Hometown Conflict and Refugees' Integration Efforts*

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Abstract

How does violence in origin areas affect the educational outcomes of refugees in their destinations? Using administrative panel data, we find that heightened violence in the hometowns of Syrian students leads to improvements in their school outcomes in Türkiye. Turkish language and Math scores of refugee students improve, with larger impacts on Turkish scores. There is no impact on naturalized Syrian students. We observe positive spillovers on Turkish students. These findings suggest ongoing violence in refugee-origin areas reduces the prospect of returning home, and induces students to better integrate into host countries by investing in education.

JEL codes: J15, I21, I25, F51, O15

Keywords: Conflict, forced migration, integration effort, return migration

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1 Introduction

Amidst an unprecedented global displacement crisis, where 1.4 percent of the world's population was forcibly displaced by 2022—tripling the 0.4 percent recorded in 1990 (UNHCR, 2022)—the humanitarian challenges are profound and extensive. Notably, developing countries shoulder most of the burden, hosting approximately 75 percent of the world's refugees, with nearly half being children. Persistent crises in countries like Syria, Afghanistan, Ukraine, Venezuela, Libya, and Yemen indicate that achieving political stability remains elusive in the foreseeable future.

Against this backdrop, we focus on a previously under-explored dimension: how persistent violence in the districts of origin affects refugee integration. The unresolved conflicts, particularly in Syria, cast a long shadow on the prospects of return, prompting a closer examination of how this protracted instability affects human capital investment decisions—serving as a proxy for integration efforts, aspirations, and return expectations—among refugee children in Türkiye.

We estimate the causal effect of ongoing violence in Syria on the educational outcomes of refugee children in Türkiye. The heightened levels of concurrent violence may influence educational attainment through two opposing mechanisms. On the one hand, the trauma experienced may worsen schooling outcomes. On the other, the continued violence may alter expectations, prompting refugee children to reassess their beliefs about the likelihood of returning to Syria. This despair, in turn, may lead to more investments in their educational development, as an effort to integrate more effectively into their host communities.

To unravel this puzzle, we obtain individual-level administrative panel data that comprehensively document the academic performance of Syrian students and merge it with detailed information regarding the timing, location, and intensity of violence in their hometowns in Syria. As such, our empirical strategy exploits within-origin district-academic semester variation in conflict.

Controlling for individual, year-since-arrival, grade, and classroom fixed effects, we find an improvement in both Turkish language and Math scores of refugee students in response to heightened violence in their Syrian hometowns. Notably, the increase in Turkish language scores is larger than that observed in Math, supporting the interpretation that these children are intensifying their efforts to integrate into their host communities. Conversely, naturalized Syrian students show no discernible improvement in academic performance in response to escalating violence, and absenteeism remains unaffected. If anything, an escalation in violence is associated with a reduction in missed school days.

Additionally, there is no evidence suggesting that ongoing violence leads to differential attrition among Syrian students. When examining gender-based heterogeneity, we find that the impact of violence on Math scores is primarily driven by female students. Furthermore, the investments in the academic performance of refugee students leads to positive spillover effects on Turkish students. Our estimates also remain robust when using alternative measures of conflict intensity (violent events and fatalities), using alternative difference-in-differences estimators, and ruling out the importance of influential observations. Additionally, we argue our results are unlikely to be explained by teacher biases.

The conflict in Syria began in 2011 and rapidly escalated into a full-scale civil war, triggering a mass exodus and leading to one of today's most significant refugee and displacement crises (World Bank, 2023). Millions sought refuge in neighboring Türkiye, Lebanon, and Jordan. Türkiye hosted the largest population of Syrian refugees, reaching approximately 3.8 million by June 2022.[1] The likelihood of return to Syria has diminished significantly due to ongoing political instability, persistent conflict, proxy wars, and the emergence of extremist groups.

Syrian children have borne a disproportionate burden of the adverse effects stemming from violent conflict, forced displacement, and persistent instability. At the beginning of the 2022-23 school year, approximately 1.4 million school-age (5-17) refugee children were present in Türkiye, exhibiting lower test scores, reduced enrollment, and higher absenteeism compared to their native peers (Tumen et al., 2023). These disparities are frequently attributed to language barriers, identified as a primary challenge for the educational integration of refugee children (UNHCR, 2019). In addition to language barriers and other integration challenges arising from forced displacement, Syrian children in Türkiye are consistently exposed to news concerning ongoing violence and casualties in their hometowns. By 2022, an estimated 306,887 civilians (about 84 civilians a day) had lost their lives since the conflict's onset, underscoring the brutal impact on civilian lives (SNHR, 2023). As discussed later in the paper, violence and casualties in Syria exhibit significant variation across time and space.

Our estimates suggest that violence-driven change in Syrian children's expectations and despair generated increased integration efforts, outweighing the possible discouragement consequences of trauma, ultimately leading to improved academic outcomes.

These findings contribute to two distinct strands in the migration literature. We are the first to demonstrate the impact of ongoing violence in hometowns on the academic performance of immigrant students in the host country. Previous research has predominantly concentrated on the effects of past cumulative exposure to violence, documenting its adverse impacts on various life outcomes (Verwimp and Van Bavel, 2014).[2] In contrast, contemporaneous exposure is likely to alter expectations and investments. Exposure to crime and police activity around schools are also known to affect educational outcomes negatively (Cabral et al., 2022; Koppensteiner and Menezes, 2021; Ang, 2021; Brown and Velasquez, 2017; Chang and Padilla-Romo, 2023).[3] In contrast, we examine the effect of large-scale violence simultaneously occurring in the hometowns of refugee students in a different country. While this violence does not directly jeopardize the safety of refugee students, it serves as

[1]See https://data.unhcr.org/en/situations/syria/location/113.

[2]See also, Akresh and de Walque (2008), Angrist and Kugler (2008), Chamarbagwala and Moran (2011), Shemyakina (2011), Leon (2012), Rodriguez and Sanchez (2012), Akbulut-Yuksel (2014), Justino et al. (2014), Bertoni et al. (2019), and Bruck et al. (2019).

[3]See also Monteiro and Rocha (2017), Casey et al. (2018), and Michaelsen and Salardi (2020).

a mechanism that diminishes their anticipated probability of return. Our findings illustrate that exposure to ongoing violence in the hometown raises human capital accumulation by lowering the expected likelihood of return.

Second, we contribute to the refugee integration literature by offering causal evidence that prolonged despair in the home country increases refugees' integration efforts. We provide empirical support for theoretical notions suggesting that human capital investment abroad rises with the expected duration of migrant stay. Existing evidence indicates that refugees are less likely to return compared to economic (or voluntary) immigrants (Cortes, 2004). Generally, the longer immigrants envision staying, the more they invest in their human capital (Dustmann, 1996; Khan, 1997; Adda et al., 2022) and local language acquisition (Abramitzky et al., 2023), while saving less and sending fewer remittances to their home country (Galor and Stark, 1990; Merkle and Zimmermann, 1992). Our findings suggest that the academic success of Syrian refugee students increases in response to the intensity of violence in their hometowns, but we do not observe a corresponding improvement in the academic outcomes of naturalized Syrian students. The heightened intensity of violence in Syria diminishes the probability of return, and Syrian students increase their integration efforts.

In Section 2, we provide an overview of the background. Section 3 delves into the specifics of our data, while Section 4 outlines our empirical strategy. Our findings are discussed in Section 5, and Section 6 concludes.

2 Background and institutional setting

2.1 Armed conflict and violence in Syria

The Syrian conflict began in early 2011 as a peaceful protest triggered by discontent with the government. However, it swiftly escalated, encompassing a vast geographical area and evolving into a full-scale civil war. This conflict gave rise to one of the largest refugee waves in human history. The origins of the crisis are rooted in a complex array of political, historical, religious, and economic factors.[4]

Here, we discuss three prominent features of the violence, crucial for understanding the context and research design. First, the conflict displayed significant temporal variation, as illustrated in Figure A1.[5] It began escalating in early 2012, peaking by the end of 2014. Although it gradually subsided thereafter, intermittent spikes persisted. A key factor contributing to this temporal variation was the direct involvement of foreign countries, such as Russia, the US, and Iran.[6] Additionally, the timing of Syrian refugee flows into Türkiye aligns with the pattern of violent events in Syria (Figure A2).

Second, the conflict and its temporal variation exhibit significant regional disparities. Cu-

[4] For further reading, see Phillips (2015), Van Dam (2017), Abel et al. (2019), Daoudy (2020), and Tumen (2023).

[5] Our analysis includes all 65 districts in Syria. Figure A1 shows the sub-sample of districts that cover 90 percent of student refugees in Türkiye in our data.

[6] Russia increased its military presence in Northern Syria in late 2014 and conducted a series of air strikes and ground operations throughout 2015, leading to an upsurge in violent events in 2014 and 2015.

mulative violence across regions is illustrated in Figure A3, showcasing considerable regional variation. Meanwhile, Figures A4 and A5 reveal significant variation in the patterns of violence across regions, with conflict events igniting and dissipating at different times in different areas. The ethnic and religious diversity of Syria's demographic structure plays a pivotal role in creating these regional differences.[7] Figure A6 displays the distribution of Syrian students in our dataset based on their district of birth.

Finally, the temporal and regional variation in violence exhibit similar patterns across different measures of violence. As detailed in Section 4, we employ two distinct measures of violence in this paper: the number of violent events and the number of conflict-related fatalities. The first measure can be viewed as the extensive margin of violence, relying solely on event counts. In contrast, the second measure represents the intensive aspect, quantifying the intensity of each event.

2.2 School integration of refugee children

The integration of refugee children into schools has proven challenging, primarily due to language barriers. Syrians speak Arabic, and there are significant differences between Arabic and Turkish, notably in their alphabets. This distinction makes it particularly difficult for Syrian children to learn Turkish. Typically, Syrian children are exposed early to the Arabic alphabet at home or through preschool attendance in Quran courses (Boucher et al., 2021).

The number of Syrian refugees in Türkiye was relatively small during the initial stages of the conflict (see Figure A2). The Turkish government constructed refugee accommodation camps near the Syrian border, primarily to provide emergency humanitarian assistance, with the initial expectation that refugees would eventually return to Syria.

