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DOES HEALTH REFORM REDUCE INEQUALITIES? PRIMARY HEALTHCARE OF YOUNG CHILDREN IN TURKEY[1]

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Abstract

Health service utilization in early childhood is crucial. It is often observed that children from low-resource households lack sufficient access to health services. We investigate whether the family medicine system introduced as part of the Turkish Health Transformation Program equalized utilization of health services between young children from low- and high-resource households. Using difference-in-differences analysis, we compare the change in service utilization over time between the two groups of children, using official nationally representative microdata from the Health Research Surveys in 2008, 2010, and 2012. We study a set of measures of service utilization and alternative indicators of household resources. Moreover, we test the common trends assumption. Overall, the effect of the reform depends on the measure of utilization. Considering 'being taken to a health institution' as the measure, we find no evidence for a positive differential effect on children from low-resource households. On the other hand, considering 'being taken to a health institution when not sick', the reform benefited children from lower-resource households more than it benefited better-off children. The evidence for having newborn screening is weak. Regarding the utilization of family health centers, we find no evidence for a positive differential effect for lower-resource households.

Keywords: Access to health; inequity in health; child health; health reform; difference-in-differences; Turkey.
JEL Classifications: I10; I13; I14; C25.

1. Introduction

The early childhood development is considered to be the most important developmental phase throughout the life span as it strongly influences basic learning, school success, economic participation, social citizenry, and health (Irwin, Siddiqi, and Hertzman 2007; Almond and Currie 2011). Therefore, healthy early childhood development strongly influences well-being and economic participation in the later life (Rarani et al. 2018; Currie, Stabile, Manivong and Roos 2010). Early childhood development has strong links to social determinants of health including health systems. Case, Lubotsky, and Paxson (2002) demonstrated that the relationship between the socio-economic status (SES) and health has its origins in early childhood and expands as children age. They report a strong relationship between parental income and several salient measures of child health, including common childhood chronic health conditions, a relationship that accumulated as children age. This relationship persisted even after controlling for other measured background characteristics, including parental education. Subramaniam, Loganathan, Yerushalmi, Devadason, and Bin Majid (2018) demonstrate that although the determinants of infant mortality vary between countries there is evidence of long-run relationships among infant mortality, education, female fertility, income and access to healthcare. Early childhood development can be improved by providing access to and utilization of early childhood care (WHO 2019).

Inequalities and inequities in health are the most important issues in international health agenda nowadays as all the partners of United Nations are committed to meeting Sustainable Development Goals (SDGs) aimed to ensure the health and well-being of all population (WHO 2018; WHO 2020; UN 2019). Utilization of child health services has been reported to play a significant role towards reducing inequalities and achieving the SDGs of the reduction of child mortality and achieving universal health coverage (WHO and UNICEF 2018). Infant and under-five mortality rates are strongly related with and reflect the effect of socioeconomic conditions on the health of mothers and newborn (Wang 2014; Rashad and Sharaf 2018; Shehzad 2006), and weaknesses of health system such as poor access, low level of utilization, and inefficiency (Ibrahim, Daneshvar, Hocaoğlu, and Olasehinde-Williams 2019). Despite excellent progress on global health since Alma-Ata Declaration, the unfinished agenda of preventable child and maternal mortality remains (WHO 2018).

Reducing child mortality rate is a top priority in Turkey for more than a half century (Atıcı and Erer 2009). There have been significant improvements in the reduction of infant mortality rates in the past 25 years. Under-five mortality rate fell sharply from 61 per 1000 live births in 1993 to 11 in 2018 (infant from 60 to 9) (Dilli 2016; The MoH of Turkey 2019a). Turkey is among the few successful middle-income countries that have significantly reduced the under-five mortality rate below the Millennium Development Goals 2015 target levels (Aran, Aktakke, Gurol-Urgancı, and Atun 2015). Yet, Turkey still lags behind OECD and EU countries (OECD 2019). Therefore, the Turkish Health Transformation Program (HTP) especially focuses on improving primary care and child health. Protecting and improving child health and establishing the family medicine system are listed as the main goals of HTP (The MoH of Turkey 2014 and 2019b). However, a recent research claims that the process and structure of primary care in Turkey are not as strong as in most of the European countries due to lack of manpower in primary care, high number of patients per family physician, lack of procedures supporting team and multidisciplinary work (Akman 2014). Moreover, the socioeconomic status of the parent still matters for utilization of child care services in Turkey (Caner, Karaoğlan, and Yaşar 2018).

