Utilization of Healthcare Services by Young Children:

The Aftermath of the Turkish Health Transformation Program

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Abstract

The Turkish Health Transformation Program (HTP), which was initiated in 2003, has identified achieving universal access to healthcare as one of its main tenets. To date, substantial progress has been made towards universal health coverage (UHC) and service utilization statistics display an upward trend. In this study, we use official and nationally representative micro data collected by the Turkish Health Research Surveys in years 2008, 2010, and 2012 to examine young children's (ages 0-5) utilization of health services. Children in this age group deserve special attention, because adverse health conditions in early childhood are known to have long-time consequences. Statistics such as infant mortality rate and under-5 mortality rate are regularly monitored. We conduct logistic regression analyses to explain the probabilities of being taken to a health institution, to a dentist, and being included in the newborn screening program. We use a rich set of explanatory variables that represent the socio-economic status (SES) of the child's household. Contrary to our expectations and to the goals of UHC, we find that factors that represent the SES and insurance ownership of the parent matter for utilization. Children from low SES households are at a disadvantage. We conclude that children from such households should be given special attention and that research effort should focus on explaining the possible methodological reasons behind the observed gaps in the utilization rates.

JEL Classifications: I10; I13; I14; C25
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1. Introduction

The importance of investing in early childhood health is well known. The literature has shown that socioeconomic inequalities in health persist (Mackenbach, 2017) and health status in the childhood has consequences in adulthood for health and labor market outcomes as well as socioeconomic status (Case, Fertig, & Paxson, 2005). Given the long-lasting effects of childhood health, it is clear that pursuing policies that aim to improve child health is one of the best human capital investments that a country can make (Richter et al., 2017). By improving health, we mean both increasing the average health status of children in the country and reducing health inequities across socioeconomic groups (Murray & Frenk, 2000).

A well-functioning health system should take measures to ensure universal access of children to basic health services. Universal health coverage (UHC) is a sustainable development goal (Goal 3) that all UN Member States have agreed to try to reach by 2030 (United Nations, 2015). UHC is defined as securing access to adequate health care services for all at an affordable price. By this definition, it requires the provision of healthcare for all (the breadth of service) at an adequate level (the depth of service) at an affordable cost (financial protection). Therefore, an important means of progress towards UHC is expanding the set of services that are available to people without exposure to out-of-pocket payment, either by including new services in the benefit package or by reducing the cost of the existing package. User fees that affect access to services should also be considered in the implementation of UHC (Carrin & James, 2004; Yasar & Ugurluoglu, 2011; Kutzin, 2013).

Currently, different healthcare systems exist, but all have a central objective of achieving UHC. Some countries rely on general taxation-based state financing (as in the UK); others rely on health insurance premiums paid to private providers of services (as in the US). The third group of countries rely on compulsory social health insurance that is usually aligned with occupational status and financed mainly by employer and employee contributions (as in Germany). The healthcare system in Turkey resembles the third type. It is a system that mainly insures the formally employed population. The informally employed (a non-negligible part of the population) can have access either by qualifying for a means-tested public health insurance scheme, or, more recently, by joining the system voluntarily and paying the premium themselves.

Our focus group in this study, the 0-5 year old children, are a special group in the sense that they (along with all individuals younger than 18) have been granted health insurance coverage by law (Official Gazette, 2006, sec. 69). This means that children are covered in the General Health Insurance (GHI) system (which is explained in the next section) regardless of the insurance status of their parents or their ability to pay. Moreover, services provided by family health centers (examinations, laboratory tests, vaccines) are provided free of charge and without an

appointment. Yet, other healthcare services (such as secondary or tertiary care, or medications) are subject to contribution fees. They also have to arrange for their own transportation to the health institution, under normal conditions.

Achieving universal access to healthcare has been a main tenet of the Turkish Health Transformation Program (HTP), which was initiated in 2003. With the help of several factors including economic growth and political stability, important strides have been made in the long way towards UHC. The gains from the HTP are visible on both the demand side (increased insurance coverage, health service access, and use of key child health services) and the supply side (better infrastructure, health human resources, and health services) (Atun et al., 2013).

However, as our findings indicate, more work needs to be done to achieve UHC. In the 2008-2012 period, the socioeconomic status of a young child (the education level or the insurance status of the parent) is still associated with the likelihood of using healthcare services, which should not be the case in UHC. In this paper, we aim to identify the factors that are related to the utilization of healthcare services by young children in Turkey in 2008-2012. We use micro level data collected by the nationally representative Health Research Surveys. To the best of our knowledge, ours is the first study in the literature that examines health service utilization by young children using survey data. Other studies consider either the entire population or a different time period. Probably the closest study to ours is Aran, Aktakke, Gurol Urganci, & Atun (2015), which investigates maternal and child health in Turkey in 2003-2008 with a focus on antenatal, delivery, and postpartum care of mothers.

We contribute to the literature in the following dimensions. First, we confirm that differences in utilization by young children are correlated with the socioeconomic status and insurance ownership of the parent, which we do not expect to see under UHC. Second, we are the first to examine the utilization of healthcare services by young children and how it has changed over time by using extensive nationally representative household survey data from Turkey. Finally, we apply non-linear decomposition techniques in order to estimate the extent to which the changes in the explanatory variables have led to the changes in utilization of healthcare services.

The remainder of the paper is organized as follows. Section 2 presents the background information on the Turkish health system. Section 3 describes the dataset used in this study and presents some descriptive statistics. Section 4 explains the theoretical basis of the study and its empirical methodology, Section 5 explains the results of the analyses. Section 6 concludes.

2. Background

In its recent history, Turkey has gone through major changes in its health system. Since 2003, a series of health reforms have been introduced under the Health Transformation Program

(HTP). These health reforms have been on the agenda since the 1980s and nearly all of them were targeted by the National Health Policy (NHP) document prepared in 1993. However, as there was insufficient commitment on the part of the government (because of the coalitions) and the activists, the NHP document mostly remained on the paper. The only innovation was the introduction in 1992 of the Green Card program that serves the low-income population (Official Gazette, 1992; Yasar, 2011; Yasar & Ugurluoglu, 2011).

The HTP is designed to address longstanding problems in the Turkish health care system, namely: (i) inferior health outcomes when compared to other OECD and middle-income countries; (ii) inequities in access to health care; (iii) fragmentation in financing and delivery of health services, which contributes to inefficiency and undermines financial sustainability; and (iv) poor quality of care and limited patient responsiveness (The MoH of Turkey, 2003; OECD-WB, 2008).

The health reforms introduced since 2003 under the HTP have aimed to reduce inequities in health financing and access to health services (Johansen & Guisset, 2012). The program was influenced, coordinated, and financially supported by the World Bank (World Bank, 2003; Yasar, 2011). The HTP aims to achieve a transformation in the framework of eleven themes:

(1) Ministry of Health (MoH) as planner and supervisor

(2) GHI gathering all people under a single umbrella

(3) Widespread, easily accessible and friendly health service system

- (a) Strengthened primary health care services
- (b) Effective and graduated chain of referral
- (c) Administratively and financially autonomous health enterprises

(4) Knowledge and skills-equipped and highly-motivated health care human resources

(5) System-supporting educational and scientific bodies

(6) Quality and accreditation for qualified and effective health care services

(7) Institutional structuring in rational drug use and material management

- (a) National Pharmaceuticals Agency
- (b) Medical Devices Agency

(8) Access to effective information in decision-making: Health Information System (MoH, 2007).

(9) Health promotion for a better future and healthy life programs

(10) Multi-dimensional health responsibility for mobilizing parties and inter-sectoral collaboration

(11) Cross-border health services to increase the country's power in the international arena (Akdağ, 2009).

As of 2012, all of the themes have been implemented. However the discussions and criticism about the reform still continue (Atun et al., 2013; Civaner et al., 2013).

Here, we will evaluate how HTP changed the provision of health services, health financing, access and utilization of health services. We will also report on how mortality rates have changed after the HTP, as they are directly related to young children's access and utilization of health services.

Health services provision:

After HTP, the MoH was positioned as a strategic institution carrying out the planning rather than the provision of health services, even though most of the hospitals still belonged to the MoH. One year after the HTP, in 2004, a pilot family medicine implementation act was adopted. With this act, family physicians are contracted by the MoH and paid based on performance measures focusing on key priority areas, such as immunization rates of children and prenatal care of pregnant women. Up to 20% of base salary payments of family physicians are 'at risk' if immunization, antenatal care and follow-up of registered babies and children drops below 99% among their registered population. The performance-based payment system for physicians was adopted with the expectation that it would improve the efficiency of health professionals and increase access to health care services (Akdağ, 2009; World Bank, 2013). The official statistics indicate that infant mortality rates, immunization and service coverage have improved considerably. Between 2003 and 2015, infant mortality rate fell from 28.5 to 7.6 per 1,000 live births and average national immunization coverage rates rose from 70% to 97% (World Bank, 2013; The MoH of Turkey, 2016, p. 20). As of 2015, there were 21.696 family medicine units and 970 community health centers. A family physician, on average, was assigned to 3629 patients (The MoH of Turkey, 2016, pp. 117–118). In areas with a low population density, this may mean that some households are located quite far away from a family health center. World Bank (2013) reports that, between 2007 and 2010, the gap between the provinces with the highest and lowest human resources fell from 0.6 general practitioners per 1,000 population to 0.36. However, regional inequality still remains. In 2015, population per actively working family medicine was 3.953 in Istanbul, compared to 3.331 in the Central Anatolia (The MoH of Turkey, 2016, p. 118).

The HTP placed special emphasis on enhancing primary care and child health. Protecting and enhancing child health and improving the family medicine system are assigned special priority within the set of public health goals, as clearly admitted in the Strategic Plan of the Public Health Institution of Turkey for 2013-2017 (MoH, Public Health Institution, 2012). For example, one of the targets under Goal 1 is to ensure that 0-12 year old children visit a dentist twice a year. Goal 2 is to take all preventive measures to protect and develop health of mothers, children, and youth and thereby to invest in the health of the next generations. The targets under this goal are to standardize and to improve the quality of maternal and child healthcare services; to continue and strengthen new-born screening programs; to provide children with necessary micronutrients such as iron and vitamin D; to improve and to extend new-born screening programs. Some

performance indicators are to increase the share of babies who are given iron supplements to 85% by 2014 and to 98% by 2017; to maintain the 99% rate of new-born screening; to increase the share of babies who have had their hearing tested to 93% by 2014 and 95% by 2017; and to increase the share of babies who were tested for hip displacement to 75% by 2014 and 95% by 2017. Clearly, the strategic plan has placed a special emphasis on child health. Goal 3 is to reduce the mortality and morbidity of diseases, with a child-specific target of achieving full vaccination for 13-24 month old children at a rate of 90% by 2014 and maintaining that rate. Goal 4 is to ensure the quality, efficiency, and effectiveness of primary care services. One performance indicator under this goal is to increase the current share of patients who visit family health centers as the point of first contact from the current level of 38% to 43% by 2014 and to 50% by 2017. Another indicator is to increase the number of family physicians so as to reduce the population per family physician from the 2012 level of 3557 to 3437 by 2014 and to 2954 by 2017.

