Old-age income and health care utilization: A consumption puzzle in Mexico

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This paper uses the quasi-experimental implementation of a non-contributory pension scheme in Yucatan, Mexico to evaluate the health care utilization and expenditure responses of the elderly to an exogenous unanticipated income shock. Using a difference-in-difference approach and data from a longitudinal aging survey we find evidence that non-contributory pensions encourages the use of formal health care services by 8.6 percentage points and medication adherence by approximately 6.7 percentage points. Furthermore, individuals with previous utilization shift from informal to formal services portraying a transfer to higher quality care. In contrast to the greater utilization, we find a reduction in out-of-pocket health expenditures potentially explained by the higher uptake of public health insurance. Finally, we find that non-contributory pensions reduce the incidence of catastrophic health care expenditures by 18 percentage points. Overall, our findings suggest that post-retirement income shocks can improve health care utilization, uptake of health insurance, and financial risk protection amongst the elderly.

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Social protection programs have grown across the world, in particular those that provide old-age income support for the elderly (United Nations, 2013). Despite the expansion of these programs there is still little understanding on how they impact consumption in this age-group. In a recent paper Tullio Jappelli and Luigi Pistaferri (2010) develop a series of predictions of how household consumption should respond to different types of income shocks. In particular, they suggest that consumption should only respond to unanticipated shocks, or to anticipated income shocks under credit constraints. Due to the large interest in understanding consumption responses many studies have evaluated the effect of anticipated income shocks, however the literature on unanticipated shocks is scarcer and greater challenges exist in identifying true exogenous unanticipated income shocks (e.g. Jonathan Gruber, 1994, Tullio Jappelli and Mario Padula, 2015, Christina H Paxson, 1993, Kenneth I Wolpin, 1982).

In this paper we take advantage of a quasi-experimental implementation of a pension scheme in the Yucatan province in Mexico to evaluate the effect of an unanticipated income shocks on health care utilization, expenditures, health insurance uptake, and financial risk protection. For this we compare health care consumption patterns between the treatment city of Valladolid and the control city of Motul using a difference-in-difference approach. In December 2008, eligible individuals aged 70 and over in the city of Valladolid began receiving a non-contributory lifelong benefit of MXN $550 per month (US$58.07 at 2014 PPP). Pensions were distributed in cash at the town hall or delivered to beneficiaries with important physical limitations.

We use data from baseline and follow-up survey conducted in both cities a few months before the announcement and implementation of the pension program (August-November 2008) and 6 months after the first pension disbursement (July–September 2009). Data was collected on 2,299 individuals aged 70 and over from both cities using the Survey of Household Economic Characteristics in the State of Yucatan (ENCAHEY), a conceptually comparable survey to the Mexican Health and Aging Survey (MHAS) but adapted to the cultural and institutional characteristics of Yucatan. The survey instrument adapted measures from other studies such as the U.S. Health and Retirement Survey (HRS), the U.S. Panel Study of Income Dynamics (PSID), amongst others. Our analysis uses a difference-in-difference approach that exploits the control and treatment nature of the different cities to compare health care expenditure patterns and changes in health care consumption.

There are few previous studies that evaluate the effect of non-contributory pensions on access to health insurance, out-of-pocket (OOP) health expenditures, and on health care utilization patterns. Two previous studies in Brazil had found that pensions improve access to health care services and medications at the household level however do not evaluate the effect on utilization patterns (Peter Lloyd-Sherlock, 2006, Helmut Schwarzer and Ana Carolina Querino, 2002). Furthermore, in a previous study using data from the same experiment Emma Aguila et al. (2015b) found a higher proportion of elderly recipients reporting visiting to doctors. They also find a decline in the proportion of elderly recipients reporting having a serious health problem and not going to the doctor by 4.4 percentage points; and strong improvements in elderly's health. These studies however only evaluate a limited range of health outcomes, and it is of interest to understand how unanticipated income shocks can influence health care utilization patterns, health insurance uptake, and financial risk protection.

Our results show that a non-contributory pension scheme encourages the use of formal health care and the likelihood of taking prescribed medications. Furthermore, we disentangle the effect according to baseline utilization of health care and find that individuals without use at baseline increase their use of informal care services and medication. Meanwhile, individuals with baseline use shift from informal to formal services highlighting a move from low quality to high quality health care once their minimum needs are covered. We find, in contrast to the theory, that individuals in the treatment village reduce their overall out-of-pocket health expenditures that can be explained by the increased uptake of public health insurance. Finally, we find that non-contributory pensions can have important effects on financial risk protection with individuals in the treatment village being 18 percentage points less likely of having a catastrophic health care expenditure.

This paper builds upon the current literature and finds evidence to support the proposal that unanticipated income shocks leads to large consumption responses when the time horizon is finite, the shock is persistent, individuals face borrowing constraints, and precautionary savings motives are strong (Christopher D Carroll, 1996, Christopher D Carroll et al., 1992, Tullio Jappelli and Luigi Pistaferri, 2010, Stephen P Zeldes, 1989a, b). This is also in line with evidence showing that conditional cash transfers increased the use of different health services (Mylene Lagarde et al., 2007). Furthermore, we find evidence to support previous studies that have shown income shocks to influence health care spending patterns specifically among the elderly (Gopi Shah Goda et al., 2011). Finally, we find evidence to suggest that income shocks can increase the uptake of health insurance and thus highlight the influence that pension income can have on different aspects (Laura B Rawlings and Gloria M Rubio, 2005).

This paper is organized as follows. Section 1 describes the *Reconocer* program in general and the quasi-experimental nature of its implementation in the Yucatan province. Section 2 briefly presents a theoretical framework use to predict the effects that an unanticipated income shock can have on health care use and expenditures. Section 3 presents the data and methodology used in this paper. Section 4 presents the results and section 5 concludes.

I. The *Reconocer* program in Mexico

The *Reconocer* program, Yucatan's non-contributory pension program, was part of the social platform for Yucatan's newly elected government in 2007 as a response to the growing number of older adults in poverty conditions. The program was implemented in three phases over 37 localities in the state of Yucatan, Mexico over a period of four years. Phase I and II were implemented in rural areas, were the program provided monthly cash payments to adults age 70 and over of MXN$ 500 (US $61 in 2011 PPP) and a food basket. The program was expanded to urban areas in phase III (Emma Aguila et al., 2014), where the main component of the program was a monthly cash transfer of MXN $550 (US$ 58.07 in 2014 PPP). This amounts to approximately one-half of the monthly minimum wage in Yucatan which amounted for $1,089 MXN per month or US$114.97 in 2014 PPP (CONASAMI, 2016). In contrast to many other programs across the world, the *Reconocer* pension program included all adults over the age of 70 and did not apply mean-testing.

