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WORKING PAPER NO. 222

Does Conditionality Matter for Adults' Health? Evidence from a Randomized Experiment

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April 2009

This version January 2010

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Abstract
We present evidence on how the requirement to attend health and nutrition sessions affects the health behaviour of adults living in households targeted by a nutritional programme in rural Mexico. The evaluation sample of the Programa de Apoyo Alimentario (PAL) is unique in having four different treatment types, which are randomly assigned to four different groups of localities, with one group designated to receive transfers but without any requirement to attend health and nutrition courses. We find that attendance at educational sessions does not affect drinking and smoking behaviour, but significantly reduces the probability of having a large waist circumference among women. We provide evidence that attending health and nutrition related courses determines a large drop in the probability that adult women have excessive calorie intake. The results suggest that lack of information can explain, at least in part, the impressive rise in female obesity in developing countries.

Keywords: Adult Health, Conditional Cash Transfers, Information, PAL

JEL Classification: I12, O12

Acknowledgements*:* I thank Orazio Attanasio, James Bank, Stefano Della Vigna, Vincenzo Di Maro, Francesco Drago, and Juan Pablo Gutierrez and Grant Miller for their comments. All errors are my own.

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1 Introduction

Drawing on the experience of *Oportunidades*,[1] conditional cash transfer (CCT) programmes have been introduced in many developing countries; evaluations show that they have been extremely effective at improving the well being of poor households.[2] However, evidence on how individual CCT components contribute to producing the overall effect is limited.[3] In this paper we exploit the unique evaluation design of the Food Assistance Programme, *'Programa de Apoyo Alimentario'* (PAL), implemented in rural Mexico, to study how the requirement to attend health and nutrition sessions as one of the conditionalities for receiving transfers, affects the probability of smoking, heavy drinking and obesity among adults.

In order to receive the transfers, household members have to engage in a set of activities, including prenatal care, well-baby care and immunization, nutrition monitoring and supplementation, preventive checkups and participation in educational sessions on health and nutrition topics. A priori there are strong arguments in favour of making transfers conditional. Alongside other reasons, conditionalities would help governments to identify families that are in less need and to overcome information asymmetries related to the benefits of immunization and screening programmes. However, it has also been argued that imposing conditionalities brings disadvantages (see De Brauw and Hoddinott (2008) for a summary). First, it has been documented that their imposition contributes to significantly increased administration costs. Caldes et al. (2006) shows that monitoring conditionalities represented some 18% of the administrative costs related to *Oportunidades* and 2% of total programme costs. Second, some households may find the conditions too difficult to meet: if these households are among the poorest households, then imposing conditions might affect the compliance of those who are the primary targets of the programme. Third, the opportunity costs for households of fulfilling these conditionalities will likely not be shared equally among household members: the burden of taking children to health clinics or attending health and nutrition sessions falls primarily on the mothers (Molyneux (2006)). If the actual or perceived benefits of the conditionalities do not outweigh the additional costs, imposing conditions on the receipt of transfers may not be worthwhile.

[1] The programme was previously called PROGRESA.

[2] Among others, see Skoufias (2005) for a review of the impact of *Oportunidades* on a variety of welfare indicators. Attanasio and Mesnard (2006) document the effect of *Familias en Accion* on household consumption in Colombia.

[3] Paxson and Schady (2007) find that an unconditional cash transfer programme implemented in Ecuador had a positive and beneficial effect on the physical, cognitive and socio-emotional development of children. De Brauw and Hoddinott (2008) exploit the fact that some *Oportunidades* beneficiaries who received transfers did not receive the forms needed to monitor their children's school attendance, to test how conditionality affects school enrolment and attendance.

There is well established evidence documenting the positive effect of CCT programmes on health outcomes.[4] However, the evaluation designs implemented so far do not allow researchers to distinguish to what extent improvements in health related indicators are due to increases in the resources available, and to what extent they are due to the behavioural requirements. Moreover, since most of these programmes target women as the transfer recipients, part of the combined effect of CCTs on health outcomes might be related to the increased bargaining power of women in their households. Attanasio and Lechene (2002) show that as the share of household income brought by the wife increases, expenditure on tobacco and alcohol falls and the expenditure on child items increases.[5]

In this paper, we investigate how the requirement to attend health and nutrition sessions as one of the conditionalities for receiving transfers, affects the health related behaviour of adults measured by their propensity to smoke, drink to excess and become obese. It is crucial to disentangle the effects of behavioural requirements from the increased resources due to the programme on these outcomes. More resources might not necessarily bring healthier lifestyles. On the one hand, a higher income allows better access to health inputs (e.g. medical care and food). On the other hand, people with more resources can buy more goods, including cigarettes, alcohol and unhealthy food.[6] Traditionally, malnutrition and infectious diseases are the main health related burdens for developing countries. However, many of these countries are seeing dramatic increases in the incidence of obesity (Popkin (2001)) and related morbid and comorbid conditions. Fernald et al. (2004) using the 2000 National Health Survey find that in Mexico the combined prevalence of obesity and being overweight is nearly 60% in women and more than 50% in men.[7]

The PAL is a nutritional programme that operates in very poor rural localities in Mexico. According to the initial design, the evaluation sample comprises four different treatment types assigned randomly across localities, selected according to the following criteria: 50 localities as controls; 51 localities that receive transfers in kind; 52 localities that receive

[4]Gertler and Boyce (2003) find that *Oportunidades* produced significant improvements in both child and adult health, measured by a reduction in the number of days of experiencing difficulty in conducting daily activities and the number of days of being confined to bed through illness. Gertler (2004) provides evidence on the effect of *Oportunidades* on child health including morbidity, height and anemia. For a review of the effect of CCT programmes on health outcomes in Latin America and Africa, see Lagarde et al. (2007).

[5]Rubalcava et al. (2009), drawing on direct measures of inter-temporal preferences collected in the Mexican Family Life Survey (MxFLS), suggest that women have longer planning horizons.

[6]Ruhm (2000, 2005) finds that recessions improve adult health, arguing that individuals engage in healthier lifestyles during downturns as they take more exercise, they drink and smoke less.

[7]Case and Menendez (2007) reports that in 138 out of 194 countries for which World Health Organization (WHO) statistics on obesity are available, women are more than 50% more likely to be obese than men.

transfers in kind conditional on participation in nutrition and health education; 53 localities that receive cash benefits conditional on participation in nutrition and health education.[8] The nutrition and health education (or education component) is delivered in sessions by local administrators who have received appropriate training.

In order to identify the effect of the requirement to attend health and nutrition sessions, we compare the propensity to engage in risky health behaviours of individuals who live in localities where the in-kind transfers are conditional on the attendance at health and nutrition sessions with those who live in localities where the in-kind transfers are unconditional. Our analysis does not consider those localities that received cash transfers as it is not possible to distinguish the effect of type of transfer from the effect of the education component.

Our main results are as follows. First, the requirement to attend health and nutrition sessions determines a not statistically significant reduction in the probability of smoking and drinking to excess. Second, we find evidence that the education requirement significantly reduces the probability of having a large waist circumference, but only among women. Women who live in localities where food transfer (in-kind transfer) is conditional on health and nutrition education, are 4.9 percentage points less likely to have a large waist circumference than women who live in localities where the food transfer is unconditional. The size of the effect corresponds approximately to 11% of the proportion of women with a large waist circumference in the group of control localities. Third, using quantile regression methods we document that the effect of the education requirement on female waist circumference is not uniform across the distribution, but is concentrated around the values that are used to define the different categories of obesity-related health risk. Finally, in order to shed some light on the pathways through which sessions affect female waist circumference, we provide evidence that exposure to health and nutrition education determines a reduced probability of excessive calorie intake. Robustness checks rule out the possibility that our results are driven by differential changes in health supply and prices. Additional tests do not support the hypothesis that women who live in localities where there is an education requirement are more reluctant to submit to having their waists measured as result of increased social pressure.