The General Health Insurance (GHI) system in Turkey (introduced with the HTP) provides near universal coverage (98.4% in 2015) of healthcare costs for a core set of services, in many cases with cost sharing, which usually includes consultations with doctors and specialists, tests and examinations, and surgical and therapeutic procedures. A recent research and a recent report show that a large proportion of population still lacks GHI despite the overarching aim of universal coverage (Erus, Yakut-Cakar, Cali, and Adaman 2015; Turkish Court of Accounts 2018). In response, the government announced in 2017 a new regulation, which covered all the people who were out of GHI in return for a premium payment of 3% of gross minimum wage (around 12 Euros per month), allowing for the application to Green Card (a program that caters low-income households who do not have other health insurance) if needed.

A study that assesses the evolution of outpatient visits and inpatient admissions by age and sex for 195 countries from 1990 to 2016 shows that Turkey is one of the countries with a substantial increase in utilisation rates along with China and Indonesia (Moses et al. 2019). The number of doctor consultations per person per year has increased substantially after HTP, from 3.1 consultations per year in 2002 to 9.5 in 2018, of which only one-third are to family physicians (FPs) for primary health care (The MoH of Turkey 2019a). The low level of FPs' consultation mostly resulted from the non gate-keeping policy in place in primary care, and competition among both public and private hospitals to attract patients, as public hospitals also have some financial authonomy.

This study contributes to the literature by asking a new question: Has the Turkish HTP equalized utilization of health services between children from low-resource households and those from high-resource households? The main finding is that the impact of health reforms on equalization of utilization has been limited.

2. Data and Descriptive Statistics

We will use Turkish Health Research Survey (THRS) data set, prepared by the Turkish Statistical Institute (TurkStat). In this paper, we will utilize 2008, 2010 and 2012 rounds of the survey. These years are chosen to compare utilization before 2010 to after 2010 so that we can examine the impact of family medicine program on utilization of healthcare services by young children, since the program became accessible in all the provinces of Turkey in 2010.

We give the definitions of the variables that we use in this research in the Appendix. We first control whether the definitions of variables are consistent or not across the survey years that we examine. We also compare the descriptive statistics with administrative sources. For instance, we compare insurance ownership rates with national statistics. Samples include 2,025 children in ages 0-5 in 2008, 1,955 in 2010, and 3,408 in 2012.

Descriptive statistics are presented in Tables 1 and 2. Table 1 shows that the samples before and after 2010 are comparable in children's and parents' characteristics. Parents who have primary school degree or less are the majority, despite an improvement over time in the average educational attainment. We observe that average household income has increased over time. Regarding the average number of children per household, we observe a significant decline between 2008 and 2012. In contrast, we do not observe significant change in children's average age and the occurrence of chronic illnesses. The effect of the reform is visible in statistics: The prevalence of having financial access has decreased over time. Similarly, we observe a significant rise in public insurance ownership, as well as private insurance ownership. Last, as a result of the reform, descriptive statistics show that there is a significant decline in both green card ownership and having no insurance.

Health service utilization rates are presented in Table 2. Descriptive statistics show that there is a significant increase in the proportion of children who were taken to a health institution (THI). However, in contrast to our expectations, we did not observe a considerable change in the proportion of children who are taken to a health institution when not sick (THINS) (see the Appendix for variable definitions). The participation rate for the Newborn Screening Program increased substantially. The utilization rate of Family Health Centers (FHCs) also increased.

Utilization rates are on average higher for children living in households where the parent is a university graduate (compared to those with lower education), has high income (compared to lower income), or where there are two or fewer children (compared to three or more children). The exception is the utilization of FHCs, as the descriptive statistics show that the prevalence of taken to a FHC increases with low parental education and income. The statistics also suggest that as the number of children increases in the household, then the likelihood of being taken to a FHC also rises.