During the third phase, the *Reconocer* program expanded to cities with populations of more than 20,000 inhabitants. Eleven cities were selected for this phase. With the perspective of evaluating the program the state government chose

Valladolid and Motul among the 11 cities as treatment and control respectively. The first pension payment was made in Valladolid in December 2008 (Emma Aguila, Abril Borges, Arie Kapteyn, Rosalba Robles and Beverly A Weidmer, 2014). The following paper focuses and evaluates the effect of the non-contributory pension program on health care use in the first six months after implementation.

Despite the expansion of the *Reconocer* program over a period of 4 years the program represented an unanticipated income shock for individuals in the evaluated cities for several reasons. First, the pension program began in rural localities and there was no certainty on the timing of implementation. Second, the quasi-random implementation of the pension program in the third phase implies an unanticipated income shock for those living in the treated city. Finally, while the *Reconocer* program was part of the social platform of the elected government there was no announcement of timings or cities that would be affected by the program. Consequently, individuals in the evaluated cities would have known about the program but would not have known whether it would take place in their locality.

II. Theoretical framework

Seminal work on life-cycle and permanent income models suggest that individuals anticipate changes in income and smooth their income throughout their life time (Milton Friedman, 1957, Franco Modigliani and Richard Brumberg, 1954). This original work has guided research in the area of consumption for decades but faced important challenges in distinguishing what constitutes a predictable change in income from an unanticipated change in income from both a theoretical and empirical perspective. For this paper we rely on the models

developed by Tullio Jappelli and Luigi Pistaferri (2010) to predict the effects that a non-anticipated but permanent income shock should have on health care consumption.

For this, we consider an agent who seeks to maximize time separable utility of consumption over a certain period of time given by:

$$(1)\ \sum_{i=t}^{\tau}(1+\delta)^{t-i}U(i,C_i)$$

where δ is the pure rate of time preference, C_i is the consumption in period *i*, and $U(i,C_i)$ is the within period utility function. The agent seeks to find a consumption plan $C^*(t,\tau)=(C_t^*,C_{t+1}^*,\dots,C_\tau^*)$ that maximizes (1) subject to the following intertemporal budget constraint:

$$(2)\ (1+r)^{i-t}\left[A_t+\sum_{j=1}^{i-1}(1+r)^{i-j}(Y_j-C_j)\right]\geq B_i$$

where A_i is the net worth in period *i,* B_i is the minimal level of net worth, *r* is the real rate of return, and Y_j is real income. This problem is solved by the consumption Euler equation:

$$(3)\ u'(c_{it-1})=\frac{E_{t-1}\left[(1+r_t)u'(c_{it})\right]}{(1+\delta)}$$

As noted by Robert E Hall (1979), *ex-post* marginal utility will only change if expectations are not realized, thus meaning that anticipated income shocks will not have an effect on marginal utility of consumption because the agents will already have incorporated this decline in income as part of their optimal consumption plan.

The model before enables us to evaluate how household consumption responds to unanticipated changes in income such as the ones characterized by the *Reconocer* pension scheme in Yucatan. Using only income as a source of uncertainty, equation 3 can be written as follows:

$$(4) \quad \Delta c_{it} = \frac{r}{1+r}\left(1 - \frac{1}{(1+r)^{\tau-t+1}}\right)^{-1} \sum_{i=0}^{\tau-t}(1+r)^{-\tau}(E_t - E_{t-1})Y_{it+\tau}$$

which implies that changes in consumption between periods $t-1$ and t depend on revisions in the expectations for future incomes between the periods. Thus when a pension scheme such as the *Reconocer* program is implemented there is new information about future income that leads to an update of the optimal consumption plan. From the equation above it is also possible to see that the impact will depend on the real interest rate. Tullio Jappelli and Luigi Pistaferri (2010) go further to show that the consumption responses will depend the income process assumptions. In particular, and relevant to our scenario, they show that the higher degree in persistence of the shock the more volatile the consumption will be between periods. Consequently, the models lead to the expectation that the persistent pension income shock created by the *Reconocer* program should increase consumption overall. Furthermore, we expect some impact on health care consumption given the importance of health care amongst the elderly and previous evidence health expenditure as a proportion of total consumption in this age group (Victor R Fuchs, 1999).

III. Data and Methodology

A. Data

In this paper we use the data collected in the baseline and follow-up survey using the Survey of Household Economic Characteristics in the State of Yucatan (ENCAHEY). This survey is conceptually comparable to the Mexican Health and Aging Study (MHAS) but has been adapted to reflect cultural and institutional characteristics of Yucatan. The surveys included a comprehensive set of measures related to health, working hours, access to medicine and doctors, access to food, and the price of food and medicines. Validated measures were adapted from other

existing survey such as MHAS; the U.S. Health and Retirement Study (HRS); the U.S. Panel Study of Income Dynamics (PSID); the Survey on Health, Well-Being, and Aging in Latin America and the Caribbean (SABE) amongst others. Complete descriptions of the protocols of the implementation of the research project are available elsewhere (Emma Aguila et al., 2015a).

Our sample contains household and individual information on 2,299 individuals age 70 and over from the cities of Valladolid and Motul in a 9-month period. For individuals in our sample we have information on their demographics, out-of-pocket expenditures, health care utilization, self-reported health status, chronic conditions, family characteristics, different biomarkers, and household income and assets. Additionally, the data contains information on community level health services, public and private programs, and institutions that provide services and support for older workers. The response rate at baseline was 91.4% in Valladolid and 95.2% in Motul, whereas the rate at follow-up was 87.9% in Valladolid and 81.9% in Motul.

Out-of-pocket health expenditures includes doctor, folk healer, dentist, outpatient surgery, and hospitalization costs of the elderly respondent. Unfolding brackets and missing responses were imputed following similar imputation methods to the MHAS (Rebeca Wong and Monica Espinoza, 2003). All components of out-of-pocket health expenditures were imputed separately and deflated using the Mexican National Consumer Price Index (INEGI, 2016).

The data collected from these surveys provides several advantages. The survey measures used in this study have been adapted from other aging surveys across the world thus making the analysis comparable to other countries. Furthermore, the conceptual comparability with the MHAS survey implies that the results from

these surveys can be compared with other surveys representative of the total Mexican population. Additionally, the detailed measures of health care utilization and out-of-pocket expenditure allow us to disaggregate the consumption effect of the pension income shock by type of care. Finally, we have information on health insurance coverage that allows us to distinguish the effect of pension income on health insurance uptake.

Table 1 presents descriptive statistics for our sample in Motul and Valladolid at baseline. An initial balance test suggests that both groups are comparable in all but four dimensions. The average age in both cities is approximately 78 years with an average education of 1.9 years. A large fraction of individuals in the sample are either in a couple (47%) or widowed (35%). The average monthly household income at baseline is about $172 USD in Motul and $206 USD in Valladolid representing a difference of approximately $34 USD. A comparable fraction of the sample works for pay and there are approximately 3.4 people per household. In Motul, individuals have on average 0.81 chronic conditions, and a depressive symptom score of 0.57. To compare, in Valladolid individuals reported an average of 0.68 chronic conditions and a depression score of 1.04. The final row shows that approximately 82% of individuals in Valladolid where receiving the *Reconocer* pension after 6 months.