This work contributes to two strands of the literature. First, it provides important guidelines for the design of CCTs. As Gertler (2004) emphasizes, a better understanding

[8]Skoufias et al. (2008) find that, irrespective of whether the transfer is in cash or in kind, the programme determines a large increase in food and total consumption, and a significant reduction in poverty. The results in Cunha (2009) show that for food consumption the in-kind transfer is inframarginal for all households and, on average, in-kind or equivalent cash value transfers do not determine differential increases.

of how the different components of a programme contribute to their overall effect would improve their cost-effectiveness. Second, we provide experimental evidence on the role of health education as an important determinant of health related behaviour. This result should give greater scope to specific public policies addressed to improving health related knowledge.

The paper is organized as follows. Section 2 provides details on PAL and the evaluation design. Section 3 discusses our empirical strategy. The main results are presented in Section 4. Section 5 presents the robustness checks and Section 6 concludes.

2 Background

2.1 The PAL Programme

PAL, which began in 2004 and is still on-going, is an intervention aimed at reducing poverty and improving the nutritional status of target households in rural localities of Mexico. PAL operates in small (population less than 2,500) localities, which are very marginalized (according to National Council for Population (CONAPO) criteria), do not receive other transfer programmes, are accessible (not more than 2.5 km from a road) and close enough (not more than 2.5 km) to a DICONSA store. DICONSA is the public agency in charge of administering the programme. PAL provides in-kind transfers (food baskets) to most of the 150,000 target households. An alternative cash transfer is offered to communities that DICONSA cannot reach regularly. Approximately 5% of PAL beneficiaries receive cash as opposed to in-kind goods. The cost to the Mexican government of both types of transfer is 150 Mexican pesos (about US$ 13) per month.[9] The food basket, which is not conditional on household size, contains powdered fortified milk, beans, rice, cornflour, soup pasta, vegetable oil, cookies, corn starch, powdered chocolate drink, ready-to-eat cereal, and sardines.[10] The contents were chosen by nutritionists and aim at providing a balanced nutritional intake of 1,750 calories per day. It was originally intended to make monthly food basket deliveries to beneficiary households; however, for logistical reasons delivery is two baskets every two months. Programme rules specify that transfers should be made to women wherever possible. The programme also includes a household eligibility means test criterion for the households in eligible villages.

[9] The mean share of transfer in pre-programme consumption is 11.5%.

[10] This basket of goods was distributed between June and October 2004. From November 2004 cereals were replaced by dried meat, and corn starch was replaced by lentils in order to improve variety of intake.

Each village in the programme is required to appoint a three member Committee of Beneficiaries. The food baskets are delivered to and stored in several warehouses, and then distributed by DICONSA to the rural communities. Eligible households collect their food baskets from the Committee of Beneficiaries. PAL beneficiaries have to attend monthly courses (*platicas*) that include sessions on health, nutrition and hygiene related topics, as well as participation in programme-related logistic activities. The members of the Committee of Beneficiaries, who are usually those in the communities with good levels of education, receive special training and are responsible for delivering the education sessions. While, in principle, the courses are a requirement for the receipt of a transfer,[11] Skoufias et al. (2008) report that since the start of PAL no household has been denied benefits on the grounds of not attending educational courses. The classes are meant to help empower individuals by allowing them to acquire knowledge, habits, attitudes and practices that will encourage them to consume the right amount of food to avoid or prevent nutritional problems, such as malnutrition, anaemia, vitamin A deficiency, diabetes, obesity and hypertension.

2.2 Evaluation Design and Data

The evaluation is designed as an experimental community trial; data were collected two years apart: baseline in October 2003 through April 2004, and follow-up in October through December 2005.[12] Of the 208 villages surveyed at the baseline, 2 could not be re-surveyed due to concerns about interviewers' safety. The final evaluation sample consists of 206 localities from 8 Mexican states (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz and Yucatan). These localities were randomly assigned to a 'control' group of 50 localities, and three treatment groups - assigned to receive 'in-kind transfers without education' (52 localities referred to as *Ink*), 'in-kind transfer and education' (51 localities referred to as *InkPl*), and 'cash transfer and education' (53 localities referred to as *Cash*). The means test criterion was applied to treatment villages, but not control ones. However, the data do not include household eligibility determined through the means testing.

While an introductory session on the logistics and the organization of the programme was compulsory for all three treatment groups, the sessions on health and nutrition topics were supposed to be only for localities *InkPl* and *Cash*. However, sessions on health and nutrition were also delivered in localities *Ink*, which resulted in contamination of the experimental design. According to González-Cossío et al. (2006) and Skoufias et al. (2008), this was a

[11] Households are supposed to be excluded from the programme if they miss more then two courses in a row or four in one year.

[12] Further details about the sampling procedure can be found in Skoufias et al. (2008).

spontaneous decision taken by the local programme administrators.

In each locality, 33 households were randomly chosen by the National Institute of Health (INSP) for interviews. The surveys provide extensive information at household and individual level on household consumption of food (based on 7 day recall) and non-foods, and individual nutritional intakes of all children under 5, and their mothers (based on 24 hour recall). Anthropometric measures and haemoglobin levels (in the follow-up survey only) are available for children under 5, adult females, and men aged 31 or above. We also have detailed information on number, content and timing of education courses at household level.[13] Since the questions were answered by the female head of the household, who in most cases was the person who attended the education meetings, we are confident that the information on education courses is fairly accurate.

2.3 Descriptives

Table 1 reports means, and differences in means, by treatment group, for key characteristics of individuals aged 18-60 at baseline. Consistent with the randomized design of the evaluation sample, with the exception of percentages of males, which is higher in localities *InkPl*, there are no significant differences in the main demographic characteristics across the four groups of localities. The average age of the individuals surveyed at the baseline was just less than 35 years. Around 80% of them were literate and 30% had been educated to secondary level or above. 48% of the individuals in the sample declared that they had worked the week before the interview. Only 14% of the individuals were covered by any type of health insurance.[14] On average, around 83% of the individuals in our sample own at least one house, while 73% own plots of land. Household respondents were asked about receipt of any additional welfare programme and, in the case of affirmative answers, which one. On average, at the baseline 36% were receiving aid from at least one programme in addition to PAL. 2.8% of individuals in the sample were beneficiaries of Social Milk Supply (*Leche Liconsa*), while 11.5% reported receiving *Oportunidades*. In theory, this is not allowed according to PAL's operational rules. However, for each additional welfare programme we found that the average proportion of households receiving it did not differ significantly across the four

[13]Respondents were asked to indicate up to 5 topics from the following: 1) organization of PAL; 2) nutrition; 3) health; 4) hygiene; 5) other.

[14]In Mexico there are two main public health care providers for households not covered by insurance: Health Secretary (*SSA*) and *IMSS Solidaridad*. At national level, 42% of all Mexican hospitals are run by *SSA*. IMSS Solidaridad is a programme that was launched by the Mexican Government in cooperation with Mexican Institute of Social Security (*IMSS*) for rural populations in marginal areas.

treatment groups.

