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ABSTRACT

Neighbourhood Gangs, Crime Spillovers, and Teenage Motherhood*

Using an identification strategy based on random assignment of refugees to different municipalities in Denmark between 1986 and 1998, we find strong evidence that gang crime rates in the neighbourhood at assignment increase the probability of boys to commit crimes before the age of 19, and that gang crime (but not other crime) increases the likelihood of teenage motherhood for girls. Higher levels of gang crime also have detrimental and long-lasting effects, with men experiencing significantly higher levels of inactivity and women experiencing lower earnings and higher levels of welfare benefit claims at ages 19 to 28.

JEL Classification: J1, K4, I3

Keywords: crime spillovers, gang crime, teenage motherhood

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1 Introduction

The effects of neighbourhood characteristics on the development of children and adolescents is a key area of research in the social sciences literature. Early papers such as Brooks-Gunn et al. (1993) document strong associations between children's outcomes and the characteristics of the neighbourhoods they live in. More recent work finds evidence that the neighbourhood children grow up in affects their earnings, college attendance, marriage, fertility (Chetty et al., 2016; Chetty and Hendren, 2018a,b; Chyn, 2018; Deutscher, 2020), and school performance (Åslund et al., 2011; Galster et al., 2016).[1] One particular concern is the effect of neighbourhood characteristics on adolescents' criminal, delinquent, and health-compromising activities (for a review, see Leventhal and Brooks-Gunn (2000)), in particular the potential negative impacts of gangs, drugs and violence on children and young teenagers (Jencks and Mayer, 1990; Popkin et al., 2002). A small literature investigates the impact of exposure to crime on the criminal behaviour of young men and women,[2] but little is known about which type of criminal activity in the neighbourhood may lead to spillovers, how this compares with the impact other neighbourhood characteristics have on later outcomes, how exposure to crime affects other dimensions of risky behaviour in particular for girls, and what the longer-term economic consequences of exposure to crime for males and females are.

In this paper we address these issues and extend the existing literature in several important ways. First, access to detailed conviction records allow us to construct a measure of

[1] Chetty and Hendren (2018a) finds significant childhood exposure effects to better neighbourhoods, showing that outcomes of children improve with time spent growing up in more favourable areas. Deutscher (2020) confirms these findings for Australia and shows that exposure effects are strongest during the early teenage years. Chetty et al. (2016) emphasize that beneficial effects of moving to better neighbourhoods on future college attendance and earnings are present only for children younger than 13 at exposure, and Chyn (2018), shows that children moving to better neighbourhoods due to demolition of public housing have better labour market outcomes, lower high school dropout rates and lower arrest rates than comparable children remaining in public housing.

[2] See e.g. Case and Katz (1991) for an early non-causal analysis of neighbourhood effects on crime, Ludwig et al. (2001), Kling et al. (2005), and Ludwig and Kling (2007) for work based on the Moving to Opportunity (MTO) re-location project in the US, Damm and Dustmann (2014) for work on Denmark, Deming (2011), Billings et al. (2014), and Billings et al. (2019) on the role of schools in determining the criminal behaviour of youth, and Bayer et al. (2009) on the impact of exposure to delinquent peers in correctional facilities on subsequent criminal activity of juveniles.

"group crime" activity, which we define as a crime for which more than one individual is convicted, and which is either of a violent nature, involves weapons, drug sales, vehicular theft, or malicious damage to property. Our definition of group crime draws on the classification of a youth gang adopted by Esbensen and Maxson (2011) and on the types of crimes that gangs usually commit (NGIC, 2013). As we do not observe whether individuals convicted together for committing a crime form indeed a "gang", we refer to this measure as "group crime" rather than "gang crime". The group crime conviction rate in a municipality (to which we refer simply as "group crime") is then the percentage of males aged 15-25 who were convicted for group crimes committed in a calendar year.[3] Our analysis will therefore shed new light on the mechanisms that create spillovers related to neighbourhood crime.

Second, we provide new evidence for girls, by investigating the impact of a criminal environment more generally, and group crime activity in particular, not just on their own criminal behaviour and long-term outcomes, but also on teenage pregnancy.[4] The investigation of teenage pregnancy addresses a hypothesis by Sanders (2011) who suggests that while risky behaviour of boys establishes itself through criminal activity, risky behaviour of girls manifest itself through early motherhood.[5] Third, detailed information on various non-crime neighbourhood characteristics allows us to contrast the effect of neighbourhood crime and group crime with that of other neighbourhood characteristics that individuals are exposed to at assignment. Finally, the long observation window that we have available allows us to investigate the effects of exposure to crime at youth on outcomes such as earnings, inactivity

[3]Importantly, our measures of criminal activity refer to the share of criminals *living* in a neighborhood, rather than the *number* of crimes committed in that neighborhood, as used in many other studies, and are therefore measures of exposure to criminals rather than crime itself.

[4]Berkout et al. (2011) point out that girls' delinquent behavior is less well understood than that of boys', and that peer and family background variables appear to be less predictive of female delinquency. Bertrand and Pan (2013) link differences in externalizing (disruptive) behavior between boys and girls to their differing sensitivities to the level and quality of parental inputs.

[5]In line with this idea, Minnis et al. (2008) find that having partners who are involved in gangs is associated with teenage pregnancy, a finding attributed to a higher incidence of unsafe sexual behavior among young females with gang-affiliated partners, caused by physical and psychological coercion to unprotected sex, intoxication on drugs and/or alcohol, and limited access to the means of birth control (see Sanders et al., 2009; Miller et al., 2012; Dickson-Gomez et al., 2017). Koppensteiner and Manacorda (2016) show that exposure to violence in the first trimester of pregnancy leads to a small increase in the risk of low birthweight and prematurity.

and welfare dependence at later ages.

We address the main challenge to establish a causal relationship between neighbourhood crime and individuals' risky behaviour, the endogenous sorting of individuals into neighbourhoods, by drawing on the same experimental setting than Damm and Dustmann (2014), who use a policy in Denmark where refugee immigrants and their families were quasi-randomly assigned to different municipalities (which is our unit of neighbourhood) from 1986 to 1998. We focus on the children of these immigrants who were younger than 15 years old when their parents were assigned to a neighbourhood. The quasi-random allocation of refugees in our sample allows us to identify the causal effect of crime rates at assignment in a neighbourhood on assigned individuals. Moreover, the rich nature of our data, with families and their children being allocated to 201 different municipalities over the course of the policy, and the long period over which the policy was implemented enables us to condition not just on a large set of time-varying municipality characteristics, but also on municipality fixed effects, thus using across cohort variation in crime rates at assignment for identification. We therefore not only remove a large array of time varying municipality characteristics but also time constant unobserved neighbourhood effects that may be correlated with both risky behaviour of assigned children and neighbourhood crime alike. In addition, we conduct several tests and robustness checks to show that any remaining influence of time varying unobserved neighbourhood characteristics that are correlated with neighbourhood crime and criminal behaviour is likely to be small. This gives us confidence that we eliminate most "correlated effects" such that we can interpret our estimates as "social effects" in the terminology of Manski (1993, 2000).

Our analysis shows that crime spillovers are not only particularly salient for young men, but also that the share of young men in a neighbourhood that is convicted for a violent crime is highly influential in creating these spillovers, which confirms earlier results by Damm and Dustmann (2014). We add to their findings by showing that it is not crime, nor violent crime per se, but group crime, and in particular violent group crime, that drives these effects for boys. Thus, we identify group crime as a particularly problematic type of crime that creates

crime spillovers and potentially crime multipliers. While we find no effects of exposure to a criminal environment at assignment on the criminal activity of young women, we do find sizeable effects on their probability of teenage motherhood, which is driven solely by group crime. Our results on the causal link between local group crime and teenage births support the view expressed in the literature that teenage motherhood is a marker of social problems (see the survey by Kearney and Levine, 2012) and confirms the hypothesis of Sanders (2011) that risky behaviour of girls manifests itself through early motherhood rather than criminal behaviour. We further illustrate that one possible mechanism is direct involvement with males who are convicted for group crimes, and therefore likely to be part of a criminal gang, which supports the hypotheses that having partners involved in gangs is associated with teenage pregnancy (Minnis et al., 2008) and illustrates that association of teenage girls with partners who are involved with gang crime is one possible channel that explains the effect of group crime on female outcomes (see Sanders et al., 2009; Miller et al., 2012; Dickson-Gomez et al., 2017). Finally, our analysis of the effects of other municipality characteristics suggests group crime as the most influential neighbourhood characteristic that impacts negatively on assigned teenagers. Some other municipality characteristics (such as poverty rates and employment) affect teenage pregnancy unconditional on municipality fixed effects, in line with earlier work by Kearney and Levine (2012). However, only group crime seems important when using within municipality variation only. This is an important finding as it allows for the identification of neighbourhoods where interventions could be most effective, focusing on one characteristic only – at least for Denmark.