[Insert Table 1 Here]

Table 2 presents and compares the data on different health seeking behaviors between villages. The data show that individuals in Motul have greater access to formal care and take their medication. Additionally, expenditures in different types of care is significantly lower at baseline in Motul. Finally, the uptake of

social security and overall health insurance is larger in Motul, while uptake of private and public health insurance is greater in Valladolid.

[Insert Table 2 Here]

B. Methodology

To evaluate the health care utilization and expenditure effects of a permanent unanticipated income shock amongst the elderly we use a difference-in-difference approach. For this we define the treatment group as those individuals over the age of 70 and residing in Valladolid where the pension program was implemented from December of 2008 onwards, and the control group is composed by individuals age 70 and over from the city of Motul. We use data from the Mexican Household Income and Expenditure Survey (ENIGH) to provide some evidence concerning the common trends assumption that this approach requires. Table 3 presents the results from this preliminary regression and shows that the trends in Valladolid are not significantly different than those in Motul. Although this analysis provides some support to our assumption there is the caveat of the small sample size. To evaluate the robustness of our analysis we use a matching difference-in-difference approach where we match individuals from both cities according to their baseline propensity score as shown in Appendix Figure 1.

[Insert Table 3 Here]

Another condition for the difference-in-difference approach is that no other reform was implemented differently in the treatment and control village during the evaluation time. Two programs to consider are *Oportunidades* and *Seguro Popular*. In the first case, the program *Oportunidades* was implemented in 1997 and evidence shows that its coverage stagnated from 2005 onwards (Evelyne Rodríguez, 2005). This emphasizes the non-differential impact of *Oportunidades*

in the treatment and control village during the time of the study. The case of *Seguro Popular* is different because the roll-out timing were different across municipalities. This could consequently bias the difference-in-difference estimates. However, a report from the ministry of health shows that this timing was the same for Motul and Valladolid, and furthermore both municipalities had already been included in the *Seguro Popular* program by the end of 2006 (CONEVAL, 2006). Since both cities belong to the same federal government, and these programs were implemented simultaneously in both locations it is therefore likely that the common trends assumption holds.

Building on this, our main results and robustness analysis evaluate the effect of an unanticipated income shock on health care utilization and expenditure using the following specification:

$$(5)\ Y_{it} = \beta_1 T_i + \beta_2 P_{i,t} + \beta_3 T_i P_{i,t} + \beta X_{i,t} + I_i + \epsilon_{i,t}$$

Where Y_{it} is a binary outcome of whether the individuals has accessed a specific health service in the last 3 months or the linear value of health expenditure. T_i is whether individual *i* is in treatment group received, and is equal to 0 in the control group. $P_{i,t}$ is an indicator variable for the period post implementation of the *Reconocer* program; $X_{i,t}$ are controlling variables including health status and demographic characteristics; and I_i are individual fixed effects. Due to the autocorrelation between outcomes standard errors are clustered at the individual-level. The models before estimate the intent-to-treat effect of the *Reconocer* pension program, i.e. the effect of the program on all the individuals in the treatment village.

In terms of outcomes, we evaluate access to health care, health expenditures, health insurance uptake, and financial risk protection. In the first case we combine

different types of self-reported care into the following categories: formal, informal, hospital, medication uptake, and access to any type of care. Formal health care is defined as access to a dentist, outpatient care, or a doctor in the last 3 months. Informal care corresponds to folk healers and consultation with the pharmacists. Access to hospital is defined as having at least a one night stay in a hospital during the last 3 months. Medication uptake is defined as taking their medication conditional on having a prescription. In the case of health care expenditure, we use similar categories as before and evaluate self-reported expenditures during the last 3 months.

Concerning health insurance, we define four categories based on the characteristics of the Mexican health care system: private health insurance, social security, and public health insurance. In our models we evaluate the effect of being eligible for the *Reconocer* program on the uptake of these categories of health insurance, as well as uptake of any type of health insurance. For all of the outcomes above we stratify our models by whether the individual had any access to health care, or if they had health insurance at baseline. Finally, for financial risk protection we evaluate the effect of the *Reconocer* program on the incidence of catastrophic health care expenditures. We define this as a binary variable that identifies individuals who live in households where their health care expenditure is greater than 20% of the total household income(Adam Wagstaff and Eddy van Doorslaer, 2003). This has been often considered in the literature as an important source of financial hardship (Ke Xu et al., 2007, Ke Xu et al., 2003).

IV. Main Results

A. Health care utilization: Eliminating utilization barriers

Table 4 presents the coefficients of the *Reconocer* program on different categories of health care utilization. The results in Panel A for the complete sample show an overall reduction in access to any type of health care. However, this reduction was small in the treatment village. This suggests that the *Reconocer* program encouraged the use of health care service when compared to individuals without the program. Specifically, we find that an unanticipated income shock for the elderly leads to an 8.6 percentage point increase in the access to formal health care services in the last 3 months relative to the control group. Furthermore, individuals in the treatment village had on average a 6.7 percentage point higher medical adherence. The previous results are confirmed by that of overall health care use where individuals in the treatment village had on average a 6.7 percentage point higher use of health care services. These results are consistent with a growing literature in the healthcare domain showing that income is associated with better medical adherence and increased health care utilization (M Robin DiMatteo, 2004, Gopi Shah Goda, Ezra Golberstein and David C Grabowski, 2011). One additional result to note is the larger, yet insignificant, reduction in use of informal care amongst those who were eligible for the non-contributory pension program. The combination of all results from Panel A suggest that an income shock can have the potential of shifting health care use from informal to formal services. This is supported by the literature showing that when financial barriers are addressed individuals shift from low to high quality health care use that is usually expensive (Ronald Andersen and John F Newman, 2005, Annette L Fitzpatrick et al., 2004).

[Insert Table 4 Here]

The results discussed above show an overall positive effect of unanticipated income shocks on health care use, however they do not provide a nuanced vision of how non-contributory income can influence different individuals. Panels B and C provide similar results stratifying the models by individuals who had any health care utilization at baseline and those who did not. Panel B presents the coefficients for individuals without any health care use at baseline. The results from columns 2 and 4 show that an unanticipated income shock leads to an increase in use of informal health care services such as pharmacists of folk healers, and an increased adherence to medications. This suggests that eliminating financial barriers will first encourage individuals to have any type of health care use, regardless if it is considered low quality. Panel C in contrast presents the results for individuals with any use of health care at baseline. The results from columns 1 and 2 show that individuals eligible for the pension program had a 10.2 percentage point higher use of formal health care services, and a 6.7 percentage point lower use of informal services. The results suggest that informal care may be an inferior good that as income increases individuals shift from informal to formal care. This conclusion is important as it shows that elderly individuals will use any type of health care until they have sufficient income to substitute low quality for high quality care.