Table 1: Descriptive statistics on the characteristics of young children and parents

	2008	2012	Change*
Household Resources per Child			
% Children by Parental Education			
Elementary education or less	72.1	58.1	Decrease
Secondary Education (Middle School)	7.3	13.1	Increase
Secondary Education (High School)	14.1	17.4	Increase
Tertiary Education+	6.5	11.3	Increase
% Children in Income Groups			
Not revealed	60.5	60.2	
Lower Income Brackets	38.3	35.6	Decrease
Highest Income Bracket	1.2	4.2	Increase
Average Number of Children (less than 14 years old)	2.4	2.2	Decrease
Other variables:			
Average age in the young children sample	2.7	2.8	
% Children with a Chronic Illness	5.1	6.0	
% Female Children	48.4	49.3	Increase
Parent's Age (mean)	34.0	35.6	Increase
Parent's Insurance Type			
Public	66.5	78.2	Increase
Private	0.4	0.9	Increase
Green Card	21.7	16.1	Decrease
No Coverage	11.4	5.0	Decrease
% of Children based on the parent's access problems			
Access problems related to financial issues	14.9	5.3	Decrease
Access problems related to physical issues	1.7	1.5	

Notes: We present weighted statistics in Table 1. It is important to note that in numerous questions of the survey the respondent can choose all that fits (such as the questions regrading insurance ownership)

* Based on a test of null hypothesis of no change between 2008 and 2012 (or no change between 2010 and 2012 if 2008 data are not available). The p-values are calculated and the direction of change is shown if p-value is less than 0.05.

Source: Authors' calculations using data set that comes from the THRS.

Table 2: Descriptive statistics on the usage of healthcare services by young children (%)

	THI		THINS		Newborn Screening Program		Family Health Center (FHC)	
	2008	**2012**	**2008**	**2012**	**2008**	**2012**	**2010**	**2012**
All Children	59.7	71.6	33.3	33.7	17.8	74.8	64.5	73.7
Household Resources per Child								
Parental Education								
Elementary education or less	56.7	66.6	32.6	28.7	15.8	70.8	75.3	78.3
Secondary Education (Middle School)	63.1	76.1	40.0	40.2	17.1	76.1	65.9	78.1
Secondary Education (High School)	69.0	78.0	41.8	48.4	24.3	78.9	56.2	71.2
Tertiary Education+	68.6	82.5	44.8	57.2	27.0	87.4	45.8	61.5
Household Income								
Not revealed	61.1	74.3	36.2	39.8	18.9	77.1	65.5	73.4
Lower Income Brackets	56.9	65.7	33.4	29.6	15.9	69.5	69.5	75.6
Highest Income Bracket	82.2	83.5	45.7	57.1	23.6	87.2	24.7	68.3
Number of Children (less than 14 years old)								
<= Median	63.9	75.7	39.7	42.6	22.3	78.1	63.5	72.5
> Median	50.8	61.8	25.9	22.8	8.2	66.9	68.1	79.3
Observations	2,025	3,408	2,025	3,408	2,025	3,408	627	1,265

Notes: We present weighted statistics in Table 2. In the table, THI refers to "Taken to a Health Institution" and THINS refers to "Taken to a Health Institution when Not Sick". If the respondent answers "yes" to THINS, then the respondent is asked the type of health institution that the child was taken. The answers of this question are listed can be as follows: Family health center (FHC), Hospital, Physician's private office. The respondent can choose all that fits.

Source: Authors' calculations using data set that comes from the THRS.

