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The Impact of the PROGRESA/Oportunidades Conditional Cash Transfer Program on Health and Related Outcomes for the Aging in Mexico

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Abstract

Conditional cash transfer (CCT) programs link public transfers to human capital investment in hopes of alleviating current poverty and reducing its intergenerational transmission. Whereas nearly all studies of their impacts have focused on youth, these CCT programs may also have an impact on aging adults, by increasing household resources or inducing changes in allocations of time of various household members, that may be of substantial interest, particularly given the rapid aging of most populations. This paper contributes to this under-researched area by examining health and work impacts on the aging for the best-known and most influential of these programs, the Mexican PROGRESA/Oportunidades program. For a number of health indicators, the program appears to significantly improve health, with impacts that are larger with a greater time receiving the program. However, most of these health impacts are concentrated on women.

The Impact of the *PROGRESA/Oportunidades* Conditional Cash Transfer Program on

Health and Related Outcomes for the Aging in Mexico

by

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Abstract: Conditional cash transfer (CCT) programs link public transfers to human capital investment in hopes of alleviating current poverty and reducing its intergenerational transmission. Whereas nearly all studies of their impacts have focused on youth, these CCT programs may also have an impact on aging adults, by increasing household resources or inducing changes in allocations of time of various household members, that may be of substantial interest, particularly given the rapid aging of most populations. This paper contributes to this under-researched area by examining health and work impacts on the aging for the best-known and most influential of these programs, the Mexican PROGRESA/*Oportunidades* program. For a number of health indicators, the program appears to significantly improve health, with impacts that are larger with a greater time receiving the program. However, most of these health impacts are concentrated on women.

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1. Introduction

Conditional cash transfer (CCT) programs have spread widely throughout the world since they first were introduced in Brazil and Mexico in 1997, with over 30 such programs in Latin America and the Caribbean (LAC), Asia, Africa and North America (Fiszbein and Schady 2009). Most research on the impacts of these programs focuses on schooling and nutritional and health status of children and adolescents or household consumption and savings. But these CCT programs may also have an impact on aging adults, for example by increasing household resources or inducing changes in allocations of time of various household members, that may be of substantial interest, particularly given the rapid aging of most populations.[1]

This paper contributes to the under-researched area of the impact of CCT programs on aging adults by examining these effects for the best-known and most influential of these programs, the Mexican PROGRESA/*Oportunidades*[2] anti-poverty and human resource investment program. This program was introduced originally in small rural communities (populations less than 2,500) in 1997 and since expanded to cover over 30 million poor Mexicans in all but the largest urban areas. The program incorporated data collection and systematic evaluation as an integral component from the start, with an initial experimental design in rural areas with random assignment for the first about 1.5 years of treatment among 506 rural communities in the evaluation sample and a subsequent control sample selected through propensity score matching (PSM). Indeed the main reason that *PROGRESA/Oportunidades* is so well-known has been the centrality of efforts at serious evaluation from the start – in contrast to other in some cases even larger anti-poverty and human resource investment programs (particularly in Brazil) on which little information has been collected that would permit systematic evaluation. *PROGRESA/Oportunidades* has been explicitly imitated in some important respects in a number of countries worldwide, as noted above.

PROGRESA/Oportunidades is known primarily because of its efforts to enhance the human resources of younger Mexicans through CCTs. These transfers generally are made to the mothers in the household, conditional on behaviors such as children and adolescents attending school, mothers attending sessions on nutritional and health practices, and all family members having regular checkups. Probably best known are the numerous studies on the impact of *PROGRESA/Oportunidades* on schooling, using a range of methodologies and finding

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[1] The average age of the world population is projected to increase from 28.3 years in 1995 to 32.6 years in 2020 based on United Nations (1996). Among the major world regions, Latin America and the Caribbean is projected to have the greatest increase in average age (24.4 to 31.0), with Asia second (25.2 to 30.4), Europe and North America next (35.2 to 39.0), and then Africa (24.7 to 28.2) (Behrman, Duryea and Szekely 2003).

[2] *PROGRESA* is an acronym for the original name of the program (*Programa de Educacíon, Salud y Alimentacíon*, Program for Education, Health and Nutrition) introduced in the Zedillo government. When the Fox government came into power after the 2000 election, the program was modified in some details (e.g., coverage of upper secondary schooling, extension into more urban areas) and renamed "*Oportunidades*."

significant and fairly substantial impacts on indicators of completed schooling attainment.[3] There also have been a number of studies of the program impacts on health and nutrition particularly of infants and younger children, as well as on other outcomes.[4]

In part because the program includes relatively large transfers conditional on schooling and early life health and nutritional investments, *PROGRESA/Oportunidades* is widely known as a schooling program or perhaps focused somewhat more broadly on children from infancy through adolescence. But though the program has a considerable emphasis on schooling and other human resource investments in children, it also potentially has impacts on adults, including aging adults. In fact the initial formulation of the program was basically to make transfers to poor households more effective (with less leakages) and better targeted by shifting from effectively inframarginal in-kind food transfers to cash transfers conditional on behaviors affecting all household members (through the conditionalities on health and nutrition related checkups), with the schooling conditionalities added late in the pre-program developmental phase (Levy 2006).