The results presented above only discuss the effect of being eligible for the *Reconocer* pension program. Appendix Table 1 presents the difference-in-difference estimates comparing individuals who actually received the non-contributory pension with those that do not. Similar to the results in Table 4, receiving the non-contributory pension encourages the use of formal care, medication adherence, and access to any type of health care while discouraging the use of informal care.

B. Health care expenditure: A consumption puzzle

Estimating the effect of the unanticipated income shock on health care expenditure we find that while health care utilization increases, health care expenditure does not. Table 5 presents the individual fixed effects models coefficients for different categories of health care utilization. As before, Panel A presents the results for the full sample and shows that individuals eligible for the non-contributory pension program have on average a greater reduction in health expenditures than individuals in the control village. The coefficients from columns 1, 3 and 4 suggest that an unanticipated income shock can lead to average reductions of of $6 USD in formal health care expenditures, $24.45 USD in hospital stays expenditures, and $31.38 USD in total OOP health care expenditures relative to the control village. This suggests that the largest reduction in expenditures is accrued in hospital services which is intuitively linked to their higher costs.

[Insert Table 5 Here]

Similar as before, Panel B presents the results for individuals with no health care utilization at baseline. The results show that while there is an overall reduction in expenditures, this reduction is not statistically significant to that which occurs in the control village for ineligible individuals. This implies that most of the difference in health care expenditure trends occurs amongst individuals that had any type of health care use. The results for this are presented in Paenl C and show that eligible individuals with any health care use at baseline had on average $10.70 USD, $43.36 USD, and $55.56 USD lower expenditures on formal services, hospital stays, and total OOP health expenditures when compared to individuals in the control village. It is important to notice that the reduction in expenditures is approximately 10% of unanticipated income shock.

As before, Appendix Table 2, provides the difference-in-difference for receiving the non-contributory pension income. The results for health care expenditure qualitatively similar however with larger standard errors. These results confirm that receiving the non-contributory pension leads to a reduction in health care expenditure but the larger variation suggests that individuals receiving the pension may have higher consumptions than those who do not. This would provide supportive evidence to the theory linking unanticipated income shocks to higher consumptions.

C. Health insurance: Explaining the expenditure puzzle

The results above suggest that unanticipated shocks can increase health care utilization, but at the same time reduce health care expenditures. While the first is in line with the theory, the second contradicts our expectations that an unanticipated income shock should increase overall expenditures. One possible explanation for this is improvements in health that lead to lower overall expenditures in health care (Laura B Rawlings and Gloria M Rubio, 2005, James P Smith, 1999). This possibility would be in line with the current evidence showing that the *Reconocer* program leads to improved health (Emma Aguila, Arie Kapteyn and James P Smith, 2015b). It is however unlikely that these effects are transferred to expenditure in such a short time. We explore another potential reason which is health insurance since it would intuitively increase health care use but at the same time reduce OOP expenditures.

Table 6 presents the estimated effect of the *Reconocer* program on health insurance uptake for the full sample in Panel A; for individuals without and with previous health care use in Panels B and C; and for individuals without and with

health insurance at baseline in Panels D and E. The results from the full sample show that individuals eligible for the non-contributory pension program have on average a 3.9 percentage point higher uptake of public health insurance. Furthermore, we find that in the treatment village the uptake of any type of health insurance is 2.9 percentage points higher than in the control village. This increased uptake of health insurance could explain the higher use of health care as well as the lower overall expenditure. Furthermore, the results are consistent with previous literature showing how income influences health insurance uptake in other countries (A Colin Cameron and Pravin K Trivedi, 1991, Carmen DeNavas-Walt et al., 2004). Our findings show that the largest uptake is that of public health insurance, mainly *Seguro Popular,* which despite its public nature does require the payment of annual fees that can be as high as $1,370 USD in 2014 PPP. This is equivalent to approximately 20% of the pension income provided by the *Reconocer* program. Consequently it is possible that individuals are able to cover the public health insurance fee with the unanticipated pension income shock.

[Insert Table 6 Here]

Looking at the results from Panel B and C, we observe the general trend that the uptake of any type of health insurance is higher in the case of Valladolid than in Motul, for both individuals with and without previous health care utilization. However, the difference is particularly significant in the case of public health insurance uptake for individuals without utilization of any type of health service at baseline. For these, being eligible to the *Reconocer* program lead to an increase of more than 50% in the uptake of public health insurance when compared to the trend in Motul. Similar to Panel A, we also find a 4.6 percentage point increase in

the uptake of any health insurance thus confirming the likelihood that insurance uptake led to higher health utilization and lower health care expenditures.

Panel D presents the estimates for individuals without health insurance at baseline. The results show that overall there was a large increase in health insurance uptake providing further support to health insurance as a potential explanation for the negative trends in health care expenditure. More importantly, the results from column 3 show an increase in uptake of public health insurance of approximately 7.4 percentage points. The results for any health insurance is stronger than in the results before and shows that being eligible for the non-contributory pension programs increase the uptake of any type of health insurance by 9.8 percentage points amongst those without any health insurance at baseline. Finally, Panel E presents the results for individuals with previous health insurance and there is no significant difference in trends between Valladolid and Motul. As for the previous results, Appendix Table 3 presents the estimates for receiving a non-contributory pension on the uptake of health insurance. The results confirm the estimates above and suggest even stronger effects.

In summary, our results suggest that a non-contributory pension program can lead to an increased uptake of health insurance overall and specially among those without previous health insurance. These results can explain part of the puzzle where health care expenditures decrease in contrast to overall health care utilization. While we discussed the potential for pensions to reduce the financial barriers of purchasing health insurance, it is also possible that such non-contributory programs can act as an informational channel where pension recipients learn about other programs that they are eligible for.

D. Non-contributory pensions and financial risk protection

One of the main reasons for the use of non-contributory pension in Latin America has been poverty reduction (C. Mesa-Lago, 2008, P. Whiteford and E. Whitehouse, 2006). Therefore, beyond the effect on health care consumption and insurance uptake, pensions have an intrinsic goal of providing financial risk protection and promoting economic well-being. We evaluate the role of the *Reconocer* program on financial risk protection by estimating its effect on the incidence of catastrophic health care expenditures. Table 7 presents the results for different categories of individuals. The coefficient in the first column shows that individuals in the treatment village are 17.3 percentage points less likely to have catastrophic health care expenditures. The reduced incidence of financial hardship due to medical expenditures is likely due to the increase household income from the non-contributory pension income, as well as the reduced health care expenditure.

[Insert Table 7 Here]

Columns 2 to 5 present similar results but for different individuals. Overall, we find that regardless of health insurance or health care use at baseline, being eligible for the non-contributory pension income reduces the likelihood of financial hardship due to medical expenditures. Appendix Table 4 presents similar results for the effect of receiving the non-contributory pension income. This results are in line with previous studies of the experiment showing that individuals were less likely to forego health care due to income reasons (Emma Aguila, Arie Kapteyn and James P Smith, 2015b).