3. Method

In this paper, the theoretical framework relies on Goddard and Smith (2001), such that we collect the concepts of need, access and utilization in our empirical model. Health reforms aim to reach 'equal access for equal need', which is the basis of equity in health care. Hence, we expect that young children's utilization of healthcare services should be independent of the parent's socio-economic status (SES) (or to be more specific, the amount of resources that the household can allocate each child), owing to health reforms. Defining SES is a challenging task. Household income is a commonly used indicator in the literature (for example, Sözmen and Ünal 2016; Wolfe 2015), but there are several concerns about it: It is difficult to measure precisely in surveys; it is difficult to know how income is shared within a household; and current income may be a weak indicator of lifetime income and thereby a weak indicator of access to resources in the longer term. Parental education may be a better indicator, since the level of educational attainment usually stays constant during adulthood (unlike income that varies), and it shapes the parent's labor market experience as well as social network and access to information. Education is also much easier to measure in surveys than income. As another indicator of SES, we consider the number of children (who are 14 years old or less) in the household, since it is directly related to the amount of time and financial resources that can be allocated to a child. We have chosen not to consider the parent's insurance status as an indicator of SES, because the very purpose of the introduction of the GHI in 2008 was to achieve universal health coverage, regardless of the financial resources of households. Coverage indeed expanded as the share of those with no insurance declined to 5% in 2012 (Table 1). Private insurance ownership would indicate household resources; however, it is rare in Turkey (less than 1%).)

Descriptive statistics in the previous section indicated an increase in utilization of healthcare services by young children. However, the important question here is whether the expansionary policy had a greater impact on children living in households with lower resources compared to those living in households with higher resources. In other words, we aim to assess the differential effect of the expansion of the family medicine system on children with different resources. We implement a difference-in-differences (DID) analysis separately for each healthcare services, namely THI, THINS, newborn screening program and FHC. The time dimension in the DID setting is determined by the gradual expansion of the family medicine system across the provinces of Turkey. Since the system became accessible in all provinces of the country by the end of 2010, we call 2008 (2010 in the analysis of FHC use) as the pre-treatment

period and 2012 as the post-treatment period. Hence, we compare data in the years that are closest to 2010 (i.e., right before and right after full access). We estimate the following equation:

$$U_{iek} = \alpha + \gamma\, T_i + \psi\, Low_i + \beta\, (Low_i * T_i) + \epsilon_{iek} \quad (1)$$

where U_{iek} is the binary variable that indicates whether child *i* in a household with resources *e* (where *e* is either high or low) uses the healthcare services in year *k* (before or after the reform), Low_i is a dummy variable which is 1 if the child is from a low-resource household and 0 otherwise. Depending on the resource indicator used, Low_i is 1 for children in household whose income is lower than the top-income bracket, in households at or below minimum-wage income (used as a robustness check against income brackets), with parents who have at most a primary school degree, or in a household with more than the median number of children (>2). T_i equals 1 if the child is observed in 2012 (post-reform) and 0 if observed in 2008 or 2010 (pre-reform). The interaction term $Low_i * T_i$ helps us measure the effect of the treatment on children from low-resource households relative to high-resource households. We are mainly interested in the estimate of β, which shows the treatment effect on the treated.

One major assumption behind DID analysis is the common trends assumption (i.e., that treatment and control groups have the same trend in utilization rates before the reform). This assumption was tested (using the "didq" command in Stata). The null hypothesis of the test states that common dynamics existed in the low- and high-resource children before the FMCs became nationally available. The test was performed on THI, THINS, and newborn screening regressions (but not on FHC, since it includes only two time periods). The DID analysis relies on a short time period. Therefore, to be cautious and conservative, we run DID regressions both with common trends and with heterogenous (separate) trends. In the latter, we follow Green, Heywood, and Navarro (2014) and control for the time trend (survey year) and its interaction with the treatment dummy, as shown in equation (2).

$$U_{iek} = \alpha + \gamma\, T_i + \psi\, Low_i + \beta\, (Low_i * T_i) + \phi\, Time\ Trend + \delta\, Time\ Trend * Low_i + \epsilon_{iek} \quad (2)$$

4. Results

As the reform eased access to health services, children from low-resource families should be the ones to benefit the most from the reform. The reform is expected to affect children from high-resource households less, since they most probably receive proper healthcare both before and after the reform.

Table 3 provides the p-values for the common trends test. In the regressions with THI as the dependent variable, the null hypothesis of common trends cannot be rejected. In the regressions with THINS, the null hypothesis is rejected. In the regressions with newborn screening, we reject the null hypothesis (at 5% significance) for household income or education as the resource indicator, but not for the number of children.