We show that the effect of group crime on the criminal behaviour of young men and on teenage motherhood of young women are strongest for those children assigned to a neighbourhood between age 7 and 14 which is in line with a literature in the social sciences, suggesting that the age between 6 and 14 represents a critical development period during which children are at heightened risk of neighbourhood-based effects on antisocial behaviour

problems (Ingoldsby and Shaw, 2002).[6] Finally, we show that for both genders, exposure to group crime when young has detrimental and long-lasting effects on labour market attachment and welfare dependence. Men exposed to higher group crime rates at assignment experience significantly higher levels of inactivity, while women experience lower earnings and claim a higher level of welfare benefits at ages 19 to 28. While for men, these effects are likely caused through increased engagement in criminal activity, for women it is teenage pregnancy that is likely to induce higher welfare dependence.

2 Background and Data

2.1 The Danish Dispersal Policy

In the period from 1986 to 1998, the Danish Refugee Council (DRC) oversaw the allocation of refugees (i.e. asylum seekers whose applications have been approved for refugee status) across Danish municipalities. The guiding principle of this allocation was equal distribution of refugees according to pre-existing populations, and it was implemented as a two-stage process: in the first stage, individuals, once they received asylum (i.e. obtained "refugee status" and became "refugees"), were allocated to one of the 15 counties of Denmark proportional to the county population size. In a second stage, refugees were allocated to municipalities within counties, again relative to the municipality population size. The equal allocation of refugees across municipalities within a county was aimed to be achieved over a 3-5-year timescale and was implemented through a rotation scheme where DRC offices moved from one town to another within counties.

Allocation decisions were made without face-to-face meetings between placement officers and refugees, but the council had information on certain demographic characteristics such as date of birth, nationality, marital status, and number of children from a questionnaire that refugees filled in upon receiving asylum. The assignment to municipalities was thus random

[6]Estimates represents a combination of differences in years of potential exposure and age at assignment as changes to the assignment age and years of potential exposure cannot be disentangled.

conditional on these characteristics, which we control for in our analysis, and influenced neither by refugees' other characteristics nor their location preferences. While there were no relocation restrictions, refugees were urged to stay in the municipality of assignment for an 18-month introductory period while participating in Danish language courses and receiving social assistance. Any reassignment requests were considered only after the refugees had moved to the municipality to which they had originally been allocated. It is this first assignment that we use for identification of neighbourhood crime. Table A1 of the Appendix reports that in our final sample of assigned refugee children, 62% still lived in the municipality of assignment 5 years later (and 50% 10 years later). For more details on the Danish refugee spatial dispersal policy, see Dustmann et al. (2019).

2.2 Data and Sample

We use individual-level information, contained in administrative registers and provided by Statistics Denmark, that can be linked via a unique individual identifier. Specifically, we use the Immigration Register and the Annual Population Registers containing information on all individuals residing in Denmark on January 1st of a given year to identify assigned refugee children and their first-born child. We use the Central Police Registers on individuals' charges and convictions to infer the criminal history of assigned refugees, as well as to construct municipal crime conviction rates. Finally, we use information from the Education Registers to obtain individuals' educational attainment, and the Income Registers and the register-based labour force statistics to construct other municipal characteristics such as poverty and employment rates and to investigate longer run labour market outcomes of the assigned refugees, such as earnings and employment, in the final part of the paper.

2.2.1 Group crime and other crime measures

Our main measures of crime are crime convictions. To check the robustness of our estimates, we use criminal charges as an alternative measure of criminal behaviour. Arrests, a crime

measure used in most US studies, are not common in Denmark.[7] According to Statistics Denmark (2018, Table 1.7.01), only 22 percent of all criminal charges were accompanied by an arrest, and most individuals who are charged with a crime are not arrested at any point between the date of their charge and the date a conviction is made in the court.

We construct municipal crime measures for years 1986-1998 using information from the Central Police Register, which records individuals' criminal convictions and charges, together with the dates and types of offenses (allegedly) committed. We link this data with information on offenders' gender, date of birth, and municipality of residence using the Population Registers.

Our measure of municipal group crime activity is then the percentage of males aged 15-25 living in the municipality in the beginning of the assignment year who were convicted for group crimes committed in that calendar year (to which we refer as the group crime conviction rate of municipality r in year t).[8] We focus on male conviction rates because only few females are convicted for group crimes, but our results are robust to the inclusion of females in our measure of group crime. We classify a crime as a group crime if (i) at least two individuals are convicted for the crime[9] and (ii) at least one of the co-offenders are convicted for one of the following offenses: violent non-sexual offenses (including robbery and extortion), weapons offences, drug trafficking, theft of registered vehicles, or malicious damage to property (including arson and graffiti).[10] Among offenders who are originally

[7]According to the Danish "Law on Administration of Justice" (Retsplejeloven, Article 755, part 1), a person should be arrested only if considered necessary to prevent further criminal offenses, and arrests should not be contemplated if a disproportionate measure in regard to the nature of the offense.

[8]As pointed out earlier, a particular feature of this measure is that it relates to the number of criminals who live in the area of assignment, not to the crimes committed in that area. As individuals may commit crimes in areas other than where they live, these two measures can be very different. We believe that it is the first that matters most for spillover effects.

[9]We also conduct robustness checks where we change the group crime classification to include at least 3 offenders convicted for the same crime, see Section 4.4.3.

[10]The requirement that at least two individuals should be convicted is in line with the gang crime definition adopted by criminologists, who consider a gang to be an association of individuals with the purpose to engage in delinquent activities *together* (Esbensen and Maxson, 2011). The restrictions on the type of offense follow the (US) National Gang Intelligence Center and take into account that gangs specialize in violent crimes such as drug trafficking, threats, intimidation, assault, and robbery, more so than in white collar-type crimes (NGIC, 2013).

charged for the same crime, delinquents are convicted for different offenses in 14.6% of the cases classified here as group crimes. These offenses are most commonly property crimes (42.8% of cases), drug trafficking (8.6%), and violent non-sexual offences (39.6%).[11]

In the same manner as the group crime conviction rate, we construct the municipal non-group crime conviction rate as the percentage of males aged 15-25 living in the municipality at the start of each calendar year who were convicted for only non-group crimes committed during that year.[12] To look more deeply at the effects of different types of crime, we also construct analogous measures of violent crime, property crime, drug crime, non-group violent, non-group property, non-group drug, and other non-group crime for each municipality and year. The area's overall crime conviction rate in a particular year equals the sum of the group crime and non-group crime conviction rates. Table A2 of the Appendix shows that the group crime conviction rate is positively correlated with other crime conviction rates over municipalities and time, but not strongly so.

Figure 1 presents the distribution of group crime conviction rates that the assigned refugee children in our sample are exposed to in the municipality and year of assignment. The distribution is asymmetric with a right tail (which is truncated in the figure at 1.1% of convicted males aged 15-25), a mean of 0.48% and a standard deviation of 0.26 (see Table 1). The percentage of young males convicted for group crimes is far smaller than the percentage convicted for non-group crimes (3.53%). Property and non-group property crimes are the most common crime type with, on average, 2.85% and 2.49% of males aged 15-25 each year having committed this type of crime for which they were later convicted. The percentage of young males convicted for group crimes is most comparable to the percentage convicted for violent or drug crimes: Table 1 shows that on average, 0.50% of young males are convicted

[11] Pedersen and Lindstad (2012) provide a brief introduction to the history of street gangs in Denmark. Pedersen (2014) investigates the joining of gangs among juveniles in socially disadvantaged neighborhoods in Copenhagen using school-based surveys. She finds that 13% of youth aged 13-17 are members of a street gang, and that members of street gangs are more likely to have contact with older gangs. Pedersen (2014) points out that these numbers are not dissimilar from what is found in a US context using a similar definition of street gangs (Esbensen et al., 2013).

[12] We exclude offences against the Traffic Act throughout our analysis.

for violence and 0.48% of young males are convicted for drug crimes committed in each year.

[Figure 1 and Table 1 about here]

2.2.2 Assigned refugees and their children

We identify assigned refugees from the Population Registers, available from 1980 to 2019, which provide individual demographic information (such as gender, date of birth, parents' ID numbers, marital status, current place of residence, country of origin, and date of immigration) for the full Danish population. In particular, we define an assigned refugee to be a person who (i) immigrated from one of eight refugee-sending countries: Afghanistan, Ethiopia (prior to 1991), Iran, Iraq, Lebanon, Somalia (after 1988), Sri Lanka, and Vietnam;[13], (ii) who was assigned to a municipality between 1986 and 1998, and (iii) was not a child or a spouse of either an individual from a non-refugee sending country or an immigrant from a refugee-sending country who had immigrated more than one year earlier. The latter condition excludes immigrants who are likely to arrive to Denmark by routes other than as asylum seekers or who are not assigned to a location after being granted asylum.