Some non-governmental organizations within the camps, supervised by the Ministry of National Education, offered limited educational services. However, these efforts were on a relatively small scale and often project-specific. There was no systemic attempt to integrate refugee children into the Turkish education system. Early on, many refugee families were hesitant to send their children to Turkish schools due to concerns about potential assimilation.

Since mid-2014, the conflict and violence in Syria have significantly intensified. By the beginning of 2016, the number of refugees had more than tripled. Recognizing the urgent need for educational integration, policies were overhauled to fully integrate Syrian children into the Turkish education system. The Turkish government initiated nationwide programs, funded by the EU Facility for Refugees in Türkiye (FRIT), aimed at integrating refugee children into the Turkish public education system.

The journey to integrate refugee children into Turkish schools has been marked by numerous challenges. Boucher et al. (2021) and Tumen et al. (2023) show that refugee children exhibit lower rates of school continuation compared to native students, with this trend being more pronounced at the secondary school level. Beyond language barriers, additional factors

[7] For information about the pre-war heterogeneity in population see Khalifa (2013).

contribute to their reduced school participation. The compulsory education period in Syria is five years, in contrast to Türkiye's 12-year requirement. Due to the legal status of Syrians in Türkiye, compulsory education is not fully enforceable for refugees. Moreover, refugee families are often larger, and children with lower academic achievement are frequently expected to contribute to family income and household chores. Male children are more likely to drop out to engage in labor for income, while girls tend to leave school either to assist with housework or due to early marriages, sometimes occurring as young as 12 years old.

3 Data

Administrative data on educational outcomes. The primary data source for refugee and native students' academic achievement is the administrative data obtained from the Ministry of National Education of the Republic of Türkiye (MoNE), for the academic years between 2011-12 and 2018-19. In our main analysis, we focus on refugee students, but for analyzing spillovers, we also use data on Turkish students.

Our outcomes include the end-of-semester scores from all courses taken by all registered students, and their absenteeism records. The end-of-semester score is derived from a weighted average of exam results, quizzes, homework assignments, and other graded activities for each course. Absenteeism is quantified in terms of days missed per academic year for each student. Additionally, the dataset contains school names, classroom, and grade-year information, and key individual-level characteristics, including gender, date of birth, and place of birth (including governate and district). While data on parental characteristics is available, it has several missing entries.

Our dataset includes all refugee and native students registered in Turkish public schools across four provinces: Ankara, Bursa, Gaziantep, and Sanliurfa. Ankara, Türkiye's capital, is the second-largest city, with a population exceeding 5.7 million. Bursa, situated in the northwestern region of Türkiye, ranks as the fourth-largest city, with a population of over 3.1 million. It is an appealing destination for refugees due to the presence of large manufacturing companies, which provide employment opportunities. Gaziantep and Sanliurfa, neighboring provinces to Syria, are known for hosting significant refugee populations, with some schools in these areas experiencing substantial refugee enrollments. Initially, during the early stages of the Syrian crisis, these provinces housed large refugee camps. Following the closure of these camps, a significant number of refugees remained in Gaziantep and Sanliurfa.

We focus on grade levels 4 through 12. In grade levels 1 to 3, grading is rather informal and employs a three-category scale (good, intermediate, should be improved) primarily intended for guidance rather than evaluation. Conversely, for grade levels 4 to 12, a formal grading scale ranging from 0 to 100 is used.

Our empirical analysis focuses on mandatory courses (Turkish language and Math) taken by all students, along with absenteeism, as key variables. Turkish language scores measure communication skills in the local language, also making them a valuable indicator of social integration. Additionally, language proficiency serves as a proxy for non-cognitive skills and enhances learning efficiency across other subjects. Math scores, on the other hand, assess students' cognitive and analytical capabilities. In combination, Math and Turkish language scores provide a comprehensive measure of the core components of refugee students' academic capacity, school performance, and skill set. Absenteeism serves as an indicator of school attachment and a measure of educational integration for refugee students.

Conflict data. The conflict data is from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset, which collects information on state-based armed conflicts, non-state conflicts, and one-sided violence. This dataset specifically includes conflicts that have exceeded the threshold of 25 battle-related deaths in a single calendar year.[8] We concentrate on violent incidents and related fatalities that occurred during the Syrian civil war between 2011 and 2019, specifically at the district level, covering 60 Syrian districts.

Constructing the study sample. We merge administrative education data with the conflict data, using the district of birth information. While Math and Turkish scores are recorded for each semester, absenteeism provides the school days missed in an academic year. We create two datasets: one at the semester level and the other at the year level. At the semester level, we aggregate conflict-related events and fatalities occurring in each Syrian district during semester t. The fall semester spans September to January, while the spring semester is from February to May. In the final semester sample, we only include students for which both Math and Turkish language scores were recorded in semester t. At the year level, we aggregate conflict-related events and fatalities occurring in each Syrian district during academic year t. We exclude events or fatalities that took place during the summer holidays, from June to August, from both of our data sets.

Descriptive statistics. Figure A7 shows the distribution of Math and Turkish language scores among Syrian students. The red vertical dashed line illustrates the average scores achieved by native students, while the vertical blue solid line represents the corresponding scores for Syrian students. On average, Syrian students achieve a Math score of 57.6, whereas Turkish students score 64.9. Notably, the difference in Turkish scores is more substantial, exceeding 10 points, with Syrian students averaging 58.2 and Turkish students 69.9.[9]

Figure A8 shows the distribution of the number of school days missed per school year for the full sample (Panel A) and observations below the 95th percentile (Panel B).[10] The red vertical dashed line represents the average number of schooldays missed per school year by native students, and the vertical blue solid line represents the mean for Syrian students. Both panels show that Syrian students are absent more frequently than their Turkish classmates. On average, Syrian students miss ten days of school per year (Panel B), while their Turkish

[8] If a conflict exceeded the 25-deaths threshold in a single year but produced events in either preceding or subsequent years, all events associated with that conflict are considered, even if the threshold was not surpassed in those years.

[9] Differences in Math and Turkish scores between refugee and native students are statistically significant by t-test at the 1% level.

[10] Panel A in Figure A8 illustrates the distribution of the number of school days missed in a year among Syrian students. On the right tail of the distribution, it is evident that some students missed more than 150 days of school, suggesting they were enrolled but did not attend. Figure A8, Panel B removes these points.

classmates miss 7.6 days (statistically significant at the 1% level).

We measure concurrent ongoing violence in the Syrian students' district of birth during each semester by the number of events, and separately the number of conflicted related fatalities. On average, Syrian students in Türkiye are exposed to 81 attacks, with 346 corresponding deaths in their hometowns during a semester. The medians are 35 and 93 for attacks and deaths, respectively.

4 Empirical Strategy

To investigate the impact of ongoing violence in the Syrian students' district of birth on their outcomes in Türkiye, we estimate the following specification with individual fixed effects:

$$\ln Y_{idtcy} = \beta \ln V_{dty} + f_i + f_a + f_{cty} + \epsilon_{idtcy}, \tag{1}$$

where i, t, y, d, a, and c index students, summer vs winter semesters, academic years, districts of birth in Syria, years since displacement, and classrooms, respectively. Y is the end-of-semester Math or Turkish score, V is the violence indicator, and ϵ is an error term.

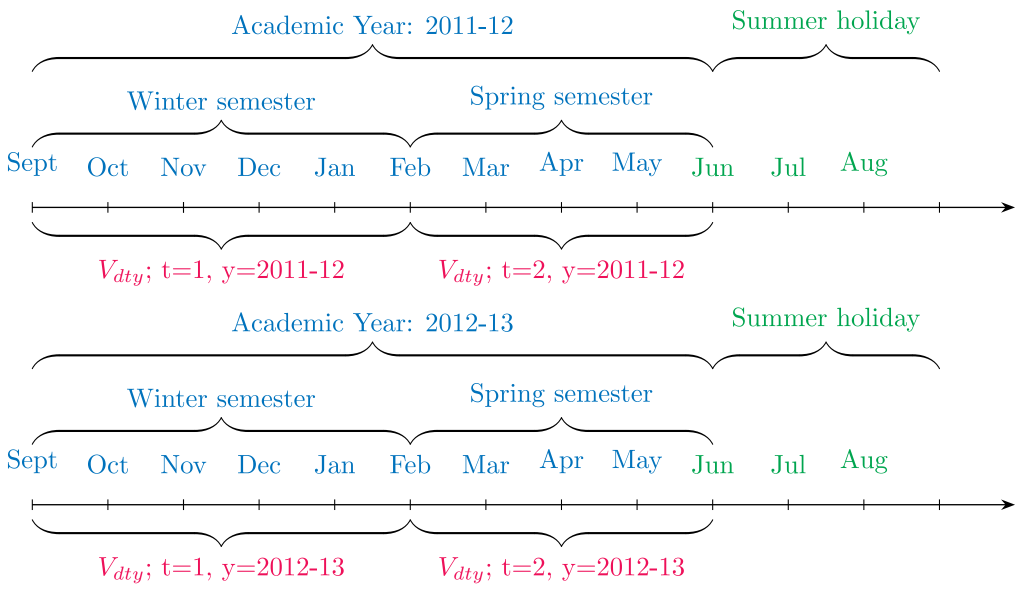
The treatment variable, V, is defined in two ways to capture both the intensive and extensive margins: (i) the number of violent events in the district of birth d, during semester t, and year y; and (ii) the number of conflict-related fatalities in the district of birth d, during semester t, and year y.[11] The figure below visually illustrates how we construct these measures.

f_i are individual fixed effects and capture the effect of time-invariant student characteristics on outcomes (such as innate ability or motivation, past conflict exposure, and parental background). It controls for the possibility that differences between students drive the observed outcomes. The years since arrival fixed effects f_a (which increases incrementally in each year), accounts for the influence of time-related factors (such as acculturation, language proficiency, education system familiarity, social integration, stress, and trauma) associated with a student's duration of residence in the host country on their academic outcomes. Lastly, school-classroom-grade-academic year fixed effects are included f_{cty} to capture the unique characteristics of each classroom that may impact student performance, such as the teaching style of the teacher, the quality of classroom materials and resources, or the peer group of students in the classroom. Since classrooms change every semester, the fixed effects control for the school-classroom-grade-academic year. Standard errors are clustered at the refugee students' district of birth in Syria.

