The Impacts of Syrian Refugees on Natives' Health Outcomes*

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Abstract

This paper investigates the causal effects of the massive Syrian refugee inflow on natives' health outcomes using the Turkish Income and Living Conditions Survey data. We deal with the reverse causality and endogeneity problems arising from refugees' location preferences by implementing a two-stage least squares estimation method using a distance-based instrument. We find that refugee inflow improved the health status of high-skilled males, while the effect is ambiguous for the group of low-skilled native males. We cannot find any significant effect for females. We also investigate the potential channels through which the refugees can affect natives' health outcomes and show evidence that the improvements in high-skilled males' working conditions and reduced probability of finding a job for low-skilled males when they are not employed drive our results.

JEL Classification: I18, J15, O15

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1 Introduction

More than 80 million people worldwide were forcibly displaced and 86 percent were hosted in developing countries by the end of 2020 (UNHCR, 2020). The growing number of immigrants is associated with a high incidence of threats to locals' living standards.[1] On the other hand, relatively little research is conducted to examine the relationship between migration and health. Previous studies primarily focused on economic migrants and health outcomes in developed countries. Using German Socio-Economic Panel Data, Giuntella and Mazzonna (2015) show that a higher share of unskilled immigrants in the labor market increases the likelihood that residents report better health outcomes by sorting natives into safer occupations. Bellés-Obrero et al. (2021) show that the inflow of immigrants to Spain induced natives to pursue less manual-intensive occupations and reduced workplace accidents among Spanish-born workers. Similarly, Dillender and McInerney (2020) show that Mexican immigration to the United States shifted natives to safer jobs resulting in fewer workers' compensation benefits claims. Some papers establish the health implications of the displaced populations through alternative channels. Escarce and Rocco (2018) demonstrate that immigration improves physical and mental health and reduces mortality among older natives in Europe. The mechanism underlying these beneficial health effects is that the increasing supply of immigrants provides low-cost personal and household services. In a developing country context, Baez (2011) provides evidence on adverse health consequences of the refugee inflow from Burundi and Rwanda on local children living close to refugee camps in Tanzania by using chronic morbidity and infant mortality as indicators of health measures. Contributing to this literature, in this paper, we investigate the effects of Syrian refugees on natives' health outcomes in Turkey.

The Syrian Civil War began in the Spring of 2011 and led to a massive refugee influx. By the end of 2020, 6.7 million refugees, of which Turkey welcomed 3.6 million under the temporary protection regime, were displaced to neighboring countries. An open-door policy for the refugees and free access to public services differentiate Turkey from many refugee-hosting countries. Cultural similarities and the generous welcoming policy of the Turkish government contribute to this massive refugee influx. While Syrians initially lived in camps in border provinces, over time, they started to move out of camps and scattered to cities or towns that were better in terms of the labor market opportunities and living conditions.

In this paper, we investigate the effect of large-scale refugee inflow on the well-being of natives in the context of a middle-income country and explore the main causal channels using two differ-

[1] The strong impact of refugee inflow on alternative measures of welfare has been addressed in abundant literature; see e.g. Tumen (2016), Borjas (2017), and Aksu et al. (2018) for labor market implications, Foged and Peri (2016), Akgündüz and Torun (2020), and Altındağ et al. (2020) for task content and productivity, Alix-Garcia and Saah (2010) and Balkan and Tumen (2016) for price effects, Tumen (2021) for the educational outcomes, and Akay et al. (2014) and Betz and Simpson (2013) for effects on natives' well-being.

ent health measures: (i) *self-assessed health status*, (ii) *chronic diseases*. For this purpose, we use Turkstat Income and Living Conditions Survey for the 2006-2019 period and combine it with the data on the ratio of refugees to natives provided by the Directorate General of Migration Management. Our empirical analysis exploits the regional variations in exposure to the inflow of Syrian refugees to identify the impact on natives' health outcomes. To take into account the non-random allocation of immigrants across provinces, we use the distance-based instrument as in Aygün et al. (2021).[2]

The massive refugee influx can affect natives' health outcomes through different channels. Firstly, refugees might overcrowd the health system through which natives' health outcomes might be affected. Turkey granted access to public health services to all registered Syrian refugees free of charge. Additionally, unregistered Syrians can use preventive and emergency services for free (Aygün et al., 2021). Considering the fact that Syrian refugees spend a long period of time on travel before reaching their host countries, the poor travel conditions, together with the poor health status of a growing number of refugees (especially the youngest and the elderly)[3], the pressure on health services might have an adverse effect on natives' health.

The labor market channel is the second channel through which the massive influx of refugees can affect locals' health outcomes. Until 2016, Syrian refugees did not have access to the formal labor market. In 2016, Turkey introduced a work permit system for refugees, which was an important step to include refugees in the Turkish economy. Yet, only a small percentage of Syrians were granted work permits. Limited skills and the young age held by most Syrian refugees push them into the informal labor market.[4] The high incidence of informality in Turkey is another factor contributing to the refugees' strong attachment to informal jobs.[5] Given the intense competition between the host population and refugees in the labor market, natives might lose their jobs or face a wage reduction that will eventually cause poor quality of life and result in stress-related diseases and physical health problems. On the other hand, an increase in the supply of informal labor might upgrade working conditions and reduce injuries or any work-related diseases of natives. Therefore, the overall effect of refugee influx on natives' health through the labor market channel is not clear, and it might change according to natives' education levels or employment status.

[2]They refine the instrument by Del Carpio and Wagner (2015) by accounting for four neighboring countries (Turkey, Lebanon, Jordan, and Iraq) as a final destination that might eventually affect the size of the refugee inflow to Turkey.

[3]According to a recent survey of Syrian refugees living in Turkey, 15.2% of respondents reported having chronic diseases with 56.6% among elders (Mipatrini et al., 2019). Another survey implemented by the Ministry of Health finds that almost 59% of the Syrian refugees are at high risk of non-communicable diseases (Balcilar, 2016).

[4]There is a large literature on the impact of Syrian refugees on local population's labor market outcomes in Turkey; see, e.g, Aksu et al. (2018), Ceritoglu et al. (2017), Del Carpio and Wagner (2015), Tumen (2016), Akgündüz and Torun (2020), Altındağ et al. (2020), and Cengiz and Tekgüç (2021).

[5]According to a recent report by the TURKSTAT, by the end of 2020, the rate of unregistered employment is 31.0%.

Our results show that refugee inflow does not have any significant effect on the probability of having chronic illnesses in the total sample. However, it has a significant impact on the self-assessed health status of being good or very good. Our sub-sample analysis, according to gender, level of education and employment status, shows interesting patterns. Syrian refugees have a positive effect on high-skilled[6] natives' health outcomes which is driven by the male sample. We show that a 10 percentage point (ppt) increase in the refugee to native ratio increases the probability of having good health by 3.59 ppt (4.1%) and decreases the probability of having chronic illnesses by 2.93 ppt (18%). For the low-skilled natives, a different picture emerges: refugee inflow has an adverse effect on their health outcomes, the probability of having chronic illness increases, which is again driven by the male sample. We find the largest adverse effect in the sample of males who are not employed. A 10 ppt increase in the refugee to native ratio decreases having good health status of unemployed males by 4.12 ppt (6.4 %) and increases the probability of having chronic illnesses by 6.76 ppt (13.8 %).

We investigate the two possible mechanisms, labor market and overcrowding in the health system, that can explain our results. We, first, investigate the labor market channel. To check the labor market adjustments as a particular channel, we implement our analysis in the group of employed individuals. Our results in this group show that the positive effect for high-skilled males is larger in magnitude and more precisely estimated in the employed sample. Hence, we argue that the complementarity of tasks between natives and refugees explains the improvement in locals' health status as supported by the findings of Akgündüz and Torun (2020). They find that refugee inflow decreases routine and manual intensities of jobs high-skilled natives perform, while the abstract intensities of their jobs increases.