All respondents aged 12 or over were asked whether they smoked, including occasionally. At the baseline, the smoking rate is extremely low for women in the age group 18-60 - around 1%, and there are not significant differences across the four different treatment groups (see column 1 in the top panel of Table 2). Around 15% of men aged 18-60, in the baseline survey admitted to smoking. The proportion of male smokers is lower in localities where transfer in-kind is not conditional on attendance at educational sessions, compared to the other three groups (see column 4 of Table 2). Evidence from the follow-up survey shows that the percentage of female smokers is virtually unchanged across the four treatment groups (see column 1 in the bottom panel of Table 2), but smoking among adult men has increased. The variation is large and statistically significant for men living in localities where transfers in-kind are not conditional on attendance at education sessions (see column 4).

Individuals were asked whether they drank alcohol, even occasionally, and the number of drinks they had consumed in the week before the interview. According to the WHO, a woman (man) should not exceed 1 (2) units of alcohol per day. We therefore classify as heavy drinkers those women (men) who consumed 7 (14) or more drinks the week before the interview. Both the baseline and the follow-up data show an extremely low percentage of heavy drinkers among women (see column 2 in Table 2). These results, while potentially biased by severe underreporting, are in line with those in the National Survey of Addictions (ENA) 2002, which reports that 0.27% of women aged 18-65 living in rural areas drink daily or almost daily. Among men, evidence from the baseline shows that the proportion of heavy drinkers is slightly higher in the treatment group *Ink*. Consistent with the results for smoking, there is an increase in the proportion of male heavy drinkers between the first and second surveys, with a variation that is particularly large for individuals who live in the localities in the control group and those where the transfer is not conditional on health and nutrition education.

In the first wave, we collected information on body mass index (BMI) only for children under 5, and women in the age group 12-52. At the baseline 25.8% of women aged 18-52 have a BMI equal to or above 30 and therefore are classified as obese.[15] In the follow-up survey we measured the waist circumferences (WC) of all women (men) aged 12 (31) or over. Waist circumference is a convenient and simple measure which is unrelated to height and is an approximate index of intra-abdominal fat mass and total body fat. According to the

[15]Using data from the Social Welfare Survey (2003), for a sample of low-income rural Mexicans, Fernald et al. (2004) find that 22.2% (13.6%) of adult women (men) have a BMI equal to or above 30.

WHO, women (men) with a waist circumference over 88 (102) cm[16] display an increased risk of metabolic complications. Medical evidence suggests that body fat distribution is a more important determinant of disease risk than body mass.[17] Therefore, waist circumference is becoming accepted as a more sensitive measure of relative disease risk, especially among menopausal and post-menopausal women.[18] Klein et al. (2007) using the National Health and Nutrition Examination Survey III for the US find that 14% of women as opposed to 1% of men had a large waist circumference but a normal BMI (below 25). In addition about 70% of women with a BMI between 25 and 29.9 had a waist circumference of over 80 cm.

In our sample 48.6% (17.2%) of the adult women (men) in the age group 18-60 (31-60) have a waist circumference of over 88 (102) cm. Among women, the proportion of respondents with a large waist circumference is lower in *InkPl* localities, while among men the lowest rate is in the control group. Although the samples in the first and the second survey and the two measures of obesity are not perfectly comparable, we can draw two preliminary conclusions. First, consistent with the results for other developing countries (see Case and Menendez (2007) for South Africa) the prevalence of obesity is much higher among women than among men. Second, measures based on BMI might severely underestimate the burden of obesity, especially among women.

3 Empirical Framework

In order to separate the effects of the educational requirement and increased resources on health risk factors, we test whether adult behaviour varied significantly between those in the group of localities where the food basket was conditional on the attendance at health and nutrition sessions and those where it was not. We exclude individuals in localities where the transfer was distributed in cash as it would not be possible to separate the effect of educational sessions from the effect related to the type of transfer. Cunha (2009) shows that, when valued at local prices, the value of the in-kind transfer is about 30% higher than the value of the cash transfer. Moreover, changes in health behaviours might be driven

[16] Or 35 (40) inches.

[17] Individuals with a high proportion of abdominal fat are at greater risk of developing diabetes mellitus type 2, coronary artery and cardiovascular diseases. Among others, Yusuf et al. (2004), using data from the cross country study INTERHEART, finds that the effect of the BMI on the risk of myocardial infarction becomes statistically not significant once abdominal obesity (waist/hip ratio) is included in the controls in the multivariate regression.

[18] During the menopause there is an increase in abdominal adiposity that is countered by an accelerated loss of lean mass, such that body weight should not change significantly (see Van Pelt et al. (2001)).

by variations in prices due to general equilibrium effects. However, the evidence in Cunha (2009) does not support the hypothesis of differential changes in prices between in-kind and cash localities.

Table 3 shows that the proportion of households in the village that reported receiving at least one transfer (above 90%) is almost equal across the two groups of localities that received the transfer in-kind. Since we do not have measures for eligibility, it is impossible to measure take up rate among those that were eligible. Angelucci and De Giorgi (2009) document that 97% of those eligible took part in the *Oportunidades* programme, and the population is comparable to the PAL one.[19] The average number of transfers is practically the same (around 13) for the two groups of localities.

In the *InkPl* group respondents attended five courses on average, as opposed to an average of just over four in the *Ink* localities, with a difference that is significant at the 10% level. For both groups the average attendance is much less than the one course per month specified in the programme's rules. In the treatment group *InkPl*, 91.8% of households attended at least one course, as opposed to 81.4% in group *Ink*. Both groups were supposed to attend an introductory session that describes the organizational features of the programme (type of benefit, timing and place of the delivery, requirements). Consistently, we did not detect any significant difference in the proportions of households that attended at least one session on the organization of the programme. Due to contamination of the evaluation sample, in group *Ink* 34% (55%) of the respondents attended at least one session covering health (nutrition) topics. However, beneficiaries in group *InkPl* were significantly more likely to attend sessions that covered these themes: 47% (70%) attended at least one health (nutrition) session. Despite contamination of the experimental design, households in *InkPl* localities were significantly more likely to be exposed to health and nutrition discussions than households in *Ink* localities.

Our baseline specification relies on a cross sectional comparison of the effect of the programme on the behaviour of adults living in localities where, according to the original design, receipt of food baskets was conditional on health and nutrition session attendance versus those where it was not. Formally, we estimate the following model:

$$Y_{ij} = \beta_0 + \beta_1 Ink_j + \beta_2 InkPl_j + \gamma' X_{ij} + u_{ij} \tag{1}$$

where Y_{ij} is the health risk related behaviour of individual i in locality j recorded in the follow-up survey. Ink_j is a dummy variable for whether the locality j belongs to the group

[19]The fact that eligible households had to show identification cards makes it unlikely, although not impossible, that eligibility criterion was violated.

where the transfer in-kind is not conditional on attendance at educational sessions, and 0 otherwise. $InkPl_j$ is a dummy variable that takes the value 1 if in the locality j receipt of the food basket is conditional on attendance at the educational courses, and 0 otherwise. In this specification the control localities act as the omitted category. X_{ij} is a full set of individual and household characteristics, age, square of age, sex, a dummy for household head status, marital status, dummies for educational attainment and ability to speak the indigenous language, dummies for asset holding (e.g. house, land) and dummies for each additional welfare programme received by the household. All regressions control for state fixed effects.

