CAN REFUGEES IMPROVE NATIVE CHILDREN'S HEALTH?: EVIDENCE FROM TURKEY

Cansu Oymak and Jean-François Maystadt

LIDAM Discussion Paper IRES
2023 / 17

UCLouvain

LIDAM
IRES | Louvain Institute of Data Analysis and Modeling in economics and statistics

Can refugees improve native children's health?: Evidence from Turkey

Cansu Oymak* Jean-François Maystadt†

September 12, 2023

Abstract

Following the most dramatic migration episode of the 21^{st} century, Turkey hosted the largest number of Syrian refugees in the world. This paper assesses the impact of the arrival of Syrian refugees on the Turkish children's health, with a focus on height – a standard nutritional outcome. Accounting for the endogenous choice of immigrant location, our results show that Turkish children residing in provinces with a large share of refugees exhibit a significant improvement in their height as compared to those living in provinces with less refugees. Against other potential channels, a refugee-induced increase in maternal unemployment and the associated increase in maternal care seem to explain the observed positive effect on children's health.

Keywords: refugees, child health, anthropometric measures, labor market outcomes
JEL-Classification: O15, I15

*Lancaster University, Economics Department, United Kingdom.
†IRES/LIDAM, UCLouvain; FNRS - Fonds de la Recherche Scientifique, Belgium; Lancaster University, Economics Department, UK.

1 Introduction

Civil wars and natural disasters constitute immediate sources of forced migration, leading millions of people to leave their home country. The total number of refugees who have been displaced from their country of birth reached almost 89.3 million at the end of 2021, half of whom are reported to be children (United Nations High Commissioner for Refugees, 2021). Unprecedented immigration waves such as those ignited by the Syrian civil war can affect the well-being of local inhabitants through various channels, including their health conditions. On the one hand, the threats include disease transmission due to refugee mobility, depletion of natural resources, reduced per capita availability of healthcare facilities and healthcare professionals, and environmental degradation (Maystadt et al., 2019). Particularly, in the case of children, the combined impact of such factors is likely to induce a deterioration in health outcomes during early stages of life. On the other hand, the refugee inflow may boost the welfare of the host population and accelerate local economies through increased demand, the flow of financial/humanitarian aid from intergovernmental organizations, and infrastructural improvements (Aygün et al., 2021; Erten et al., 2022). Delving into whether the benefits outweigh the costs is ultimately an empirical question, as these channels work in unique directions and the magnitude of their effects is largely unknown.

We aim to explore the effect of Syrian refugee inflow on Turkish native children's anthropometrics, focusing on the z-score of height-for-age (HAZ), using 2008, 2013, and 2018 rounds of the Turkish Demographic and Health Survey (TDHS). Using an Instrumental Variable approach, we show that the Turkish children residing in provinces with large refugee share improve their HAZ: the estimated quasi-elasticity ranges between 0.02 and 0.03 (in terms of z-score standard deviations. The positive effect persists even after a series of robustness and sensitivity checks. Placebo checks confirm the causal interpretation to be given to our results. The observed positive impact contrasts with previous findings in the related literature. For example, Baez (2011) and Dagnelie et al. (2023) report an adverse effect of the immigration shock on the native children's anthropometrics in Tanzania and in 29 African countries, respectively. This contradiction is fairly puzzling. We therefore examine several alternative channels to elucidate the observed positive effect.

The hypothesised mechanisms consist of changes in the supply of healthcare resources, mother's labor market outcomes, income, time allocation, quality-quantity trade-off, and investment in children's human capital through vaccination. The labor market and associated mothers' time for child care channels are found to be the most plausible explanation. We show that Turkish mothers residing in provinces with a large refugee share are less likely to be in the labor force at the time of survey. Similar to Tumen (2018), we find that refugees reduce the odds of low-educated Turkish mothers' being in the labour market. That is explained by strong labor substitution since refugees are *-on average-* low-skilled and are willing to take low-pay jobs. Paradoxically, improvement in anthropometric indicators are concentrated in households where low-educated mothers seem to have been replaced with Syrian immigrants in the labor place. Such a mechanism may seem surprising. However, it has been documented in other contexts that maternal unemployment *–in particular among low-skilled mothers-* may boost the quality of maternal time to be spent with their offspring and have positive repercussions on their children's health (Mosca et al., 2017; Danzer and Lavy, 2018; Anderson et al., 2019). For instance, maternal unemployment can result in more frequent utilization of healthcare resources, better maternal supervision through provision of rich-nutrition diets or through longer duration or exclusivity of breastfeeding, each of which can positively contribute to the children's physical growth. Altogether, we attribute the positive health effect of refugee inflow to the migration-induced maternal unemployment among the least skilled mothers.

Our contribution is twofold. First, we provide evidence of the health effects of the largest migration movement of the 21^{st} century. The existing evidence mainly focuses on refugee camps in Africa (Baez, 2011; Dagnelie et al., 2023). In the Middle East, most refugees are dispersed in their hosting countries (UNHCR, 2022). It is unclear how such a dispersion matters. On the one hand, the dispersion of refugees may reduce the risk of disease transmission and potential competition in accessing resources such as clean water, sanitation, or basic health services (Maystadt et al., 2019; Clemens and Ginn, 2020). On the other hand, the concentration of refugees in camps may facilitate the provision of basic health services and facilitate the control of communicable diseases. In Turkey, two papers touch upon the health consequences of hosting refugees. Aygün et al. (2021) investigate the impact of refugees on healthcare system and mortality outcomes (i.e., infant, child, and elderly mortality). Their results suggest that Syrian refugees placed a considerable burden on healthcare system, despite the central government's investments in the physical and human capital indicators of healthcare resources in response to refugee shock. However, their estimates report no evidence of an impact on the Turkish natives' mortality outcomes. Erten et al. (2022), in turn, mainly concentrate on the native children's vaccination outcomes in addition to the prevalence of infectious/non-infectious diseases among native children. Their benchmark results document a drastic reduction in the probability of being fully immunized against Hepatitis B, tuberculosis, and measles. They attribute their findings to the refugee-induced supply constraints in the healthcare resources. Although we will discuss potential effects on the supply of healthcare services and mortality, our paper focuses on children's anthropometric, height-for-age (HAZ) z-score, a standard outcome in health economics.[1] Improved early-life health outcomes and sufficient nutrition intake are key to explain later-life outcomes such as better cognitive abilities, higher wages in the labor markets, and reduced health risks (Case and Paxson, 2010; Currie and Vogl, 2013). A change in mortality and health care resources is difficult to interpret without knowing the impact on children's nutritional status, and inversely. Our paper also sheds light on the mechanisms that drive possible health impacts of refugees. Existing studies emphasize the transmission of diseases such as Malaria in Africa (Dagnelie et al., 2023), or other vaccine-preventable diseases (e.g., chickenpox and tuberculosis) and sexually transmitted diseases (e.g., syphilis) in Latin America (Ibáñez et al., 2021), and/or overburdened healthcare resources (Tatah et al., 2016; Aygün et al., 2021; Erten et al., 2022). Against these channels, we highlight the role of another mechanism through which immigration can affect health outcomes: the labor market channel and the associated mother's time allocation.

The remainder of this paper is structured as follows. Section 2 provides information on the arrival of Syrian refugees in Turkey and their integration into the Turkish healthcare system. Section 3 provides a description of the data. Section 4 elaborates on the identification strategy. Empirical results are presented in Section 5 while potential mechanisms are explored in Section 6. Finally, the last section discusses the findings and the need for extended child care in Turkey.

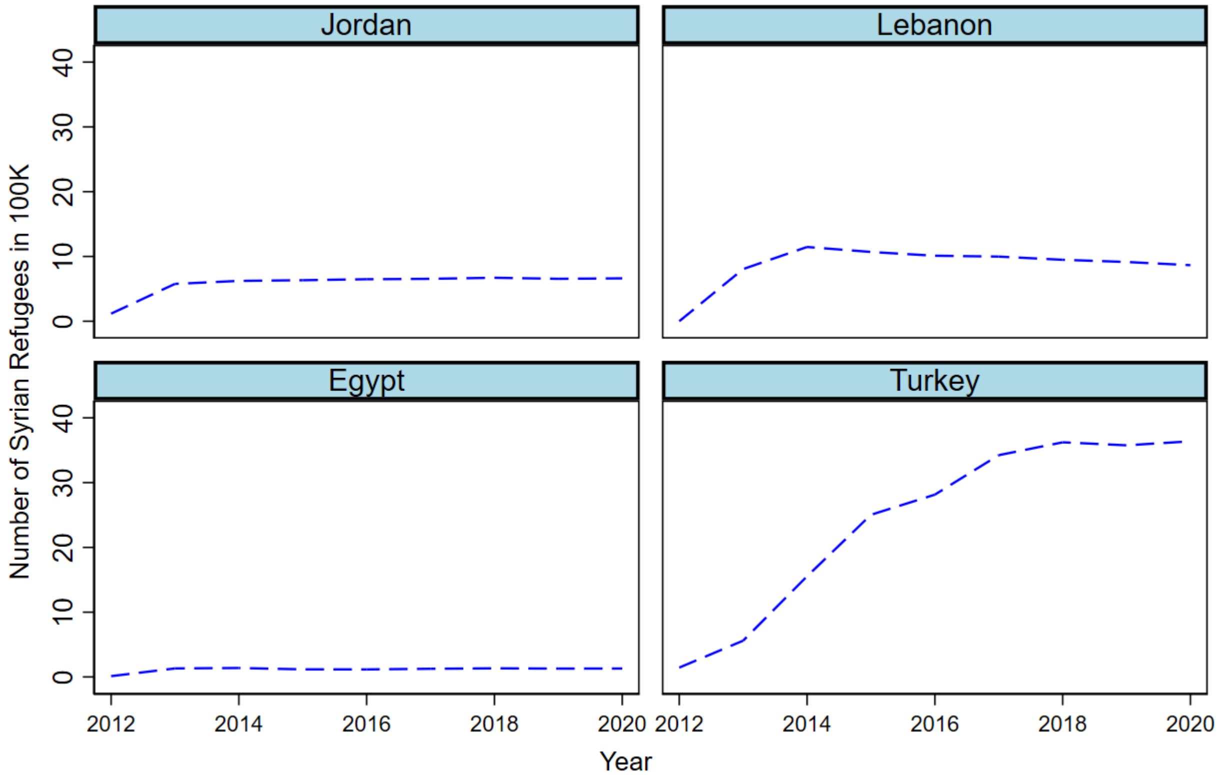
[1] There is a long tradition in economics to utilize anthropometric data as an ultimate measure of children's health status (Alderman et al., 2006; Bundervoet, 2009; Akresh et al., 2011)

2 Background

2.1 Syrian refugees

The Syrian civil war sparked in March 2011, resulting in a forced displacement of 7.5 million Syrian individuals. Due to geographical proximity and the open door policy of the Turkish government, Turkey has become the main choice of destination for Syrians (Ferris and Kirisci, 2016). The open-door policy is of paramount importance, as it eliminates any attempt to enter the country illegally. In the early wave of the refugee influx, Syrian refugees, under temporary protection, were placed in refugee camps. Although the Turkish government has established 26 refugee camps in 10 provinces that provided housing to more than 270,000 Syrians by the end of 2013 (Benner et al., 2015), the uninterrupted nature of refugee inflow put a heavy burden on the capacity of camps in 2014. The number of refugees reached 2.5 million in 2015, and 3.5 million in 2018 (Erdoğan, 2014; Akbulut-Yuksel et al., 2022). The massive increase resulted in the spread of refugees in 81 provinces of Turkey. As of 2019, the share of refugees residing in camps was 2.4%. In 2019, Istanbul, the most populous province in Turkey, hosted the largest number of refugees, amounting to 548,000 individuals. Istanbul was followed by provinces close to the Syrian border (e.g., 443,000 in Gaziantep and 431,000 in Sanliurfa, and 430,000 in Hatay) (Ministry of Interior, 2022). Unlike other countries that have a border with Syria (e.g., Jordan and Lebanon), Turkey has experienced a significant increase in the number of refugees overtime. Figure 1 depicts time series pattern of the number of officially registered Syrian refugees in Jordan, Lebanon, Egypt, and Turkey. It is obvious from Figure 1 that Turkey continues to host the largest number of immigrant populations among the other host countries.

Figure 1: Total Number of Refugees (in 100K) by Country



Notes: The data on the registered number of refugees comes from the UNHCR.

2.2 Syrian Refugees in Turkish Health System

Refugees came to Turkey in need of healthcare. In addition to forced displacement, property damages, and economic destruction, the civil conflict in Syria resulted in a dramatic deterioration of healthcare services. Kherallah et al. (2012) report that both civilians and healthcare professionals have experienced severe physical injuries and mental health deteriorations including post-traumatic stress disorder. Furthermore, the war prevented healthcare facilities from operating effectively. According to WHO (2012), in the second year of the war, almost 40% of the hospitals were out of service and nearly 65% of the healthcare providers left their home country. Thereby, victims that were in urgent need of medical intervention were barely treated. WHO (2012) also state that the war left Syrians in an insanitary environment due to limited access to medical services, food, and drinking water. Resource constraints and unhygienic living conditions are known to increase the risk of epidemic diseases. WHO (2012) therefore warms that Syrians constitute a significant threat to the public health of host communities when considering the risk of spreading epidemic diseases such as measles and tuberculosis. The prevalence of measles, tuberculosis, and malaria have been reported to increase among countries providing temporary protection to Syrian refugees (WHO, 2012). For the Turkish case, the number of chickenpox, measles, tuberculosis, and Hepatitis A cases increased both inside and outside of the camps. However, the incidence rate of these diseases among Syrian immigrants was found to be considerably larger as compared to the Turkish natives (Leblebicioglu, 2016; Ekmekci, 2017).

The Turkish government has adopted an ambitious response to the provision of healthcare services to forcibly displaced Syrian people who were in immediate need of medical treatment (Aygün et al., 2021). According to the existing policy, Syrians can benefit from any type of healthcare facility (e.g., preventive healthcare facilities, emergency departments, first-, second-, and third-step healthcare centers) in their province of registration with full coverage of medical and treatment costs. Syrian immigrants under temporary protections are recognized as the beneficiaries of universal health coverage just as the Turkish native population. In addition, the Turkish government began to set up Health Centers for Refugees (HCR) in 2017. In the 29 provinces of Turkey, the government recruited native Syrian healthcare professionals (i.e., more than 700 doctors and 900 nurses) and bilingual healthcare professionals (Aygün et al., 2021; Commission, 2006). Nevertheless, the majority of HCRs were established after the implementation of the Supporting Immigrant Health Services Project (SIHSP), which was fully funded by the European Union (EU). Prior to the SIHSP, the number of HCRs located in provinces with a larger share of immigrants was limited to six.

Risks of health congestion were reported. For example, Savas et al. (2016) conducted a survey to investigate the effect of Syrian individuals on the workload of healthcare professionals in one of the provinces with a large share of refugees, Hatay. Their results indicate that waiting time at hospitals and healthcare providers' hours worked significantly increased because of the Syrian patients. This study also highlights two crucial issues. First, intensive care units became insufficient in capacity, again due to Syrian patients. Second, the prevalence of infectious diseases, hospitalization rates, and intensive care receipts are found to be much higher among Syrian patients compared to Turkish patients. Nevertheless, Aygün et al. (2021) take this survey-design study one step further by combining several administrative data sources. They provide suggestive evidence indicating that adult intensive care beds decline in per-capita terms. Similarly, WHO (2019) reports that almost 40% of patients in hospitals in (Turkish) provinces that have a border with Syria are Syrian individuals. Therefore, provinces with higher refugee shares are more likely to encounter capacity problems and the native population should be at higher risk of having infectious diseases. The breadth of the European Union (EU) financial assistance was nonetheless not negligible when considering the scope of the EU Facility for Refugees in Turkey (FRIT). The FRIT aims to ensure the socioeconomic well-being of Turkish natives as well as Syrian refugees. Knowing whether increased household income induced by external financial aid can compensate for potential negative effects on children's nutrition remains an empirical question.