A priori the program would seem to potentially affect the health and health-related behaviors of aging Mexicans (50 years or older is how we define that term, for concreteness) who live in households that are *PROGRESA/Oportunidades* beneficiaries through a number of mechanisms: (1) the CCTs increase household income and the demands for health inputs and the health outcomes of aging household members are responsive to these income increases;[5] (2) the conditionalities of having regular health checkups lead to improved health behaviors; (3) the attendance at information sessions on health and nutrition lead to improved health behaviors (particularly for women who are much more likely to attend these sessions than men); (4) the distribution of resources and bargaining power at the margin to women tends to lead to more relative emphasis on using a given level of resources for health and nutrition than for other uses; and (5) the changed incentives for time use for school-aged children result in reallocation of time uses for aging adults, among others.

Despite such possibilities, there has been but limited investigation of the impact of the program on health and health-related behaviors of older adults. Gertler and Boyce (2001) suggest that the initial (1.5 year) experimental aspect of the program in rural areas had some important positive impacts on health and health-related behaviors of aging adults (above the age

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[3] These include a variety of approaches ranging from exploiting the original experimental design to estimate enrollment relations (Schultz 2004) and transition matrices for entering, exiting, progressing and repeating school grades (Behrman, Sengupta and Todd 2005) to using matching estimators for longer-run effects (Behrman, Parker and Todd 2009, 2011) to using sibling estimators to control for unobserved family background (Parker, Todd and Wolpin 2009) to using structural models based on the baseline data and validated by the experiment to explore counterfactual policies (Attanasio, Meghir and Santiago 2011, Todd and Wolpin 2006).

[4] For example, Behrman and Hoddinott (2005), Gertler (2004) and Rivera et al (2004) present estimates of the impact on early childhood growth. Summaries and reviews of many of the studies undertaken of *PROGRESA/Oportunidades* are in Behrman and Skoufias (2006), Skoufias (2004), Levy (2006) and Levy and Rodriguez (2004).

[5] In the longer-run, aging household members also may benefit from increased income earned by younger (present or former) household members due to their enhanced human resources induced by the program. But not enough time had passed for such effects to be observed in the data that we use for this paper.

of 50) in the original rural communities, including reductions in self-reported sick days and increases in reported number of kilometers able to walk without tiring. However, the results are not disaggregated by gender and only refer to the short-run effects of a fairly short-run difference (1.5 years) in exposure to the program.

In this paper we contribute new estimates of the longer-run impacts of *PROGRESA/Oportunidades* on a wider range of health and health-related behaviors of aging Mexicans in rural areas, focusing on how impacts change over time and how they differ by gender. The initial experimental evaluation began in 1998 with 320 communities being randomly assigned to receive benefits and 186 communities to a control group. The control group began to receive benefits in 2000 so that comparisons between the two groups after 2000 reflect the impact of differential time of exposure to the program. In 2003 a new comparison group was added to the evaluation sample, adding a group that had never received benefits, allowing the potential impact of receiving the program 6 years versus never receiving the program, albeit non experimentally. The matrix below shows the different potential comparison to estimate these effects; in this paper we carry out longer-run comparisons B and C.

		Time Since Program Initiation	
		(1) Short Run	(2) Longer Run
	(1) Short Differential (experimental)	A: Short-run impact of short differential exposure	B: Longer-run impact of short differential exposure
Exposure Differential	**(2) Longer Differential (non experimental)**	N/A	C: Longer-run impact of longer differential exposure

Comparison B uses the experimental data to estimate longer-run impacts of the effects of the short differential in exposure. That is, B compares the original treatment with the original control group about 6 years post program initiation. At this point the original treatment group had received about 5.5 years of benefits versus 4.0 years for the original control group. For comparison C, we use the new comparison group added in 2003 to carry out propensity score matching estimates based on 5.5 (4.0) years differential exposure e.g. that compare the original treatment T1998 (control group T2000) with the new comparison group that had never received benefits to derive insights into the effects of longer-run differentials in exposure.

We thus use both experimental and non experimental estimators to provide a picture of the longer-run impacts of *PROGRESA/Oportunidades* on elderly health by length of time receiving the Program. The experimental estimates are based on 1.5 years of differential exposure, whereas the non experimental estimates are based on 4.0 and 5.5 years of differential exposure. Note that the experimental estimator is also useful for judging the plausibility of the non-experimental estimators. As we generally expect that health may improve with more time in receiving program benefits, we expect the impact estimates based on a lower differential exposure to be smaller than those based on a longer differential in program exposure.[6]

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[6] Most previous studies of PROGRESA/Oportunidades use the experimental design and concentrate on the short-run program impacts before the experimental design ended. Diaz and

In Section 2 we describe the program and in Section 3 we discuss the basic study design and data for our estimates. Section 4 presents the methodology and Section 5 the results. Section 6 concludes.

