They Can't or They Don't Want To? On the decision of treatment of Chronic Diseases in Chile *

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Abstract

We provide pioneer evidence about the determinants of treatment of three chronic conditions in Chile. By exploiting a rich database, we are able to include non-cognitive characteristics as one of the many determinants of this decision. We find that some people *can't* and some people *don't want to* go under treatment. Both descriptive and econometric analysis are consistent in showing that there exists substantial heterogeneity across diseases. The evidence shows that there is little but significant effect of risk aversion and self-control in the decision of treatment of depression and diabetes, and no effect for hypertension. Male population with worse self-control levels and more risk-seeking behavior tend to show smaller treatment rates for diabetes. We also find that health insurance is not a relevant dimension for this decision, being this previously documented by empirical literature.

Keywords: NCD, Chronic diseases, household allocation, behavioral economics.

JEL Classification: D03, I10, I18.

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1 Introduction

In recent years, Non-communicable diseases (NCD)[1] have arisen as a primary concern for health policymakers and for international organizations. Prevalence of these diseases have substantially increased in the last decades, and to date they are the biggest cause of death worldwide (World Health Organization 2011). This concept encompasses a class of diseases, characterized by their long duration and generally slow progression (Tunstall-Pedoe 2006)). Cardiovascular diseases, cancers, chronic respiratory diseases and diabetes are highlighted as the conditions with higher death rates worldwide (World Health Organization 2011).

Naturally, the main concern regarding these conditions and their growth relates to their deep negative impact on people's health status. International organizations, mainly the World Health Organization (WHO), have consistently warned about the effects of NCD's and how they can be prevented. Nevertheless, a growing literature is researching about the economic impact of these diseases, and the evidence collected so far may not be ignored.

Even though the relationship between economic growth and population's health and nutrition indicators has been documented by Nobel Prize winners (Fogel and Wimmer 1992, Fogel 1994), the literature on the economic impact of NCD's is recent. On the macroeconomic side, Abegunde and Stanciole (2006) show that income losses attributable to NCD's reached 2.73% of Russia's GDP in 2005, 0.92% of Brazil's and 1.08% of China's. Moreover, these same numbers are projected to grow up to 12.35%, 3.21% and 3.94% respectively in 2015. A similar study was conducted on 23 low and middle-income countries, and an estimated US$84 billion of economic production was lost from only three NCD's (heart disease, stroke and diabetes) in these countries between 2006 and 2015 (Abegunde et al. 2007). These income losses proceed mainly from a lower capital accumulation (due to a lower savings rate motivated by higher healthcare costs) and from a lower labor force productivity (due to absenteeism, disabilities and mortality).

Another way to assess the economic impact of these diseases is through a *cost-of-illness* approach. This approach consider direct costs, such as drugs and medicine, hospitalizations, consultations

[1] These diseases are also called *Chronic Diseases* or *Group II Diseases* by the World Health Organization (Tunstall-Pedoe 2006).

and management of complications, but also indirect costs defined by income losses due to premature mortality and disabilities attributed to a certain condition. For developed countries, the total cost of impact for cardiovascular disease varies between 1% and 3% of GDP (Mayer-Foulkes 2011). Barceló et al. (2003) provides evidence for developing countries, showing estimations of costs of diabetes from US$22.5 billion in Brazil to US$2.4 billion in Chile.

A third approach relates to the microeconomic impact of these conditions. In many cases the presence of a household member with a chronic disease may lead to catastrophic household health expenditures, which may conduct to financial distresses (Su, Kouyaté and Flessa 2006). As expected, this result is more likely to happen on poorer households. In Jamaica, 59% of households affected by chronic diseases experimented financial difficulties (Henry-Lee and Yearwood 1999). An impact on the labor market is also documented: in the United States, working hours are 6.1% lower for men with chronic diseases and 3.9% lower for women with chronic diseases (Suhrcke et al. 2006). Contreras et al. (forthcoming) provides evidence for Chile, showing lower participation rates for people with chronic diseases and a higher probability of being unemployed for women with chronic diseases.

The evidence, briefly summarized above, is consistent about the economic relevance of NCD's. Many of the health economics literature has focused on obtaining estimates of the burden of NCD's in national healthcare systems and into family budgets (Su, Pokhrel, Gbangou and Flessa 2006, Lundkvist et al. 2008, Schmidt et al. 2011). Another body of literature investigates the determinants of healthcare demand, which can be somehow related to diagnosis of NCD's (Grossman 1972, Currie and Madrian 1999). However, this is only one side of the problem. Aside of diagnosis, the treatment of these chronic diseases may be a major issue in order to offset the effects of NCD's in the population. Simple reasoning could lead us to think that, once diagnosed, every person who is able to follow a treatment will do it. Nevertheless, we present evidence that shows this may not be entirely true.

For many reasons, treatment is a very important dimension when examining the impact of NCD's into physical and monetary well-being, both individual and collective. On the physical side, medical literature presents overwhelming evidence about the physical benefits of early

treatment of NCD's. Also, this early treatment helps to reduce the likelihood of developing more severe conditions, avoiding longer and more invasive treatments. Moreover, treatment of diseases with low mortality (like many NCD's) could generate significant gains on labor force productivity (Bloom et al. 2004). On the monetary side, severe conditions are related to an increase in healthcare spending (Willey et al. 2008). According to the type of health insurance of the diseased, this impact is absorbed by the household of the diseased (if health insurance is private-financed) or by the government (if health insurance is public-financed). Therefore, increasing health costs due to late treatment of NCD's may become a public finance issue on large public-funded healthcare systems with low out-of-pocket spending.

The main contribution of this paper to the literature of NCD's is to extend empirical evidence about the determinants of treatment of some of these diseases by including proxy personality variables and controlling for unobserved heterogeneity. We find that some people *can't* and some people *don't want to* go under treatment, meeting many documented results. By including non-cognitive characteristics proxy variables, we show that people with self-control problems tend to show smaller treatment rates, same as people with more risk-seeking behavior. Also, there exists substantial heterogeneity across diseases.

The rest of the paper is organized as follows: section 2 presents a brief discussion about impact and determinants of treatment of NCD's, section 3 talks about methodology, and section 4 describes the database used and presents descriptive statistics. The results are presented in section 5, and section 6 discusses these results. Finally, section 7 concludes.

2 Impact and Determinants of Treatment of Non-Communicable Diseases

The motivation for this question comes from the fact that treatment rates for many chronic conditions are considerably low. Moreover, this phenomena is global, reaching from high income countries to developing economies.

Kohn et al. (2004) presents a complete worldwide survey about the existence of "treatment gaps"[2] for mental conditions. For depression, this magnitude is 56.9% worldwide, and in some developed countries the situation is really alarming (83.9% in UK). In developing countries, like Chile, the treatment gap for depression is estimated on 39.2% (Saldivia et al. 2004). de Renteria et al. (2013) provides estimations of treatment rates for Brazil, and for depression 39% of the diagnosed declare being under treatment. The authors find low treatment rates for other conditions (68.5% for hypertension, 40.35% for arthritis).

