

# Protection in Good and Bad Times?

## The Turkish Green Card Health Program

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## Abstract

This paper evaluates the equity and financial protection implications of the expansion of the Green Card (Yeşil Kart) non-contributory health insurance program in Turkey during the growth years from 2003 to 2008. It also considers the program's protective impact during the economic crisis in 2009. The authors find that the rapid expansion of the program between 2003 and 2008 was highly progressive. It led to significant gains in coverage of the poor but offered limited financial protection as

out-of-pocket expenditures even before the introduction of the program had been limited. Using a specialized welfare monitoring survey, fielded in 2009, the authors estimate the impact of the program on household level health care utilization during the first phase of the economic slowdown in Turkey. Using three different estimation techniques, they find that the Green Card program had a significantly positive impact on protecting health care utilization during the crisis.

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# **Protection in Good and Bad Times? The Turkish Green Card Health Program**

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## 1. Introduction

Universalization of health insurance has gained significant momentum in a number of developing countries, especially emerging market economies. In most instances, such reforms aim to improve both efficiency as well as equity outcomes of input-financed public health systems which coexisted with contributory social insurance schemes for those in – or linked to – the formal labor market. Inefficiencies often stemmed from lacking incentives and resources for providers to deliver health services where they were indeed needed; inequities arose due to the hidden out-of-pocket expenditures or absence of essential services so that the poorest, quite often, had to rely on costly private health services in emergency situations. Creation of such parallel, non-contributory health insurance schemes includes the definition of a basic package of health services to which those without formal social insurance coverage are entitled; the identification of the eligible population; the pricing of the package as well as individual service charges providers can claim; and the establishment of a reimbursement mechanisms for participating providers. This allows financing within the system to flow to providers where effective demand materializes. Countries that have introduced such non-contributory insurance schemes on a large scale in parallel to Bismarkian social insurance – and in which the two coexist – include, for example, Argentina (*Plan Nacer*), Chile (*FONASA*), Mexico (*Seguro Popular*) and Indonesia (*Kartu Sehat*) (Pradhan, Saadah et al. 2001; Bitrán and Giedion 2003; World Bank 2004; World Bank 2010).

During the past decade, Turkey also expanded a similar program, the *Yeşil Kart* (Green Card) non-contributory insurance program. The program aimed to provide health services to the poor who were not covered through formal means of health insurance (Akdağ 2009). While initially launched in 1992, almost twenty years ago, the Green Card program was expanded rapidly especially between 2003 and 2008 when the number of *Yeşil Kart* beneficiaries increased nearly four-fold, from 2.5 million beneficiaries to 9.5 million beneficiaries. In parallel, program benefits were expanded: in 2004, Green Card holders started to benefit from outpatient as well as inpatient services at hospitals and as of January 2005, beneficiaries became fully covered for outpatient prescription drugs. The expansion of the number of beneficiaries and benefits associated with the Green Card took place in parallel to significant

increases in the budgetary allowance for the program. Green Card expenditures rose significantly in real terms between 2004 and 2008.

The stated aim of the program was to improve access and quality of essential health services for the uninsured, mostly poor. Apart from raising both the level and quality of care on aggregate, the very concept of insurance, with a defined bundle of inpatient and outpatient health services as well as prescription drugs, was to provide households with uninterrupted access to vital health services, including in times of household level income shocks. The Green Card program, which had started out as a stand-alone program with a separate budget and was the main flagship social protection program of the Turkish government in the past decade, was—as of January 2012—fully integrated into the Universal Health Insurance Scheme covering all Turkish citizens (under Law 3816).

This paper assesses the Green Card program along several dimensions. First, we look at who was reached by the massive coverage expansion between 2003 and 2008. Using repeated cross-section household survey data, we report both average and marginal incidence changes. Second, we assess whether the program had a significant impact on improving the financial protection of households by lowering out-of-pocket expenditures which would have been both impoverishing as well as catastrophic in nature. Third, using a special household survey which was collected during the economic crisis in Turkey in 2008 and 2009, we evaluate whether the Green Card non-contributory health insurance program protected health care utilization during the economic crisis period during which households faced income shocks.

The structure of our paper is as follows: We start in Section 2 by providing information on the institutional set-up and targeting mechanism of the program. Section 3 describes the data used in this paper. Section 4 presents the results as to who benefited from the massive expansion of the program that occurred between 2003 and 2008. Section 5 reports our results on the financial protection impact of the program while Section 6 includes an assessment of the program with respect to protecting the health utilization of the poor in Turkey through the Global Financial Crisis period in 2008-2009. Section 7 concludes.

## 2. Institutional Background and Targeting Mechanism

The Green Card program, initially set up in 1992, was an important social protection mechanism, centrally financed through general revenues. Prior to 2002, the budget and coverage of the program had remained small (Yildirim and Yildirim 2011). Through the Health Transformation Program (HTP), launched in 2002, several changes were made in the health financing system resulting in significant program scale-up (OECD and World Bank, 2008). In 2005, outpatient care and pharmaceuticals were included in the program package which caused a marked increase in program applications. The budget increased from 780 million TL in 2004 (0.14 percent of GDP, 16 percent of budget of Ministry of Health) to 3.65 billion TL in 2008 (0.38 percent of GDP; 33 percent of Ministry of Health budget).

The application process for the Green Card Program was administered by local committees at the district level.<sup>1</sup> The Green Card was distributed through a hybrid targeting scheme, combining community discretion with eligibility rules determined by the central government. Applications were collected at the district level Green Card offices which usually reported directly to the centrally appointed district heads (*kaymakams*). The ultimate decisions on the distribution of the cards were made by local committees chaired by the *kaymakam* (in districts) and the deputy governor in charge of the Green Card in the province center. In a typical district with a population exceeding 50,000, the distribution of the cards looked like the following:

Step 1: The application process was handled through a Green Card service center. The one-stop service center checked to see if the applicant was registered with any of the formal social security institutions (*SSK*, *Emekli Sandığı* or *Bağkur* prior to 2006 and *SGK* after 2006<sup>2</sup>) or if the applicant owned a motor vehicle (ownership of a car prevented the applicant from obtaining a Green Card).

Step 2: The total income of the household was approximated by adding the reported incomes of the individuals in the household to any estimated income from agricultural land holdings. The total household income was then divided by the number of people in the household. If

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<sup>1</sup> Districts are the third government level in Turkey with the district head – *kaymakam* – being centrally appointed by the Minister of the Interior.

<sup>2</sup> Prior to 2006, there were three social security institutions in Turkey *SSK* (covering private sector employees), *Emekli Sandığı* (covering government employees) and *Bağkur* (for the self-employed). In 2006, the government merged the formal social security system under the umbrella of *SGK* (Social Security Institution).

the estimated income per capita was less than 1/3 of minimum wage (net of taxes), then the household members were deemed eligible for the Green Card.

Step 3: The local committee decided whether or not qualifying applicants (according to steps one and two above) were indeed to be admitted to the Green Card program. Even if the household was formally eligible, the committee was able to use its discretion not to provide the card if evaluated the person/s not as poor. The household members who qualified each obtained an individual green booklet which registered all interactions with the health system.

This hybrid targeting mechanism, combining central criteria with local knowledge and assessment, resulted in a progressive roll-out of the program during expansion.

### **3. Data and Variables Used**

We use two main data sources in our Green Card assessment: the Turkey Household Budget Surveys (HBS) from six consequent years (2003-2008) and the Turkey Welfare Monitoring Survey Baseline dataset (collected in May 2009).

HBS data sets are cross-sectional household surveys collected annually by the Turkish Statistical Institution (TURKSTAT). Their main purpose is to provide estimations of household expenditure levels for various categories and to monitor poverty developments in the country. The samples are nationally representative, varying in size but large throughout (25,764 households in 2003, about 8,600 from 2004-2008). The data provide consistent information over time, capture households' access to health insurance as well as health expenditures in various sub-categories.

The HBS contains a number of variables which allow for an assessment of the Green Card program. First, it records, for each individual household member, access to various forms of health insurance such as the formal social security health insurance, private plans, or the Green Card program. We can then use nominal household per capita expenditures to assess the targeting and coverage outcome of the Green card program.<sup>3</sup> Health expenditures are recorded in line with the international COICOP standards.

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<sup>3</sup> Ideally, we would prefer to use real consumption at the household level with both spatial and adult equivalence adjustments. But due to lacking regional identifiers in the household dataset, we can only compute nominal per capita expenditures to define population deciles.

The second data source we use in this paper is the Turkey Welfare Monitoring Survey (TWMS) baseline data set. The collection of this dataset was mobilized by the World Bank, UNICEF and the Economic Policy Research Foundation of Turkey, TEPAV, in early 2009 and the survey was fielded in May-June 2009. The aim of the survey was to monitor the welfare of Turkish households during the beginning of the Global Financial Crisis of 2008-2009 and to measure the ways in which households coped with the economic turndown. The survey was fielded in five major cities: Istanbul, Ankara, Izmir, Kocaeli and Adana, accounting for forty percent of the overall urban population in Turkey. It is representative for the combined five-cities and includes 2,102 households.<sup>4</sup>

The TWMS includes a number of different questions on health demand behavior, including retrospective questions on the household's utilization of health services during the crisis period October 2008 to May 2009. Combined with information on insurance access included in the survey, it is hence possible to track the health utilization behavior of various types of households through the creation of a quasi-panel.<sup>5</sup> The survey distinguishes between the reduction in curative and preventative care services.

Further, we construct a wealth variable at the household level using the TWMS. The asset index constructed for this purpose is based on housing characteristics and household durable goods following (Filmer and Pritchett 2001). We use the asset index to derive both wealth deciles as well as wealth quintiles of the urban sample.

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<sup>4</sup> The survey can be obtained from [www.worldbank.org/turkey](http://www.worldbank.org/turkey) or by emailing the World Bank Turkey Country Office [turkeywebfdbk@worldbank.org](mailto:turkeywebfdbk@worldbank.org).