Section 2. Program Description

PROGRESA/Oportunidades began operating in small rural communities in 1997. Since then, it has gradually expanded to urban areas and now covers a total of 5 million families, or about one quarter of all families in Mexico. The program conditions cash transfers on children's enrollment and regular school attendance and on family members visiting health clinics for regular checkups. The program also includes in-kind health benefits and nutritional supplements for children up to age five, and pregnant and lactating women. Table 1 shows the amounts of monetary grants. There are two types of grants, those tied to schooling and those tied to health/nutrition. The schooling grants given for children under 22 years of age and enrolled in school between the third grade of primary and the third grade of senior high school (e.g. up until twelfth grade). In the first semester of 2006, the specific grant amounts ranged from $US11 (120 pesos) in the third grade of primary to about $US60 (665 pesos) for boys and $US69 (760 pesos) for girls in the third year of senior high school and the fixed monetary grant for nutrition was $180 pesos monthly.   The grants are received every two months during the school calendar. All monetary grants are given to the mother of the family with the exception of scholarships for upper-secondary school, which can be received by the youth themselves.

The health care and nutritional component provides basic health care for all members of the family, with some emphasis on preventive health care (Table 2). These services are provided by Mexican public health institutions including the Ministry of Health and the Mexican Social Security Institute. This component includes a fixed monetary transfer equal to about $US16.50 (180 pesos) monthly (specified to be for "improved food consumption" although the Program does not monitor the expenditures of beneficiaries), as well as nutritional supplements, which are principally targeted to children between the ages of four months and two years and to pregnant and lactating women. The nutritional supplements are also given to children aged 2 to 4 years if any signs of malnutrition are detected. Mothers visit the clinic at least once a month (more if they are pregnant or have small children) and pick up nutritional supplements monthly. To receive the fixed health and nutrition transfer, all members of beneficiary families must adhere to a regular schedule of health clinic visits. The calendar of visits varies by the age and gender of each individual (Table 3).

Beneficiaries (generally mothers) are also required to attend monthly talks at the clinics on topics such as nutrition, hygiene, infectious diseases, immunization, family planning, and chronic diseases detection and prevention. Under the 2002 extension of schooling grants to the high school level, high school students are also required to attend (separate) talks on topics aimed towards adolescents.

Handa (2006) present informative estimates for our study that are successful at replicating *PROGRESA/Oportunidades* short-term impacts on school and work using non-experimental methods (cross-sectional matching).

There is a maximum limit of monthly benefits for each family that was equivalent in 2006 to about $US100 for families with children in primary and junior high school and $US175 for those with (at least one) children in senior high school. The maximum amount of benefits is intended to reduce any incentive the program might provide to have additional children. Benefits are provided directly to the female beneficiary by wire transfer in offices and modules that near the communities. The average monthly transfers during the twelve-month period of 2003 (the last year of the rural evaluation survey) was 309 pesos monthly per beneficiary family or about $US27.50.

In 2006, a pension for the elderly was added to the program, providing a monthly payment to each adult age 70 years or over who is part of a *PROGRESA/Oportunidades* family, equal in 2006 to 250 pesos monthly (about US$22). The data that we use and analyze were collected before the introduction of this pension.

Targeting and continued program eligibility

The program is means-tested with an elaborate targeting mechanism. The first stage of targeting is geographic, using aggregate local indicators to select poor rural communities and urban blocks. Then, to select household-level beneficiaries, in rural areas, *PROGRESA/Oportunidades* carried out a survey of socio-economic conditions for all households denominated the ENCASEH, in the selected communities. With this data, discriminant analysis was used to identify eligible households from non-eligible households. In essence, the program made an initial classification of poverty depending on a household's per-capita income. Using this initial classification, discriminant analysis related this initial classification to a number of other household characteristics including dwelling characteristics, dependency ratios, ownership of durable goods, animals and land, and the presence of disabled individuals. According to the predicted scores, a final classification of households as poor (eligible) or non-poor was made. Individuals signed their acceptance as program beneficiaries and received registration forms for schools and the family clinic. Nearly all selected families enrolled in the program in rural areas, so that self-selection in program participation is not a significant evaluation issue for the rural sample.

Section 3. Evaluation Design and Data

The original evaluation and sample design for *PROGRESA/Oportunidades* selected 506 communities with 320 randomly assigned to receive benefits immediately and the other 186 to receive benefits later (though there was no formal notification of this intention). The eligible households in the original treatment localities (we term these T1998), determined by a means test, began receiving program benefits in the spring of 1998 whereas the eligible households in the control group (T2000) began receiving benefits at the end of 1999. Between 1998 and 2000, evaluation surveys (ENCELs) with detailed information on demographics, education, health, income and expenditures were administered every six months to households in both the T1998 and T2000 groups. All households in the 506 communities in the evaluation sample, including both eligible and ineligible households, were interviewed.

In 2003, there was a new follow-up round of the rural evaluation survey (ENCEL2003). The sampling frame was augmented to include a new subsample of households from other communities that had not received the program by 2003. These communities (C2003) were selected to be similar to the communities in the original experiment through a matching

procedure that matched the experimental communities to comparison group communities based on locality characteristics, such as geographic location and the availability of schools and health clinics.