Aside from low treatment rates, there is another situation that is concerning the health organizations, which is treatment adherence. According to the World Health Organization (2003), treatment adherence for a long-term condition is defined by *"the extent to which a person's behaviour -taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider"*. The same institution estimates that adherence to long-term therapy for chronic illnesses averages 50% in developed countries. For instance, in the United States, only 51% of the patients treated for hypertension adhere to the prescribed treatment (World Health Organization 2003). Dunbar-Jacob and Mortimer-Stephens (2001) also provide estimates for United States, and according to the authors as many as 60% of persons with chronic disorders are poorly adherent to treatment. Moreover, only half of those who are prescribed pharmacological therapies take enough doses of the medication to experience a therapeutic effect. As expected, adherence magnitudes for developing countries are even lower: in China, adherence for hypertension reaches 43% of the diagnosed, and in Gambia only 27% (World Health Organization 2003).

Both economic and medical impact of the two problems described above are considerable. In an medical dimension, low adherence to long-term therapies is associated to poor health outcomes, like unsatisfactory control of blood pressure (in the case of hypertension, World Health Organization 2003). For the United States, non-adherence on chronic conditions leads to hospital readmissions from 5 to 40% of the time (Dunbar-Jacob and Mortimer-Stephens 2001). In contrast, good adherence to treatment for diabetes type 2 (dietary modification, physical activity, foot

[2]The author defines "treatment gap" as the *absolute difference between the true prevalence of a disorder and the treated proportion of individuals affected by the disorder.*

care, ophtalmological check-ups) proved to be effective in reducing complications and disability (World Health Organization 2003). When we look at the economic impact of non-adherence, the situation is also severe: for the United States, estimates for the annual cost caused by non-adherence range from US$ 100 billion (only considering medication, Dunbar-Jacob and Mortimer-Stephens 2001) to US$300 billion, that being almost 19% of US annual total health costs (Bender and Rand 2004[3]).

In simple words, people may postpone their treatment for two main reasons: first, because *they can't* go under treatment in their preferred moment of time. This incapacity may be caused by multiple limitations and costs associated to treatment. One of them is the monetary cost related to healthcare. Depending on the disease, treatment may consist of periodic visits to the doctor or simply the periodic use of certain medicine. For instance, treatment for depression requires constant medical consultancy, and severe arthritis may require kinesiology therapy. Therefore, in this matter health insurance will be crucial to determine the monetary burden of these diseases into families' budget.

A second limitation that might explain why people postpone their treatment refers to time costs. This restriction is very important both in diagnosis and treatment. Some treatments are very time-intensive, not only because of the type or severity of the condition (which is a very important determinant), but also for other reasons, namely: distance to healthcare facilities, waiting times at these facilities, among others. The relevance of this motive in the decision of treatment will obviously depend on the individual time opportunity cost, which is determined by many observable characteristics, such as labor market status and household composition.

For these limitations, the existing literature has documented significant findings. For the case of depression, Zuvekas (2014) examines the impact of many socio-economic, demographic and health determinants, finding no relationship between treatment of depression and family income. In fact, in many studies this determinant is ruled out when the relevant sample corresponds to insured population (Stockwell et al. 1994 for the case of hypertension). Regarding household composition, the study first mentioned finds a negative effect of familiy size on treatment of

[3]According to Bender and Rand (2004), US health costs in 2002 reached US$1.6 trillion, 14.9% of GDP.

depression. According to the author, this finding is explained by "an increasing family size may reduce resources available, both money and time, to any particular adult in the family for treatment". As expected, the number of kids between 0 and 5 years old are linked to greater negative effects (1.2 percentage points on the likelihood of treatment). However, an interesting finding in this topic is provided by Abidin et al. (2014) in Malaysia, stating that the presence of a household member diagnosed with diabetes increases the likelihood of treatment for that condition. Here the mechanism is associated to an increase in awareness.

In contrast, empirical evidence is mixed regarding the role of education. For instance, Zuvekas (2014) finds a positive and increasing effect of educational attainment on treatment demand for depression, while Duhoux et al. (2012) investigate the determinants of quality of care for Major Depression Episodes (MDE) in Canada, finding no evidence of an impact of predisposing factors (one of them is education attainment) in the reception of treatment. Similar mixed results exist for the impact of health insurance, where the absence of effect has even motivated the question of treatment determinants for insured populations (Stockwell et al. 1994 for hypertension in United States).

At this point, several motives of why people can't go under treatment of their diseases have been described. But then, why *still* there are people who, being able to do so, choose to not go under treatment? Then, a third reason for why people postpone their treatments arises: maybe it is because *they don't want to*. More formally: in the absence of monetary, physical or time limitations, an NCD-diagnosed might choose to not go under treatment in a certain period of time, due only to her preferences.

Arguably, this is not a optimal decision for the diagnosed. In a theoretical approach, Mehrez and Gafni (1987) develop a model to characterize an optimal treatment strategy, for a given medical condition. Across many assumptions and cases[4], the conclusion is more or less the same: it is optimal to go under treatment as soon as the condition is diagnosed. This result is, however, conditional to certain assumptions related to preferences (which are rational) and the absence

[4] Mehrez and Gafni (1987) consider any given disease, not necessarily chronic. Various cases were studied: one disease-one treatment, one-disease-many treatments, many diseases-many treatments.

of heterogeneity in socio-economic, monetary and time constraints. Nevertheless, these findings are very informative about what would be the optimal strategy in a perfect scenario, and they can be used as a benchmark.

Rationality in preferences assures certain characteristics that are desirable, or at least expectable, in human behavior like perfect foresight and total self-control. But, in real life, human behavior is determined by non-cognitive characteristics and personality traits, which will ultimately define the individual's response to certain stimulus and incentives. Therefore, heterogeneity in preferences may explain why some people decide to postpone their treatments and some people don't. In this topic, the behavioral economics literature have made substantial contributions. In a very influential work, O'Donoghue and Rabin (1999) show that individuals with quasi-hyperbolic preferences (a theoretical representation for self-control problems) tend to anticipate activities with instant rewards, and also tend to postpone activities with instant costs (and future rewards). This last definition fits pretty well with treatment of NCD's. Moreover, medical literature insists on the importance of cognitive and non-cognitive skills in patient's compliance with healthcare indications (Elder et al. 1999, Mahoney 2008). de Ridder and de Wit (2006) highlights the dynamic nature of the problem, because many treatments may involve perseverance and resilience. According to the authors, self-regulation and temperament are key characteristics for a treatment to be successful.

It is important to make a distinction between the determinants of treatment postponing related to personality characteristics and those related to demographic variables, in the sense that these might also explain why people *don't want to* go under treatment. Moreover, the effect of demographic characteristics, mainly age, has been vastly documented: Steyn et al. (2008) documents the positive effect of age in treatment for hypertension in South Africa, using a demographic and health survey, while Kang et al. (2015) presents a similar finding for Hong Kong. van den Berg et al. (2013) provides evidence of this relationship for a small hypertension-diagnosed sample in Germany.

According to this analysis, an empirical insight that considers only socio-economic and demographic characteristics in order to study this type of decision might not be enough. In this

research, we use a rich database that allow us to include proxy variables of personality traits and other non-cognitive skills, which is crucial in order to generate a complete characterization of the determinants of the decision of treatment.

3 Methodology

We begin this section by describing the econometric model used for estimation. Then, we describe the proxy variables that were considered in order to characterize heterogeneity of non-cognitive characteristics across population.