To harmonize management and payment mechanisms across all public hospitals and to pave the way towards autonomy for hospitals, the Social Insurance Institution (SII) hospitals were transferred to the MoH in 2005 (Tatar et al., 2011; Erkoç, 2012). Public hospitals were given administrative and financial autonomy in 2011 by the decree law numbered 663 that established the union of public hospital unions. The law offers the possibility of the creation of a joint hospital union at the regional level. The hospital union is a network of hospitals that would jointly undertake program planning, budgeting and implementation. Today, most of the curative services are given by the public hospitals. According to MoH statistics, in 2015, there are 1.533 hospitals, 865 of which belong to MoH, 562 of which are private hospitals, and 70 of which are university hospitals. Total number of hospitals increased 33% during the period of 2002-2015; the number of private hospitals increased by 107%, thereby raising the share of private hospitals from 23% to 37% in the same period. There were 209,648 hospital beds in 2015, 122,331 of which belonged to MoH (58%), 43,645 to private sector (21%), and 38,361 to universities (18%). The number of private hospital beds rose by 350%, which increased the share of private beds from 8% to 21% during the HTP period (The MoH of Turkey, 2016, p. 93). The number of hospital beds per 10,000 population was 24.8 in 2002 and 26.6 in 2015. However, compared to the OECD average, which is 50.5, the number of beds per population is still quite low. In addition, there is regional inequality in the distribution of hospital beds. While the number of hospital beds per 10,000 population is 32.8 in western Anatolia, it is only 20.9 in southeastern Anatolia (The MoH of Turkey, 2016, pp. 96–97).

In addition to the insufficient and unequal distribution of health services, there was an insufficient and unequal distribution of health personnel and infrastructure across the country too (Savas, Karahan, & Saka, 2002; Tatar et al., 2011; Atun et al., 2013; Ökem & Çakar, 2015). In 2015, the number of physicians per 100,000 people was 179, whereas the OECD average was 339.

The figures were 131 in the southeastern Anatolia (which is an underdeveloped region of Turkey), but 273 in the more developed western part of Anatolia (The MoH of Turkey, 2016, p. 185). The same problem exists for other health personnel like dentists, pharmacists, nurses and midwives. In 2015, the number of dentists per 100,000 people was 32 (compared to the OECD average of 70). Similarly, the number of pharmacists per 100,000 people was 27 (compared to the OECD average of 87), the number of nurses per 100,000 people was 261 (compared to the OECD average of 1071). There were also regional inequalities in the distribution of nurses and midwives. In 2015, the numbers per 100,000 people were 205 in the southeastern Anatolia, compared to 345 in the eastern Blacksea (The MoH of Turkey, 2016, pp. 185, 191, 195–196, 200).

Health financing:

In 2016, Turkey spent around 120 billion Turkish Liras for current health expenditures (4.6% of GDP) (Turkish Statistical Institute, 2017). The OECD average was 9% of the GDP, almost twice the figure in Turkey. In 2016, the share of public health expenditures in total expenditures was 79.4%, which is above the OECD average of 72.5%. Per capita current expenditure on health was 1088 US$ (purchasing power parity), the lowest among the OECD countries. OECD average in 2016 was 4003 US$. The share of out-of-pocket expenditures in current expenditures was 16.3% (20.3% in OECD countries) (OECD, 2017). Another important statistic for this study is the share of the provision and administration of the public health programs' expenditures in total health expenditures, which is quite low in recent years (only 4.5% in 2016) (Turkish Statistical Institute, 2017).

With the Social Insurance and General Health Insurance (SI-GHI) Act (law number 5510) in 2008, Turkey decided to extend the health insurance coverage to the whole population by introducing general health insurance system. Individuals deemed to be GHI holders are clearly defined in the law. Their dependents also benefit from health care and other rights. The GHI system has been operating based on premiums, which are paid by employers, employees, and the state. Neither pensioners nor dependents pay any premiums. The daily base for premiums is the minimum wage, whereas the ceiling is 7.5 times the daily base of minimum wage. The second financial resource of GHI is co-payments made by insurance holders and their dependents when using health services. Therefore, entitlement to services has some conditions (such as paying premium for a certain amount of time); however, some services are unconditionally financed by the SSI. For example, all emergency cases, communicable diseases, and preventive care services (whether the person is sick or not) are unconditionally covered. Important for our study, all individuals under the age of 18 are unconditionally covered. On the other hand, some services are subject to contribution fees, even when the case is unconditionally covered. The fees are adjusted annually. According to the fee schedule announced in 2008, no fee was charged at public primary care centers (such as family health centers -except drugs). For outpatient treatment by a doctor

or a dentist, the fees were about USD 2.3 for secondary care, USD 4.6 for tertiary care, and USD 7.7 for private hospitals. For medication provided for outpatient treatment, between 10 and 20% of the prices were charged as contribution (Social Security Institution, 2008). In 2010, the fees were about USD 1.3 for primary care, USD 5.3 for secondary and tertiary care, and USD 10 for private hospitals. No fees were charged on preventive care (Social Security Institution, 2010). In 2012, the fees stayed the same.

In 2006 another law was adopted (the Social Security Institution (SSI) Law, number 5502) which created a single pool that gathered the entire population under a single umbrella to standardize benefits and liabilities (Baris, Mollahaliloglu, & Aydin, 2011). Thus, the SSI became the sole purchaser of health services from the public and private sectors. Pooling mechanisms under social health insurance programs used to be fragmented. Primarily, there were three separate statutory health insurance schemes operating under different rules and regulations and offering or purchasing different service packages from public or private providers: The Social Insurance Organization (SSK, *Sosyal Sigortalar Kurumu*) for private sector employees or blue-collar public sector workers, Government Employees' Retirement Fund (GERF, *Emekli Sandığı*) for retired public employees and Social Insurance Agency for Merchants, Artisans and the Self-employed (*Bağ-Kur*) for self-employed. Health expenditure of active civil servants and the poor who covered by the Green Card (GC) program since 1992, were financed by the government. With this structure, there were major problems in access to a social health insurance, since access was linked to employment. It was estimated that around 33% of the population was not covered by any social security program (Yasar, 2011, p. 128). Later, in 2012, the GC program was also transferred to the SSI, thereby completing the unification of health insurance schemes in Turkey (Atun et al., 2013).

Since the implementation of the HTP, utilization of health services increased significantly. Number of visits to a physician in a healthcare facility rose from 3.1 per capita in 2002 to 8.4 in 2015. It was 6.9 for OECD countries in 2015 (OECD, 2017). However, these statistics, combined with the known shortage of physicians in Turkey, indicate that time spent per medical examination decreased substantially and raise questions about the quality of medical examinations.

Another important development in the last decade is the increase in the satisfaction with healthcare services (from 40% in 2003 to 71% in 2014). Compared to the European Union average of 62% in 2003 and 61% in 2014, the rise in satisfaction in Turkey is noticeable (The MoH of Turkey, 2016, p. 172).

We cannot ignore the significant improvements in health indicators in Turkey after the HTP. One of the most important developments is in child mortality. Infant mortality rate was 7.6 in 1000 live births in 2015 according to the MoH statistics (The MoH of Turkey, 2016, p. 20) and 10.7

in OECD statistics. For comparison, it was a staggering 31.5 in 2002, so the decline is non-negligible. However, the rate in 2015 was still far above the OECD average, which was 3.9 in 2015. At a rate of 7.6, Turkey ranks the second from the bottom among the OECD countries (the bottom rank belongs to Mexico at a rate of 12,5) (OECD, 2017). Turkey lags behind the high- income countries in lowering under-5 mortality. Under–5 mortality rate per 1000 live births was 9.7, while it was 6.8 in high-income countries (The MoH of Turkey, 2016, p. 24). Another important health indicator is maternal mortality rate, which dropped to 14.7 per 100,000 live births in 2015 from 64 in 2002 in Turkey. The figure is better than the WHO Europe Region (17.0% in 2014).

Despite these developments, regional inequalities persist in Turkey. Visits to a physician in a healthcare facility was 6.9 per capita in mid-eastern Anatolia versus 9.3 in western Marmara in 2015 (The MoH of Turkey, 2016, pp. 133–134). Visits to a physician at a primary healthcare facility was 1.7 per capita in mid-eastern Anatolia versus 3.4 in western Marmara (The MoH of Turkey, 2016, p. 138). Regional inequalities are also present in infant mortality rate (5.3 in western Marmara versus 11.6 in mid-eastern Anatolia) (The MoH of Turkey, 2016, p. 20). In maternal mortality, the figure was 9.4 per 100,000 live births in the eastern Blacksea region, while it was 19.8 in central Anatolia (The MoH of Turkey, 2016, p. 25).

Certainly, improvements in health indicators are not only related to the improvements in the health system. World Health Organisation (WHO) emphasizes the importance of the socio-economic and cultural determinants of health. WHO suggests that a country that desires to improve overall health status should improve daily living conditions and overcome inequalities in the distribution of power, money, and resources. In this respect, higher per capita GDP, urbanization, the increase in the schooling of girls, and decreased birth rates must have contributed to the improvements in health indicators such as infant mortality and under-5 mortality rate (Aran et al., 2015).

Finally, we have to mention a program that assists low-income families. It is the Conditional Cash Transfer (CCT) program, which was initiated after the 2001 crisis and supported by the World Bank until 2007, when it was transferred to the Ministry of Family and Social Policies, Directorate General for Social Aids (DGSA). The target group was households who are not covered by social protection programs, who are employed informally or who are considered as outcasts. The health component grants monthly payments of 35 TL to families on the condition of bringing 0-6 year old children regularly to a health facility. In addition, pregnant women receive monthly payments of 35 TL on the condition of having regular check-ups and a one-time payment of 75 TL upon giving birth at a health facility. The main shortcoming of the program has been identified as information asymmetry: Qualifying individuals may be unaware of the program (Ministry of Family and Social Policies, 2012).

3. Data and Descriptive Statistics

Our data source is the Turkish Health Research Surveys administered by the Turkish Statistical Institute (TurkStat) in years 2008, 2010, and 2012, and conducted on nationally representative samples during late spring or early summer. 2010 was the year when the family medicine program was available in the entire country. The inclusion of 2008 and 2012 surveys enables us to study the changes in a four-year period covering the two years before 2010 and two years after.[4]

The surveys employ a two-stage stratified cluster sampling method. In the first stage, the sampling units of blocks are chosen from clusters. Each block contains an average of one hundred households. In the second stage, households are systematically selected from each block. The dataset contains sampling weights that represent the inverse probability of being selected into the sample. All the variables used in our analyses were obtained through face-to-face interviews and self-report. Details of variable definitions are given in the Appendix.