The data used in this paper are from the baseline Survey of Household Socio-economic Characteristics (ENCASEH 1997) and the follow-up Evaluation Survey of *PROGRESA/Oportunidades* (ENCEL2003).. The Survey of Household Socio-economic Conditions serves as a baseline survey for the evaluation and is the survey that was originally used to select households in the eligible communities for participation in *PROGRESA/Oportunidades.* We link the ENCASEH97 to the ENCEL2003 in order to have longitudinal data on individual household members who were 50 years of age or older in 1997 (pre-program) and therefore 56 years of age or older in 2003. For the new comparison group households, we use recall data on their 1997 characteristics to characterize their eligibility status in 1997. Linking data between 2003 and 1997 leads to data on about 8500 program eligible men and women who were age 50 or above pre-program, distributed among the three groups of our sample. Our sample of elderly in the original treatment group is 3134, in the original control group is 1914 and in the new comparison group is 3,506.

We carry out both difference matching estimates based on after program data and difference–in-difference matching estimates based on pre-program and after program initiation data.

4. Methodology

As described above, we present three sets of longer-term estimates that differ in terms of the length of exposure to the program. First, we present those based on the experimental comparison between the original randomized treatment (T1998) and control (T2000) groups, which had both by 2003 been incorporated into the program but which have 1.5 years difference in program exposure time. Since T2000 households began to receive benefits in the year 2000, comparing these two groups provides information on the effect of *differential* exposure time to the program, in this case 1.5 years (comparison B in the matrix).

Next, we estimate non-experimental longer-term program impacts against the benchmark of no program. Here we compare the original treatment group (T1998) and the original control group (T2000) with the new comparison group (C2003) that was drawn from rural areas that had not yet been incorporated into the program in 2003, reflecting having received benefits for 5.5 and 4.0 years versus never having received benefits (comparison C in the matrix).

We thus have three sets of estimates, based on 1.5 years, 4.0 and 5.5 years of differential exposure. We expect indicators of health to be <u>cumulative</u> e.g. with a greater differential time in the program we expect larger impacts on health status to be observed. Thus, we expect the largest impacts to be observed for the (non-experimental) comparison T1998 vs. C2003, followed by T2000 vs. C2003, and the smallest impacts to be observed for the (experimental) comparison of T1998 vs. T2000.

For the experimental T1998 vs. T2000 comparison, we estimate a linear regression of the outcome variable on an indicator of whether each program-eligible individual resided in an original treatment or original control locality. Additional covariates not affected by the program (age, adult schooling attainment, indigenous status, and pre-program household characteristics including number of rooms, electricity, type of floor and water/sewage system) are included to

increase precision.[7] For the non-experimental estimators we use individual-level nearest-neighbor matching estimators that take into account differences in observed characteristics between the (T1998 and T2000) and C2003 samples[8] (Heckman, Ichimura and Todd, 1997). The approach is analogous to the standard regression estimator, but does not impose functional form restrictions in estimating the conditional expectation of the outcome variable and reweights the observations according to the weighting functions implied by the matching estimators. These propensity score matching estimators have two stages. In the first stage, the propensity score is estimated using a logistic model and a set X consisting of pre-program (1997) household- and locality-level characteristics. The second stage uses local linear regressions to construct matched no-treatment outcomes for each treated individual.

The analysis here is restricted to aging adults age 50 and above in 1997 who are in the samples in both 1997 and 2003. For most of our health indicators, pre-program information was not available, we use primarily after-program-initiation difference matching. For labor force participation, for which we do have pre-program information, we use difference-in-difference estimators. Difference–in-difference estimators have the advantage of allowing for selectivity into the program to be based on unobserved fixed attributes (analogous to fixed effects).[9]

The pre-program (and thus unaffected by the program) variables used for the matching include an individual's age, gender, indigenous status, schooling and marital status in 1997 as well as demographic characteristics of the households in 1997, a number of household characteristics and consumer and production durables in 1997, the *PROGRESA/Oportunidades*' *puntaje* score for program eligibility in 1997, income in 1997 and state of residence in 1997.

Table 4 gives the estimated propensity score model for the comparison of T1998 versus C2003, for which the variables are jointly significant at the 0.1% level (according to a Chi^2 test) and which has fairly good predictive power. Figures 1a and 1b show the distribution of propensity scores in the original treatment group (T1998) and the distribution of propensity scores in the C2003 comparison group. Although the distributions between the two groups are clearly different, there is adequate support in the sense of a number of households in C2003 that

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[7] Effective attrition over the six years is about 20 percent in the T1998 treatment group and is not significantly different in the T2000 group. Mortality is related to attrition in this sample and of course a potential indicator of program impact. In fact nearly half of attrition here is due to mortality. We estimate the impact of the program on mortality for the population over age 50 at baseline comparing T1998 versus T2000 and find that while the T1998 group has slightly lower mortality levels, these differences are not statistically significant. We cannot do the same for the C2003 sample because we do not have good information on who in the C2003 sample was in the household in 1997.

[8] The localities that were included in the sampling frame for C2003 were initially selected by matching on locality characteristics. This first matching procedure to determine the comparison group localities from which households were sampled is distinct from the finer matching that we perform to obtain our estimates, which uses both household- and individual-level data in selecting the matches.