Our identification assumption is that the timing, occurrence, and magnitude of violence in a refugee student's hometown in Syria are independent of factors influencing their concurrent school performance in Türkiye, conditional on the fixed effects.

[11] We apply a log transformation by adding 1 to the values to prevent issues associated with missing values. We show that our results are not sensitive to this choice.

Figure A. Treatment timing



Notes: Visualisation of how the treatment is calculated at the semester level, focusing on just two years. t represents semesters, and y, the academic year.

5 Results and discussion

5.1 Baseline estimates

In Table 1, we present the results based on equation 1. Our analysis centers on two key performance indicators that capture the academic achievements of Syrian children: (log) Turkish language scores and (log) Math scores. These scores represent overall outcomes at the end of the semester and encompass a composite evaluation of exams, assignments, class participation, and other graded components.

In the odd-numbered columns (1, 3, 5, and 7), we present estimates that include individual, years since arrival, and grade fixed effects. The even-numbered columns (2, 4, 6, and 8) also include school-academic year-grade-classroom fixed effects. Our analysis uses two different measures of the treatment: the logarithm of the number of violent events and the logarithm of the number of fatalities. The former represents the extensive margin of the treatment, while the latter captures the intensive dimension.

Across all columns, for both measures of violence, we consistently find that the Turkish language and Math scores of Syrian students improve in response to heightened levels of violence in their place of origin. Column 2 indicates that for a shift from the 25th to 75th percentile of violent events, we would expect Turkish scores among Syrian students to increase by 5 percent. This is equivalent to moving from the 50th to 55th percentile in the distribution of scores, or the average student's Turkish score increasing by 3 points.

The shift from the 25th to the 75th percentile in the casualties treatment, leads to an average 6 percent increase in Turkish scores. To put this in context, it's comparable to progressing from the 55th to the 60th percentile in the distribution of Turkish scores among Syrian students, resulting in an average score increase of 3.5 points.

While the effect of violence on Math scores is positive and statistically significant, it is somewhat less sizable. If the number of violent events shifts from the 25th to the 75th percentile, Math scores increase by about 1 percent, on average. This translates to an increase of just under one point across the entire distribution of Math scores. Similarly, if the number of fatalities rises from the 25th to the 75th percentile, Math scores are likely to increase by a little over 1 percent, on average. This increase corresponds to students in the 75th percentile or above achieving a gain of 1 point in their Math scores.

Our results suggest that heightened violence in their hometowns is associated with a more significant improvement in Turkish language scores compared to Math scores among Syrian refugees. This may reflect the fact that children are making considerable efforts to integrate into their new society. As violence intensifies in their hometowns, Syrian students proactively invest in improving their Turkish language skills, a crucial step in achieving effective integration, which enhances their communication and participation in educational and social activities. We also find a modest increase in Math scores, which may reflect the increased academic effort stemming from the reduced likelihood of return, or reflect improved language skills needed for math.

Do higher levels of violence affect absenteeism among Syrian students?

In Table 2, we analyze the number of school absences per semester, serving as an indicator of school attachment among Syrian students. While school attachment does not directly reflect academic achievement, it captures the students' willingness to attend school and engage in educational activities, including exams.

Across both our conflict variables, we consistently find null results for both outcomes. However, in column 8, we find a negative effect: If anything, an increase in violence may be associated with a reduction in the number of missed school days. These findings provide evidence of enhanced school attachment in response to heightened violence in hometowns, which aligns with our prior observations regarding Turkish language and Math scores.

Differential treatment effects by sub-samples

In Table 3, we present the results of split-sample regressions for two groups of Syrian students: those who continue their education within the observation window and those who eventually drop out. The treatment may have heterogeneous effects on different subgroups of Syrian students, and generalizing from whole-sample results might obscure these nuances, especially among those who face negative impacts and eventually drop out.

Our findings suggest that the positive impact is primarily attributed to the enhanced integration efforts of the continuing students. In other words, ongoing violence does not appear to result in a decline in academic performance or in the eventual dropping out of a subset of Syrian students.

Does naturalization status matter for the response to hometown violence?

The top panel of Table 4 estimates the outcomes for Syrian students who have received Turkish citizenship through naturalization. Some Syrian families obtain Turkish citizenship through avenues such as marriage or continued employment. As we observe information regarding their origin district in Syria, we can apply the same regression analyses to this subset of naturalized students.

Our findings show that the impact of violence on naturalized students is notably more modest compared to their non-naturalized counterparts. This difference may be attributed to the fact that naturalized status already offers a permanent option to stay in Türkiye. Consistent with our main results, these students appear to be less likely to change their education choices in the face of ongoing violence in their hometowns.

We find that for Turkish scores, the overall effect for naturalized students is approximately half of that observed for Syrian students who have not yet naturalized. To illustrate, if we take the same example as our baseline and consider a shift from the 25th to the 75th percentile of violent events, this results in a 2.9 percent change in Turkish scores for naturalized students and a 5.2 percent change for those not yet naturalized. Importantly, there is no statistically significant difference in Math scores between these two groups.

Is there gender-based heterogeneity?

The lower panel of Table 4 shows the effects of violence by student gender. When we consider a shift from the 25th to the 75th percentile of violent events, we observe a 4.5 percent change in Turkish scores for male students, whereas for female students, this change is slightly higher at 5.5 percent. However, it's worth noting that the difference in the extensive margin is not statistically significant. What is particularly noteworthy is that the effect on Math scores appears to be primarily driven by female students.

Are there spillover effects to Turkish students?

To explore possible spillover effects on Turkish students, we collapse our semester-level data to the level of the school-academic year-grade-semester-classroom. We calculate the average Turkish and Math scores for Turkish students at this level, as well as the share of Syrian students.

For the above-mentioned level, we calculate a weighted intensity of violence. That is, for each cell, we calculate the sum of the share of Syrian students born in each district ($Share_{ytgcsp}$) multiplied by the contemporaneous violence in the respective district d ($Violence_{dt}$):

$$WeightedIndex_{ytgcsp} = \sum_{d=1}^{n} Share_{ytgcsp} \times Violence_{dt} \tag{2}$$

Where the index is computed at the academic year y, semester t, grade g, classroom c, school s, and province p level. To estimate spillover effects at the level of the school grade-semester we estimate:

$$p_{ytgcsp} = \beta_1 \cdot Share_{ytgcsp} + \beta_2 \cdot Weightedindex_{ytgcsp} + \beta_3 \cdot Weightedindex_{ytgcsp} \times Share_{ytgcsp} \\ +\Gamma_y + \gamma_t + \theta_g + \lambda_s + \alpha_{yp} + u_{ytgcsp} \ , \tag{3}$$

where p_{trsp} and $Share_{trsp}$ are the average test score of Turkish students and share of Syrian students, respectively, in academic year y, semester t, grade g, classroom c attending school s located in province p. The standard errors are clustered at the school level. Γ_y are academic year fixed effects, γ_t is a summer-semester indicator. θ_g is a grade fixed effect, λ_s a school fixed effect, and α_{yp} an academic year-by-province fixed effect.

The spillover estimates are presented in Table 5, broken down across three panels. In Panel A, we present the results for the entire sample, offering a comprehensive view of the spillover effects. Panel B narrows the focus to schools with an above-median number of Syrian refugees during the school year, aiming to highlight instances with a substantial concentration of Syrian students. In contrast, Panel C concentrates on schools with a below-median number of Syrian refugees during the school year.

This partitioning serves a dual purpose. First, it allows us to conduct a validation test, ensuring the presence of spillover effects primarily in schools with a high concentration of Syrian students, as one would expect. Secondly, it enables a more granular examination of how these effects may vary across schools with different levels of Syrian student enrollment, shedding light on the nuanced dynamics of refugee integration within the educational system.

The presence of Syrian refugees in the classroom has a negative and statistically significant effect on the academic performance of Turkish students. However, the dynamics become more complex when considering the interaction of this refugee presence with the level of violence experienced by Syrians. The coefficient of the interaction term is positive, suggesting that as the intensity of violence faced by Syrian students increases, the negative effect diminishes. This positive coefficient can be interpreted as an indication of positive spillover effects of Syrian students' academic success on the academic success of Turkish students, which emerge as a consequence of heightened integration efforts by refugee students.

In terms of magnitudes, a one-unit increase in the share of Syrian students (about 12 students), is associated with an 18 percent decrease in the Turkish score (as shown in Table 5, column 1). This decrease represents 13.2 points as a percentage share of the mean. The impact of the intensity of violence is comparatively smaller than that of the share of Syrian students (the base effect) in the classroom, but remains meaningful.

All else being equal, a one-unit increase in the weighted index of violent events results in a 3.7 percent increase in the Turkish score and a 4.5 percent increase in the Math score. To provide some context, the mean scores for Turkish and Math are 73.7 and 68.9, respectively. The analogous effect of the intensity dimension is statistically significant, though the effect sizes are relatively smaller.

Exploring these findings in more detail, our split-sample regressions reveal that the spillover effects are stronger in school-years with a substantial concentration of refugee students (Panel B). Specifically, a one-unit increase in the weighted index of violent events results in a 6.1 percent increase in the Turkish score and a 6.7 percent increase in the Math score. These effect sizes are approximately 1.5 percentage points higher than those observed in the full sample.

5.2 Robustness checks

Could teacher grading explain our results?

One may consider that teachers favorably grade students who experience violence in their hometowns. We present several reasons why we believe grading is unlikely to be the driver of the observed changes.

First, we address the potential influence of teachers by incorporating classroom fixed effects in our baseline specification. Since teachers change every semester for grades 5-12, these fixed effects should account for any teacher-related grading effects.

Second, our empirical design matches Syrian students' hometowns with the concurrent violence levels at the district level in Syria. Therefore, for a teacher to favor a student impacted by violence, they would require access to detailed information about the hometown of each Syrian student and the recent levels of violence in that area. The complexity of this situation, combined with the sensitive nature of hosting refugees in Türkiye, reduces the likelihood of such effects occurring.

Third, the fact that we observe a more pronounced impact on Turkish language grades than on Math grades, along with the observation that female refugee students outperform their male counterparts in Math, may perhaps imply actual differences in learning, rather than being solely driven by grading and reporting. Differential reporting may typically manifest similar effects across both subjects and genders.