For the low-skilled males, the probability of having chronic illnesses increases. This finding points the importance of the refugees' effect on job loss or job finding probabilities of low-skilled natives. Therefore, we investigate whether refugee inflow has any effect on natives job loss/finding probabilities. First, focusing on the sample of individuals who were unemployed before the survey year, we find that refugee inflow reduces their job-finding probabilities. Therefore, we argue that Syrians might deteriorate the health outcomes of low-skilled native males by decreasing their probability of finding a new job if they are unemployed.

Next, we investigate whether the overcrowding in the health system has the potential to explain our results. We show that the refugee influx increases the likelihood of natives reporting that the reason for having unmet medical needs is not being able to make an appointment if they have any unmet medical need. This effect is observed in total, female and male samples. Additionally, we observed similar effects for low and high skilled males. The fact that we do not find any effect of

[6]We define high-skilled individuals as high school graduates and above and, low-skilled individuals as those who did not complete secondary education.

refugees on the health outcomes of females supports the hypothesis that the labor market channel drive our results. As crowding in the health system would affect all individuals independent of gender, if it were the channel, we should have found a health effect in the female sample, too. Therefore, overcrowding in the health system cannot be the mechanism that leads to our results.

Our paper is most closely related to Aygün et al. (2021) that investigate the refugee inflow on the health infrastructure and the mortality outcomes of natives using province-level data in Turkey. While their instrumental variable estimates indicate no evidence on the effects of refugees on natives' mortality for any age group, they observe a decline in health-care resources. We complement their findings by showing that refugees have an effect on self-reported health outcome and chronic illnesses. Additionally, our heterogeneous findings for different subgroups highlight the importance of subgroup analysis which may reveal different patterns. [7]

Our paper, also, contributes to the broad literature that investigate the possible effects of voluntary immigrants on locals health consequences in high-income countries (Bauer et al. (1998), Dillender and McInerney (2020), Bellés-Obrero et al. (2021), Escarce and Rocco (2018), Baez (2011), Giuntella and Mazzonna (2015), Akay et al. (2014)). We complement this literature by presenting evidence of a previously explored mechanism in the context of a middle-income country that provides unlimited access to health care services and suffers from a refugee-induced labor supply shock.

The organization of the paper is as follows: The next section gives the background information and describes the data. Section 3 introduces the conceptual framework. We explain the methodology in Section 4, report the results in Section 5, and investigate the mechanisms of our results in Section 6. We implement several robustness checks to verify our findings in Section 7. Section 8 concludes the paper.

2 Background and Data

With the start of the Syrian civil war in March 2011, Syrians began to flee to neighboring countries, Turkey, Lebanon, Jordan and Iraq. As Turkey had an "open-door policy" for the refugees, Syrians could enter Turkey without visas. Additionally, in October 2011, the Turkish government announced that Syrians would be given "temporary protection" status, a right to health, education, and work for those under protection (Erdoğan, 2020). Therefore, as of 2020, out of 6.7 million Syrian refugees registered in the neighboring countries, 3.6 million of them reside in Turkey. The vast majority of those living outside camps live mainly in the Turkish border provinces and other major cities in Turkey. In comparison, only 1% of Syrians live in Temporary Accommodation

[7] In a related study İkizler et al. (2020) document an increase in the unmet health-care needs of natives due to the massive refugee influx.

Centers (Migrants' Presence Monitoring Annual Report 2020).

The government of Turkey introduced a work permit system for Syrian refugees in 2016. However, it was very difficult to obtain work permits as the employer must request the permit, requiring them to pay the minimum wage. A document released by UNHCR in 2020 reports that the total number of Syrian citizens who declared a work permit in Turkey was only 132,497.

Table 1 documents the differences between Syrian refugees and natives in terms of background characteristics. Table 1 shows that Syrian refugees are younger and less educated than the natives. These two factors lead employment of refugees in low-paying jobs that tend to be highly exploitative and physically demanding (Orrenius and Zavodny, 2009).

In this paper, we use the 2006-2019 Income and Living Conditions Survey (SILC) microdata set conducted by the Turkish Statistical Institute (TURKSTAT) to determine how Syrian refugees affect the health outcomes of natives. The SILC is collected to produce data on income distribution, relative poverty based on income, living conditions, and social exclusion. The Survey is a household-based cross section and representative at the NUTS-1 level. It consists of Individual and Household questionnaires. The Individual questionnaires cover all individuals over 15 years old who live in a household and contain information on a broad range of socio-economic indicators. The SILC also provides information on several health outcomes. Specifically, respondents were asked about their health status with the following questions: (i) *How is your health in general?* The possible answers are (1) Very good, (2) Good, (3) Fair, (4) Bad, and (5) Very Bad. We define a binary variable "Healthy" that is equal to 1 for those individuals who responded "Very Good" or "Good" and 0 otherwise.[8] (ii) *Do you suffer from any a chronic (long-standing) illness or condition?*[9] The second variable we define, "Chronic" is an indicator of having any chronic illness.

We combine these micro-level data sets on natives with data on the number of Syrians across the 81 provinces of Turkey from 2012 to 2019. The second data source is provided by the Directorate General of Migration Management.[10]

We restrict our sample to individuals aged between 20 and 54. After dropping observations with missing values, the final sample consists of around 420,000 observations. Table 2 presents the descriptive statistics of the variables used in our analysis. We report them separately before and after the arrival of refugees, i.e., for the period of 2006-2011 and 2012-2019. The table shows

[8]Self-assessed health status has been shown to a good predictor of health deterioration such as mortality or multiple morbidities (Mossey and Shapiro, 1982, Idler and Benyamini, 1997, Bailis et al., 2003, Franks et al., 2003).

[9]Turkey Health Survey Micro Data Set, a comprehensive dataset containing information, considers the following illnesses as chronic diseases: asthma, bronchitis, heart attack, hypertension, stroke, arthrosis, low back disorder, neck disorder, diabetes, allergy, cirrhosis of the liver, urinary incontinence, kidney problems, depression, high cholesterol, alzheimer, coeliac, drug abuse, down syndrome, and autism.

[10]We have the residential location of respondents in SILC at the NUTS-1 level. Therefore, we aggregate the information on the number of refugees at the NUTS-1 level to match with our main data set.

that, on average, natives are relatively healthier following the refugee inflow. When the outcome is defined as a relatively objective measure of health, individuals are more likely to report suffering from a chronic disease over time. These differences are statistically different between the two periods. Furthermore, there are significant differences between the average education level of individuals, education level increased. Also, the unemployment rate declined. Therefore, it requires a refined analysis to understand whether natives are relatively better in their health outcomes after the refugee inflow.

We created a variable, the ratio of immigrants to natives, to investigate the effect of refugees on natives' health outcomes. There is substantial variation in the ratio of immigrants to natives across regions and over time. Figure 1 depicts the ratio of refugees to the native population in 2013, 2016, and 2019 where darker shades represent a larger share. In 2013, the vast majority were located in the provinces closer to the Syrian border. Over time, they flee to other industrialized cities such as Mersin, Adana, İstanbul, Bursa, and İzmir. This documents the importance of considering the geographical distance to the main migration points in our empirical analysis.

3 Conceptual Framework

In this section, we discuss the potential channels through which forced migrants can affect the locals' health outcomes. Refugees and migrants might pose a threat to natives by transmitting infectious diseases from one location to another. Especially undocumented immigrants from less developed countries show a higher prevalence of infections (López-Vélez et al., 2003, Parenti et al., 1987, Akresh and Frank, 2008, Grove and Zwi, 2006). Besides, refugees living in poor conditions might place a high burden on the host country's health system by high utilization of healthcare services (Aygün et al., 2021). Therefore, we would expect that the refugee flow might have a detrimental effect on natives' health.