[9] The matching approach is analogous to the standard difference-in-difference (DID) regression estimator, but does not impose any functional form restriction in estimating the conditional expectation of the outcome variable and reweights the observations according to the weighting functions implied by the matching estimators.

have propensity scores similar to those in T1998, although some comparison households with very high propensity scores are likely to be used a number of times as matches. To avoid the possibility of matching aging adults of different ages and genders, in addition to the household's propensity score, we use exact matching on age and gender.

Similarly, for the T2000 versus the C2003 we carry out a separate propensity score model, whose results are extremely similar to those of the T1998 versus C2003 comparison. Graphs 2a and 2b present the distribution of propensity scores for this comparison.

Section 5. Results

Table 5 presents the principal impact estimates based on the three different periods of differential exposure for men and women on eight indicators of health and health-related behaviors separately for aging women and men (50 years of age or older pre-program in 1997). Beginning with the estimates of being exposed to 5.5 years of *PROGRESA/Oportunidades* versus never being exposed, for both aging women and men *PROGRESA/Oportunidades* increased significantly the probability of attending a health clinic in the previous two months by about 0.20. This result represents a very large proportional increase on the order of 61 percent for women and 77 percent for men. The larger proportional increase for men reflects the pre-program lower rate of having attended a health clinic in the previous two months; prior to the program, only about a quarter of men reported having visited a health clinic in the previous two months versus almost 40 percent of women.

With respect to the impacts on health and health-related outcomes, here the results are striking because of the strong gender differences. For nearly all of the health indicators, women show a significant improvement in health status. More specifically, women show a significant reduction in days reported ill and days in which they were unable to carry out their normal activities. The program also shows a significant reduction in the proportion of women reporting high blood pressure and a significant increase in the proportion of those reporting an ability to carry out vigorous activities such as running or carrying heavy objects. Finally, perhaps in part due to this improvement in health, women, who in these rural communities traditionally have very low rates of labor market participation, show a significant increase in the probability of working of almost 8 percentage points.

In contrast, apart from a positive impact on clinic visits, there are no significant impact on health and health-related outcomes for men, with the only exception of a self-reported reduction in the overall prevalence of diabetes. Such a result should be confirmed through data derived through direct measurement, and, if validated, would represent an important impact of the program. It is possible the program might reduce diabetes through the improved diet that has been documented for the program (see Hoddinott and Skoufias 2000). Other than this, however, the results show no other significant impacts of the program on health-related indicators for men. The program also shows no significant impact on the labor force participation of men.

We now turn to the additional impact estimators in Table 5 based on the non-experimental comparison of 4.0 years of benefits versus never receiving benefits and the experimental differential exposure comparison of T1998 vs. T2000 that estimates the impact of 5.5 years of receiving benefits versus 4.0 years of benefits. The comparison of T2000 to C2003 shows similar results as does the comparison of T1998 versus C2003, with generally slightly smaller impacts, as would be expected given the shorter time receiving the program. There remains a general pattern of larger and more widespread impacts on women than men under

these estimators as well. The experimental estimates comparing T1998 and T2000 show few significant effects of the program for both men and women. For women, significant impacts of T1998 compared with T2000 are apparent for consultations and the probability of working. For men, there are no significant impacts for any of the health or work variables. Thus, this estimator is also consistent with greater impacts of the program for women than for men. [10]

Overall, it is noteworthy from Table 5 that in fact, impact estimates are largest for the 5.5 differential years of exposure and smallest under the experimental estimator of 1.5 years of differential exposure, in accordance with expectations. For instance, in the case of clinic visits, the T1998 versus C2003 comparison (5.5 years of benefits versus never receiving) shows an impact for women of the program of increasing clinic visits by 0.22 for 5.5 years of benefits versus 0.19 for 4.0 years of benefits versus 0.05 for the experimental estimate of 1.5 years of differential exposure. Similarly for the case of labor market participation, the estimates show an increased participation of 7.6 percentage points with 5.5 years of differential exposure, an increase of 6.8 percentage points for 4 years of differential exposure and 3.6 percentage points for 1.5 years of differential exposure (all significant). In summary, for the variables showing significant impacts, nearly all follow the pattern of larger impacts being observed with a greater difference in time receiving program benefits. All estimates also support the conclusion that the strong program impacts are mainly on women, and are much lower for men.

Estimates in Table 6 show impacts disaggregated by age for the T1998 vs. C2003 comparison. Again, the main picture of an important gender difference in program impacts is apparent with larger impacts for women on health indicators continuing to hold. The picture is particularly striking for the elderly age 70 and above pre-program. For these females, the program reduces sick days, the days unable to carry out normal activities, the reported incidence of high blood pressure, and the reported incidence of diabetes. For men, however, there are no significant impacts on any of the health indicators in any age group. The disaggregation by age shows that the increase in female labor force participation observed in Table 6 are primarily for the age groups 50-59 and 60-69 pre-program. For men, there continue to be no significant impacts of the program on labor force participation in any age group.