E. Robustness analysis: Matching Difference-in-Difference

To address the limitations in the testing of the common trends assumption, we performed a propensity-score matched difference-in-difference based on baseline characteristics. Appendix Table 5 presents the effect estimates of the Reconocer program on health care utilization for the full sample and according to baseline health care use. The results for the matched analysis are similar to those in main results and suggest that the *Reconocer* program encourages formal health care use and medication adherence. Furthermore, the matched results confirm that for individuals without previous access to health care there is an increase in the use of informal care, and a larger increase in medication adherence. Finally, the results in Panel C confirms the shift from informal to formal health care for those eligible to the *Reconocer* program.

Appendix Table 6 presents the matched difference-in-difference estimates for the effect of the *Reconocer* program on health care expenditure. Similar to the main results we find that individuals in the treated village have a larger reduction in health expenditure for all categories when compared to those individuals in the control village. This provides some confirmation of the results obtained before and further suggests that being part of the *Reconocer* program can lead to a reduction in overall OOP health expenditures. As analyzed above, one potential reason for this is the uptake of health insurance which is supported by the matching results presented in Appendix Table 7. Finally, Appendix Table 8 presents the matched results for financial risk protection. Similar to the main results, eligibility to the *Reconocer* leads to important reductions in the likelihood of having catastrophic health care expenditures.

In summary, the matched difference-in-difference models confirm the main results. Overall, we find that the *Reconocer* program encourages the use of health care utilization for all individuals, but particularly a shift from informal to formal health care services. Furthermore, our results show that the association of the program to a lower health care expenditure is partially explained by the larger of uptake of public health insurance amongst the uninsured and those without any previous access to health care. Finally, we find that non-contributory pensions could have important effects in protecting households from the financial hardship of medical expenditures of the elderly.

V. Conclusion

The announcement and implementation of the third phase of the *Reconocer* program in Yucatan during December 2008 provided a scenario where all individuals over the age of 70 in the treatment village of Valladolid where eligible for a pension income equivalent to approximately one-third of the minimum wage. We used a difference-in-difference approach to compare elderly individuals in Valladolid with those of the control village of Motul and estimate the effect of an unanticipated income shock on health care utilization, health care expenditure, health insurance uptake, and financial risk protection from health.

Our results show that the *Reconocer* program encouraged formal health care use and medication adherence. Further disentangling this result, we find that on one hand individuals without any health care utilization at baseline had a larger increase in formal care, informal care, and medical adherence. On the other hand, our results show that individuals with previous health care utilization shift their use from informal to formal services thus suggesting a move from low-quality to high-quality health care. Additionally, our results for health expenditure are in

contrast with predictions and show that individuals in the treatment village have on average a larger reduction in health expenditures.

This is potentially explained by the results we find suggesting that the *Reconocer* program increased the uptake of public health insurance overall, and specially for those who were previously uninsured. The important role of public health insurance in reducing out-of-pocket payments may explain the overall increase in health care utilization but reduction in health expenditures. While we show that the increased income would be sufficient to help cover the highest fees in the public health insurance program, we cannot disregard that these pension programs can have an information channel through which individuals learn about other programs that they are eligible for. Finally, our results further suggest that non-contributory programs may have a fundamental role in enhancing financial risk protection from medical expenditures. In particular, we find that individuals eligible for the program, and receiving the pension were less likely of suffering financial hardship due to out-of-pocket health expenditures from the elderly.

Overall, there are several contributions of this paper to the current literature. First, we build on previous studies to evaluate the effect of an unanticipated income shock and provide evidence on how these can influence health care utilization, health care expenditure, uptake of health insurance, and enhance financial risk protection. Second, we use a quasi-experimental scenario that allows for a robust evaluation across different individuals of how pension programs can influence health care use and expenditures while taking into account all the challenges of implementing these types of programs. Third, this paper builds on the current literature and provides further evidence on how social programs influence health behaviors of the elderly where current evidence is limited and necessary as this age-group continues to grow. Finally, we find

relevant evidence on how these social programs can be used to improve the uptake of health insurance amongst the uninsured.

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VI. Tables

TABLE 1- SUMMARY STATISTICS

	Motul (1)	Valladolid (2)	Difference (1)-(2)	P-value
Male	0.511 0.500	0.457 0.498	-0.053	0.007
Age	77.926 6.354	77.817 6.481	-0.109	0.670
Education (years)	1.898 1.736	1.834 1.956	-0.064	0.389
Marital status: couple	0.472 0.499	0.469 0.499	-0.003	0.899
Marital status: divorced or separated	0.024 0.153	0.030 0.171	0.006	0.348
Marital Status: widow	0.354 0.479	0.340 0.474	-0.014	0.460
Household size	3.443 2.144	3.488 2.217	0.045	0.617
Works for pay	0.148 0.355	0.167 0.373	0.019	0.205
Household income (December 2008 USD$)	172.301 220.063	206.557 405.109	34.256	0.006
Self-reported health: Good, very good or excellent	0.809 0.942	0.678 0.885	-0.131	<0.001
Depressive symptoms score	0.574 1.690	1.036 2.208	0.461	<0.001
Receives *Reconocer* pension	0.000 0.000	0.817 0.387	0.817	0.000
Observations	975	1,324		

TABLE 2. SUMMARY STATISTICS OF HEALTH CARE UTILIZATION

	Motul (1)	Valladolid (2)	Difference (1) – (2)	P-value
Formal care in last 3 months	0.572 0.495	0.520 0.500	-0.052	0.009
Informal care in last 3 months	0.160 0.367	0.217 0.412	0.057	<0.001
Hospital stay in last 3 months	0.157 0.364	0.164 0.371	0.007	0.624
Not taken medication in last 3 months	0.183 0.387	0.237 0.426	0.054	<0.001
Expenditure in formal care (December 2008 USD)	9.654 72.280	10.497 39.679	0.843	0.728
Expenditure in informal care (December 2008 USD)	0.204 2.850	0.943 10.255	0.739	0.008
Expenditure in hospital stays (December 2008 USD)	3.814 61.541	26.010 373.003	22.195	0.033
Total OOP health care expenditure (December 2008 USD	14.744 107.316	38.877 385.340	24.133	0.030
Social security	0.644 0.479	0.396 0.489	-0.248 .	<0.001 .
Private health insurance	0.005 0.072	0.031 0.175	0.026	<0.001
Public health insurance	0.095 0.293	0.268 0.443	0.173	<0.001
Health insurance	0.761 0.426	0.713 0.453	-0.049	0.005
Observations	975	1,324		

TABLE 3 COMMON TREND EVALUATION

	Health care expenditure per capita in 2008 USD
Valladolid	-1.83
	(13.04)
2005	-11.60
	(10.86)
2006	-14.07
	(10.67)
2008	-17.94*
	(10.48)
2005 * Valladolid	23.70
	(20.39)
2006 * Valladolid	11.36
	(14.09)
2008 * Valladolid	16.08
	(14.19)
Constant	20.61**
	(10.42)
Observations	201
F-statistic	3.482

Robust standard errors in parenthesis. The model before compares the trends of health care expenditure in treatment and control villages using data from the Mexican Household Economic Survey from 2004 until 2008.