3.1 Econometric Model and Empirical Specification

In a first approach, we use a simple probabilistic model described by the following equation:

$$Treat_{it} = f(\beta_0 + \beta_1 \mathbf{P}_{it} + \beta_2 \mathbf{Dem}_{it} + \beta_3 \mathbf{Inc}_{it} + \beta_4 \mathbf{HC}_{it} + \beta_5 \mathbf{NCD}_{it} + \beta_6 \mathbf{HI}_{it})$$

Where $Treat_{it}$ is a dummy variable valued 1 if a NCD-diagnosed (indexed by i) is currently under treatment, and 0 if not. Therefore, this variable represents the probability of i of being under treatment.

$\mathbf{P}_{it}$ is a vector of personality proxy variables, which will be described in the next section. $\mathbf{Dem}_{it}$ is a vector of demographic characteristics, such as age, education and gender. $\mathbf{Inc}_{it}$ is a vector of variables related to income, and $\mathbf{HC}_{it}$ is a vector of variables associated to household composition. $\mathbf{NCD}_{it}$ is a vector of variables that characterize health status and comorbid conditions, and $\mathbf{HI}_{it}$ is a dummy variable valued 1 if the individual has private health insurance, and 0 if not.
This specification incorporates the analysis presented in the previous section. With these variables, we are able to capture socio-economic and condition-related determinants of treatment, but we are also able to include determinants related to preferences.

3.2 Identification

A plausible source of endogeneity in this model might be reverse causality, this is, the effect that previous treatment might have into personality variables. In this sense, Jokela et al. (2014)

provides empirical evidence of the impact of chronic conditions in personality traits, accelerating the average age-related changes in these characteristics. Therefore, the specification described above might not be identifying a causal effect of personality characteristics on treatment.

We partially control for endogeneity by including a lagged dependent variable into the econometric specification, following Angrist and Pischke (2008):

$$Treat_{it} = f(\beta_0 + \beta_1 \mathbf{P}_{it} + \beta_2 \mathbf{Dem}_{it} + \beta_3 \mathbf{Inc}_{it} + \beta_4 \mathbf{HC}_{it} + \beta_5 \mathbf{NCD}_{it} + \beta_6 \mathbf{HI}_{it} + \beta_7 Treat_{it-1})$$

Where $Treat_{it-1}$ is a dummy variable valued 1 if the individual was under treatment in a past period. This enables us to control for any effect that previous treatment decisions would have had into contemporaneous personality variables. Hence, marginal effects using the estimated coefficients associated to these variables can be interpreted as the effect of personality traits on the decision of treatment, whether is the beginning or the continuation of a treatment plan, after controlling for some unobserved heterogeneity.

Additionally, by including historical information about medical conditions and treatment the specification also captures heterogeneity across individuals and through time, thus enhancing the identification of the effects of explanatory variables on treatment. This decision, as motivated in the previous section, is also greatly influenced by previous outcomes in this matter (treatment adherence). Therefore, a lagged dependent variable specification is adequate in order to model the dynamic structure of the phenomena.

We chose not to use a panel data specification with fixed effects because the very essence of the estimation is to try to measure the influence of non-cognitive characteristics (which in this particular case are time-invariant), and not simply control for them. Also, a mixed specification (with lagged dependent variable and fixed effects) needs much stronger identification assumptions[5].

3.3 Personality Proxy Variables

In this section, we describe how we capture non-cognitive characteristics that are related to the topic in question. As previously described, some non-cognitive skills are arguably important

[5]See Angrist and Pischke (2008) for a complete discussion about identification on panel data.

when deciding if to go under treatment or not. In this research, we will address two of them:

1. **Risk Aversion**

   Risk aversion may play a significant role in this decision. Classical microeconomic theory (Expected Utility model) highlights risk aversion as a key parameter, as characterizes individuals according to their attitude towards risk. From a behavioral perspective, Kahneman and Tversky (1979) argue the existence of "loss aversion" instead of risk aversion. Based on experimental evidence, the authors show that human perception gives more relevance to losses than to gains, as a minimal loss is preference-equivalent to a significant gain. Treatment of NCD's, as healthcare in general, have an important component of uncertainty. Depending on the condition, treatment-associated gains might not be enough to compensate any possible loss generated by the current diagnosis. Therefore, attitude towards risk could reflect how people respond to this unbalance.

   The survey data used in this study includes several questions about non-cognitive skills. One of these questions refers to attitudes towards risk. We use the following question: *"In a scale from 0 to 10, where 0 means you are not willing to take risk and 10 means you are very willing to take risk; How do you describe yourself according to this scale?"*.

2. **Self-control and Responsibility**

   The behavioral economics literature has vastly documented the relevance of self-control in a decision-making process, most importantly when the decision has an intertemporal component. The concept of time inconsistency has been widely studied in the economic literature, in the most varied topics. For instance, the seminal work of Kydland and Prescott (1977) introduced this concept into macroeconomics, particularly in monetary policy. In this context, time inconsistency may be exacerbated by certain aspects related to treatment, and health care in general: unpleasant medical procedures, non-instant rewards, among others. Treatment of NCD's is by definition a dynamic decision, thus, persistence and willpower are key skills in order to follow an optimal dynamic strategy.

   Responsibility also may play a major role. Self-reported perception about responsibility could inform about subjective valuation of treatment-associated gains and losses. We

expect that a responsible person have more information about the disease she has been diagnosed of, and the benefits associated to its treatment. Therefore, this could avoid an underestimation of long-term benefits of early treatment, making this decision more attractive and increasing the likelihood of treatment adherence.

Another interesting measure our data offers is the Ten-Item Personality Inventory (TIPI) Test. As described in Gosling et al. (2003), the TIPI is a ten-item measure of the Big-Five personality dimensions that are commonly used in psychology to describe human personality[6]. In particular, we are interested into capture non-cognitive characteristics related to responsibility and self-control. Thus, we use just two of the ten items surveyed, being able to construct a score for the "Conscientiousness" dimension.

4 Data description

Information about healthcare and treatment of chronic diseases in Chile has become more accessible in recent years. In addition to aggregate measures of prevalence and treatment rates (mainly provided by administrative data), efforts have been carried out to collect data on this topic at the individual level. The Chilean National Health Survey (Encuesta Nacional de Salud, ENS) is a nation-representative survey aimed to characterize the current health status of the population. It provides rich information about prevalence, treatment and burden of NCD's, but unfortunately lacks the necessary socio-economic information in order to estimate the previously described model.

To empirically examine the decision of treatment of NCD's in Chile, we used the Social Security Survey (Encuesta de Protección Social, EPS), a nation-representative panel survey. The EPS was first conducted in 2002, and three additional waves have been conducted since then (2004, 2006 and 2009). For the purposes of this research, we will use the two latest waves of EPS (2006 and 2009). We selected this dataset because of the many benefits of panel surveys: it allow us to include lagged variables to control for unobserved heterogeneity. As mentioned in the previous section, historic information is introduced as a covariate in the regressions in order to capture

[6]These five dimensions are: Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

the dynamic nature of the decision and distinguish it from the static one, which is also relevant. The 2006 wave of EPS was conducted to a sample of 16,443 households, while in the 2009 wave the sample was reduced to 14,463 observations (attrition of 12%).

The 2006 and 2009 waves of EPS feature a complete description about health status of the surveyed and her household members. To learn about prevalence of NCD's, the question asked is: *Have you ever been diagnosed with -NCD-, by a doctor?*. The conditions considered in the survey are: Asthma or emphysema, Depression, Diabetes, Hypertension or high blood pressure, Cardiac conditions, Cancer, Arthritis or osteoarthritis, Kidney disease, Brain stroke, Mental condition and HIV-AIDS.

