	RDD (polynomial)			RDD (local linear)		
			Cubic coeff	SEs	Obs	Optimal band width	150% of O.B.	200% of O.B.
Percentage of households that (in last 1 month)...								
Gave food / money for food as a gift to others	3.7	2.6	3.083	(2.681)	1,515	3.669	3.158	2.559
Received food / money for food as a gift	9.4	9.9	-4.862	(4.513)	1,515	1.725	0.367	-1.818
Lent food / money for food to others	1.7	1.7	2.518	(1.990)	1,515	4.634	3.555	2.405
Borrowed food / money for food from others	54	46	-20.844***	(7.627)	1,515	-17.635**	-17.601***	-15.577***

Source: Food Stamps IE survey.



**Table A.5 - Consumption expenditure**

	Control	Treatment	RDD (polynomial)			RDD (local linear)		
			Cubic coeff	SEs	Obs	Optimal band width	150% of O.B.	200% of O.B.
Total household consumption per capita per/month (excl. rent)	69399	56441	13.592	(16.759)	1,515	17.105	14.109	11.975
Breakdown of total by type of consumption:								
Durable goods	21868	18232	1.405	(1.818)	1,515	-0.234	0.271	0.945
Health expenditures	3179	1754	-0.161	(1.364)	1,515	-0.982	-1.339	-1.011
Education expenditures	3693	2707	-0.025	(1.088)	1,515	-0.890	-0.365	-0.367
Consumables (using food stamp)	4.1	7663	7.986** *	(0.765)	1,515	7.973***	8.425** *	8.509* **
Consumables (not from food stamps)	40654	26085	4.387	(16.131)	1,515	10.369	6.347	4.266
Breakdown of consumables by type of good:								
Carbohydrates	6825	6672	0.996	(0.616)	1,515	0.613	0.873	1.016
Meat/ fish	12842	10358	-1.060	(1.148)	1,515	-1.654	-1.55	-1.195
Dairy products	2354	1637	0.525	(0.434)	1,515	0.474	0.19	0.141
Oil	1408	1250	0.033	(0.170)	1,515	0.108	-0.01	-0.008
Fruit	330	202	0.010	(0.158)	1,515	0.117	0.069	0.023
Vegetables	2040	1782	0.054	(0.276)	1,515	0.093	-0.004	0.025
Other food /drink	8468	3427	6.290	(9.382)	1,515	9.771	7.055	5.385
Alcohol and tobacco	6390	8420	5.525	(12.958)	1,515	14.373	7.443	6.598

Source: Food Stamps IE survey. Notes: prices have been expressed in constant 2010 December prices (thousands of Tugruk per capita per month) and have been adjusted using the monthly inflation figures contained in the HSES.

## Annex B - Regression Discontinuity Design

This section of the Annex explains more in detail the assumptions behind the Regression Discontinuity Design (RDD) employed in our impact evaluations as well as the estimation strategies adopted. The RDD method can be used to estimate the causal effect of a treatment on one or more outcomes of interest when the treatment is a deterministic function of an assignment variable and the threshold that determines the treatment is known – which is the case with Food Stamps/Medicaid and the PMT score. Under certain assumptions, we can use observations close to the eligibility threshold and work with them to assess impact. In the close neighbourhood of the threshold, we can identify the causal impact of having access to the food stamps/Medicaid treatment on an outcome of interest ( $y_i$ ) by comparing the treatment and control observations and by applying an appropriate regression model.

### Assumptions

RDD identifies the causal impact of being treated on the outcomes of interest if the only source of discontinuity in the outcomes at the threshold is the probability of getting the treatment. The five assumptions that need to hold in order for RDD to be valid are:

#### **ASSUMPTION 1: the assignment variable has a monotonic effect on the probability of being treated for everyone.**

Whilst we cannot test this directly, we can be reasonably confident that the higher your PMT score is the more likely you are to be targeted for treatment.

#### **ASSUMPTION 2: the gains from treatment must be a function of the assignment variable at the cut-off.**

This assumption relates to worries about the ability of households to have an influence on the assignment variable, particularly if they are able to manipulate the assignment variable to increase their probability of receiving the treatment.

The worry is that if households understand the link between the targeting exercise (i.e. the data collection exercise carried out for the PMT score assessment), and the targeting criteria of the Food Stamps programme, some households will attempt to manipulate their PMT score to ensure that they become beneficiaries. If the distribution of these *manipulators* is non-random in the sense that they are the best-informed or best-connected households, this could lead to bias in any estimates of impact made using RDD.