The second channel is the labor market consequences of a refugee supply shock. Natives living in areas with a high concentration of refugees might lose their job or face a wage reduction depending on the degree of substitutability between native workers and migrants.[11] We would expect that unemployment, a stressful life event, causes poor health (Strully, 2009, Hamilton et al., 1997, Gerdtham and Johannesson, 2003). On the other hand, immigrants are more likely to work in risky jobs that do not require any educational qualifications or language skills (Orrenius and Zavodny, 2009). Therefore, native workers tend to specialize in abstract tasks that are less physically strenuous (Akgündüz and Torun, 2020) and relate to better health outcomes (Giuntella and Mazzonna, 2015). Considering those channels through which the refugee inflow can affect the health outcomes of local citizens, the overall effect depends on which effect dominates. In addition, the

[11] See Becker and Ferrara (2019) and Verme and Schuettler (2021) for a review of the literature.

effect may differ across different groups according to the education level, employment status, or the type of work of natives. Therefore, in our empirical analysis, we investigate the heterogeneity of the effects of refugees on natives' health outcomes.

4 The Empirical Methodology

We exploit the variation in the ratio of refugees to natives between 2006 and 2019 to estimate the impact of refugee inflow on natives' health outcomes. We use the following equation:

$$Y_{ipt} = \psi + \alpha Ratio_{pt} + X_{ipt}{}'\beta + \gamma Z_{pt} + \delta_p + \delta_t + \theta_{rt} + \varepsilon_{ipt} \tag{1}$$

where Y_{ipt} is the health outcome of the individual i at time t in region p, which denotes regions at the NUTS-1 level (12 regions). We define two health outcomes: (1) being healthy (Healthy), a variable taking the value of one if the individual reports having good or very good health, and (2) chronic illness (Chronic) is equal to one if the individual suffers from a chronic illness or condition. $Ratio_{pt}$ is the ratio of refugees to the natives in region p at time t.

X_{ipt} is a vector of individual and household characteristics used as control variables in the model, including age intervals fixed effects[12], an indicator for gender, dummies for three education categories (less than primary education (omitted), primary, secondary, and tertiary education), a dummy for the marital status, and household size. The assumption that the allocation of refugees is random might be problematic if macroeconomic trends affect their dispersion. We also add region fixed effects δ_p and survey year fixed effects δ_t. Region fixed effects control for the time invariant factors that can affect natives' health outcomes. The year fixed effects capture the changes in health inputs at the national level over time.

The use of regional variations in the migrant-to-native ratio may give biased estimates of the effects of refugees on natives' health outcomes for the following reasons. First, following the refugee influx, natives may move to non-treated regions. If internally displaced people are healthier than stayers, this generates a negative bias.[13] Second, refugees tend to locate in regions with better economic conditions and quality of health services which would cause our estimates to be biased. To overcome the issue of endogeneity, we use a distance based instrument employed in Aygün et al. (2021). Our instrument is defined as follows

[12] Until 2010, SILC provided age groups at five year intervals.

[13] In the Robustness Section, we show that refugees do not have a significant effect on the probability of changing location among natives.

$$I_{pt} = \sum_{s=1}^{13} \frac{\left(\frac{1}{d_{s,T}}\right)\pi_s}{\left(\frac{1}{d_{s,T}} + \frac{1}{d_{s,L}} + \frac{1}{d_{s,J}} + \frac{1}{d_{s,I}}\right) d_{p,s}} \frac{T_t}{d_{p,s}} \tag{2}$$

where I_{pt} is the expected number of refugees received in NUTS-1 region p at time t and $d_{s,T}$, $d_{s,L}$, $d_{s,J}$, and $d_{s,I}$ stand for the travel distance from Syrian province s to the closest point of entry in four neighboring countries: Turkey, Lebanon, Jordan, and Iraq, respectively. π_s is the pre-war population share in Syrian province s, $d_{p,s}$ is the distance of Turkish region p[14] to Syrian province s, and T_t is the total number of refugees in four neighboring countries at a given point time t. The instrument proxies the sum of the expected number of migrants across Syrian provinces for each Turkish NUTS-1 region at time t. In the next section, we present our results using both specifications separately.

The main parameter of interest can be interpreted as the causal effect under the assumption that trends in health outcomes would be similar across the regions without the refugee inflow. In order to test the identification assumption, we conduct a formal hypothesis of the common trend assumption using the approach adopted by Aksu et al. (2018). We use three different specifications for the control and treatment regions, as in Tumen (2021). In the first specification, the control area consists of regions 10 and 11, while the treated one is region 12. For the second specification, regions 8, 9, 10, and 11 are included in the control region, while the treatment group covers regions 6 and 12. The final specification assigns treatment to regions 1, 6, and 12, while the control group includes regions 2, 3, 4, 5, 7, 8, 9, 10, and 11. In Figure A1, we present the ratio of refugees to the native population in these regions over time. We test the equality of linear trends between the treatment and control groups by aggregating the health outcomes and testing for differential pre-treatment trends in those samples. Table 3 shows that parallel trends do not hold for almost half of the outcomes. Therefore, as argued by Aygün et al. (2021), we include five region-year fixed effects (θ_{rt}) to account for existing differential trends in the outcome where r denotes regions at the 5 region level.[15]

5 Results

We, first, estimate equation 1 for the total sample, as well as female and male samples for the two health outcome variables: "Being healthy" and "Having chronic illness". Table 4 presents

[14]The cities with higher GDP are considered to be the capital of each NUTS-1 region.

[15]The five regions are defined as follows: West (NUTS-1 regions 1 to 4), Central (NUTS-1 regions 5 and 7), South (NUTS-1 region 6), North (NUTS- 1 regions 8 and 9) and East (NUTS-1 regions 10 to 12).

these results. In columns (1) and (3), we present ordinary least square estimation results where health outcome is regressed on the ratio of immigrants to natives and other control variables we explained in the previous section. These results show that the impact of the refugee inflow on natives' health outcomes is ambiguous as the ratio of refugees to the native population increases, the probability of suffering from a chronic illness increases. At the same time, natives are more likely to report that they feel healthy following the refugee flow.

As we mentioned earlier, OLS results are biased due to endogeneity and reverse causality problems; therefore, these estimates do not provide a causal relationship. In order to get the causal effect of the refugee inflow on natives' health outcomes, we use the instrument adopted in Aygün et al. (2021) and introduced in the previous section as a proxy for the geographical concentration of immigrants. In Table A1, we present the first-stage results. As Table A1 shows, the expected number of migrants is a strong predictor of the immigrants to natives ratio. F-statistics are far larger than the acceptable threshold of ten (Staiger and Stock, 1994), ensuring that our instrument is sufficiently strongly correlated with the endogenous variable.

We present the IV results for the total sample in the second and fourth columns of Table 4.[16] The IV results suggest that the refugee-to-native ratio has no significant effect on having chronic illnesses; however, it has a positive impact on being healthy which is marginally significant in the total sample. However, when we run the regression separately for males and females, the significant relationship between being healthy and the refugee share disappears for the female sample.

As we explained in Section 3, the effects of refugees might differ according to the natives' education levels, employment status, or type of work they perform. To explore the heterogeneity of these results in different sub-samples, first, we present the IV estimation results by dividing the sample by employment status and education level in Table 5. The first two columns show the estimated effects for the pooled sample of males and females, and the next columns present the estimates for males and females, respectively. In each panel, we present the results for different sub-samples. The first two panels show the employed individuals who are regular or casual employees, employer, self-employed, or unpaid family workers, and their counterparts who are not working (not employed). In the next panel, we present the results for unemployed individuals who are not working but are actively looking for a job. Then, we split the sample according to the education level of individuals: high-skilled (have at least a high school degree) and low-skilled (have less than a high school degree) individuals. This analysis allows us to investigate whether the impact of immigration on health outcomes differs across subgroups.