In the beginning of the study, we had to recode the entire data. The most challenging task was to ensure the consistency of the variable definitions across the years of the survey. Where possible, the descriptive statistics were cross-checked with administrative sources (for example, insurance ownership rates were compared with the nationwide statistics in the yearbooks of the SSI). Our samples include 2,025 children in 2008, 1,955 in 2010, and 3,408 in 2012.

Table 1 presents descriptive statistics for the variables used in the analyses. These statistics confirm that the sample composition remained stable over time in children's average age, sex, and the prevalence of chronic illnesses. On the other hand, the table also shows us that in 2012, compared to 2008, an average parent is older, better educated and less likely to smoke, has a higher BMI, a higher income, and is less likely to have financial access problems. In 2012, an average household has fewer children. There have been changes in insurance ownership and employment rates as well as the types of income received by the parent. Both public and private insurance ownership increased while Green Card ownership[5] declined. The share of parents with no insurance declined as well.

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[4] The 2008 survey is the earliest survey. Although the 2014 survey data are available to us, we have chosen not to use them, because the change in the design of the questionnaire makes compatibility with earlier years problematic.

[5] The Green Card (GC) program caters low-income households who do not have other health insurance. According to the law, if the applicant's per capita household income is less than 1/3 of the gross minimum wage, then all household members are eligible for a GC. A local committee, chaired by the district governor makes the ultimate decision on entitlement. In 2012, the GC scheme was transferred to the newly established Universal Health Insurance system and the means-testing procedure was further formalized, incorporating a computerized proxy means-testing based on a weighted composite of household characteristics. Yet, discretion by local administrators still influences the final decision (by conducting household visits and subjective assessments).

Table 2 presents descriptive statistics on the children's use of health services. The statistics reveal that the proportion of children who were Taken to a Health Institution (THI) significantly increased from 59.76 % to 71.68 % between 2008 and 2012. For age 0, we observe a significant decrease, which is both surprising and worrying. The surveys ask parents if during the calendar year the child was Taken to a Health Institution when Not Sick (THINS). Further questions were asked if the child was THINS (see the Appendix for details). In general, among children THINS, the rates of being included in certain measurements or controls have increased significantly over time. We show in Table 2 that among 0-5 year old children, the rate of being included in the newborn screening program increased at an enormous rate from 17.86% in 2008 to 74.85% in 2012. The low rate of being taken to a dentist (around 9.25-9.7%) showed no sign of increase.

Appendix Table A1 shows the utilization rates for children who are THINS, by the type of the health institution. Among children THINS, the share of those taken to a family health center (FHC) was 64.51 % in 2010 and 73.77 % in 2012 (see table A1 in appendix) (the increase is significant at 1 %). Clearly, FHCs were the most popular choice of parents for check-ups of their young children, followed by hospitals. Between 2010 and 2012, the share of those taken only to a FHC increased from 42.25% to 48.76%, whereas the share of those taken only to a hospital decreased from 21.49% to 15.12%. We observe that taking young children to physician's office is the least common choice by parents.

GC holders now receive the same benefits package that other beneficiaries have been receiving since the July 2007 Health Budget Law (Erus, Yakut-Cakar, Cali, & Adaman, 2015; Yardim, Cilingiroglu, & Yardim, 2014).

Table 1: Descriptive statistics on children's and their parents' characteristics (ages 0-5)

	2008	2010	2012	Change (p-value)*	Direction (if significant at 5%)
1. Average age in the 0-5 year old sample	2.70	2.76	2.76	0.1833	
2. % Children with a Chronic Illness	5.05	4.64	6.01	0.2083	
3. % Female Children	48.42	52.01	49.31	0.043	Up
4. % Children by the Parent's Education level					
Primary School or Less	72.05	67.15	58.13	0	Down
Middle School Graduate	7.32	8.46	13.14	0	Up
High School Graduate	14.12	14.86	17.41	0	Up
University+	6.50	9.52	11.32	0	Up
5. Number of Children (<14) in the Household	2.36	2.43	2.20	0	Down
6. Parent's Age (mean)	33.99	35.12	35.59	0.0001	Up
7. Parent's BMI Levels (Mean)	25.06	25.6	25.72	0	Up
8. % Children whose Parents Smoke	NA	18.74	15.5	0.0344	Down
9. Type of Insurance that the Parent Has					
Public insurance	66.5	63.71	78.15	0	Up
Private insurance	0.43	0.99	0.99	0.0003	Up
Green Card	21.74	24.02	16.05	0	Down
No insurance	11.43	11.28	4.98	0	Down
10. % of Children whose Parent Has Problems with:					
Financial access	14.91	15.08	5.26	0	Down
Physical access	1.68	1.36	1.49	0.3067	
11. % Children by Employment Status of Parent					
Employed	16.39	18.85	19.19	0.0003	Up
Unemployed	1.26	0.7	0.63	0.1498	
Seasonal Worker	0.54	0.26	0.15	0.0068	Down
Inactive	81.81	80.19	80.02	0.0036	Down
12. % Children in Income Brackets					
Income not revealed	61	52.47	61.1	0.2686	
Income bracket 1 (lowest)	9.46	8.77	3.08	0	Down
Income bracket 2	7.22	8.38	3.16	0	Down
Income bracket 3	4.71	4.88	2.04	0	Down
Income bracket 4	4.89	5.15	3.95	0.3186	
Income bracket 5	3.14	4.52	5.46	0	Up
Income bracket 6	3.21	3.97	4.58	0.0013	Up
Income bracket 7	1.56	3.93	4.39	0	Up
Income bracket 8	2.35	2.63	4.97	0	Up
Income bracket 9	1.27	2.10	3.01	0.0001	Up
Income bracket 10 (highest)	1.18	3.19	4.25	0	Up
13. % Children by Type of Income Received in the Household					
Income Type: Labor	90.18	91.56	94.17	0	Up
Income Type: Asset	1.7	0.67	1.9	0.5327	
Income Type: Retirement	9.88	10.1	10.62	0.2410	
Income Type: Transfers	5.80	9.02	6.43	0.9391	

Notes: Weighted statistics are shown in the table. In several questions of the survey (such as insurance ownership or type of income received) the parent can choose all that applies.

* Null hypothesis is no change between 2008 and 2012. If the variable is not available in 2008, the null hypothesis is no change between 2010 and 2012.
Source: Authors' calculations using data from the Turkish Health Research Surveys.

Table 2: Descriptive statistics on the children's use of health services

	2008	2010	2012	Change (p-value)Ω	Direction (if significant at 5%)
1. % Children Taken to a Health Institution (THI) (for any reason)					
All children in ages 0-5	59.76	70.75	71.68	0	Up
Age 0	79.9	65.84	62.53	0.0068	Down
Age 1	74	73.19	75.22	0.2791	
Age 2	61.03	73.32	77.69	0	Up
Age 3	54.72	70	70	0	Up
Age 4	46.87	67.02	69.5	0	Up
Age 5	52.35	72.04	70.57	0	Up
Parental Insurance Type: Public Insurance	64.16	73.66	74.94	0	Up
Parental Insurance Type: Private Insurance	73.87	92.30	86.89	0.6418	
Parental Insurance Type: Green Card	50.36	61.87	58.15	0.0343	Up
Parental Insurance Type: No Insurance	51.87	71.34	62.11	0.0027	Up
2. Among the Children Taken to a Physician When Not Sick (THINS):					
% Height measured	66.06	75.66	85.84	0	Up
% Weight measured	70.64	77.41	86.73	0	Up
% Proper nutrition suggested	40.42	43.13	51.01	0	Up
% Vaccinated	62.21	66.52	71.55	0	Up
% Well-child check-up	73.13	67.41	67.65	0.0466	Down
% Supplement provided	54.68	42.39	37.27	0	Down
% Developmental screening	NA	45.14	43.9	0.899	
% Mental development checked	NA	15.19	17.38	0.0592	Up
4. % Newborn Screening Program	17.86	53.84	74.85	0	Up
5. % Children taken to a Dentist	NA	9.25	9.7	0.3854	

Notes: Weighted statistics are shown in the table. Ω Null hypothesis is no change between 2008 and 2012. If the variable is not available in 2008, the null hypothesis is no change between 2010 and 2012.
Source: Authors' calculations using data from the Turkish Health Research Surveys.

4. Method

Theoretical Basis

Our study relies on the theoretical framework that links together the concepts of need, access, and utilization (Goddard & Smith, 2001). Equity of access is a completely supply-side related concept, which means the same services are made available to those in equal need. Equity of utilization, on the other hand, may depend on the interaction between supply and demand, and therefore be

influenced by preferences, perceptions, and attitudes of the patients and the providers (Goddard & Smith, 2001).

Equity in health care usually refers to the principal of 'equal access for equal need'. To determine whether the principle is satisfied, we have to define what need is and what access is. However, it is hard to find an unambiguous definition of 'need' (Culyer, 1995). A proper definition would entail taking one's circumstances as well as personal choice and inherent healthiness into account. In empirical work, authors are constrained by the set of variables in their dataset, so they use a variable that has the closest resemblance to 'need'. It is common to take one's overall subjective or objective health status as a measure of need, but both have deficiencies, because in both definitions the researcher has to assume that there is no systematic variation across groups (either in the way the subjective health question is answered or in the way the objective health status in measured). In this study, we use the age of the child and the presence of a chronic illness to measure 'need'. Here, the idea is that health services should be tailored to the need of the child, which is determined by the age and the chronic health condition of the child.

To define 'access', operational feasibility is prioritized, as we do in defining 'need'. Access to health services can simply be thought of as having health insurance or, in a broader sense, the ability to use a desired range of services at the desired quality. In fact, 'access' has an elusive nature as it is inevitably related to several abstract concepts such as the appropriate use of services and the patient's compliance with the process. Variation in access to service may arise from variations in service available across geographic areas or particular groups of the population, variations in awareness of the availability, and variations in affordability of the service (Goddard & Smith, 2001). Since the measurement of access is difficult, most of the empirical studies investigate the observed choice (i.e., 'utilization' or 'receiving treatment') rather than the unobserved concept of 'availability of treatment'. We follow the same strategy in this paper.

Hence, the model of utilization decision relies on the economic choice, made by a person with a known level of need, between the expected benefit of utilization versus the perceived costs.

Empirical Strategy

In our empirical analyses, we study the relationship between a child's utilization of heath care services and the child's and the household's observable characteristics. In particular, we estimate the coefficients of the following equation using binary multivariate logistic regression:

$$U_i = \beta_0 + B_1\, Need_i + B_2\, Nonneed_i + \epsilon_i, \qquad (1)$$

where U_i is a binary variable that indicates child i's use of health care services (1 if the child uses services, 0 otherwise). B_1 and B_2 are the coefficient vectors to be estimated. $Need_i$ and $Nonneed_i$ are the need related and non-need related characteristics of the child and the household. Need related variables are the age of the child and the chronic illness dummy variable (1 if yes, 0 if no).