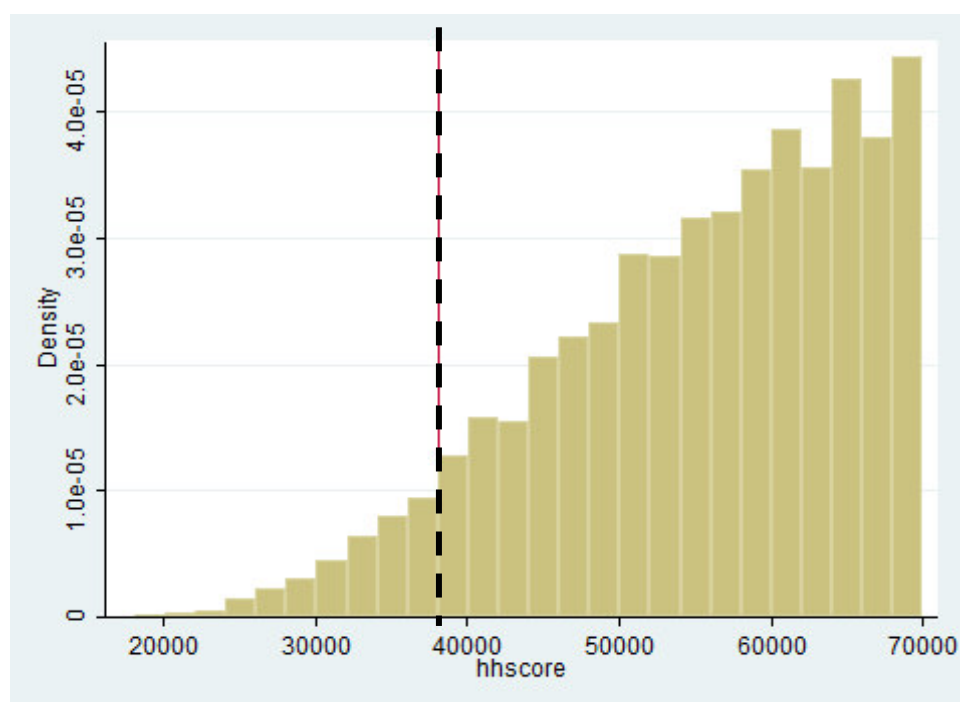
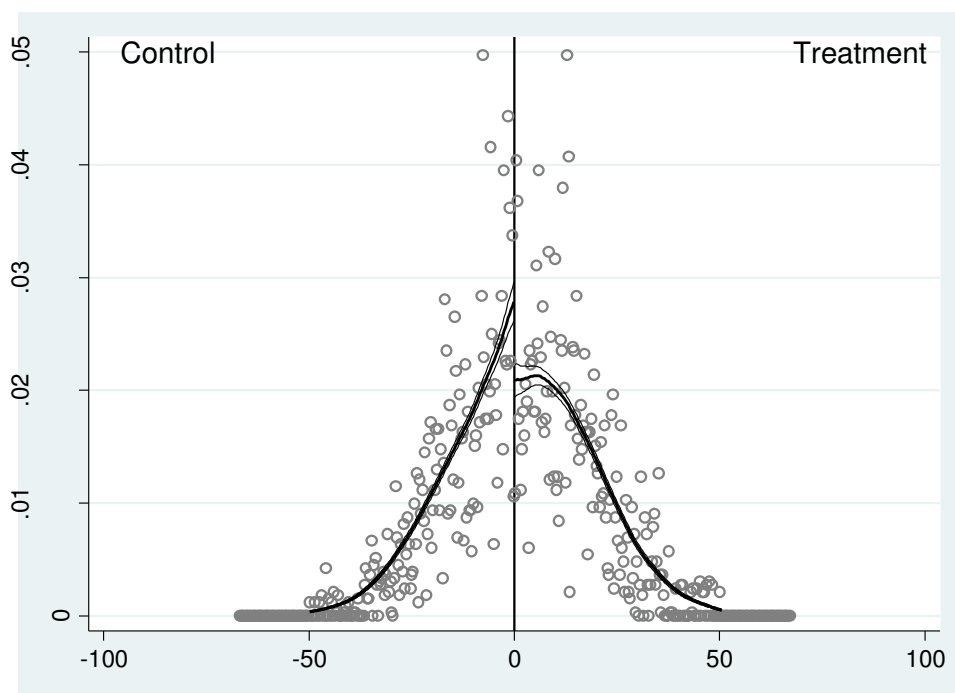
The distribution of the PMT score in the population is shown below. This suggests that there is a discontinuity in the assignment variable, with a clumping of beneficiaries just above the cutoff (Note that the graph shows the normalised PMT score in which individuals with higher PMT scores are shown on the left of the graph). The formal test of discontinuity (DCdensity command in STATA) confirms this observation, as it rejects the null hypothesis of no discontinuity at the 5% confidence level<sup>17</sup>.