<sup>5</sup> We consider the responses of households to the following two questions in the baseline data: (i) "*Have you had to reduce visits to the doctor between October 2008-May 2009?*" and (ii) "*Have you had to reduce the utilization of preventive health services from October 2008-May 2009?*" Both questions when answered positively involve a reduction in the utilization of health care in the time period  $t_0$  to  $t_1$ .

#### 4. Expansion of the Program: Targeting and Coverage

The analysis of HBS surveys shows that health insurance coverage in Turkey increased considerably between 2003 and 2008. Coverage expansion occurred both for formal sector insurance schemes as well as the Green Card program. The coverage of formal contributory insurance schemes (*SSK*, *Emekli Sandığı* and *Bağkur*) expanded from 40.6 million individuals (59% of the population) in 2003 to 50.1 million individuals (69% of the population) in 2008. The number of Green Card beneficiaries rose from 2.5 million in 2003 to 9.5 million in 2008 with peak registration at 10.2 million in 2006. Table 1 provides details on the numbers of individuals in the Green Card scheme as estimated from the HBS datasets. These household level findings are consistent with administrative data sources: According to the statistics by the Ministry of Health, as of September 2008, the total number of Green Card holders in Turkey was about 9.4 million people.<sup>6</sup>

As a result of the expansion of health insurance schemes in Turkey, the total share of the population covered by one of the different health insurance schemes increased from 64 percent in 2003 to 87 percent in 2008. The poor, who had traditionally not been covered by formal sector health insurance mechanisms, benefited significantly from this expansion, largely through the expansion of the Green Card program. In 2003, only about a fourth of the population in the poorest decile had been covered by some kind of health insurance plan (of which about half had been covered through the Green Card), this share rose remarkably to 82 percent in 2008 (with over two-thirds of these having access to the Green Card scheme). Figure 1 maps the rapid and progressive expansion of the Green Card scheme for each year between 2003 and 2008.

While such rapid expansion of any program puts pressure on the administrative capacity at various government levels, the rapid roll-out of the Green Card program from 2003 to 2008 was accompanied by an improvement in overall targeting performance (Figure 2). In 2003, 55 percent of beneficiaries pertained to the bottom quintile (33 percent in the poorest decile, 22 percent in the second decile) and this ratio continuously improved to 64 percent in 2005, 68 percent in 2007 and finally 70 percent in 2008. As such, the targeting performance of the Green Card scheme in Turkey compared well internationally: 60 percent of Chile's SUF cash transfers, 39 percent of Brazil's *Bolsa Escola* CCT program, 34 percent of Mexico's

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<sup>6</sup> The Ministry of Health reports that there have been cancellations of about 6 million Green Cards from 2003-2008, which may explain the drop in the total beneficiary numbers from 2006-2007 to 2008.

*Oportunidades* CCT program and 34 percent of Indonesia's *Kartu Sehat* health insurance program benefited the poorest quintile of the population in those countries (Lindert 2005).

## **5. Trends in Out-of-Pocket Payments for Health Care and Catastrophic Health Expenditures during Program Expansion**

This section assesses to what degree the expansion of the Green Card program led to an improved financial protection of beneficiaries by reducing households' out-of-pocket expenditures. As such, the measured impact of the program depends on the extent of out-of-pocket expenditures of beneficiaries before – or at the time of - program entry. Such out-of-pocket expenditures had been, for the most part, relatively moderate, reflecting that affordable access to public health services had existed before program roll-out.

Figure 3 provides the distribution of out-of-pocket health expenditures across the percentiles of the population in 2003 and 2008, respectively. The Figure shows the cumulative distribution of the population ranked by nominal per capita expenditures and maps per capita (gross) expenditures and expenditures net of health spending for each individual in the sample in 2003 and 2008. The vertical lines in the Figure show the nominal size of health expenditures for each individual in the sample. The horizontal dashed lines are the poverty lines for 2003 and 2008. Around the poverty line, the expenditures of the poor on health were relatively small in both of these years. Also, we can observe that relatively modest amounts of vertical lines crossed the poverty line in 2003, before the expansion of the Green Card took place.

If we compare Green Card households to those households without any insurance coverage, we observe a small difference in the share of total expenditures allocated to health in 2008. Households with a head holding a Green Card in 2008 spent on average 1.6 percent of total expenditures and 2.7 percent of non-food expenditures on health, while those households with no insurance spent 2.1 percent of total and 2.9 percent of non-food expenditures on out-of-pocket health expenditures.

The difference in spending in terms of percentage of household expenditures between the two groups is 0.45 percent of total household expenditures. While this difference is statistically significant for the overall sample (at the 95 percent confidence level), it is not statistically significant when restricted to the poorest quintile. Welch test results for this hypothesis test are provided in Table 2. For the poorest households -- which already had low levels of health

expenditures (also depicted in Figure 3) – we do not observe a lower level of health expenditures for Green Card holders compared to those without.

Similarly, we also estimate the additional protective impact of the Green Card against impoverishing health expenditures to have been relatively modest. Health expenditures can have an impoverishing impact if near-poor households have to switch away from buying other necessary goods in order to cover urgent health costs. A near-poor household that covers health expenditures and therefore has to reduce spending on food would then become a poor household in terms of its living standards (O'Donnell et al. 2004). In Turkey, national poverty measures are calculated using a consumption basket that *includes* health spending. With health expenditures included in household nominal expenditures, a household that might be poor without health expenditures may record non-poor levels of expenditures if we include health spending.<sup>7</sup>

Table 3 quantifies the impoverishing impact of health spending. We calculate this impact as the percentage of individuals who were poor *without* taking into account health expenditures (and measured against a poverty line similarly net of health expenditures<sup>8</sup>) but were non-poor if health expenditures are taken into account. We find that, with 0.8 percent, the impoverishing impact of health spending was modest at the onset of program expansion (2003) due to limited out-of-pocket spending even in the absence of the Green Card program. We observe a mild decline in the poverty impact of health spending in Turkey between 2003 and 2008 from 0.8 to 0.3 percent, although the decline is not statistically significant when the confidence interval around the poverty headcount estimates are considered.

Lastly, we examine the incidence of catastrophic health expenditures. These are defined as the share of total expenditures dedicated to health above a certain threshold level (Xu et al.

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<sup>7</sup> We apply the following calculation to assess the impoverishing impact of health spending: Given published poverty rates by TURKSTAT at the national level, we derive poverty lines endogenously for each HBS year, using nominal expenditures (as the publically available household surveys do not include geographic identifiers which would have allowed for a computation of regional poverty lines and the derivation of real consumption expenditures). Those households above the poverty line are marked as non-poor (including health expenditures). We then create a new poverty line that does not include health expenditures and assess the poverty status of each household not including health expenditures. The impoverishing impact of health spending is the percentage of individuals who were poor without health expenditures (when compared to the poverty line net of health expenditures) but were non-poor when full expenditures are compared to the full poverty line (including health expenditures).

<sup>8</sup> The poverty line is adjusted by subtracting the average health expenditures of the poorest three deciles from the poverty line. The poverty line shifts from the 27<sup>th</sup> percentile in 2003 to the 17<sup>th</sup> percentile in 2008, hence we pick the bottom 3 deciles as an approximation for the deciles around the poverty line across this time period.

2007). We apply different threshold levels for catastrophic payments on health care varying between 5 and 25 percent of total household expenditures and between 15 and 40 percent of non-food expenditures of the household. We calculate both the incidence and the mean gap of catastrophic health care spending at these difference thresholds (Table 4).<sup>9</sup>

The expansion of the Green Card program went hand in hand with a decline of the incidence of catastrophic health care spending in Turkey, independent of threshold level chosen. The percentage of households having faced health expenditures above 10 percent of household expenditures stood at 4.89 percent in 2003 and declined to 3.99 percent in 2008 (a statistically significant difference at the 95 percent confidence level). The intensity of catastrophic health expenditures also declined in this period from 0.50 to 0.36 (at the 10 percent of total expenditures threshold). In 2008, 0.79 percent of households (down from 1.10 percent in 2003) had health expenditures that exceeded 25 percent of their total spending. Similarly, in 2008, 0.41 percent of households in Turkey (down from 0.86 percent in 2003) recorded health spending that exceeded 40 percent of their non-food expenditures. In comparison to other countries in the ECA region, the catastrophic expenditure levels in Turkey in 2003 and 2008 were relatively low: The percentage of the population that spent more than 10 percent of total expenditures on health were 20.8 percent in Albania, 12.7 percent in Serbia and 26.3 percent in Kosovo (Mendola, Bredenkamp et al. 2007).

One dimension of the expansion of the insurance scheme which we were, due to the lack of data, not able to look at during the period of expansion, from 2003 to 2008, concerns the actual utilization of health services which can very well be the major dimension of welfare improvement for beneficiaries. We are able, though, to look at the impact of the program on health care utilization during the recent economic downturn which we turn to in the next section.

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<sup>9</sup> Catastrophic health care payments measures are expressed in similar terms as poverty measures, in terms of incidence (headcount) and intensity (gap) of out-of-pocket health care spending. The incidence (headcount) is the percentage of individuals whose health care costs, expressed as a share of total or non-food expenditures, exceed a certain threshold,  $z\%$ . The intensity (mean gap) is the average amount by which payments as a proportion of income exceed the threshold  $z$ .

## **6. Protective Impact of the Green Card during the 2008-2009 Economic Downturn**

In this Section, we make use of the Turkey Welfare Monitoring Survey (TWMS) to assess whether the Green Card had a protective impact for its beneficiaries during the recent economic downturn. Our hypothesis is that the Green Card did provide such protective impact by lowering the costs of both outpatient and inpatient care. If true, we would find Green Card holders to have reduced health consumption less than non-beneficiaries (of any insurance program). The analysis in this Section, hence, compares the health care utilization behavior of Green Card holding households with households with no insurance coverage. The counterfactual in the analysis therefore is households that did not have access to any form of health insurance (whether through the Green Card, through SGK coverage or private insurance). We estimate the different behavior of households with access to the Green Card and with no health insurance throughout the crisis using three different estimation methods: (i) a non-parametric technique, (ii) a parametric linear probability model (LPM) and maximum likelihood probit regressions; and (iii) propensity score matching.