From the sample of assigned refugees, we construct a sample consisting of 8,172 assigned refugee children who immigrated with at least one parent, were younger than 15 at assignment, and who are observed in the registers in every year between assignment and age 19. From the Population Registers, we construct for these children an indicator variable for having a child while aged between 15 and 18, and compute characteristics of their household at assignment, such as the age and number of children of their parents.[14] Data on the education levels of the parents is obtained from the survey-based register on immigrants' educational

[13]Refugees from the former Yugoslavia were subject to another dispersal policy implemented in 1993 called the "Bosnian program". Quasi-random allocation for this group was far less rigorous than for the other groups, which is why we do not consider this group in our analysis. Furthermore, the allocation of refugees from the other countries we consider was independent of that of refugees from the former Yugoslavia, see Dustmann et al. (2019).

[14]We use an age cutoff of 18 instead of 19 (as in e.g. Kearney and Levine, 2012) to define teenage motherhood as many of the assigned refugee girls marry at the age of 18 (the legal age for marriage in Denmark). Therefore, some births occurring post age 18 may simply be related to teenage marriage. Changing the cutoff to age 19 has very little effect on our estimates.

attainment before immigration. We further use information from the Central Police registers on crime dates and convictions to construct an indicator variable for whether a refugee child assigned before the age of 15 was convicted for a crime (other than a traffic offense) committed between the age of 15 and 18.

Panel A in Table 2 displays the shares of assigned refugee boys and girls who have been convicted of a crime committed between the age of 15 and 18, by crime type.[15] Overall, 34.8% of boys and 8.6% of girls have been convicted for at least one crime committed in this age range. This is a large fraction, comparable to disadvantaged children in the US (for instance, Kling et al., 2005, report that the proportion of disadvantaged children ever arrested is 53% for males and 19% for females). These numbers are also markedly higher than crime conviction rates amongst children with Danish parents: among native children born in 1985, (the mean year of birth in the sample of assigned refugee children) conviction rates are 12.8% for boys and 3.3% for girls in the same age range. Property offenses are the most frequent type of crimes, with a conviction rate of 26.2% for boys and 7.6% for girls, of which the vast majority are non-group property crimes. The share of girls convicted for other crimes is small (at less than 1% for group crimes, violent crimes, and drug crimes), whereas 12% of boys have been convicted for violent offenses (8.7% for non-group violent crime), 4.7% for non-group drug-related crimes, and 10% for group crimes under our definitions (see Section 2.2.1).

Panel B of Table 2 shows that 5% of refugee girls have given birth before their 19th birthday, with approximately half of these births happening when girls are 18 years old (see Figure 2 for the distribution of the age of first birth among teenage mothers). This fraction is comparable to the highest teenage birth rates of about 6% in Mississippi in the United States (Kearney and Levine, 2012).[16] This fraction is also high relative to native Danish women:

[15]The missing entries in the table are due to confidentiality concerns if there are less than 5 individuals in a cell and follow the instructions set forth by Statistics Denmark on the use of individual level administrative registers.

[16]It should be noted that the teenage birth rate reported in Kearney and Levine (2012) is based on an range from 13-19. For the girls in our sample the share of teenage mothers using this definition is 8.9%.

in the 1985 cohort of native women only 1.1% have given birth by age 19. Interestingly, the probability of having a first child between ages 15-19 varies with age at assignment: among girls who were between 7 and 14 years old at assignment, the share of teenage mothers is more than twice as high as among girls who were less than 7 years old at assignment (7% vs. 3%). Contrary to refugee girls only few refugee boys (0.5%) father a child before their 19th birthday and there is no variation by age at assignment.

Panel C and D show characteristics of the mothers and fathers of assigned refugees respectively. In 22% (31.5%) of cases the mother arrives before (after) the father, whereas both parents arrive together in the remaining cases. Mothers tend to be slightly younger than fathers, with the most common education among both being a general non-tertiary education, while the least common is a tertiary education.

[Table 2 about here]

2.2.3 The Fathers

Strict regulations in Denmark to assign both mother and father to each newborn child enable us to match 89% of children of teenage refugee mothers to their fathers. Figure 2 presents the age distribution of teenage mothers and the fathers of their children, and Table A3 displays the fathers' basic demographic characteristics. The figure shows that the fathers are far older than the mothers, with a mean age of 24. Almost all these fathers are of non-Danish origin, with over 70% originating from the same source country as the mother.

[Figure 2 about here]

2.2.4 Other municipality characteristics

In addition to the municipality crime conviction rates, we construct a wide range of other municipality characteristics that we condition on in our empirical analysis. These include the (log) number of inhabitants, which may be related to criminal opportunities and thus

criminal activity (see Glaeser and Sacerdote, 1999), and the relative poverty rate, which is widely used in the literature as a summary measure for neighbourhood quality (see e.g. Kling et al., 2007). We also compute the employment rate as well as the share of immigrants relying on welfare benefits among the 18-65 year old. Employment and opportunities for legitimate work may affect the benefit that individuals derive from crime, decrease the amount of time available for criminal activity, and increase the opportunity cost of prison if caught (see e.g. Burdett et al., 2004; Bell et al., 2013; Dustmann et al., forthcoming; Pinotti, 2017). To address the concern that teenage motherhood might be affected by teenage motherhood rates in the neighbourhood (see, for instance, Chetty and Hendren, 2018a), which in turn is correlated with crime, we construct the teenage motherhood rate in the municipality of assignment as the share of girls aged 13 to 18 at the beginning of the year of assignment who had given birth. Other municipality characteristics we condition on include the share of the municipality inhabitants that are immigrants from the same source country as the individual under consideration, the share of the municipality inhabitants that are immigrants from other countries, the average weekly number of teacher hours per pupil (as a proxy for school resources that may affect the amount of teachers' attention received by children and hence the relative attractiveness of non-normative behaviour) as well as various characteristics measuring the average educational attainment of adults aged 18-65 and residing in the municipality. Finally, we include the number of police officers employed per 1,000 inhabitants, the crime detection rate as well as the conviction rate to reflect the efficiency and presence of police services in the municipality.[17]

[17]The number of police officers and the crime detection rate prior to 1990 are constructed at the police district level. There are 54 police districts in Denmark covering 275 municipalities during our observation period. We include a detailed description of these variables in Appendix Table A4 and descriptive statistics in Table A5.

3 Empirical Model

Our basic specification is:

$$O_{itr} = \alpha_0 + \alpha_1 C_{tr} + \alpha_2 G_{tr} + \mathbf{X_{it}}\bar{\alpha} + \mathbf{Z_{tr}}\bar{\bar{\alpha}} + \mathbf{T_t} + \mathbf{R_r} + \epsilon_{itr} \tag{1}$$

where the variable O_{itr} measures the respective outcomes of individual i assigned to municipality r in year t. These outcomes include criminal behaviour measured as crime convictions or charges and whether an individual gives birth (for girls) when aged between 15 and 18, as well as earnings, welfare transfers, and an indicator for being inactive (we label individuals as inactive if they have no wage earnings and are not studying) by age. The variables C_{tr} and G_{tr} denote the overall crime conviction rate and the group crime conviction rate of municipality r in year t respectively. The vector $\mathbf{X_{it}}$ contains i's household characteristics in the year of assignment, including age at immigration, characteristics of both parents at the time of assignment (age, dummy for legally-married, education dummies, indicator for a single-parent household, number of children, an indicator for which parent was assigned first and a dummy for the parent being missing), country of origin fixed effects, and a dummy for having been assigned to Copenhagen. The vector $\mathbf{Z_{tr}}$ represents a large array of observable time-varying municipality characteristics as discussed above (the log of the number of inhabitants, the share of immigrants from other source countries in the municipal population, the share of immigrants from the same source country in the municipal population, the employment rate, the poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate in the municipality). The vector $\mathbf{T_t}$ constitutes year of assignment fixed effects, $\mathbf{R_r}$ is a vector of municipality fixed effects and ϵ_{itr} an error term.

Our main parameter of interest is α_2. Conditional on C_{tr} (the overall crime conviction

rate, which equals the sum of the group crime conviction rate G_{tr} and the non-group crime conviction rate NG_{tr}) this parameter measures the ITT effect of the group crime conviction rate G_{tr} at assignment on outcomes, over and above the effect of non-group crime.[18] In (1) this parameter is identified conditional on the large set of time-varying municipality characteristics $\mathbf{Z_{tr}}$, as well as municipality fixed effects $\mathbf{R_r}$, as we observe assignment of multiple cohorts of children to the same municipality, thus relying only on variation in local crime rates across arrival cohorts.