The results in Table 5 show that for the sample of employed natives, the coefficient of the "Healthy" variable is significant and positive in the male sample. In the sample of not employed

[16] In Table A2, we present the coefficient of other control variables for being healthy and having any chronic illness.

and unemployed males, a consistent result emerges: the refugee-to-native ratio has a negative impact on health outcomes. As the refugee-to-native ratio increases, the probability of being healthy decreases and having a chronic illnesses increases. Similarly, for the low-skilled natives, refugee inflow has a negative impact on health outcomes; however, the effect is smaller relative to the unemployed/not employed sample. On the other hand, a different result is observed for the high-skilled sample: Refugees have a positive impact on high skilled natives' health outcomes which is driven by the high skilled male sample. Estimated coefficients are insignificant and relatively smaller for female natives than male counterparts.

6 Mechanisms

6.1 Labor Market

The evidence of deteriorating health outcomes of the low-skilled, unemployed and not employed individuals and improved health outcomes of high-skilled individuals highlight the importance of the labor market status and its health implications. Therefore, we argue that the adjustments in the labor market might be the causal channel that led to these results. Akgündüz and Torun (2020) find that refugee inflow decreases routine and manual intensities of jobs high skilled natives perform, while the abstract intensities of their jobs increase. Therefore, the effect of refugees on high-skilled native males' work conditions might drive our results. On the other hand, the worse health status of least educated or inactive natives might be attributed to job losses or struggles to find a job following the refugee inflow. We construct "Job Loss" and "Job Finding" indicators considering these channels. We define the job loss variable as one if the respondent does not work currently but is looking for a job, zero otherwise in the sample of individuals who spent at least one month at full-time or part-time employment one year ago. In Table 6, we present the effect of the refugees to natives ratio on this variable for high/low-skilled individuals. We observe a negative but insignificant impact on the probability of job separation among low-skilled males.

Then, we focus on the sample of respondents who spent at least one month in unemployment in the previous year and define the job finding variable as one if the individual is employed in the survey year and zero otherwise. We repeat the same analysis for the job finding variable. As reported in Table 7, the refugee inflow significantly reduced the job finding probability of low-skilled males. It is not surprising to find negative effects among low-skilled males because they are more likely to work in manual jobs and immigrants are substitutes for them. The effect is positive for the high-skilled males, but it is statistically insignificant. These findings suggest that the arrival of refugees might deteriorate natives' health by decreasing their chance of finding a job when they are unemployed. Supporting this argument Ceritoglu et al. (2017), Del Carpio and Wagner (2015),

and Aksu et al. (2018) show that refugee inflow leads to a reduction in the employment of Turkish male workers in the informal labor market.

Throughout our analysis, we do not find significant effects among females. Caro (2020) shows that only a small percentage of women among Syrian refugees (11.2%) is active in the labor market, so we expect that they are less likely to have any effect on native females' labor market outcomes.

As discussed above, the observed differences in the health outcomes among natives might be attributed to the reallocation of job-related tasks or substitution to another jobs. As refugees tend to concentrate on physically demanding jobs, native workers are more likely to be employed in abstract and safer tasks. To test the relevance of this channel, we present the regression results conditional on being employed in Table 8. We present the results for four samples of employed individuals: those who are working in blue collar or white collar jobs [17] and those with at least a high school degree (high-skilled) and lower than a high school degree (low-skilled).

In Table 8, we find significant and positive health effects for high-skilled individuals and those working in white collar jobs. The positive effect is driven by the male sample. In particular, we find that a 10 percentage points increase in the refugees to native ratio leads to a 5.1 percentage points (6%) rise in self-assessed health outcomes and a reduction in risk of having chronic illness by 3.8 percentage points (25%) for high skilled employed males. Our findings are supported by the findings of Akgündüz and Torun (2020) that employment and abstract intensities of high-skilled rise while routine and manual intensities fall.[18] They also find that the task intensities of low educated are not affected.[19]

6.2 Overcrowding in the Health System

Our results suggest a negative health impact of the refugee inflow on those who attained less than high school. Aygün et al. (2021) provide evidence that refugees have an adverse effect on per capita healthcare resources. Therefore, poorer health outcomes of low-skilled individuals might also be associated with difficulties in getting access to health resources. To explore this particular channel, we focus on individuals who have an unmet need for medical or dental examination or treatment during the last 12 months. We focus on this group because our data do not allow us to

[17] White collar includes managers, professionals, technicians and associate professionals and clerical support workers. Blue-collar includes skilled agricultural and fishery workers, trade workers, plant and machine operators, and elementary occupations.

[18] Our results are similar to Dillender and McInerney (2020) that show that Mexican immigrants in the U.S. improved workplace safety. This effect is concentrated among native workers with high school degrees or college. They also argue that the smaller estimates among low-skilled workers are due to the inability to shift to jobs with the fewer physical requirement. Similarly, Giuntella et al. (2019) find that immigration reduces the average physical burden of UK-born workers with a high school degree but no evidence among those with low skill. This demonstrates that the effects are largest among those natives who can easily displace to another job.

[19] The improvement in health outcome for the high level of educational attainment might also be attributed to the positive wage effects of the Syrian Migration on high skilled natives (Cengiz and Tekgüç, 2021).

identify whether individuals applied to a health institution and met their needs or simply did not apply. Focusing on this group, we would like to understand whether the reason for unmet needs is not being able to make an appointment on time. These reasons might be related to overcrowding in the health system. To get treatment, individuals have to wait a long time. We use the survey question that asks the reason for unmet need for a medical or dental examination, and construct the "Crowding" variable equal to one if the respondents state the main reason for unmet need is giving too late appointment and zero otherwise. We estimate the same model in equation 1 with the dependent variable "Crowding". Our results in Table 9 show that refugee inflow has a significant effect on overcrowding in each subgroup. Given that we do not observe any health effects for the female sample and differential effects on the high-skilled and low-skilled male samples, overcrowding in the health system is less likely to be the mechanism that leads to our results. Therefore, we argue that the labor supply channel is the main driver of the effects of refugees on natives' health in the Turkish setting.

7 Robustness Checks

In this section, we present additional analysis to check the robustness of our results. Our findings would be biased estimates of the effects of refugees on natives' health if refugee inflow affected natives' immigration probability. To address this concern, we define an additional outcome variable equal to one if the individual switched to another residence before the survey year and checked whether refugee inflow affected migration patterns. Table 10 presents the refugee impact on the switching residence variable for the overall sample and sub-samples divided by gender, employment status, and skill levels. Our results do not reveal any evidence that the refugee inflow affects internal migration.[20] Therefore, we can conclude that our results do not suffer from sample selection bias.

Second, we re-estimate our regression excluding the Istanbul region to see if the results are driven by the Istanbul region. It is the economic capital of Turkey and hosts the largest number of Syrian refugees, and many refugees live in Istanbul despite being registered in other cities. Table 11 shows that estimated effects of the refugee inflow on natives' health are very similar for the male sample, while coefficients are larger in magnitudes for females compared to estimates in Table 8. Overall, our results are not driven by Istanbul region.

[20]The results presented here could be interpreted as upper bound estimates of the true impacts since the respondent is considered to move no matter if she moved to another district or city.

8 Conclusion

By the end of 2020, 6.7 million Syrians have left their country to seek asylum. Turkey welcomed 3.6 million Syrian refugees under the temporary protection regime. This sudden large-scale migration significantly altered host countries' social and economic structures. In this context, as an alternative measure of possible welfare implications, we analyze the impact of refugees on the health of natives using the Income and Living Conditions Survey data set. We use two-stage least squares estimation method and a distance-based instrument to account for the endogeneity of the refugees' location choices.