When modeling the impact of a demand-side subsidy on health care utilization, we need to control for self-selection given that cardholders could have un-observable attributes which could be correlated with both program enrolment and the actual use of health services. Simply comparing medical care use between program participants (the treatment group) and non-participants (the control group) could otherwise result in a biased estimate of the program's effect. With experimental data, this bias would not be present as the random assignment of individuals to each group would balance the observable and unobservable individual characteristics affecting health utilization.

In the absence of experimental data, we make use of retrospective questions included in the TWMS. The TWMS recorded households' health care utilization at the beginning (October 2008) of the crisis and at the time of data collection (June 2009). With such a quasi-panel, we can isolate household fixed effects by estimating the probability of change in health care utilization for each household during the crisis. Comparing the estimated reduction in the probabilities of health care utilization of Green Card holding households versus households with no insurance coverage, then allows us to assess the protective impact of the program.

Table 5A provides summary statistics for household head characteristics with respect to insurance access, distinguishing Green card holders from those with access to the SGK

(formal health insurance holders) and household heads not covered by any health insurance.<sup>10</sup> Green Card holding household heads record, on average, less educational attainment and a higher likelihood of employment in the informal sector than other groups (note that the latter is one of the beneficiary selection criteria as discussed above). In Table 5B, the same variables are presented for the sample of households in the poorest asset quintile only. Here, the difference across insurance types by educational attainment is not as pronounced. The proportion of household heads employed in agriculture and industry are also roughly similar between Green Card holding households heads and those without any insurance. The only difference remains in the proportion of household heads formally employed with 4.3 percent of Green Card beneficiaries holding formal jobs and 21.1 percent of household heads without any insurance. This difference is a function of the eligibility criteria for the card and derives from the targeting process described above.

### 6.1 Non-parametric Estimation

We use three different estimation techniques with the TWMS to assess the protective impact of the Green Card program during the economic crisis in Turkey. We first employ the below non-parametric comparison between the group of households with access to the Green Card and those that have no health insurance coverage:

$$\Delta y_t(x) = E(\Delta y|x, G_i = 1) \quad (1)$$

$$\Delta y_t(x) = E(\Delta y|x, G_i = 0, H_i = 0)$$

where  $G_i$  is the treatment variable for having access to the Green Card in period  $t_1$ ;  $H_i$  is the variable for having access to other health insurance at the household level (through formal sector health insurance *SGK* or private insurance); and  $x$  is log income per capita in the household. The outcome variable  $\Delta y_t$  is a binary variable that represents the reduction in health utilization between October 2008 and May 2009 and takes on two different variable definitions: (i) reduction in utilization of curative care and (ii) reduction in utilization of preventive care. We consider the responses of households to the following two questions in the baseline data: (i) “Have you had to reduce visits to the doctor between October 2008-May 2009?” and (ii) “Have you had to reduce the utilization of preventive health services

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<sup>10</sup> Note that private insurance holders make up less than 1 percent of the urban sample and have hence been excluded from the summary statistics in this section.

*from October 2008-May 2009?* Both questions when answered positively involve a reduction in the utilization of health care in the time period  $t_0$  to  $t_1$ .

Table 6 provides estimates of the probability of reducing utilization of curative care and preventive care for the whole sample and for the poorest per capita income quintile for those households that had access to the Green Card and those that did not have access to any insurance, respectively. For the group of household heads who had no access to health insurance, the probability of reducing utilization through this period was 36.6 percent while for Green Card holders the probability of such reduction was 21.7 percent.<sup>11</sup> Similarly, we observe a difference in the probability of utilization of preventive health care (in Panel B of same Table) of 15.96 percentage points between Green Card holders and those without any insurance (statistically significant with p value <0.01). The same Table also shows the results for the poorest per capita income quintile only. Here, the difference in the means is even larger with 18.8 percentage point for curative and 26.4 percentage points for preventive care. Both differences are statistically significant.

Figure 4 plots the non-parametric kernel regression estimates for the probability of reducing utilization of curative and preventive health services during the assessed period. The Figure plots the conditional probabilities for reducing health care utilization for the Green Card group ( $G_i=1$  in equation (1)) and the group of households with no health insurance coverage. The non-parametric kernel estimation results are in line with the simple mean differences across the insurance groups (Table 6). The x-axis in the Figure is log per capita income and the analyses is conducted at the household level. The difference in utilization probabilities is starkest among the poorer quintiles where the protective impact of the Green Card program was largest.

## 6.2 Parametric Estimation

By imposing a structure on the relationship between Green Card access ( $G_i$ ) and the change in utilization through the crisis period ( $\Delta y_i$ ), we can estimate the average treatment effect (ATE) by using a parametric regression. The empirical specification for the parametric estimation in time  $t$  is :

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<sup>11</sup> The difference of 14.8 percentage points between the two groups is statistically significant (with a p-value < 0.01), using a Pearson Chi-2 test comparing two binomial distributions.

$$y_{it} = \beta_0 + \beta_1 G_{it} + \beta_2 N_t + \beta_3 N_t G_{it} + \beta_4 X_i + \beta_5 H_{it} + \beta_6 H_{it} G_{it} + u_{it} \quad (2)$$

where

- $y_{it}$  is the utilization of health services for household  $i$  in period  $t$ ,
- $G_{it}$  is the ownership of the Green Card for household  $i$  in period  $t$ ,
- $N_t$  is a dummy variable for the national level macro shock (the crisis). The dummy takes the value of 1 in  $t_1$  and 0 in  $t_0$ ,
- $N_t G_{it}$  is the interaction term for having access to the Green Card in period  $t$  and experiencing the macro shock,
- $X_i$  summarizes household fixed characteristics,
- $H_{it}$  is the household level variable for household income,
- $H_{it} G_{it}$  is the interaction term for having access to the Green Card in period  $t$  and income at the household level, and
- $u_{it}$  is the household and time specific error term

We have two time periods in the data:  $t=0$  in October 2008 and  $t=1$  in May 2009, and we only observe the changes in health utilization behavior (dummy variable for reducing health care utilization) in  $t_1$ , rather than levels in both periods. The same holds for income at the household level for which a retrospective question allows us to assess the changes in income level at the household level (similar to the change in health care utilization).

The difference in equations for the two time-periods becomes:

$$\begin{aligned} \Delta y_{it} = y_{i1} - y_{i0} = & \beta_1 (G_{i1} - G_{i0}) + \beta_2 (N_1 - N_0) + \beta_3 (N_1 G_{i1} - N_0 G_{i0}) + \beta_5 (H_{i1} - H_{i0}) \\ & + \beta_6 (H_{i1} G_{i1} - H_{i0} G_{i0}) + (u_{i1} - u_{i0}) \end{aligned} \quad (3)$$

The dependent variable  $\Delta y_{it}$  is a binary variable in the dataset taking a value of 1 if the household reports having reduced health care utilization (of curative and preventive care respectively). The coefficient  $\beta_1$  gives the additional impact of obtaining access to the Green Card for those households that did not have access to it in  $t_0$ . With the dataset at hand, however, we cannot observe the variable for access to the Green Card in the initial period  $t_0$  (October 2008). Overall enrollment in the Green Card program was very stable during the entire crisis period<sup>12</sup> so that we make the assumption here that households with access to the

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<sup>12</sup> As of 2010, the number of green card holders was 9.5 million indicating that the total number of Green Card beneficiaries did not increase during 2008-2010. While some churning might have occurred (some households

Green Card in May 2009 already had access to the card in October 2008. The macro shock variable  $N$  takes the value 1 in May 2009 and 0 in October 2008 (as the severity of the crisis started to mark labor market outcomes towards the end of 2008). In equation (3), we set  $N_1 = 1$  in  $t_1$  and  $N_0 = 0$  in  $t_0$ , and assuming that there has not been a change in the household's Green Card holding status<sup>13</sup> between  $t_0$  and  $t_1$  ( $G_{i1} = G_{i0}$ ), we derive a simplified form of the equation as follows:

$$\Delta y_{it} = \beta_2 + \beta_3(G_{i1}) + \beta_5(H_{i1} - H_{i0}) + \beta_6 G_{i1}(H_{i1} - H_{i0}) + (u_{i1} - u_{i0}) \quad (4)$$

$$\text{where } E(u_{i1} - u_{i0}) = 0$$

The coefficient  $\beta_2$  measures the impact of the macro shock on the probability of reducing health care utilization. The coefficient is expected to have a positive value (with the macro shock being associated with a positive probability of reducing utilization of health care).<sup>14</sup> The  $\beta_3$  coefficient can be interpreted as the protection provided by the Green Card stemming from the macro shock and  $\beta_6$  is the coefficient for the protection provided to the household in the face of a household level income shock. Assuming selection on observables only, we can interpret the sum of these two coefficients as the average treatment effect of the Green Card, stemming from both a household level income shock as well as the macro impact.

In our baseline fixed-effects model, household characteristics drop out of the differenced equation. However, it is possible that household characteristics influence the change in utilization itself. In one variation, therefore, we retain such characteristics in the model:

$$E(\Delta y_{it}|G, x) = \beta_2 + \beta_3(G_{i1}) + \beta_4 X_i + \beta_5(H_{i1} - H_{i0}) + \beta_6 G_{i1}(H_{i1} - H_{i0}) \quad (5)$$

In the estimation, the household characteristics ( $X_i$ ) include: (i) the household asset index; (ii) the educational attainment level of the household head; and (iii) household demographic composition (number of children, adults and elderly in the household). All of these

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leaving the program and some entering), we can reasonably assume that households which recorded access to the Green Card in May 2009 already had such access at the outset of the crisis in October 2008.

<sup>13</sup> If this assumption is not true and a household in the sample received the Green Card in May 2009 ( $t_1$ ) and not in  $t_0$ , we would most likely underestimate the protective impact of the Green Card program as the actual reduction of the probability of reducing health services would have been higher if the protective impact of the Green Card program had been present throughout the period. In the reverse (households losing access between  $t_0$  and  $t_1$ ), the effect would be the opposite.