Due to quasi-random assignment of refugee children to municipalities with different crime rates, the parameter α_2 is causal. It measures the combined effect of group crime at assignment on outcomes and the effect of other unobserved municipality characteristics that are correlated with group crime and outcomes alike ("correlated effects", see Manski, 1993). To interpret α_2 as a "social spillover effect" of group crime on outcomes requires that we condition on all correlated effects. Although we are confident that the tight specification in (1) is likely to eliminate the influence of correlated neighbourhood effects, we perform a large array of robustness checks to highlight that that is the case. First, we illustrate – variable by variable – the sensitivity of our estimates to the inclusion of various other municipality characteristics Z. These estimates are interesting in their own right, as they measure the effect of other neighbourhood characteristics on the various outcomes and have a causal interpretation due to random assignment. Our estimates not only show that the coefficient on group crime hardly changes, but also that most other municipality characteristics at assignment have little impact on outcomes. Second, to further investigate the importance of unobservable characteristics that are not captured by our time varying regressors, we conduct a test suggested by Oster (2019) which allows for assessment of how influential unobservable characteristics would have to be relative to observable characteristics to explain away the estimated effects. These tests suggest that unobservable characteristics would have to be

[18]Since $C_{tr} = NG_{tr} + G_{tr}$, and ignoring other controls we have that $O_{itr} = a_0 + a_1 C_{tr} + a_2 G_{tr} + u_{itr} = a_0 + a_1 NG_{tr} + (a_1 + a_2) G_{tr} + u_{itr} = b_0 + b_1 NG_{tr} + b_2 G_{tr} + u_{itr}$, so that $a_1 = b_1$ and $a_2 = b_2 - b_1$, where a_2 is the effect of group crime, b_2, over and above the effect of non-group crime, b_1.

much more influential than observable characteristics to explain away the estimated effect of group crime on outcomes of assigned children.

We further estimate specifications that allow for a different impact according to the age at which a child is assigned to a neighbourhood, by interacting both the overall and the group crime conviction rates with indicator variables measuring if an individual's age at immigration was below 7 (the primary school starting age over the period 1981-2010), or 7 and above, to obtain the following specification:

$$\begin{aligned} O_{itr} = \gamma_0 + (\gamma_1 C_{tr} + \gamma_3 G_{tr}) \cdot 1(Age_{it} < 7) + (\gamma_2 C_{tr} + \gamma_4 G_{tr}) \cdot 1(Age_{it} \geq 7) \\ + \mathbf{X_{it}}\bar{\gamma} + \mathbf{Z_{tr}}\bar{\bar{\gamma}} + \mathbf{T_t} + \mathbf{R_r} + u_{itr} \end{aligned} \tag{2}$$

This may matter for several reasons. Children who are assigned at very young age may be less susceptible to a delinquent environment than children assigned in their teenage years. Moreover, they (or their parents) may be better able to adjust to the new environment, having more time to implement strategies to manage the challenges associated with the new neighbourhood environment.[19] Differences by age at assignment could also reflect differences in the share of children who still reside in their assignment municipality when outcomes are measured since children assigned at younger ages have had more time to move. This will affect the interpretation of the estimated effect only if moving is selective and correlated with group crime at assignment. We illustrate that, conditional on municipality fixed effects, there is little evidence that group crime at assignment affects the probability of residing in the assignment municipality at age 19 (Appendix Table A6).

[19] Chetty and Hendren (2018a) for instance show that children moving to higher income neighbourhoods at younger ages benefit more from exposure to these neighbourhoods than those moving to higher income areas at later ages.

4 Results

4.1 Balancing Tests

Due to the dispersal policy, the allocation of refugees across municipalities should be independent of municipal crime conviction rates and other area characteristics, conditional on the information available to placement officers which may have been used in the allocation process. To test for this, we regress the overall, group, property, and violent crime conviction rate of assignment municipalities in the year of assignment on characteristics of refugee parents of assignees – both those that were known (age, family size, and marital status), and those that were unknown (educational attainment) to the council when making the assignment decision. If the allocation of refugees is indeed quasi-random, characteristics that are unknown to the council but observed by us (such as a refugee's level of education) should be uncorrelated with municipality characteristics. Table 3 reports estimates, unconditional (Panel A) and conditional (Panel B) on municipality fixed effects, with the latter specifications testing for quasi-randomness of assignment across arrival cohorts within municipalities.

[Table 3 about here]

Each column reports regressions for one particular crime type and regressors include those known (year of assignment, country of origin, number of children in the household, and age and marital status of both parents and an indicator for one parent being missing), and those unknown to the council at assignment (educational attainment of both parents)[20]. In each Panel we report F-tests for the joint significance of the education dummies of both parents, the joint significance of all family characteristics, and the joint significance of all family characteristics except for the number of children. In none of the specifications can the null hypothesis that the variables for the level of education of the parents are jointly equal to zero be rejected at the 10% significance level, conditional on other household characteristics

[20]We separate educational attainment of mothers and fathers into 4 categories: general non-tertiary education, vocational non-tertiary, tertiary (baseline category) and missing education information.

observed by the council and by us (first set of rows). This supports the presumption that the refugee dispersal policy was implemented in a way that ensured conditional quasi-random allocation of refugees across municipalities.

To investigate further whether the allocation was related to some of the characteristics observed by the council, we report in the next two rows F-statistics and p-values for the joint significance of (for the council) all observed and unobserved characteristics, and of all characteristics except for the number of children. The null hypothesis that the coefficients of all household characteristics (those known and unknown to the council) are equal to zero cannot be rejected in 2 out of 4 regressions in Panel A, and in none of the regressions when we condition on municipality fixed effects in Panel B. When we exclude the number of children, none of the null hypotheses are rejected at the 10% level in Panels A and B. Thus, the number of children (i.e. household size) was an important determinant for the council's allocation decision, while other observed household characteristics does not seem to have been important. In all our regressions below, we condition on variables observed and not observed by the council.

4.2 Neighbourhood Crime and Criminal Activity

We first investigate the impact of crime in the municipality of assignment in the year of assignment on assigned refugee children's' own crime conviction rates during their teenage years (age 15-18), by estimating regression models of the form of Equations (1), where we add indicator variables for gender and its interactions with all other characteristics including municipality crime conviction rates. The dependent variable records whether an individual has been convicted for a crime of a particular type committed when aged between 15-18 (i.e. we estimate a linear probability model).

We report in Table 4 two different specifications where we condition on individual and municipality characteristics (odd numbered columns), and on municipality by gender fixed effects in addition (even numbered columns). We report estimated effects of the overall crime

conviction rate and the group crime conviction rate in the municipality of assignment in the year of assignment, where the latter is to be interpreted as the effect of group crime on conviction probabilities, over and above that induced by non-group crime (see footnote 18).

Estimates in Panel A show that crime convictions of teenage boys for all categories, but particularly for violent and group crime, are strongly affected by the local group crime conviction rate at the time of assignment, with coefficients slightly larger when conditioning on municipality fixed effects. Based on estimates that condition on municipality fixed effects, a one standard deviation increase in the group crime conviction rate at assignment increases the probability that a teenage boy is convicted for any crime committed in the age range 15-18 by 3.7 percentage points (or 10.6% relative to the mean), for a violent crime by 3.4 percentage points (or 28.1% relative to the mean), for a property crime by 2.1 percentage points (8.1% relative to the mean), and for a group crime by 2.8 percentage points (28.2% relative to the mean). Interestingly, the overall crime conviction rate has only small and imprecisely estimated effects on boys' criminal behaviour, suggesting that it is group crime, and not other types of crime, that create crime spillovers.

[Table 4 about here]

In Panel B of Table 4 we report estimates from Equation (2) breaking down the assigned refugees by their age at assignment, distinguishing between the pre-school period (0-6) and the school period (7-14). Estimates show that effects of group crime conviction rates in the municipalities on the criminal convictions of boys at age 15-18 is primarily (if not only) driven by refugee boys assigned when 7 to 14 years old, with a one standard deviation increase in the group crime conviction rate at assignment increasing the probability of conviction for any crime, committed at age 15-18, by 6 percentage points (17.5% relative to the mean), for a violent crime by 4.7 percentage points (42.3% relative to the mean), for a group crime by 3.1 percentage points (34.4% relative to the mean) and for a property crime by 3.7 percentage points (14% relative to the mean). Estimates for boys assigned at age 0 to 6 are smaller and

mostly imprecisely estimated.[21]

Assessing the importance of group crime in comparison to other forms of crime on later criminal activity shows that it is violent and group crime that increases convictions of assignees, while property and drug crime seem to have little effect (Panel A of Appendix Table A7). Moreover, when we condition on both violent and violent group crime conviction rates (Panel B), it is only group related violence that creates crime spillovers for boys. When we further divide our measure of group crime into each of its subcomponents and include them as separate regressors, estimates show that it is violent group crime in particularly that contributes to the criminal behaviour of young boys (Appendix Table A8). This is an important finding which helps with targeting crime prevention policies: while Damm and Dustmann (2014) showed already that violent crime increases convictions of assigned boys, the results presented here add to that by showing that it is violent group crime that leads to spillovers.

In contrast to the estimated effects of group crime rates on boys' conviction probabilities, those for girls are smaller, unsystematic, and imprecisely estimated. This is the case for overall and group crime rates (see Table 4), as well as crime rates for violent, property and drug crime.[22] Moreover, we also generate crime conviction rates in the assignment municipality for female offenders, and we find no effects for any type of crime on young women's crime convictions.[23] Thus, the crime conviction rate in a municipality in the year of assignment has large and significant effects on the probability that boys engage in criminal activity in subsequent teen years, with (violent) group crime being the key driver, and with boys in middle childhood and early teenage years upon assignment being particularly vulnerable. Girls' criminal activity instead does not respond to crime in their neighbourhood of any kind.