Our results suggest that refugee inflow improved the health outcomes of high-skilled male workers. However, low-skilled males experienced health deterioration because of the refugee inflow. We cannot find any effect for females. We estimate that 10 percentage points increase in the refugee-to-native ratio increases the probability of stating a good health condition by 3.59 ppt (4.1%) and reduces the risk of having chronic illness by 2.9 ppt (18%) for high skilled males. For low-skilled males, 10 percentage points increase in the refugee-to-native ratio increases the probability of having chronic illness by 2 ppt (8%).

We also investigate the mechanisms through which refugees affect the natives' health outcomes. In particular, we focus on two channels: Labor supply and overcrowding in the health system. Dividing our sample according to the employment status of individuals, we show that the negative effects are mostly generated by males who are not working while the positive effect is pronounced the most in high-skilled employed males. Therefore, we argue that the complementarity of tasks between natives and refugees explains the improvement in high-skilled natives' health status as supported by the findings of Akgündüz and Torun (2020). We also find evidence that the refugee inflow decreases the probability of finding a job when native males are not employed.

Our results in overcrowding in the health system show that the refugee influx increases the likelihood of natives reporting that the reason for having unmet medical needs is not being able to make an appointment if they have an unmet medical need. We find significant effects in total, female and male samples. Therefore, we argue that overcrowding in the health system cannot be the mechanism that leads to our results. If it were the channel, we would expect to find a health effect in the female sample as well. So, the effects of refugees on labor market outcomes drive our results.

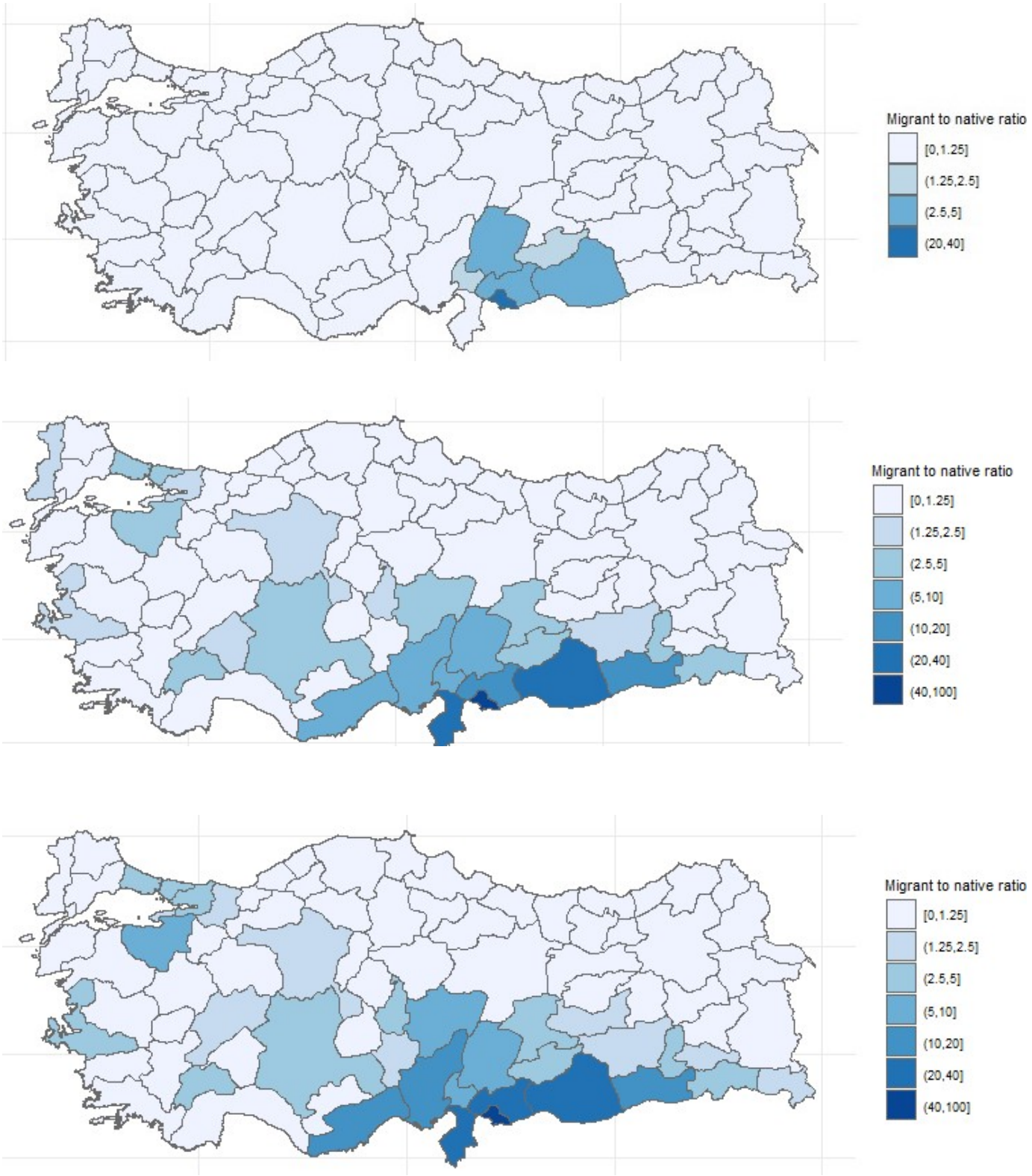
We show that refugees affect natives' welfare; therefore, government policies should take the health dimension into account. Especially health deterioration among disadvantaged groups should not be neglected.

Table 1: Background Characteristics of Syrian Refugees and Natives in Turkey

	Syrian Refugees	Natives
Gender:		
Male	0.54	0.50
Age:		
0-14	0.41	0.23
15-64	0.58	0.68
65+	0.02	0.09
Education:		
Illiterate	0.33	0.03
No Degree (literate)	0.13	0.11
Primary Educ.	0.17	0.4
Lower-Sec.	0.07	0.12
Upper-Sec. or Higher	0.06	0.33
Unknown	0.27	0.01
Total	3,576,370	83,154,997

Notes:Retrieved from Erdoğan (2020) and Turkstat.

Figure 1: Syrian refugees in Turkey, 2013, 2016 and 2019



Source:Ministry Interior of Turkey and Turkstat.

Table 2: Descriptive Statistics

	2006-2011		2012-2019		Differences	
	Mean	SD	Mean	SD	Mean	SD
Healthy	0.705	(0.456)	0.747	(0.435)	0.042***	(0.001)
Chronic Illness	0.239	(0.427)	0.265	(0.441)	0.025***	(0.001)
Aged 20-24	0.155	(0.361)	0.135	(0.342)	-0.019***	(0.001)
Aged 25-29	0.165	(0.371)	0.147	(0.354)	-0.018***	(0.001)
Aged 30-34	0.154	(0.361)	0.156	(0.363)	0.002	(0.001)
Aged 35-39	0.146	(0.353)	0.158	(0.365)	0.012***	(0.001)
Aged 40-44	0.139	(0.346)	0.145	(0.352)	0.006***	(0.001)
Aged 45-49	0.129	(0.335)	0.133	(0.34)	0.004***	(0.001)
Aged 50-54	0.113	(0.317)	0.126	(0.331)	0.012***	(0.001)
Male	0.483	(0.5)	0.487	(0.5)	0.005***	(0.002)
Married	0.783	(0.412)	0.703	(0.457)	-0.081***	(0.001)
No School	0.149	(0.356)	0.124	(0.318)	-0.025***	(0.001)
Primary	0.55	(0.498)	0.493	(0.5)	-0.056***	(0.002)
Secondary	0.197	(0.398)	0.206	(0.408)	0.009***	(0.001)
Tertiary	0.104	(0.306)	0.176	(0.363)	0.072***	(0.001)
Household Size	3.301	(1.543)	3.157	(1.453)	-0.144***	(0.005)
Observations	131,971		296,694		428,665	