3 Data and Descriptive statistics

This paper combines two types of data for the empirical analysis: (1) individual level data on the Turkish native children's health outcomes as measured by anthropometric information, (2) 81-province level data on the Syrian refugee inflows as well as other province-level information such as the number of physical capacity indicators of healthcare (i.e., number of hospital beds and number of hospitals), public expenditure, GDP per capita, and a terrorism index as a measure for local violence intensity.

3.1 Data on Children's Anthropometric Indicators

The primary source of data is the 2008, 2013, and 2018 waves of the Turkish Demographic and Health Survey (TDHS), each of which is a nationally representative cross-sectional survey. The TDHS provides comprehensive information on women of reproductive age (15-49) who gave birth in the five years preceding the survey year, and their offsprings. Collected information includes, but is not limited to, household characteristics (e.g., information on household head and wealth index), demographics of mothers and their children (e.g., sex, age, birth year/month, and education), mothers' marriage history (e.g., marital status and age at first marriage), fertility outcomes (e.g., current fertility, children ever born and living, and age at first birth), and utilization of healthcare services (e.g., antenatal/postnatal care visits, vaccination) and child health and nutrition (e.g., height and weight).

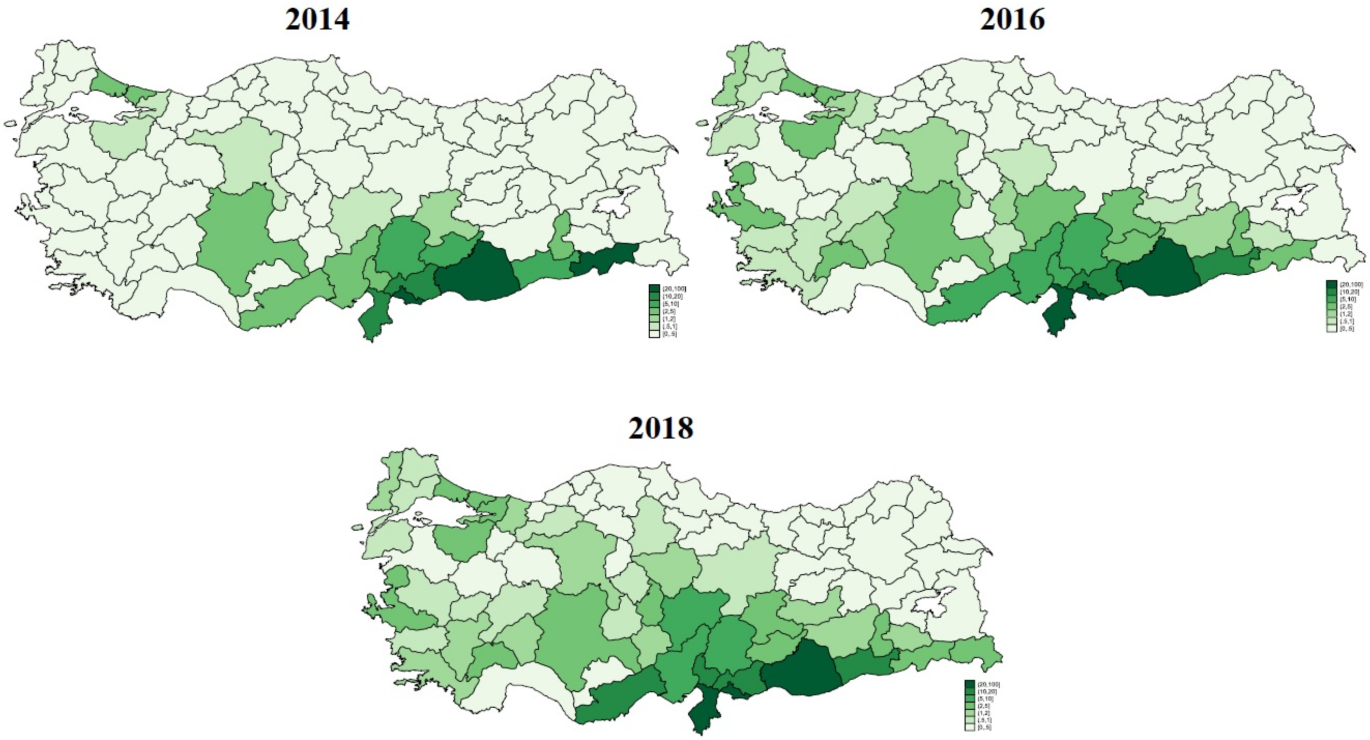
A vital dimension of early childhood welfare, proximate predictor of human capital formation, is investigated in our paper: nutrition. According to international standards (WHO, 2006), height-for-age z scores (HAZ) can be calculated for 5,892 children, due to either rejection of height measurement and the absence of the child (ren) at the time of the survey. However, our operating sample consists of 5,341 children under the age of five, as we exclude those who born in year 2012. The reason why we exclude the year 2012 from our empirical analyses is the lack of refugee data (see Section 3.2). It is also of great importance to indicate that anthropometric information is only available for the last-born children, who are below the age of 5. The HAZ, given sex, is a widely used indicator of child health in the long term. A low HAZ reflects the cumulative impacts of chronic malnutrition, stunting, and infections before and after birth. Being stunted, more prominent under five years of age, is considered to originate from food intake at sub-sufficient levels over a prolonged period, vitamin and/or protein deficiencies, co-existence of multiple diseases, and the poor health status of mothers during gestation. Table 1 shows the descriptive statistics on the Turkish children's HAZ z-scores. On average, a child in Turkey is 0.334 standard deviation shorter over the sample period in refugee-dense provinces. Interestingly, the HAZ z-scores, on average, have improved after the immigration shock. The magnitude of this improvement is visibly higher in refugee-dense provinces.

3.2 Data on Refugees and Time Varying province Attributes

Data on the number of refugees in Turkish provinces come from the Directorate General of Migration Management (DGGM). Prior to 2012, there were almost no Syrian refugees in Turkey, although there were officially registered refugees and asylum seekers from different countries. For example, UNHCR (2011) reports that there were 14,465 refugees in Turkey in 2011 whom of 6,600 were from Iraq. For the particular case of Syrian war victims, their arrival in Turkey began in July 2012 (Akbulut-Yuksel et al., 2022). However, refugees have been placed in refugee camps in Turkish provinces having a border to Syria in 2012. As a result, data on the number of refugees at the province level, and therefore treatment, start in 2013.[2] We also divide the number of refugees by the province-level 2010 population. Population data, at the 81 province-level, is obtained from the Turkish Statistical Institute (TSI). Figure 2 shows the spatial distribution of Syrian refugees per inhabitants across 81 provinces of Turkey in the years 2014, 2016, and 2018, respectively. As discussed in Beine et al. (2021), refugees progressively move to other regions, especially to the industrialized and Western provinces such as Istanbul. Besides, in 2018, a substantial portion of the dark-red shades still appear in provinces having either a border or close to Syria. This highlights the importance of distance as a significant factor in determining the locations of Syrian refugees in Turkey (Beine et al., 2021).

[2]That is why the year 2012 is excluded from the main analysis. Although there were refugees in Turkey from July 2012, their number at the province level is not available in 2012. Therefore, the corresponding number cannot be calculated and remains missing for the native children born in 2012. In other words, each empirical specification excludes the children whose year of birth is 2012. We assess the importance of this sample restriction in Section 5.2.

Figure 2: Spatial Distribution of Syrian Refugees (in Percent)



Notes: Data on native population come from the Turkish Statistical Institute while the data on refugees come from Presidency of Migration Management. This figure shows the ratio of the Syrian refugee population to the province native population in Turkey for 2014, 2016, and 2018, respectively.

As indicated in Figure 2 and already documented by Aygün et al. (2021) and Aksu et al. (2022), refugees tend to locate in provinces that either have a border to Syria or are close to Syrian border (i.e., Southeastern provinces). Refugee-dense provinces are less industrialized and less developed as compared to the Western provinces. Such a negative selection is common in refugee studies (Maystadt and Verwimp, 2014; Wahba, 2014; Kadigo and Maystadt, 2023). Therefore, we can anticipate that native children should have worse HAZ z-scores in refugee-dense provinces, at least before the refugees arrive. The descriptive statistics in Table 1 confirm that prior to 2012, HAZ z-scores are lower in provinces with larger share of refugees.

Table 1: Children's Anthropometric Indicators by
Native-to-Refugee Ratio Density in Provinces (Excluding 2012)

	(1)	(2)	(3)
	Entire Period (2003-2018)	Before Syrian Crisis (2003-2011)	After Syrian Crisis (2013-2018)
High-Density	-0.334	-0.591	0.066
	(1.700)	(1.759)	(1.521)
Observation	1,497	913	584
Low-Density	-0.285	-0.453	-0.006
	(1.599)	(1.623)	(1.518)
Observation	3,844	2,404	1,440

Notes: The data come from Turkish Demographic and Health Survey (TDHS) 2008, 2013, and 2018. The entries are at means. Standard deviations are in parentheses. High intensity provinces are as follows: Adana, Hakkari, Hatay, Mersin, Şanlıurfa, Gaziantep, Kilis, Siirt, Mardin, Osmaniye, and Istanbul.

There exist several factors at the local level that could affect health status and be correlated with the presence of refugees. We use the following time-varying province controls: (1) the number of hospitals per 1,000 inhabitant, (2) public expenditure per 1,000 inhabitant, and (3) an index for terrorism. The first two variables are included to take into account public capacities in the provision of healthcare services and other local public goods. Given the high risk of terrorism in Turkey, the last index aims at capturing the later-life health consequences of early-life shocks related to terrorism. Terrorism threats have indeed been found to impair later life outcomes, including children's anthropometry (Camacho, 2008; Grossman et al., 2019; Ekhator-Mobayode and Abebe Asfaw, 2019). Since these variables can also act as bad controls (Angrist and Pischke, 2009), these variables will be added parsimoniously in our main specifications.

The data on the number of hospitals comes from the Turkish Statistical Institute (TSI). Public expenditure data are obtained from the Turkish Republic Presidential Strategy and Budget department.[3] Overall, the supply of health services or the level of public expenditures have improved over

[3]Other data on the number of doctors, nurses, midwives and hospital beds are used in Section 6. The data can be

the period of investigation (see Appendix Table A.1). The observed improvement –irrespective of the arrival of refugees– can be attributed to the Health Transformation Program (HTP) implemented by the Turkish Ministry of Health (MoH) between 2003 and 2013, and the Health System Strengthening and Support Project supported by the World Bank since 2015.[4] A terrorism index is constructed using data from the Global Terrorism Database (GTD). The GTD provides comprehensive information on the terror events that took place in each province: (1) the number of incidents, (2) the number of fatalities, (3) the number of injuries, and (4) the number of property damages. These four measures and the formulation provided by Vorsina et al. (2017) are utilized to construct the terrorism index.[5] According to Appendix Table A.1, the inflow of refugees has coincided with a rise in terrorist risk.[6]

4 Identification strategy

Our research design seeks to compare the average health outcomes of children exposed to the presence of refugees with children who are not (or less) exposed. More specifically, a naïve empirical specification can be presented as follows:

$$Health_{icrt} = \beta Refugee\, Share_{ct} + \theta H'_{ict} + \gamma X'_{ct} + \alpha_c + \alpha_t + t_r + \epsilon_{icrt} \quad (1)$$

$Health_{icrt}$ is the health outcome of the child i, residing in province c (and region r) in year t. $Refugee\, Share_{ct}$ denotes a continuous treatment variable capturing the exposure to the presence of refugees for the child i leaving in province c. Exposure to the refugee shock is determined by the number of refugees in the children's province of residence at the time of their birth, divided by the 2010 population of province c. Since our main variable of interest has an abundant number of zeroes,

found in https://www.sbb.gov.tr/yatirimlarin-illere-gore-dagilimi/. The expenditures are at current prices.

[4]Even though the HTP has been implemented between 2003 and 2013, it has positive and long-lasting effects on the healthcare system. Detailed information can be reached via https://csep.org/wp-content/uploads/2022/09/Health-Systems-in-Transition-TURKEY-1.pdf. Relevant information on the scope of the Health System Strengthening and Support Project can be accessed via https://documents.worldbank.org/en/publication/documents-reports/documentdetail/534641468190775240/turkey-health-system-strengthening-and-support-project

[5]Following Vorsina et al, (2017), the terrorism index is calculated based on the following formula. Terrorism Index=(1 x Incidents) + (3 x Fatalities) + (0,5 x Injuries)+(2 x Property Damage). The terrorism index has a minimum of 0 and a maximum of 754.5 (mean=21.34 and SD=87.28). To minimize the variation, the terrorism index is re-scaled between 1 and 10 (mean=0.15 and SD=0.82).

[6]To alleviate the ethniprovince-led terror incidents in Turkey, the ruling party (i.e., Justice and Development Party (JDP)) has started a "peace" process with the Kurdistan Workers' Party (PKK) in 2009. Despite significant declines in the number of PKK-induced terror events in Turkey between 2012 and 2013, Turkish government's military operations to destory PKK camps, warehouses, and shelters dissolved this the peace process (Köse et al., 2019). Since then, terrorist attacks have followed an increasing trend.

in particular prior to 2013, we apply an Inverse Hyperbolic Sine (IHS) transformation.[7] We control for individual and household observed characteristics (H_{ict}) including child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother resides in a rural area, the total number of older siblings, being a female headed household, and the wealth index. The vector of coefficients γ will capture the impact of time varying province attributes, namely (log) hospitals per 1,000 inhabitant, (log) public expenditure per 1,000 inhabitant, and the terrorism index. α_c stands for province fixed effects to control for any time-invariant heterogeneity across 81 provinces. α_t denotes survey year fixed effects to account for any macroeconomic shocks at the national level. The specification will be further augmented with region-specific time trends, t_r, (and alternatively with region-year fixed effects).[8] ϵ_{icrt} stands for the error terms. Standard errors are clustered at the 81-province level. Individual sampling weights are also used to render our results nationally representative.

Despite controlling for observed and unobserved characteristics, a challenge in comparing children with different levels of exposure to the presence of refugees at birth is that the location of refugees is not random. Refugees have indeed been found to move within Turkey, even if they appear to be particularly sensitive to variations of income at origin and distance (Beine et al., 2021). Refugees may therefore prefer to move to provinces with employment opportunities and better healthcare. The opposite is also possible. We cannot exclude that refugees are forced to settle in peripheral areas in which local hosts feature worst health conditions compared to the rest of the country.[9] Syrian refugees

[7]We mainly hinge on the IHS transformation to ease the interpretation of our results. In applied economics, it is a widespread practice to transform right-skewed variables (e.g., the refugee-share variable) that include zero and/or negative values. One popular transformation practice is to take the logarithm of such a variable. Nevertheless, one potential problem of taking the logarithm of a variable is that it does not allow retaining zero-valued observations as ln(0) is undefined (Bellemare and Wichman, 2020). We show that our main results do not change, without such a transformation in Section 5.2.

[8]Turkey counts 5 regions (i.e., North, South, East, West, and Central). Due to multicollinearity (Variance Inflation Factor (VIF)=70, well above the rule-of-thumb of 10, it leads to severe serial correlation), survey years are used instead of year of birth for time indicators. We therefore introduce 5 region-specific time trends and alternatively, 5 region-year fixed effects following Erten et al. (2022). We also assess the sensitivity of our results to the use of more disaggregated subnational divisions in Section 5.2.

[9]Based on observed characteristics, it is not obvious to quantify the direction of such an endogeneity bias. We indeed explore whether there exists a systematic association between the presence of refugees and the characteristics of Turkish provinces (Akbulut-Yuksel et al., 2022). We follow Akbulut-Yuksel et al. (2022) in regressing the (log) number of refugees on the following province-level characteristics: native population, number of hospitals per 1,000 inhabitant, public expenditure per 1,000 inhabitant, and terrorism index. The results are reported in Appendix Table A.2. Results suggest that refugees are attracted by larger provinces but there is no clear pattern with the (log) number of hospitals, public expenditure per 1,000 or the threat of terrorist attacks. Although not precisely estimated, the correlations rather suggest refugees to move to places with deteriorating healthcare.

might also prefer to locate in less populous and small-sized provinces to minimize their living costs. If labor market opportunities and government services are relatively limited in such provinces, then the coefficients obtained through the OLS model would be downward biased.