<sup>14</sup> Note that the question used in the survey for the change in health utilization questions are "Have you had to reduce visits to the doctor since Oct 2008?" and "Have you had to reduce your use of preventive health care services since Oct 2008?" Hence, both questions when answered positively involve a reduction in the utilization of health care in the time period  $t_0$  to  $t_1$ .

characteristics may potentially be correlated with not only the level of health care utilization and demand but also its changes which we are interested in here.

The regression results for model specifications without and with household characteristics are provided as a linear probability model (LPM) in Table 7 and a *probit* regression (reporting marginal effects) in Table 8. We include separate estimation results for the reduction of curative and preventative health services separately.

In the LPM regressions reported in Table 7, the sample is limited to households that either have access to the Green Card or have no health insurance. The dropped category (and counterfactual) in the LPM regressions is the group in which the household head has no health insurance. Such a household, on average, recorded a 33.9 percent likelihood of reducing utilization of curative care and a 24.7 percent likelihood of reducing curative care in the period analyzed (as provided by the constant term in the regressions, and represented in Equation 4 as  $\beta_2$ ). The  $\beta_2$  coefficient assumes a positive, large and statistically significant value. For households that received a household level income shock in addition to the macro level shock, their probability of reducing utilization of curative health care increased by a further 18.9 percentage points (see Column 1), though their utilization of preventive care did not change (denoted by  $\beta_5$  in Equation (4)).

Households that had access to the Green Card were less likely to reduce utilization of curative care by 12.5 percentage points and preventive care by 15.8 percentage points compared to households with no insurance coverage. This is represented by the  $\beta_3$  term in Equation (4) and can be interpreted as the interaction between the macro shock of the crisis and access to the Green Card at the household level. The interaction term between Green Card access and the household level idiosyncratic income shock does not reveal statistically significant coefficients ( $\beta_6$ ) in these regressions. However, the average treatment effect on health care utilization (protective impact) of the Green Card among those households that received an income shock can be calculated as a combination of  $\beta_3$  and  $\beta_6$  coefficients in Equation 4. This protective impact of the Green Card can then be tested using a joint F-test of significance for  $\beta_3$  and  $\beta_6$ . The joint F-test is reported at the bottom of Table 7 and shows the significance of the Green Card protective impact results.

To provide robustness checks on the results provided above, we control for household characteristics ( $X_i$ ) as in Equation (5) allowing for a more flexible model whereby household

characteristics may be associated with the change in health utilization differently in the two periods. The results of the LPM regression for the specification in Equation (5) are provided in Table 7 in Columns 2 and 4, respectively, for curative and preventive health care utilization. Here, we consider again the partial correlation coefficient of having access to health insurance through the Green Card on changes in health care utilization by looking at the partial correlation coefficients  $\beta_3$  and  $\beta_6$ . The dropped category in these regressions are the households that have no health insurance and where the household head has no formal educational attainment (illiterate or holds no diploma). For this group, the likelihood of reducing health care utilization between Oct 2008 and May 2009 is 43.2 percent for curative care and 20.9 percent for preventive care as reflected by the constant term ( $\beta_2$ ).

The results on Green Card protective impact are robust to the addition of these household level characteristics, where the size of  $\beta_3$  remains negative and significant: minus 11.1 for curative care and minus 14.3 for preventive care with this specification. These regressions make it possible to analyze the change in health utilization behavior by household characteristics in this time period: we observe for instance that for increased values of the asset index (for wealthier households) the probability of reducing curative health care utilization is lower. Household demographics also matter in determining health care utilization through the crisis: in households where there are infants (ages 0-3), and where there are elderly people (ages 60+) the probability of reducing curative health care utilization is lower. For each additional infant in the household, the probability of reducing curative health care utilization drops by 9.7 percentage points, and for each elderly person added to a household the probability of reducing curative health care utilization drops by 8.7 percentage points.

For completeness, we also report the marginal effects from the *probit* regression with the specification in equation (4) in Table 8:<sup>15</sup> Access to the Green Card at the household level is associated with a reduction in the probability of reducing visits to the doctor for preventive care by 12.7 percentage points and the probability of reducing utilization of health services for preventive care by 17.1 percentage points compared to households that have no access to health insurance (Table 8:, Columns 1 and 3). Once again, the results are robust to

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<sup>15</sup> Normally, in a model where the dependent variable is a binary outcome, we would prefer to use a maximum likelihood *probit* or *logit* model rather than a linear probability model as the main estimation. However, in this instance, since  $\beta_2$  the constant term is one of the main coefficients we would like to estimate, we provide the probit model as a robustness check, rather than presenting these results as the main model.

controlling for household characteristics in the probit model as provided in Columns 2 and 4 of the same table.

The results using the linear probability model and the *probit* model with marginal effects both give similar conclusions that (i) access to the Green Card when interacted with the macro shock through the crisis (in  $\beta_3$ ) is associated with a reduction in the probability of reducing health care utilization (both for preventive and curative care); (ii) the household level income shock is associated with a significant increase in the probability of reducing curative health care services but not preventative health care services ( $\beta_5$ ); and (iii) the interaction between the Green Card and the income shock at the household level, on its own, does not take on a significant coefficient ( $\beta_6$ ) but that the  $\beta_3$  and  $\beta_6$  coefficients are jointly significant in both models.

### 6.3. Propensity Score Matching

Lastly, we employ propensity score matching techniques for assessing the protective impact of the Green Card program on health care utilization through the Crisis. We first estimate each household's propensity to receive the binary treatment (of having the Green Card), using a *probit* or *logit* model, as a function of observable characteristics; and then match the treated and untreated households on the basis of this propensity score, to compare their differences in the outcome variable (Rosenbaum and Rubin, 1983). We construct cells based on the propensity score,  $p(x)$ , and compute the expected value of the outcome variable for the treated and untreated observations with the same (or similar) propensity scores (calculating  $E(y|w = 1) - E(y|w = 0)$  in each cell) and then aggregate over all propensity score cells.<sup>16</sup>

The observations in the treatment and derived control group are comparable to each other since they are equally likely to be treated. Maintaining the selection on observables, the difference between the two observations gives the effect of the treatment for that particular value of the propensity score. Repeating this exercise over many values of the propensity score and then aggregating over the whole sample gives the average treatment effect (ATE). We determine the propensity score using *logit* and *probit* regressions separately. The specification for the regressions determining the propensity score is provided in Table 6. Household characteristics (household size, composition, housing conditions and assets) as

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<sup>16</sup> The propensity score matching results are obtained using the *psmatch2* package in STATA. Leuven and Sianesi (2003).

well as the characteristics of the household head (gender, educational attainment and type of employment) are used as independent variables to determine the propensity score for accessing the Green Card.

We then match treated observations using four different matching techniques including (i) one-to-one matching, (ii) nearest neighbor matching, (iii) radius matching, and (iv) kernel matching. The size of the coefficient for the average treatment effect (ATE) is somewhat sensitive to the choice of matching technique. In one-to-one matching, a single control is used for each treatment observation (with replacement); in nearest-neighbor matching, the nearest 3 neighbors are selected as the control group; in radius matching, all untreated observations within a certain radius (in this case caliper 0.2) are included in the control group. Finally, in the kernel matching, we use multiple controls for each treatment, with a weight that declines with the distance from the treatment observation. The standard errors of the estimators are obtained using bootstrapping (with 500 repetitions in each scenario). In order to provide one further robustness check, the data is trimmed in certain scenarios to increase common support and the results of the trimmed sample scenarios are also provided in the results.

Using these different matching methods, Table 10 provides results for the change in utilization of preventive health care. The average treatment effect in these estimations varies between 12.8 percentage points and 17.8 percentage points depending on the matching technique, whether we use a *logit* or *probit* function for the determination of the propensity score, and whether we employed trimming or not. Table includes the same analysis for the reduced utilization of curative care between October 2008 and May 2009. The average treatment effect of having the Green Card lowers the probability of reducing curative health care utilization by somewhere between 12.7 to 20.9 percentage points.

## 7. Conclusions

In this paper, we have assessed whether the Turkish Green Card program had a protective impact on beneficiary households during the 2000s – and this time period includes clearly ‘good’ times for Turkey (from 2003 to 2008) as well as ‘bad’ times when the country was impacted by the international financial crisis. While the available data sources do not allow us to examine the protective impact both through financial protection and safeguarding health care utilization in parallel, we were able to tease out these impacts separately for different time periods.

The analysis of household surveys indicates that in the period 2003-2008, the rapid roll-out and successful targeting of the Green Card scheme has increased the health insurance coverage of Turkey’s poor. In the same time period, out-of-pocket health expenditures have also declined slightly, reducing the incidence of catastrophic health expenditures. However, observed small reductions in levels of out-of-pocket expenditures are not causally attributable to the expansion of the Green Card. Similarly, we found a very slight – and statistically not significant – decline in the impoverishing impact of health expenditures in connection with the roll-out of the program.

To assess the protective impact during the ‘bad’ time, we use a unique household survey fielded during the financial crisis in Turkey to assess the impact of the Green Card in times of economic hardship. Three different methodologies are used to establish the impact of the Green Card on health care utilization during the crisis. Both non-parametric and parametric estimates using the Turkey Welfare Monitoring Survey establish that the Green Card program was an effective and functional safety net, protecting the health care utilization of the poor during the crisis period. Propensity score matching estimates and robustness checks using four different matching techniques – as well as trimming to increase common support -- confirm that access to the Green Card was associated with a positive and significant impact on protecting the health care utilization of poor households through the beginning of the financial crisis.