* $p < .1$, ** $p < .05$, *** $p < .01$

TABLE 4. EFFECT OF RECONOCER PROGRAM ON HEALTH CARE UTILIZATION

	(1) Formal care in last 3 months	(2) Informal care in last 3 months	(3) Hospital stay in last 3 months	(4) Not taken medication in last 3 months	(5) Any access to health care
			Panel A) Full sample		
Valladolid * Post	0.086**	-0.015	0.016	-0.067**	0.067**
	(0.034)	(0.020)	(0.014)	(0.027)	(0.034)
Post	-0.093	-0.183*	-0.009	0.033	-0.130
	(0.184)	(0.094)	(0.102)	(0.150)	(0.185)
Observations	3567	3567	3567	3566	3567
			Panel B) No health care utilization at baseline		
Valladolid * Post	0.026	0.038**	-0.004	-0.079**	0.059
	(0.041)	(0.019)	(0.012)	(0.036)	(0.041)
Post	0.275	0.000	-0.074	-0.082	0.346**
	(0.174)	(0.105)	(0.106)	(0.164)	(0.175)
Observations	1541	1541	1541	1541	1541
			Panel C) Any health care utilization at baseline		
Valladolid * Post	0.102***	-0.067**	0.026	-0.056	0.028
	(0.039)	(0.032)	(0.025)	(0.038)	(0.035)
Post	-0.132	-0.391**	0.152	0.291	-0.264
	(0.223)	(0.181)	(0.183)	(0.211)	(0.225)
Observations	2026	2026	2026	2025	2026

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any health care utilization at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

TABLE 5. EFFECT OF RECONOCER PENSION OF HEALTH CARE EXPENDITURE

	(1) Expenditure in formal care (December 2008 USD$)	(2) Expenditure in informal care (December 2008 USD$)	(3) Expenditure in hospital (December 2008 USD$)	(4) Total OOP medical expenditure (December 2008 USD$)
		Panel A) Full sample		
Valladolid * Post	-6.184*	-0.692	-24.449*	-31.383**
	(3.745)	(0.552)	(13.747)	(14.711)
Post	4.454	0.168	-169.293	-164.653
	(5.804)	(0.528)	(176.109)	(179.086)
Observations	3567	3567	3551	3552
		Panel B) No health care utilization at baseline		
Valladolid * Post	-2.131	0.089	-7.589	-9.636
	(2.686)	(0.218)	(6.453)	(6.975)
Post	5.302	0.404**	-270.758	-265.003
	(4.965)	(0.205)	(262.154)	(265.366)
Observations	1541	1541	1538	1538
		Panel C) Any health care utilization at baseline		
Valladolid * Post	-10.699*	-1.396	-43.355	-55.558**
	(5.909)	(1.013)	(26.722)	(28.142)
Post	13.793	-0.534	49.959	63.295
	(11.226)	(1.013)	(55.759)	(58.406)
Observations	2026	2026	2013	2014

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any health care utilization at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

TABLE 6. EFFECT OF RECONOCER PENSION ON HEALTH INSURANCE UPTAKE

	(1) Social security	(2) Private health insurance	(3) Public health insurance	(4) Any health insurance
		Panel A) Full sample		
Valladolid * Post	-0.000	-0.001	0.039***	0.029*
	(0.013)	(0.004)	(0.013)	(0.016)
Post	0.059	-0.004	0.061***	0.107
	(0.073)	(0.005)	(0.018)	(0.072)
Observations	3514	3514	3514	3567
		Panel B) No health care utilization at baseline		
Valladolid * Post	-0.003	-0.002	0.056***	0.046*
	(0.020)	(0.005)	(0.021)	(0.027)
Post	0.076	-0.002	0.097***	0.156
	(0.106)	(0.006)	(0.028)	(0.107)
Observations	1519	1519	1519	1541
		Panel C) Any health care utilization at baseline		
Valladolid * Post	0.002	0.001	0.020	0.011
	(0.017)	(0.007)	(0.016)	(0.020)
Post	0.004	-0.012	0.036	0.026
	(0.024)	(0.009)	(0.026)	(0.027)
Observations	1995	1995	1995	2026
		Panel D) No health insurance at baseline		
Valladolid * Post	0.008	0.012	0.074**	0.098**
	(0.026)	(0.007)	(0.038)	(0.043)
Post	0.104***	0.023	0.324***	0.453***
	(0.037)	(0.015)	(0.056)	(0.077)
Observations	951	951	951	953
		Panel E) Any health insurance at baseline		
Valladolid * Post	-0.009	-0.007	0.013	-0.015
	(0.015)	(0.005)	(0.010)	(0.013)
Post	0.046	-0.013*	-0.012	0.015
	(0.097)	(0.008)	(0.017)	(0.099)
Observations	2563	2563	2563	2614

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression score. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any health care utilization at baseline and those who did respectively. Panels D and E present similar results but stratifying by availability of health insurance at baseline.

* $p < .1$, ** $p < .05$, *** $p < .01$

TABLE 7 EFFECTS OF RECONOCER PENSION PROGRAM ON INCIDENCE OF CATASTROPHIC HEALTH CARE EXPENDITURES

	(1) All	(2) No utilization at baseline	(3) Any utilization at baseline	(4) No health insurance at baseline	(5) Any health insurance at baseline
Valladolid * Post	-0.173***	-0.191***	-0.158***	-0.138**	-0.180***
	(0.030)	(0.042)	(0.041)	(0.067)	(0.033)
Post	0.224	0.147	0.409*	-0.136	0.364**
	(0.174)	(0.226)	(0.237)	(0.395)	(0.174)
Observations	3567	1541	2026	953	2614

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression score. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. The coefficients represent the reduction in catastrophic health care expenditures, defined as OOP health expenditures that exceed 20% of total household income.