Our main object of interest is in the difference between β_2 and β_1, which measures the effect of the differential requirements to receive the food basket. Standard errors are always clustered at village level to account for intra-village correlated shocks. The parameters estimated above represent Intention To Treat (ITT) effects as they make no adjustment for either receipt of a food basket or attendance at health and nutrition sessions. ITT effects are diluted for two reasons: first, non compliance with the requirement to attend health and nutrition sessions among those who live in localities *InkPl*; second, attendance at health and nutrition sessions by those living in *Ink* localities due to the decision of local organizers to offer them. The empirical section concludes, therefore, with a set of estimates that use the assignment dummy for living in a locality *InkPl* rather than in a locality *Ink* as an instrumental variable (IV) for attendance at one or more sessions on health (nutrition) topics. This generates an estimate of the effect of health and nutrition session attendance. Formally, we estimate the following equation using a Two Stages Least Squares (2SLS):

$$Y_{ij} = \delta_0 + \delta_1 Talk_{ij} + \gamma' X_{ij} + u_{ij} \tag{2}$$

where $Talk_{ij}$ is a dummy for whether the household where individual i lives has been exposed to health/nutrition discussions.

4 Results

4.1 Intention To Treat Estimates

We present our ITT estimates pooled by gender, and for females and males separately, because the prevalence of health risk behaviours differs substantially by gender.

We start by considering how the programme affects the smoking behaviour of adults. Column 1 in Table 4 shows the results for the full sample. Living in a locality where, accord-

ing to the original design, the transfer is not conditional on any educational requirements, determines a small and not significant increase in the probability of smoking, compared to those who live in control localities. And vice versa, those who live in localities where transfer is conditional on attendance at health and nutrition discussions show a reduction in the probability of smoking compared to adults in control localities. Overall, those who live in *InkPl* localities are 1.5 percentage points less likely to smoke than those who live in *Ink*. When we present the results separately by gender we find that the effect is bigger for men (2.7 percentage points) than for women (0.2). However, none of the ITT effects is statistically different from zero at conventional significance levels.

We observe a very small increase in the probability of drinking to excess for adults in *Ink* localities with respect to those who live in control localities, and a reduction among those living in localities *InkPl* (see column 4 in Table 4). Overall, those who live in *InkPl* localities are 1 percentage point (significant at 10% level) less likely to drink heavily than those who live in *Ink* localities. In line with the results for smoking, the requirement to attend health and nutrition sessions as a condition to receive the food basket has a larger effect on the drinking behaviour of men (1.8 percentage points) than women (0.3 percentage points), but in neither case is the difference between β_2 and β_1 statistically significant.

Finally, we consider how the educational requirements affect the probability of being obese, as measured by the probability of having a waist circumference above the recommended measurement threshold. When we consider the entire sample (see column 7) we find that individuals who live in *Ink* localities are 3.7 percentage points more likely (significant at 10% statistical level) to have a large waist circumference than those who live in control localities. Individuals in *InkPl* localities show a small reduction (0.7 points) in the probability of having a large waist circumference. Overall, those who live in localities where attendance at health and nutrition discussions is a requirement are 4.4 percentage points less likely to have a large waist circumference than those who live in localities where the food basket is unconditional. The effect is statistically significant at 1%. When we present the results separately by gender, we find that the requirement to attend the health and nutrition discussions determines a large and statistically significant reduction in the probability of a large waist circumference only among women (4.9 percentage points). The effect on men is smaller (3.5 percentage points) and statistically not significant.

Our results so far show that the requirement to participate in health and nutrition sessions significantly reduces the probability of being obese among women, but does not significantly affect the propensity to smoke and drink heavily. There are two potential explanations for these differential results. First, smoking and heavy drinking as opposed

to obesity, are not common among women, and it is the women who comply with the education requirement. Second, the existing evidence, although limited,[20] suggests that smoking and heavy drinking might receive less attention than nutritional issues during the sessions. We would interpret the findings so far as evidence that, while adult women who live in households not subject to the education requirements respond to an increase in available resources by increasing the amount of food intake, those who are required to attend the courses substitute, at least partially, the food items being routinely consumed, with those included in the basket. In order to provide support for this explanation, in the next section we study the effect of the health and nutrition sessions on women's calorie intake.

While women (men) with a waist circumference equal to or above 88 (102) cm are considered at high risk of obesity related diseases, medical guides advise women (men) to not gain further weight if the waist circumference is greater than or equal to 80 (95) cm. In the sample of women aged 18-60 living in the control localities only 26.3% have a waist circumference below 80 cm. A much larger percentage (62) of men aged 31-60 in the control localities has a waist circumference that can be classified as normal.[21] Therefore, we need to understand how the programme affects the overall waist circumference distribution. In columns 2 to 10 of Table 5 we report the quantile regression estimates for each decile and use the OLS estimates reported in column 1 as a benchmark. The top panel reports the results for the full sample of men and women. We find that living in localities with no education requirements is associated with a positive but not significant effect on every decile except the 9th. In contrast, the requirement to attend health and nutrition courses determines negative, but not statistically significant quantile effects. Overall, we find significant evidence of differential treatment effects on the 4th and 5th deciles of the waist circumference distribution.

For women we find there is a positive effect of living in an *Ink* locality rather than in a control one, with the size that is particularly large in correspondence of the 3rd decile of the waist circumference distribution. Living in a *InkPl* locality has basically no effect on the lowest quantiles, while it has a negative, although not significant effect on the deciles equal to or greater than the 4th. The size of the effect is particularly large on the median of the distribution. When we consider the differential effects of the two types of treatment, we find that living in locality *InkPl* rather than a *Ink* locality has a negative effect on most of

[20]Skoufias (2005) reports that the lectures that were a requirement of the *Oportunidades* transfer, cover some 25 themes. However, the focus is on topics relevant to mothers, including nutrition, hygiene, infectious diseases, immunization, family planning, etc.

[21]The median waist circumference of women (men) living in the control localities is 87.8 (91.8) cm, with standard deviation equal to 12.1 (10.6) cm.

the distribution, with differences that are large and significant at the 3rd, 4th, 5th and 6th decile. There are no significant differential ITT effects for deciles equal to or bigger than the 7th.

The fact that most of the effect of the educational requirement on female waist circumference distribution occurs around those values that are used as thresholds to define the different categories of obesity-related health risk, is consistent with the hypothesis that women might learn about their increased risk during the health and nutrition courses. However, mechanisms other than information might explain our results. The health and nutrition sessions might increase the social pressures on obese women, who might be more reluctant to get their waist circumference measured - especially if there is the possibility that this will be disclosed during the sessions. Therefore, our results might be the artifact of differential rates of attrition in the measurement of waist circumference. The absence of a significant differential treatment effect on the highest quantiles does not support this explanation, as the women with the largest waist circumference would be those more likely to avoid the measurement.

In the bottom panel we report the results for the subsample of men. The effect of living in a *InkPl* rather than an *Ink* locality is negative for the 2nd decile and above. However, the difference between the two treatment effects is never statistically significant.

4.2 Two Stages Least Squares Estimates

As mentioned above, there are two sources of dilution of the ITT effects. First, households in *InkPl* localities failed to comply with the requirement to attend any health and nutrition session. Second, individuals in *Ink* localities attended health and nutrition discussions as result of the decision of local organizers to offer them. The average effect on the sample of those who attended at least one health (nutrition) discussion provides a better measure of whether attendance at content specific sessions can determine behavioural changes among welfare programme recipients. In practice, the effects on course attendance are larger than ITT effects, with the proportional increase equal to the inverse of the difference in attendance rates at health (nutrition) sessions in localities *InkPl* and *Ink*.

We estimate the model in eq. 2 using three different proxies for attendance at content specific classes ($Talk_{ij}$): a dummy for attendance at one or more health related sessions, a dummy for attendance at one or more nutrition related sessions, and a dummy for the attendance at at least one session covering a health or nutrition topic. We treat $Talk_{ij}$ as endogenous and use the randomized assignment to group *InkPl* rather than to group *Ink*

as our instrument. In this case the parameter δ_1 in eq. 2 is *just* identified. For reasons of space we only report the separate results for men and women. Although in the majority of cases, courses are attended by women, we can assess the existence of within household externalities by testing their effect on males' behaviour. In particular, we test whether the fact that women attended health and nutrition sessions has a positive effect on their partners.