All children in ages 0-5 require preventive care, including well-child visits, scheduled vaccinations, and guidance on proper nutrition. Especially in the first year of life, routine visits to a health facility are crucial to ensure a healthy start to life. Children with special needs (e.g. chronic conditions) have to be treated in accordance to their specific needs.

If utilization were determined solely by need, all of the non-need variables would have a zero coefficient in equation (1). However, there is evidence in the literature that utilization is related to non-need variables. For example, there is evidence for gender-based discrimination in pediatric healthcare, even in immunizations (Khera, Jain, Lodha, & Ramakrishnan, 2014). To account for gender-based differences, we control for the sex of the child. There is also evidence in the literature that factors such as the socio-economic status of the household, household resources and insurance ownership may be determinants of health service utilization (Sözmen & Ünal, 2016). To account for such factors, we include the education level of the parent, the number of children (ages 0-14) in the household, household income (which is available in the data as a categorical variable), the employment status of the parent, and the income sources of the household as control variables in the regressions.

One important non-need variable is the type of insurance held by the parent (base category: no insurance). The insurance status of the parent should not affect utilization, since all children are covered by the state (as explained in section 2 above). Other non-need variables are whether the parent has difficulties in financial access (difficulty in affording out-of-pocket expenditures) or physical access (being far from a health facility). The western regions of the country have a higher population density than the eastern regions, which means that the density of health facilities may vary across regions. For this reason, we control for the geographical region where the household lives (12 NUTS-1 regions). In the regressions, we also control for the parent's health related behaviors (smoking status) and a health indicator of the parent (Body Mass Index (BMI)). Here, we aim to control for the possibility that unobserved attitudes and preferences of the parents affect their own health related behaviors and health indicators as well as their decisions on their children's utilization of health care services.

In addition to obtaining logit estimates, we perform some decompositions, as described below. Descriptive statistics in Table 1 show that the mean values of some of the explanatory variables (such as insurance ownership, access problems, income and education of the parent) have changed substantially over time. If nothing else changed, these changes alone could have generated a change in the utilization rates. With X representing the control variables and $\hat{\beta}$ the coefficient estimates, the logit equation can be written as

$$U = F(X\hat{\beta}). \quad (2)$$

The change in the average value of U between years t_1 and t_0 can be decomposed as follows:

$$\bar{U}_{t1} - \bar{U}_{t0} = \left[\sum_{i=1}^{N_{t1}} \frac{F(X_{i,t1}\hat{\beta}_{t0})}{N_{t1}} - \sum_{i=1}^{N_{t0}} \frac{F(X_{i,t0}\hat{\beta}_{t0})}{N_{t0}}\right] + \left[\sum_{i=1}^{N_{t1}} \frac{F(X_{i,t1}\hat{\beta}_{t1})}{N_{t1}} - \sum_{i=1}^{N_{t1}} \frac{F(X_{i,t1}\hat{\beta}_{t0})}{N_{t1}}\right], \quad (3)$$

where N is the number of observations. In equation (2), the term in the first square brackets is the part due to changes in the distributions of control variables and the term in the second square brackets is the part due to changes in the process that determines U. The second term also captures the portion of the change in U due to time differences in unmeasurable or unobserved factors, such as changes in health attitudes or preferences over time. We are mainly interested in the first term, rendering the second term to a residual. This is known as the 'Fairlie decomposition' technique, which is an extension of the classical Oaxaca-Blinder decomposition technique (Fairlie & Robb, 2007). Basically, the technique estimates the contributions of the control variables (or groups of control variables) in explaining the change in utilization.

The decomposition in equation (2) relies on using the t_0 coefficients as weights in the first term and the t_1 distributions of the control variables as weights in the second term. Alternatively, t_1 coefficients and t_0 distributions could have been used as weights. As a third alternative, the pooled coefficients $\hat{\beta}^*$ can be used (which are obtained from the logit regressions that pool observations in years t_0 and t_1). Since there is no theoretical guidance on which coefficients to use in the first term, we follow the third alternative and therefore estimate the first term as:

$$\left[\sum_{i=1}^{N_{t1}} \frac{F(X_{i,t1}\hat{\beta}^*)}{N_{t1}} - \sum_{i=1}^{N_{t0}} \frac{F(X_{i,t0}\hat{\beta}^*)}{N_{t0}}\right]. \quad (4)$$

Finally, we test whether the coefficient estimates in the logit regressions change over time (i.e., whether $\hat{\beta}_{t0} = \hat{\beta}_{t1}$ for a particular control variable). For this purpose, we interact all control variables with a time dummy and test whether the coefficient estimates of the interaction terms are statistically significant in a pooled regression. For example, interacting an "Insurance" variable with the time dummy yields the following three terms:

$\alpha_1 Insurance + \alpha_2 Time + \alpha_3 Insurance.Time.$

A t-test on $\hat{\alpha}_3$ tells us whether there is a statistically significant change in the process that links $Insurance$ to Y.

5. Results

Logit Estimation Results

Table 3 presents the results obtained from logit regression estimation of equation (1). 2012 data are used. Following the common practice in the literature, we present odds ratios and confidence intervals (95%) built around the odds ratios.

Starting with the need variables, we observe that children in ages 0-4 are more likely to be THINS (compared to the 5-year old base category). (The corresponding odds ratios are greater

than one, as shown in column (3)). They are also more likely to participate in the newborn screening program (column (7)), which is not surprising given the rise in the participation rate from about 17.86% in 2008 to almost 75% in 2012 (See Table 2).[6] We observe that children are not taken to a dentist before age 5 (column (5)). For many children, the first dental check-up is probably performed during dental screening at elementary school. Considering being THI, we find evidence that visits in the first year of life are missed (or not reported) and weak evidence that younger children are more likely to be THI than 5 year olds (column (1)). The other need variable that we control for is having a chronic illness. Children with a chronic illness are much more likely (about 40%-60% more likely) to have used health care services (see columns (1), (5), and (7)). Therefore, both age and having a chronic illness are important variables that should be controlled for in these regressions.

The non-need variables that we control for are the child's gender as well as parental and household characteristics. We begin with gender. Earlier studies on developing countries have reported evidence for gender-based discrimination in attending healthcare needs of children. However, in Turkey, the estimated odds ratios for girls are statistically not different from 1. The largest measured effect is about 16% lower likelihood for girls of being taken to a dentist (column (5)). We conclude that in Turkey there is no statistically significant evidence for gender-based discrimination in health service utilization of 0-5 year old children in 2012.

We use several variables to control for the socio-economic status (SES) of the household and the amount of resources that the child has access to. The excluded dummy variables for income and education are 'highest income bracket' and 'university or more'. The odds ratios for income bracket dummies are mostly less than one and some of them are statistically significant, which means that relative to the children of households in the highest income bracket, those in lower brackets have lower odds of using healthcare services. Children of parents with at most primary school education are significantly less likely (about 40-45% less likely) to receive healthcare services compared to children whose parents have a university degree or more. Also, we observe a difference between the children of parents with primary school versus high school degree (except for the 'newborn screening' regression).[7] However, no significant difference is observed between having a primary school versus a middle school degree (except for the THI regression).

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[6] We have to mention here that recall bias may also be at work. Information about children's health is collected from their parents. Compared to the parents of older children, it may be easier for parents of younger children to remember the newborn screening program.

[7] The p-values of the test for equality of the effects of having a primary school graduate parent and a high school graduate parent are 0.026 in the THI regression, 0.0002 in the THINS regression, and 0.0135 in the 'taken to dentist' regression. However, the p-value is 0.4105 in the 'newborn screening' regression. The difference between the coefficients of having a parent with a primary and middle school degree is statistically zero.

Moreover, a child is about 40% less likely to be included in the newborn screening program if the parent does not have a university degree (column (7)). In addition, if the parent is female, the child is about 42% less likely to participate in the newborn screening program. These are alarming findings that should be investigated further to determine the extent to which they are a result of the recall bias of parents. The number of children (0-14 years old) in the household is another significant factor that influences the odds of receiving health services. Our results clearly show that children from crowded families have a lower odds of using health services. An additional child in the household reduces the odds by about 10-25%. The odds of being THINS is reduced by about 25%. Hence, crowded families may be targeted by selective subsidies or better incentives for health care.

Our results also indicate that if the parent experiences difficulty in physical access (problems making appointments or transportation) or financial access (difficulty in making out-of-pocket payments), this, in general, does not preclude a child from using health services. The only exception is that physical access problems significantly reduce the odds of being in the newborn screening program (by about 49%). In this case, for households that are located far from health institutions or in places with scarce health resources, there exists the problem of intergenerational transmission of disadvantages: The difficulties that a parent faces may adversely affect the health of the child.

Under the current legal framework that regulates access of children to basic health care and preventive care services, the insurance status of the parent should not matter for service use, once we control for need. However, our results indicate otherwise. Compared to those with no insurance, children whose parents have public or private insurance have greater probability of being THI and THINS. This means that, controlling for income and access problems, children whose parents have no insurance have lower odds of being THI and THINS. Such a finding is surprising, given the enlarged network of family health centers and assistance programs that offer cash transfers conditional on the use of health services (Ministry of Family and Social Policies, 2012). Further investigation is needed to recover the reasons behind the finding (such as a lack of information on the availability of services, social exclusion, a superstition that keeps children away from health institutions, or some other reason).

Table 3: Logit Regression Results (2012 data): Odds ratios and 95% confidence intervals