Source: Income and Living Conditions Survey Micro Data Set (Cross-Sectional)

Table 3: Test of Common Trend Assumption

	All		Male		Female	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Specification 1	0.003	-0.005	0.004	-0.005	0.002	-0.005
	(0.006)	(0.003)	(0.005)	(0.003)	(0.007)	(0.004)
Specification 2	0.013**	-0.008	0.012*	-0.011*	0.014*	-0.006
	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.008)
Specification 3	0.013**	-0.008*	0.013**	-0.009**	0.014*	-0.008
	(0.006)	(0.004)	(0.005)	(0.003)	(0.006)	(0.005)
Observations	12					

Notes: *p<0.1 **p<0.05 ***p<0.01. Robust standard errors are used. The data is aggregated at years. We regress the mean values of health indicators on the treatment indicator, a linear year trend and the interaction of treatment dummy and the linear year trend. The estimates shows the coefficients of interaction variables.

Table 4: Effect of Refugees on the Health Outcomes

	Dependent Variables			
	Healthy		Chronic	
	OLS	IV	OLS	IV
Total				
Refugee-to-native ratio	0.148*	0.180**	0.132*	0.095
	(0.079)	(0.081)	(0.079)	(0.068)
F statistic		837		837
Mean dependent variable	0.734	0.734	0.257	0.257
	(0.442)	(0.442)	(0.437)	(0.437)
Observations		428,665		
Male				
Refugee-to-native ratio	0.193***	0.206***	0.077	0.067
	(0.073)	(0.075)	(0.075)	(0.067)
F statistic		836		836
Mean dependent variable	0.770	0.770	0.219	0.219
	(0.421)	(0.421)	(0.413)	(0.413)
Observations		208,249		
Female				
Refugee-to-native ratio	0.108	0.153	0.182*	0.123
	(0.100)	(0.101)	(0.093)	(0.081)
F statistic		838		838
Mean dependent variable	0.700	0.700	0.293	0.293
	(0.458)	(0.458)	(0.455)	(0.455)
Observations		220,416		

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. Dependent variables are positive health status and suffering any chronic illnesses.

Table 5: Effect of Refugees on the Health Outcomes Among Subgroup of Natives

	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Employed						
Refugee-to-native ratio	0.288***	-0.033	0.357***	-0.039	0.156	0.003
	(0.090)	(0.076)	(0.087)	(0.079)	(0.117)	(0.127)
F statistic	826.2	826.2	831.0	831.0	732.1	732.1
Mean	0.780	0.214	0.798	0.194	0.739	0.259
	(0.414)	(0.410)	(0.401)	(0.396)	(0.439)	(0.438)
Observations	246,909	246,909	170,850	170,850	76,059	76,059
Not Employed						
Refugee-to-native ratio	0.044	0.231***	-0.412***	0.460***	0.164	0.174*
	(0.091)	(0.079)	(0.109)	(0.115)	(0.113)	(0.094)
F statistic	825.1	825.1	820.2	820.2	825.5	825.5
Mean	0.672	0.315	0.643	0.331	0.679	0.310
	(0.470)	(0.464)	(0.479)	(0.471)	(0.467)	(0.463)
Observations	181,756	181,756	37,399	37,399	144,357	144,357
Unemployed						
Refugee-to-native ratio	-0.348**	0.196	-0.387**	0.206	-0.635	0.313
	(0.141)	(0.129)	(0.163)	(0.152)	(0.418)	(0.346)
F statistic	787.8	787.8	787.1	787.1	584.7	584.7
Mean	0.778	0.199	0.764	0.202	0.819	0.191
	(0.4169)	(0.400)	(0.425)	(0.402)	(0.385)	(0.393)
Observations	18,303	18,303	13,846	13,846	4,457	4,457
Low Skilled						
Refugee-to-native ratio	0.172*	0.139*	0.124	0.205***	0.193	0.108
	(0.095)	(0.075)	(0.084)	(0.078)	(0.118)	(0.094)
F statistic	857.5	857.5	866.7	866.7	850.1	850.1
Mean	0.668	0.306	0.709	0.260	0.636	0.342
	(0.471)	(0.461)	(0.454)	(0.439)	(0.481)	(0.474)
Observations	275,365	275,365	120,573	120,573	154,792	154,792
High Skilled						
Refugee-to-native ratio	0.259***	-0.211**	0.359***	-0.293**	0.006	0.025
	(0.091)	(0.094)	(0.112)	(0.123)	(0.088)	(0.104)
F statistic	707.2	707.2	728.7	728.7	654.5	654.5
Mean	0.854	0.168	0.859	0.159	0.848	0.179
	(0.353)	(0.374)	(0.348)	(0.366)	(0.359)	(0.383)
Observations	153,300	153,300	87,676	87,676	65,624	65,624

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. Dependent variables are positive health status and suffering any chronic illnesses.

Table 6: Effect of Refugees on the Job Loss

	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	-0.060	-0.087	0.017
	(0.053)	(0.066)	(0.029)
F statistic	835.6	841.7	755.7
Mean	0.0535	0.0650	0.0303
	(0.225)	(0.247)	(0.171)
Observations	268,211	179,357	88,854
Low Skilled			
Refugee-to-native ratio	0.000	-0.050	0.042
	(0.063)	(0.079)	(0.038)
F statistic	858.8	870.8	704.6
Mean	0.0564	0.0765	0.0180
	(0.231)	(0.266)	(0.133)
Observations	160,287	105,167	55,120
High Skilled			
Refugee-to-native ratio	-0.108*	-0.115	-0.048
	(0.066)	(0.081)	(0.058)
F statistic	713.3	727.7	633.0
Mean	0.0493	0.0488	0.0503
	(0.216)	(0.215)	(0.219)
Observations	107,924	74,190	33,734

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The sample covers individuals who spent at least one month at work in the previous year, and the dependent variable is equal to 1 if the respondent is unemployed in the reference period, 0 otherwise.

Table 7: Effect of Refugees on the Job Finding

	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	-0.146	-0.233	0.019
	(0.169)	(0.184)	(0.537)
F statistic	656.9	656.6	528.9
Mean	0.599	0.634	0.459
	(0.490)	(0.482)	(0.498)
Observations	43,751	35,060	8,691
Low Skilled			
Refugee-to-native ratio	-0.368**	-0.411**	0.445
	(0.183)	(0.185)	(0.877)
F statistic	666.5	661.1	634.2
Mean	0.204	0.181	0.250
	(0.478)	(0.472)	(0.500)
Observations	26,510	23,665	2,845
High Skilled			
Refugee-to-native ratio	0.220	0.202	-0.629
	(0.364)	(0.370)	(0.754)
F statistic	570.3	592.9	405.7
Mean	0.526	0.572	0.438
	(0.499)	(0.495)	(0.496)
Observations	17,241	11,395	5,846

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, five region-year fixed effects. The sample covers individuals who spent at least one month in unemployment in the previous year, and the dependent variable is equal to 1 if the respondent is employed during the reference period, 0 otherwise.