* $p < .1$, ** $p < .05$, *** $p < .01$

VII. Appendix

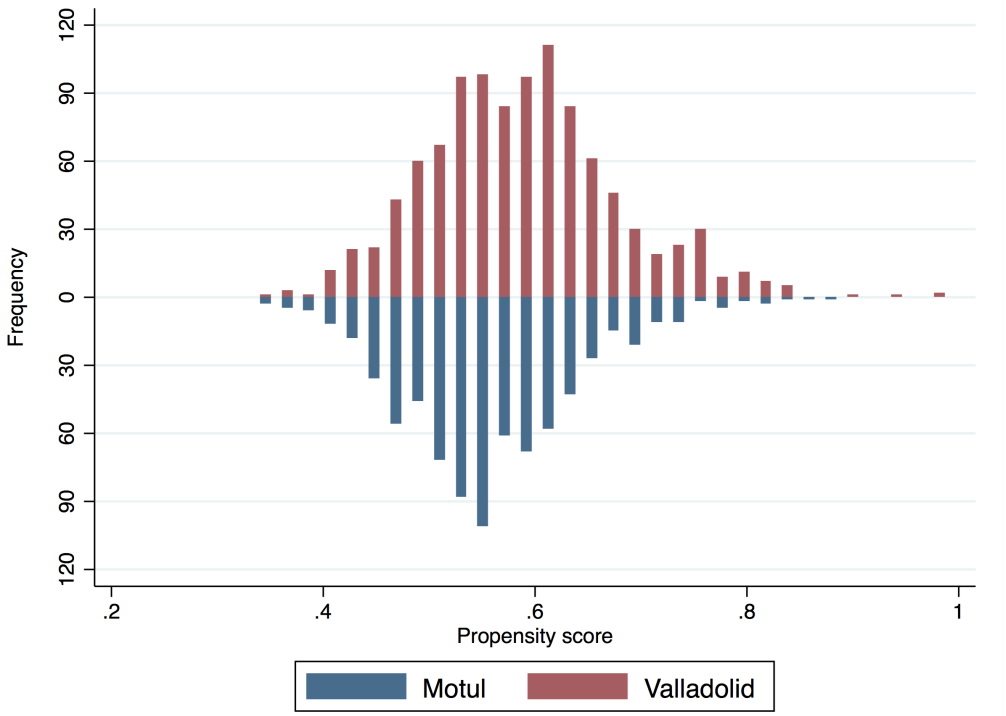

FIGURE 1. PROPENSITY SCORE ESTIMATES FOR VALLADOLID AND MOTUL

APPENDIX TABLE 1. ATT ESTIMATES OF RECONOCER PROGRAM ON HEALTH CARE UTILIZATION

	(1) Formal care in last 3 months	(2) Informal care in last 3 months	(3) Hospital stay in last 3 months	(4) Not taken medication in last 3 months	(5) Any access to health care
			Panel A) Full sample		
Reconocer * Post	0.095***	-0.007	0.020	-0.065**	0.084**
	(0.033)	(0.020)	(0.014)	(0.027)	(0.034)
Post	-0.088	-0.184*	-0.008	0.029	-0.127
	(0.184)	(0.094)	(0.102)	(0.150)	(0.185)
Observations	3567	3567	3567	3566	3567
			Panel B) No health care utilization at baseline		
Reconocer * Post	0.039	0.035*	-0.000	-0.074**	0.072*
	(0.040)	(0.019)	(0.012)	(0.036)	(0.040)
Post	0.276	0.003	-0.075	-0.089	0.350**
	(0.174)	(0.106)	(0.106)	(0.164)	(0.175)
Observations	1541	1541	1541	1541	1541
			Panel C) Any health care utilization at baseline		
Reconocer * Post	0.123***	-0.046	0.033	-0.052	0.070**
	(0.039)	(0.032)	(0.024)	(0.038)	(0.035)
Post	-0.129	-0.398**	0.153	0.288	-0.268
	(0.222)	(0.181)	(0.183)	(0.211)	(0.224)
Observations	2026	2026	2026	2025	2026

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any health care utilization at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 2. ATT ESTIMATES OF THE RECONOCER PROGRAM ON HEALTH CARE EXPENDITURE

	(1) Expenditure in formal care (December 2008 USD$)	(2) Expenditure in informal care (December 2008 USD$)	(3) Expenditure in hospital (December 2008 USD$)	(4) Total OOP medical expenditure (December 2008 USD$)
		Panel A) Full sample		
Valladolid * Post	-4.815	-0.689	-3.314	-8.862
	(3.600)	(0.580)	(19.642)	(20.622)
Post	3.948	0.122	-172.414	-168.311
	(5.762)	(0.527)	(176.225)	(179.207)
Observations	3567	3567	3551	3552
		Panel B) No health care utilization at baseline		
Valladolid * Post	-1.038	0.129	-6.993	-7.989
	(2.535)	(0.208)	(6.016)	(6.527)
Post	5.067	0.408**	-271.367	-265.833
	(4.898)	(0.208)	(262.162)	(265.376)
Observations	1541	1541	1538	1538
		Panel C) Any health care utilization at baseline		
Valladolid * Post	-9.040	-1.400	-4.385	-14.981
	(5.725)	(1.067)	(36.613)	(38.165)
Post	12.948	-0.613	41.857	54.276
	(11.190)	(1.031)	(57.520)	(60.113)
Observations	2026	2026	2013	2014

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, self-reported health and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any access to health care at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 3. ATT ESTIMATES OF THE RECONOCER PROGRAM ON HEALTH INSURANCE UPTAKE

	(1) Social security	(2) Private health insurance	(3) Public health insurance	(4) Any health insurance
		Panel A) Full sample		
Valladolid * Post	0.005	-0.001	0.032**	0.022
	(0.013)	(0.005)	(0.013)	(0.016)
Post	0.058	-0.004	0.064***	0.110
	(0.073)	(0.006)	(0.018)	(0.072)
Observations	3514	3514	3514	3567
		Panel B) No health care utilization at baseline		
Valladolid * Post	0.001	-0.002	0.056***	0.041
	(0.020)	(0.005)	(0.021)	(0.027)
Post	0.076	-0.002	0.101***	0.160
	(0.106)	(0.006)	(0.029)	(0.108)
Observations	1519	1519	1519	1541
		Panel C) Any health care utilization at baseline		
Valladolid * Post	0.006	0.001	0.006	0.000
	(0.017)	(0.008)	(0.016)	(0.019)
Post	0.003	-0.012	0.039	0.028
	(0.024)	(0.010)	(0.026)	(0.027)
Observations	1995	1995	1995	2026
		Panel D) No health insurance at baseline		
Valladolid * Post	0.023	0.013*	0.073**	0.106**
	(0.025)	(0.008)	(0.037)	(0.042)
Post	0.102***	0.025	0.335***	0.466***
	(0.037)	(0.015)	(0.056)	(0.078)
Observations	951	951	951	953
		Panel E) Any health insurance at baseline		
Valladolid * Post	-0.004	-0.007	0.009	-0.015
	(0.015)	(0.006)	(0.010)	(0.013)
Post	0.046	-0.013*	-0.012	0.014
	(0.097)	(0.008)	(0.017)	(0.099)
Observations	2563	2563	2563	2614

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, self-reported health and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any access to health care at baseline and those who did respectively. Panels D and E present similar results but stratifying by availability of health insurance at baseline.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 4 ATT ESTIMATES OF RECONOCER PENSION PROGRAM ON INCIDENCE OF CATASTROPHIC HEALTH CARE EXPENDITURES