6. Conclusions

This paper has analyzed the impact of *PROGRESA/Oportunidades* on health and labor force participation measures of the aging, those aged 50 and over prior to the program measured 5.5 years after the program began. We have found important impacts on male and female clinic visits. For a variety of measures of self-reported health, the program appears to significantly

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[10] Note that the comparison T1998 versus T2000 is slightly different than the other two comparisons in that it is based on comparing two groups receiving the program, with one receiving benefits longer than the other, whereas the other two comparisons are with respect to a comparison group that has never received benefits. So smaller impacts in the T1998 versus T2000 might be expected both because of a smaller differential in time receiving the program and because receiving the program may allow the T2000 group to "catch up" to the T1998 group.

improve health, with impacts that are larger with a greater time receiving the program. Nevertheless, most of these health impacts are concentrated on women.

Why are the impacts more prominent for women than men? We argue that there are several aspects to the program that might generate higher impacts on female health than on male health. First, the program is in a number of ways oriented more to women than to men.[11] In particular, women are recipients of the monetary transfers, which likely implies that they have more control over their use. Second, while for the elderly only a yearly checkup is required of PROGRESA/Oportunidades beneficiaries and there are no gender differences in this requirement, female heads *(titulares)* of the program are required to attend monthly health talks, so that many of the elderly women in our sample may attend these talks and/or accompany their daughters/grandchildren to the clinic for their more regular clinic visits requirements. This may provide the opportunity to have access to additional information on health-promoting behaviors. Additionally, as women are clearly the emphasis in *PROGRESA/Oportunidades*, by being more invested with the program, women may be more likely to follow the health measures/advice given by doctors at the health clinics.

A second issue relates to the specific mechanisms that *PROGRESA/Oportunidades* has that might lead to an improvement in health indicators for the aging. As described in the introduction, *Progresa/Oportunidades* might improve health by improving income, diet and spending on health, increasing knowledge, and inducing time reallocations. The income increases represent about 25 percent in monthly income, a substantial increase and previous evaluations have documented not only an increase in spending but an also substantial improvement in the quality and diversity of diet (Hoddinott and Skoufias, 2000). The conditionalities that lead to increased health clinic attendance and attendance at monthly health lectures may also lead to the adoption of healthier behavioral practices, as well as improved access to medicines and other health treatments. Increased income, better diet, more and better health care and more information about health practices would seem likely to lead to the sorts of effects observed here, such as the reduction of sick days and ability to better carry out daily activities. It is also possible that the program might reduce stress, an important factor affecting blood pressure. Particularly for women, *PROGRESA/Oportunidades*, by providing a regular source of income under their control, might reduce the stress associated with living in conditions of extreme poverty.

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[11] In addition to women receiving the transfers, girls in school receive higher grants than boys at the post-primary school levels and there is an important pre and post-natal health component.

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Table 1

Cash benefits of Progresa/Oportunidades (pesos per month, 2006)

	Boys	*Girls*
Primary School		
Grade 3	120	120
Grade 4	140	140
Grade 5	180	180
Grade 6	240	240
Middle School		
Grade 7	350	370
Grade 8	370	410
Grade 9	390	450
High School		
Grade 10	585	675
Grade 11	630	715
Grade 12	665	760

Fixed monthly nutrition grant per household	180 pesos
Support for adults aged 70 or more	250 pesos (begun in 2005)
Maximum household monthly transfer with no children in HS	1095 pesos
Maximum household monthly transfer with children in HS	1855 pesos

Exchange rate: 11 pesos=$1US

Note: Progresa also provides in-kind benefits including school supplies, medical consultations and nutritional supplements.

Table 2
Interventions in the basic health services package:
Progresa/Oportunidades

- ω Basic hygiene
- ω Family planning
- ω Prenatal, childbirth and post-natal care
- ω Supervision of nutrition and children's growth
- ω Vaccinations
- ω Prevention and treatment of outbreaks of diarrhea
- ω Anti-parasite treatment
- ω Prevention and treatment of respiratory infections
- ω Prevention and control of tuberculosis
- ω Prevention and control of high blood pressure and diabetes mellitus
- ω Accident prevention and first-aid for injuries
- ω Community training for health care self-help

Source: Oportunidades, 2004 (Program Operating Rules) oportunidades.gob.mx

Table 3
Annual Frequency of Health Care Visits Required by Progresa/Oportunidades

Age Group	Frequency of Check-Ups
Children	
Less than 4 months	3 check-ups: 7 and 28 days, and at 2 months
4 months to 24 months	8 check-ups: 4, 6, 9, 12, 15, 18, 21 and 24 months with 1 additional monthly weight and height check-
2 to 4 years old	up
5 to 16 years old	3 check-ups a year: 1 every 4 months
	2 check-ups a year: 1 every 6 months
Women	
Pregnancy	5 check-ups: prenatal period
Post-pregnancy	2 check-ups: 1 immediately following birth and 1 during lactation
Adults and youths	
17 to 60 years old	One check-up per year
Over 60 years old	One check-up per year

Source: Oportunidades, 2004 (Program Operating Rules) oportunidades.gob.mx

Table 4: Logit Model for Probability of Participating in Rural Progresa/Oportunidades