It is worth noticing that this information is self-reported, so it is expected the existence of some measurement error on key variables, such as treatment status. Although this problem might affect the efficiency of the estimation, empirical exercises show that this error is not significantly large. For instance, Dunbar-Jacob and Mortimer-Stephens (2001) confirmed that self-reporting on treatment (in this case, the daily administration of a pill) has measurement error, but in a small magnitude: 97% of the individuals self-reported that were following the treatment, while 94% of them were actually following it. This was verified through a pill count.

4.1 Descriptive Statistics

4.1.1 Prevalence

Table 1 shows the prevalence of six NCD's in Chile. These conditions were selected only because of their relatively high prevalence in comparison with the discarded conditions.

Hypertension is the most prevalent condition, reaching almost 20% of the population. This magnitude is in line with international evidence[7]. Depression shows a higher prevalence in comparison with other countries (5 percentage points in average[8]). For almost all conditions prevalence grows with age, except depression, where this relationship is rather unclear.

[7] See World Health Organization (2010).
[8] See World Health Organization (2012)

The data also shows that women have greater prevalence in all diseases. For instance, the prevalence of depression in women is more than three times greater than men, and in arthritis this gap increases to almost four times. International evidence is consistent with this result: in the case of depression almost one of each ten women, no more than three months after giving birth, declares to have been diagnosed with this condition.

When looking at prevalence by type of health coverage, this is greater in the public health system for all diseases. In Chile, nearly 80% of the population is in the public health insurance system (FONASA), which is why prevalence for this group is very similar to population figures. Nevertheless, this gap suggests that health insurance may be playing a significant role in diagnosis.

Table 1: Prevalence of selected Non-Communicable Diseases
(percentages)

	Asthma	Depression	Diabetes	Hypertension	Cardiac Conditions	Arthritis
by age						
19-24 years	1.6	3.1	0	1.3	2	0
25-34 years	2.2	6.4	1.2	3.5	1.4	0.7
35-44 years	2.4	9.1	2.9	9	2	2.4
45-54 years	3.9	10.9	7.7	20.2	4	6.2
55-65 years	5.5	13	16.2	38.7	8.1	15.4
66-74 years	6.2	12.4	19.1	56.6	12.8	20.9
75 years and more	11.6	10.5	19.3	57.1	19	23.7
by gender						
Males	2.9	4	5.9	14.3	3.8	2.9
Females	4.6	14.1	8.5	24.7	5.8	10.8
by health coverage						
Private	3.5	5.7	4.6	10.5	1.6	3.2
Public	3.9	9.8	7.7	21	5.3	7.5
Total	3.8	9.2	7.3	19.7	4.8	7

Source: Author's own calculations using EPS 2009.

4.1.2 Treatment rates

The statistics associated with treatment of the previously mentioned conditions are presented in Table 2.

Table 2: Treatment Rate of selected Non-Communicable Diseases
(percentages of diagnosed population)

	Asthma	Depression	Diabetes	Hypertension	Cardiac Conditions	Arthritis
by age						
19-24 years	62.4	26.9	-	54.3	69	-
25-34 years	35.9	48.8	74.9	60.5	48.9	69.5
35-44 years	74.7	56	75.9	73.5	62.7	65.3
45-54 years	70	65.5	89.3	85	67.1	72.6
55-65 years	83.3	65.4	93.9	90.9	79	75.1
66-74 years	85.5	78.8	97	93.6	89.8	81.3
75 years and more	85.7	67	97.3	94.4	90.6	77.9
by gender						
Males	65.5	59.1	89.4	83.4	72.8	67.4
Females	77.8	61.5	93.2	89.9	80.3	77.5
by health coverage						
Private	73.5	52.9	94	92.4	77.6	78.8
Public	73.1	61.7	91.5	87.3	77.4	75.3
Total	73.2	61	91.7	87.6	77.4	75.5

Source: Author's own calculations using EPS 2009.

Treatment rates are, as expected, very dependent on the condition. For instance, diabetes treatment rate is significantly high (more than 90% of diseased), but numbers also show that only three out of five depression-diagnosed is currently under treatment. The explanation of this heterogeneity can be sustained on the differences that exist between treatments, namely in their costs and prognosis[9]. Therefore, the analysis must take into account this heterogeneity.

Treatment usually increases with age, with few exceptions. Once again, gender differences appear:

[9]Prognosis refers to the most probable outcome of the treatment.

women tend to show greater treatment rates than men. This may be caused in part by a greater time endowment of women in Chile, whose participation rate in the labor market is considerably low[10]. An interesting result is that there is no clear relationship between treatment and health coverage, suggesting that these treatments are not complex enough to justify a gap between healthcare providers.

5 Results

The results for the probabilistic model described in previous sections are summarized in Table 3. In a first approach, and according to prevalence rates, we focused the analysis on NCD-diagnosed between 35 and 65 years old. Also, we only consider three of the conditions examined in the descriptive statistics section: depression, diabetes and hypertension, due to sample size.

Column (1) presents an estimation of the model for depression. It can be seen that personality proxy variables have no statistical significance, but the estimated coefficients have the expected (or intuitive) sign: more risk-seeking behavior is associated to a lower probability of treatment, and higher levels of self-control suggest a higher probability of treatment. Other relevant estimated effects are a negative impact of years of education in the likelihood of treatment, and a high negative effect of income, which can be counterintuituive. The time cost motive finds support when looking at the household composition variables: an additional household member has a negative effect of 3.9 percentage points in the probability of treatment.

However, the results described above are not taking into account the matters discussed in the Identification section. Therefore, column (2) expands the model by adding a lagged dependent variable into the specification. By doing this, evidence is found for an impact of personality variables, in particular self-control: a one standard deviation in self-control proxy increases the likelihood of treatment by 3.9 percentage points. In addition, when controlling for reverse causality and some unobserved heterogeneity a gender gap is significant: males have an average positive effect of almost 10 percentage points in comparison to females. Also, the income effect above described disappears and the household composition effect is still (but less) significant. It is also important to mention that, across these specifications, age may not seem to play a major role.

[10] See Contreras and Plaza (2010).

Columns (3) and (4) present the results for diabetes. For this condition, a significant effect is found for the two measures of personality here considered, even when controlling for endogeneity and unobserved heterogeneity. A one standard deviation in the risk-aversion measure reduces the probability of treatment in 1.5 percentage points, and in the case of self-control the effect is positive (in 1.4 perentage points). Unlike depression, age has a positive and robust impact on treatment, increasing its likelihood in 3.5 percentage points in average for the 55-65 years old bracket. In addition, no evidence of income or household composition effects is found. An interesting point arises when looking the marginal effect of the lagged dependent variable: its magnitude is significantly lower (a fourth) that the one estimated for depression, which can be interpreted as a poor treatment adherence. This result has been widely documented in the medical literature (see Davies et al. (2013) and Larkin et al. (2015) for a survey on this topic).

Finally, columns (5) and (6) comprises the results for hypertension, where no evidence of effects of personality variables on treatment is found, even when controlling by past treatment decisions. For this condition, the main determinants might be related to demographics, as treatment increases importantly with age. This effect is also documented in described literature (Steyn et al. (2008) for South Africa, Kang et al. (2015) for Hong Kong, van den Berg et al. (2013) for Germany).