Endogenous location choice of refugees makes it essential to instrument the Turkish children's exposure to the immigration shock. To account for the potential endogeneity of immigrant location decisions, we use a distance-based instrument following Del Carpio and Wagner (2015). The instrumental variable approach relies on the rationale that the travel distance from the Syrian governorate from which Syrian immigrants take the road to each province in Turkey is central in predicting their settlement decisions. The gravity models of migration posit that the farther the two locations are from each other, the lower the spatial interaction, or namely migration, between them (Anderson, 2011; Beine et al., 2021).

The TDHS dataset provides data on the respondents' province of residence at the time of survey. It allows us to calculate the cross-border variation in travel distance between 81 provinces in Turkey and 13 governorates in Syria.[10] Following Del Carpio and Wagner (2015), the distance-based instrument for the Turkish children's exposure to Syrian refugees for each province in Turkey can be represented as follows:

$$Distance\ Instrument_{ct} = \sum_{i=s} \frac{1}{\eta_{sc}} \phi_s S_t \tag{2}$$

where η_{sc} denotes the shortest travel distance (measured in kilometers using Google Maps) from each origin Syrian governorate s to a Turkish province c. As noted by Erten et al. (2022), there are six border crossing points from Syria to Turkey, two in Hatay and the other four in Gaziantep, Kilis, Şanlıurfa, and Mardin provinces. Therefore, choosing between these border crossing points are contingent upon the Syrian individuals' governorate of residence and the intended province of arrival in Turkey. Due to the Turkish government's open-door policy towards Syrian refugees, there was no incentive for them to target one particular border crossing point while entering Turkey. Hence, the distance measure between 81 Turkish provinces and 13 Syrian origin governorates considers the shortest travel pathway. ϕ_s shows the share of Syrian population in each origin governorate s in the

[10] There are 13 origin governorates in Syria: Aleppo, Al-Hasakah, As-Suwayda, Damascus, Daraa, Deirez-zor, Hama, Homs, Idlib, Latakia, Quneitra, Rakka, and Tartus.

pre-immigration period (i.e., 2010)[11], and S_t is the total number of officially registered Syrian refugees in Turkey in year t (measured in thousands). There are 1,053 origin-arrival pairs to construct the Instrumental Variable (IV).[12] The instrument is also standardized in order to ease the interpretation of the first-stage results.

The IV method relies on the identifying assumption that the instrument has no correlation with the unobserved trends in the outcome variables. For instance, such assumption may be threatened when the instrument is correlated with the latent trends in macroeconomic indicators (e.g., (un)employment). Such trends could also affect the Turkish children's anthropometrics. Furthermore, Western region of Turkey is considerably more developed as compared to Eastern region, which is close to border crossing points. If the time trends in children's health outcomes in Western region of Turkey differs from that of Eastern region, then the identifying assumption will no longer holds. To minimize that threat, we follow Aygün et al. (2021) in using time-region interactions to weaken the independence assumption. We further discuss the validity of our instrumental variable approach in Section 5.3.

[11]Pre-war populations of the Syrian governorates in 2010 are obtained from the Syrian Arab Republic Central Bureau of Statistics.

[12]There are 81 provinces in Turkey and 13 origin governorates in Syria, amounting to 1,053 origin-arrival pairs (i.e., 81 x 13 =1,053).

5 Empirical Analysis

5.1 Main Results

Table 2 presents the effect of refugees on children's nutritional status, as measured by the Height-for-Age z-scores (HAZ). Columns (1)-(3) show the OLS estimates. Columns (4)-(6) display the 2SLS results. In Panel A, we only include survey year and province fixed effects. In Panels B and C, we gradually add different sets of control variables. The first stage F-statistics (or, Kleibergen-Paap rk Wald F) are reported in Columns (4)-(6), each of which is sufficiently large. This confirms that the distance-based instrument is strong enough for proper identification.

Unlike previous findings in the African context (Baez, 2011; Dagnelie et al., 2023), the 2SLS estimates suggest a positive effect of refugee inflow at 1% significance level in each panel, regardless of the specification.[13] Turkish children residing in provinces with larger refugee share are on average taller than others.[14] The estimated quasi-elasticity stands at 0.0296 in our preferred specification with individual/household-level controls (see Column (6) in Panel B of Table 2). Increasing the presence of refugees by 10 percent (equivalent to an increase by about 2,900 refugees from the mean) boosts children's height by one third of a standard deviation (0.0296 x 10 = 0.296). Although with the reverse sign, the magnitude is slightly higher than the quasi-elasticity of -0.02 found by Dagnelie et al. (2023). Although the magnitudes and the corresponding quasi-elasticities become slightly smaller in Panels B and C, we still observe a notable improvement in HAZ when gradually adding (i) individual/household-level and (ii) province-, individual/household-level control variables. For presentation purposes, we relegate the estimated coefficients for the full set of control variables (i.e., Panel C of Table 2) in Appendix Table A.4. Results are mostly as expected with positive and significant coefficients for proxies for healthcare supply, education and wealth. The number of older siblings has a negative and significant effect on HAZ.

[13] Our results also contrast with these existing studies if we replace our dependent variable with an alternative nutritional outcome: the weight-for-age. The WAZ, given sex, is a measure of child health in the short run. Low levels of WAZ imply wasting and thereby the presence of current protein-energy malnutrition. We prefer HAZ over WAZ to proxy the Turkish children's health based on two reasons. First, HAZ is more appropriate for our research design (WAZ being a short-term indicator and much more volatile). Accumulated (or long-run) effect of chronic malnutrition *-due to either mentally or physically low levels of growth-* is captured by HAZ, while WAZ shows the acute malnutrition induced by current undernutritional patterns. Second, being underweight childhood is easier to overcome in later stages of life than shortness in height-for-age. However, we replicate our results with that alternative indicator (WAZ) in Table A.3 The evidence still confirms the positive effect of refugees on children's health, as proxied with the WAZ z-score.

[14] The difference between the OLS and the 2SLS confirms the negative selection observed descriptively in Section 2.

Table 2: Effect of Refugees on Children's HAZ (Excluding 2012)

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.0991***	0.0555*	0.0662**	0.6404***	0.7864***	0.8257***
	(0.0325)	(0.0295)	(0.0329)	(0.1970)	(0.2141)	(0.2195)
Elasticity	0.0036	0.0021	0.0024	0.0238	0.0293	0.0307
Kleibergen-Paap rk Wald F				19.07	25.18	26.53
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0959**	0.0533	0.0600	0.6198***	0.7623***	0.7961***
	(0.0387)	(0.0354)	(0.0382)	(0.1845)	(0.2040)	(0.2085)
Elasticity	0.00357	0.00198	0.00224	0.0231	0.0284	0.0296
Kleibergen-Paap rk Wald F				19.41	25.96	27.24
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	0.0454	0.0243	0.0193	0.5133***	0.6515***	0.6669***
	(0.0286)	(0.0333)	(0.0322)	(0.1675)	(0.1873)	(0.1852)
Elasticity	0.0016	0.0009	0.0007	0.0191	0.0243	0.0248
Kleibergen-Paap rk Wald F				18.08	24.25	24.15
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

5.2 Robustness Checks

The results of our estimation may be sensitive to the model's specification. Therefore, we check the robustness of our results to (a) alternative transformations of our dependent variable and our variable of interest, (b) the use of more requiring region-time trends and fixed effects; and (c) alternative samples.

Alternative transformations. We may be concerned by extreme values in our dependent variable. The literature defines biologically plausible values of height-for-age z-scores, which lie between -6 and +6 (Mei and Grummer-Strawn, 2007). We show that our main results are robust to the exclusion of biologically implausible values of the HAZ z-scores (see Appendix Table A.5). Another potential concern might be related to the utilization of IHS transformation in refugee share variable. To rule out the possibility that IHS might distort our results, we re-estimate our main results shown in Table 2 where IHS transformation is not applied to the refugee share variable. As can be seen from Appendix Table A.6, the positive effect on the HAZ remains the same without IHS transformation.

Alternative time trends. Having data at the 81-province level allows us to utilize more flexible trends than Region trends, such as trends at the NUTS-1 (i.e., 12 regions) or even NUTS-2 level (i.e., 26 regions). We include these requiring time trends to make sure that our findings are not driven by differential pre-existing time trends across regions. The results are presented in Appendix Table A.7 and Appendix Table A.8, confirming the improvement on the HAZ.

Alternative samples. The definition of our sample of interest may be questioned. Due to a lack of refugee data, we decided to exclude the year 2012. We re-estimate the main specifications including the year 2012, replacing missing information on refugees by zeroes. Results remain similar (Appendix Table A.9).

5.3 Plausibility of identification assumptions

Our identification strategy rests on key identification assumptions. First, we assume that there is no confounding trends in health outcomes between provinces with high and low values of refugee shares or the instrument, conditional on the use of fixed effects and control variables. Second, we assume that the composition of the treated and control provinces remains constant overtime. The stability of our 2SLS coefficients when controlling sequentially for province-level, individual and household characteristics is reassuring but only deals with *observed* changes. The stability of our sample composition may be threatened by several selection issues. We discuss the plausibility of both assumptions below, distinguishing between selective migration, selective marriage, selective fertility and selective mortality as threats to the second assumption.[15]

Confounding trends. Adding region-specific time trends may not be sufficient to assume that Turkish children residing in provinces with large (predicted) share of refugees follow a similar trend in their HAZ z-scores compared to children in provinces with lower share of refugees. Therefore, we assess the presence of pre-existing trends using two different exercises (i) quantifying the effect of the future exposure to refugee shock on the current HAZ z-score of Turkish children (i.e., using the forward values of the refugee share and the instrument) and (ii) following Aksu et al. (2022)'s Placebo exercises. First, we restrict the sample to children born in the 2008-2011 period and assign the 2015-2018 values of the refugee share and the distance-based instrument for each province to the 2008-2011 sample.[16] In Appendix Table A.10, the estimated coefficients are negative and statistically insignificant. Overall, such a placebo exercise rejects the possibility that the positive effect found in our main results may be explained by pre-existing trends in HAZ z-scores. Second, we follow Aksu et al. (2022) in estimating the slope coefficient from a regression of residual trends of the dependent variable (i.e., HAZ) on the value of the time-constant instrument (i.e., 2016). As suggested by Jaeger et al. (2020), the aim of this Placebo approach is to assess whether pre-shock trends in the outcome variable are independent of the instrument, after accounting for fixed effects, time trends and/or control variables. The results are presented in Appendix Table A.11. The identification assumption fails for some parsimonious specifications, i.e. those without controls (see Column (1) of Appendix Table A.11) or when region trends or region-year fixed effects are based on more disaggreggated regions (NUTS-2 regions, see panel C of Appendix Table A.11). As soon as we add region time trends or

[15] Scholars have recently demonstrated the limits of two-way fixed effects estimations in the presence of heterogeneous treatment effects (Athey and Imbens, 2021; de Chaisemartin and D'Haultfœuille, 2020; Goodman-Bacon, 2021). Heterogeneity in our treatment over time is unlikely given that our refugee share only varies between 2013 and 2015. We confirm that intuition by implementing the approach proposed byJakiela (2021). Building on the Frisch-Waugh-Lovell theorem, the homogeneity assumption requires the relationship between residualized outcome and treatment variable to be linear and to be constant across comparison groups. While confirming a positive coefficient for our average treatment effect, we do not find evidence that the treatment effect changes across comparison groups.

[16] Even though exposure to refugee shock started in 2012, it is important to note that the province-level refugee data is missing in 2012. Therefore, children born in 2011 and earlier are the ones corresponding to the pre-immigration observations.

region-year fixed effects and control variables in Panels A and B of Table Appendix Table A.11, there is no correlation between the residual trends and the IV defined in 2016.[17] In the rest of the paper, we focus on specifications with individual and household covariates, with or without region-specific trends and region-year fixed effects.[18]

Selective Migration. Native displacement is a major concern in migration studies (Borjas, 2006; Card and DiNardo, 2000; Card, 2001; Andersson et al., 2021). A massive outflows of natives may explain our results, in particular if those with a low socio-economic background (likely with poor health conditions) are leaving. To explore such a selective migration, we first note that Akgunduz et al. (2015) find lower in-migration rates and unchanged out-migrations in regions that hosted a large number of Syrian refugees in Turkey. Aksu et al. (2022) also find no impact on in-migration, with the exception of a positive impact for more-educated natives.[19] With our data, we investigate whether the migration influx affects migration inflows and outflows based on the TSI's migration statistics at the 81-province level over the period of 2008-2018.[20] Based on the results presented in Appendix Table A.12, we do not find evidence of native displacement as a result of the refugee inflows. Similarly, we do not report any evidence of outflows as a response to the inflows of refugees. However, we do find that low-educated natives are more likely to move in areas with a large share of refugees (see Panel B, Columns (2) and (3) of Appendix Table A.12).[21] If anything, the fact refugee-hosting areas act as an attraction force for the low-educated suggests that our main results would have been even more positive, if – as expected – low-educated natives are also associated with lower health outcomes for their children.

Selective Marriage and Selective Fertility. Unprecedented population shocks, such as those triggered by Syrian civil war, are known to potentially alter marriage market dynamics and fertility

[17]Similar results are found when the reference year of the instrument is changed to the year 2015 or 2014.

[18]We decide not to include the province-level controls systematically since they may act as bad controls. For instance, when investigating the importance of investment in healthcare resources, it does not make sense to control for likely endogeneous province-level controls such as the number of hospitals or public expenditure. Our results are nonetheless robust to the addition of province-level controls and available upon request. Similarly, individual controls are not included when estimating the impact of refugees on the age at first birth and the age at first marriage since the estimations are implemented at the mother level.

[19]Those results contrast with Elmallakh and Wahba (2023) who found a considerable increase in native outflows in Jordan.

[20]The relevant information is available at `https://nip.tuik.gov.tr/?value=IllerArasiGoc`.

[21]Our results contrast with Aksu et al. (2022). One possible reason is that our analysis uses different time periods.

decisions of native women.[22] The presence of refugees has the potential to impact patterns of family formation and fertility decision by modifying the employment opportunities and occupational status of native men and women (Carlana and Tabellini, 2018). We cannot exclude the possibility of a selective change in our population of interest, since marriages and births at early ages have been linked with a number of adverse outcomes such as poorer maternal and child health, especially in developing countries (see Alam (2000) for India and Raj et al. (2010) for Bangladesh). To test these possibilities, we explore the effect of refugee influx on Turkish women's age at marriage and age at first birth. In Appendix Table A.13, we report no evidence of a change in age at first marriage and age at first birth, indicating that our results are not driven by a change in family formation patterns.[23] No evidence is also found when the sample is stratified between low- and high-educated mothers.

Selective Mortality. Feotal Origins hypothesis posits that in utero shocks (e.g., sub-optimal nutrition, wars, and weather shocks) impairs fetal growth which in turn leads to a predisposition to have poorer health outcomes in later life (Barker (1990) and Almond and Currie (2011)). Shocks in utero may also alter the composition of the population of interest (Dagnelie et al. (2018)). In response to a detrimental shock during gestational age, a portion of fetuses lying at the bottom of the health distribution cannot survive since their initial health endowment does not exceed the survival cutoff (Dagnelie et al. (2018)). We can therefore not exclude that in case of disproportionate mortality in refugee-hosting provinces, our positive effect would reflect the better health conditions of the surviving kids. We first note that such a selection is highly implausible since most of evidence has been found for large-scale shocks such as famine, conflict or natural disasters (Almond and Currie, 2011; Dagnelie et al., 2018; Leon, 2012; Lavy et al., 2016). We nonetheless test whether Syrian refugee shock affects the survival patterns during pregnancy, and thus the population composition. In Table A.14, we assess the likelihood of experiencing miscarriage and stillbirth among Turkish women. Our results do not yield a statistically significant effect on the probability of experiencing miscarriage and stillbirth (see Columns (1) to (6) in Appendix Table A.14). Although not obvious in the studied context, induced abortion might also constitute another mechanism through which immigration can

[22] In the US context, the marriage markets and fertility can be explained by a change in sex ratios, for example, by making it easier for native women to find a spouse and to have child(ren) (Angrist, 2002). In our context, it is not a plausible mechanism even though the prevalence of poverty/unemployment among the Syrian refugees can be an encouraging factor for them to marry a Turkish citizen. Syrian refugees who are under Temporary Protection do not have the right to marry a Turkish citizen to gain citizenship (and hence an employment chance) by marriage. Relevant information can be found at `https://multeciler.org.tr/eng/common-misconceptions-about-syrians/`.