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## Tables and Figures

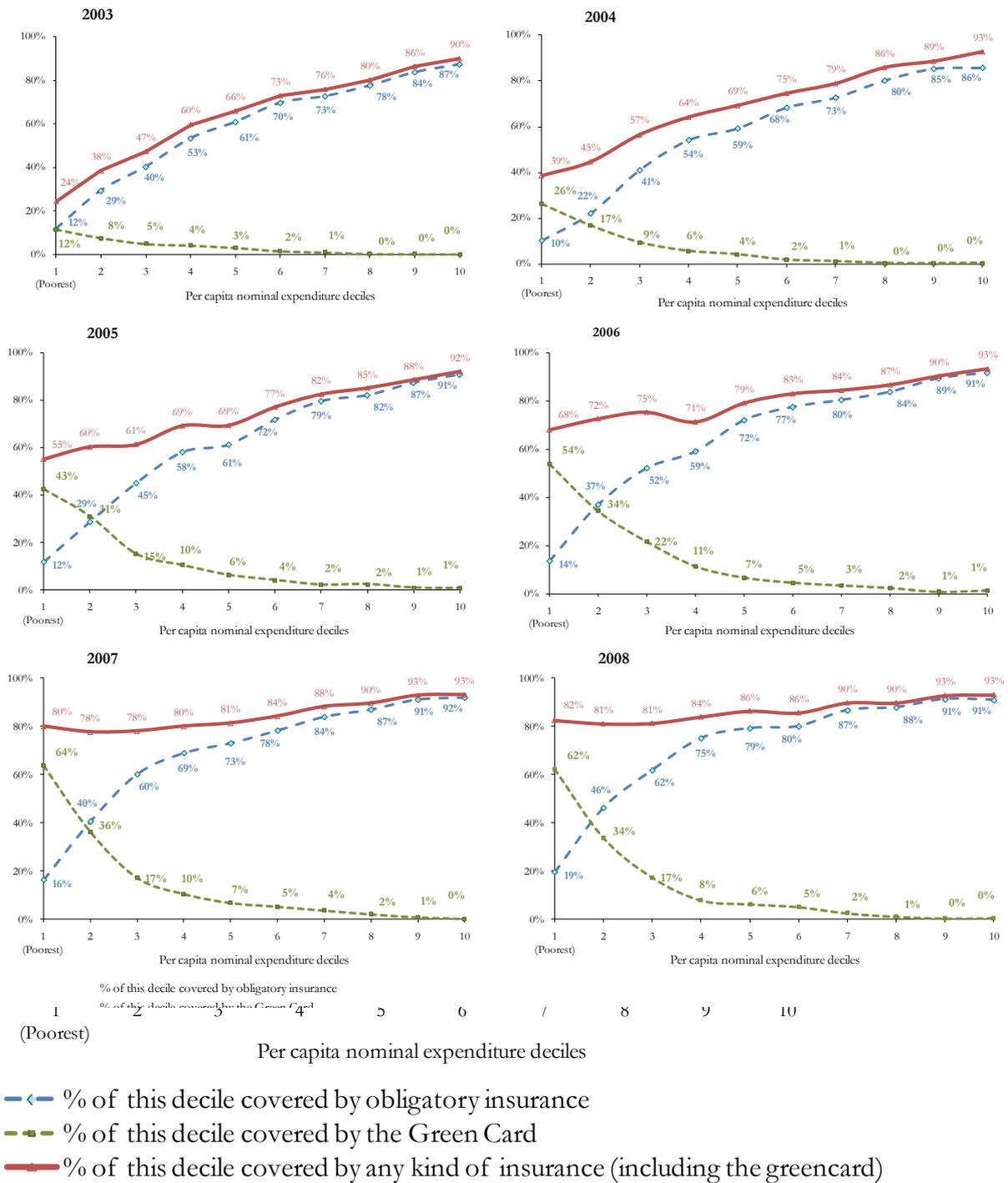
Table 1 Green Card Health Insurance Coverage, 2003-2008,  
by Nominal Expenditure Deciles<sup>17</sup>

Per capita expenditure deciles	Estimated number of people reporting they have Green Card health insurance coverage					
	2003	2004	2005	2006	2007	2008
<b>1 (poorest)</b>	801,594	1,852,719	3,038,263	3,907,549	4,382,775	4,328,693
<b>2</b>	533,523	1,184,520	2,233,720	2,497,700	2,495,587	2,352,694
<b>3</b>	344,074	666,158	1,089,972	1,569,825	1,185,609	1,205,924
<b>4</b>	293,593	399,576	750,898	829,203	722,516	542,773
<b>5</b>	220,208	293,819	452,704	487,747	469,804	430,959
<b>6</b>	114,442	125,991	300,398	335,848	360,315	350,054
<b>7</b>	73,853	84,023	159,324	252,175	251,105	168,810
<b>8</b>	27,709	23,323	174,562	176,042	143,873	72,134
<b>9</b>	24,482	17,703	69,196	57,285	58,160	19,249
<b>10</b>	14,355	27,770	52,736	101,474	14,689	29,298
<b>TOTAL</b>	2,447,833	4,675,602	8,321,773	10,214,848	10,084,433	9,500,588

*Source data:* Author calculations using Turkey Household Budget Surveys (2003-2008)

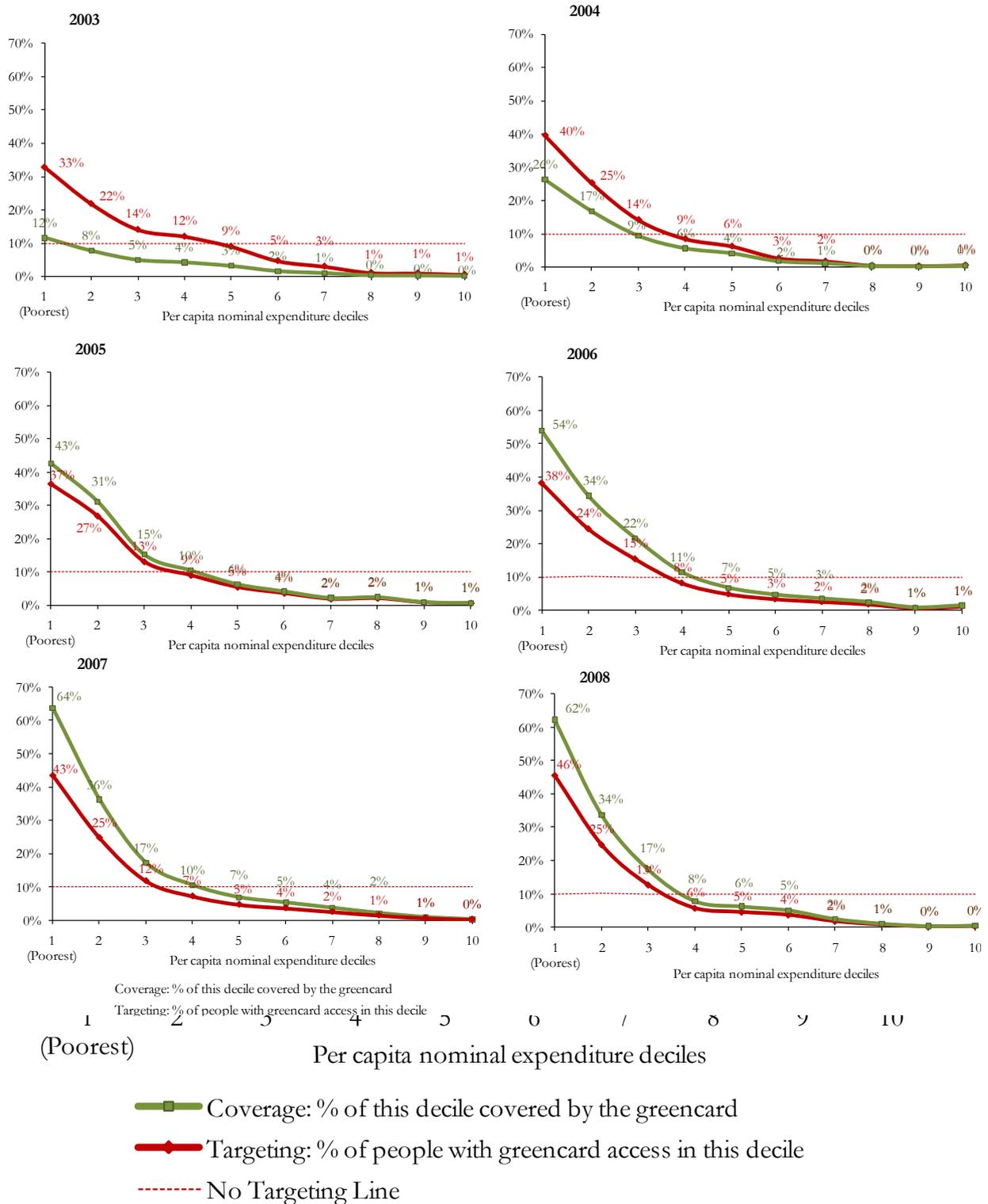
<sup>17</sup> The results come from Household Budget Surveys for 2003-2008 individual modules. Per capita expenditure deciles are constructed by using total household monthly expenditures and household size as reported in HBS.