Fourth, the estimated test score effects are much smaller for naturalized students. If differential reporting were at play in response to violence in the students' hometowns, we would expect to see a similar impact for naturalized students. Alternatively, differential grading might respond to the integration incentives of refugee children, but given the political climate in Türkiye, this is a highly improbable hypothesis.

Finally, we find small yet statistically significant positive spillover effects on Turkish students, with a stronger effect in schools with a higher concentration of refugee students. This suggests that the academic performance of Turkish students improved in response to the increased integration efforts of Syrian students. This result further supports that the enhanced educational outcomes of Syrian students are not primarily a result of differential grading.

Clean control analysis

Recent research in the difference-in-differences literature has shown that standard two-way fixed effects estimations may be prone to biases when confronted with treatment heterogeneity and differential treatment timing. These biases arise from units being concurrently considered as controls, even though they had undergone treatment in previous time periods. The literature suggests several difference-in-difference estimators that are resilient; however, their applicability is limited to specific settings. For example, Sun and Abraham (2021), Callaway and Sant'Anna (2021) only apply to treatments that follow a staggered design (that is, once a unit is treated, the treatment cannot switch off) while de Chaisemartin et al. (2022) allow the treatment to be continuously distributed at every point in time under certain conditions.

We adopt the approach suggested by de Chaisemartin et al. (2022), employing "movers" as treated observations and "quasi-stayers" as control observations. To distinguish between these groups, we generate dummy treatment variables. In our context, movers are observations with a significant treatment intensity, defined as a treatment intensity ranking in the 25th percentile or higher within the distribution of the treatment.

A quasi-stayer is defined as an observation with a small and irrelevant treatment intensity, falling below the 25th percentile in the distribution of treatment intensity. As illustrated in Appendix Figure A1, there is significant variation in treatment over time, necessitating additional simplifications for a refined set of controls. Specifically, we (i) exclude units whose treatment switches on in time period t and then off in $t + n$, where n ranges from 1 to 16, and (ii) exclude units that consistently receive treatment. Consequently, our sample of interest comprises units that are never treated and units initially untreated in the first period, subsequently receiving treatment in a later period and remaining treated.

Appendix Table A1 shows that our findings remain robust in the clean controls analysis, suggesting that the effects we identify are not simply an artifact of the heterogeneous treatment effects in our empirical setting.

Ruling out influential observations

We rule out the importance of influential observations by plotting the coefficients of our preferred specifications as each province is omitted at a time. Appendix Figure A9 shows that our coefficient estimates are quite stable even as a specific province is eliminated from our main sample in each iteration.

We repeat a similar analysis with Appendix Figure A10 in which we drop one semester-year at a time and again find that our estimates are not driven by any single semester-year.

The role of past exposure to violence

We investigate how the intensity of violence experienced in Syria shapes the responses to contemporaneous violence. Appendix Table A2 shows that refugee students exposed to violence levels below the median in Syria exhibit a reduced response to current violence compared to their counterparts who encountered higher levels of violence in their origin districts. The findings suggest that children relocating from areas in Syria with notably high violence levels might have dedicated greater effort to their studies.

6 Conclusion

We investigate the relationship between ongoing violence in the hometowns of Syrian refugee students and its impact on their educational performance in Türkiye. Using an administrative panel dataset, we document several key findings. First, we find that heightened levels of violence in a refugee's hometown lead to improved academic outcomes in Türkiye. This improvement is observed in their grades for both Turkish language and Math classes, with Turkish grades being larger in magnitude. Importantly, we do not observe a corresponding improvement among naturalized Syrian students. These findings suggest that increased violence levels may lead to greater efforts toward integration into the host country, driven by a recognition of the limited prospects for returning home. Furthermore, we identify a small yet statistically significant positive effect of the violence on the academic performance of Turkish students. This spillover indicates that the enhanced integration efforts of their Syrian peers have a beneficial impact on native students.

Our findings have important policy implications. Given the evident improvement in language scores among refugee students and related positive spillover effects to natives, there is a case for prioritizing language support measures. This may involve allocating additional resources to develop targeted courses and specialized tutoring programs. Such initiatives can effectively expedite the language acquisition and educational progress of refugees while also fostering interaction and mutual understanding with their Turkish peers. Tailored academic and social support should be a focus, such as academic assistance and counseling, alongside programs designed to facilitate their integration into the host country.

To sum up, our research highlights the influence of events in the refugees' home countries on the integration of refugee children into the education system and, consequently, into the host society. As a result, it becomes crucial for authorities to formulate educational policies that prioritize inclusiveness, nurturing academic achievement, and fostering mutual understanding among students from different backgrounds.

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Table 1: Math and Turkish scores

	Log Turkish score				Log Math score			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log. # of violent events	0.0155***	0.0261***			0.0037**	0.0075**		
	(0.0022)	(0.0046)			(0.0014)	(0.0029)		
Log. # of fatalities			0.0108***	0.0137***			0.0034***	0.0041**
			(0.0020)	(0.0038)			(0.0009)	(0.0018)
R-squared	0.744	0.839	0.744	0.838	0.754	0.839	0.754	0.839
# of observations	53,973	53,973	53,973	53,973	53,973	53,973	53,973	53,973
# of clusters	44	44	44	44	44	44	44	44
Mean baseline (2011-2014)	60.49	60.49	60.49	60.49	58.33	58.33	58.33	58.33
Mean sample	58.31	58.31	58.31	58.31	57.77	57.77	57.77	57.77
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grade FE	Yes	No	Yes	No	Yes	No	Yes	No
Classroom FE	No	Yes	No	Yes	No	Yes	No	Yes

Notes: This table reports estimates from individual fixed effect regressions. The dependent variable is *Log. Turkish score* in columns (1) - (4) and *Log. mathematics score* in columns (5) - (8). *Mean baseline* and *Mean sample* refer to the mean of the dependent variable calculated over the academic years from 2011-2012 to 2013-2014 and for the regression sample, respectively. The sample is the semester level data. Standard errors are clustered at the district level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 2: School absences

	Log(# of school days missed +1)			
	(1)	(2)	(3)	(4)
Log. # of violent events	0.0026	-0.0046		
	(0.0200)	(0.0157)		
Log. # of fatalities			0.0059	-0.0133
			(0.0134)	(0.0118)
R-squared	0.718	0.925	0.718	0.925
# of observations	17,458	7,871	17,458	7,871
# of clusters	42	37	42	37
Mean baseline (2011-2014)	13.41	6.34	13.41	6.34
Mean sample	16.10	16.24	16.10	16.24
	Log(# of school days missed)			
	(5)	(6)	(7)	(8)
Log. # of violent events	0.0085	-0.0182		
	(0.0206)	(0.0132)		
Log. # of fatalities			0.0049	-0.0216*
			(0.0142)	(0.0110)
R-squared	0.712	0.901	0.712	0.901
# of observations	15,390	6,561	15,390	6,561
# of clusters	42	35	42	35
Mean baseline (2011-2014)	14.95	7.50	14.95	7.50
Mean sample	17.62	17.78	17.62	17.78
Individual FE	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes
Grade FE	Yes	No	Yes	No
Classroom FE	No	Yes	No	Yes

Notes: This table reports estimates from individual fixed effect regressions. The dependent variable is *Log. # of school days missed + 1* in columns (1) - (4) and *Log.# of school days missed* in columns (5) - (8). *Mean baseline* and *Mean sample* refer to the mean of the dependent variable calculated over the academic years from 2011-2012 to 2013-2014 and for the regression sample, respectively. The sample is the academic year level data and students who have missed more than 115 school days in a year (95th percentile) are excluded from the sample. Standard errors are clustered at the district level. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

Table 3: Differential treatment effects by sub-samples

	Log Turkish score		Log Math score		Log Turkish score		Log Math score	
Sub-sample:	Cont.	Drop out	Cont.	Drop out	Cont.	Drop out	Cont.	Drop out
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log. # of violent events	0.0297***	-0.0106	0.0099***	-0.0172				
	(0.0049)	(0.0107)	(0.0031)	(0.0127)				
Log. # of fatalities					0.0156***	-0.0087	0.0053**	-0.0103
					(0.0046)	(0.0105)	(0.0024)	(0.0082)
R-squared	0.842	0.809	0.844	0.804	0.842	0.810	0.844	0.803
# of observations	49,273	4,696	49,273	4,696	49,273	4,696	49,273	4,696
# of clusters	42	35	42	35	42	35	42	35
Mean baseline (2011-2014)	.	60.49	.	58.33	.	60.49	.	58.33
Mean sample	58.32	58.25	57.85	56.97	58.32	58.25	57.85	56.97
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from individual fixed effect regressions. The dependent variable is *Log. Turkish score* in columns (11), (2), (5) and (6), and *Log. mathematics score* in columns (3), (4), (7) and (8). *Cont.* (odd columns) and *Drop out* (even columns) refer to the sub-samples of students who are, by assumption, continuing their education (outcome of final compulsory education unknown) and who dropped out before the end of their compulsory education, respectively. *Mean baseline* and *Mean sample* refer to the mean of the dependent variable calculated over the academic years from 2011-2012 to 2013-2014 and for the regression sample, respectively. The sample is the semester-level data. Standard errors are clustered at the district level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 4: Heterogeneous effects – naturalised and female students

	Log Turkish score		Log Math score	
	(1)	(2)	(3)	(4)
Log. # of violent events	0.0273***		0.0075**	
	(0.0045)		(0.0033)	
Naturalised × Log. # of violent events	-0.0119**		0.0001	
	(0.0055)		(0.0061)	
Log. # of fatalities		0.0144***		0.0044**
		(0.0038)		(0.0020)
Naturalised × Log. # of fatalities		-0.0072**		-0.0031
		(0.0034)		(0.0032)
Total effect	0.0154	0.0072	0.0075	0.0013
p-value	0.0073	0.0102	0.0922	0.5413
R-squared	0.839	0.839	0.839	0.839
# of observations	53,973	53,973	53,973	53,973
# of clusters	44	44	44	44
Mean baseline (2011-2014)	60.49	60.49	60.49	60.49
Mean sample	58.31	58.31	57.77	57.77
Individual FE	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes
Classroom FE	Yes	Yes	Yes	Yes