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<sup>17</sup> DCdensity normscore , breakpoint(0) generate(Xj Yj r0 fhat se\_fhat) graphname(DCdensity.eps); Using default bin size calculation, bin size = .32660422; Using default bandwidth calculation, bandwidth = 16.8497394; Discontinuity estimate (log difference in height): -.298839248 (.04843386); Performing LLR smoothing. 308 iterations will be performed.

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However, as it appears that the lumping is on the “wrong” side of the cutoff (i.e. there are too many non-beneficiaries just above the cutoff), there is no reason to believe that this discontinuity is due to individuals being able to manipulate their PMT score to ensure that they become beneficiaries. For this reason, we have no a priori reason to believe that this discontinuity should introduce a bias in our results due to the systematic inclusion of so-called “manipulators”.



Note: histogram of the PMT score assignment variable in the PMT database (sample frame), showing the PMT score range. The total range of values in the database is from 18,118 to 540,365. The dashed line indicates the cut-off.

### **ASSUMPTION 3: there must be a discontinuity in the probability of being treated around the cut-off.**

This assumption requires that the programme is sufficiently well implemented such that those who are eligible by their value of the assignment variable actually receive the treatment, whilst those who are deemed ineligible do not. The survey responses on operational monitoring at follow-up indicate that the programmes were overall well implemented and that except for a very small number of cases this assumption can be considered satisfied. The cross-tabulation of eligibility against actual receipt of transfers shows that there was only 1 non-eligible household that received transfers and 13 eligible households out of more than 1,500 respondents that failed to receive the transfer. These errors are not deemed sufficient to warrant using a fuzzy RDD or similar techniques, given the loss of efficiency entailed by such corrections. Furthermore, the operational question identifying actual receipt of payment contains 441 missing observations out of 1,951 total observations. Consequently, the use of this variable to identify actual beneficiaries in a fuzzy RDD analysis would lead to a significant loss of sample size. For these reasons, we choose to use a sharp RDD.

### **ASSUMPTION 4: the observables must be a continuous function of the assignment variable at the cut-off.**

RDD requires that the baseline values of the outcome variables are a continuous function of the assignment variable at the cut-off. If this is not the case then we could not be sure whether a discontinuity in a given outcome variable found following the follow-up impact survey is a result of the impact of receiving the treatment, or because of a pre-existing discontinuity.

The baseline tables presented in the section above show that in most cases this assumption seems to hold. However, there are a few outcome indicators for which a discontinuity is found at baseline, but most of these indicators appear to be related to variables that enter the PMT score calculation directly or indirectly. Hence a pre-treatment discontinuity is not totally unexpected, but discontinuity/impact found at follow-up in these indicators should be interpreted with great caution.

We also tested for discontinuities away from the cut-off (PMT score 38,100). Such discontinuities would indicate that the observable variable is unreliable due to lumpiness. In this case, we would not be sure whether the observed discontinuity at the cut-off reflected a genuine change in the outcome variable linked to the treatment, or whether it reflected lumpiness of the outcome variable. Discontinuities were tested for the two following alternative cut-offs:

- PMT score = 36,041
- PMT score = 40,085

The tests found in almost all cases that there were no discontinuities away from the cut-off for the outcome variables for which we had found statistically significant discontinuities at the cut-off. This suggests that the discontinuities that were identified reflected changes attributable to the treatment received rather than to lumpiness in the outcome variables. Partial exceptions to this finding include:

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- Respondents who did not seek treatment due to poor quality of hospital care: A discontinuity significant at 10% level was found for PMT= 36,041 and 5% for PMT= 40,085.
- Respondents who complained about the quality of medicine: A discontinuity significant at 1% level was found for PMT= 36,041.
- Respondents who declared having inadequate housing: A discontinuity significant at 10% level was found for PMT= 36,041.
- Individuals who declared eating less preferred food: Discontinuities significant at 10% and 5% levels were found for PMT= 36,041.