	Taken to Health Institution (THI)		Taken to Health Institution when not sick (THINS)		Taken to a dentist		Newborn Screening Program	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Odds R.	95% CI	Odds R.	95% CI	Odds R.	95% CI	Odds R.	95% CI
Need Variables:								
Child's Age:0	0.662**	0.465 - 0.941	4.045***	2.853 - 5.733	0.0113***	0.00156 - 0.0813	1.347	0.931 - 1.948
Child's Age:1	1.208	0.909 - 1.606	4.434***	3.354 - 5.862	0.0529***	0.0277 - 0.101	2.879***	2.128 - 3.896
Child's Age:2	1.417**	1.054 - 1.906	1.966***	1.487 - 2.599	0.177***	0.113 - 0.277	1.819***	1.361 - 2.431
Child's Age:3	0.928	0.709 - 1.214	1.283*	0.979 - 1.681	0.349***	0.243 - 0.502	1.493***	1.141 - 1.954
Child's Age:4	0.892	0.680 - 1.171	0.834	0.627 - 1.110	0.580***	0.424 - 0.793	1.345**	1.031 - 1.754
Chronic illness	1.591**	1.075 - 2.354	1.006	0.690 - 1.468	2.005***	1.266 - 3.176	1.755***	1.169 - 2.636
Non-Need Variables:								
Female	0.895	0.754 - 1.063	0.969	0.822 - 1.143	0.840	0.653 - 1.081	0.986	0.827 - 1.175
Income not revealed	0.785	0.489 - 1.262	0.727*	0.498 - 1.061	1.069	0.608 - 1.879	0.660	0.389 - 1.120
Income bracket 1 (lowest)	0.635	0.317 - 1.271	0.668	0.332 - 1.345	0.255**	0.0657 - 0.991	0.485*	0.227 - 1.039
Income bracket 2	0.454**	0.231 - 0.891	0.325**	0.137 - 0.770	0.288*	0.0701 - 1.183	0.265***	0.132 - 0.533
Income bracket 3	0.690	0.310 - 1.539	0.730	0.314 - 1.696	0.0600***	0.00761 - 0.472	0.585	0.262 - 1.305
Income bracket 4	0.752	0.390 - 1.450	0.725	0.409 - 1.285	0.659	0.259 - 1.681	0.455**	0.230 - 0.898
Income bracket 5	0.387***	0.215 - 0.699	0.353***	0.200 - 0.623	0.501	0.190 - 1.318	0.466**	0.247 - 0.879
Income bracket 6	0.601*	0.331 - 1.094	0.744	0.438 - 1.262	1.606	0.758 - 3.402	0.710	0.369 - 1.367
Income bracket 7	0.695	0.377 - 1.280	0.641*	0.379 - 1.084	0.878	0.388 - 1.988	0.361***	0.190 - 0.686
Income bracket 8	0.889	0.477 - 1.658	0.640*	0.382 - 1.072	0.817	0.354 - 1.884	0.785	0.405 - 1.520
Income bracket 9	0.540*	0.280 - 1.042	0.819	0.445 - 1.508	1.081	0.440 - 2.657	0.894	0.407 - 1.964
Parent: Primary School or Less	0.651**	0.449 - 0.944	0.590***	0.434 - 0.802	0.551**	0.344 - 0.883	0.536***	0.363 - 0.791
Parent: Middle School Graduate	0.840	0.554 - 1.272	0.666**	0.466 - 0.951	0.564**	0.334 - 0.952	0.591**	0.383 - 0.912
Parent: High School Graduate	0.877	0.600 - 1.284	0.920	0.674 - 1.255	0.885	0.571 - 1.372	0.598**	0.402 - 0.888
No.of Children in the hh	0.832***	0.771 - 0.898	0.742***	0.676 - 0.814	0.819***	0.705 - 0.953	0.901**	0.828 - 0.980
Parent's Age	1.007	0.995 - 1.020	0.999	0.986 - 1.012	1.008	0.990 - 1.026	1.006	0.994 - 1.018
Parent Female	0.925	0.578 - 1.482	1.339	0.846 - 2.121	1.044	0.511 - 2.134	0.577**	0.354 - 0.941
Difficulty in Physical Access	1.547	0.838 - 2.857	1.135	0.556 - 2.317	1.924	0.795 - 4.660	0.507**	0.264 - 0.976
Difficulty in Financial Access	1.339	0.913 - 1.962	1.080	0.711 - 1.640	0.784	0.404 - 1.521	0.873	0.588 - 1.296
Insurance: Public	1.609**	1.096 - 2.361	2.065***	1.339 - 3.185	1.427	0.719 - 2.831	1.135	0.765 - 1.684
Insurance: Private	3.099**	1.049 - 9.161	3.882***	1.669 - 9.032	1.197	0.325 - 4.405	1.168	0.452 - 3.014
Insurance: Green Card	1.272	0.823 - 1.965	1.536*	0.944 - 2.500	1.288	0.554 - 2.995	1.115	0.715 - 1.739
Observations	3,363		3,363		3,363		3,363	

Notes: The odds ratios estimated for the region dummies (12 NUTS-1 regions) are not shown in the table. They vary in the range 0.358-1.668 if the dependent variable is “Taken to Health Institution”, 1.133-2.926 if the dependent variable is “Taken to a health institution when not sick”, 0.290-1.269 if the dependent variable is “Taken to a dentist”, and 0.639-4.782 if the dependent variable is newborn screening program; many of them are statistically significant. We also control for the ‘parent employed’ dummy variable, three dummy variables for income type received by the household (labor, asset, retirement), and a dummy for ‘Parent not mother or father’. Base categories are as follows: For income, the top bracket; for child’s age, “Child age: 5”; for parent’s education level, “University or higher degree”; for insurance types, “No insurance”; for employment status of the parent, “Not employed”; and for household’s income type: “Income Type: Subsidy”. All regressions include a constant term. *** 1%, ** 5%, * 10% level of significance.
Source: Authors’ calculations based on data from Turkish Health Research Surveys.

Table 4 presents the odds ratios for logit regressions on the type of health institution visited: FHC, hospital, or a private office. Here, the samples include children THINS and not all 0-5 year old children. We saw in Table 2 that younger children are more likely to be THINS. Here, we see that among those who are THINS, the younger children are more likely to use a FHC. For children with chronic problems, the odds of being taken to a hospital is substantially higher (almost three times higher) than being taken to the other two alternatives.

We find no difference in the choice of health institution between boys and girls or across household income brackets (except that the middle brackets have lower odds of being taken to a private office). However, the findings on parental education and the number of children in the household reveal a picture in which SES of the households is a crucial factor in health care choices. Among children THINS, children whose mothers have less education are more likely to use FHC and not a private physician's office; children from crowded families are less likely to use hospitals or physicians' offices. In Table 2, we found that a child is less likely to be THINS if the parent has at most primary education, compared to a parent with a university degree and that a child has lower odds of using healthcare services if the child has a crowded family. Hence, the results in Table 4 are complementary to the results in Table 2 in this sense.

In Table 2, we found that insurance type matters in the use of health care services. Here, in Table 4, we observe that private insurance owners are less likely to use a FHC. More interestingly, Green Card holders are more likely to use hospitals. Table 5 presents the odds ratios for logit regressions on the procedures followed during the visit to a health institution. Once again, in these regressions the samples include children THINS. We find that the child's age is the most important determinant of whether the standard set of measurements are taken and necessary recommendations are made to the parents. Younger children are substantially more likely (up to 6 or 7 times more likely) to have the measurements and check-ups done (compared to 5-year-old children). This finding may be explained by the closer follow-up of youngest children both by the health personnel and by their parents. On the other hand, evidence show us that children with a chronic illness are not treated differently than other children. We would expect to see the contrary: children with chronic conditions should be followed more closely and carefully. The insignificance of the estimates may be explained by the small proportion of children with a chronic condition.

Controlling for need variables, non-need variables should not affect the type of procedures followed on a child THINS and this is what we find. None of the non-need variables significantly affect all of the dependent variables listed in Table 5, with the exceptions of having a high number of children in the household and having no insurance (the omitted category). These reduce the odds of receiving some of the measurements and necessary recommendations. Therefore, in

congruence with earlier results, we can say that some households may be excluded from the network of preventive care services in Turkey.

As part of robustness checks, we include the parent's health related behaviors and health indicators (BMI and smoking status) in the set of non-need variables and see that our results are robust in the sense that they do not significantly change. In general, our results suggest that children with smoker parents have greater odds to be THI and THINS. Those children are also more likely to have a dental visit and they have greater odds of having supplement provided. Regarding the parent's BMI levels, we observe that for children whose parents have greater BMI levels are more likely to be THI. Nevertheless, this group of children have lower tendency to participate in the newborn screening program.[8]

Table 4: Logit regressions on the type of institution visited (Odds ratios are shown) (2012)

VARIABLES	(1) Family Health Center	(2) Hospital	(3) Physician's Office
Need Variables:			
Child's Age:0	2.690***	1.603*	0.830
Child's Age:1	2.888***	0.876	0.943
Child's Age:2	1.999***	1.121	1.013
Child's Age:3	1.704**	0.873	0.912
Child's Age:4	1.747**	0.757	0.744
Chronic illness	0.813	2.826***	0.558
Non-Need Variables:			
Female	1.031	0.968	0.853
Income not revealed	0.963	1.046	0.755
Income bracket 1 (lowest)	1.808	1.706	4.731
Income bracket 2	0.986	1.054	
Income bracket 3	0.312*	1.789	0.674
Income bracket 4	1.086	1.564	0.242*
Income bracket 5	0.858	1.252	0.201**
Income bracket 6	0.949	1.422	1.080
Income bracket 7	0.720	1.025	1.372
Income bracket 8	1.177	1.285	0.982
Income bracket 9	0.880	1.407	1.073
Parent: Primary School or Less	3.004***	0.912	0.405***
Parent: Middle School Graduate	2.119***	0.785	0.459***
Parent: High School Graduate	1.515*	0.807	0.771
Number of Children in the hh	1.130	0.830**	0.644***
Parent's Age	0.994	1.010	1.029**
Parent Female	0.840	0.424**	1.276
Difficulty in Physical Access	2.292	0.512	0.569
Difficulty in Financial Access	0.928	1.184	0.965
Insurance: Public	0.628	1.539	1.916
Insurance: Private	0.176**	2.046	3.764
Insurance: Green Card	0.319*	3.320**	0.352
Observations	1,253	1,253	1,241

Notes: Samples include children taken to a health institution when not sick during the year. "Family health center" is equal to one if the child was taken to a family health center and equal to zero if not. The other

[8] Full results are available from the authors upon request.

dependent variables are defined similarly, without excluding joint use of health institutions. The odds ratios estimated for the region dummies (12 NUTS-1 regions) are not shown in the table. They vary in the range 0.638-2.161 in column (1), 0.312-0.862 in column (2), and 0.608-2.920 in column (3). Many of the region effects are statistically significant, except the ones in column (3). Regression results suggest that there is no significant difference in private physician's office visits across regions. We also control for the 'parent employed' dummy variable, three dummy variables for income type received by the household (labor, asset, retirement), and a dummy for 'Parent not mother or father'. All regressions include a constant term. Base categories are as follows: For child's age; "Child age: 5"; For parent's education levels; "University or higher degree", for insurance types; "No insurance", for employment status of the parent; "Unemployed or inactive or seasonal worker", and for household's income type: "Income Type: Subsidy". All regressions include a constant term. *** 1%, ** 5%, * 10% level of significance.
Source: Authors' calculations based on data from Turkish Health Research Surveys.