[23] **Note that we also assess the impact of refugees on the number of births in Section 6.3**

affect the composition of our sample and hence, native children's health. In Appendix Table A.14, we assess this possibility and report null results.[24]

6 Investigating Possible Channels

Our findings contradict the existing research documenting either an adverse or a null impact of migration shocks on health outcomes (Montalvo and Reynal-Querol, 2007; Baez, 2011; Ibáñez et al., 2021; Dagnelie et al., 2023). In the Turkish context, there exist two relevant studies exploring the health effects of forced migration. First, Aygün et al. (2021) examine the health effects of Syrian refugee shock in Turkey, as proxied by Turkish natives' infant, child, and elderly mortality. Their OLS results provide suggestive evidence indicating that mortality outcomes exhibit an increasing pattern. Yet, once the endogenous location choice of Syrian refugees is accounted for, their IV estimates yield no evidence that forced migration affects mortality. The study indicates that Syrian individuals are more prone to locate in provinces for which, in the absence of the migration flow, mortality outcomes would follow a more negative trend over time. That being said, Erten et al. (2022) show that native children residing in provinces with larger refugee flows are less likely to be fully vaccinated against measles, hepatitis B, DTP, and tuberculosis. They also document that the native children living in refugee-intense regions are at higher risk of catching an infectious disease and upper/lower respiratory diseases. Taken together, the results displayed in this paper are sufficiently puzzling to require further investigation.

We explore a number of channels through which an unprecedented immigration crisis can affect health outcomes. These channels include (1) investment in healthcare resources, (2) Turkish mothers' labor market outcomes and their time allocation at home, (3) income channel, (4) and the quality-quantity trade-off channel as measured by the total number of births (either still or live birth) and investment in children's human capital through vaccination. To explore these channels, we keep similar OLS and 2SLS specifications and samples, than the ones explained in Section 4. The only differences are that some outcomes (healthcare) require to aggregate our data at the province level. Time-varying province attributes are omitted since they are likely to be endogeneous to the outcome of interest related to healthcare resources, labor markets, income, the number of births, and investment in children's human capital.[25]

[24]No evidence is found when the sample is stratified according to education level (see Appendix Table A.15).

[25]Our results can nonetheless be shown to be qualitatively unaffected by the addition of these controls.

6.1 Investment in Healthcare Resources

The most obvious explanation relates to changes in healthcare resources. We therefore explore the response of the central government to the refugee wave in terms of investment in human and physical healthcare resources in the refugee-hosting provinces. Using data from the TSI, we quantify the effect of refugees on the supply of healthcare resources at the 81-province level. The province-level healthcare indicators cover: (1) the number of doctors, (2) the number of nurses, (3) the number of midwives, and (4) the number of hospital beds. Descriptive statistics are shown in Appendix Table A.1.

We present our detailed results in Appendix Tables A.16 but a summary of the 2SLS results are provided in Table 3. The 2SLS estimates indicate that there is a significant increase in the number of doctors, nurses, midviwes, and hospital beds. Overall, the results confirm that the central government responded to this migration shock by increasing the supply of healthcare professionals and hospital beds (see Panel A of Table 3). However, one should be cautious when interpreting these results as the outcome variables are not in per capita terms. To proxy for the capacity to maintain sufficient healthcare services per inhabitant, we divide the healthcare outcomes by the total population, including both Turkish natives and Syrian refugees, in each province. When transformed in per capita terms, the effect is reversed for the supply of healthcare professionals and not significant for the number of hospital beds (see Panel B of Table 3).[26] Similar to Aygün et al. (2021), we do report a negative effect for doctors and no effect for hospital beds, both are in per capita terms. However, due to sample size and specification differences, the magnitude of our coefficient differs. We also note that regarding Aygün et al. (2021), it is true that the level of significance varies substantially[27]. The negative effect found for nurses is not significant in their case, while we cannot find significant results for midwives. That is being said, a full replication of their results is beyond the scope of our research.

Overall, our results suggest that the central government has made significant investments in healthcare resources in refugee-receiving provinces. Yet, the magnitude of this investment did not sufficiently compensate for the reduction in per capita availability of healthcare professionals in provinces with more refugees. Provinces that experience a disproportionate amount of refugee inflows encounter a significant shortage of medical professionals relative to provinces with less refugees. The supply

[26]Detailed results are provided in Appendix Tables A.16, with or without region-specific time trends and region-year fixed effects.

[27]Another example regarding the differences in the results can be seen in Erten et al. (2022), who also report a reduction in nurses per capita while it is not the case in Aygün et al. (2021)

of healthcare services does not seem to explain our positive effect on children's health. We should nonetheless acknowledge that we cannot exclude the possibility that the overall health system has been affected by the refugee inflows. Although it does not jeopardize our main results, our identification strategy cannot deal with general equilibrium effects. Furthermore, our proxies for healthcare services only account for the number of healthcare staff or hospital beds, but not for the quality of services.

Table 3: Summary Table I: Investment in Healthcare Resources (2SLS Results , With region-year FEs)

Dep. Var.	Healthcare Resources			
Model	Doctor	Nurse	Midewife	Hospital Beds
	(1)	(2)	(3)	(4)
Panel A	(Log) Number			
Refugee Share (IHS)	0.9578***	1.5942***	0.9028***	1.6573**
	(0.2288)	(0.2882)	(0.2420)	(0.7046)
Elasticity	0.00081	0.00188	0.00111	0.00155
Kleibergen-Paap rk Wald F	16.81	16.81	16.81	16.81
Panel B	Per 1,000 inhabitant			
Refugee Share (IHS)	-0.9078***	-1.1355**	-0.2826	-0.0286
	(0.2540)	(0.4927)	0.(2283)	(1.0534)
Elasticity	-0.00535	-0.00539	-0.00245	-0.00131
Kleibergen-Paap rk Wald F	15.65	15.65	15.65	15.65
Observations	1,215	1,215	1,215	1,215

Notes: Information on the healthcare resources variables is obtained from Turkish Statistical Institute (TSI). The full sample is for the 2003–18 period, excluding 2012, at the 81-province level. Each cell shows the estimates for the ratio of migrants to natives, with year, province fixed effects and region-year fixed effects. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Standard errors, given in parentheses, are clustered at the province level *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

6.2 Labor Market, Income, and Time Allocation

Labor Market competition. Two potential pathways through which migration flows can deteriorate children's health outcomes are considered to be fiercer competition on the labor market and the related income shocks (Baez, 2011; Maystadt et al., 2019). In Turkey, recent research reports a notable job loss for natives in informal sector due to Turkish workers' being replaced with Syrian workers (Ceritoglu et al., 2017; Aksu et al., 2022).[28] The adverse employment effect is found to be more pronounced among disadvantaged groups, namely those who are less-educated, temporary-waged, and women in self-employment, and young workers in agricultural sector (Aksu et al., 2022). The job losses induced by migrant influx are likely to produce two opposite effects. The first effect is a reduction of income following possible job losses. Limited access to healthy nutrients, stemming from the households' reduced purchasing power, may prevent children from following an appropriate diet and thereby cause them to experience growth retardation. The second effect is less obvious. Unemployment, in particular among women, may translate into more time spent with offsprings. Hence, women might allocate more time to invest in their children's health capital through more frequent healthcare visits and/or provision of healthier nutrition. That second mechanism is likely to be particularly binding in countries where child care is poorly developed.

To test these possibilities, we first explore the effect of refugees on Turkish mother's labor market outcomes. Based on the sample of Turkish women's being in the labor force at the time of survey, the 2SLS model indicates a negative and a statistically significant coefficient (Panel A, Column (1) of Table 4).[29] Mothers living in provinces that received a large number of refugees are less likely to be employed as compared to mothers residing in less affected provinces. The effect is quite sizable. A 10% increase in refugees correspond to a fall by 5 percentage points (pp) in the probability to be employed. Given the mean value of employment (0.15), that is equivalent to a one-third reduction in employment. The negative employment effect differs between better-educated and less-educated women. Syrian refugees, being on average less skilled, might not be plausible substitutes for better-

[28] Turkish government introduced a work permit system allowing registered Syrian refugees to access formal employment in 2016. In other words, Syrian individuals were employed in the informal sector with considerably lower wages as compared to Turkish natives prior to 2016. Erten and Keskin (2021) provide evidence that Turkish native women are more likely to be displaced from the informal employment sector than native men due to presence of Syrian workers.

[29] Detailed results are provided in Panel A, Column (6) of Appendix Table A.17. The TDHS first asks "Have you ever worked?". The answer is based on "Yes" or "No" answer scheme. It then asks "Are you currently working?" to those who replied "Yes" to the first question. It is worth noting that we consider women who replied "No" to the first question as unemployed at the time of survey.

educated natives in the labor market (Tumen, 2018). If this is the case, then one can expect to find null or even positive employment effects on better-educated mothers and to find negative employment effects on less-educated mothers. We divide our sample based on the completion of compulsory years of schooling.[30] Our results support this conjecture (Panel A, Columns (2) and (3) of Table 4).[31] Mothers with less than 12 years of education are more likely to be out of the labor market, while mothers with 12 or more years of education are not affected by the presence of refugees. The negative employment effect is found to be more prevalent for the native mothers with less education, who can be assumed to work in low-pay jobs. It is therefore natural to revisit our main results for children with low-educated mothers. We re-estimate Equation 1 by stratifying our sample by mother's education. Children, whose mother did not complete compulsory years of education, experience an increase in their HAZ: the estimated quasi-elasticity is 0.021 (see Panel A, Column (5) of Table 4).[32] Taken together, job loss experienced by less-educated mothers is associated with a puzzling improvement in their children's health. A plausible explanation is that the likely negative income effect is compensated by time reallocation towards their offsprings.

[30]In Turkey, compulsory years of schooling has been raised from 8 years to 12 years in 1997.

[31]Detailed results are provided in Panel A, Column (6) of Appendix Table A.18 for probability of working at the time of survey.

[32]Detailed results are provided in Panel D of Appendix Table A.18. As expected, we do not find any improvement in the HAZ z-score for those who have mothers with 12 or more years of education see Columns (4) to (6).

Table 4: Summary Table II: Labor markets, Income and Time Allocation (2SLS Results , With region-year FEs)

Dep. Var.	Selected Maternal Outcomes					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Working	Working$\|Edu \geq 12$	Working$\|Edu<12$	HAZ	HAZ$\|Edu<12$	HAZ$\|Edu \geq 12$
Refugee Share (IHS)	-0.0505**	0.1156	-0.0677**	0.7961***	0.6911***	0.5421
	(0.0220)	(0.1056)	(0.0283)	(0.0.2085)	(0.2010)	(0.4859)
Elasticity				0.0296	0.0212	0.0604
Kleibergen-Paap rk Wald F	27.24	12.74	29.83	27.24	27.80	11.51
Observation	5,341	636	4,705	5,341	4,705	636
Panel B	Wealth	Wealth$\|Edu \geq 12$	Wealth$\|Edu<12$	Time with Offspring	Time$\|Edu<12$	Time$\|Edu \geq 12$
Refugee Share (IHS)	-0.0084	0.4600*	-0.0460	0.0506*	0.0427*	0.2535
	(0.0767)	(0.2727)	0.0729)	(0.0297)	(0.0247)	(0.1967)
Elasticity	-3.51e-05	0.0012	-0.0002			
Kleibergen-Paap rk Wald F	27.14	11.27	29.59	27.24	29.83	12.74
Observation	5,341	636	4,705	5,341	4,705	636
Panel C	Antenatal Visits[1]	Antenatal$\|Edu \geq 12$	Antenatal$\|Edu<12$	Postnatal Care	Postnatal$\|Edu \geq 12$	Postnatal$\|Edu<12$
Refugee Share (IHS)	0.0990**	0.1377	0.1069**	0.0070	-0.0007	0.0090
	(0.0447)	(0.1340)	(0.0466)	(0.0111)	(0.0157)	(0.0124)
Elasticity	0.0005	0.0006	0.0006			
Kleibergen-Paap rk Wald F	27.16	11.04	29.88	28.29	12.74	29.90
Observation	5,323	634	4,689	5,336	636	4,700

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index (not in wealth index regression). Year, province and region-year fixed effects are included. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Income effect. Health improvements are compatible with positive income induced by the presence of refugees. In other contexts, the presence of refugees has boosted the local economies (Maystadt et al., 2019; Maystadt and Duranton, 2019; Taylor et al., 2016). For Turkey, it is less obvious (Aksu et al., 2022). To assess that possible explanation, we run Equation 1 using the household wealth index. The estimated coefficients are far from being statistically significant (Panel B, Column (1) of Table 4).[33] We cannot exclude the possibility that the null effect is driven by the importance of financial aid –either provided by central government or international organization. In any case, it does not seem sufficient to explain the observed health improvements.

Maternal Time Allocation. The crowding-out effect of refugees that left Turkish native women unemployed can increase the amount of time to be spent between mother and their offspring. This can have positive repercussions on children's health outcomes because mothers would be able to invest more in their children's health capital through several channels. Examples include, but are not limited to, increasing the frequency of received pre- or postnatal care and exerting more effort to provide a healthier diet, both of which are crucial for children's nutrition. To test this hypothesis, we explore the impact of refugees on the following outcomes: (1) mothers' time spent with their children, (2) the number of antenatal care visits, and (3) receipt of postnatal care within two months. [34] Overall, our findings suggest that the presence of refugees increases (i) the time spent by mothers with their offsprings, (ii) the number of antenatal care visits, and (iii) the likelihood of receiving postnatal care two months after birth. The effects summarized in Table 4 are sizeable (see Panel B, Column (4); Panel C, Columns (1) and (4)).[35] A 10% increase in the share of refugees leads to a 5 pp rise in the likelihood that the mother is spending time with her offspring, and a 9 pp increase in the number of antenatal care visits. These effects represent (i) a 6% increase in the maternal time spent with offspring and (ii) a 4% rise in the antenatal care visits at the the mean values (0.75 for time spent and 2.02 for antenatal checks). For the probability of receiving postnatal care, our baseline

[33]Detailed results are provided in Panel B of Appendix Table A.17. We also present the results by the completion of compulsory education in Appendix Table A.18.

[34]In TDHS, women are asked how many times they attended antenatal care checks for their last birth during pregnancy. For postnatal check; however, women are asked whether their babies were examined by a health professional within two months after the birth. When it comes to the mothers' time allocation, the TDHS asks the following question "Who does spend time with child(ren) in your house primarily?" The answers are in a categorical form, ranging from "herself" to "no one". Using this question, a binary variable, taking value of 1 if the mother responded "herself" and 0 otherwise, is constructed. It should be noted that the TDHS does not provide information on the specific daily time allocation of Turkish mothers with their offspring.

[35]Detailed results are provided in Appendix Table A.17 for maternal time allocation and Appendix Table A.19 for the number of antenatal care visits and the receipt of postnatal care two months within birth

specification, which allows for region-year FEs, reports a positive but statistically insignificant effect while the specification without region-specific trends shows a positive effect at 1% significance level (see Panel B, Column (4) of Appendix Table A.19). Therefore, we argue that antenatal and postnatal care increase because women have more free time due to maternal unemployment. Furthermore, we expect our results to be sensitive across educational level for these variables. We present our results in Appendix Table A.18 for maternal time spent with offspring at home (see Panel C, Column (12)), Appendix Table A.20 for antenatal care visits and receipt of postnatal care. Our findings on maternal time spent suggest that less educated women are more likely to spend time with their children at home (see Panel C, Column (12) of Appendix Table A.18). Nevertheless, we find no evidence of the refugee influx increases better educated mothers' time spent with their offspring. Such an increase in mothers' time allocation is likely to induce a rise in healthcare utilization which in turn can positively contribute to their children's growth patterns. As can be seen from Panel A, Column (12) of Appendix Table A.20, the effect is stronger for less educated mothers for antenatal care visits, while we report null results for better educated mothers. Regarding the likelihood of receiving postnatal care two months within birth, the positive effect is captured for less educated mother in the specification where we do not introduce region-trends and region-year fixed effects (see Panel B, Column (10) of Appendix Table A.20). The positive effect; however, disappears once we add region-year FEs (see Panel B, Column (12)).