**ASSUMPTION 5: the unobservables must be a continuous function of the assignment variable at the cut-off.**

This assumption relates to concerns over the possibility of a discontinuity in unobservable variables (such as ability) that could affect the outcome variable of interest. If such a discontinuity existed, then one could not be sure if a discontinuity in the outcome indicator of interest observed at follow-up was a result of the treatment or the unobservable.

By the nature of unobservable indicators it is not possible to test this assumption. However, given that we assess discontinuity for a wide variety of observable indicators it is likely that this assumption will hold.

## Estimation Strategy

As identified in Lee & Lemieux (2010) and elsewhere there are **two main regression strategies** that can be applied in Regression Discontinuity Design: parametric or local linear regressions. In both the polynomial and the local linear settings we implement the RDD by estimating two separate regressions on each side of the cut-off score. We can then estimate the value of the regression functions at the cut-off point, which can give us the estimate of impact via RDD.

In a **polynomial/parametric setting** we can estimate the following (linear) regression:

$$outcome_i = \alpha + \beta_1 Treatment_i + \beta_2 S_i + \beta_3 Treatment_i * S_i + \varepsilon_i$$

Where, as above,  $Treatment_i$  is a dummy variable defining beneficiary and  $S_i$  is the value of the assignment score. The estimated impact or discontinuity is then given by the estimate of the coefficient  $\beta_1$ . In addition, there is no reason to assume that the true model is linear, and this assumption can be relaxed by including polynomial functions<sup>18</sup> of the assignment score  $S$  in the regression model. In fact, it is sensible to be flexible with the specification in a parametric setting when we do not know the true functional form, to assess the robustness of the RDD estimates of impact.

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<sup>18</sup> That is we can include quadratic, cubic, quartic, etc. specifications. In the cubic setting, which we are using as a sensitivity test to check the robustness of our local linear estimates, the regression model would be:

$$outcome_i = \alpha + \beta_1 Treatment_i + \beta_2 S_i + \beta_3 Treatment_i * S_i + \beta_4 S_i^2 + \beta_5 Treatment_i * S_i^2 + \beta_6 S_i^3 + \beta_7 Treatment_i * S_i^3$$

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Lee & Lemieux (2010) point out that a possible disadvantage with this approach is that polynomial regressions of this type provide global estimates of the regression function over all values of  $S$ , while RDD depends instead on local estimates of the regression function at the cut-off point. In other words data far away from the cut-off point (i.e. data corresponding to values of the assignment score further away from the cut-off point) may have too much predictive power over the value of the outcome variable of interest at the cut-off point.

A **local linear setting** may therefore be more appropriate for implementing the RDD and it is the main strategy adopted in our impact evaluation.

This can be implemented using a similar pooled regression:

$$outcome_i = \alpha + \beta_1 Treatment + \beta_2(S_i - c) + \beta_3 Treatment_i * (S_i - c) + \varepsilon_i$$

$$where\ c - h \leq S \leq c + h$$

$$c = cutoff\ point$$

$$h = bandwidth\ around\ cutoff$$

This approach differs from the linear case of a parametric regression in two key ways. First, we restrict the local linear regression to some window  $h$  around the cut-off. For selection of  $h$  we follow the optimal, data dependent, bandwidth choice rule as proposed by Imbens & Kalyanaraman (2009), which seeks to minimise the mean squared error, with a smaller bandwidth tending to produce lower bias and higher variance. As explained in the Annex A above, we also use bandwidths of different sizes as sensitivity tests to check the robustness of the estimates originally obtained within the optimal bandwidth.

Secondly, a kernel weighting approach can be used such that data is weighted according to its distance from the cut-off point (i.e. data corresponding to values of the assignment score further away from the cut-off are assigned a lower weight). We apply a triangular kernel weighting approach which gives greater weight to data points closer to the cut-off than those further away, with the weights falling off in a linear fashion.

Overall, the non-parametric local strategy seems to be preferable because it provides less biased estimates than the parametric strategy. Within the optimal bandwidth, the functional form of the relationship between the outcome variable and the scoring variable (PMT in our case) is closer to linear. Therefore, an RDD local strategy is able to produce consistent estimates with a simple linear regression by focusing on the optimal data range selected.