Table 5: Logit regressions on the procedure followed during the child's visit to a health institution (Odds ratios are reported) (2012)

VARIABLES	(1) Height Measured	(2) Weight Measured	(3) Proper Nutrition Suggested	(4) Vaccination	(5) Well-Child Check-Up	(6) Supplement Provided	(7) Developmental Screening	(8) Mental Development Checked
Need Variables:								
Child's Age:0	3.022***	3.526***	3.197***	7.398***	1.602*	2.075***	3.329***	1.193
Child's Age:1	4.431***	4.942***	3.719***	8.927***	1.140	2.596***	3.473***	1.349
Child's Age:2	2.591***	2.519***	2.781***	3.487***	1.211	1.366	1.429	1.201
Child's Age:3	2.248***	2.748***	2.016***	2.450***	1.272	1.313	1.986***	0.903
Child's Age:4	1.048	1.281	1.194	0.804	0.838	0.635	0.859	1.143
Chronic illness	0.582	0.546*	0.935	0.939	1.117	1.522	0.993	1.629
Non-Need Variables:								
Female	1.097	1.004	0.918	0.822	1.029	1.097	1.023	1.222
Income not revealed	0.474	0.499	0.969	0.909	0.858	1.009	0.770	0.593
Income bracket 1 (lowest)	0.398	0.563	0.539	0.669	0.473	0.925	0.766	
Income bracket 2	1.153		0.0672**	0.340	1.058	0.807	0.241	
Income bracket 3	0.113***	0.105***	0.0494***	0.160**	0.484	1.388	0.326	
Income bracket 4	0.305	0.607	0.505	1.221	0.848	1.890	0.484*	0.574
Income bracket 5	0.287	0.309	0.489	0.689	1.429	0.512	0.347**	0.227**
Income bracket 6	0.451	0.440	0.998	0.993	1.152	1.467	0.804	0.466
Income bracket 7	0.425	0.655	0.833	0.711	0.749	1.234	0.563	0.956
Income bracket 8	0.546	0.497	0.928	1.031	0.843	1.258	0.618	0.402*
Income bracket 9	0.855	1.108	2.458**	2.152	1.428	1.818	0.701	0.435
Parent's Education Level:								
Primary School or Less	0.867	1.176	0.811	1.097	0.927	0.825	0.692	0.877
Middle School Graduate	1.307	1.551	0.890	1.426	1.411	0.932	0.701	1.170
High School Graduate	1.184	1.514	1.140	1.259	1.607**	1.026	0.904	0.983
Number of Children in the hh	0.790**	0.755***	0.748***	0.953	0.889	0.698***	0.848**	0.919
Parent's Age	1.012	1.002	1.000	0.997	1.011	1.001	1.004	0.985
Parent Female	0.740	0.610	0.318***	0.876	1.086	1.271	1.030	1.183
Difficulty in Physical Access	1.797	1.465	1.127	1.318	0.799	0.626	1.561	0.459
Difficulty in Financial Access	2.072	2.073	1.529	1.891	1.055	1.720	1.916*	0.892
Insurance: Public	0.878	1.268	0.824	0.875	2.049*	2.285*	2.578**	1.228
Insurance: Private	0.758	1.148	0.894	0.754	1.749	2.613	5.007**	0.784
Insurance: Green Card	0.594	0.634	0.951	1.250	1.800	2.095	1.326	1.134
Observations	1,253	1,241	1,253	1,253	1,253	1,253	1,253	1,204

Notes: The odds ratios estimated for the region dummies (12 NUTS-1 regions) are not shown in the table. They vary in the range 0.333-2.799 in column (1), 0.303-3.272 in column (2), 0.528-1.583 in column (3) 0.193-0.517 in column (4), 0.588-1.594 in column (5), 0.366-5.027 in column (6), 0.633-2.582 in column (7) and 1.454-10.00 in column(8). Many of them are statistically significant, except for columns (3) and (5). We also control for the 'parent employed' dummy variable, three dummy variables for income type received by the household (labor, asset, retirement), and a dummy for 'Parent not mother or father'. Base categories are as follows: For income levels, top income bracket; For child's age; "Child age:5"; For parent's education levels; "University or higher degree", for insurance types; "No insurance", for employment status of the parent; "Unemployed or inactive or seasonal worker", and for household's income type: "Income Type: Subsidy". All regressions include a constant term. *** 1%, ** 5%, * 10% level of significance.
Source: Authors' calculations based on data from Turkish Health Research Surveys

Fairlie Decomposition Analyses

Descriptive statistics in Table 2 reveal that there is a huge increase in the rate of participation to the newborn screening program. The nationwide prevalence of newborn screening increased from 17.86 % in 2008 to 74.85 % in 2012. There is also considerable increase in the rate of being THI, from 59.76 % in 2008 to 71.68 % in 2012. Moreover, among the children who were THINS, we observe a significant increase in the utilization of family health centers, from 64.51% in 2010 to 73.77 % in 2012 (See Appendix Table A1). In sum, we observe a substantial increase in these three dependent variables.

In this part of the paper, we aim to explain the factors that have led to the changes described in the previous paragraph. First, we use the Fairlie decomposition technique to estimate the extent to which the changes in the explanatory variables have led to the changes in the three dependent variables: being THI, newborn screening, and visiting FHC. As the fourth dependent variable, we consider being THINS. Even though there is no significant increase in this variable during the analysis period, we are still interested in it, since it is an important indicator of utilization of preventive healthcare services by children.

The decomposition results in Table 6 initially show us the predicted probabilities (i.e. $E(U_i)$ in equation (1)) in the beginning and at the end of the analysis period. Next, the results show us the percentage of the difference in $E(U_i)$ explained by the change in the distribution of the control variables. The contribution of the change in the control variables is estimated as in equation (4), relying on the pooled coefficients. For example, column (1) of the table shows the results for the dependent variable "being THI". We can see that only 26.28% of the increase in this variable between 2008 and 2012 can be explained by the changes in the distribution of need and non-need variables. In columns (3) and (4), again, we see that only a small share of the predicted change is explained by the changes in the need and non-need variables. Looking at the contributions of need versus non-need variables, we notice that the contribution of the changes in the distribution of need variables is negligible.

In column (2), the increase over time in the rate of being THINS is already small so that there is not much change to be explained. The interesting finding here is that, keeping all else the same, the changes in the explanatory variables alone would have led to a greater increase in the dependent variable, which did not realize.

In columns (1) and (2), we observe three non-need variables that significantly contribute to explaining the change in $E(U_i)$: the number of children in the household, the education level of the parent, and insurance ownership. Logit estimation results suggest that a higher number of children in the household reduces the chances of a child to use healthcare services. We also know that the number of children per household declined over time (Table 1). Here, we find that the

decline over time in the number of children per household has led to an increase in the likelihood of a child's utilization of health services. Similarly, with advances in parental education (a decline over time in the share of parents who have at most primary school education, Table 1) has led to an increase in being THI and THINS. The third finding is that the rising share of insurance ownership contributed significantly to explaining the increase in the rates of being THI and THINS. This means that efforts of the government to increase insurance coverage of the population have generated the beneficial result of increasing utilization.

In column (3), as in columns (1) and (2), the changes in the number of children per household and insurance ownership contributed positively to $E(U_i)$. Finally, in column (4), we find that none of the control variables (except asset ownership), contributed significantly to explain the change in $E(U_i)$. Asset ownership reduced $E(U_i)$ at 10% significance level.

Therefore, the main findings in the decomposition analyses can be summarized as follows: The factors that have contributed significantly to the increase in the utilization rate of healthcare services are the reduction in the number of children per household as well as improvements in average education level of the parents and their insurance ownership. We would expect the share of children THINS to have increased faster, given the substantial changes in non-need variables, but this expectation did not realize. In the overall, control variables can explain only a small part of the change in the dependent variables in columns (1), (3), and (4). Therefore, the change in $E(U_i)$ must be, to a great extent, the result of changes in the process that determines U (changes in β), or changes in unmeasurable or unobserved factors, such as changes in health attitudes or preferences over time.

Changes in Ceofficient Estimates Over Time

With the aim of explaining the factors that have led to the increases in utilization rates, we next re-estimate the logit regressions, where we interact all the control variables with a year dummy, which is equal to 1 for year 2012. In other words, we are interested in knowing which children (i.e. children with which characteristics) increased their utilization over time. The results are shown in Table 7. We observe that in columns (1), (2), and (3), younger children (ages 0-1) became less likely to use the services than before. This is an alarming development, since sufficient use of health services is essential to the health of children in the first years of life. It is also quite contradictory to what we would expect to see, given the noticeable efforts of the government (and the Ministry of Health in particular) to build a system of universal health care.

Our regression estimates show us evidence of regional disparities in children's utilization of services (some region dummies are significantly negative in the regressions). The addition of interaction terms with year 2012 dummy allows us to see whether the negative coefficient estimates have become zero or positive. This actually happens in five regions in the THINS and the newborn screening regressions. The estimates of the other regions do not change signs.

Therefore, we do find some evidence for a decrease in regional disparities in the utilization of these two services.[9]

Table 6: Fairlie Decomposition Results

	(1) Taken to a Health Institution (THI)	(2) Taken to Health Institution when not sick (THINS)	(3) Newborn Screening Program	(4) Visit to a Family Health Center (FHC)
Predicted U_i (earlier year)	0.6484	0.4384	0.2352	0.6887
Predicted U_i (later year)	0.7268	0.4455	0.7803	0.7946
Difference	0.0784	0.0071	0.5451	0.1059
Explained difference	0.0206	0.0407	0.0277	-0.0143
Percent explained	**26.28%**	**573.24%**	**5.08%**	**-13.50%**
Contributions from across-year differences in:				
Need variables	-0.000811	0.00792***	0.00127	-0.00149
	(-1.03 %)	**(111.54%)**	**(0.23 %)**	**(1.41 %)**
Child's Age	-0.00085	0.075***	0.001502	0.000545
Chronic illness	0.00000594	-0.0000446	-0.0000836	-0.00127
Non-need variables	0.0215***	0.0325***	0.0263***	-0.0125
	(27.42 %)	**(457.75 %)**	**(4.83 %)**	**(-11.8 %)**
Female	-0.000592	0.0000703	0.000576	0.00126
Household Income	0.011621	0.009507	0.00609	-0.0063
Parent: Primary School or Less	0.00257	0.00898	0.00405	-0.00863
Parent: Middle School Graduate	-0.000670	-0.00473*	-0.00237	0.00203
Parent: High School Graduate	0.000363	-0.00100	-0.00107	0.000542
Number of children in the hh	0.00262***	0.00209**	0.00503***	-0.00173
Parent's Age	-0.00194	0.000171	0.00369	0.000155
Parent Female	-0.000213	-0.000343	0.0000948	0.000823
Difficulty in Physical Access	0.0000181	-0.000140	0.00004	
Difficulty in Financial Access	-0.00129	0.00205	0.00395	0.00671
Insurance: Public	0.0120***	0.0162***	0.00936**	-0.00333
Insurance: Private	0.000619	0.00163**	0.000583	0.00222
Insurance: Green Card	-0.00246	-0.00162	-0.00159	0.00554
Observations	3,375	3,375	3,375	749

Notes: a) Decompositions in columns (1), (2) and (3) are implemented by using the pooled 2008 and 2012 THS data sets and using observations for children who are under 4 years old in order to circumvent overlapping. Decomposition in column (4) is implemented by using 2010 and 2012 pooled THS data set (because the 2008 survey does not ask the type of the institution that the child was taken). In column (4), we use the observations for children who are under 2 years old.

b) We aggregate the estimates of income brackets and reveal only the total effect of income in Table 6. Income brackets 2, 3, 5 and 6 significantly explain the variation in the probabilities of THI and THINS. None of the income brackets are significant in the decomposition in column (3). None of the income brackets are significant in the decomposition in column (4). The results of the separate effects of each income bracket are available upon request.

c) We sum up the effect of each child's age and reveal only the total effect of child's age in Table 6. In column (1), age zero dummy is positive and significant, age 1 dummy is negative and significant. All of the age dummies are significant in column (2). Age of the child is significant in column (3) if the child is less than 1 year old. None of the age groups significantly explain the variation in column (4) The results of the separate age effects are available upon request.