The 2SLS estimates are reported in Table 6. The top panel shows the results for smoking. Irrespective of which type of session we consider, attendance has a negative but very small effect for the sample of women. The size of the effect is larger for men: a 10 percentage point increase in the probability that a household member has attended a session reduces the probability of smoking by 1.7 percentage points. However, consistent with the not significant ITT, the effects are never statistically significant.

The middle panel shows the effect of the health and nutrition sessions on drinking behaviour. In line with the results for smoking, there is no effect for women. There is an effect of attendance on male drinking behaviour: a 10 percentage point increase in exposure to health and nutrition information reduces the probability of heavy drinking by 1.1 percentage points, but again, in this case, the effect is not statistically different from zero. Finally, we consider the effect of attending at least one health/nutrition session on the probability of having a large waist circumference. A 10 percentage point increase in the probability that at least one household member attended one or more content specific discussions lowers the probability among women of having a large waist circumference by approximately 3 percentage points. For each type of content the effect is statistically different from zero at the 5% significance level. The first stage F statistic of the 2SLS varies between 7.66 and 9.51 according to the proxy for the type of session attended. In the case of multiple instruments, Stock and Yogo (2002) suggest that the first stage F statistic should be large, above 10, in order to reject the hypothesis of weak instruments. However, as stressed by Angrist and Pischke (2009), in a *just* identified model a not sufficiently strong correlation between the endogenous regressor and the excluded instrument might potentially determine an increase in the standard errors, but would not affect identification. The size of the effects for men are in line with those for women, but they are not statistically significant.

The results presented above capture the effect of attendance at health and nutrition sessions on the propensity to have a large waist circumference among those women whose decision to attend is affected, at the margins, by the fact that the sessions are a requirement to receive the food basket, the so called Local Average Treatment Effect (LATE). To identify the parameter it is irrelevant that the conditionality is not enforced *ex post* by the organizers

just so long as the condition is perceived as such by the beneficiaries as existing.

Our results are consistent with the hypothesis that a high prevalence of female obesity can be explained, at least in part, by the fact that women are poorly informed about health and nutrition issues. It is important to stress that the results presented above do not isolate the effect of course attendance *per se*, but they capture the interaction between attendance at health and nutrition discussions and the in-kind nature of the transfer.

Our strategy cannot distinguish between two pathways through which health and nutrition sessions can affect the level of health related knowledge. The information acquired from the sessions might determine a genuine increase in an individual's information set but might also add salience to a problem that is to an extent understood (see Della Vigna (2009) for a review). Since attention is a limited resource, people often use an "availability heuristic" to weight personal experience more heavily, in decisions that involve a variety of self-protective behaviours.

The estimates in Table 6 suggest that the health related sessions are at least as important as those on nutrition. In the health related discussions, participants learn about the benefits of losing weight (i.e. lower risk of diabetes and cardiovascular diseases), in the nutrition related sessions, they learn how to combine different nutrients in order to achieve a balanced diet. Using the terminology of the technology adoption literature, in the former they learn about the existence of the new technology, in the latter about the adoption criteria. There is no evidence of within household spillovers, as male partners do not seem to modify their behaviour in response to the information acquired by their wives.

4.3 Sessions and Calorie Intake

Above, we have shown that attending health and nutrition discussions may significantly reduce the propensity for a large waist circumference among adult women. A reduction in waist circumference may be due to a reduction in calorie intake or increased calorie expenditure. Cutler et al. (2003) argue that the impressive rise in obesity observed in the US is due primarily to increased calorie intake and that calories expended have not changed significantly. In this section, we disentangle the effects of the attendance of health/nutrition sessions on the propensity to have an excessive calorie intake.

In the follow-up survey of PAL we collected individual information, based on a 24 hour recall method,[22] on the nutritional intake of children under 5, and their mothers. We exploit

[22]This relates to the type and the quantity of food consumed at home and outside the home, in the previous 24 hours.

the information on mothers' intake to test whether attendance at health and nutrition sessions can affect calorie consumption. Although calorie requirements might change depending on metabolism and level of physical activity, nutritional guidelines on calorie intake provide recommendations that vary with age and gender. In Mexico the INSP advises women under 20 to not consume more than 2,300 kcal per day. Women between 21 and 34 should not exceed 2,000 kcal per day, women between 35 and 54 not more than 1,850, while women over 55 are advised not to consume more than 1,700 kcal per day.[23] Based on this information, we construct a binary variable for whether a woman consumes more than the recommended number of calories.

A priori it is not clear how the transfer in-kind might affect the calorie intake of recipients. On the one hand, individuals might increase their calorie intake as result of the increased resources - *quantity* effect. On the other hand, they might potentially substitute unhealthy food items for those included in the basket, reducing the number of calories - *quality* effect. Because of the potential endogeneity of the number of benefits received, we cannot separately identify the effect of the food baskets and attendance at the health and nutrition sessions, on the probability of excessive calorie intake. The objective of this section is to test whether, conditional on the number of food baskets, attendance at the health and nutrition discussions affects calorie consumption.

The OLS estimates in columns 1-3 of Table 7 display a small and not significant effect associated with attendance at health and nutrition sessions. A higher number of food baskets is associated with a small and not significant increase in the probability of consuming more calories than recommended. When we instrument $Talk_{ij}$ using random assignment to group *InkPl* rather than group *Ink*, we find that attendance at health and nutrition sessions reduces the probability of excessive calorie intake. A 10 percentage point increase in the probability of attending at least one health session reduces the probability of excessive intake by almost 5.8 percentage points but the effect is not statistically significant. A 10 percentage point increase in the probability of attending at least one nutrition talk reduces the probability by around 4.3 percentage points (significant at 10%). Similarly, attending al least one health or one nutrition discussion lowers the probability of excessive calorie consumption by 4.7 percentage points.[24] Interestingly, there is a positive and significant association between the number of food baskets and the propensity to consume a higher than recommended calorie intake. After controlling for endogeneity of the dummy for attending at least one

[23] Based on a 24 hour dietary recall system in a representative sub-sample of 2,630 Mexican women aged 12-49 from the National Nutrition Survey 1999, Barquera et al. (2003) find that the median energy consumption is 1,471 kcal.

[24] The results are robust to alternative definitions of excessive calorie intake.

nutrition session, an extra food basket increases the probability of excess calorie intake by 0.6 percentage points. The positive sign of the coefficient on the number of baskets might suggest that the quantity effect prevails over the quality effect. However, no causal interpretation can be given as the number of food baskets might be potentially endogenous.

Attending health and nutrition sessions might also affect the propensity to burn calories. As stressed by Cutler et al. (2003), there are two components to calorie expenditure: voluntary exercise and involuntary expenditure associated with employment. Attendance at health related sessions might result in an appreciation of the benefits of physical activity. Unfortunately, the survey does not collect information on time usage. With respect to involuntary calorie expenditure, it is unlikely that attendance at health and nutrition sessions affects the decision to work in more energy intensive jobs. Skoufias et al. (2008), studying the effect of PAL on labour outcomes, find no significant difference between localities *Ink* and *InkPl*.

In summary, these results suggest that exposure to health and nutrition information provided through the programme, determines a large and marginally significant reduction in the probability of an excessive calorie consumption.