[21] We may expect young men to respond more to criminals who are from a similar background. In line with this, we find that higher group crime rates among immigrants and descendants from refugee sending countries in the assignment municipality at the time of assignment increases crime of assigned boys over and above the effect induced by the overall level of group crime in the municipality. Results are available upon request.

[22] We also divided the property crime outcome further into shoplifting and shoplifting from supermarkets. We find no evidence of an effect of a higher group crime conviction rate for either of these crime outcomes for girls.

[23] Results are available upon request.

This finding is in line with conjectures in the psychology and criminology literature on the gender gap in crime responses to a criminogenic environment, arguing that negative moral evaluations are stronger for females, and that males are both more likely to have delinquent friends, and are more affected by these peers than females (see Bennett et al., 2005, for a discussion of this literature).

4.3 The Impact of Group Crime on Teenage Motherhood

We next investigate whether exposure to crime manifests itself through early motherhood rather than criminal behaviour for girls, a hypothesis set out by Sanders (2011), and where engagement with partners who are associated to criminal groups may lead to pregnancies induced by physical and psychological coercion to unprotected sex, intoxication on drugs and/or alcohol, and limited access to birth control (see Sanders et al., 2009; Miller et al., 2012; Dickson-Gomez et al., 2017). In Panel A of Table 5 we report results where we regress the incidence of teenage motherhood on crime conviction rates in the municipality of assignment in the assignment year, for the same specifications as in Table 4. In the first two columns we report results where we regress on the overall crime conviction rate, while columns 3-4 report results where we regress on the group crime conviction rate only and columns 5-6 report results where we regress on both crime measures.

[Table 5 about here]

The estimates in columns 1-2 indicate that the overall crime conviction rate has no impact on the probability of teenage motherhood, with estimates being essentially zero across both specifications. In contrast, estimates in columns 3-4 suggest that a higher group crime conviction rate at assignment increases the probability of teenage motherhood. Based on estimates in column 4, a one standard deviation higher group crime conviction rate increases the probability of teenage motherhood by 2 percentage points, or approximately 41% of the mean.

Columns 5-6 report results where we condition on both group crime and overall crime conviction rates. The group crime estimate is now to be interpreted as the effect of group crime on teenage motherhood, over and above that induced by non-group crime activity in the municipality of assignment (see footnote 18). The group crime estimate becomes larger when controlling for the overall crime conviction rate, while other crimes, if anything, appear to have a small negative effect on teenage pregnancy. One explanation for this could be precautionary behaviour by parents or the girls themselves in areas with obviously prevalent criminal activity. Overall, these estimates suggest that group crime but not more general criminal activity at assignment increases the incidence of teenage motherhood.[24]

We next turn to specifications that break down the young refugee girls by their age at assignment, distinguishing between the pre-school period (0-6) and the school period (7-14), where the latter group accounts for 45.5% of the assigned refugee girls (Panel B of Table 5). The first two columns show that – as before – the overall crime conviction rate in the municipality of assignment in the year of assignment has no impact on the probability of teenage motherhood for both age groups. In contrast, estimates in columns 3-4 show that the positive effect of a higher group crime conviction rate on the likelihood of giving birth during the teenage years is mainly driven by girls aged 7 to 14 years at assignment. For this group, being assigned to an area with a one standard deviation higher group crime conviction rate leads to an 1.6-2.5 percentage points increase in the probability of teenage motherhood. Columns 5-6 report results where we condition on both the group crime and the overall crime conviction rates at assignment. Again, estimates are larger and more precise for girls assigned in the age range between 7 and 14, with a small negative effect of the overall crime conviction rate.

This response suggests that girls in middle childhood and early teenage years upon assignment are particularly vulnerable to group crime activity in their environment, similar

[24]We also consider the effect of crime rates on the parenthood status of boys. We find that higher group crime in the neighbourhood of assignment has no effect on the likelihood that boys will father children during their teenage years, see Appendix Table A9.

to our findings for the criminal behaviour of boys. This is in line with the social sciences literature (see Ingoldsby and Shaw, 2002, for a review) that points at the age between 6 and 14 as a critical development period during which children are at a heightened risk for neighbourhood-based effects on behaviour. Dishion and Patterson (1997) and Gonzales et al. (1996) explain this by the development of values and role models in this age range that is easily influenced by exposure to older and delinquent peers.[25]

4.4 Other Outcomes and Robustness Checks

4.4.1 Other Municipality Characteristics, Crime and Teenage Fertility

Municipality characteristics at assignment other than crime may also affect criminal behaviour of boys and teenage pregnancy. Kearney and Levine (2012) for instance argue that a considerable part of the geographical variation in teenage childbearing in the United State can be explained by variation in income inequality and by teenage girls with low economic prospects growing up in unequal societies deciding to have children when they are young and unmarried. Moreover, Kearney and Levine (2015) show that the increase in unemployment rates in the aftermath of the financial crisis led to a decrease in the teenage birth rate. We next investigate what impact municipality characteristics other than crime itself have on subsequent outcomes of assigned children, and how the inclusion of these variables affects the estimated effects of municipality crime at assignment. Due to random assignment these estimates have also a causal interpretation.

Estimates of the impact of each municipality characteristic on crime convictions for boys and on teenage motherhood, unconditional and conditional on municipality fixed effects, are presented in Table 6 where we also condition on the overall and group crime conviction. The first two rows of each panel report estimates of the overall and group crime rates, and the

[25] Changes to the age at assignment also change years of potential exposure to a neighbourhood so that the estimates by age group at assignment represents also differences in the potential years of exposure to municipality characteristics. It should be noted however that by conditioning on municipality fixed effects (even columns) we eliminate any persistent differences in any municipality characteristics across municipalities.

third row reports estimated effects of a one standard deviation increase in the municipality characteristic described in the column label. Focusing first on Panels A and B (crime convictions of boys), there are two important findings. First, no matter which municipality characteristic we condition on, the estimated effect of group crime on crime conviction rates of boys hardly changes. Second, most of the other municipality characteristics do not affect boy's probability of being convicted for a crime when aged between 15-18 (with two exceptions; teacher hours per pupil and the conviction rate), with most estimates being small and imprecisely estimated.

Panel C and D display the estimated effect for girls when the dependent variable is an indicator for teenage motherhood. Again, the effect of group crime on teenage motherhood hardly changes across specifications. However, there is some evidence that some other municipality characteristics such as a higher relative poverty rate, a lower employment rate and a larger share of immigrants from other source countries are associated with a higher probability of teenage motherhood in specifications that do not condition on municipality fixed effects. The estimates presented in Panel C suggest for instance that a one standard deviation higher employment rate at assignment increases the probability of teenage motherhood by 0.8 percentage points, while a one standard deviation higher poverty rate increases the probability of teenage motherhood by 1.2 percentage points, both of which are slightly smaller than the 1.6 percentage point increase in teenage motherhood associated with a one standard deviation higher group crime conviction rate at assignment in these specifications. These estimates are in line with the hypothesis put forth in Kearney and Levine (2012, 2014) that girls with low socioeconomic status are more likely to become teenage mothers if they feel that they have little to lose by having a child while young. Most of these estimates, except for the (group) crime rate, become insignificant when we condition on municipality fixed effects in Panel D. This is not surprising, as the variation in some of these indicators over time is very limited, and therefore eliminated by the municipality fixed effects. It also suggests that the effect of crime is driven by within municipality rather than between mu-

nicipality variation (as is e.g., the effect of poverty), so that it is exposure to (group) crime in the immediate period after arrival that matters for later outcomes.

[Table 6 about here]

Once we condition on all municipality characteristics, as in our main specifications (estimates shown in Appendix Table A10), the pattern is similar. The impact of group crime on both boy's criminal activity and girl's motherhood remains very alike in magnitude and precisely estimated, while most other municipality characteristics are imprecisely estimated. Thus, there remains a strikingly strong and stable effect of group crime on the two outcomes we investigate. Other municipality characteristics play a far lesser role, although there is some pattern that suggests that detrimental neighbourhood conditions such as poverty or lower employment impact the probability of teenage motherhood and that schooling resources impact the criminal behaviour of boys.

4.4.2 Unobserved Correlated Neighbourhood Effects

The above analysis suggests that the effect of group crime on boy's criminal outcomes and girls' teenage motherhood is hardly affected by the inclusion of a large array of municipality characteristics. It seems unlikely therefore that non-observed and time varying municipality characteristics correlated both with outcomes and (group) crime rates at assignment will eliminate the estimates of group crime that we report in previous tables.

To nevertheless investigate the importance of unobservable characteristics in more detail, we conduct a test suggested by Oster (2019) which builds on earlier work by Altonji et al. (2005), and allows for the assessment of how influential unobservable characteristics would have to be relative to observable characteristics to explain away the estimated effect, a parameter we refer to as δ, following the notation in Oster (2019). As a benchmark, and similar to Altonji et al. (2005), Oster argues that a value of δ equal to one or more suggests that estimates are bounded away from zero even if all unobservable characteristics that are correlated with the outcome and regressor of interest alike were included in the regression.