6.3 The quantity-quality trade-off

Conventional theories on family economics, especially on the intra-household resource allocation, suggest that parental decisions regarding the number of children and investments in children's human capital are interdependent. The theory posits that there exists a negative association between the number of children (i.e., quantity) and children-specific outcomes such as health and schooling (i.e., quality) (Becker and Lewis, 1973; Becker and Tomes, 1986).[36] Therefore, it is theoretically possible that the favorable effect of migration on children's growth indicators can be attributed to the quality-quantity trade-off: a decrease in the total number of children in the household can bring about an increase in the investment in health capital per child. To test whether such a trade-off exists, we run Equation 1 where the dependent variable is the number of children per woman. Our investigation

[36]Empirical investigation of the quality-quantity trade-off reports mixed results (Rosenzweig and Wolpin, 1980; Black et al., 2005; Qian, 2006).

rejects that possible explanation (Panel A, Column (1) of Table 5).[37] Furthermore, Aygün et al. (2021) find no evidence of a significant effect on child mortality. Second, possible changes in household size or fertility decisions do not seem to have been followed by an improvement in early childhood investment. We indeed explore children's probability of being fully vaccinated against Hepatitis B, Measles, and Tuberculosis[38]. The 2SLS estimates are all negative and statistically significant at any conventional level (see Table 5, Panel A, Column (3) and Panel B, Columns (1) and (4)). That is, the likelihood of being fully immunized decreases in the provinces receiving a greater share of Syrian refugees as compared to provinces with a lower share of refugees. The results confirm the findings of Erten et al. (2022) who show a notable decline in the vaccination outcomes induced by the immigration shock. Nevertheless, the relationship between vaccination and child height is a complex one.[39] In our analysis, we consider vaccination as a way to measure early child investment in health. It is possible the reduction in vaccination mitigates the positive effect of refugees on the height of natives' chidlren but at least, it cannot be a valid explanation for this positive effect on height.

[37]Detailed results are provided in Panel A of Appendix Table A.21. We further show the births per woman by their education level in Appendix Table A.22.

[38]Detailed results on the probability of vaccine completion are provided in Appendix Table A.21 (see Panel B for Hepatitis, Panel C for Tuberculosis (BCG), and Panel D for Measles).

[39]One the one hand, childhood vaccination can positively contribute to the children's nutritional status by disease protection and thus lead to better physical growth patterns in developing countries. Substantial portion of existing research associates vaccination intake with reductions in stunting and wasting in children under five years of age (Adair and Guilkey, 1997; Frongillo Jr et al., 1997; Anekwe and Kumar, 2012; Ignis and Tomini, 2022). Others report that there is no statistically significant link between vaccination take up and children's height and weight (Bloom et al., 2012). On the other hand, vaccination may create a selective mechanism through its effects on mortality and morbidity. That is, the effect of vaccination might be heterogenous on children having better health outcomes versus children at the bottom of the health distribution.

Table 5: Summary Table III: Quantity-Quality Trade-off (2SLS Results , with region-year FEs)

Dep. Var.	Selected Child and Maternal Outcomes					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Total Births	Births$\|Edu \geq 12$	Births$\|Edu<12$	Hepatitus B	Hepatitus$\|Edu \geq 12$	Hepatitus$\|Edu<12$
Refugee Share (IHS)	0.3842***	0.4361**	0.4285***	-0.1283***	-0.3241	-0.1321***
	(0.1050)	(0.1944)	(0.1176)	(0.0347)	(0.2422)	(0.0388)
Elasticity	0.00163	0.00303	0.00173			
Kleibergen-Paap rk Wald F	27.29	12.84	29.80	29.17	6.24	28.72
Observation	5,341	636	4,705	2,689	342	2,347
Panel B	Tuberculosis	Tuberculosis$\|Edu \geq 12$	Tuberculosis$\|Edu<12$	Measles	Measles$\|Edu \geq 12$	Measles$\|Edu<12$
Refugee Share (IHS)	-0.1309***	-0.1284*	-0.1512***	-0.2439***	-0.4707**	-0.2634**
	(0.0334)	(0.0706)	(0.0377)	(0.0945)	(0.2329)	(0.1054)
Elasticity						
Kleibergen-Paap rk Wald F	27.75	8.33	26.76	29.06	11.86	24.58
Observation	3,217	405	2,812	2,352	287	2,065

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older (not in total births per woman regressions), being a female headed household, and wealth index. Individual survey weights are used in each specification. Year, province and region-year fixed effects are included. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

7 Conclusions

We investigate the effect of massive immigration shock induced by the Syrian Civil War on Turkish children's anthropometric indicators. Dealing with the endogeneous settlement of Syrian refugees across 81 Turkish provinces, we find that the Turkish children's height-for-age z-score is significantly higher in the provinces with a large share of refugees. This finding contradicts existing evidence which report a substantial decline in native children's growth indicators in the African contexts. Our additional results suggest that a plausible explanation is the increase in mothers' time spent with their offsprings, paradoxically as a result of job losses mostly experienced by low-skilled women. We indeed confirm that children's health improvement is concentrated among households with low-educated mothers.

While the loss of job among low-educated mothers is a source of concern, our paper sheds light on a crucial trade-off associated with parental participation into the labor markets in absence of strong child care services. From a policy perspective, maternal unemployment is certainly not a desirable channel to improve child health. However, it highlights the importance of child care provision, especially in a middle-income country like Turkey. When the provision of child care remains at sub-optimal levels, women are likely to encounter a trade-off between engaging in their career via formal employment and staying at home. Accessible and affordable child care is a potent tool to boost the equality of opportunity by promoting women's participation to labor market and child development in later stages of life (Blau and Currie, 2006; Currie and Almond, 2011; Ruhm and Waldfogel, 2012). Despite a notable progress in the availability of preschool and child care facilities, enrollment rates remained at low levels (WorldBank, 2015).[40] One possible reason for low enrollment can be the fact that public preschools target children aged 4-5. Population shock induced by the continuous arrival of refugees, on the other hand, is likely to reduce the enrollment rate when considering the negative relationship observed between childcare supply and population density in Turkish provinces (WorldBank, 2015). Altogether, our research indirectly sheds light on the importance of extending child care at younger age. It is critical because extending child care can foster women's employment (by freeing up women's time) and hence economic development (Duflo, 2012).

Finally, this paper is not without limitations. Our analysis consists in assessing the change in health outcomes in refugee-hosting provinces compared to other provinces. We are therefore not able

[40] From 2006 to 2015, Turkey experienced a sizable increase in the number of preschool and child care providers, i.e., the total number of providers has risen by almost 31%, while 73% of this increase was provided by the public sector (WorldBank, 2015)

to estimate general equilibrium effects. For instance, we are not able to capture the consequences of a general decrease (due to budget re-allocations) or increase (due to international aid) of the central government budget dedicated to healthcare.There also exist a number of unexplored channels due to lack of data. First, improvements in the anthropometrics are parallel to the supply of satisfactory nutrition intake. Unfortunately, The TDHS does not ask sufficiently detailed nutritional intakes from the time of birth. Instead, it asks whether the child(ren) has been given some particular foods/beverages (e.g., milk, juice, eggs, bread, meat, and fish) within the last 24 hours. One alternative outcome could be breastfeeding duration or exclusivity of breastfeeding to measure nutrition. However, there a number of contributors to duration and exclusivity of nursing (e.g., mother's fertility preferences, sibling sex composition and size) (Jayachandran and Kuziemko, 2011; Chakravarty, 2015). Therefore, it is not straightforward to distinguish such effects from refugees' arrival and it is beyond our paper's scope. Second, we do not investigate possible changes in healthcare provider.The information is available in the TDHS but cannot be exploited. Beyond the endogeneous nature of the provider choice, there is only a limited number of mothers with a private healthcare insurance. For instance, in 2013, less than 2 percent of mothers reported to have access to a private health insurance. Third, the time allocation (at home) question in the TDHS is far from providing an ideal measure when quantifying the changes in the time spent between mother and children.

References

Adair, L. S. and Guilkey, D. K. (1997). Age-specific determinants of stunting in filipino children. *The Journal of nutrition*, 127(2):314–320.

Akbulut-Yuksel, M., Mocan, N. H., Tumen, S., and Turan, B. (2022). The crime effect of refugees. Technical report, National Bureau of Economic Research.

Akgunduz, Y., den Berg, M. V., and Hassink, W. (2015). The Impact of Refugee Crises on Host Labor Markets: The Case of the Syrian Refugee Crisis in Turkey. *IZA Discussion paper*, 8841.

Akresh, R., Verwimp, P., and Bundervoet, T. (2011). Civil War, Crop Failure and Child Stunting in Rwanda. *Economic Development and Cultural Change*, 59(4):777–810.

Aksu, E., Erzan, R., and Kırdar, M. G. (2022). The impact of mass migration of syrians on the turkish labor market. *Labour Economics*, page 102183.

Alam, N. (2000). Teenage motherhood and infant mortality in bangladesh: maternal age-dependent effect of parity one. *Journal of biosocial science*, 32(2):229–236.

Alderman, H., Hoddinot, J., and Kinsey, B. (2006). Long Term Consequences of Early Childhood Malnutrition. *Oxford Economic Papers*, 58(3):450–474.

Almond, D. and Currie, J. (2011). Killing me softly: The fetal origins hypothesis. *Journal of economic perspectives*, 25(3):153–172.

Anderson, J. E. (2011). The gravity model. *Annu. Rev. Econ.*, 3(1):133–160.

Anderson, P. M., Butcher, K. F., and Schanzenbach, D. W. (2019). Understanding recent trends in childhood obesity in the united states. *Economics & Human Biology*, 34:16–25.

Andersson, H., Berg, H., and Dahlberg, M. (2021). Migrating natives and foreign immigration: Is there a preference for ethnic residential homogeneity? *Journal of Urban Economics*, 121:103296.

Anekwe, T. D. and Kumar, S. (2012). The effect of a vaccination program on child anthropometry: evidence from india's universal immunization program. *Journal of Public Health*, 34(4):489–497.

Angrist, J. (2002). How do sex ratios affect marriage and labor markets? evidence from america's second generation. *The Quarterly Journal of Economics*, 117(3):997–1038.

Angrist, J. D. and Pischke, J.-S. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton university press.

Athey, S. and Imbens, G. (2021). Design-based Analysis in Difference-in-Differences Settings with Staggered Adoption. *Journal of Econometrics*.

Aygün, A., Kırdar, M. G., and Tuncay, B. (2021). The effect of hosting 3.4 million refugees on native population mortality. *Journal of health economics*, 80:102534.

Baez, J. E. (2011). Civil Wars Beyond Their Borders: The Human Capital and Health Consequences of Hosting Refugees. *Journal of Development Economics*, 96:391–408.

Barker, D. J. (1990). The fetal and infant origins of adult disease. *BMJ: British Medical Journal*, 301(6761):1111.

Becker, G. S. and Lewis, H. G. (1973). On the interaction between the quantity and quality of children. *Journal of political Economy*, 81(2, Part 2):S279–S288.

Becker, G. S. and Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of labor economics*, 4(3, Part 2):S1–S39.

Beine, M., Bertinelli, L., Cömertpay, R., Litina, A., and Maystadt, J.-F. (2021). A gravity analysis of refugee mobility using mobile phone data. *Journal of Development Economics*, 150:102618.

Bellemare, M. and Wichman, C. (2020). Elasticities and the inverse Hyperbolic Sine Transformation. *Oxford Bulletin of Economics and Statistics*, 82(1):0305–9049.

Benner, H., Uraz, A., de Berry, J., and Wiseman, W. (2015). Turkey's response to the syrian refugee crisis and the road ahead. *Disclosure*.

Black, S. E., Devereux, P. J., and Salvanes, K. G. (2005). The more the merrier? the effect of family size and birth order on children's education. *The Quarterly Journal of Economics*, 120(2):669–700.

Blau, D. and Currie, J. (2006). Pre-school, day care, and after-school care: who's minding the kids? *Handbook of the Economics of Education*, 2:1163–1278.

Bloom, D. E., Canning, D., and Shenoy, E. S. (2012). The effect of vaccination on children's physical and cognitive development in the philippines. *Applied Economics*, 44(21):2777–2783.

Borjas, G. J. (2006). Native internal migration and the labor market impact of immigration. *Journal of Human Resources*, XLI(2):221–258.

Bundervoet, T. (2009). Health and civil war in rural Burundi. *Journal of Human Resources*, 44(2):536–563.

Camacho, A. (2008). Stress and birth weight: evidence from terrorist attacks. *American Economic Review*, 98(2):511–515.

Card, D. (2001). Immigrant Inflows, Native Outflows and the Local Labor Market Impacts of High Immigration. *Journal of Labor Economics*, XIX:22–64.

Card, D. and DiNardo, J. (2000). Do immigrant inflows lead to native outflows? *American Economic Review*, 90(2):360–367.

Carlana, M. and Tabellini, M. (2018). Happily ever after: Immigration, natives' marriage, and fertility.

Case, A. and Paxson, C. (2010). Causes and consequences of early-life health. *Demography*, 47(1):S65–S85.

Ceritoglu, E., Yunculer, H. B. G., Torun, H., and Tumen, S. (2017). The Impact of Syrian Refugees on Natives' Labor Market Outcomes in Turkey : Evidence from a Quasi-Experimental Design. *IZA Journal of Labor Policy*, 6(5):1–28.

Chakravarty, A. (2015). Gender-biased breastfeeding in egypt: Examining the fertility preference hypotheses of jayachandran and kuziemko (2011). *Journal of Applied Econometrics*, 30(5):848–855.

Clemens, M. A. and Ginn, T. (2020). Global mobility and the threat of pandemics: evidence from three centuries. *Available at SSRN 3751840*.

Commission, E. (2006). The eu facility for refugees in turkey. Technical report, European Neighbourhood Policy and Enlargement Negotiations.

Currie, J. and Almond, D. (2011). Human capital development before age five. In *Handbook of labor economics*, volume 4, pages 1315–1486. Elsevier.

Currie, J. and Vogl, T. (2013). Early-life health and adult circumstance in developing countries. *Annu. Rev. Econ.*, 5(1):1–36.

Dagnelie, O., De Luca, G. D., and Maystadt, J.-F. (2018). Violence, selection and infant mortality in congo. *Journal of health economics*, 59:153–177.

Dagnelie, O., Mayda, A.-M., and Maystadt, J.-F. (2023). Refugees, child health and malaria transmission in africa. *CEPR Discussion Paper*, 18284.

Danzer, N. and Lavy, V. (2018). Paid parental leave and children's schooling outcomes. *The Economic Journal*, 128(608):81–117.

de Chaisemartin, C. and D'Haultfœuille, X. (2020). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review*, 110(9):2964–96.

Del Carpio, X. and Wagner, M. (2015). The Impact of Syrian Refugees on the Turkish Labor Markets. *World Bank Policy Research Working Paper*, (7402).

Duflo, E. (2012). Women Empowerment and Economic Development. *journal of Economic Literature*, 50(4):1051–1079.

Ekhator-Mobayode, U. E. and Abebe Asfaw, A. (2019). The child health effects of terrorism: evidence from the boko haram insurgency in nigeria. *Applied Economics*, 51(6):624–638.

Ekmekci, P. E. (2017). Syrian refugees, health and migration legislation in turkey. *Journal of immigrant and minority health*, 19(6):1434–1441.

Elmallakh, N. and Wahba, J. (2023). Syrian Refugees and the Migration Dynamics of Jordanians: Moving In or Moving Out? *Economic Development and Cultural Change*, 71(4):1283–1330.

Erdoğan, M. M. (2014). Syrians in turkey: Social acceptance and integration. *HUGO Executive Summary and Report*.