5 Econometric Concerns

5.1 Potential Confoundings

In this section we discuss two issues that might potentially confound the validity of our results. So far we have interpreted the differential treatment effect between localities *InkPl* and *Ink* as the effect of the requirement to attend health and nutrition discussions in order to receive the food basket. This interpretation is valid only if, consistent with the original design of the evaluation sample, there are no other differences between the two groups of localities that might be correlated with adult health outcomes.

The first potential concern is that in localities where the transfer is subject to attendance at health and nutrition discussions, there might have been differential improvements in health supply or increased attention to nutrition related diseases among health professionals. For instance, women who attend health centres in *InkPl* localities might be more likely to be reminded by doctors or nurses about the risks related to obesity. In order to rule out this confounding factor we test whether there are differential treatment effects on alternative health outcomes: the probability of being diagnosed as having hypertension, diabetes, and for each of these two conditions the probability of being advised a treatment after diagnosis.

Since it is unlikely that in the short run the programme can affect the risk of contracting diabetes and hypertension, differential effects on the prevalence of the two conditions would suggest that there are differences in the probability of their detection. All things being equal, medical guidelines for health professionals operating in *InkPl* localities might put more emphasis on the treatment of obesity related diseases. The results in Table 8 show that there is no significant evidence of differential treatment effects for any of the health outcomes described above.

Beneficiary households in localities belonging to groups *Ink* and *InkPl* receive the same food baskets. Therefore, we do not expect any differential change in prices between the two groups of localities. The follow-up survey included detailed questions about the prices of 67 items in the locality questionnaire. Table 9 shows that we did not detect any significant difference in the prices of unhealthy goods (chocolate, candies, biscuits) and healthy goods (fish). Results not displayed for other food items are in line with those presented.

In summary, the above results suggest that the differential effect of the programme on female waist circumference cannot be explained by differential changes in either health supply or food prices.

5.2 Attrition

There are two differential sources of attrition that might bias our results. First, some of the households interviewed at the baseline might not be re-surveyed in the follow-up. Household attrition between the first and the second survey was reasonably low, even though it was significantly higher in control localities at 15.03%, than in the two in-kind groups: 10.3% in *Ink* localities and 10.5% in *InkPl* localities. However when we compare the characteristics of adults in non attrited households as recorded in the baseline survey we find no significant differences across the three groups (see Table AI).

A second source of bias might be related to missing waist measurement observations, among women interviewed in the follow-up. Health and nutrition discussions might increase the stigma associated with obese or overweight women, with the result that, in the localities where attendance at health and nutrition sessions is a requirement, obese women might be more likely to avoid having their waists measured, producing non-random selection. In our case, the percentage of women in the 18-60 age group for which we do not have waist circumference measurements does not differ between *InkPl* and *Ink* localities (respectively 23.3 versus 22), and for both treatment groups is in line with the control group (24).

This evidence together with the lack of a significant differential treatment effect on the

highest quantiles of female waist circumference distribution reassures us that our results are not driven by non-random attrition.

6 Conclusions

It has been documented that CCT programmes have strong positive effects on the well-being of beneficiary households, but little is known about how the individual components of these programmes contribute to the combined result. This paper assesses the impact of an education requirement in a conditional transfer programme implemented in rural Mexico on adult health behaviour. We exploit the randomized evaluation design of the Food Assistance Programme to study how the requirement to attend sessions on health and nutrition affects the propensity to smoke, drink heavily and be obese, in male and female adults.

We find no significant evidence that the education requirement affects either smoking or drinking behaviour. Our findings do provide evidence that the requirement to attend health and nutrition sessions contributes to a large and significant reduction among women in the probability of having a large waist circumference. We show that attendance at nutrition specific sessions reduces the probability of excessive calorie intakes among mothers with at least one child under 5. Overall, our results support the hypothesis that the requirement to attend content-specific classes, either by increasing the level of information or stressing the relevance of already known nutritional issues, can improve women's eating habits.

This study contributes to the current debate on whether transfers should or should not be conditional on behavioural and educational requirements. Our results suggest that improved nutrition related outcomes, especially among adult women, can be achieved if the increased resources are accompanied by improved health/nutrition knowledge. Previous work has documented that, by targeting women as the transfer recipients, CCTs reduce household consumption of unhealthy goods and increase food and child related expenditure. However, provision of specific information seems essential to achieve an effective improvement in the nutritional outcomes of all household members. While women seem to take advantage of the information they acquire through the sessions, men do not display any significant behavioural change. Therefore, the design of future transfer programmes should address explicitly this lack of within household spillovers.

More generally, our results show that lack of information plays a key role in explaining the dramatically high prevalence of female obesity in developing countries. Policies addressed to improving health knowledge can have large and significant effects.

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Table 1: Pre-Treatment Balance: Adults' Characteristics by Treatment Group

	(1)	(2)	(3)	(4)	(5)	(6)
		Contrast by treatment status				
	Control mean	InK v. Control	InKPl v. Control	Cash v. Control	F-Stat (all=control)	Obs
Age	34.679	-0.136	-0.457	0.256	1.134	14643
		(0.394)	(0.377)	(0.390)	[0.336]	
Male	0.468	0.009	0.016**	0.002	2.059	14643
		(0.008)	(0.008)	(0.007)	[0.107]	
Married	0.485	0.001	0.038	0.028	1.216	14643
		(0.026)	(0.027)	(0.029)	[0.305]	
Literate	0.809	0.000	-0.002	-0.006	0.020	14643
		(0.029)	(0.028)	(0.028)	[0.996]	
No Schooling	0.170	-0.005	-0.004	0.004	0.050	14643
		(0.027)	(0.028)	(0.026)	[0.985]	
Primary Educ.	0.519	-0.004	0.040	0.026	1.277	14643
		(0.023)	(0.026)	(0.023)	[0.283]	
Secondary Educ.	0.201	0.006	-0.033	-0.017	1.393	14643
		(0.021)	(0.020)	(0.020)	[0.246]	
Tertiary Educ.	0.102	0.007	-0.001	-0.013	0.426	14643
		(0.018)	(0.018)	(0.016)	[0.735]	
Indigenous Lang.	0.184	0.025	-0.044	-0.040	0.457	14643
		(0.076)	(0.072)	(0.069)	[0.713]	
Spanish Lang.	0.158	-0.014	-0.050	-0.047	0.386	14643
		(0.060)	(0.059)	(0.057)	[0.763]	
Worked Last Week	0.483	-0.001	-0.009	-0.017	0.653	14643
		(0.013)	(0.013)	(0.013)	[0.582]	
Health Insurance	0.141	0.042	-0.027	-0.018	1.416	14643
		(0.038)	(0.030)	(0.030)	[0.239]	
Own House	0.833	0.014	-0.003	-0.003	0.259	14639
		(0.023)	(0.023)	(0.023)	[0.855]	
Own Land	0.732	0.030	-0.019	0.005	0.727	14631
		(0.033)	(0.035)	(0.035)	[0.537]	
Additional Welf. Prog.	0.365	0.017	0.011	0.010	0.027	14643
		(0.061)	(0.059)	(0.059)	[0.994]	

Note: The sample includes individuals aged 18-60. *InK* denotes the localities that according to the original design receive the transfer with no requirement to attend health and nutrition sessions; *InkPl* denotes the localities that receive the transfer in-kind subject to the educational requirement; *Cash* denotes the localities that receive the transfer in cash subject to the educational requirement. Columns 2 to 4 report the coefficients and the standard errors in parenthesis of an OLS regression of the individual characteristic on three treatment dummies. Column 5 reports the F Statistic and the p value in brackets.

*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level.