The test studies jointly the stability of the group crime coefficient and movements in R^2 when observable control variables are included. It requires an assumption about the coefficient of determination R^2 in a hypothetical specification that includes all observable and unobservable characteristics in the regression (R_{max}), and Oster (2019) suggest a value of R_{max} of 1.3 times the R^2 from the specification including all observed controls.

Appendix Table A11 shows that the estimated parameter δ is numerically larger than 1 for both outcomes, with estimates of 2.3 for boy's crime and 1.6 for girl's teenage motherhood. This adds additional confidence in the interpretation of our estimates as "social effects" that identify the effect of exposure to group crime at assignment on individuals' behaviour.

4.4.3 Alternative Measures of Crime and Additional Robustness Checks

Table 7 reports robustness checks and alternative specifications, focusing on teenage motherhood and girls who were between 7 and 14 years old at assignment.

[Table 7 about here]

Columns 1-2 present our baseline estimates for comparison, columns 3-4 present estimates where we replace the group crime conviction rate by the violent crime conviction rate, while columns 5-6 present estimates where the group crime conviction rate is replaced by the percentage of young males convicted for crimes committed by more than one individual, but which are not classified as group crimes according to our definition (see Section 2.2). Estimates in columns 3-6 show no significant effect on teenage motherhood. In Columns 7-8 we present estimates on the group crime conviction rate, but where we change the definition to require at least 3 offenders to be convicted for the same crime to be classified as a group crime. Estimates are very similar to those using our main definition of the group crime conviction rate. Finally, in columns 9-10 of Table 7 we investigate whether our results are driven by girls assigned to major urban areas, by reporting coefficients on overall and group crime conviction rates when observations on girls assigned to the five largest and most urban municipalities (Copenhagen, Aarhus, Odense, Aalborg, and Frederiksberg) are excluded leaving us with

69% of the original sample. The estimates remain almost identical to those from the full sample, implying that the estimated relation between group crime and teenage motherhood is not primarily driven by girls assigned to large urban municipalities.

Because our main outcome is realized childbirths, rather than initiated pregnancies, we may undercount the degree to which group crime affects teen pregnancy if some of the group crime induced pregnancies are aborted. To investigate this, we use data from the Danish Patient registers that includes information on the date of all abortions conducted in Danish hospitals since 1995. We thus observe whether an assigned refugee girl had at least one abortion when aged 15 to 18 and use this measure as an outcome variable in specifications of the same form as those reported in Table 5. The corresponding estimates are reported in Appendix Table A12.[26] There is no evidence of a relationship between higher group crime conviction rates and the probability of abortion during the teenage years.

Our measure of group crime is the share of young men residing in the neighbourhood who commit any group crime within the assignment year, which ignores the intensity of their criminal conduct. To capture the latter, we construct an alternative measure of group crime intensity in the neighbourhood as the number of group crimes committed by males aged 15-25 for which they were eventually convicted, and who live in the assignment municipality in the assignment year. The average number of group crimes committed per 100 males aged 15-25 is 0.504. Moreover, those who commit a group crime in the assignment year commit on average 1.03 crimes during that year. Estimates using the number of group crimes as the main explanatory variable show that a higher group crime intensity in the assignment municipality at the time of assignment leads to a significantly higher probability that boys are convicted for a crime committed between age 15 and 18 as well as an increase in the probability that girls become teenage mothers (see Table A13 in the Appendix). Focusing on specifications that condition on municipality fixed effects, one more group crime per 100 males aged 15-25 in the assignment municipality leads to a 13.5 percentage point higher

[26] Because the information on abortion from the Danish Patient register is available only from 1995 onwards, the sample used in these regressions is smaller than our main sample.

probability that boys are convicted for a crime committed when aged between 15 and 18 and a 7.9 percentage point increase in the probability that female assignees become teenage mothers.[27]

We have conducted several additional robustness checks to investigate the sensitivity of the estimated effect of group crime on the criminal behaviour of boys and on teenage motherhood, such as: omitting the municipality specific conviction rate as a regressor; focusing only on the period from 1990 onwards (leaving us with 63% of our original sample) where we condition on the crime detection rate at the municipality as opposed to the police district level; focusing on the post 1989 period only and not conditioning on the crime detection rate; adding a measure for "reported crimes" that should pick up other municipality specific circumstances related to crime that impacts on individuals' outcomes and group crime alike, such as municipal interventions, and that is available at the police district level up until 1989 and at the municipality level from 1990 onwards.[28] All these restrictions and additions change our main coefficients only marginally (see Table A14).

Finally, since our main measure of criminal behaviour of assigned children is based on criminal convictions, which may be subject to variation in the behaviour of agents in the criminal justice system, we also perform robustness checks where we use criminal charges as opposed to criminal convictions as a measure of criminal behaviour. A criminal charge is a predecessor to a conviction filed by the police if they suspect that an individual has committed a crime. Consequently, charges are not subject to discretion by judges and other actors in the criminal justice system. The estimated effects of group crime in the assignment municipality at assignment using charges as opposed to convictions as a measure of criminal behaviour of young boys and girls are very similar to those using conviction (see Table A15).

[27]Not surprisingly, these estimates are similar to those in Tables 4 and 5, as the average number of group crimes committed is close to one.

[28]Note that our main measures of crime are based on where criminals reside, and not where they commit crimes, so that both measures (reported crimes and crime conviction rates) are identified.

4.4.4 Girls assigned in Late Teenage Years

We next address the question of whether births by girls older than 14 years at assignment are likewise affected by group crime activity in their area of assignment. To investigate this, we construct a sample of young female refugees who are 15 to 20 years old at assignment, observed in the registers continuously from their arrival until age 24, and who have not given birth before arriving in Denmark.[29] Of those individuals, 25.1% have their first child within the first four years after assignment. Estimating the same specifications as for our baseline sample in Table 5, results in Table 8 show that neither the overall nor group crime conviction rate has any significant effect on the probability of giving birth within four years of assignment for this group of young women. Thus, it is only teenage pregnancy of girls assigned at an age younger than 15 (and in particular in the age range between 7 and 14) that appear to be affected by group crime in the assignment municipality.

[Table 8 about here]

4.4.5 The Fathers

As pointed out in Section 2, regulations in Denmark require that each child is assigned a father. This provides us with the rare opportunity to investigate whether the effect of neighbourhood group crime on teenage motherhood is driven by girls' direct involvement with men involved in group crime, by matching the fathers to the children of teenage mothers. We can identify and have information on the father for 89% of all children born to teenage mothers in our sample (see Table A3). We obtain information on the criminal convictions of these fathers and calculate their conviction rates using the Central Police registers.

We plot the conviction rates of fathers (first bar), males of the same age as fathers in the year of conception from refugee-sending countries (second bar), and males of the same age as fathers in the year of conception from the overall population (third bar) in Figure 3.

[29] 15.0% of women aged between 15 and 20 at assignment are not observed in the registers continuously until age 24. Among those who are, 20.6% gave birth before the date of assignment.

Specifically, we compute their overall crime, group crime and violent crime conviction rates based on crimes committed in the year of, and five years prior to the conception of the child.[30] The figure shows clearly that fathers of children with a teenage mother are far more crime prone than other men of the same age from both the overall population and from refugee-sending countries. This is the case for overall crimes, violent crimes, and group crimes, with the difference being particularly pronounced for group crimes, where the probability that fathers of children born to teenage mothers are convicted for group crimes committed in the years leading up to conception is more than five times as high as the analogous conviction rate for males of comparable age from refugee-sending countries, and more than fourteen times as high as for males of comparable age in the overall population. The patterns presented in Figure 3 suggests therefore that direct social interactions with group members is a likely mechanism explaining the higher incidence of teenage births among refugee girls assigned to municipalities with a higher prevalence of group crime.

[Figure 3 about here]

4.5 Group Crime and Longer-Term Outcomes

If group crime conviction rates in the area of assignment affect future crime rates of young men and teenage pregnancies of women, then this can be expected to have knock-on effects on their labour market outcomes later in life. Discrimination by employers based on criminal history could present one such channel for men (see e.g. Pager, 2003; Agan and Starr, 2018).[31] Alternatively higher levels of group crime may directly affect labour market outcomes by changing the relative returns to participation in the formal labour market. We now investigate

[30] To each father having a child with a girl aged 15 to 18 at the time of birth, we randomly match approximately 100 individuals from the full population and 100 individuals from the Danish population with the same origin countries (1st and 2nd generation immigrants) who are from the same age cohort. We then compute their criminal conviction rates over the same five-year period as the fathers.