We also control for the 'parent employed' dummy variable, three dummy variables for income type received by the household (labor, asset, retirement), and a dummy for 'Parent not mother or father'. All regressions include a constant term. *** 1%, ** 5%, * 10% level of significance.

[9] The coefficients of region dummies interacted with year dummies are available upon request.

Source: Authors' calculations using Turkish Health Research survey data and Fairlie decomposition technique.

Table 7. Changes in the Coefficient Estimates Over Time:

Pooled Logit Estimation Results: 2008-2012 in columns (1)-(3); 2010-2012 in column (4)

VARIABLES	(1) THI	(2) THINS	(3) Newborn Screening	(4) FHC
Need Variables:				
Child Age:0*Year 2012	-1.611***	-1.231***	-2.461***	-0.209
	(0.351)	(0.337)	(0.343)	(0.487)
Child Age:1*Year 2012	-0.652***	-0.218	-0.754***	
	(0.228)	(0.226)	(0.267)	
Child Age:2*Year 2012	0.172	0.253	-0.324	
	(0.226)	(0.228)	(0.276)	
Chronic Illness*Year 2012	0.588	-0.226	0.818	0.177
	(0.433)	(0.431)	(0.548)	(1.173)
Non-Need Variables:				
Female*Year2012	-0.0833	-0.0452	-0.0624	0.0363
	(0.177)	(0.172)	(0.199)	(0.458)
Income not revealed*Year2012	-0.0990	-0.451	-0.0470	-1.554
	(0.803)	(0.621)	(0.737)	(0.995)
Income bracket 1*Year2012	0.553	-0.0974	-0.285	-4.855**
	(0.897)	(0.766)	(0.887)	(1.920)
Income bracket 2*Year2012	-0.555	-1.520*	-1.044	-2.240
	(0.897)	(0.839)	(0.862)	(2.245)
Income bracket 3*Year2012	-0.624	-0.467	0.376	
	(0.957)	(0.824)	(0.918)	
Income bracket 4*Year2012	0.623	0.0401	0.111	
	(0.921)	(0.769)	(0.931)	
Income bracket 5*Year2012	-0.117	-0.296	-0.390	-0.323
	(0.901)	(0.784)	(0.899)	(1.578)
Income bracket 6*Year2012	-0.903	-1.277*	-0.419	1.194
	(0.947)	(0.760)	(0.880)	(1.767)
Income bracket 7*Year2012	-0.421	-0.486	-1.077	-0.563
	(0.965)	(0.802)	(0.900)	(1.438)
Income bracket 8*Year2012	-1.101	-2.570***	-1.702*	-1.816
	(0.982)	(0.819)	(0.891)	(1.609)
Parent: Primary School or less*Year 2012	-0.400	-0.389	-0.691	0.615
	(0.402)	(0.384)	(0.443)	(0.860)
Parent: Middle School Graduate*Year 2012	-0.213	-0.0969	-0.0616	-0.228
	(0.482)	(0.471)	(0.532)	(0.861)
Parent: High School Graduate*Year 2012	-0.177	0.302	-0.741*	1.794**
	(0.416)	(0.394)	(0.440)	(0.774)
Number of children in the hh* Year 2012	-0.0795	-0.203**	0.306**	0.342
	(0.0684)	(0.0840)	(0.136)	(0.269)
Parent's Age*Year 2012	0.0237*	0.0131	-0.00231	-0.0832*
	(0.0123)	(0.0133)	(0.0167)	(0.0481)
Parent Female*Year 2012	-0.290	0.250	-1.160*	1.791
	(0.479)	(0.506)	(0.596)	(1.289)
Difficulty in Physical Access*Year 2012	-0.519	-0.0571	-1.327*	
	(0.619)	(0.678)	(0.683)	
Difficulty in Financial Access*Year 2012	0.410	0.289	0.198	1.192
	(0.336)	(0.346)	(0.421)	(1.091)
Insurance: Public*Year 2012	-0.00216	-0.200	-0.763*	-0.936
	(0.356)	(0.373)	(0.434)	(1.819)
Insurance: Private*Year 2012	1.127	0.261	-1.101	-1.906
	(1.376)	(1.410)	(1.435)	(2.252)
Insurance: Green Card*Year 2012	-0.186	-0.0116	-0.0975	1.828***

	(0.290)	(0.280)	(0.322)	(0.667)
Observations	3,362	3,375	3,375	717

Notes: The interaction terms with region dummies are not shown in the table, but we can say that region has no significant impact on the probability of taking the child to a health institution (except region 8) or to a family health center. However, we observe a significant change in the coefficient estimates of some regions between 2008 and 2012 in columns (2) and (3). We also control for the 'parent employed' dummy variable, three dummy variables for income type received by the household (labor, asset, retirement), and a dummy for 'Parent not mother or father'. All regressions include a constant term. *** 1%, ** 5%, * 10% level of significance.

Source: Authors' calculations using data from THS 2008, 2010 and 2012 Surveys.

6. Conclusions

This paper investigates the utilization of healthcare services by children in ages 0-5 in Turkey, where a major health transformation program (HTP) was initiated in 2003. As expected, descriptive statistics of the Turkish Health Research Surveys and our estimation results confirm the rise in utilization in the period 2008-2012. In particular, the shares of children taken to a health institution (THI) and to newborn screening increased. Also, visits to family health centers (FHC) increased. However, contrary to our expectations, the share of children taken to a health institution when not sick (THINS) did not increase significantly over time. In addition, we observe that the socio-economic status and insurance ownership of the parent have a crucial impact on utilization. This is surprising, since all children are unconditionally covered by the General Health Insurance (GHI) law, regardless of their parents' SES or insurance ownership. Hence, we may conclude that, the data do not confirm that we have achieved universal access of young children to healthcare services in Turkey.

This paper contributes to the literature as being the first study that examines the utilization of healthcare services by young children and how it has changed over time by using extensive nationally representative household survey data from Turkey.

In this paper, we conduct multivariate logistic regression analyses in order to investigate the determinants of the utilization of healthcare services by young children. We differentiate between need and non-need variables. Under UHC, non-need variables should not exist in the regression, once we control for need. However, non-need variables do matter for utilization. Children from lower income families and children whose parents are less educated are less likely to receive healthcare services. As the number of other children in the household increases, the child's probability of using healthcare services decreases. Children whose parents are (publicly or privately) insured are more likely to be THI and THINS. Possible reasons behind this finding can be the lack of information on the availability of services, social exclusion or a superstition that keeps children away from health institutions.

Furthermore, we observe that the parent's SES and the number of children in the household are crucial elements for explaining the choice of the visited healthcare institution. For instance, children whose mothers have less education are more likely to use a FHC and less likely to use a private physician's office. Children from crowded families are less likely to use hospitals and physicians' offices. Insurance ownership of the parent is also an important factor that explains the choice of healthcare institution. For instance, we observe that private insurance owners are less likely to use a FHC, and Green Card holders are more likely to use hospitals.

We also perform Fairlie decomposition analysis in order to estimate the extent to which the changes in the explanatory variables have led to the changes in utilization. The results suggest that in the overall, control variables can explain only a small part of the change in utilization. Hence, we conclude that the observed changes must be, to a great extent, the result of changes in the process that determines the usage of these services, or changes in unmeasurable or unobserved factors, such as changes in health attitudes or preferences over time. The factors that have contributed significantly to explaining the increase in utilization are the reduction in the number of children per household, improvements in average education level of the parents and their insurance ownership.

Finally, we ask whether the coefficient estimates in the logistic regressions have changed over time. We find that in some regions where utilization had been low, the probability of using services (THINS and newborn screening) increased over time. This is good news, since it hints at a decrease in regional disparities in the utilization of these two services. The bad news is that we find that younger children (ages 0-1) became less likely over time to use the healthcare services. This is an alarming development, since sufficient use of health services is essential to the health of children in the first years of life. It is also quite contradictory to what we would expect to see, given the noticeable efforts of the government (and the Ministry of Health in particular) to build a system of universal health care.

As the conclusion, we admit that we find some results of the study unexpected and surprising, and emphasize the need for further analysis of young children's utilization of health services in Turkey. In 2008, Turkey initiated the General Health Insurance system, which aimed to cover the entire population regardless of insurance status or income level. This is a big and important step towards achieving the Sustainable Development Goal of universal health coverage (UHC). It is difficult to explain some of the findings observed in the survey data (such as the low (and declining) utilization rate of the youngest children and the existence of a link between the parent's insurance status and child's utilization), given the huge efforts of the government in achieving UHC and the resources devoted to this aim. The explanation could be methodological differences between administrative and survey data in measuring utilization.

Conflict of interest

The authors declare that there is no conflict of interest.

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References

Akdağ, R. (2009). *Progress report health transformation program in Turkey January 2009*. (S. Aydın & H. Demirel, Eds.). Ankara: Sağlık Bakanlığı.

Aran, M. A., Aktakke, N., Gurol Urganci, I., & Atun, R. A. (2015). Maternal and Child Health in Turkey Through the Health Transformation Program (2003-2008). *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2701839

Atun, R., Aydın, S., Chakraborty, S., Sümer, S., Aran, M., Gürol, I., … Akdağ, R. (2013). Universal health coverage in Turkey: enhancement of equity. *The Lancet*, *382*(9886), 65–99. https://doi.org/10.1016/S0140-6736(13)61051-X

Baris, E., Mollahaliloglu, S., & Aydin, S. (2011). Healthcare in Turkey: from laggard to leader. *BMJ*, *342*(jan21 1), c7456–c7456. https://doi.org/10.1136/bmj.c7456

Carrin, G., & James, C. (2004). *Reaching Universal Coverage via Social Health Insurance: Key Design Features in the Transition Period* (Discussion Paper N.2, Department ‘‘Health System Financing, Expenditure and Resource Allocation (FER). Cluster ‘‘“Evidence and Information for Policy (EIP)”’). Geneva: WHO.

Case, A., Fertig, A., & Paxson, C. (2005). The lasting impact of childhood health and circumstance. *Journal of Health Economics*, *24*(2), 365–389. https://doi.org/10.1016/j.jhealeco.2004.09.008

Civaner, M. M., Azap, A., Pala, K., Akalın, A., Aksakoğlu, G., Aksu Tanık, F., … Hamzaoğlu, O. (2013). ‘THE LANCET’ SAĞLIKTA DÖNÜŞÜM PROGRAMI’NIN ‘BAŞARILARI’NI DÜNYAYA PAZARLIYOR (“The Lancet” Markets The ‘Successes’ Of Transformation In Health Internationally). *Toplum ve Hekim*, *28*(6), Kasım-Aralık, 403-421.