	Log Turkish score		Log Math score	
	(5)	(6)	(7)	(8)
Log. # of violent events	0.0233***		-0.0004	
	(0.0040)		(0.0025)	
Female × Log. # of violent events	0.0053**		0.0153***	
	(0.0025)		(0.0023)	
Log. # of fatalities		0.0127***		-0.0003
		(0.0030)		(0.0009)
Female × Log. # of fatalities		0.0020		0.0085***
		(0.0021)		(0.0022)
Total effect	0.0286	0.0146	0.0149	0.0082
p-value	0.0000	0.0029	0.0001	0.0049
R-squared	0.839	0.838	0.840	0.840
# of observations	53,973	53,973	53,973	53,973
# of clusters	44	44	44	44
Mean baseline (2011-2014)	60.49	60.49	60.49	60.49
Mean sample	58.31	58.31	57.77	57.77
Individual FE	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes
Classroom FE	Yes	Yes	Yes	Yes

Notes: This table reports estimates from individual fixed effect regressions. The dependent variable is *Log. Turkish score* in columns (1), (2), (5) and (6), and *Log. mathematics score* in columns (3), (4), (7) and (8). *Mean baseline* and *Mean sample* refer to the mean of the dependent variable calculated over the academic years from 2011-2012 to 2013-2014 and for the regression sample, respectively. The sample is the semester-level data. Standard errors are clustered at the district level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 5: Spillovers to Turkish students

	Log Turkish score		Log Math score	
Panel A: All	(1)	(2)	(3)	(4)
Share of Syrian students	-0.1791**	-0.1395**	-0.2293**	-0.1993**
	(0.0801)	(0.0670)	(0.1092)	(0.0913)
Weighted index: violent events	-0.0034**		-0.0014	
	(0.0015)		(0.0017)	
Share of Syrian students × Weighted index: violent events	0.0406**		0.0462*	
	(0.0195)		(0.0268)	
Weighted index: fatalities		-0.0027***		-0.0009
		(0.0010)		(0.0012)
Share of Syrian students × Weighted index: fatalities		0.0239*		0.0305*
		(0.0127)		(0.0173)
R-squared	0.624	0.624	0.614	0.614
# of observations	25,946	25,946	25,946	25,946
# of clusters	1,903	1,903	1,903	1,903
Mean sample	73.20	73.20	68.17	68.17
Panel B: At least median number of Syrian refugees in the school-year	Log Turkish score		Log Math score	
	(5)	(6)	(7)	(8)
Share of Syrian students	-0.2756***	-0.2246***	-0.3417***	-0.2904***
	(0.0931)	(0.0790)	(0.1250)	(0.1065)
Weighted index: violent events	-0.0049**		-0.0010	
	(0.0021)		(0.0026)	
Share of Syrian students × Weighted index: violent events	0.0579**		0.0652**	
	(0.0228)		(0.0309)	
Weighted index: fatalities		-0.0035**		-0.0002
		(0.0015)		(0.0018)
Share of Syrian students × Weighted index: fatalities		0.0353**		0.0411**
		(0.0151)		(0.0203)
R-squared	0.569	0.569	0.558	0.558
# of observations	13,463	13,463	13,463	13,463
# of clusters	550	550	550	550
Mean sample	72.81	72.81	67.54	67.54
Panel C: Below median number of Syrian refugees in the school-year	Log Turkish score		Log Math score	
	(9)	(10)	(11)	(12)
Share of Syrian students	0.2535	0.2677	-0.1221	-0.0405
	(0.3688)	(0.3636)	(0.4681)	(0.4653)
Weighted index: violent events	-0.0075***		-0.0070***	
	(0.0020)		(0.0025)	
Share of Syrian students × Weighted index: violent events	0.0212		0.0938**	
	(0.0305)		(0.0383)	
Weighted index: fatalities		-0.0048***		-0.0042***
		(0.0011)		(0.0014)
Share of Syrian students × Weighted index: fatalities		0.0136		0.0556***
		(0.0157)		(0.0211)
R-squared	0.927	0.927	0.921	0.921
# of observations	12,370	12,370	12,370	12,370
# of clusters	1,819	1,819	1,819	1,819
Mean sample	73.65	73.65	68.89	68.89
School FE	Yes	Yes	Yes	Yes
Grade FE	Yes	Yes	Yes	Yes
Academic year FE	Yes	Yes	Yes	Yes
Summer semester FE	Yes	Yes	Yes	Yes
Province × academic year FE	Yes	Yes	Yes	Yes

Notes: This table reports estimates from classroom level linear regressions. The dependent variable is *Log. Turkish score* in columns (1), (2), (5), (6), (9) and (10), and *Log. mathematics score* in columns (3), (4), (7), (8), (11) and (12). Panel A is the sample of Turkish students assigned to classrooms with at least 1 Syrian student, Panel B is the sub-sample of classrooms with at least the median number of Syrian students and Panel C is the sub-sample of of classrooms with below median number (and at least 1) of Syrian students. Standard errors are clustered at the school level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

7 Appendix

Table A1: Clean controls analysis

	Log Turkish score				Log Math score			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
# of violent events $\geq$ 25th percentile	0.0314***	0.0583***			0.0043	0.0325***		
	(0.0057)	(0.0032)			(0.0035)	(0.0021)		
# of violent events $\geq$ 50th percentile			0.0355***	0.0527***			0.0093***	0.0253***
			(0.0025)	(0.0018)			(0.0018)	(0.0023)
R-squared	0.838	0.826	0.839	0.840	0.839	0.832	0.839	0.840
# of observations	53,973	23,207	53,973	23,243	53,973	23,207	53,973	23,243
# of clusters	44	39	44	39	44	39	44	39
Mean sample	54.63	53.47	54.63	53.94	53.59	52.20	53.59	52.83
Number of students	17,857	7,384	17,857	10,858	17,857	7,384	17,857	10,858
Number of treated students	4,838	4,838	8,299	8,299	4,838	4,838	8,299	8,299
Number of control students	2,546	2,546	2,560	2,559	2,546	2,546	2,560	2,559
	Log Turkish score				Log Math score			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
# of fatalities $\geq$ 25th percentile	0.0349***	0.0570***			0.0104***	0.0326***		
	(0.0040)	(0.0017)			(0.0024)	(0.0039)		
# of fatalities $\geq$ 50th percentile			0.0348***	0.0533***			0.0103***	0.0267***
			(0.0030)	(0.0020)			(0.0010)	(0.0046)
R-squared	0.839	0.842	0.839	0.839	0.839	0.845	0.839	0.840
# of observations	53,973	21,136	53,973	22,659	53,973	21,136	53,973	22,659
# of clusters	44	39	44	40	44	39	44	40
Mean sample	54.63	53.99	54.63	53.88	53.59	53.06	53.59	52.83
Number of students	17,857	10,060	17,857	10,685	17,857	10,060	17,857	10,685
Number of treated students	7,892	7,892	8,331	8,331	7,892	7,892	8,331	8,331
Number of control students	2,168	2,168	2,355	2,354	2,168	2,168	2,355	2,354
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Classroom FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from individual fixed effect regressions. The dependent variable is *Log. Turkish score* in columns (1)-(4) and (9)-(12), and *Log. mathematics score* in columns (5)-(8) and (13)-(16). Odd columns are the full semester level sample, while even columns are the sub-sample corresponding to the "clean control" analysis. Standard errors are clustered at the district level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table A2: Heterogeneous effects – exposure to violence in Syria

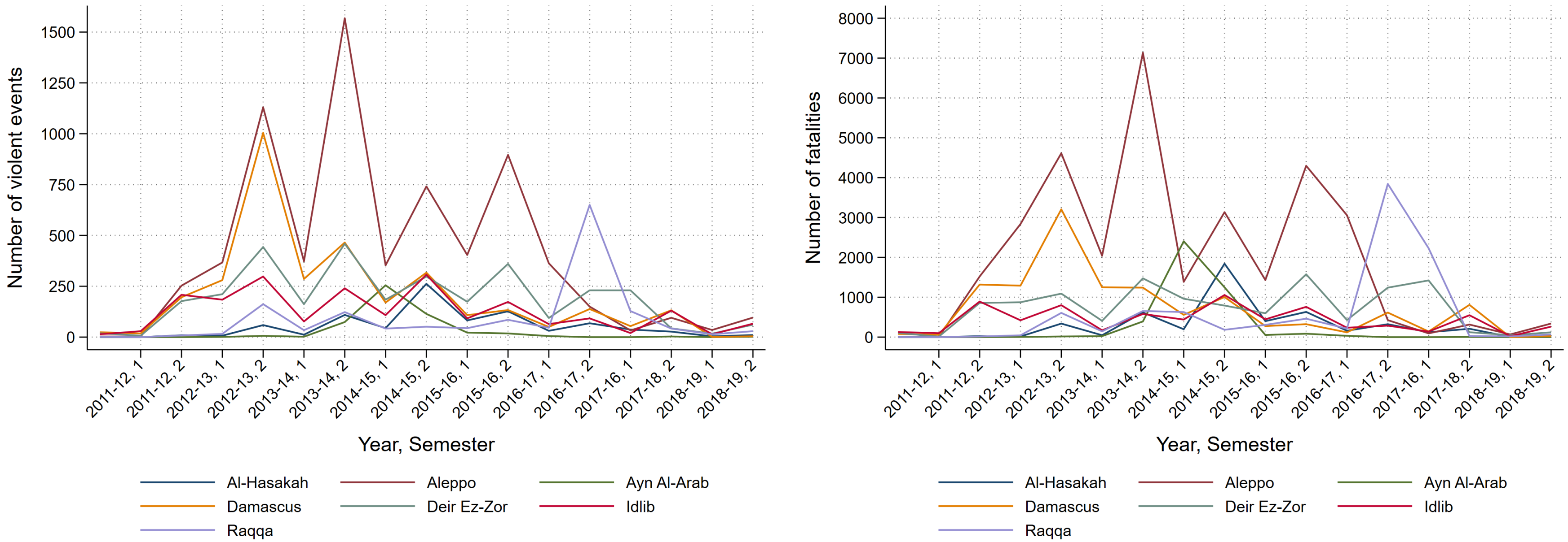
	Log Turkish score		Log Math score	
	(1)	(2)	(3)	(4)
Log. # of violent events	0.0350***		0.0119***	
	(0.0006)		(0.0006)	
Below median: past violence in Syria × Log. # of violent events	-0.0185***		-0.0091**	
	(0.0050)		(0.0034)	
Log. # of fatalities		0.0215***		0.0078***
		(0.0004)		(0.0003)
Below median: past violence in Syria × Log. # of fatalities		-0.0150***		-0.0071***
		(0.0037)		(0.0012)
R-squared	0.839	0.839	0.839	0.839
# of observations	53,973	53,973	53,973	53,973
# of clusters	44	44	44	44
Mean sample	58.31	58.31	57.77	57.77
Individual FE	Yes	Yes	Yes	Yes
Years since arrival FE	Yes	Yes	Yes	Yes
Classroom FE	Yes	Yes	Yes	Yes