Erten, B. and Keskin, P. (2021). Female employment and intimate partner violence: evidence from syrian refugee inflows to turkey. *Journal of Development Economics*, 150:102607.

Erten, B., Keskin, P., Omurtak, M., and Ozen, I. C. (2022). Syrian refugee inflows, health care access, and childhood vaccination in turkey. *The World Bank Economic Review*, forthcoming.

Ferris, E. and Kirisci, K. (2016). *The consequences of chaos: Syria's humanitarian crisis and the failure to protect*. Brookings Institution Press.

Frongillo Jr, E. A., de Onis, M., and Hanson, K. M. (1997). Socioeconomic and demographic factors are associated with worldwide patterns of stunting and wasting of children. *The Journal of nutrition*, 127(12):2302–2309.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.

Grossman, D., Khalil, U., and Ray, A. (2019). Terrorism and early childhood health outcomes: evidence from pakistan. *Social Science & Medicine*, 237:112453.

Ibáñez, A. M., Rozo, S. V., and Urbina, M. J. (2021). Forced migration and the spread of infectious diseases. *Journal of Health Economics*, 79:102491.

Ignis, I. O. and Tomini, S. (2022). Vaccination coverage: vaccine-related determinants & anthropometric measures in children resident in a rural community in nigeria. *Current Drug Safety*, 17(3):199–210.

Jaeger, D., Theodore, J., and Kaestner, R. (2020). A Cautionary Tale of Evaluating Identifying Assumptions: Did Reality TV Really Cause a Decline in Teenage Childbearing? *Journal of Business & Economic Statistics*, 38(2):317–326.

Jakiela, P. (2021). Simple dagnostcs for two-way fixed effects. *mimeo*.

Jayachandran, S. and Kuziemko, I. (2011). Why do mothers breastfeed girls less than boys? evidence and implications for child health in india. *The Quarterly journal of economics*, 126(3):1485–1538.

Kadigo, M. and Maystadt, J. (2023). How to cope with a Refugee Shock? Evidence from Uganda. *World Development*, forthcoming.

Kherallah, M., Alahfez, T., Sahloul, Z., Eddin, K. D., and Jamil, G. (2012). Health care in syria before and during the crisis. *Avicenna journal of medicine*, 2(03):51–53.

Köse, T., Yıldırım, J., and Tanrıvere, G. (2019). The effects of terror attacks on happiness: Evidence from turkey.

Lavy, V., Schlosser, A., and Shany, A. (2016). Out of africa: Human capital consequences of in utero conditions. Technical report, National Bureau of Economic Research.

Leblebicioglu, H. (2016). Managing health and infections in refugees: Turkey's experience. *International Journal of Infectious Diseases*, 45:56.

Leon, G. (2012). Civil conflict and human capital accumulation: The long-term effects of political violence in perú. *Journal of Human Resources*, 47(4):991–1022.

Maystadt, J.-F. and Duranton, G. (2019). The Development Push of Refugees. *Journal of Economic Geography*, 19(2):299–334.

Maystadt, J.-F., Hirvonen, K., Mabiso, A., and Vandercasteelen, J. (2019). Impacts of Hosting Forced Migrants in Poor Countries. *Annual Review of Resource Economics*, 11:439 – 459.

Maystadt, J.-F. and Verwimp, P. (2014). Winners and Losers Among a Refugee-Hosting Population. *Economic Development and Cultural Change*, 62(4):769–809.

Mei, Z. and Grummer-Strawn, L. M. (2007). Standard deviation of anthropometric z-scores as a data quality assessment tool using the 2006 who growth standards: a cross country analysis. *Bulletin of the World Health Organization*, 85:441–448.

Ministry of Interior, M. (2022). Yillara gore gecici koruma kapsamindaki suriyeliler.

Montalvo, J. G. and Reynal-Querol, M. (2007). Fighting against malaria: prevent wars while waiting for the "miraculous" vaccine. *The Review of Economics and Statistics*, 89(1):165–177.

Mosca, I., O'Sullivan, V., and Wright, R. (2017). Maternal employment and child outcomes: evidence from the irish marriage bar.

Qian, N. (2006). Quantity-quality: The positive effect of family size on school enrollment in china. *Economics Department, Brown University, Providence RI.*

Raj, A., Saggurti, N., Winter, M., Labonte, A., Decker, M. R., Balaiah, D., and Silverman, J. G. (2010). The effect of maternal child marriage on morbidity and mortality of children under 5 in india: cross sectional study of a nationally representative sample. *Bmj*, 340.

Rosenzweig, M. R. and Wolpin, K. I. (1980). Testing the quantity-quality fertility model: The use of twins as a natural experiment. *Econometrica: journal of the Econometric Society*, pages 227–240.

Ruhm, C. and Waldfogel, J. (2012). Long-term effects of early childhood care and education. *Nordic Economic Policy Review*, 1(1):23–51.

Savas, N., Arslan, E., Inandi, T., Yeniçeri, A., Erdem, M., Kabacaoğlu, M., and ALIŞKIN, Ö. (2016). Syrian refugees in hatay/turkey and their influence on health care at the university hospital. *Int J Clin Exp Med*, 9(9):18281–18290.

Tatah, L., Delbiso, T. D., Rodriguez-Llanes, J. M., Gil Cuesta, J., and Guha-Sapir, D. (2016). Impact of refugees on local health systems: a difference-in-differences analysis in cameroon. *PLOS one*, 11(12):e0168820.

Taylor, J., Filipski, M., and Alloush, M. (2016). Economic impact of refugees. *Proceedings of the National Academy of Sciences*, 113(27):7449–53.

Tumen, S. (2018). The impact of low-skill refugees on youth education. *Available at SSRN 3273708*.

UNHCR (2011). *UNHCR Global Trends 2012*. United Nations High Commission for Refugees.

UNHCR (2022). Syria emergency. Technical report, United Nations High Commissioner for Refugees.

United Nations High Commissioner for Refugees (2021). *Global Trends: Forced Displacement in 2020*. Geneva.

Vorsina, M., Manning, M., Fleming, C. M., Ambrey, C. L., and Smith, C. (2017). The welfare cost of terrorism. *Terrorism and Political Violence*, 29(6):1066–1086.

Wahba, J. (2014). Immigration, emigration, and the labor market in jordan. *The Jordanian Labour Market in the New Millennium*, 172:1–22.

WHO (2006). Child growth standards. Technical report, World Health Organization, Situation Report Numbered 7.

WHO (2012). Syrian arab republic unrest. Technical report, Situation Report Numbered 7.

WorldBank (2015). Supply and Demand for Child Care Services in Turkey. Technical report, World Bank - Technical Papers.

Appendix A Tables

Table A.1: Summary Table - Province Characteristics

	(1)	(2)	(3)
	Entire Period	Before Syrian Crisis	After Syrian Crisis
	(2003-2018)	(2003-2011)	(2013-2018)
Number of Refugees (in thousands)	12.026	0	30.104
	(54.181)	(0)	(82.535)
Native Population (in thousands)	915.748	873.662	978.876
	(161.366)	(150.637)	(176.214)
Total Population (in thousands) [1]	928.172	873.662	1.010.105
	(163.172)	(150.637)	(181.303)
Doctors per 1,000 inhabitant	1.34	1.23	1.50
	(0.50)	(0.50)	(0.45)
Nurses per 1,000 inhabitant	1.59	1.44	1.99
	(0.54)	(0.41)	(0.47)
Midwives per 1,000 inhabitant	0.81	0.80	0.82
	(0.32)	(0.33)	(0.32)
Hospital Beds per 1,000 inhabitant	2.40	2.27	2.61
	(0.90)	(0.90)	(0.86)
Hospitals per 1,000 inhabitant	2.33	2.28	2.40
	(1.00)	(0.98)	(1.01)
Terrorism Index	0.15	0.04	0.31
	(0.82)	(0.30)	(1.23)
Public Expenditure per 1,000 inhabitant	344.426	224.319	524.957
	(401.450)	(347.532)	(409.697)
Observation	1,215	729	486

Notes: The data on population and number of hospitals are obtained from Turkish Statistical Institute (TSI) (2022). The data on public budget comes from Presidential Strategy and Budget department. The data on terrorism are gathered from Global Terrorism Database (GTD). Year 2012 is excluded. [1] Native and refugee population.

Table A.2: Relationship between Refugee Flows and province Attributes

Dep. Var.	(Log) Number of Refugees			
Model	OLS			
	(1)	(2)	(3)	(4)
(Log) Native Population	0.1204***	0.1194**	0.1028*	0.1067
	(0.0442)	(0.0470)	(0.0485)	(0.0504)
(Log) Number of Hospitals per 1,000 inhabitant	-0.0266	-0.0315	-0.0282	-0.0281
	(0.0214)	(0.0212)	(0.0212)	(0.0214)
(Log) Public Expenditure per 1,000 inhabitant	-0.0612	-0.0092	-0.0098	-0.0102
	(0.1578)	(0.0065)	(0.0067)	(0.0069)
Terrorism Index	0.0395	0.0203	0.0204	0.0271
	(0.0247)	(0.0178)	(0.0186)	(0.0302)
Observations	1,215	1,215	1,215	1,170
Year FE	Y	Y	Y	Y
province FE	Y	Y	Y	Y
Region trends	N	Y	N	N
Region-year FE	N	N	Y	N
Exclude Ankara, Istanbul, and Izmir	N	N	N	Y

Notes: The data on population and number of hospitals are obtained from Turkish Statistical Institute (TSI) (2022). The data on Public Budget comes from Presidential Strategy and Budget department. The data on terrorism is obtained from Global Terrorism Database (GTD). Year 2012 is excluded from the analysis due to the unavailability of refugee data. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.3: Effect of Refugees on Children's WAZ (Excluding 2012)

Dep. Var.	Weight-for-Age z-scores (WAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.0127	-0.0022	-0.0134	0.2166***	0.2511***	0.2374***
	(0.0574)	(0.0621)	(0.0604)	(0.0799)	(0.0802)	(0.0814)
Elasticity	0.0006	-0.0001	-0.0006	0.0107	0.0124	0.0117
Kleibergen-Paap rk Wald F				19.07	24.83	26.25
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0129	-0.0030	-0.0162	0.2097***	0.2401***	0.2233***
	(0.0652)	(0.0693)	(0.0667)	(0.0750)	(0.0754)	(0.0763)
Elasticity	0.000639	-0.000147	-0.000800	0.0104	0.0119	0.0110
Kleibergen-Paap rk Wald F				19.35	25.62	26.95
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	-0.0102	-0.0191	-0.0394	0.1640**	0.1934***	0.1525**
	(0.0574)	(0.0636)	(0.0578)	(0.0720)	(0.0734)	(0.0744)
Elasticity	-0.0005	- 0.0009	-0.0019	0.0081	0.0095	0.0075
Kleibergen-Paap rk Wald F				18.31	24.39	24.33
Observations	5,613	5,613	5,613	5,613	5,613	5,613
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.4: Effect of Refugees on Children's HAZ

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Refugee Share (IHS)					
Refugee Share (IHS)	0.0454	0.0243	0.0193	0.5133***	0.6515***	0.6669***
	(0.0286)	(0.0333)	(0.0322)	(0.1675)	(0.1873)	(0.1852)
Elasticity	0.00169	0.000903	0.000717	0.0191	0.0243	0.0248
Kleibergen-Paap rk Wald F				18.08	24.25	24.15
Panel B	province-level controls					
(Log) public Expenditure per 1,000 inhabitant	0.1465**	0.1364**	0.1575**	0.2079***	0.2347***	0.2344***
	(0.0587)	(0.0622)	(0.0666)	(0.0518)	(0.0617)	(0.0645)
(Log) Number of Hospitals	1.4655***	1.4249***	1.4614***	0.8545***	0.9021**	0.8330**
	(0.2402)	(0.2379)	(0.2432)	(0.3248)	(0.3693)	(0.3873)
Terrorism Index	0.1412	0.1395	0.1517	0.1296	0.0908	0.0743
	(0.1685)	(0.1699)	(0.1941)	(0.1702)	(0.1688)	(0.1836)
Panel C	Individual- and Household- level controls					
Female	0.0401	0.0406	0.0389	0.0443	0.0433	0.0419
	(0.0380)	(0.0377)	(0.0376)	(0.0391)	(0.0386)	(0.0389)
Female Household Head	0.1220	0.1225	0.1225	0.1171	0.1152	0.1162
	(0.1016)	(0.1017)	(0.1016)	(0.1004)	(0.1017)	(0.1025)
Mother Education (Base: No Edu/Primary Incomplete)						
Primary Complete	0.1026	0.0967	0.0968	0.0885	0.1018	0.1052
	(0.0749)	(0.0757)	(0.0756)	(0.0780)	(0.0773)	(0.0765)
Secondary Complete	0.2380***	0.2380***	0.2362***	0.2323***	0.2323***	0.2333***
	(0.0885)	(0.0883)	(0.0878)	(0.0887)	(0.0897)	(0.0884)
Complete High School/Higher	0.2257*	0.2263*	0.2250*	0.1915	0.1846	0.1875
	(0.1174)	(0.1159)	(0.1165)	(0.1210)	(0.1206)	(0.1203)
Rural	-0.0721	-0.0714	-0.0752	-0.0532	-0.0554	-0.0571
	(0.0852)	(0.0844)	(0.0847)	(0.0837)	(0.0830)	(0.0839)
Wealth Index (Base: Poorest)						
Poorer	0.2226***	0.2222***	0.2154***	0.2221***	0.2254***	0.2175***
	(0.0601)	(0.0600)	(0.0605)	(0.0611)	(0.0629)	(0.0636)
Middle	0.4992***	0.4975***	0.4904***	0.6373***	0.5293***	0.5206***
	(0.0780)	(0.0780)	(0.0770)	(0.1176)	(0.0785)	(0.0762)
Rich	0.6099***	0.6104***	0.6035***	0.6373***	0.6410***	0.6254***
	(0.1198)	(0.1192)	(0.1199)	(0.1176)	(0.1175)	(0.1192)
Richest	0.6122***	0.6113***	0.6020***	0.6324***	0.6383***	0.6181***
	(0.0846)	(0.0834)	(0.0828)	(0.0863)	(0.0881)	(0.0880)
Total Number of (Older) Siblings	-0.0366***	-0.0356***	-0.0359***	-0.0381***	-0.0408***	-0.0414***
	(0.0133)	(0.0134)	(0.0134)	(0.0131)	(0.0132)	(0.0131)
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. The coefficients of child's month of birth, mother's age, mother's age square exhibit expected signs, and the results available upon request. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.5: Effect of Refugees on Children's (Biologically Plausible) HAZ

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.1005***	0.0757**	0.0872**	0.6024***	0.7970***	0.8236***
	(0.0327)	(0.0325)	(0.0366)	(0.1770)	(0.2042)	(0.2042)
Elasticity	0.00363	0.00273	0.00315	0.0218	0.0288	0.0297
Kleibergen-Paap rk Wald				18.94	24.98	26.35
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0954**	0.0714*	0.0799*	0.5991***	0.8005***	0.8233***
	(0.0393)	(0.0392)	(0.0430)	(0.1715)	(0.2030)	(0.2029)
Elasticity	0.00345	0.00258	0.00288	0.0216	0.0289	0.0297
Kleibergen-Paap rk Wald F				19.25	25.70	27.01
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	0.0505*	0.0437	0.0429	0.5189***	0.7135***	0.7236***
	(0.0267)	(0.0330)	(0.0314)	(0.1601)	(0.1910)	(0.1860)
Elasticity	0.00182	0.00158	0.00155	0.0187	0.0258	0.0261
Kleibergen-Paap rk Wald F				17.94	24.04	23.99
Observations	5,308	5,308	5,308	5,308	5,308	5,308
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.6: Effect of Refugees on Children's HAZ (Excluding 2012) (Without IHS Transformation)