[31] In Denmark, a criminal conviction that is not traffic related results in a mention on the criminal record for 2 to 5 years after the sentence is served. Individuals can retrieve their own criminal record. Employers can request the criminal record during the application process, but they are not allowed to discriminate against individuals with a criminal record during the hiring process (with a few exceptions, such as employment in childcare).

whether exposure to group crime at assignment and before the age of 15 affects individuals' criminal behaviour, inactivity (we label individuals as inactive if they have no formal wage earnings and are not studying), their earnings, and their welfare dependence in adulthood. We adjust monetary outcomes to 2015 prices, measured in $1000. We observe these outcomes up until 2018, which is the final year for which data is currently available, and we consider individuals over the age range 19-28. Because not all refugees have turned 28 by 2018, our sample is an unbalanced panel consisting of 8,173 refugees, assigned to a Danish municipality at age 0 to 14, whom we observe, on average, for 9 years between ages 19 and 28.[32]

Panel (a) of Figure 4 illustrates the impact of being assigned to a municipality with a one percentage point higher group crime conviction rate at assignment, on the probability of having been convicted for at least one crime committed between age 15 and the age indicated on the primary axis (ranging from age 19 to 28), estimating the same specifications as in Table 4 which condition on municipality fixed effects. Estimates are shown for men in diagrams to the left and for women in diagrams to the right. For comparison we also show similar estimates for the effect of the overall crime conviction rate in grey. The estimated effect for boys is similar in magnitude to the estimated effect at age 18 (see Table 4), with the estimate remaining stable throughout the estimation period. Panel (b) of Figure 4 shows however, that a higher group crime rate at assignment leads to an increase in the cumulative number of crimes committed by assigned refugee boys at age 19, and that the estimated effect continues to increase until age 25. This suggests that while entry into crime beyond age 18 is unaffected by the level of group crime, those who are assigned to high crime areas continue to commit more crime up until age 25. There is no effect of assignment to a neighbourhood with a higher group crime conviction rate on the longer run criminal behaviour of women, nor does the overall crime conviction rate affect the criminal behaviour of boys and girls.

[32]Attrition from the sample occurs if individuals die, or if they migrate out of the country. Among the individuals in our main sample 89% of those who have turned 28 by the end of our sample period are observed in the registers at age 28. Estimates show no evidence of a systematic relationship between the crime rates in the municipality of assignment upon assignment and being in the sample at age 28 (Table A16), with characteristics of those families of assignees who do and do not exit the data before 28 being very similar and not statistically different in most instances (Table A17).

[Figure 4 about here]

Focusing next on labour market outcomes, Panel (a) in Figure 5 displays the impact of assignment to a municipality with a one percentage point higher group crime conviction rate at assignment on the probability of being inactive between age 19 and 28, while Panel (b) reports the effect on the accumulated number of years of inactivity since age 19. For men, the probability to be inactive remains higher up to age 28, and the accumulated effect increases over time, with a one standard deviation higher group crime rate at assignment leading to an increase in inactivity at age 23 by 0.13 years (or 13.2% of the mean). For women, group crime at assignment seems to have no longer term effects on inactivity. One reason may be the relatively high inactivity rate of females over the age range displayed and that those females that are affected by group crime may have remained inactive even without such exposure. Another reason may be that while a criminal record can act as a screening device for employers when hiring men, thereby resulting in higher inactivity rates, this is unlikely to be the case for teenage motherhood (see e.g. Pager, 2003; Agan and Starr, 2018).

[Figure 5 about here]

In Figure 6 we illustrate the effect of group crime exposure at assignment and before the age of 15 on annual earnings in Panel (a) and on cumulative earnings in Panel (b). For both men and women annual earnings decrease. By age 24, the accumulated reduction in earnings from being exposed to a municipality with a one standard deviation higher group crime rate amounts to about \$4,547 for men and \$2,564 for women, which corresponds to 5.5% and 4.4% of the sample mean respectively. The fact that we observe negative earnings effect for women, but no effect on their probability of being inactive suggests effects at the intensive margin, by women being hired either in lower paying jobs or being more likely to work part time. We see little evidence of an effect of the overall crime conviction rate for both men and women.

[Figure 6 about here]

Group crime exposure also leads to higher annual welfare benefit levels for both men and women during their early twenties (Figure 7). While the effects appear to fade away for men, they remain sizeable, and increasing, for women over the entire age range. The accumulated effects suggest that by age 28 transfers to men assigned as children to a municipality with a one standard deviation higher group crime rate are \$794 (or 1.1%) higher, while for women these numbers amount to \$7,799 (or 6.5%). The large effects for women are likely a direct consequence of their early fertility, resulting in higher levels of welfare benefit claims.

[Figure 7 about here]

We show estimated coefficients for other municipality characteristics on each of the longer run labour market outcomes measured at age 22 for both men and women in Appendix Table A18. Again, there is little evidence of systematic and robust effects of other neighbourhood characteristics on longer run outcomes.

Overall, these estimates suggest that exposure to group crime at a young age has considerable effects on later outcomes, such as inactivity, welfare dependence, and to some extend earnings, for both men and women, with different channels, as analysis in Sections 4.2 and 4.3 suggests: While one likely mechanisms of exposure to group crime at a young age on later outcomes is own criminal activity for men, it is teenage pregnancy for women.[33]

5 Discussion and Conclusions

Investigating the causal effect of neighbourhood group crime on young boys and girls using a design that is based on quasi-random allocation of refugee families to neighbourhoods in Denmark over more than a decade, we show that boys exposed to higher crime intensities at assignment are more likely to be convicted for crimes committed between age 15 and

[33]Investigating again how important unobservable characteristics would have to be relative to observable characteristics to explain away the estimated effect of group crime on long run outcomes using the methodology presented in Oster (2019), we find that δ is always numerically larger than one (the only exception is for the inactivity of girls, where we also find no significant effects) suggesting that spillovers from group crime are likely to drive our estimates (see Table A19).

18. These effects are driven by group crime, with violent group crime being a particularly important driver. For girls, we cannot detect effects of exposure to any sort of crime on their criminal behaviour, but we find strong evidence that teenage motherhood – defined as giving birth to a child when in the age range between 15 and 18 – increases with higher levels of group crime activity in the neighbourhood of assignment, while being unaffected by other types of crime including the overall crime rate in the assignment area. For both boys and girls, we show that these responses are driven by those children who were in the age range between 7 and 14 at assignment. As for longer term outcomes, we show that exposure to higher group crime rates during childhood leads to increased criminal activity of boys in early adulthood, increases the rate of inactivity and (at least in early adulthood) earnings of men and decreases earnings and increases welfare benefit claims for women. These longer run effects are likely to arise, at least in part, through the effect of the group crime rate on the criminal behaviour of young men and teenage pregnancies of young women. By showing that exposure of young girls to group crime manifests itself through teenage motherhood rather than through criminal activity itself, our results support observational evidence in the epidemiological literature that contacts with group members increase the risk of teenage birth for adolescent girls (see e.g. Minnis et al., 2008; Sanders et al., 2009; Miller et al., 2012; Dickson-Gomez et al., 2017). Moreover, they add to a recent literature that emphasizes exposure to better neighbourhoods during childhood having long lasting positive effects on earnings, employment and teenage birth rates (Chetty and Hendren, 2018a; Chetty et al., 2016; Chyn, 2018; Deutscher, 2020), by highlighting group crime as a particularly harmful neighbourhood characteristic that results not only in higher crime rates among young men and higher teenage pregnancy rates among young women, but also in poorer economic outcomes during early adulthood. Other municipality characteristics seem to play a lesser role, although there is some pattern that suggests that detrimental neighbourhood conditions such as poverty or lower employment have some impact on teenage pregnancy rates. This adds important evidence to the literature that explores the effect of context on the development of children and teenagers. It suggests

that – at least for Denmark – crime rates, and in particular group crime rates, are a most relevant indicator for identifying neighbourhoods where interventions may benefit teenagers.

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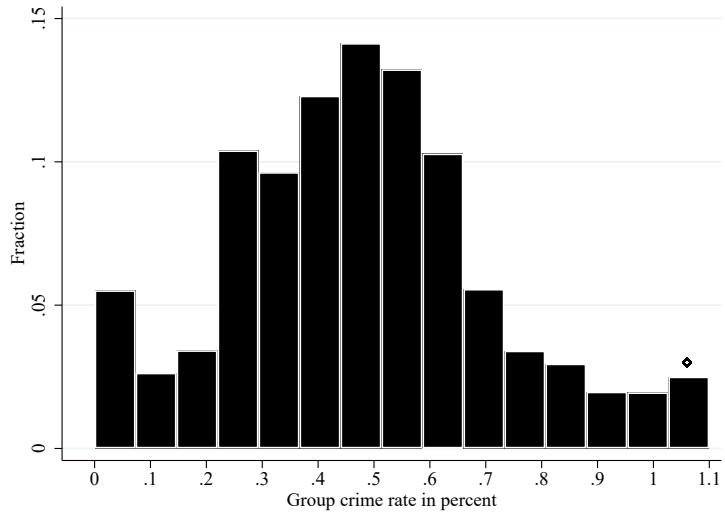
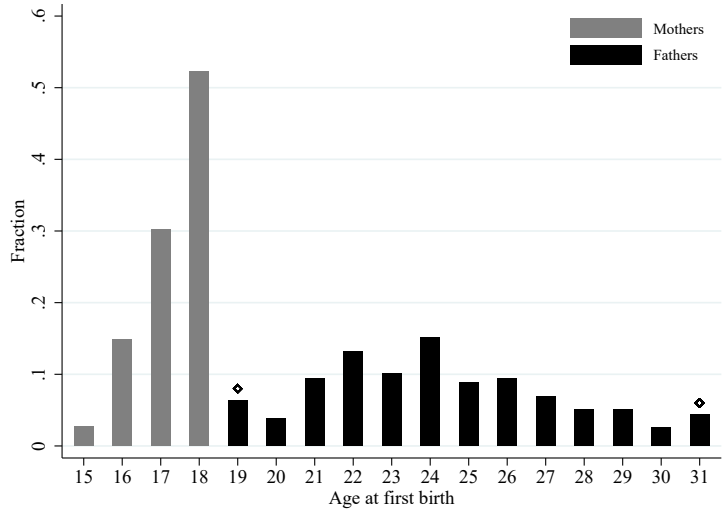
Tables and Figures