Figure 1: Health Insurance Coverage, Various Programs, 2003-2008



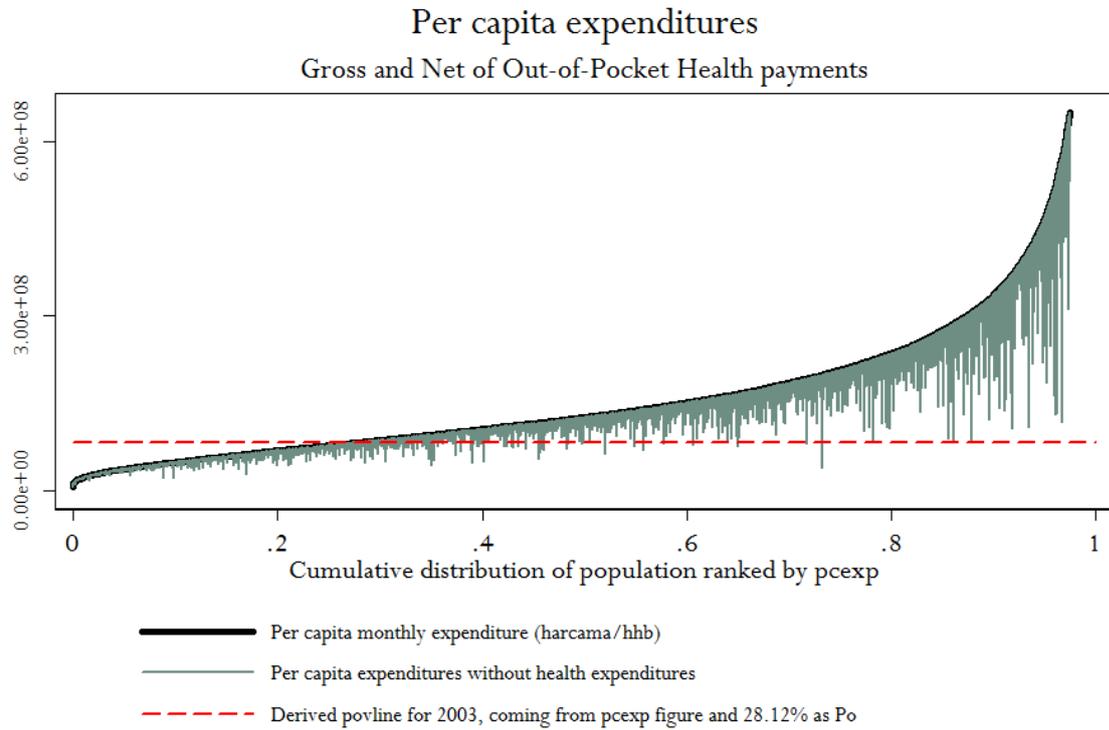
Source data: Author calculations using Turkey Household Budget Surveys (2003-2008)

Figure 2: Targeting Performance of the Green Card, 2003-2008

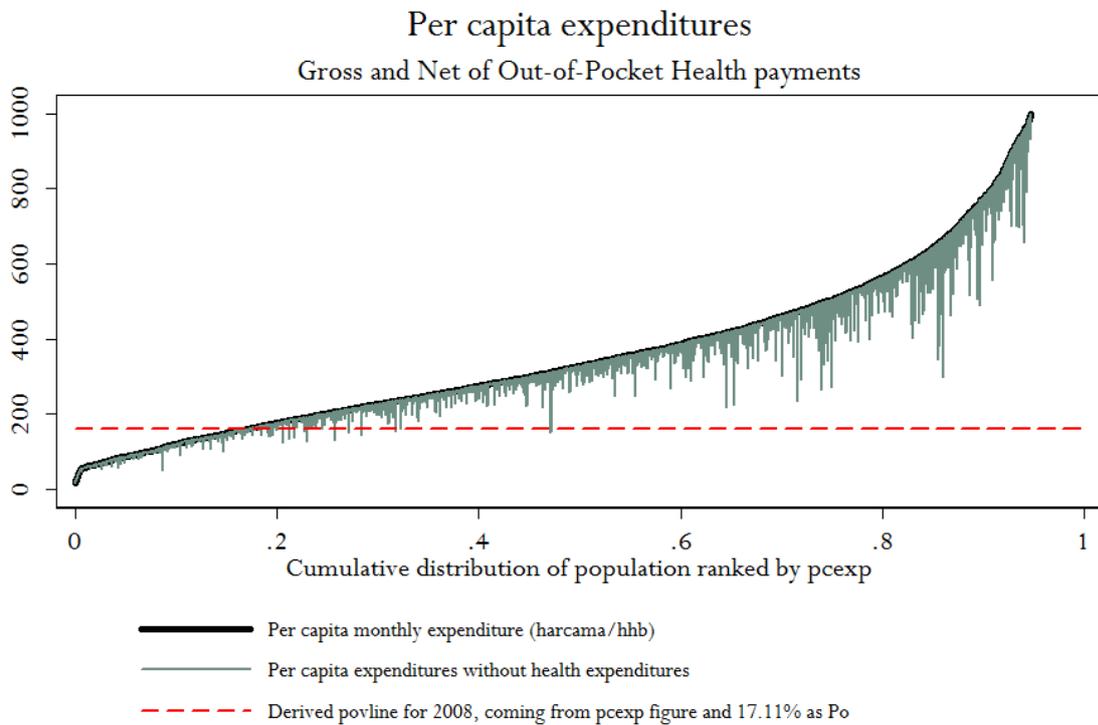


Source data: Author calculations using Turkey Household Budget Surveys (2003-2008)

Figure 3: Per capita Household Expenditures: Gross and Net of Out-of Pocket, 2003 and 2008



Source: Turkey Household Budget Survey 2003



Source: Turkey Household Budget Survey 2008

Table 2 Welch T-Test for Differences Across Insurance Groups, 2003 and 2008  
Out-of-Pocket Health Spending as percent of Total Spending

<b>Two-sample test with unequal variances (2003)</b>						
<b>Whole sample, using no weights</b>						
<b>Group</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Err.</b>	<b>Std. Dev.</b>	<b>[95% Conf</b>	<b>. Interval]</b>
<b>Green Card</b>	923	0.0164	0.0014	0.0420	0.0137	0.0191
<b>No insurance</b>	758	0.0209	0.0019	0.0518	0.0172	0.0245
<b>Combined</b>	1681	0.0184	0.0011	0.0467	0.0162	0.0206
<b>Difference</b>		(0.0045)	0.0023		(0.0091)	0.0001
diff = mean(Green Ca) - mean(No insur)					t = -1.9213	
Ho: diff = 0			Welch's degrees of freedom = 1451.07			
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
<b>Pr(T &lt; t) = 0.0274</b>		<b>Pr( T  &gt;  t ) = 0.0549</b>		<b>Pr(T &gt; t) = 0.9726 (significant)</b>		

<b>Two-sample test with unequal variances (2008)</b>						
<b>Only poorest per capita expenditure quintile, using no weights</b>						
<b>Group</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Err.</b>	<b>Std. Dev.</b>	<b>[95% Conf</b>	<b>. Interval]</b>
<b>Green Card</b>	608	0.0154	0.0016	0.0390	0.0123	0.0185
<b>No insurance</b>	195	0.0177	0.0030	0.0415	0.0118	0.0235
<b>Combined</b>	803	0.0159	0.0014	0.0396	0.0132	0.0187
<b>Difference</b>		(0.0023)	0.0034		(0.0090)	0.0043
diff = mean(Green Ca) - mean(No insur)					t = -0.6915	
Ho: diff = 0			Welch's degrees of freedom = 312.354			
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
<b>Pr(T &lt; t) = 0.2449</b>		<b>Pr( T  &gt;  t ) = 0.4898</b>		<b>Pr(T &gt; t) = 0.7551 (not significant)</b>		

Source data: Turkey Household Budget Surveys 2003 and 2008

Table 3: Impoverishing Impact of Out-of-Pocket Health Expenditures in Turkey, 2003 to 2008

		Measure of Impoverishment :		
(i)		(ii)	(i) + (ii)	
Year	Poverty headcount estimate (with gross per capita expenditures including health expenditures)	Standard Error	% who are non-poor with gross health expenditures (using current poverty line) but poor net of health expenditures (using poverty line with no health expenditures for bottom 3 deciles)	Poverty headcount with impoverishing effect of health expenditures
<b>2003</b>	28.1%	0.0039	0.8%	28.9%
<b>2004</b>	25.6%	0.0065	0.5%	26.1%
<b>2005</b>	20.5%	0.0063	0.4%	20.9%
<b>2006</b>	17.8%	0.0063	0.6%	18.4%
<b>2007</b>	17.8%	0.0060	0.5%	18.3%
<b>2008</b>	17.1%	0.0061	0.3%	17.4%

Source: Author calculations using Turkey HBS 2003-2008.

Table 4 Catastrophic Health Spending, Various Treshholds, 2003 to 2008

Out-of-pocket health spending As share of total HH expenditure		Threshold budget share, z			
		5.0%	10.0%	15.0%	25.0%
		Mean	Mean	Mean	Mean
2003	Head count	0.103	0.049	0.027	0.011
	Mean gap	0.009	0.005	0.003	0.001
2004	Head count	0.115	0.057	0.031	0.012
	Mean gap	0.010	0.006	0.004	0.001
2005	Head count	0.114	0.056	0.032	0.010
	Mean gap	0.009	0.005	0.003	0.001
2006	Head count	0.109	0.053	0.029	0.010
	Mean gap	0.009	0.005	0.003	0.001
2007	Head count	0.116	0.053	0.030	0.010
	Mean gap	0.009	0.005	0.003	0.002
2008	Head count	0.087	0.040	0.021	0.008
	Mean gap	0.007	0.004	0.002	0.001

Out-of-pocket health spending As share of non-food HH expenditure		Threshold budget share, z		
		15.0%	25.0%	40.0%
		Mean	Mean	Mean
2003	Head count	0.050	0.022	0.009
	Mean gap	0.007	0.003	0.001
2004	Head count	0.056	0.026	0.010
	Mean gap	0.007	0.004	0.001
2005	Head count	0.055	0.026	0.007
	Mean gap	0.007	0.003	0.001
2006	Head count	0.049	0.022	0.007
	Mean gap	0.006	0.003	0.001
	Mean positive gap	0.125	0.128	0.121
2007	Head count	0.048	0.022	0.008
	Mean gap	0.006	0.003	0.001
2008	Head count	0.036	0.015	0.004
	Mean gap	0.004	0.002	0.001

Source: Author calculations using Turkey HBS 2003-2008.