A very important result, which is also consistent across conditions and specifications, relates to health insurance. In none of the estimations the effect of private health insurance is statistically signifcant, even when controlling for past treatment. This result can be explained by the existing public healthcare policies in Chile, where treatment for this conditions, whether health insurance is public or private, is legally guaranteed.

5.1 Including Comorbid conditions

As described in previous sections, treatment outcomes are greatly influenced by comorbid conditions, understood as "any distinct additional entity that has existed or may occur during the

clinical course of a patient who has the index disease under study"[11]. We examine the effect of this mechanism by including a dummy variable valued 1 if the NCD-diagnosed was diagnosticated with a new condition in the last three years. Table 4 present the results of this exercise.

Results show that, when extending the model, the majority of the preliminary findings remain statistically significant, including those related to personality variables. For depression the estimated effect gains significance, and for diabetes these reduce their magnitude. In the case of hypertension, no new evidence is found. As suggested by literature previously described, the included variable has a considerable significant effect on treatment, across all conditions studied. This is, the diagnosis of a new condition in the last three years increases the likelihood of treatment, and for depression this effect is almost 17 percentage points. However, the interpretation of these effects has to be extremely careful, since the variable is not only capturing the medical effect of comorbidity, but also the mere fact of getting medical consultation during the time period considered.

5.2 Precising Household Composition

A preliminary result refers to the effect of household composition into treatment, in particular the negative impact of family size. In an effort to deepen this result, we decompose the variable "# Household members" into four categories, following Zuvekas (2014): 0 to 5 years old, 6 to 17 years old, 18 to 64 years old, and 65 years old or older. This might distinguish more precise effects, related to household time allocation hypothesis.

Estimations for these specifications are presented in Table 5. Once again, the overall picture of results remains untouched. Personality proxy variables keep their original significance, but their magnitude decreases again for diabetes. In turn, new findings appear when comparing the estimated effects of the original household composition variable and those of each category. Unlike Zuvekas (2014), the negative effect of family size on treatment for depression is driven only by the presence of household members (other than the individual) between 18 and 64 years old. Moreover, an additional household member of that age bracket decreases the probability of

[11] Valderas et al. (2009).

treatment in 4.4 percentage points. For diabetes, we find positive effects of families with older members in the probability of treatment, which was not identified when grouping all members into one variable, although its significance is relatively weak (10%). Finally, for hypertension no new evidence was found.

5.3 Heterogenous effects

At this point it is clear that the main results of this research, namely those of personality proxy variables, have a certain level of robustness. Therefore, we again try to decompose previous findings in order to capture potential heterogeneity. In this case, we introduce interactive variables into the specifications for those variables. As suggested by literature and the descriptive statistics here presented, we interact personality proxy variables with a dummy gender variable to learn if the estimated effects are driven by males, or females, or probably both.

Table 6 presents the results for these estimations, which highlight the existence of significant heterogeneity across conditions. For depression, we find no distinctive effect of personality (in this case self-control) when including gender interactive variables. This can be interpreted as the existence of a positive homogeneous effect of this dimension into treatment of this condition. However, the story is different when looking at diabetes. Here personality proxy variables have significant effect only for the male population. In the case of risk aversion, a one standard deviation in this variable has a significant negative impact of 2.1 percentage points for males, in contrast to the 0.8 percentage points effect when considering the previous specification. Similarly, when analyzing the impact of self- control, a one standard deviation in this proxy measure has a significant positive impact of 1.1 percentage points for males, which is 0.2 percentage points greater than the estimated effect assumed as homogeneous. In this case, we can state that personality variables are relevant only for males.

6 Discussion

Several appreciations can be drawn by the results presented above. One of them is the corroboration of the existence of significant heterogeneity across conditions here considered. Even

though these pathologies share a common set of characteristics that distinguish them from other diseases, most of them related to medical features[12], there is no evidence of a systematic or homogeneous impact of personality-related variables on the decision of treatment. Therefore, when consolidation of these conditions into a global category (namely "chronic disease" or "NCD") is performed, some particular effects might be offsetting themselves. This was confirmed when regressions with that grouped variable were estimated (not presented here). However, these estimations were aimed at obtaining a primary look at the phenomena, and also in order to gain power due the relatively small size of our sample.

That being said, and regarding to the main scope of this investigation, empirical evidence is found about the role of personality or behavioral characteristics into the decision of treatment, for at least two of the conditions here studied. This has been widely mentioned on related literature as a key determinant of the decision, but never measured. For instance, Ariely (2010) delivers both experimental and anecdotal evidence suggesting that procrastination and self-control negatively affects demand for healthcare. Also, Elder et al. (1999) argues that behavior is a major determinant of patient compliance in primary care. In the effort of measuring these often unobservable traits, proxy variables that were considered (risk-aversion question score and TIPI test score) reflected risk aversion and self-control/responsibility in a satisfactory way. This measuring approach existed in the literature (Erlen et al. 2011), but only in a descriptive analysis. Due to their intrinsic proxy nature, assessments about estimated effect's magnitude must be very careful, noting that only a part of an unobservable characteristic is captured by these variables. This is an important mention, given that statistically significant effects of proxy variables are relatively small in magnitude. However, in almost every specification the estimated coefficients associated to these variables had the expected (or intuitive) sign.

When looking at what we already knew, many of the estimated effects of socio-economic determinants meet the evidence presented by the existing literature. Household allocation hypothesis, suggested by household composition variables, finds empirical support for depression and diabetes. Moreover, we also find that household income is not a relevant dimension when deciding to go under treatment. In this sense, the use of a nationwide household survey yielded a picture

[12]Mainly diagnosis and prognosis.

in terms of the influence of certain socio-economic or demographic factors on the decision of treatment that is somewhat similar to what medical and health economics literature has documented, despite the arguably existence of measurement error in our data.

Another remarkable outcome refers to the effect of health insurance. In 2006, a great number of conditions were added to the chilean public healthcare coverage net known as Explicit Guarantees on Health Plan (Plan GES). This program secures coverage to the whole population with health insurance, whether it is public-financed or private-financed. Among these conditions[13] were diabetes mellitus type I and type II, depression for population aged 15 or more, hypertension and high blood pressure for population aged 15 or more, and many others. This means that, for our sample, treatment for these conditions was, at least financially, guaranteed. Therefore, it was somewhat expected that the type of funding of health insurance (public or private) was not relevant into the decision of treatment for all conditions that were examined[14]. Moreover, descriptive statistics also shows that supply factors are not binding when asking individual why they are not currently under treatment[15]. This suggests that public health policies in Chile oriented to increase treatment take-up and adherence for chronic diseases should tackle other aspects, besides coverage[16].

Finally, it is worth mentioning that this investigation considers only one dimension of the problem of non-communicable diseases, which is treatment. Poor diagnosis outcomes are also a major challenge in order to improve welfare, and the influence of personality characteristics on healthcare demand is almost straightforward. Therefore, all our results are pertinent for the diagnosed population. Further research should incorporate the diagnosis stage for a more comprehensive understanding of the effects of personality in overcoming chronic diseases.