Table 2: Health Risk Factors

	(1)	(2)	(3)	(4)	(5)	(6)
	Women			Men		
	Baseline					
	Smoking	Heavy Drinking	BMI[1]>=30	Smoking	Heavy Drinking	
Control	0.014	0.003	0.27	0.168	0.044	
	(0.116)	(0.056)	(0.444)	(0.374)	(0.205)	
Ink	0.012	0.001	0.245	0.129	0.048	
	(0.111)	(0.023)	(0.431)	(0.335)	(0.213)	
InkPl	0.007	0.002	0.246	0.143	0.04	
	(0.083)	(0.046)	(0.431)	(0.350)	(0.195)	
Cash	0.007	0.003	0.262	0.152	0.036	
	(0.086)	(0.055)	(0.440)	(0.359)	(0.186)	
	Follow-Up					
	Smoking	Heavy Drinking	WC>=88cm	Smoking	Heavy Drinking	WC[2]>=102cm
Control	0.013	0.005	0.483	0.182	0.085	0.141
	(0.115)	(0.070)	(0.500)	(0.386)	(0.279)	(0.348)
Ink	0.012	0.004	0.494	0.188	0.083	0.173
	(0.109)	(0.065)	(0.500)	(0.391)	(0.277)	(0.379)
InkPl	0.010	0.003	0.468	0.168	0.066	0.155
	(0.101)	(0.053)	(0.499)	(0.374)	(0.248)	(0.362)
Cash	0.011	0.003	0.501	0.166	0.061	0.184
	(0.106)	(0.058)	(0.500)	(0.372)	(0.240)	(0.387)

Note: The sample includes individuals in the age group 18-60. Smoking takes the value 1 if the respondent smokes even occasionally. Heavy drinking takes the value 1 if a woman (man) reports drinking at least 7 (14) units of alcohol in the week before the interview. Men and women with a BMI equal to or above 30 are considered at high risk. Women (men) with a waist circumference (WC) equal to or more than 88 (102) cm are considered at high risk of obesity related diseases.
[1] At baseline, BMI is collected only for women aged under 52.
[2] In the follow-up, data on WC are collected for men aged 31 or over.

Table 3: Programme Take Up in In-Kind Localities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	At least 1 Transfer	Food Baskets	Courses Attended	At least 1 Course	At least 1 Organiz. sess.	At least 1 Health sess.	At least 1 Nutrit. sess.
Ink	0.928	12.973	4.104	0.814	0.4	0.339	0.549
	(0.259)	(5.000)	(4.024)	(0.389)	(0.490)	(0.474)	(0.498)
InkPl	0.915	13.477	4.973	0.918	0.36	0.47	0.7
	(0.280)	(5.166)	(3.945)	(0.274)	(0.480)	(0.499)	(0.461)
InkPl-Ink	-0.013	0.504	0.869*	0.104***	0.040	0.130**	0.151***
	(0.031)	(0.481)	(0.522)	(0.038)	(0.045)	(0.050)	(0.051)

Note: The sample includes all households in localities *Ink* and *InkPl*.
*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level.

Table 4: Intention To Treat Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Smoking			Heavy Drinking			Obese	
	Full Sample	Women	Men	Full Sample	Women	Men	Full Sample	Women	Men
Ink	0.007	0.000	0.012	0.001	0.001	0.001	0.037*	0.036	0.037
	(0.010)	(0.003)	(0.021)	(0.007)	(0.002)	(0.014)	(0.021)	(0.024)	(0.029)
InkPl	-0.008	-0.002	-0.015	-0.009	-0.002	-0.017	-0.007	-0.013	0.002
	(0.011)	(0.004)	(0.022)	(0.007)	(0.002)	(0.015)	(0.021)	(0.025)	(0.025)
Obs	9511	5044	4467	9510	5040	4470	5735	3860	1875
InkPl-Ink	-0.015	-0.002	-0.027	-0.010*	-0.003	-0.018	-0.044***	-0.049**	-0.035
	(0.011)	(0.004)	(0.021)	(0.006)	(0.002)	(0.012)	(0.017)	(0.019)	(0.027)

Note: The sample includes individuals in the age group 18-60. Smoking takes the value 1 if the respondent smokes even occasionally. Heavy drinking takes the value 1 if a woman (man) reports drinking at least 7 (14) units of alcohol in the week before the interview. Obese takes the value 1 if a woman (man) has a waist circumference equal or above 88 (102) cm. WC data for men are available only for those aged 31 or over.

*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level. Additional controls include age, age squared, a dummy for household head status, marital status, dummies for educational attainments, dummy for speaking the indigenous language or not, dummies for household assets and dummies for any additional welfare programme received by the household. All regressions control for state fixed effects.

Table 5: OLS and Quantile Estimates on Waist Circumference

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	Quantile regressions								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
					Full Sample					
Ink	0.313	0.285	0.332	0.615	0.613	0.413	0.506	0.642	0.124	-0.114
	(0.609)	(0.739)	(0.569)	(0.664)	(0.696)	(0.756)	(0.715)	(0.745)	(0.857)	(1.024)
InkPl	-0.361	-0.208	-0.205	-0.289	-0.606	-0.757	-0.547	-0.021	-0.236	-0.638
	(0.611)	(0.716)	(0.600)	(0.700)	(0.671)	(0.785)	(0.700)	(0.759)	(0.897)	(1.024)
Obs					5735					
InkPl-Ink	-0.675	-0.493	-0.537	-0.904*	-1.219**	-1.170**	-1.054*	-0.662	-0.360	-0.524
	(0.460)	(0.657)	(0.498)	(0.516)	(0.488)	(0.575)	(0.575)	(0.589)	(0.761)	(0.888)
					Women					
Ink	0.626	1.019	1.025*	1.424**	1.294*	0.981	0.921	0.649	-0.096	-0.923
	(0.620)	(0.823)	(0.592)	(0.721)	(0.713)	(0.819)	(0.784)	(0.730)	(0.880)	(1.030)
InkPl	-0.190	0.002	0.093	0.006	-0.133	-0.688	-0.503	-0.066	-0.192	-0.320
	(0.670)	(0.875)	(0.577)	(0.759)	(0.762)	(0.877)	(0.823)	(0.856)	(0.991)	(1.143)
Obs					3860					
InkPl-Ink	-0.816*	-1.017	-0.933*	-1.418**	-1.427***	-1.670***	-1.424**	-0.715	-0.096	0.603
	(0.478)	(0.704)	(0.523)	(0.608)	(0.541)	(0.601)	(0.667)	(0.658)	(0.849)	(0.991)
					Men					
Ink	-0.392	-0.278	-1.219	-0.994	-0.338	0.057	-0.626	0.095	0.255	-0.158
	(0.985)	(1.361)	(1.120)	(1.182)	(1.089)	(1.189)	(1.152)	(1.188)	(1.427)	(1.807)
InkPl	-0.913	0.237	-0.811	-1.288	-0.804	-1.104	-0.889	-0.283	-1.212	-2.038
	(0.906)	(1.163)	(1.098)	(1.108)	(1.049)	(1.207)	(1.163)	(1.134)	(1.387)	(1.694)
Obs					1875					
InkPl-Ink	-0.521	0.515	0.408	-0.294	-0.466	-1.161	-0.264	-0.378	-1.467	-1.880
	(0.807)	(1.095)	(0.828)	(0.913)	(0.930)	(0.972)	(0.951)	(0.995)	(1.089)	(1.383)

Note: The sample includes women (men) in the age group 18-60 (31-60).
*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level. Standard errors for quantile estimates are obtained with 500 bootstrap repetitions. Additional controls include age, age squared, a dummy for household head status, marital status, dummies for educational attainments, dummy for speaking the indigenous language or not, dummies for household assets and dummies for any additional welfare programme received by the household. All regressions control for state fixed effects.