Notes: This table reports estimates from individual fixed effect regressions. Standard errors are clustered at the district level. ***, ** , and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Figure A1: Violence over time

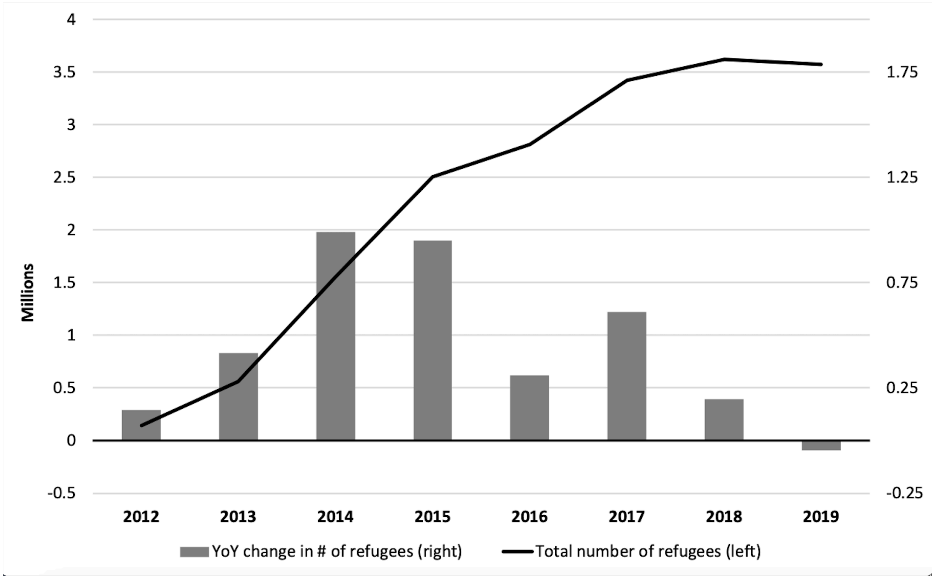
Panel A: Number of violent events over time

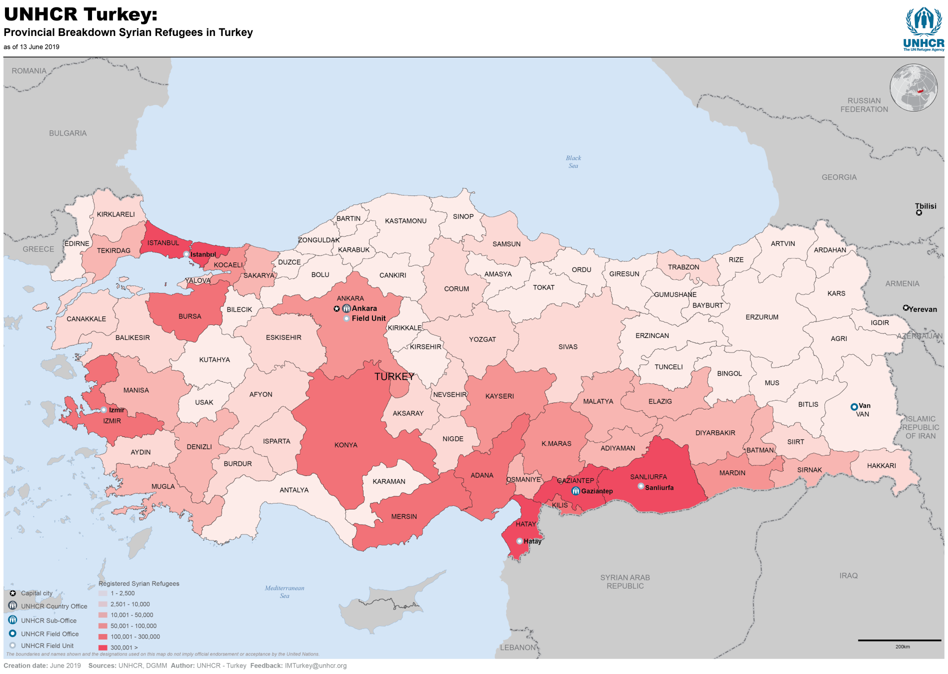
Panel B: Number of conflict-related fatalities over time



Notes: Panel A shows the number of violent events that occurred over time at the district level for our sample period. Panel B shows the number of conflict-related fatalities over time at the district level for our sample period. On the x-axis, the academic year is followed by the semester; “2011-12, 1” and “2011-12, 2” indicate the fall and spring semesters, respectively. The sample is restricted to the districts that cover 90 percent of student refugees in Türkiye.

Figure A2: Syrian refugees in Türkiye



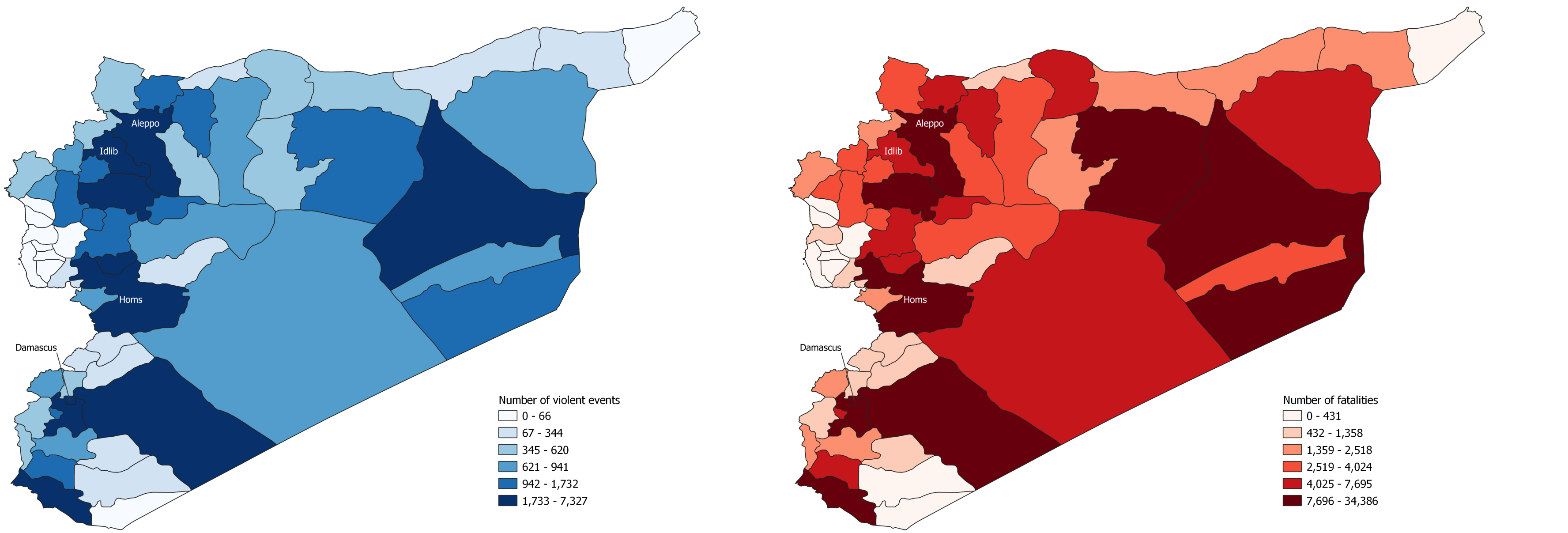


Notes: The upper panel shows the time variation in the number of Syrian refugees in Türkiye, while the lower panel shows the regional distribution as of 2019.

Figure A3: Cumulative violence

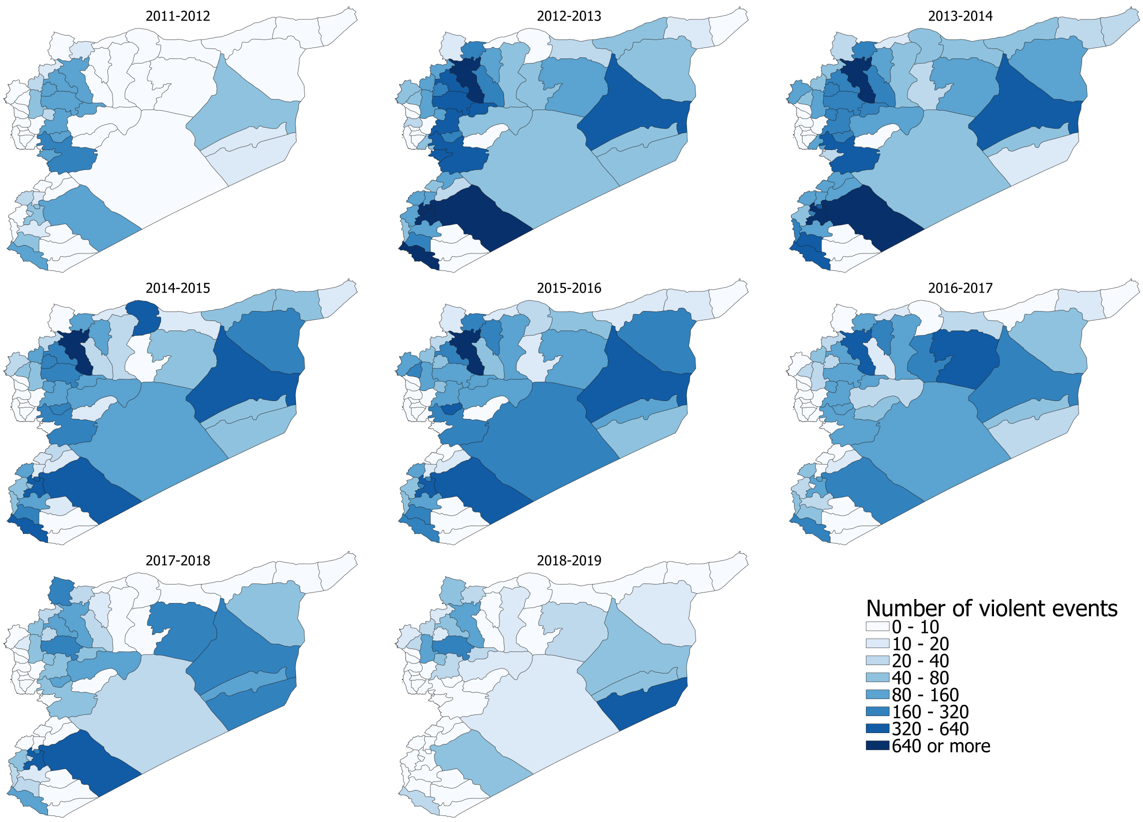
Panel A: Cumulative number of violent events