D=1 Original poor individuals aged 50 in treatment group beginning to receive benefits in 1998
D=0 Individuals program eligible in new comparison group never having received benefits

Variable (all pre-program 1997)	Coef.	Std. Err.	Variable	Coef.	Std. Err.
Age	-0.01	0.00	Total HH income	0.00	0.00
Gender	-0.04	0.07	Total HH income squared	0.00	0.00
Speaks indigenous language	0.61	0.11	Blender	-0.03	0.10
Speaks Spanish & indig language	0.06	0.11	Refrigerator	-0.08	0.17
Grades of schooling	-0.07	0.02	Gas stove	0.29	0.13
Married	-0.34	0.09	Gasheater	-0.03	0.24
Children 0 to 5	-0.37	0.04	Radio	0.32	0.07
Children 6 to 21	0.18	0.04	Television	0.14	0.09
Children 13 to 15	0.53	0.06	Video	0.77	0.25
Children 16 to 20	0.32	0.04	Washer	0.58	0.27
Women 20 to 39	0.06	0.08	Car	-0.51	0.41
Women 40 to 59	-0.26	0.08	Truck	0.40	0.25
Women 60+	-0.33	0.07	State1	0.23	0.17
Men 20 to 39	0.18	0.05	State2	0.62	0.15
Men 40 to 59	-0.28	0.08	State3	0.10	0.16
Men 60+	-0.40	0.08	State4	-0.08	0.15
# Rooms	0.00	0.01	State5	0.18	0.15
Electricity in HH	-0.50	0.07	State6	-1.22	0.14
Water in HH	-0.79	0.07	Missing water	-2.16	0.08
Dirt floor	-0.42	0.09	Missing electricity	-2.35	0.12
Room material (inferior)	0.33	0.08	Missing rooms	0.94	0.85
Wall material (inferior)	0.21	0.08	Missing income	-0.84	1.32
Own animals	0.14	0.07	Missing own animals	1.97	1.39
Own land	0.37	0.07	Missing ownland	1.05	2.22
Score	1.79	0.21	Constant	1.09	0.41
Score squared	-0.17	0.03			
Number of obs	6536		Pseudo R2	0.268	
LR chi2(49)	2421		Log likelihood	-3309	

Table 5
Table 5
Estimated Impacts of *Oportunidades* on Health and Work
by differential time of exposure to *Progresa/Oportunidades*.
Nearest neighbor matching.
Men and women aged 50 and over preprogram

Indicator	Impact (Standard error)			
		by treatment/control comparison.		
Women	C2003 level	T1998vs.C2003	T2000 vs. C2003	T1998 vs. T2000
Probability of attending clinic in previous 2 months	0.36	0.215 (0.026)*	0.193 (0.031)*	0.050 (0.025)*
Days reported sick in previous 4 weeks	3.54	-1.04 (0.351)	-1.15 (0.424)	-0.218 (0.288)
Days unable to carry out normal activities in previous 4 weeks	1.65	-0.730 (0.252)*	-0.655 (0.304)*	-0.214 (0.217)
Proportion with diabetes (self-reported)	0.123	-0.015 (0.017)	-0.041 (0.019)*	0.007 (0.014)
Proportion with high blood pressure (self-reported)	0.328	-0.105 (0.023)*	-0.083 (0.028)*	0.000 (0.020)
Proportion able to carry out vigorous activities such as running or carrying heavy objects	0.69	0.055 (0.022)*	0.057 (0.027)*	-0.000 (0.020)
Number of kilometers able to walk before getting tired	2.16	-0.081 (0.052)	-0.130 (0.069)	0.023 (0.136)
Proportion working in the previous week in activity contributing to family income	0.15	0.076 (0.021)*	0.068 (0.025)*	0.036 (1.73)*
Men				
Probability of attending clinic in previous 2 months	0.26	0.188 (0.025)*	0.179 (0.028)*	0.025 (0.023)
Days reported sick in previous 4 weeks	2.5	-0.017 (0.314)	-0.418 (0.359)	0.098 (0.292)
Days unable to carry out normal activities in previous 4 weeks	1.4	0.031 (0.293)	0.019 (0.296)	-0.031 (0.244)
Proportion with diabetes (self-reported)	0.076	-0.034 (0.012)*	-0.022 (0.014)	0.005 (0.010)
Proportion with high blood pressure (self-reported)	0.145	-0.014 (0.018)	-0.15 (0.020)	0.007 (0.017)
Proportion able to carry out vigourous activities such as running or carrying heavy objects	0.80	0.014 (0.019)	0.004 (0.216)	0.011 (0.017)
Number of kilometers able to walk	3.88	-0.15	-0.401*	-0.036

before getting tired		(0.194)	(0.192)	(0.172)
Proportion working in the previous week in activity contributing to family income	0.779	0.016 (0.022)	0.050* (0.026)	-0.023 (0.023)

† All estimates are after program difference estimators with the exception of working, which is a double difference estimator using before and after program information. 2 neighbors.
　*Significantly nonzero at 5% level.