Table 8: Effect of Refugees on the Health Outcomes (Conditional on Being Employed)

	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Blue Collar						
Refugee-to-native ratio	0.217**	0.060	0.298***	0.038	0.116	0.113
	(0.107)	(0.081)	(0.096)	(0.081)	(0.196)	(0.179)
F statistic	847.7	847.7	882.3	882.3	479.1	479.1
Mean	0.732	0.241	0.764	0.209	0.655	0.316
	(0.443)	(0.428)	(0.424)	(0.407)	(0.475)	(0.465)
Observations	136,216	136,216	95,528	95,528	40,688	40,688
White Collar						
Refugee-to-native ratio	0.439***	-0.178	0.460***	-0.156	0.381**	-0.230
	(0.098)	(0.109)	(0.108)	(0.124)	(0.156)	(0.142)
F statistic	727.9	727.9	742.9	742.9	617.9	617.9
Mean	0.839	0.181	0.841	0.175	0.835	0.194
	(0.367)	(0.385)	(0.365)	(0.380)	(0.371)	(0.395)
Observations	110,693	110,693	75,322	75,322	35,371	35,371
Low Skilled						
Refugee-to-native ratio	0.213*	0.078	0.258**	0.105	0.229	-0.012
	(0.110)	(0.081)	(0.101)	(0.083)	(0.159)	(0.156)
F statistic	850.1	850.1	863.8	863.8	644.4	644.4
Mean	0.718	0.255	0.749	0.223	0.651	0.325
	(0.450)	(0.436)	(0.433)	(0.416)	(0.477)	(0.468)
Observations	146,261	146,261	100,447	100,447	45,814	45,814
High Skilled						
Refugee-to-native ratio	0.472***	-0.379***	0.518***	-0.387**	0.216	-0.241
	(0.112)	(0.135)	(0.128)	(0.159)	(0.143)	(0.182)
F statistic	706.0	706.0	716.2	716.2	642.3	642.3
Mean	0.869	0.155	0.868	0.153	0.873	0.159
	(0.337)	(0.362)	(0.339)	(0.360)	(0.333)	(0.366)
Observations	100,648	100,648	70,403	70,403	30,245	30,245

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey yearlevel are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. Dependent variables are positive health status and suffering any chronic illnesses.

Table 9: Effect of Refugees on the Overcrowding

	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	0.194***	0.213***	0.175***
	(0.055)	(0.057)	(0.063)
F statistic	576.7	582.1	571.3
Mean	0.0439	0.0424	0.0455
	(0.205)	(0.202)	(0.208)
Observations	81,561	41,342	40,219
Employed			
Refugee-to-native ratio	0.221***	0.217***	0.244***
	(0.059)	(0.061)	(0.079)
F statistic	514.9	537.1	411.1
Mean	0.0411	0.0420	0.0389
	(0.198)	(0.201)	(0.193)
Observations	47,659	33,866	13,793
Not Employed			
Refugee-to-native ratio	0.169**	0.170**	0.152**
	(0.066)	(0.077)	(0.072)
F statistic	620.2	667.7	598.4
Mean	0.0479	0.0443	0.0490
	(0.214)	(0.206)	(0.216)
Observations	33,902	7,476	26,426
Low Skilled			
Refugee-to-native ratio	0.154***	0.143**	0.164***
	(0.053)	(0.056)	(0.063)
F statistic	569.1	574.3	564.9
Mean	0.0369	0.0347	0.0389
	(0.189)	(0.183)	(0.193)
Observations	61,597	28,680	32,917
High Skilled			
Refugee-to-native ratio	0.420***	0.460***	0.223
	(0.140)	(0.147)	(0.188)
F statistic	574.1	572.8	559.2
Mean	0.0655	0.0599	0.0752
	(0.247)	(0.237)	(0.264)
Observations	19,964	12,662	7,302

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is equal to 1 if main reason for unmet need for medical or dental examination or treatment is giving to late time for appointment.

Table 10: Effect of Refugees on Natives' Internal Migration

Panel A:	*Internal Migration*					
	Low Skilled			**High Skilled**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	-0.032	-0.031	-0.032	0.012	0.045	-0.061
	(0.028)	(0.027)	(0.030)	(0.057)	(0.055)	(0.079)
F statistic	857.5	866.7	850.1	707.2	728.7	654.5
Mean dependent variable	0.976	0.974	0.977	0.965	0.965	0.965
	(0.153)	(0.158)	(0.150)	(0.183)	(0.183)	(0.184)
Observations	276,999	122,692	154,307	151,666	85,557	66,109
Panel B:	**Blue Collar**			**White Collar**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	-0.027	-0.029	-0.044	0.042	0.089*	-0.121
	(0.030)	(0.033)	(0.051)	(0.052)	(0.051)	(0.092)
F statistic	847.7	882.3	479.1	727.9	742.9	617.9
Mean dependent variable	0.977	0.974	0.985	0.963	0.963	0.964
	(0.149)	(0.159)	(0.123)	(0.188)	(0.189)	(0.187)
Observations	136,216	95,528	40,688	110,693	75,322	35,371
	Internal Migration (Conditional on Being Employed)					
	Low Skilled			**High Skilled**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	-0.032	-0.031	-0.032	0.012	0.045	-0.061
	(0.028)	(0.027)	(0.030)	(0.057)	(0.055)	(0.079)
F statistic	857.5	866.7	850.1	707.2	728.7	654.5
Mean dependent variable	0.976	0.974	0.977	0.965	0.965	0.965
	(0.153)	(0.158)	(0.150)	(0.183)	(0.183)	(0.184)
Observations	276,999	122,692	154,307	151,666	85,557	66,109

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, five region-year fixed effects. The dependent variable is equal to 1 if the individual switched to another residence before the survey year.

Table 11: Effect of Refugees on the Health Outcomes Excluding Istanbul (NUTS-1 Region)

Panel A:	*Health Outcomes*					
	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Low Skilled						
Refugee-to-native ratio	0.173*	0.137*	0.125	0.205***	0.194*	0.107
	(0.095)	(0.075)	(0.084)	(0.078)	(0.118)	(0.094)
F statistic	857.0	857.0	866.1	866.1	849.6	849.6
Mean	0.663	0.308	0.704	0.262	0.631	0.344
(0.473)	(0.462)	(0.456)	(0.440)	(0.482)	(0.475)	
Observations	250,099	250,099	110,116	110,116	139,983	139,983
High Skilled						
Refugee-to-native ratio	0.261***	-0.214**	0.361***	-0.295**	0.009	0.023
	(0.090)	(0.094)	(0.112)	(0.123)	(0.088)	(0.104)
F statistic	707.3	707.3	728.7	728.7	654.7	654.7
Mean	0.850	0.169	0.856	0.160	0.843	0.180
	(0.357)	(0.375)	(0.352)	(0.367)	(0.364)	(0.384)
Observations	132,359	132,359	75,547	75,547	56,812	56,812
Panel B:	*Health Outcomes (Conditional on Being Employed)*					
	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Blue Collar						
Refugee-to-native ratio	0.217**	0.058	0.298***	0.037	0.119	0.109
	(0.107)	(0.081)	(0.096)	(0.081)	(0.197)	(0.179)
F statistic	847.0	847.0	881.8	881.8	478.1	478.1
Mean	0.728	0.243	0.762	0.210	0.651	0.318
	(0.445)	(0.429)	(0.426)	(0.408)	(0.477)	(0.466)
Observations	125,927	125,927	87,394	87,394	38,533	38,533
White Collar						
Refugee-to-native ratio	0.437***	-0.178	0.459***	-0.157	0.382**	-0.232
	(0.097)	(0.109)	(0.107)	(0.124)	(0.156)	(0.143)
F statistic	728.0	728.0	742.8	742.8	618.3	618.3
Mean	0.834	0.183	0.837	0.177	0.828	0.197
	(0.372)	(0.387)	(0.369)	(0.381)	(0.377)	(0.398)
Observations	94,771	94,771	64,881	64,881	29,890	29,890
Low Skilled						
Refugee-to-native ratio	0.214*	0.075	0.259**	0.104	0.233	-0.018
	(0.110)	(0.082)	(0.102)	(0.084)	(0.160)	(0.156)
F statistic	849.4	849.4	863.3	863.3	643.2	643.2
Mean	0.713	0.258	0.745	0.225	0.645	0.328
	(0.452)	(0.438)	(0.436)	(0.417)	(0.478)	(0.470)
Observations	132,883	132,883	90,052	90,052	42,831	42,831
High Skilled						
Refugee-to-native ratio	0.474***	-0.382***	0.521***	-0.391**	0.217	-0.239
	(0.112)	(0.135)	(0.128)	(0.159)	(0.143)	(0.183)
F statistic	706.0	706.0	716.1	716.1	643.1	643.1
Mean	0.866	0.156	0.865	0.154	0.868	0.160
	(0.341)	(0.363)	(0.342)	(0.361)	(0.339)	(0.367)
Observations	87,815	87,815	62,223	62,223	25,592	25,592

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. Dependent variables are positive health status and suffering any chronic illnesses.