Panel B: Cumulative number of fatalities



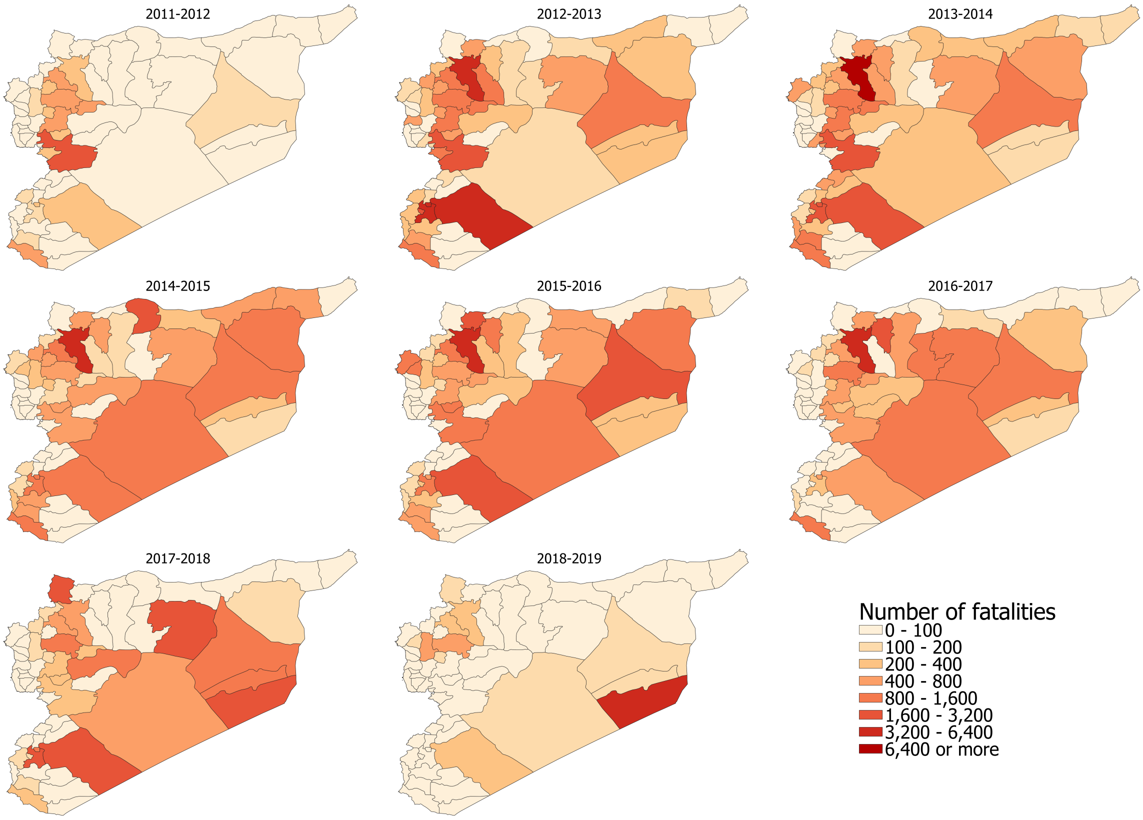
Notes: This figure shows cumulative violence during the academic years from 2011-2012 to 2018-2019. Panel A and Panel B correspond to the number of violent events and fatalities, respectively.

Figure A4: District-level violent events per academic year



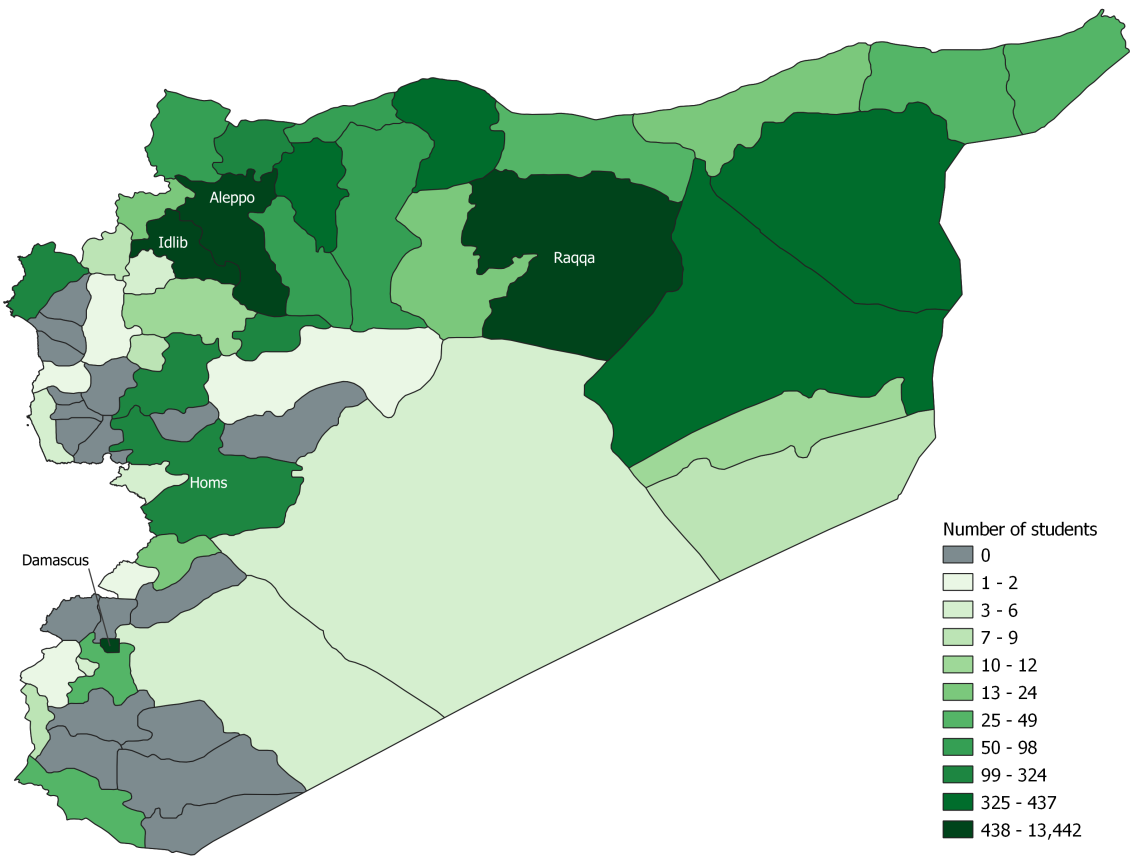
Notes: These maps show the number of violent events at the district level for the academic years from 2011-2012 to 2018-2019.

Figure A5: District-level fatalities per academic year



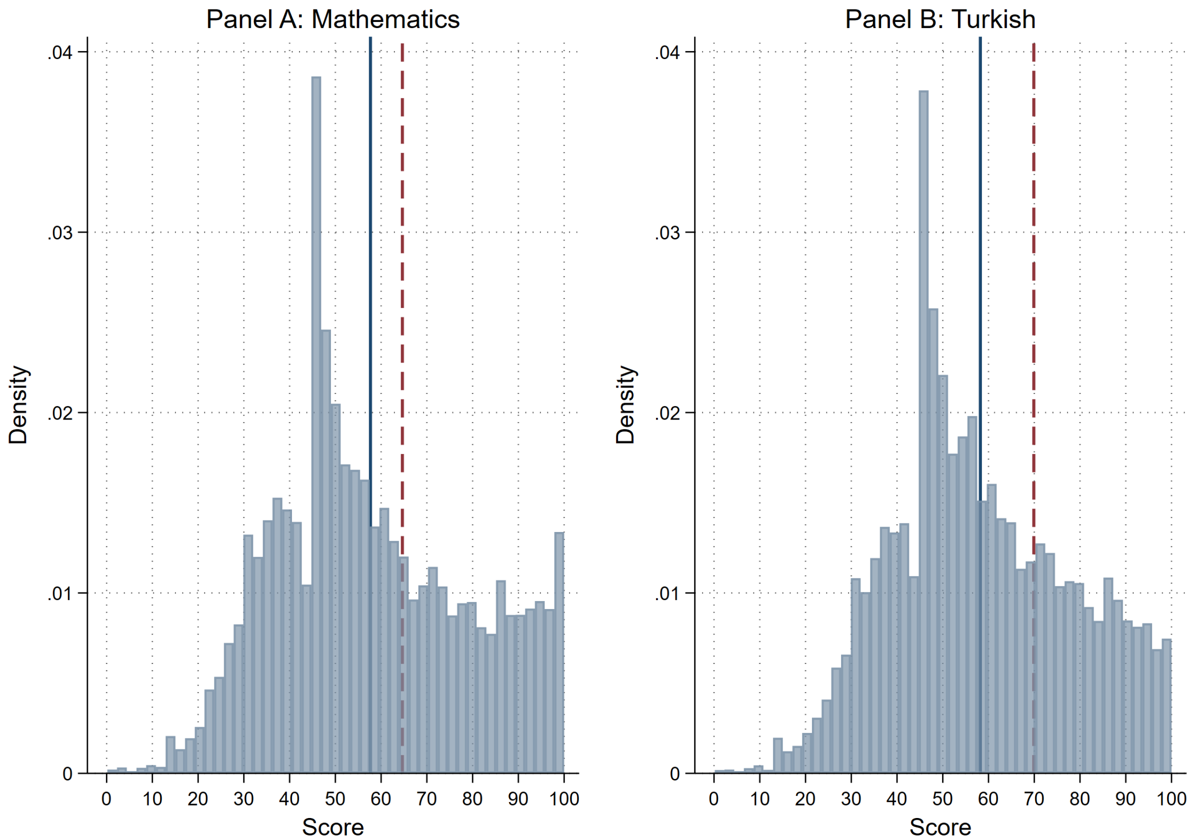
Notes: These maps show the number of conflict-related fatalities at the district level for the academic years from 2011-2012 to 2018-2019.