	(1) All	(2) No utilization at baseline	(3) Any utilization at baseline	(4) No health insurance at baseline	(5) Any health insurance at baseline
Valladolid * Post	-0.179***	-0.194***	-0.165***	-0.099	-0.204***
	(0.029)	(0.041)	(0.041)	(0.064)	(0.032)
Post	0.212	0.132	0.401*	-0.162	0.356**
	(0.174)	(0.226)	(0.237)	(0.394)	(0.174)
Observations	3567	1541	2026	953	2614

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression score. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. The coefficients represent the reduction in catastrophic health care expenditures, defined as OOP health expenditures that exceed 20% of total household income.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 5. EFFECT OF THE RECONOCER PROGRAM ON HEALTH CARE UTILIZATION IN MATCHED SAMPLE

	(1) Formal care in last 3 months	(2) Informal care in last 3 months	(3) Hospital stay in last 3 months	(4) Not taken medication in last 3 months	(5) Any access to health care
			Panel A) Full sample		
Reconocer * Post	0.089***	-0.016	0.013	-0.074***	0.070**
	(0.034)	(0.020)	(0.015)	(0.027)	(0.035)
Post	-0.093	-0.169**	0.004	0.061	-0.132
	(0.186)	(0.086)	(0.103)	(0.157)	(0.188)
Observations	3194	3194	3194	3193	3194
			Panel B) No health care utilization at baseline		
Reconocer * Post	0.022	0.038**	-0.002	-0.074**	0.058
	(0.041)	(0.019)	(0.013)	(0.037)	(0.041)
Post	0.248	-0.001	-0.064	-0.069	0.322*
	(0.174)	(0.106)	(0.097)	(0.169)	(0.176)
Observations	1459	1459	1459	1459	1459
			Panel C) Any health care utilization at baseline		
Reconocer * Post	0.111***	-0.072**	0.020	-0.072*	0.031
	(0.041)	(0.032)	(0.026)	(0.040)	(0.036)
Post	-0.137	-0.359**	0.172	0.340*	-0.277
	(0.224)	(0.150)	(0.200)	(0.200)	(0.226)
Observations	1735	1735	1735	1734	1735

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, self-reported health and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any access to health care at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 6. EFFECT OF RECONOCER PROGRAM ON HEALTH CARE EXPENDITURE IN MATCHED SAMPLE

	(1) Expenditure in formal care (December 2008 USD$)	(2) Expenditure in informal care (December 2008 USD$)	(3) Expenditure in hospital (December 2008 USD$)	(4) Total OOP medical expenditure (December 2008 USD$)
		Panel A) Full sample		
Valladolid * Post	-5.194	-0.864	-38.591*	-44.705*
	(4.535)	(0.578)	(21.801)	(22.979)
Post	5.512	0.112	-149.799	-144.128
	(6.214)	(0.592)	(163.359)	(166.444)
Observations	3194	3194	3191	3192
		Panel B) No health care utilization at baseline		
Valladolid * Post	-2.121	0.064	-7.478	-9.567
	(2.784)	(0.223)	(6.270)	(6.847)
Post	5.862	0.409**	-243.734	-237.437
	(4.918)	(0.207)	(239.724)	(242.712)
Observations	1459	1459	1458	1458
		Panel C) Any health care utilization at baseline		
Valladolid * Post	-9.632	-1.725	-73.258*	-84.780*
	(6.922)	(1.081)	(43.484)	(45.205)
Post	17.171	-0.772	68.935	85.465
	(13.056)	(1.263)	(64.493)	(66.900)
Observations	1735	1735	1733	1734

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, self-reported health and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any access to health care at baseline and those who did respectively.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 7. EFFECT OF *RECONOCER* PROGRAM ON HEALTH INSURANCE UPTAKE IN MATCHED SAMPLE

	(1) Social security	(2) Private health insurance	(3) Public health insurance	(4) Any health insurance
		Panel A) Full sample		
Valladolid * Post	0.000	-0.001	0.041***	0.032*
	(0.014)	(0.004)	(0.013)	(0.017)
Post	0.058	-0.003	0.069***	0.114
	(0.073)	(0.005)	(0.019)	(0.072)
Observations	3146	3146	3146	3194
		Panel B) No health care utilization at baseline		
Valladolid * Post	-0.005	-0.002	0.056***	0.045
	(0.020)	(0.005)	(0.021)	(0.028)
Post	0.078	-0.001	0.102***	0.162
	(0.106)	(0.006)	(0.029)	(0.106)
Observations	1439	1439	1439	1459
		Panel C) Any health care utilization at baseline		
Valladolid * Post	0.003	0.002	0.024	0.016
	(0.019)	(0.007)	(0.017)	(0.021)
Post	-0.000	-0.010	0.048*	0.032
	(0.025)	(0.009)	(0.028)	(0.028)
Observations	1707	1707	1707	1735
		Panel D) No health insurance at baseline		
Valladolid * Post	0.005	0.011	0.075**	0.096**
	(0.026)	(0.007)	(0.036)	(0.043)
Post	0.102***	0.024	0.318***	0.446***
	(0.037)	(0.015)	(0.056)	(0.078)
Observations	891	891	891	892
		Panel E) Any health insurance at baseline		
Valladolid * Post	-0.008	-0.007	0.014	-0.015
	(0.015)	(0.005)	(0.011)	(0.014)
Post	0.040	-0.012*	-0.010	0.008
	(0.099)	(0.007)	(0.018)	(0.101)
Observations	2255	2255	2255	2302

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, self-reported health and depression. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. Panels B and C present the coefficient for individuals who did not have any access to health care at baseline and those who did respectively. Panels D and E present similar results but stratifying by availability of health insurance at baseline.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX TABLE 8 EFFECT OF RECONOCER PENSION PROGRAM ON INCIDENCE OF CATASTROPHIC HEALTH CARE EXPENDITURES IN MATCHED SAMPLE

	(1) All	(2) No utilization at baseline	(3) Any utilization at baseline	(4) No health insurance at baseline	(5) Any health insurance at baseline
Valladolid * Post	-0.173***	-0.186***	-0.162***	-0.127*	-0.185***
	(0.031)	(0.044)	(0.043)	(0.069)	(0.034)
Post	0.254	0.153	0.476**	-0.098	0.398**
	(0.173)	(0.218)	(0.218)	(0.389)	(0.177)
Observations	3194	1459	1735	892	2302

Clustered standard errors at individual level. The coefficients are estimated with an individual fixed effect models controlling for changes in age, age squared, education years, marital status, household size, labor force status, chronic conditions, and depression score. Valladolid is the treatment village where the non-contributory pension scheme was implemented in December 2008. The models use data from the baseline and follow-up survey. The coefficients represent the reduction in catastrophic health care expenditures, defined as OOP health expenditures that exceed 20% of total household income.

* $p < .1$, ** $p < .05$, *** $p < .01$