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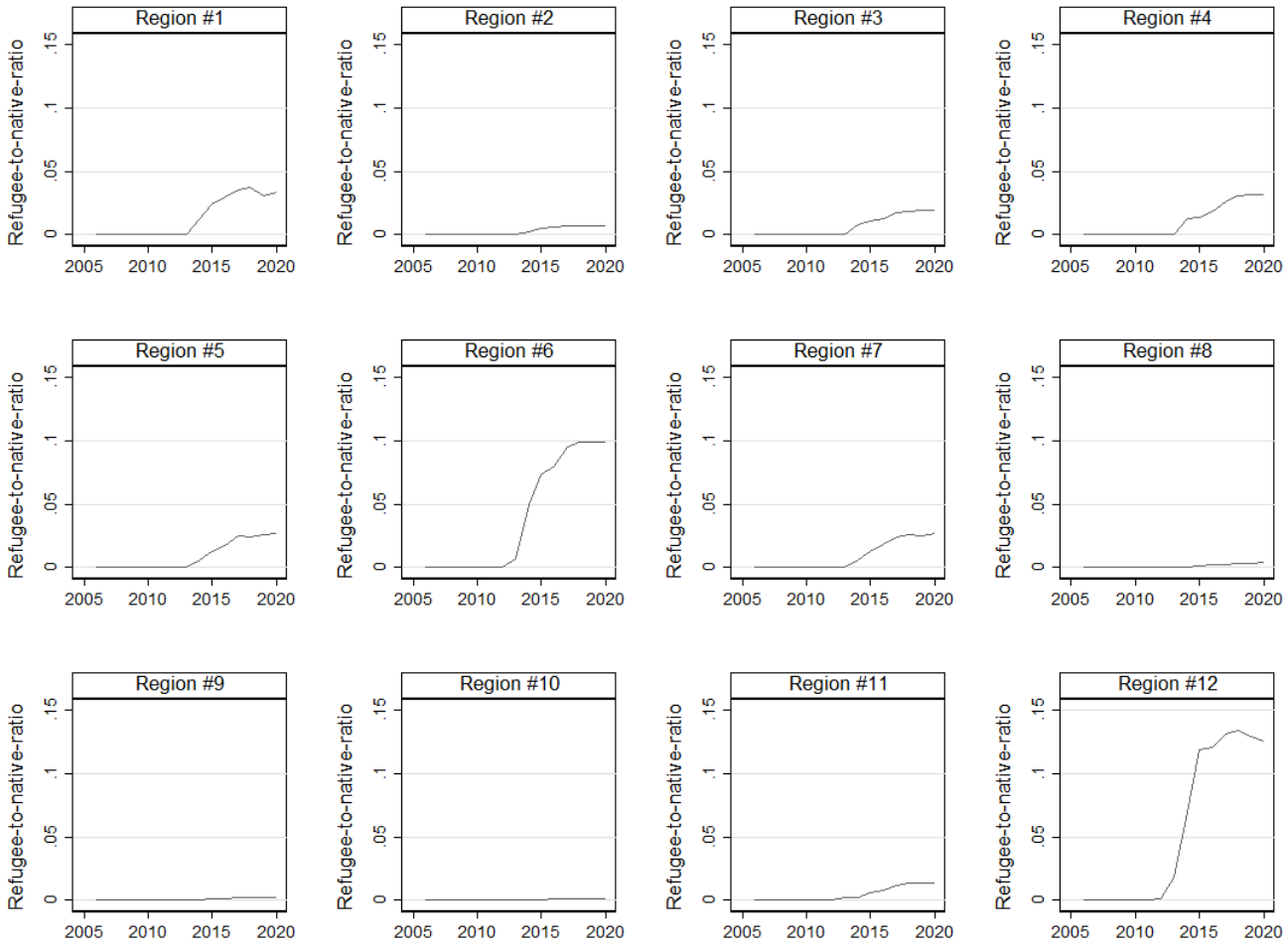
Figure A1: Geographic Distribution of Syrian Refugees Across Regions at the NUTS-1 Level



Source:Ministry Interior of Turkey and Turkstat.

Table A1: First Stage Estimation Results

	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Number of migrants	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 25-29	0.000	0.000	-0.000	-0.000	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 30-34	0.000*	0.000*	-0.000	-0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 35-39	0.000**	0.000**	0.000	0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 40-44	0.000	0.000	-0.000	-0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 45-49	-0.000	-0.000	-0.000***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Aged 50-54	0.000	0.000	-0.000**	-0.000**	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.000**	-0.000**				
	(0.000)	(0.000)				
Married	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary Educ.	-0.000***	-0.000***	-0.000***	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Secondary Educ.	-0.000***	-0.000***	-0.000***	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tertiary Educ.	-0.000	-0.000	-0.000*	-0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household Size	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	428,665	428,665	208,249	208,249	220,416	220,416

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-1 region-survey year level.

Table A2: Effect of Refugees on the Health Outcomes

	Total		**Male**		**Female**	
	Healthy	Chronic	Healthy	Chronic	Healthy	Chronic
Refugee-to-Native Ratio	0.180**	0.095	0.206***	0.067	0.153	0.123
	(0.081)	(0.068)	(0.075)	(0.067)	(0.101)	(0.081)
Aged 25-29			-0.040***	0.030***	-0.049***	0.045***
			(0.003)	(0.003)	(0.003)	(0.003)
Aged 30-34			-0.094***	0.077***	-0.110***	0.102***
			(0.004)	(0.003)	(0.003)	(0.003)
Aged 35-39			-0.139***	0.120***	-0.186***	0.170***
			(0.005)	(0.004)	(0.005)	(0.004)
Aged 40-44			-0.197***	0.182***	-0.269***	0.259***
			(0.005)	(0.004)	(0.005)	(0.004)
Aged 45-49			-0.243***	0.240***	-0.350***	0.346***
			(0.005)	(0.004)	(0.005)	(0.005)
Aged 50-54			-0.304***	0.315***	-0.431***	0.445***
			(0.006)	(0.004)	(0.006)	(0.005)
Female	-0.040***	0.054***				
	(0.002)	(0.002)				
Married	0.058***	-0.046***	0.036***	-0.026***	0.063***	-0.050***
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)
Primary Educ.	0.149***	-0.109***	0.198***	-0.157***	0.129***	-0.090***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.004)	(0.004)
Secondary Educ.	0.231***	-0.163***	0.270***	-0.197***	0.223***	-0.159***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.005)	(0.005)
Tertiary Educ.	0.294***	-0.206***	0.331***	-0.234***	0.282***	-0.204***
	(0.006)	(0.006)	(0.008)	(0.009)	(0.006)	(0.006)
Household Size	0.008***	-0.007***	0.005***	-0.004***	0.012***	-0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	428,665	428,665	208,249	208,249	220,416	220,416

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-1 region-survey year level.