Table 5A Summary Statistics: Household Head Characteristics by Insurance Groups (SKG-formal health insurance holders, Green Card holders, no health insurance holders), urban sample, 2009

Whole urban sample of households:	Primary health insurance provider							
	SGK Mean	95% CI	Green Mean	95% CI	None Mean	95% CI	Total Mean %	95% CI
<b>Household head educational attainment</b>								
Illiterate or no schooling (n=163)	6.1	[4.9,7.5]	21.3	[14.4,30.5]	8.2	[4.7,13.7]	6.8	[5.6,8.1]
Primary School (n=923)	38.7	[35.8,41.8]	62.7	[52.0,72.3]	53.6	[46.1,60.9]	41.1	[38.4,43.9]
Junior or Senior Secondary School (n=754)	37.7	[34.6,41.0]	16	[9.5,25.7]	32.4	[26.1,39.3]	36.3	[33.5,39.2]
Higher Education (n=262)	17.5	[14.6,20.7]	0		5.9	[2.3,14.2]	15.8	[13.3,18.7]
<b>Total (n=2,102)</b>	100		100		100		100	
<b>Household head previous labor status (Oct 2008)</b>								
Employed: Formal (n=926)	50.8	[47.5,54.0]	3.8	[1.4,9.8]	21.2	[15.4,28.5]	45.8	[42.8,48.7]
Employed: Informal (n=259)	6.5	[4.5,9.2]	45	[34.3,56.1]	43.8	[36.6,51.3]	12.3	[10.3,14.7]
Not working (n=917)	42.8	[39.6,46.0]	51.3	[40.4,62.1]	35	[28.5,42.1]	41.9	[39.1,44.8]
<b>Total (n=2,102)</b>	100		100		100		100	
<b>Sector (May 2009)</b>								
Agriculture (n=32)	1.7	[1.1,2.8]	10.4	[4.3,23.4]	3.7	[1.7,7.9]	2.2	[1.5,3.2]
Industry (n=265)	22.6	[19.5,26.0]	14.8	[6.4,30.5]	20.9	[14.4,29.2]	22.1	[19.3,25.1]
Construction (n=98)	6.4	[4.8,8.5]	24.9	[12.8,43.0]	11.8	[7.3,18.6]	7.5	[5.9,9.5]
Services (n=804)	69.2	[65.4,72.8]	49.9	[33.5,66.2]	63.6	[54.2,72.1]	68.2	[64.7,71.5]
<b>Total (n=1,199)</b>	100		100		100		100	
<b>Gender of household head</b>								
Female (n=379)	17.7	[15.6,19.9]	22.9	[15.3,32.9]	13.5	[9.3,19.3]	17.5	[15.6,19.6]
Male (n=1,723)	82.3	[80.1,84.4]	77.1	[67.1,84.7]	86.5	[80.7,90.7]	82.5	[80.4,84.4]
<b>Total (n=2,102)</b>	100		100		100		100	

Source data: Turkey Welfare Monitoring Survey (TWMS) Urban Sample (May 2009)

Table 5B: Summary Statistics: Household Head Characteristics by Insurance Groups (SKG-formal health insurance holders, Green Card holders, no health insurance holders), 2009, poorest asset quintile only

Poorest quintile of households:	Primary health insurance provider							
	SGK Mean %	95% CI	Green Mean %	95% CI	None Mean	95% CI	Total Mean %	95% CI
<b>Household head educational attainment</b>								
Illiterate or no schooling (n=163)	10.2	[6.4,15.9]	21.1	[12.7,32.9]	14.5	[6.7,28.6]	12.6	[8.9,17.4]
Primary School (n=923)	62.1	[55.0,68.6]	59.9	[46.2,72.3]	56.8	[44.4,68.4]	60.5	[54.8,65.9]
Junior or Senior Secondary School (n=754)	25	[19.4,31.6]	19	[10.3,32.5]	27.3	[18.2,38.9]	24.9	[20.4,30.1]
Higher Education (n=262)	2.7	[1.4,5.5]	0		1.4	[0.2,9.0]	2.1	[1.1,4.0]
<b>Total (n=2,102)</b>	100		100		100		100	
<b>Household head previous labor status (Oct 2008)</b>								
Employed: Formal (n=926)	55.8	[48.8,62.6]	4.3	[1.4,12.7]	21.1	[12.6,33.0]	41.1	[35.7,46.6]
Employed: Informal (n=259)	10	[5.9,16.6]	48.2	[34.7,62.0]	38	[27.0,50.4]	21.5	[16.9,26.9]
Not working (n=917)	34.2	[28.0,40.9]	47.5	[34.2,61.2]	40.9	[29.9,52.9]	37.4	[32.3,42.9]
<b>Total (n=2,102)</b>	100		100		100		100	
<b>Sector (May 2009)</b>								
Agriculture (n=32)	5.9	[2.8,12.1]	7.7	[2.4,22.1]	5.5	[2.0,14.3]	6	[3.4,10.4]
Industry (n=265)	26.7	[20.1,34.4]	15	[6.0,32.7]	17.8	[8.8,32.6]	23.7	[18.4,29.9]
Construction (n=98)	9.7	[4.8,18.5]	31.4	[15.4,53.5]	11.1	[5.0,22.6]	12	[7.7,18.3]
Services (n=804)	57.7	[49.0,66.0]	45.9	[26.6,66.4]	65.6	[50.1,78.4]	58.3	[51.1,65.2]
<b>Total (n=1,199)</b>	100		100		100		100	
<b>Gender of household head</b>								
Female (n=379)	7.9	[4.8,12.8]	21.6	[12.5,34.7]	9.6	[4.4,19.6]	9.9	[7.0,13.8]
Male (n=1,723)	92.1	[87.2,95.2]	78.4	[65.3,87.5]	90.4	[80.4,95.6]	90.1	[86.2,93.0]
<b>Total (n=2,102)</b>	100		100		100		100	

Source data: Turkey Welfare Monitoring Survey (TWMS) Urban Sample (May 2009)

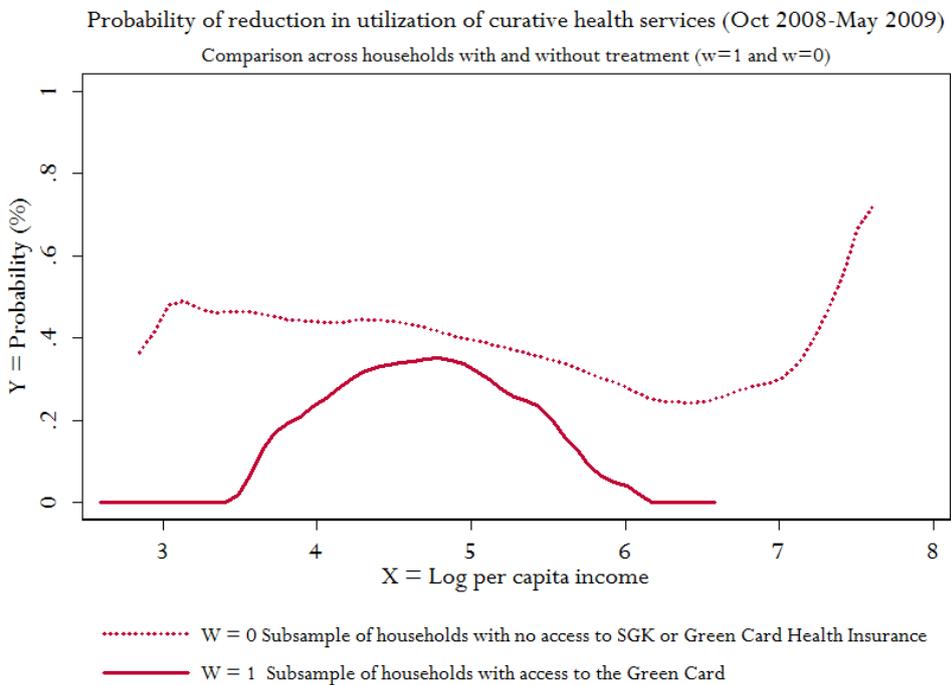
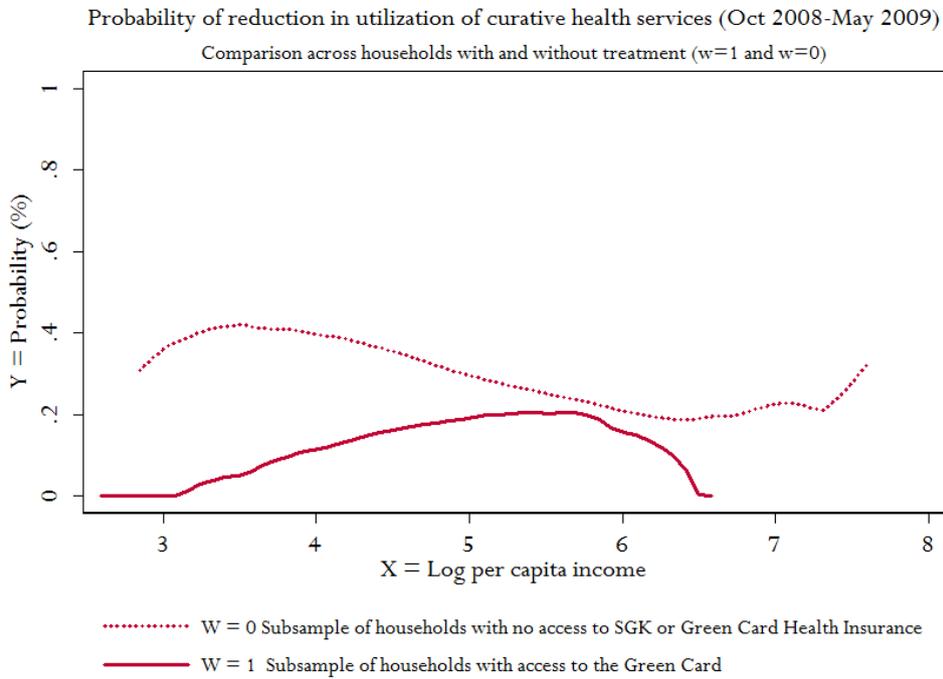
Table 6: Non-Parametric Estimation: Probability Of Reducing Health Care Utilization, by Insurance Status

(Results of Pearson's Chi2 test with one degrees of freedom is provided)