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share	0.1005***	0.0553*	0.0658*	0.2733***	0.2427***	0.2790***
	(0.0361)	(0.0312)	(0.0352)	(0.0842)	(0.0688)	(0.0774)
Kleibergen-Paap rk Wald F				41.69	49.79	48.89
Panel B	With individual and household controls					
Refugee Share	0.0961**	0.0961**	0.0584	0.2731***	0.2731***	0.2731***
	(0.0431)	(0.0431)	(0.0411)	(0.0829)	(0.0829)	(0.0829)
Kleibergen-Paap rk Wald F				41.44	41.44	41.44
Panel C	With province-level, individual, and household controls					
Refugee Share	0.0460	0.0243	0.0192	0.2006***	0.2052***	0.1992***
	(0.0291)	(0.0335)	(0.0321)	(0.0765)	(0.0738)	(0.0704)
Kleibergen-Paap rk Wald F				38.69	48.13	43.77
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.7: Effect of Refugees on Children's HAZ (Excluding 2012), NUTS-1 level (12-Region)

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.0991***	0.0610	0.0750	0.6404***	0.9842***	1.0689***
	(0.0325)	(0.0426)	(0.0518)	(0.1970)	(0.2666)	(0.2812)
Elasticity	0.00369	0.00227	0.00279	0.0238	0.0366	0.0398
Kleibergen-Paap rk Wald F				19.07	23.43	24.21
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0959**	0.0548	0.0636	0.6198***	0.9718***	1.0533***
	(0.0387)	(0.0480)	(0.0560)	(0.1845)	(0.2623)	(0.2782)
Elasticity	0.00357	0.00204	0.00237	0.0231	0.0362	0.0392
Kleibergen-Paap rk Wald F			19.41	24.12	24.69	
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	0.0454	0.0574	0.0555	0.5133***	0.8243***	0.8716***
	(0.0286)	(0.0487)	(0.0521)	(0.1675)	(0.2345)	(0.2404)
Elasticity	0.00169	0.00214	0.00207	0.0191	0.0307	0.0325
Kleibergen-Paap rk Wald F				18.08	23.04	22.74
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
NUTS-1 Region trends	N	Y	N	N	Y	N
NUTS-1 Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.8: Effect of Refugees on Children's HAZ (Excluding 2012), NUTS-2 level (26 Regions)

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.0991***	0.1104**	0.1556**	0.6404***	1.3209***	1.5802***
	(0.0325)	(0.0430)	(0.0663)	(0.1970)	(0.3100)	(0.3446)
Elasticity	0.00369	0.00411	0.00579	0.0238	0.0492	0.0588
Kleibergen-Paap rk Wald F				19.07	27.38	30.02
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0959**	0.1029*	0.1387*	0.6198***	1.3093***	1.5731***
	(0.0387)	(0.0538)	(0.0741)	(0.1845)	(0.3092)	(0.3502)
Elasticity	0.00357	0.00383	0.00517	0.0231	0.0488	0.0586
Kleibergen-Paap rk Wald F				19.41	27.98	29.69
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	0.0454	0.1290***	0.1557***	0.5133***	1.1131***	1.2934***
	(0.0286)	(0.0407)	(0.0463)	(0.1675)	(0.2843)	(0.3142)
Elasticity	0.00169	0.00480	0.00580	0.0191	0.0414	0.0482
Kleibergen-Paap rk Wald F				18.08	25.32	24.89
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
NUTS-2 Region trends	N	Y	N	N	Y	N
NUTS-2 Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.9: Effect of Refugees on Children's HAZ (Including 2012)

Dep. Var.	Height-for-Age z-scores (HAZ)					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	0.0906***	0.0477*	0.0634*	0.5707***	0.6673***	0.7422***
	(0.0285)	(0.0280)	(0.0322)	(0.1774)	(0.1886)	(0.2030)
Elasticity	0.0035	0.0018	0.0024	0.0219	0.0257	0.0285
Kleibergen-Paap rk Wald F				19.23	24.69	26.64
Panel B	With individual and household controls					
Refugee Share (IHS)	0.0897**	0.0487	0.0597	0.5666***	0.6694***	0.7371***
	(0.0357)	(0.0341)	(0.0373)	(0.1680)	(0.1824)	(0.1946)
Elasticity	0.00345	0.00187	0.00229	0.0218	0.0257	0.0283
Kleibergen-Paap rk Wald F				19.62	25.49	27.51
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	0.0480*	0.0280	0.0236	0.4772***	0.5898***	0.6262***
	(0.0287)	(0.0339)	(0.0323)	(0.1542)	(0.1710)	(0.1735)
Elasticity	0.0019	0.0011	0.0009	0.0183	0.0227	0.0241
Kleibergen-Paap rk Wald F				19.16	25.43	25.78
Observations	5,892	5,892	5,892	5,892	5,892	5,892
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.10: Placebo Test for Effect of Refugees on Children's HAZ Using Pre-Immigration Data

Dep. Var.	Height-for-Age z-scores (HAZ), Pre-treatment					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Without controls					
Refugee Share (IHS)	-0.4429	-0.4582	-0.4582	-0.9507	-0.9547	-0.9547
	(0.2847)	(0.3311)	(0.3311)	(0.8414)	(0.8702)	(0.8702)
Elasticity	-0.0205	-0.0212	-0.0212	-0.0440	-0.0442	-0.0442
Kleibergen-Paap rk Wald F				31.03	33.00	33.00
Panel B	With individual and household controls					
Refugee Share (IHS)	-0.4461	-0.4673	-0.4673	-0.7466	-0.7431	-0.7431
	(0.2920)	(0.3560)	(0.3560)	(0.8387)	(0.8625)	(0.8625)
Elasticity	-0.0206	-0.0216	-0.0216	-0.0346	-0.0344	-0.0344
Kleibergen-Paap rk Wald F				31.24	33.54	33.54
Panel C	With province-level, individual, and household controls					
Refugee Share (IHS)	-0.2893	-0.3821	-0.3821	-0.4512	-0.4529	-0.4529
	(0.3462)	(0.3820)	(0.3820)	(1.0191)	(0.9762)	(0.9762)
Elasticity	-0.0134	-0.0177	-0.0177	-0.0209	-0.0210	-0.0210
Kleibergen-Paap rk Wald F				45.27	42.50	42.50
Observations	1,590	1,590	1,590	1,590	1,590	1,590
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: The data come from the TDHS-2008 and -2013. The sample is restricted to children born between 2008 and 2011. 2015-2018 values of the refugee share and the distance instrument are assigned to 2008-2011 sample. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.11: Pre-immigration Residual Trends in HAZ on the 2016-Instrument across Regions (Year < 2012

Model	Without Controls			With Controls I			With Controls II		
Controls Include				Indv and HH			Province, Indv, HH		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A	5 Region-level Analysis								
Instrument in 2016	-0.1054**	-0.0307	-0.0317	-0.0857**	-0.0140	-0.0124	0.0135	0.0445	0.0518
	(0.0455)	(0.0450)	(0.0449)	(0.0349)	(0.0337)	(0.0336)	(0.0589)	(0.0585)	(0.0597)
Panel B	NUTS-1 Region-level Analysis								
Instrument in 2016	-0.1054**	-0.0262	-0.0258	0.0135	-0.0128	-0.0101	0.0135	0.0212	0.0286
	(0.0455)	(0.0451)	(0.0449)	(0.0589)	(0.0344)	(0.0344)	(0.0589)	(0.0568)	(0.0575)
Panel C	NUTS-2 Region-level Analysis								
Instrument in 2016	-0.1054**	-0.0533	-0.0539*	-0.0857**	-0.0367	-0.0344	0.0135	-0.0202	-0.0115
	(0.0455)	(0.0332)	(0.0318)	(0.0349)	(0.0263)	(0.0261)	(0.0589)	(0.0337)	(0.0345)
Observations	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217	3,217
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). Each cell shows the estimates for the slope coefficient from a regression of residual trends of the dependent variable (i.e., HAZ) on the value of the instrument in 2016, where the residuals are obtained after regressing the dependent variable on a set of individual-specific control variables. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Time varying province controls include (log) public expenditure per 1,000 inhabitant, number of hospitals per 1,000 inhabitant, and terrorism index. The table presents the estimated coefficient, the standard error clustered at the 81 province-level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.12: Effect of Refugees on Migration Patterns (Excluding 2012)

Model	2SLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	(Log) Inflow			(Log) Outflow		
IHS Refugee Share	-0.4135	-0.2149	-0.1583	0.0244	0.2008	0.1490
	(0.3425)	(0.2946)	(0.2935)	(0.2269)	(0.2262)	(0.2355)
Elasticity	-0.00329	-0.00171	-0.00126	0.000193	0.00160	0.00118
Kleibergen-Paap rk Wald F	17.14	17.67	16.99	17.14	17.67	16.99
Observations	810	810	810	810	810	810
Panel B	(Log) Inflow					
	Low Education			High Education		
IHS Refugee Share	0.0615	0.3389*	0.3047	-0.5261	-0.4619	-0.4058
	(0.2156)	(0.1918)	(0.2269)	(0.4333)	(0.4059)	(0.4214)
Elasticity	5.01e-05	0.000276	0.000248	-0.000414	-0.000364	-0.000320
Kleibergen-Paap rk Wald F	15.06	16.81	15.94	12.83	13.23	12.84
Observations	255	255	255	555	555	555
Panel C	(Log) Outflow					
	Low Education			High Education		
IHS Refugee Share	0.0096	-0.1044	-0.1679	0.0803	0.3976	0.2785
	(0.2367)	(0.2508)	(0.2771)	(0.2555)	(0.3016)	(0.3099)
Elasticity	7.63e-06	-8.34e-05	-0.000134	6.33e-05	0.000313	0.000219
Kleibergen-Paap rk Wald F	15.06	16.81	15.94	12.83	13.23	12.84
Observations	255	255	255	555	555	555
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y
Controls	Y	Y	Y	Y	Y	Y

Notes: Information on the migration (i.e., inflow and outflow) is obtained from Turkish Statistical Institute (TSI) for the period of 2008-2018. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Education data, referring to the average years of education by province, also comes from TSI. The average years of education at the province level is 7.30 with a min (max) of 5.10 (9.96) years. Therefore, we split the sample as "High Education" and "Low Education" where "High Education" refers to equal and/or more than 7.30 years and "Low Education" refers to lower than 7.30 years. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.13: Effect of Refugees on Selective Marriage and Fertility

Model	2SLS					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Age at First Birth			Age at First Marriage		
Refugee Share (IHS)	-0.4096	-0.3304	-0.3444	-0.2019	-0.1528	-0.1618
	(0.2506)	(0.2821)	(0.2807)	(0.1926)	(0.2182)	(0.2183)
Elasticity	-0.0002	-0.0001	-0.0002	-0.0001	-8.38e-05	-8.88e-05
Kleibergen-Paap rk Wald F	19.12	25.42	26.73	19.12	25.42	26.73
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Panel B	Maternal Age at First Birth					
	Edu≥12 Years			Edu<12 Years		
Refugee Share (IHS)	-0.2426	-0.4960	-0.4849	-0.5070	-0.4170	-0.4247
	(1.0141)	(1.3591)	(1.2910)	(0.3258)	(0.3512)	(0.3435)
Elasticity	-0.0001	-0.0002	-0.0002	-0.0003	-0.0002	-0.0002
Kleibergen-Paap rk Wald F	8.12	12.86	13.70	20.03	27.08	28.77
Observations	636	636	636	4,705	4,705	4,705
Panel C	Maternal Age at Marriage					
	Edu$\geq 12 Years$			Edu<12 Years		
Refugee Share (IHS)	-0.4583	-0.8576	-0.8377	-0.2623	-0.1927	-0.1944
	(0.8781)	(1.1869)	(1.1194)	(0.2242)	(0.2403)	(0.2352)
Elasticity	-0.0002	-0.0004	-0.0004	-0.0001	-0.0001	-0.0001
Kleibergen-Paap rk Wald F	8.12	12.86	13.70	20.03	27.08	28.77
Observations	636	636	636	4,705	4,705	4,705
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y
Controls	Y	Y	Y	Y	Y	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. The set of controls include mother's education (not in Panel B and Panel C), whether the mother reside rural area, being a female headed household, and wealth index as control variables. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.14: Effect of Refugees on Selective Mortality

Dep. Var.	Ever had Miscarriage			Ever had Abortion			Ever had Stillbirth		
Model	2SLS								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Refugee Share (IHS)	0.0803	0.0904	0.0904	0.0610	0.0484	0.0484	-0.0145	0.0024	0.0024
	(0.0657)	(0.0657)	(0.0657)	(0.0425)	(0.0471)	(0.0471)	(0.0359)	(0.0306)	(0.0306)
Kleibergen-Paap rk Wald F	13.89	14.44	14.44	13.89	14.44	14.44	13.89	14.44	14.44
Observations	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. The set of controls include mother's age, mother's age square, mother's education, whether the mother reside rural area, being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.15: Effect of Refugees on Selective Mortality by Education

Model	2SLS					
	Edu≥12 Years			Edu<12 Years		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Ever had Miscarriage					
Refugee Share (IHS)	0.4952	0.5147	0.5147	0.0500	0.0554	0.0554
	(0.5041)	(0.5493)	(0.5493)	(0.0774)	(0.0679)	(0.0679)
Kleibergen-Paap rk Wald F	7.68	11.29	11.29	14.09	14.65	14.65
Observations	310	310	310	3,415	3,415	3,415
Panel B	Ever had Abortion					
Refugee Share (IHS)	-0.3106	-0.3901	-0.3901	0.0759*	0.0641	0.0641
	(0.3499)	(0.3684)	(0.3684)	(0.0451)	(0.0478)	(0.0478)
Elasticity	-0.0346	-0.0435	-0.0435	0.00863	0.00729	0.00729
Kleibergen-Paap rk Wald F	7.68	11.29	11.29	14.09	14.65	14.65
Observations	310	310	310	3,415	3,415	3,415
Panel C	Ever had Stillbirth					
Refugee Share (IHS)	-0.0335	-0.0064	-0.0064	-0.0136	0.0039	0.0039
	(0.0361)	(0.0232)	(0.0232)	(0.0384)	(0.0318)	(0.0318)
Kleibergen-Paap rk Wald F	7.689	11.29	11.29	14.09	14.65	14.65
Observations	310	310	310	3,415	3,415	3,415
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y
Controls	Y	Y	Y	Y	Y	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The full sample is for the 2003–2018 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings, being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.16: Effect of Refugees on Investment in Healthcare Resources (In Numbers and Per Capita Terms, Excluding 2012)

Dep. Var.	Healthcare Resources											
Model	OLS			2SLS			OLS			2SLS		
	Doctor			Doctor			Nurse			Nurse		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A	In numbers											
Refugee Share (IHS)	1.0464***	0.7475***	0.8774***	1.0142***	0.6748***	0.9578***	1.5432***	1.1650***	1.2447***	1.9395***	1.4085***	1.5942***
	(0.1453)	(0.1553)	(0.1656)	(0.2039)	(0.2289)	(0.2288)	(0.1406)	(0.1679)	(0.1564)	(0.2828)	(0.2781)	(0.2882)
Elasticity	0.00127	0.000906	0.00106	0.00123	0.000818	0.00116	0.00182	0.00138	0.00147	0.00229	0.00166	0.00188
Kleibergen-Paap rk Wald F				16.80	17.29	16.81				16.80	17.29	16.81
	Midwives			Midwives			Hospital Beds			Hospital Beds		
Panel B	In numbers											
Refugee Share (IHS)	0.7503***	0.6079***	0.7064***	0.8837***	0.7969***	0.9028***	1.6740***	1.1055**	1.1503**	2.1918***	1.4714**	1.6573**
	(0.1298)	(0.1633)	(0.1529)	(0.1825)	(0.2255)	(0.2420)	(0.5906)	(0.5071)	(0.5366)	(0.7044)	(0.6195)	(0.7046)
Elasticity	0.000989	0.000801	0.000931	0.00116	0.00105	0.00119	0.00186	0.00123	0.00128	0.00244	0.00164	0.00185
Kleibergen-Paap rk Wald F				16.80	17.29	16.81				16.80	17.29	16.81
	Doctor			Doctor			Nurse			Nurse		
Panel C	Per 1,000 Inhabitant											
Refugee Share (IHS)	-0.8256***	-0.9091***	-0.8572***	-0.9585***	-1.0325***	-0.9078***	-1.0997***	-1.2196***	-1.2339***	-0.7239**	-1.1091**	-1.1355**
	(0.1433)	(0.1483)	(0.1546)	(0.2673)	(0.2838)	(0.2540)	(0.2978)	(0.3140)	(0.3501)	(0.3540)	(0.4718)	(0.4927)
Elasticity	-0.00478	-0.00516	-0.00496	-0.00572	-0.00593	-0.00535	-0.00502	-0.00575	-0.00592	-0.00309	-0.00512	-0.00539
Kleibergen-Paap rk Wald F				16.80	17.29	16.81				16.80	17.29	16.81
	Midwives			Midwives			Hospital Beds			Hospital Beds		
Panel D	Per 1,000 Inhabitant											
Refugee Share (IHS)	-0.4158***	-0.4600***	-0.4127***	-0.2585*	-0.3093	-0.2826	-0.2811	-0.9147	-0.9316	0.7233	-0.1380	-0.0286
	(0.0661)	(0.1227)	(0.1214)	(0.1550)	(0.2173)	(0.2283)	(0.6534)	(0.5945)	(0.6138)	(1.0136)	(0.9692)	(1.0534)
Elasticity	-0.00406	-0.00449	-0.00403	-0.00253	-0.00302	-0.00276	-0.000922	-0.00300	-0.00306	0.00237	-0.000453	-9.37e-05
Kleibergen-Paap rk Wald F				16.80	17.29	16.81				16.80	17.29	16.81
Observations	1,215	1,215	1,215	1,215	1,215	1,215	1,215	1,215	1,215	1,215	1,215	1,215
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y	N	N	Y