Table 6
Estimated Impacts of *Oportunidades* on Health and Work after 5.5 years of benefits
Nearest neighbor matching † T1998 vs. C2003
Men and women by age group

Indicator	Impact (Standard error) by pre-program age group		
Women	50-59	60-69	70 and above
Probability of attending clinic in previous 2 months	0.301 (0.036)*	0.058 (0.050)	0.243 (0.054)*
Days reported sick in previous 4 weeks	-0.640 (0.431)	0.086 (0.661)	-3.40 (0.968)*
Days unable to carry out normal activities in previous 4 weeks	-0.557 (0.271)*	0.326 (0.513)	-2.51 (0.729)*
Proportion with diabetes (self-reported)	-0.032 (0.023)	0.018 (0.031)	-0.068 (0.032)*
Proportion with high blood pressure (self-reported)	-0.075 (0.034)*	-0.120 (0.041)*	-0.195 (0.050)*
Proportion able to carry out vigorous activities such as running or carrying heavy objects	0.043 (0.030)	0.055 (0.046)	0.088 (0.056)
Number of kilometers able to walk before getting tired	0.147 (0.254)	-0.047 (0.032)	0.118 (0.151)
Proportion working in the previous week in activity contributing to family income	0.106 (0.033)*	0.120 (0.039)*	0.058 (0.038)
Men			
Probability of attending clinic in previous 2 months	0.210 (0.035)*	0.206 (0.045)*	0.100 (0.056)*
Days reported sick in previous 4 weeks	-0.243 (0.377)	-0.370 (0.579)	1.27 (1.33)
Days unable to carry out normal activities in previous 4 weeks	0.031 (0.293)	-0.441 (0.372)	0.982 (0.852)
Proportion with diabetes (self-reported)	-0.026 (0.018)	-0.030 (0.125)	-0.015 (0.060)
Proportion with high blood pressure (self-reported)	-0.011 (0.025)	-0.027 (0.032)	-0.020 (0.040)
Proportion able to carry out vigourous activities such as running or carrying heavy objects	-0.019 (0.023)	0.047 (0.038)	0.018 (0.060)
Number of kilometers able to walk before getting tired	0.058 (0.344)	0.162 (0.347)	0.075 (0.279)
Proportion working in the previous week in	0.016	-0.006	0.065

| activity contributing to family income | (0.027) | (0.044) | (0.581) |

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† All estimates are after program difference estimators with the exception of working, which is a double difference estimator using before and after program information. 2 neighbors.
*Significantly nonzero at 5% level.
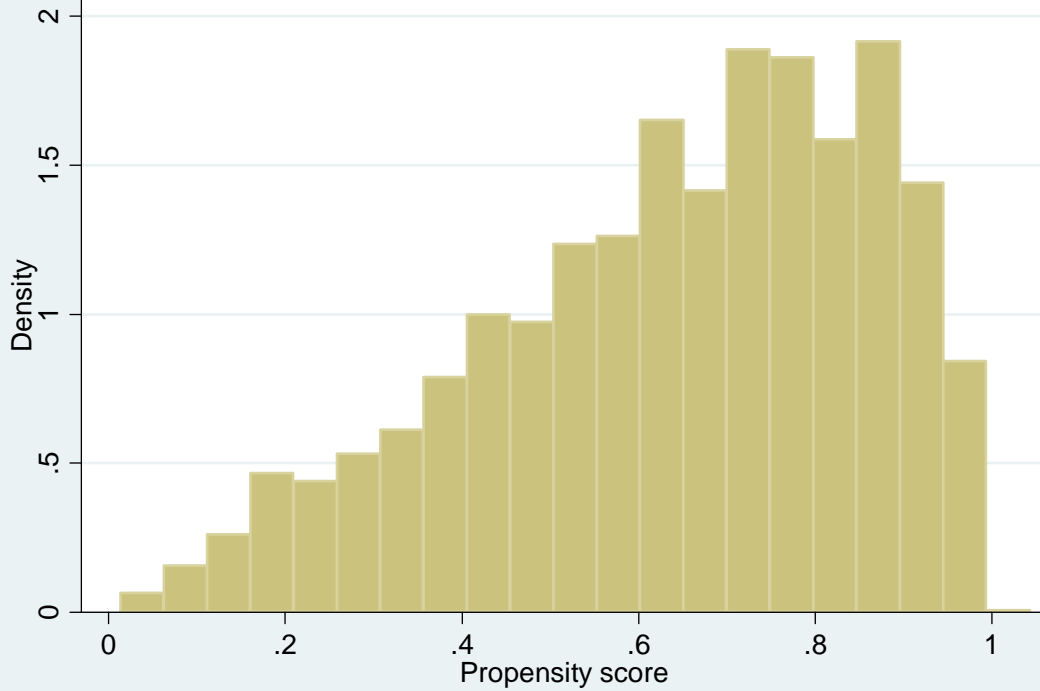
Figure 1a. Distribution of Propensity Score: Treatment98

Figure 1b. Distribution of Propensity Score: New Comparison Group

Figure 2a. Distribution of Propensity Score: Treatment00

Figure 2b. Distribution of Propensity Score: New Comparison Group

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