[13] Many of these conditions are considered *catastrophic*, both medical and financially.
[14] This was documented for many conditions, such as hypertension (Stockwell et al. 1994).
[15] See Tables 7, 8 and 9.
[16] A good summary on this topic is found in Kwon et al. (2009)

7 Conclusions

In this research, we provide novel evidence about the determinants of treatment of three non-communicable diseases in Chile. By exploiting a rich database, we are able to extend existing literature by including personality proxy variables as one of the many determinants of this decision. In particular, we incorporate attitude towards risk and self-control/responsibility as two factors that might be playing a significant role when explaining why people, being able to do so, do not go under treatment for a previously diagnosed condition. We considered proxy variables in order to capture these traits, satisfactorily reflecting the elements above mentioned.

Both descriptive and econometric analysis are consistent in showing that there exists substantial heterogeneity across chronic conditions. Although these diseases share a common set of characteristics that distinguish them from other pathologies, it is verified that many of the determinants of treatment for these diseases are different, therefore a joint analysis may lead to confounding results.

We find that attitude towards risk and self-control problems do play a role in the decision-making process of treatment for depression and diabetes. No effect was found for treatment of hypertension. Although the estimated effects are small in magnitude, proxy variables are able to capture at least a fraction of an often unobservable impact. The positive effect of self-control on the treatment of depression is homogeneous in gender. Also, attitude towards risk and self-control arises as a significant determinant in treatment for diabetes, but only for males. With these results, we illustrate that preferences have something to say in the decision, and there exists heterogeneity across conditions and gender.

Also, the evidence consistently shows that household income have no empirical relationship with treatment, for all the conditions here examined. Moreover, we find that the type of health insurance (public-funded or private funded) neither represents a significant factor when deciding to go under treatment. This might be explained by the relatively fair coverage of NCD treatment both in the public and private health systems in Chile. Thus, it can be stated that budget constraints are not binding to this decision, for this sample.

On the other hand, household composition variables are relevant for depression and diabetes, having a negative impact on the decision of treatment. It can be inferred, then, that people in these groups *can't* go under treatment if the household time allocation mechanism operates. As previous literature suggested, demographic characteristics (age) and comorbid conditions are the main determinants of the decision of treatment of hypertension.

Further research must take into account the diagnosis stage in order to obtain a more comprehensive analysis of the effect of non-cognitive characteristics on chronic diseases. Overcoming this public health issue is crucial to improve population's welfare by increasing the efficiency of health expenses.

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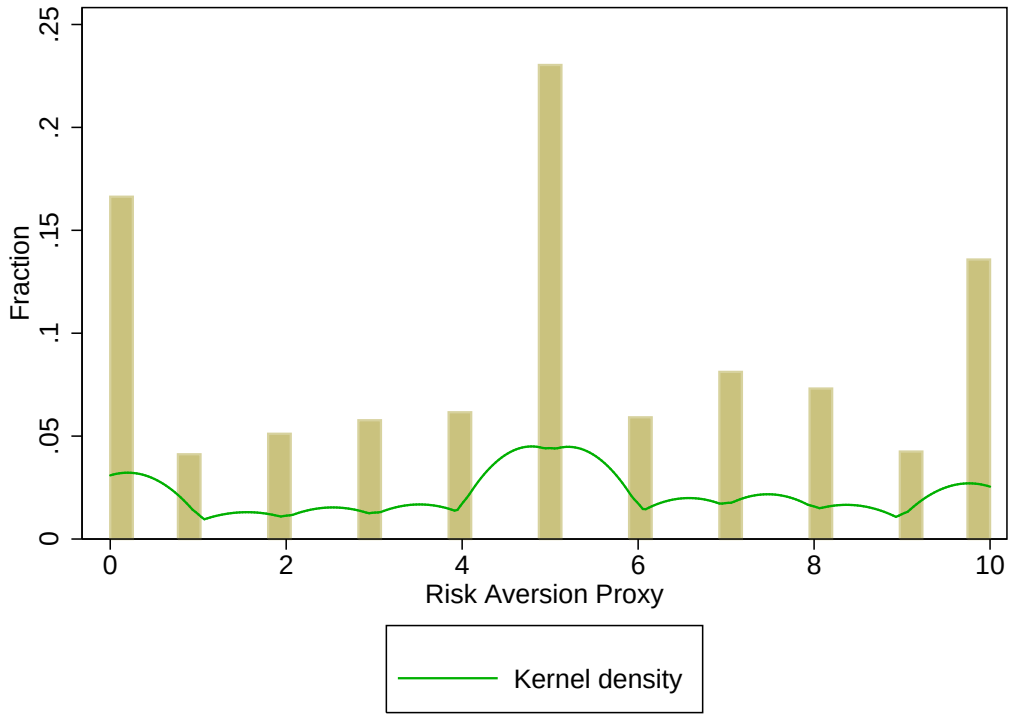

Figure 1: Risk aversion histogram. Source: EPS 2009.

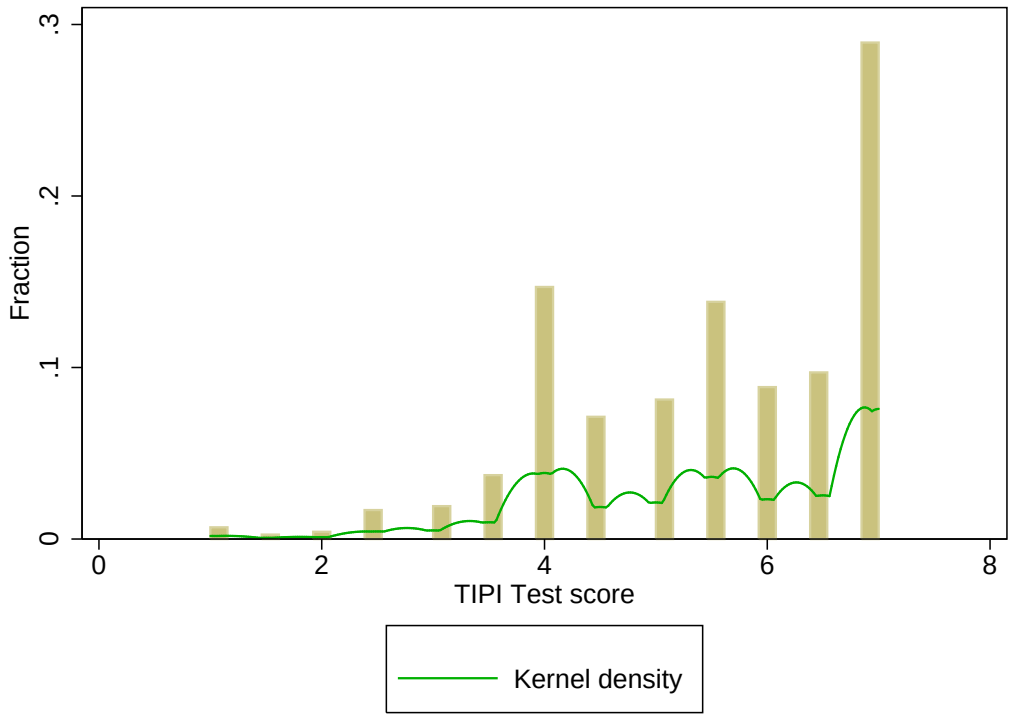

Figure 2: TIPI Test score histogram. Source: EPS 2009.