Table 3. Testing Common Trends Assumption (p-values)

Resource indicator: Healthcare Service (U_i)	Household Income	Education	Number of Children in the Household
THI	0.394	0.617	0.686
THINS	0.025	0.000	0.040
Newborn Screening Program	0.043	0.000	0.121

Source: Authors' calculations using data set that comes from the THRS.

Table 4. DID Estimation Results

Panel A.

	THI (Common trends)				THINS (Separate trends)			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	Income brackets	Minimum wage	Parental education	Number of children	Income brackets	Minimum wage	Parental education	Number of children
T_i	-0.0414	0.203	0.267***	0.321***	-0.362	0.457	-0.423**	0.165
	(0.398)	(0.151)	(0.100)	(0.0695)	(0.716)	(0.311)	(0.207)	(0.148)
Low_i	-1.146***	-0.572***	-0.577***	-0.550***	0.500	-0.112	0.360	-0.321
	(0.327)	(0.126)	(0.0852)	(0.0776)	(0.879)	(0.398)	(0.252)	(0.257)
$Low_i * T_i$	0.168	-0.136	-0.0385	-0.105	1.425*	0.782*	1.090***	0.339
	(0.408)	(0.185)	(0.121)	(0.118)	(0.748)	(0.422)	(0.266)	(0.294)
Time Trend					0.411	-0.240	0.337***	-0.0215
					(0.493)	(0.193)	(0.129)	(0.0892)
Time Trend*Low_i					-1.027**	-0.473*	-0.763***	-0.314*
					(0.509)	(0.253)	(0.160)	(0.170)

Panel B.

	Newborn Screening				Family Health Center			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	Income brackets (Separate Trends)	Minimum wage (Separate Trends)	Parental education (Separate Trends)	Number of children (Common Trends)	Income brackets	Minimum wage	Parental education	Number of children
T_i	-1.611*	-1.042***	-1.326***	1.645***	1.886***	0.912***	0.686***	0.414***
	(0.849)	(0.336)	(0.227)	(0.0692)	(0.450)	(0.255)	(0.151)	(0.126)
Low_i	0.244	-0.987**	-0.0365	-0.735***	1.903***	0.906***	0.957***	0.203
	(1.042)	(0.472)	(0.290)	(0.0821)	(0.419)	(0.326)	(0.190)	(0.236)
$Low_i * T_i$	0.883	0.257	0.803***	0.168	-1.521***	-0.692*	-0.513**	0.173
	(0.874)	(0.420)	(0.276)	(0.122)	(0.503)	(0.407)	(0.236)	(0.297)
Time Trend	2.352***	1.686***	1.971***					
	(0.582)	(0.214)	(0.142)					
Time Trend*Low_i	-0.744	0.0644	-0.429**					
	(0.597)	(0.275)	(0.175)					

Source: Authors' calculations using data set that comes from the THRS.

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4 presents DID estimation results for different household resource indicators. Depending on the results of the test in Table 3, either the specification in equation (1) (common trends) or the specification in equation (2) (separate trends) is presented. The results that are not presented confirm those in the table and are available upon request. When household income is used as the resource indicator, households that do not report income are excluded. (In the pooled data set, their share is 59.35%.)

In Panel A, the estimates from THI regressions show that utilization was lower in the lower-resource group; moreover, the reform did not close the gap between children from lower-resource and higher-resource households, regardless of the resource indicator used. In contrast, the estimates from THINS regressions show that the reform benefited children in the low-resource group more and utilization in this group is higher after the reform, compared to the high-resource group (except in column (8)).

In Panel B, the estimates from the Newborn Screening regressions show that utilization in the low-resource group is not different from the high-resource group after the reform, except when parental education is used as the resource indicator (i.e., children whose parents have low education increased participation more than the children of better educated parents). The coefficient estimates of the interaction term $Low_i * T_i$ are positive, but they have low statistical significance. The estimates from the FHC regressions, where we cannot test the common trends assumption, show that utilization in the low-resource group is lower than that in the high-resource group after the reform. (The only exception is a small positive coefficient estimate when the number of children is the resource indicator.) Surprisingly, we find no evidence for a positive differential effect of the reform on children from lower-resource households in using FHCs.