Table 6: 2SLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Women			Men		
	Smoking					
Any Health Session (Y/N)	-0.019			-0.176		
	(0.030)			(0.152)		
Any Nutrition Session (Y/N)		-0.019			-0.174	
		(0.028)			(0.153)	
Any Health/Nutr. Session (Y/N)			-0.019			-0.177
			(0.029)			(0.155)
Obs	3410	3409	3410	3077	3076	3077
F Test excl. Instrument	8.072	7.833	7.644	9.920	9.925	9.830
	Heavy Drinking					
Any Health Session (Y/N)	-0.019			-0.111		
	(0.021)			(0.091)		
Any Nutrition Session (Y/N)		-0.019			-0.109	
		(0.019)			(0.088)	
Any Health/Nutr. Session (Y/N)			-0.019			-0.113
			(0.020)			(0.092)
Obs	3407	3406	3407	3078	3077	3078
F Test excl. Instrument	8.186	7.865	7.680	9.692	10.069	9.540
	Obese					
Any Health Session (Y/N)	-0.353**			-0.323		
	(0.170)			(0.256)		
Any Nutrition Session (Y/N)		-0.308**			-0.330	
		(0.138)			(0.275)	
Any Health/Nutr. Session (Y/N)			-0.308**			-0.370
			(0.136)			(0.322)
Obs	2651	2650	2651	1295	1294	1295
F Test excl. Instrument	7.663	9.318	9.517	4.482	4.579	3.880

Note: The sample includes individuals in the age group 18-60 living in localities *Ink* and *InkPl*. *** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level. Additional controls include age, age squared, a dummy for household head status, marital status, dummies for educational attainments, dummy for speaking the indigenous language or not, dummies for household assets and dummies for any additional welfare programme. All regressions control for state fixed effects.

Table 7: Educational Sessions and Excessive Caloric Intake

	(1)	(2)	(3)	(4)	(5)	(6)
	Excessive Caloric Intake					
	OLS			2SLS		
Any Health Session (Y/N)	0.028			-0.586		
	(0.028)			(0.366)		
Any Nutrition Session (Y/N)		0.009			-0.426*	
		(0.036)			(0.228)	
Any Health/Nutr. Session (Y/N)			0.020			-0.447*
			(0.035)			(0.234)
Number of Baskets	0.004	0.004	0.004	0.007*	0.006**	0.005*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Obs	942	942	942	942	942	942
F Test excl. Instrument				5.112	11.226	10.850

Note: The sample includes mothers with at least one child aged 5 or under, living in localities *Ink* and *InkPl*. The dependent variable is the dummy for whether a woman has a higher than recommended calorie intake (see text for explanation).
*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level. Additional controls include age, age squared, a dummy for household head status, marital status, dummies for educational attainments, dummy for speaking the indigenous language or not, dummies for household assets and dummies for any additional welfare programme. All regressions control for state fixed effects.

Table 8: Test for Changes in Health Supply

	(1)	(2)	(3)	(4)
	Hypertension	Diabetes	Adv. Hyp. Treat.	Adv. Diab. Treat.
Ink	-0.002	0.003	0.064	-0.007
	(0.008)	(0.010)	(0.053)	(0.052)
InkPl	-0.001	-0.004	0.029	0.000
	(0.009)	(0.010)	(0.052)	(0.058)
Obs	9428	4431	777	373
InkPl-Ink	0.001	-0.007	-0.036	0.007
	(0.009)	(0.010)	(0.051)	(0.053)

Note: The sample includes individuals in the age group 18-60. *Hypertension* (*Diabetes*) takes the value 1 if the individual has been diagnosed as hypertensive (diabetic). *Adv. Hyp. Treat.* (*Adv. Diab. Treat.*) takes the value 1 if the individual has been advised treatment for hypertension (diabetes), after diagnosis.
*** denotes significance at 1%, ** at 5% and * at 10%. Additional controls include age, age squared, a dummy for household head status, marital status, dummies for educational attainment, dummy for ability to speak the indigenous language or not, dummies for household assets and dummies for any additional welfare programme. All regressions control for state fixed effects.

Table 9: Effect on Prices

	(1)	(2)	(3)	(4)
	Chocolate	Candies	Fish	Biscuits
Ink	0.430	-0.635	3.178	-3.763
	(7.005)	(5.383)	(5.424)	(6.796)
InkPl	-1.579	4.278	-0.929	-9.327
	(7.445)	(5.985)	(5.521)	(6.314)
Obs	149	149	149	149
InkPl-Ink	-2.008	4.913	-4.107	-5.564
	(7.130)	(5.657)	(5.104)	(6.155)

Note: *** denotes significance at 1%, ** at 5% and * at 10%. Prices are expressed in *pesos*. The prices of these items are unavailable for 4 localities: 1 in the control group, 1 in the group *Ink* and 2 in the group *InkPl*.

Table AI: Mean Baseline Characteristics of Adults in Non Attrited Households

	(1)	(2)	(3)	(4)	(5)
		Contrast by treatment status			
	Control mean	InK v. Control	InKPl v. Control	F-Stat (all=control)	Obs
Age	34.852	-0.244	-0.457	0.667	9512
		(0.398)	(0.397)	[0.515]	
Male	0.471	0.004	0.017**	2.556	9512
		(0.008)	(0.008)	[0.081]	
Married	0.489	0.001	0.034	1.419	9512
		(0.026)	(0.026)	[0.245]	
Literate	0.805	0.003	0.005	0.016	9512
		(0.029)	(0.028)	[0.985]	
No Schooling	0.171	-0.006	-0.007	0.037	9512
		(0.028)	(0.027)	[0.964]	
Primary Educ	0.522	-0.005	0.035	1.163	9512
		(0.024)	(0.027)	[0.315]	
Secondary Educ	0.192	0.013	-0.022	1.353	9512
		(0.021)	(0.020)	[0.262]	
Tertiary Educ.	0.108	0.001	-0.005	0.048	9512
		(0.019)	(0.019)	[0.953]	
Indigenous Lang.	0.194	0.009	-0.051	0.419	9512
		(0.079)	(0.075)	[0.658]	
Spanish Lang.	0.168	-0.031	-0.056	0.410	9512
		(0.061)	(0.063)	[0.664]	
Worked Last Week	0.482	-0.004	-0.006	0.130	9512
		(0.014)	(0.013)	[0.878]	
Health Insurance	0.135	0.048	-0.022	1.849	9512
		(0.040)	(0.031)	[0.161]	
Own House	0.854	0.004	-0.015	0.398	9512
		(0.021)	(0.022)	[0.672]	
Own Land	0.754	0.014	-0.038	1.205	9509
		(0.032)	(0.034)	[0.302]	
Additional Welf. Prog.	0.348	0.045	0.066	0.644	9508
		(0.060)	(0.059)	[0.527]	

Note: The sample includes all individuals aged 18-60 at the baseline, in households also surveyed in the follow-up. *InK* denotes the localities that according to the original design receive the transfer with no health and nutrition session attendance requirement; *InkPl* denotes the localities that receive the transfer in-kind subject to the education requirement. Columns 2 and 3 report the coefficients and the standard errors in parenthesis of an OLS regression of the individual characteristic on two treatment dummies. Column 4 reports the F Statistic and the p value in brackets.
*** denotes significance at 1%, ** at 5% and * at 10%. Standard errors are adjusted for clustering at locality level.