<b>Panel A</b>		<b>Since October 2008, have you had to reduce the use of health services? (mo)</b>					
		<b>Whole Sample</b>			<b>Sample of the poorest quintile</b>		
		<b>Yes</b>	<b>No</b>	<b>Total</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Health insurance	Green Card	21.7%	78.3%	100.0%	22.9%	77.1%	100.0%
	No health insurance	36.6%	63.4%	100.0%	41.7%	58.3%	100.0%
	Difference	<b>-14.8%</b>			<b>-18.8%</b>		
		Pearson chi2(1)= 6.8343 Pr= 0.009			Pearson chi2(1)= 6.8996 Pr= 0.009		
<b>Panel B</b>		<b>Since October 2008, have you had to reduce the use of preventive health services? (ms)</b>					
		<b>Whole Sample</b>			<b>Sample of the poorest quintile</b>		
		<b>Yes</b>	<b>No</b>	<b>Total</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Health insurance	Green Card	9.8%	90.2%	100.0%	8.6%	91.4%	100.0%
	No health insurance	25.7%	74.3%	100.0%	35.0%	65.0%	100.0%
	Difference	<b>-16.0%</b>			<b>-26.4%</b>		
		Pearson chi2(1)= 10.2836 Pr= 0.001			Pearson chi2(1)= 16.355 Pr= 0.000		

Source data: Turkey Welfare Monitoring Survey (TWMS) Urban Sample (May 2009)

Figure 4 Non-Parametric Estimates For The Probability Of Reducing Health Utilization, October 2008 to May 2009



Source data: TWMS Urban Sample (May 2009)

Table 7: Parametric Estimation: Linear Probability Model for Curative and Preventive Health Care Utilization, October 2008 to May 2009  
(Sample limited to households where household head has a Green Card or has no health insurance coverage)

Reporting results of the LPM regression VARIABLES	Reduced utilization of <u>curative</u> health services (Oct 2008-May 2009)		Reduced utilization of <u>preventive</u> health services (Oct 2008-May 2009)	
	(1)	(2)	(3)	(4)
Constant ( $\beta_2$ )	0.339*** (0.0334)	0.432** (0.167)	0.247*** (0.0291)	0.209* (0.114)
Health Insurance (Green Card) ( $\beta_3$ )	-0.125** (0.0518)	-0.111* (0.0582)	-0.158*** (0.0425)	-0.143*** (0.0499)
HH received a negative income shock (demeaned) ( $\beta_5$ )	0.189*** (0.0597)	0.188*** (0.0573)	0.0723 (0.0634)	0.0811 (0.0623)
Income shock(demeaned) X health insurance (Green card) ( $\beta_6$ )	-0.142 (0.107)	-0.153 (0.104)	0.0438 (0.102)	0.0292 (0.101)
Constructed Asset index (household level)		-0.0583 (0.0385)		-0.0174 (0.0301)
HH head education: Primary School		0.107 (0.0893)		0.0479 (0.0619)
HH head education: Junior or Senior Secondary School		0.139 (0.0963)		0.0718 (0.0690)
HH head education: Higher Education		0.0591 (0.179)		0.169 (0.182)
Number of infants in HH (ages 0-3)		-0.0972** (0.0456)		-0.0544 (0.0450)
Number of children in HH (ages 4-14)		0.00899 (0.0158)		0.00443 (0.0170)
Number of adults in HH (ages 15-59)		0.0175 (0.0185)		0.0199 (0.0177)
Number of elderly in HH (ages 60+)		-0.0874* (0.0451)		0.00850 (0.0431)
Observations	360	360	360	360
Test for joint significance: $H_0: \beta_3=0, \beta_6=0$ Prob > F	0.0204	0.0378	0.0014	0.0171

Note: The dropped category in columns 1 and 3 are households where the household head does not have any form of health insurance. For Columns 2 and 4, the dropped category is households where the household head does not have health insurance and also does not have any formal educational training (is illiterate or has no formal diploma).

Robust standard errors (clustered at the PSU level) provided in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 8: Parametric results: Maximum Likelihood Probit Estimation Results for Curative and Preventive Health Care Utilization, October 2008 to May 2009 (Sample limited to households where household head has a Green Card or has no health insurance coverage)

Reporting marginal effects results of the probit estimation	Reduced utilization of <u>curative</u> health services (Oct 2008-May 2009)		Reduced utilization of <u>preventive</u> health services (Oct 2008-May 2009)	
VARIABLES	(1)	(2)	(3)	(4)
Health Insurance (Green Card) ( $\beta_3$ )	-0.127** (0.0542)	-0.116** (0.0583)	-0.171*** (0.0471)	-0.156*** (0.0505)
HH received a negative income shock (demeaned) ( $\beta_5$ )	0.179*** (0.0562)	0.181*** (0.0545)	0.0623 (0.0537)	0.0720 (0.0525)
Income shock(demeaned) X health insurance (Green card) ( $\beta_6$ )	-0.123 (0.117)	-0.145 (0.118)	0.111 (0.119)	0.0941 (0.118)
Constructed Asset index (household level)		-0.0606 (0.0403)		-0.0131 (0.0297)
HH head education: Primary School		0.117 (0.104)		0.0476 (0.0724)
HH head education: Junior or Senior Secondary School		0.156 (0.116)		0.0735 (0.0828)
HH head education: Higher Education		0.0653 (0.221)		0.175 (0.200)
Number of infants in HH (ages 0-3)		-0.108** (0.0505)		-0.0638 (0.0519)
Number of children in HH (ages 4-14)		0.00810 (0.0162)		0.00319 (0.0168)
Number of adults in HH (ages 15-59)		0.0184 (0.0198)		0.0186 (0.0173)
Number of elderly in HH (ages 60+)		-0.121* (0.0630)		0.0110 (0.0476)
Observations	360	360	360	360
Test for joint significance: $H_0: \beta_3=0, \beta_6=0$				
chi2( 2) =	6.66	6.09	8.43	6.52
Prob > chi2	0.0357	0.0476	0.0148	0.0383

Robust standard errors (clustered at the PSU level) provided in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source data: Turkey Welfare Monitoring Survey (May 2009)

Table 6: Determination of The Propensity Score for Household Heads Holding a Green Card

(Using probit and logit models)

Dependent Variable: The household head has the Green Card

Independent Variables:	(1) <i>probit</i> model	(2) <i>logit</i> model
No of people in household	0.185** (0.0821)	0.317** (0.145)
Number of children in HH younger than age 15 (age <=14)	-0.0276 (0.0945)	-0.0596 (0.170)
Number of Rooms	0.115 (0.153)	0.208 (0.271)
Number of Bedrooms	-0.268* (0.157)	-0.464* (0.277)
Housing Size inM2	-0.0105** (0.00476)	-0.0196** (0.00864)
Fridge	-0.252 (0.493)	-0.380 (0.853)
Microwave	-0.224 (0.669)	-1.012 (1.635)
Dishwasher	-0.513** (0.254)	-1.041* (0.533)
DVD player	-0.160 (0.212)	-0.247 (0.396)
Wash machine	0.790** (0.319)	1.388** (0.586)
TV	-1.316* (0.675)	-2.534** (1.249)
Telephone	-0.636*** (0.202)	-1.174*** (0.390)
Cell phone	-0.170 (0.283)	-0.226 (0.503)
Private Car	-0.101 (0.361)	-0.335 (0.672)
HH head education ==Primary School	-0.204 (0.248)	-0.317 (0.441)
HH head education ==Junior or Senior Secondary School	-0.498* (0.299)	-0.848 (0.551)
HH head previous labor status==Employed: Formal	-0.845** (0.334)	-1.614** (0.669)
HH head previous labor status ==Employed: Informal	-0.267 (0.179)	-0.421 (0.318)
HH head gender== Male	-0.256 (0.209)	-0.478 (0.352)
Constant	1.464* (0.818)	2.850* (1.460)
Observations	351	351

Note: Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Source data: TWMS sample limited to urban households that have no health insurance through SGK or private insurance.

Table 10 Propensity Score Matching Results for Reduced Utilization of Preventive Health Care Services

*Average Treatment Effect (ATE) by propensity score determination method and matching scenario:*

	One-to-One Matching (1)	Nearest Neighbor Matching (2)	Radius Matching (3)	Kernel Matching (4)
Logit (No Trim)	-0.177*** (-2.60)	-0.163** (-2.35)	-0.128** (-2.48)	-0.133** (-2.37)
Logit (Trim(5%) for common support)	-0.179*** (-2.68)	-0.163** (-2.40)	-0.134*** (-2.59)	-0.136** (-2.43)
Probit (No Trim)	-0.171** (-2.37)	-0.161** (-2.33)	-0.127** (-2.47)	-0.134** (-2.40)
Probit (Trim(5%) for common support)	-0.173** (-2.46)	-0.162** (-2.38)	-0.132** (-2.56)	-0.137** (-2.46)
N	351	351	351	351

Source data: TWMS urban sample

Note: t statistics in parentheses \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Bootstrapped standard errors are reported (with 500 repetitions for all estimators).

Table 11 Propensity Score Matching Results for Reduced Utilization of Curative Health Services

*Average Treatment Effect (ATE) by propensity score determination method and matching scenario:*

	One-to-one matching (1)	Nearest Neighbor Matching (2)	Radius Matching (3)	Kernel Matching (4)
Logit (No Trim)	-0.168* (-1.83)	-0.157* (-1.90)	-0.129** (-2.14)	-0.127* (-1.87)
Logit (Trim(5%) for common support)	-0.167* (-1.87)	-0.154* (-1.90)	-0.137** (-2.25)	-0.131* (-1.93)
Probit (No Trim)	-0.208** (-2.14)	-0.169** (-2.02)	-0.129** (-2.15)	-0.127* (-1.86)
Probit (Trim(5%) for common support)	-0.209** (-2.22)	-0.168** (-2.06)	-0.136** (-2.25)	-0.130* (-1.92)
N	351	351	351	351

Source data: TWMS urban sample.

Note: t statistics in parentheses \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Bootstrapped standard errors are reported (with 500 repetitions for all estimators).