5. Discussion and Conclusions

This paper examines whether the HTP, a supply-side reform that emphasized expanding the family medicine system, had a greater impact on children from lower-resource households compared to those from higher-resource households. Because the reform aimed to facilitate access to health services, children from low-resource families should be the ones to benefit the most from improved access. Utilization rates before and after the family medicine system are compared using a difference-in-differences (DID) approach. Four definitions of healthcare service utilization are considered: “THINS”, referred as taken to health institution when not sick, “THI”, referred as taken to health

institution for any reason (defined more comprehensively to include all types of health service use, to seek treatment for any health problem or for check-up), participating in newborn screening, and being taken to family health center (FHC).

Results depend on the definition of service utilization. The reform increased the likelihood of being THINS (for check-ups) in the low-resource households more than in the high-resource group, in most regressions. However, using THINS, utilization in the low-resource group did not increase more than the high-resource group. Such a result is somewhat to be expected, since most treatments are costly (payments may be required for tests and medications) even for general health insurance owners; hence children from low-resource households are still at a disadvantage.

The reform had no differential effect in the participation of low-resource households in the newborn screening program. In addition, and surprisingly, the likelihood of being taken to a FHC is lower in the low-resource group than in the high-resource group after the reform. The reasons may be the lack of information about the family medicine system or about the importance of the newborn screening program. Lack of family physicians and nurses in some cities or regions may be another explanation (Menon, Nguyen, Arur, Yener, and Postolovska 2014). For example, although, population density is very high in East Marmara, population per actively working FHC was 3.212 in 2018. On the other hand, in the Northeast Anatolia, where population density is very low, population per actively working FHC was 2.984 at the same time. Moreover, despite improvements in access and utilization, and near universal health coverage with the introduction of GHI system, there still exists (at least to some extent) inadequate and unequal distribution of health services, health personnel, and infrastructure in Turkey (The MoH of Turkey 2019a).

Another reason might be the economic crisis in 2008. Despite intentions to maintain the health budget, the slowdown in health spending experienced in many OECD countries, including Turkey, affected all parts of the health sector (OECD 2019). The share of total health expenditures in GDP decreased from 5.8% (in 2008 and 2009) to 5.3%, 4.9%, and 4.3% during 2010-2012 respectively in Turkey (The MoH of Turkey 2019a).

In the overall, the results indicate less benefit of the reform to children from low-resource households. Policy recommendations include regular examination of the possible negative impacts of user fees and other cost sharing arrangements in the GHI system, and, where necessary, introduction of exemptions. Measures should be taken to ensure sufficient and equally distributed manpower in primary care, especially in the family medicine system.

Appendix

We obtain the data for young children's utilization of health services from the 0-6 ages module of the survey. The following questions were asked in that module are as follows:

- Whether the child participate in the newborn screening program, which includes certain tests such as heel stick collection, hearing test, hip dysplasia detection.

- Whether the child has any chronic health problems such as loss of hearing or vision, mental retardation, etc…

- Whether the child Taken to a Health Institution when Not Sick (THINS) in the last 12 months?

- If the respondent's answer is "yes", to the previous question, then the respondent is asked the type of health institution where the child was taken. The answers to this question are as follows: Family Health Center (FHC), hospital, or physician's private office. The respondent can mark all that fit.

- Within the last 6 months, did the child seek treatment for any of the following? 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)? The binary variable Taken to a Health Institution (THI) is equal to 1 if any of the above or THINS is equal to 1; otherwise THI is zero.

The survey collects information about age and gender of each person in the household; his/her relationship to the household head (namely, the reference person); education level (elementary education or less (5 years or less), secondary education (middle school and high school) and tertiary education); type of insurance (public; private; green card; no coverage). Other questions include household income (some households did not declare income; for the rest of the households net monthly income is given in different ranges (<350, 351-500, 501-620, 621-750, 751-900, 910-1100, 1101-1300, 1301-1700, 1701-2300, >2301, all in TL) and whether the parent has financial or physical access problems in reaching the healthcare services.

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