Notes: Information on the healthcare resources variables is obtained from Turkish Statistical Institute (TSI). The full sample is for the 2003–18 period, excluding 2012, at the 81-province level. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Standard errors, given in parentheses, are clustered at the province level *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.17: Effect of Refugees on Employment, Household Wealth, and Time with Offspring

Dep. Var.	Probability of Working					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	With individual, and household controls					
Refugee Share (IHS)	-0.0089	-0.0066	-0.0105	-0.0318*	-0.0426**	-0.0505**
	(0.0075)	(0.0076)	(0.0087)	(0.0184)	(0.0216)	(0.0220)
Kleibergen-Paap rk Wald F				19.41	25.96	27.24
Dep. Var.	Household Wealth Index					
Panel B	With individual, and household controls					
Refugee Share (IHS)	-0.0601	-0.0563	-0.0446	-0.0272	-0.0126	-0.0084
	(0.0434)	(0.0472)	(0.0460)	(0.0614)	(0.0708)	(0.0767)
Elasticity	-0.0003	-0.0002	-0.0002	-0.0001	-5.27e-05	-3.51e-05
Kleibergen-Paap rk Wald F				19.30	25.80	27.14
Dep. Var.	Time with Offspring					
Panel C	With individual, and household controls					
Refugee Share (IHS)	0.0040	-0.0020	-0.0006	0.0346*	0.0451	0.0506*
	(0.0085)	(0.0080)	(0.0082)	(0.0189)	(0.0280)	(0.0297)
Kleibergen-Paap rk Wald F				19.41	25.96	27.24
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, being a female headed household, and wealth index (not in wealth index regression). Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.18: Effect of Refugees on Employment, Household Wealth, and Time with Offspring by Education

Dep. Var.	Probability of Working											
Model	OLS			2SLS			OLS			2SLS		
	Edu$\geq 12 Years$			Edu$\geq 12 Years$			Edu<12 Years			Edu<12 Years		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A	With individual, and household controls											
Refugee Share (IHS)	0.0741**	0.1000**	0.0908*	0.0615	0.1033	0.1156	-0.0124	-0.0094	-0.0141	-0.0469**	-0.0567**	-0.0677**
	(0.0311)	(0.0464)	(0.0486)	(0.0976)	(0.1174)	(0.1056)	(0.0138)	(0.0148)	(0.0163)	(0.0203)	(0.0265)	(0.0283)
Kleibergen-Paap rk Wald F				8.336	12.04	12.74				20.52	28.13	29.83
Dep. Var.	Household Wealth Index											
Panel B	With individual, and household controls											
Refugee Share (IHS)	-0.1934*	-0.1065	-0.0953	0.0898	0.3970	0.4600*	-0.0556*	-0.0567	-0.0469	-0.0426	-0.0420	-0.0460
	(0.1079)	(0.1090)	(0.1039)	(0.1913)	(0.2453)	(0.2727)	(0.0298)	(0.0355)	(0.0373)	(0.0569)	(0.0672)	(0.0729)
Elasticity	-0.000512	-0.000282	-0.000252	0.000238	0.00105	0.00122	-0.000252	-0.000257	-0.000213	-0.000193	-0.000191	-0.000209
Kleibergen-Paap rk Wald F				7.602	10.72	11.27				20.41	27.87	29.59
Dep. Var.	Time Spent at Home											
Panel C	With individual, and household controls											
	0.0226	0.0351	0.0435	0.1058	0.2433	0.2535	0.0123	0.0054	0.0067	0.0265	0.0390	0.0427*
	(0.0518)	(0.0616)	(0.0641)	(0.1207)	(0.1984)	(0.1967)	(0.0101)	(0.0088)	(0.0091)	(0.0174)	(0.0233)	(0.0247)
Elasticity	0.0005	0.0008	0.0010	0.0023	0.0053	0.0055	0.0002	7.66e-05	9.47e-05	0.0004	0.0005	0.0006
Kleibergen-Paap rk Wald F				8.335	12.04	12.74				20.52	27.24	29.83
Dep. Var.	Children's HAZ											
Panel D	With province-level, individual, and household controls											
Refugee Share (IHS)	0.0660	0.0231	-0.0103	0.5263	0.5112*	0.5421	0.0415	0.0174	0.0147	0.5342***	0.6648***	0.6911***
	(0.2093)	(0.2202)	(0.2260)	(0.4722)	(0.5131)	(0.4859)	(0.0392)	(0.0451)	(0.0439)	(0.1780)	(0.2031)	(0.2010)
Elasticity	0.0039	0.0013	-0.0006	0.0461	0.0623	0.0604	0.0012	0.0005	0.0004	0.0164	0.0204	0.0212
Kleibergen-Paap rk Wald F				7.84	10.87	11.51				19.74	27.24	27.80
Observation	636	636	636	636	636	636	4,705	4,705	4,705	4,705	4,705	4,705
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, being a female headed household, and wealth index (not in wealth index regression). Individual survey weights are used in each specificat the meanion. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.19: Effect of Refugees on Receiving Antenatal and Postnatal Care

Dep. Var.	(Log) Number of Antenatal Care Visits					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	With individual, and household controls					
Refugee Share (IHS)	0.0006	-0.0261**	-0.0115	0.1093***	0.0724*	0.0990**
	(0.0124)	(0.0131)	(0.0117)	(0.0397)	(0.0419)	(0.0447)
Elasticity	3.12e-06	-0.0001	-6.38e-05	0.0006	0.0004	0.0005
Kleibergen-Paap rk Wald F				19.33	25.86	27.16
Observations	5,323	5,323	5,323	5,323	5,323	5,323
Dep. Var.	Probability of Receiving Postnatal Care two months within birth					
Panel B	With individual, and household controls					
Refugee Share (IHS)	0.0198***	-0.0011	0.0007	0.0478***	0.0057	0.0070
	(0.0065)	(0.0051)	(0.0055)	(0.0151)	(0.0112)	(0.0111)
Kleibergen-Paap rk Wald F				19.42	26	27.29
Observations	5,336	5,336	5,336	5,336	5,336	5,336
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.20: Effect of Refugees on Receiving Antenatal and Postnatal Care by Education

Dep. Var.	(Log) Number of Antenatal Care Visits											
Model	OLS			2SLS			OLS			2SLS		
	Edu$\geq 12 Years$			Edu$\geq 12 Years$			Edu<12 Years			Edu<12 Years		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A	With individual, and household controls											
Refugee Share (IHS)	0.0242	0.0388	0.0454	0.1646	0.1599	0.1377	-0.0065	-0.0331***	-0.0180	0.1110***	0.0783*	0.1069**
	(0.0682)	(0.0671)	(0.0675)	(0.1390)	(0.1523)	(0.1340)	(0.0127)	(0.0113)	(0.0124)	(0.0364)	(0.0426)	(0.0466)
Elasticity	0.0001	0.0002	0.0002	0.0007	0.0007	0.0006	-3.73e-05	-0.0002	-0.0001	0.0006	0.0004	0.0006
Kleibergen-Paap rk Wald F				7.73	10.35	11.04				20.52	28.18	29.88
Observations	634	634	634	634	634	634	4,689	4,689	4,689	4,689	4,689	4,689
Dep. Var.	Probability of Receiving Postnatal Care two months within birth											
Panel B	With individual, and household controls											
Refugee Share (IHS)	-0.0224*	-0.0205	-0.0211	-0.0143	-0.0004	-0.0007	0.0216***	-0.0007	0.0014	0.0525***	0.0074	0.0090
	(0.0128)	(0.0130)	(0.0140)	(0.0118)	(0.0153)	(0.0157)	(0.0077)	(0.0058)	(0.0061)	(0.0174)	(0.0126)	(0.0124)
Kleibergen-Paap rk Wald F				8.33	12.04	12.74				20.54	28.19	29.90
Observations	636	636	636	636	636	636	4,700	4,700	4,700	4,700	4,700	4,700
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.21: Effect of Refugees on Total Births per woman and Probability of Vaccine Completion

Dep. Var.	Total Births per Woman					
Model	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	With individual, and household controls					
Refugee Share (IHS)	0.0328	0.0522	0.0609*	0.2364***	0.3635***	0.3842***
	(0.0335)	(0.0333)	(0.0342)	(0.0710)	(0.1032)	(0.1050)
Elasticity	0.000139	0.000221	0.000258	0.00100	0.00154	0.00163
Kleibergen-Paap rk Wald F				19.44	25.99	27.29
Observations	5,341	5,341	5,341	5,341	5,341	5,341
Dep. Var.	Hapatitus B Completion					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B	With individual, and household controls					
Refugee Share (IHS)	-0.0001	-0.0096	-0.0136*	-0.0637***	-0.1179***	-0.1283***
	(0.0097)	(0.0076)	(0.0074)	(0.0208)	(0.0315)	(0.0347)
Kleibergen-Paap rk Wald F				20.64	27.77	29.17
Observations	2,689	2,689	2,689	2,689	2,689	2,689
Dep. Var.	Tuberculosis (BCG) Completion					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel C	With individual, and household controls					
Refugee Share (IHS)	-0.0323***	-0.0362***	-0.0382***	-0.0865***	-0.1299***	-0.1309***
	(0.0064)	(0.0076)	(0.0090)	(0.0211)	(0.0334)	(0.0334)
Kleibergen-Paap rk Wald F				20.17	26.14	27.75
Observations	3,217	3,217	3,217	3,217	3,217	3,217
Dep. Var.	Measles Completion					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel D	With individual, and household controls					
Refugee Share (IHS)	-0.0068	-0.0101	-0.0081	-0.1415**	-0.2231***	-0.2439***
	(0.0182)	(0.0158)	(0.0175)	(0.0613)	(0.0821)	(0.0945)
Kleibergen-Paap rk Wald F				19.49	28.92	29.06
Observations	2,352	2,352	2,352	2,352	2,352	2,352
Year FE	Y	Y	Y	Y	Y	Y
province FE	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y

Notes:Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. It should be noted that the vaccination questions are only available for children aged 0-36 months (under 3-year of age). The doses and completion dates of vaccines differ, so the sample sizes for each outcome do. Hepatitis B vaccine has three doses: at birth, end of 1-month of age, and end of 6-month of age. Therefore, Hepatitis B regressions consider children aged between 6-36 months. Tuberculosis vaccine has one dose at 2-month of age. Thus, Tuberculosis regressions consider only children aged between 2-36 months.Measles vaccine has one dose at 9-month of age. Hence, Measles regressions consider only children aged between 9-36 months. Individual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings (not in total births per woman regression), being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

Table A.22: Effect of Refugees on the Total Births per Woman and Vaccine Completion by Education

Dep. Var.	Total Number of Births											
Model	OLS Edu$\geq 12 Years$			2SLS Edu$\geq 12 Years$			OLS Edu<12 Years			2SLS Edu<12 Years		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A	With individual, and household controls											
Refugee Share (IHS)	0.1359	0.1416*	0.1484*	0.2310	0.4280**	0.4361**	0.0434	0.0592	0.0696	0.2765***	0.4028***	0.4285***
	(0.0871)	(0.0840)	(0.0841)	(0.1492)	(0.1968)	(0.1944)	(0.0429)	(0.0429)	(0.0448)	(0.0819)	(0.1148)	(0.1176)
Kleibergen-Paap rk Wald F				8.287	12.10	12.84				20.55	28.10	29.80
Observations	636	636	636	636	636	636	4,705	4,705	4,705	4,705	4,705	4,705
Dep. Var.	Hepatitis B											
Panel B	With individual, and household controls											
Refugee Share (IHS)	0.0414	0.0012	-0.0011	-0.0801	-0.3104	-0.3241	0.0018	-0.0058	-0.0109	-0.0712***	-0.1207***	-0.1321***
	(0.0361)	(0.0418)	(0.0394)	(0.1139)	(0.2394)	(0.2422)	(0.0132)	(0.0109)	(0.0117)	(0.0247)	(0.0359)	(0.0388)
Kleibergen-Paap rk Wald F				5.890	5.923	6.246				19.27	26.30	28.72
Observations	328	328	328	342	342	342	2,347	2,347	2,347	2,347	2,347	2,347
Dep. Var.	Tuberculosis (BCG)											
Panel C	With individual, and household controls											
Refugee Share (IHS)	-0.0287***	-0.0377***	-0.0267**	-0.0781**	-0.1576**	-0.1284*	-0.0377***	-0.0426***	-0.0469***	-0.0999***	-0.1497***	-0.1512***
	(0.0097)	(0.0127)	(0.0125)	(0.0371)	(0.0714)	(0.0706)	(0.0090)	(0.0101)	(0.0115)	(0.0259)	(0.0379)	(0.0377)
Kleibergen-Paap rk Wald F				7.334	7.842	8.330				18.77	24.73	26.76
Observations	390	390	390	405	405	405	2,812	2,812	2,812	2,812	2,812	2,812
Dep. Var.	Measles											
Panel D	With individual, and household controls											
Refugee Share (IHS)	-0.0671	-0.0692	-0.0715	-0.1890	-0.3962*	-0.4707**	-0.0030	-0.0041	-0.0008	-0.1597**	-0.2419***	-0.2634**
	(0.0590)	(0.0652)	(0.0669)	(0.1165)	(0.2145)	(0.2329)	(0.0218)	(0.0192)	(0.0219)	(0.0701)	(0.0919)	(0.1054)
Kleibergen-Paap rk Wald F				7.719	9.694	11.86				16.94	24.01	24.58
Observations	269	269	269	287	287	287	2,064	2,064	2,064	2,065	2,065	2,065
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region trends	N	Y	N	N	Y	N	N	Y	N	N	Y	N
Region-year FE	N	N	Y	N	N	Y	N	N	Y	N	N	Y

Notes: Data come from Turkish Demographic and Health Survey (TDHS). The sample includes mothers in 81 provinces in the 2003–2018 period excluding year 2012. The 2SLS model instruments the refugee share utilizing a distance-based instrument. ndividual and household controls include child's sex, child's month of birth, mother's age, mother's age square, mother's education, whether the mother reside rural area, total number of older siblings (not in total births per woman regression), being a female headed household, and wealth index. Individual survey weights are used in each specification. Standard errors, clustered at the 81-province level, are in parentheses. *** denotes statistical significance at the 1 percent level ($p < 0.01$), ** at the 5 percent level ($p < 0.05$), and * at the 10 percent level ($p < 0.10$), all for two-sided hypothesis tests.

INSTITUT DE RECHERCHE
ÉCONOMIQUES ET SOCIALES

Place Montesquieu 3
1348 Louvain-la-Neuve

ISSN 1379-244X D/2023/3082/17