Figure A6: District of birth



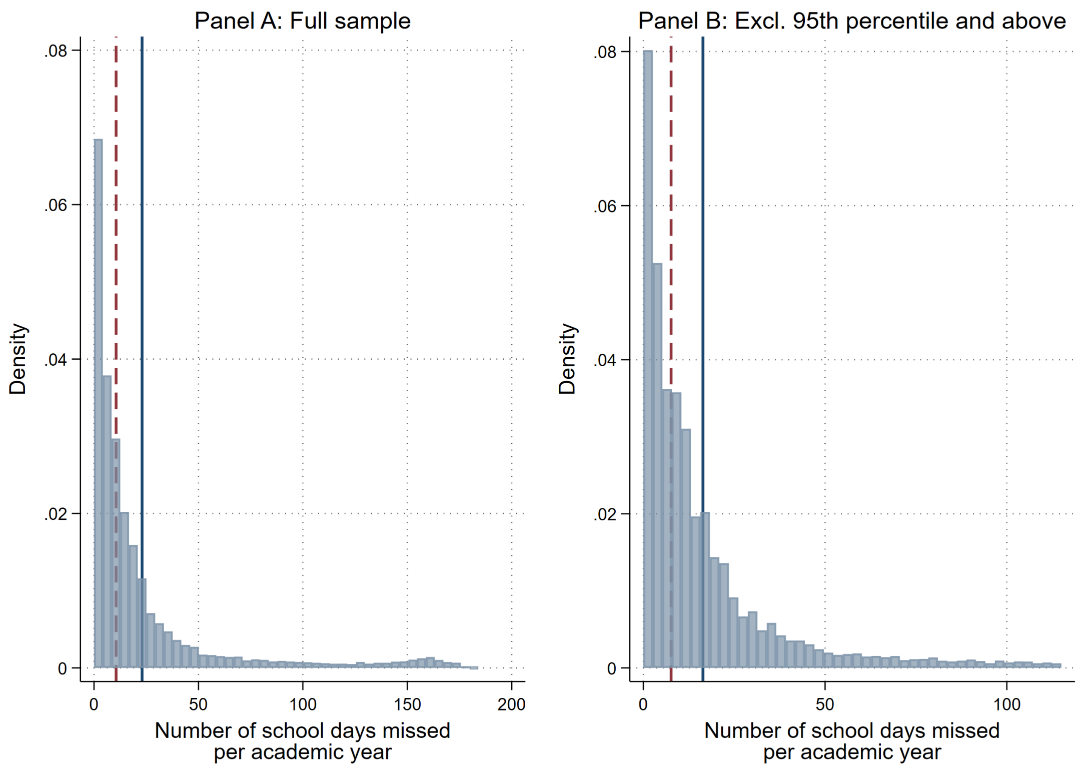
Notes: Figure shows the distribution of Syrian students according to their district of birth. District boundaries are indicated using thin black lines.

Figure A7: Math and Turkish scores among Syrian students



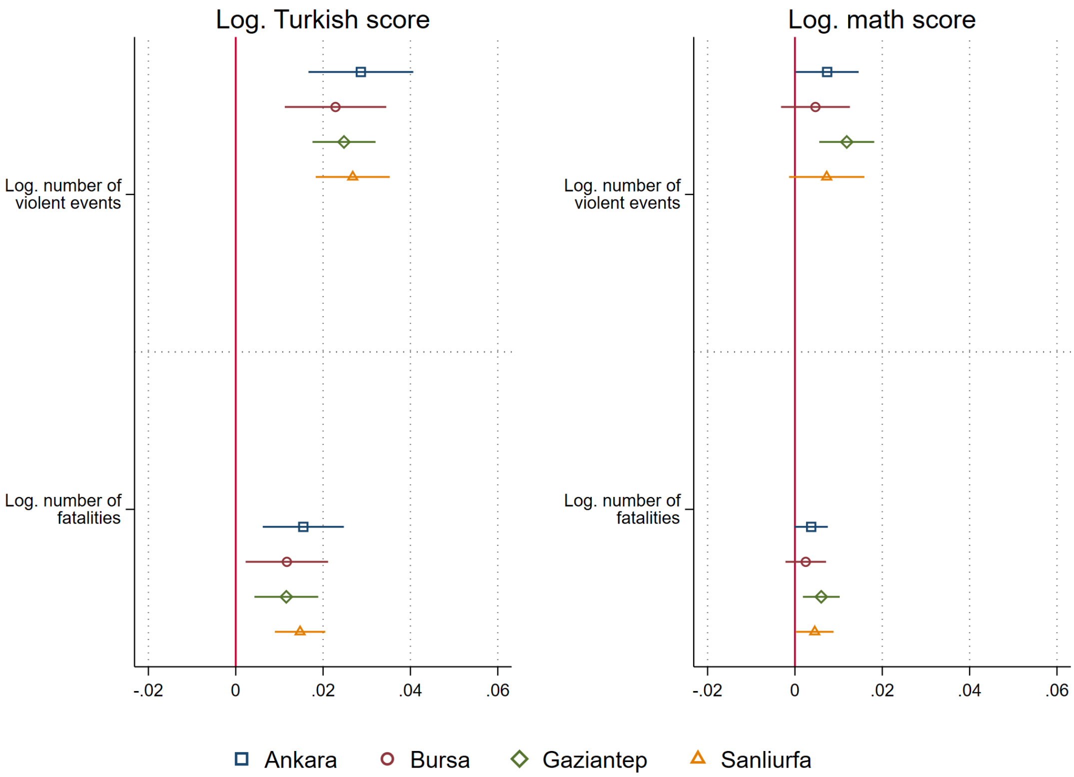
Notes: This figure shows the distribution of Math and Turkish scores in Panel A and Panel B, respectively. Sample means are indicated by the blue solid lines and red dashed lines for Syrian and Turkish students, respectively. The sample is the semester-level data and corresponds to academic years between 2011-2012 and 2018-2019.

Figure A8: The number of school days missed among Syrian students



Notes: This figure shows the distribution of the number of school days missed per school year. Panel A is the full sample, while Panel B shows observations below the 95th percentile. ample means are indicated by the blue solid lines and red dashed lines for Syrian and Turkish students, respectively. The sample is the year-level data and corresponds to academic years between 2011-2012 and 2018-2019.

Figure A9: Leaving out one (Turkish) province at a time

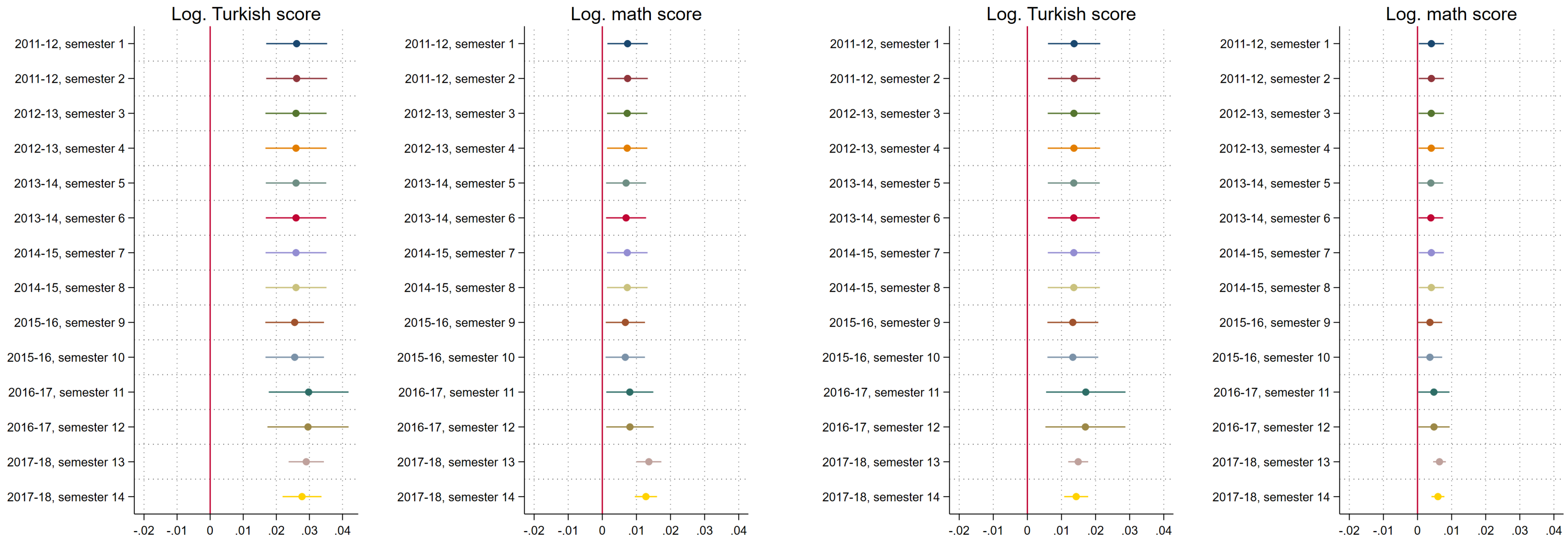


Notes: This figure reports estimates from the baseline individual fixed effects regressions. Each point corresponds to a sub-sample of the data where one of the four provinces, namely, Ankara (N=47,927), Bursa (N=38,618), Gaziantep (N=28,049,) and Sanliurfa (N=47,697) have been dropped from the data. Standard errors are clustered at the district level, and whiskers show 95% confidence intervals.

Figure A10: Leaving one semester out at a time

Panel A: Log # violent events

Panel B: Log # fatalities



Notes: This figure reports estimates from the baseline individual fixed effects regressions. The treatment variables in Panel A and Panel B are *Log # violent events* and *Log # number of fatalities*, respectively. Each point corresponds to a sub-sample of the data where the semester indicated on the vertical axis has been dropped. Standard errors are clustered at the district level and whiskers show 95% confidence intervals.