Table 3: Probit regressions for Treatment of NCD, Age 35-65

Marginal Effects (at means)

Dependent variable: 1 if NCD-diagnosed is under treatment, 0 if not

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Depression		Diabetes		Hypertension	
Personality						
Risk Aversion Proxy (standardized)	-0.032	-0.019	-0.015**	-0.015**	-0.007	-0.007
	(0.127)	(0.356)	(0.027)	(0.020)	(0.535)	(0.439)
TIPI Test score (standardized)	0.033	0.039*	0.015**	0.014**	-0.005	-0.005
	(0.149)	(0.073)	(0.023)	(0.034)	(0.637)	(0.530)
Demographic Characteristics						
Dummy Gender (Male=1)	0.081	0.093**	-0.008	-0.005	-0.036	-0.015
	(0.101)	(0.043)	(0.578)	(0.665)	(0.168)	(0.482)
Dummy Age 55-65 years	0.017	-0.009	0.048**	0.035**	0.076***	0.043**
	(0.767)	(0.860)	(0.023)	(0.046)	(0.005)	(0.043)
Education	-0.015**	-0.015***	-0.004	-0.003	-0.005	-0.004
	(0.018)	(0.007)	(0.124)	(0.157)	(0.126)	(0.104)
Income						
Ln p/capita income in Hh.	-0.044*	-0.022	0.004	0.002	0.008	0.006
	(0.060)	(0.322)	(0.551)	(0.747)	(0.635)	(0.602)
# Working people in Hh.	0.012	-0.003	-0.007	-0.008	0.016	0.008
	(0.683)	(0.914)	(0.524)	(0.414)	(0.320)	(0.521)
Household Characteristics						
# Household Members	-0.039**	-0.027*	0.007	0.005	0.001	0.004
	(0.011)	(0.051)	(0.259)	(0.367)	(0.922)	(0.599)
NCD-related						
Duration of condition (years)	0.006*	0.003	0.002*	0.001	0.005***	0.002**
	(0.079)	(0.252)	(0.075)	(0.526)	(0.000)	(0.049)
Dummy Treatment 2006		0.280***		0.070***		0.193***
		(0.000)		(0.001)		(0.000)
Health Insurance						
Dummy Private Health Insurance	0.088	0.074	0.028	0.020	0.048	0.036
	(0.216)	(0.289)	(0.192)	(0.321)	(0.255)	(0.277)
Observations	514	514	405	405	1,114	1,114

Source: Authors' own calculations using EPS 2006-2009.

Robust p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Probit regressions for Treatment of NCD including comorbid conditions, Age 35-65

Marginal Effects (at means)

Dependent variable: 1 if NCD-diagnosed is under treatment, 0 if not

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Depression		Diabetes		Hypertension	
Personality						
Risk Aversion Proxy (standardized)	-0.019	-0.018	-0.015**	-0.012**	-0.007	-0.007
	(0.356)	(0.369)	(0.020)	(0.030)	(0.439)	(0.369)
TIPI Test score (standardized)	0.039*	0.039*	0.014**	0.010*	-0.005	-0.006
	(0.073)	(0.069)	(0.034)	(0.051)	(0.530)	(0.425)
Demographic Characteristics						
Dummy Gender (Male=1)	0.093**	0.085*	-0.005	-0.004	-0.015	-0.014
	(0.043)	(0.065)	(0.665)	(0.686)	(0.482)	(0.486)
Dummy Age 55-65 years	-0.009	-0.022	0.035**	0.029**	0.043**	0.039*
	(0.860)	(0.677)	(0.046)	(0.050)	(0.043)	(0.057)
Education	-0.015***	-0.015***	-0.003	-0.002	-0.004	-0.004
	(0.007)	(0.008)	(0.157)	(0.186)	(0.104)	(0.104)
Income						
Ln p/capita income in Hh.	-0.022	-0.020	0.002	0.002	0.006	0.007
	(0.322)	(0.357)	(0.747)	(0.650)	(0.602)	(0.521)
# Working people in Hh.	-0.003	0.009	-0.008	-0.006	0.008	0.005
	(0.914)	(0.770)	(0.414)	(0.443)	(0.521)	(0.672)
Household Characteristics						
# Household Members	-0.027*	-0.032**	0.005	0.004	0.004	0.004
	(0.051)	(0.014)	(0.367)	(0.344)	(0.599)	(0.507)
NCD-related						
Dummy Treatment 2006	0.280***	0.297***	0.070***	0.112***	0.193***	0.220***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Duration of condition (years)	0.003	0.003	0.001	0.000	0.002**	0.002*
	(0.252)	(0.209)	(0.526)	(0.449)	(0.049)	(0.062)
New NCD diagnosed in 2006-09		0.166***		0.044**		0.067***
		(0.004)		(0.018)		(0.007)
Health Insurance						
Dummy Private Health Insurance	0.074	0.065	0.020	0.016	0.036	0.034
	(0.289)	(0.351)	(0.321)	(0.322)	(0.277)	(0.291)
Observations	514	514	405	405	1,114	1,114

Source: Authors' own calculations using EPS 2006-2009.

Robust p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Probit regressions for Treatment of NCD, Age 35-65, precising household composition

Marginal Effects (at means)

Dependent variable: 1 if NCD-diagnosed is under treatment, 0 if not

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Depression		Diabetes		Hypertension	
Personality						
Risk Aversion Proxy (standardized)	-0.018	-0.016	-0.012**	-0.008*	-0.007	-0.007
	(0.369)	(0.413)	(0.030)	(0.059)	(0.369)	(0.408)
TIPI Test score (standardized)	0.039*	0.039*	0.010*	0.009**	-0.006	-0.006
	(0.069)	(0.072)	(0.051)	(0.037)	(0.425)	(0.405)
Demographic Characteristics						
Dummy Gender (Male=1)	0.085*	0.088*	-0.004	-0.005	-0.014	-0.011
	(0.065)	(0.058)	(0.686)	(0.588)	(0.486)	(0.581)
Dummy Age 55-65 years	-0.022	-0.015	0.029**	0.022*	0.039*	0.042**
	(0.677)	(0.786)	(0.050)	(0.072)	(0.057)	(0.024)
Education	-0.015***	-0.015***	-0.002	-0.002	-0.004	-0.003
	(0.008)	(0.009)	(0.186)	(0.229)	(0.104)	(0.135)
Income						
Ln p/capita income in Hh.	-0.020	-0.020	0.002	0.002	0.007	0.005
	(0.357)	(0.346)	(0.650)	(0.735)	(0.521)	(0.624)
# Working people in Hh.	0.009	0.017	-0.006	-0.010	0.005	0.011
	(0.770)	(0.606)	(0.443)	(0.140)	(0.672)	(0.429)
Household Characteristics						
# Household Members	-0.032**		0.004		0.004	
	(0.014)		(0.344)		(0.507)	
# Members 0-5		-0.011		0.002		0.018
		(0.750)		(0.825)		(0.207)
# Members 6-17		-0.034		-0.005		0.005
		(0.197)		(0.407)		(0.635)
# Members 18-64		-0.044*		0.012*		-0.004
		(0.085)		(0.059)		(0.724)
# Members 65 or older		-0.032		0.026*		0.028
		(0.437)		(0.066)		(0.160)
NCD-related						
Dummy Treatment 2006	0.297***	0.296***	0.112***	0.101***	0.220***	0.217***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Duration of condition (years)	0.003	0.003	0.000	0.000	0.002*	0.002*
	(0.209)	(0.197)	(0.449)	(0.465)	(0.062)	(0.075)
New NCD diagnosed in 2006-09	0.166***	0.164***	0.044**	0.040**	0.067***	0.066***
	(0.004)	(0.004)	(0.018)	(0.014)	(0.007)	(0.007)
Health Insurance						
Dummy Private Health Insurance	0.065	0.069	0.016	0.013	0.034	0.035
	(0.351)	(0.333)	(0.322)	(0.370)	(0.291)	(0.243)
Observations	514	514	405	405	1,114	1,114

Source: Authors' own calculations using EPS 2006-2009.