Culyer, A. J. (1995). Need: The idea won’t do—But we still need it. *Social Science & Medicine*, *40*(6), 727–730. https://doi.org/10.1016/0277-9536(94)00307-F

Erkoç, Y. (2012). *Turkey Health Transformation Program Assessment Report (2003-2011)*. (R. Akdağ, Ed.). Turkish Ministry of Health.

Erus, B., Yakut-Cakar, B., Cali, S., & Adaman, F. (2015). Health policy for the poor: An exploration on the take-up of means-tested health benefits in Turkey. *Social Science & Medicine*, *130*, 99–106. https://doi.org/10.1016/j.socscimed.2015.02.015

Fairlie, R. W., & Robb, A. M. (2007). Why Are Black-Owned Businesses Less Successful than White-Owned Businesses? The Role of Families, Inheritances, and Business Human Capital. *Journal of Labor Economics*, *25*(2), 289–323. https://doi.org/10.1086/510763

Goddard, M., & Smith, P. (2001). Equity of access to health care services: *Social Science & Medicine*, *53*(9), 1149–1162. https://doi.org/10.1016/S0277-9536(00)00415-9

Johansen, A., & Guisset, A. L. (2012). Successful health systems reforms: the case of Turkey. *World Health Organization Europe*.

Khera, R., Jain, S., Lodha, R., & Ramakrishnan, S. (2014). Gender bias in child care and child health: global patterns. *Archives of Disease in Childhood*, *99*(4), 369–374. https://doi.org/10.1136/archdischild-2013-303889

Kutzin, J. (2013). *Towards Universal Health Care Coverage Goal-oriented Framework for Policy Analysis*. Washington, DC: World Bank. Retrieved from http://hdl.handle.net/10986/13772

Mackenbach, J. P. (2017). Nordic paradox, Southern miracle, Eastern disaster: persistence of inequalities in mortality in Europe. *European Journal of Public Health*, *27*(suppl_4), 14–17. https://doi.org/10.1093/eurpub/ckx160

Ministry of Family and Social Policies. (2012). *The Project on the Evaluation of Qualitative and Quantitative Effects of Conditional Cash Transfer Program on the Benefit Owners in Turkey*. Ministry of Family and Social Policies, Directorate General for Social Aid.

MoH, Public Health Institution. (2012). *Strategic Plan of Public Health Institution 2014-2017*. Republic of Turkey Ministry of Health, Public Health Institution, Department of Strategy Development, Strategic Planning and Management.

Murray, C. J. L., & Frenk, J. (2000). A framework for assessing the performance of health systems. *Bulletin of the World Health Organization*, *78*(6), 717–731. https://doi.org/https://dx.doi.org/10.1590/S0042-96862000000600004

OECD. (2017). *OECD Health Statistics 2017 – Frequently Requested Data*. Retrieved from http://www.oecd.org/els/health-systems/health-data.htm

OECD-WB. (2008). *OECD Reviews of Health Systems: Turkey*. Paris: OECD Publishing.

Official Gazette. (1992). Official Gazette. Law 3816: Green Card Law. The Prime Ministry, Republic of Turkey. Retrieved from http://www.resmigazete.gov.tr

Official Gazette. (2006). Official Gazette. Law 5510: Social Insurance and Universal Health Insurance Law. The Prime Ministry, Republic of Turkey. Retrieved from http://www.sgk.gov.tr/wps/wcm/connect/1513fcb9-6954-42f1-9711-1708b08ff3a0/SOCIAL_INSURANCE_AND_UNIVERSAL_HEALTH_INSURNCE_LAW.pdf?MOD=AJPERES

Ökem, Z. G., & Çakar, M. (2015). What have health care reforms achieved in Turkey? An appraisal of the "Health Transformation Programme." *Health Policy*, *119*(9), 1153–1163. https://doi.org/10.1016/j.healthpol.2015.06.003

Richter, L. M., Daelmans, B., Lombardi, J., Heymann, J., Boo, F. L., Behrman, J. R., … Darmstadt, G. L. (2017). Investing in the foundation of sustainable development: pathways to scale up for early childhood development. *The Lancet*, *389*(10064), 103–118. https://doi.org/10.1016/S0140-6736(16)31698-1

Savas, B. S., Karahan, O., & Saka, R. O. (2002). Health care systems in transition: Turkey., *4*(4).

Social Security Institution. (2008). 2008 Yılı Sosyal Güvenlik Kurumu Sağlık Uygulama Tebliği (Statement of Health Practices). Retrieved from http://www.resmigazete.gov.tr/eskiler/2008/09/20080929M1-1.htm

Social Security Institution. (2010). Sosyal Güvenlik Kurumu Sağlık Uygulama Tebliği (Statement of Health Practices). Retrieved from http://www.resmigazete.gov.tr/eskiler/2010/03/20100325M1-1.htm

Sözmen, K., & Ünal, B. (2016). Explaining inequalities in Health Care Utilization among Turkish adults: Findings from Health Survey 2008. *Health Policy*, *120*(1), 100–110. https://doi.org/10.1016/j.healthpol.2015.10.003

Tatar, M., Mollahaliloğlu, S., Şahin, B., Aydın, S., Maresso, A., & Hernández-Quevedo, C. (2011). Turkey: Health system review. *Health Systems in Transition*, *13*(6), 1–186.

The MoH of Turkey. (2003). *Health Transformation Programme*. Ankara.

The MoH of Turkey. (2016). *Health Statistics Yearbook 2015*. Ankara: The MoH of Turkey, General Directorate of Health Research.

Turkish Statistical Institute. (2017). *Health Expenditure Statistics 2016*. Retrieved from http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=24574

United Nations. (2015). Sustainable Development Goals, Goal 3. Retrieved from http://www.un.org/sustainabledevelopment/health/

World Bank. (2003). *Turkey - Reforming the health sector for improved access and efficiency*. Washington, DC: The World Bank. Retrieved from http://documents.worldbank.org/curated/en/919651468760505354/Turkey-Reforming-the-health-sector-for-improved-access-and-efficiency

World Bank. (2013). *Turkey - Performance based contracting scheme in family medicine : design and achievements*. Washington DC. Retrieved from http://documents.worldbank.org/curated/en/880861468338993763/Turkey-Performance-based-contracting-scheme-in-family-medicine-design-and-achievements

Yardim, M. S., Cilingiroglu, N., & Yardim, N. (2014). Financial protection in health in Turkey: the effects of the Health Transformation Programme. *Health Policy and Planning*, *29*(2), 177–192. https://doi.org/10.1093/heapol/czt002

Yasar, G. Y. (2011). 'Health transformation programme' in Turkey: an assessment. *The International Journal of Health Planning and Management*, *26*(2), 110–133. https://doi.org/10.1002/hpm.1065

Yasar, G. Y., & Ugurluoglu, E. (2011). Can Turkey's general health insurance system achieve universal coverage? *The International Journal of Health Planning and Management*, *26*(3), 282–295. https://doi.org/10.1002/hpm.1079

Appendix

The surveys contain an introductory module with questions about the household, followed by age-specific modules (0-6, 7-14, and 15+). In this study, information on the health of young children comes from the module for 0-6 year old children:

- Was the child included in the newborn screening program (heel stick collection, hearing test, hip dysplasia detection)?
- Within the last 6 months, was the child taken to a health institution to seek treatment for a contagious disease (such as mumps or measles), an upper or lower respiratory tract infection, diarrhea, cardiac problems, urinary tract infection, cancer, diabetes, dermatological problems, oral or dental problems, anemia, or treatment for an injury (such as a fracture, cut, burn, insect bite, poisoning, and so on)?
- Does the child have any chronic health problems? (loss of hearing or vision, mental retardation, muscular or skeletal anomaly, difficulty in learning, delay in speech, behavioral problems, cerebral palsy, autism)
- Has the child ever been seen by a dentist?
- Within the last 12 months, was the child Taken to a Health Institution when Not Sick (THINS)? If "yes", to which health institution was the child taken? A family health center, a hospital, or a physician's private office? (Mark all that apply.)

  If "yes", which of the following were done during the visit to the health center? Measurement of height and weight; Suggestions for proper nutrition; Vaccination; Well-child check-up; Provision of supplements (vitamin D, iron); Developmental screening; Family counseling; Mental development checked; Next visit scheduled. (Mark all that apply.)

The questions on household composition and characteristics include the following:

- Age and gender of each person in the household,
- The relationship of each person to the household reference person,
- Completed education of each person (who is 6 or older) in the household: We defined four dummy variables (Less than middle school (8 years or less education); Middle school completion; High school completion; University or a higher degree)
- Employment status of each person (who is 15 or older) in the household: Employed; Not Employed (unemployed, seasonal worker, or inactive.
- Insurance coverage of each person (Public insurance (SSI); Private insurance; Green card; No insurance): We defined these variables such that public insurance and Green Card holders do not have any other type of insurance; private insurance holders may also have public insurance.
- Household income (in brackets): For some households, income is not known; for the rest, net monthly income is given in brackets (less than 350, 351-500, 501-620, 621-750, 751-900, 910-1100, 1101-1300, 1301-1700, 1701-2300, more than 2301, all in TL).

- Sources of income received in the household (labor income (wage/salary or entrepreneurial income); asset or real estate income; retirement income; and subsidy income (state assistance, child benefits, scholarships, etc.)).
- Region of residence: 12 NUTS-1 regions of the country. The Statistical Institute reveals information on region codes, but not the names of the regions.

In the data we can see the household composition (members of the household and their relationship to the head), but not the parent of a child. We define the parent of the child as follows: If the child is the son or daughter of the reference person (which is the case for most children), the parent is the mother or, if mother is not present, the parent is the father. Otherwise, the parent is the reference person or spouse of the reference person (the grandmother in most cases). For about 95-97% of children, the parent is female. For about 83-84% of the children, the mother or the father is the reference person in the household.

The following questions are asked in the module designed for the age 15+ sample:

- Unmet need for healthcare: Within the past 12 months, whether the parent has failed to satisfy healthcare needs because of problems with financial access (affordability) or physical access (difficulty of making an appointment or lack of transportation)
- Health indicators of the parent (body mass index (BMI); current smoker or not)

Appendix Table A1: Children's use of health services when not sick

		Family HC	Hospital	Private physician's office	Total
2010	**Family HC**	**42.25**	**12.62**	**6.65**	**64.51**
	Hospital	**12.62**	**21.49**	**1.48**	**38.58**
	Private office	**6.65**	**1.48**	**12.52**	**23.64**
2012	**Family HC**	**48.76**	**13.6**	**5.98**	**73.77**
	Hospital	**13.6**	**15.12**	**1.94**	**36.09**
	Private office	**5.98**	**1.94**	**9.17**	**22.52**

Notes: The percentages on the diagonals show the share of children who were taken only to that particular institution during the survey year. The percentages on the off-diagonals show the share of children who were taken to both of two institution during the year. The share of children who were taken to all three health institutions were 2.99 % in 2010 and 5.43% in 2012 (not shown, but included in the totals).
Source: Authors' calculations using data from Turkish Health Research Surveys.