Robust p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Probit regressions for Treatment of NCD, Age 35-65, heterogenous effects

Marginal Effects (at means)

Dependent variable: 1 if NCD-diagnosed is under treatment, 0 if not

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Depression		Diabetes		Hypertension	
Personality						
Risk Aversion Proxy (standardized)	-0.016	-0.012	-0.008*	0.003	-0.007	-0.013
	(0.413)	(0.589)	(0.059)	(0.607)	(0.408)	(0.215)
TIPI Test score (standardized)	0.039*	0.040*	0.009**	0.001	-0.006	-0.017
	(0.072)	(0.100)	(0.037)	(0.724)	(0.405)	(0.126)
Risk aversion Proxy (standardized) * Gender		-0.023		-0.021***		0.013
		(0.642)		(0.007)		(0.407)
TIPI Test score (standardized) * Gender		-0.007		0.011*		0.019
		(0.890)		(0.095)		(0.220)
Demographic Characteristics						
Dummy Gender (Male=1)	0.088*	0.090*	-0.005	0.005	-0.011	-0.013
	(0.058)	(0.051)	(0.588)	(0.514)	(0.581)	(0.520)
Dummy Age 55-65 years	-0.015	-0.015	0.022*	0.018*	0.042**	0.044**
	(0.786)	(0.796)	(0.072)	(0.076)	(0.024)	(0.018)
Education	-0.015***	-0.015***	-0.002	-0.002	-0.003	-0.003
	(0.009)	(0.009)	(0.229)	(0.148)	(0.135)	(0.133)
Income						
Ln p/capita income in Hh.	-0.020	-0.020	0.002	0.003	0.005	0.005
	(0.346)	(0.347)	(0.735)	(0.437)	(0.624)	(0.624)
# Working people in Hh.	0.017	0.017	-0.010	-0.011*	0.011	0.010
	(0.606)	(0.599)	(0.140)	(0.054)	(0.429)	(0.453)
Household Characteristics						
# Members 0-5	-0.011	-0.011	0.002	0.003	0.018	0.016
	(0.750)	(0.760)	(0.825)	(0.733)	(0.207)	(0.260)
# Members 6-17	-0.034	-0.034	-0.005	-0.003	0.005	0.005
	(0.197)	(0.193)	(0.407)	(0.457)	(0.635)	(0.576)
# Members 18-64	-0.044*	-0.044*	0.012*	0.010*	-0.004	-0.003
	(0.085)	(0.085)	(0.059)	(0.062)	(0.724)	(0.766)
# Members 65 or older	-0.032	-0.033	0.026*	0.022**	0.028	0.028
	(0.437)	(0.425)	(0.066)	(0.049)	(0.160)	(0.149)
NCD-related						
Dummy Treatment 2006	0.296***	0.295***	0.101***	0.082***	0.217***	0.220***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Duration of condition (years)	0.003	0.003	0.000	0.000	0.002*	0.002*
	(0.197)	(0.188)	(0.465)	(0.581)	(0.075)	(0.060)
New NCD diagnosed in 2006-09	0.164***	0.163***	0.040**	0.033**	0.066***	0.066***
	(0.004)	(0.004)	(0.014)	(0.022)	(0.007)	(0.007)
Health Insurance						
Dummy Private Health Insurance	0.069	0.069	0.013	0.011	0.035	0.035
	(0.333)	(0.332)	(0.370)	(0.363)	(0.243)	(0.237)
Observations	514	514	405	405	1,114	1,114

Source: Authors' own calculations using EPS 2006-2009.

Table 7: Why are you not currently getting treatment? (Depression)

DEPRESSION (8.94%)	Age brackets 19-24 years	25-34 years	35-44 years	45-54 years	55-65 years	Total
Is not necessary	65.69	62.84	36.54	44.83	42.56	47.55
Lack of coverage (no public or private insurance)	0	3.88	1.72	0.56	1.52	1.77
Lack of coverage (couldn't get appointment with specialist)	0	0	1.65	0	1.69	0.8
Lack of coverage (impossibility to get medical exams)	0	0.65	1.04	2.86	1.88	1.51
Lack of trust in healthcare system (healthcare professionals)	0	0	2.77	3.09	2.94	2.09
Lack of trust in healthcare system (healthcare facilities)	0	0	3.09	2.18	0.96	1.51
I'm not interested in treatment	0	9.47	6.4	15.01	11.26	9.8
I don't have time for treatment	25.62	9.64	24.99	12.02	25.48	18.69
Other reason	8.69	9.35	20.12	12.62	9.89	12.92
No answer	0	3.01	1	3.28	1.31	1.99
No opinion	0	1.16	0.67	3.55	0.51	1.38
Total	100	100	100	100	100	100

Source: Authors' own calculations using EPS 2009.

Table 8: Why are you not currently getting treatment? (Diabetes)

DIABETES (5.75%)	Age brackets 25-34 years	35-44 years	45-54 years	55-65 years	Total
Is not necessary	31.58	32.25	23.12	17.57	25.17
Lack of coverage (no public or private insurance)	0.00	4.11	0	0	1.15
Lack of coverage (couldn't get appointment with specialists)	0.00	2.63	0	2.28	1.36
Lack of coverage (impossibility to get medical exams)	0.00	2.85	0	0	0.8
Lack of trust in healthcare system (healthcare professionals)	0.00	0	0	1.93	0.53
Lack of trust in healthcare system (healthcare facilities)	0.00	0	0	0.47	0.13
I'm not interested in treatment	6.22	10.36	13.52	41.15	19.37
I don't have time for treatment	40.66	15.14	25.02	0	17.28
Other reason	21.53	32.66	33.6	27.86	30.27
No answer	0.00	0	0	8.74	2.41
No opinion	0.00	0	4.75	0	1.53
Total	100.00	100	100	100	100

Table 9: Why are you not currently getting treatment? (Hypertension)

HYPERTENSION (14.94%)	Age brackets 19-24 years	25-34 years	35-44 years	45-54 years	55-65 years	Total
Is not necessary	0	13.91	40.5	22.79	31.45	27.58
Lack of coverage (no public or private insurance)	0	0	2.35	1.22	2.19	1.55
Lack of coverage (couldn't get appointment with specialist)	0	4.67	0.93	0.59	1.24	1.45
Lack of coverage (impossibility to get medical exams)	0	0	0.84	1.24	1.07	0.88
Lack of trust in healthcare system (healthcare professionals)	0	0	0.98	4.47	7.48	3.69
Lack of trust in healthcare system (healthcare facilities)	0	0	0	2.41	0.06	0.75
I'm not interested in treatment	0	39.57	12.65	20.78	18.32	20.39
I don't have time for treatment	100	37.13	22.49	23.96	16.67	25.5
Other reason	0	0	16.72	18.48	12.22	13.07
No answer	0	3.03	1.08	2.69	3.15	2.41
No opinion	0	1.7	1.46	1.34	6.14	2.73
Total	100	100	100	100	100	100

Source: Authors' own calculations using EPS 2009.