Figure 1: Distribution of group crime conviction rates



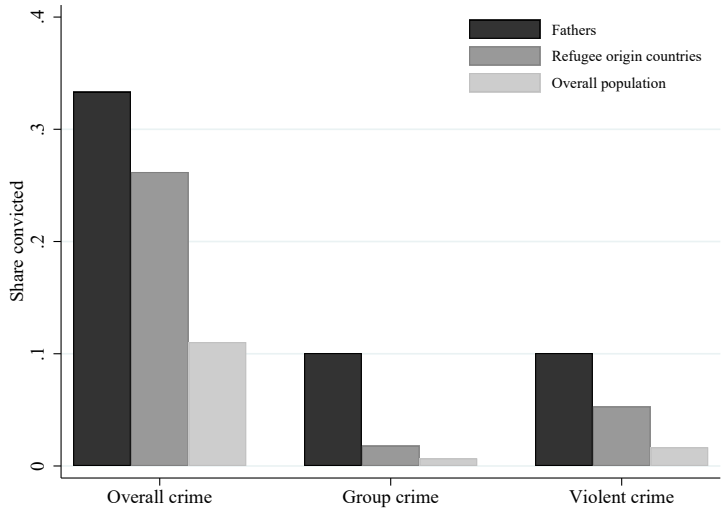
Note: The municipality group crime conviction rate is measured as the percentage of males aged 15-25 who were convicted for group crimes committed in a respective year. A group crime is defined as a crime for which more than one individual is convicted, and where at least one of the co-offenders are convicted for a crime that is either of a violent nature, involves weapons, drug sales, vehicular theft, or malicious damage to property. The graph is truncated at 1.1 which is indicated by a diamond.

Figure 2: Age distribution at first birth for teenage mothers and the respective fathers



Note: The figure plots the age distribution at first birth for refugee girls who were younger than 15 at assignment and who gave birth when they were 15-18 years old, and that of the respective fathers. "Age 19" pools fathers who were 19 or younger at the birth of the child and "Age 31" pools fathers who were 31 or older (respective bars are marked).

Figure 3: Fathers' conviction rates

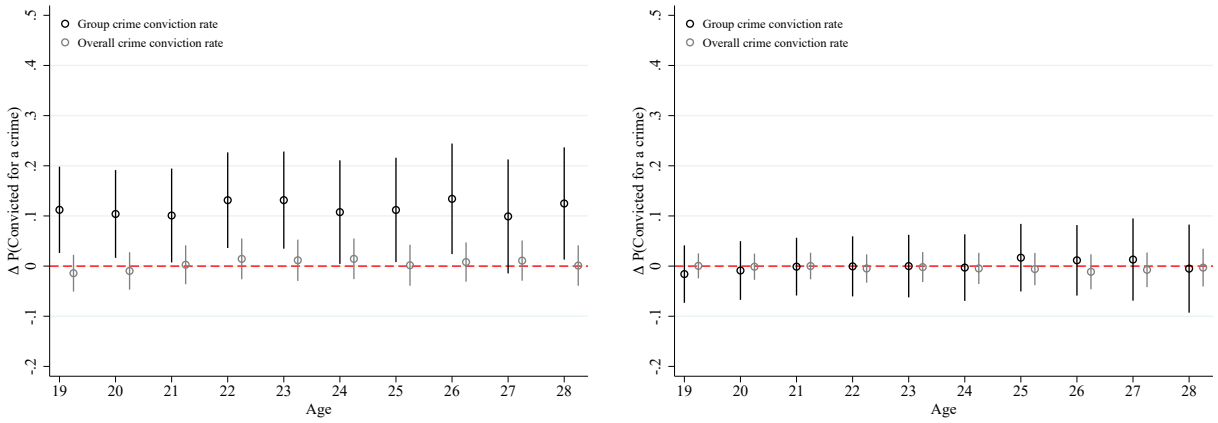


Note: The figure plots the share of fathers of children of teenage mothers who are convicted for crimes committed in the 5 years before the year of conception, for overall, group and violent crime (black bars), and conviction rates over the same period for males of the same age from refugee-sending countries, and males from the overall population.

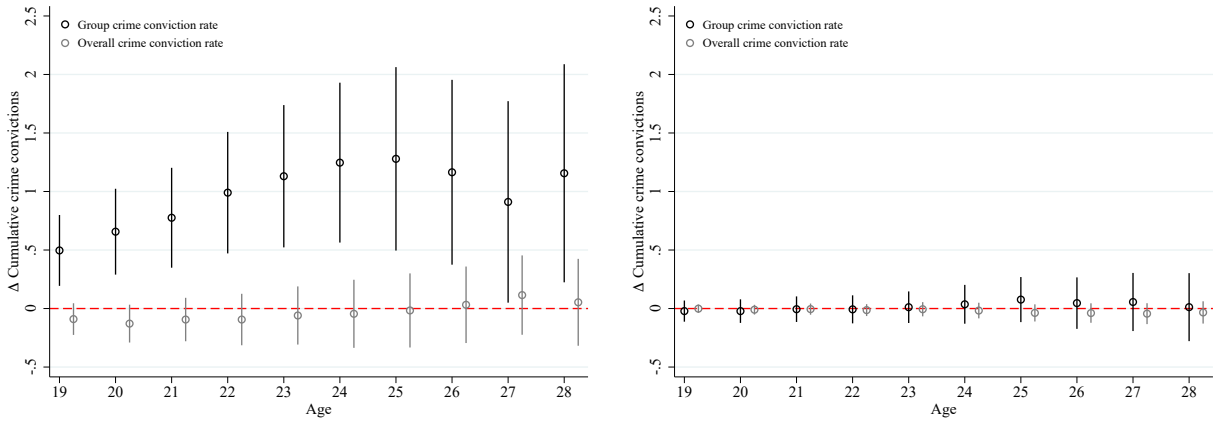
Figure 4: Crime conviction probabilities at age 19-28 and municipality crime

Men Women

(a) Dependent variable: Committed at least one crime between age 15 and the indicated age leading to a conviction



(b) Dependent variable: Cumulative number of crimes committed leading to a conviction

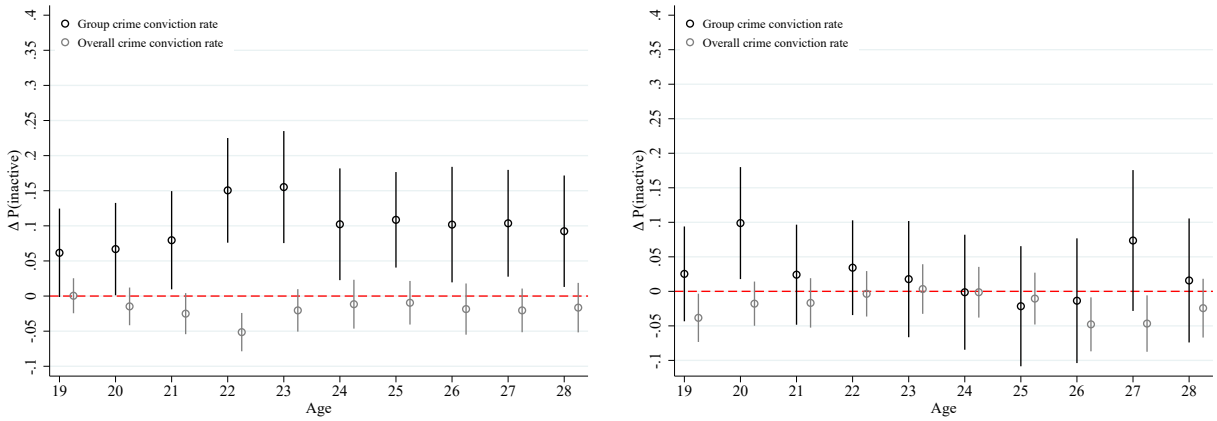


Note: The figure shows the estimated effect of assignment to a municipality with a one percentage point higher group (black) or overall (grey) crime conviction rate at assignment on the age specific probability of having committed at least one crime that eventually leads to a conviction in Panel (a) and on the cumulative number of crimes committed that eventually leads to a conviction in Panel (b). The sample includes refugees assigned to a Danish municipality at age 0-14 from 1986-1998, who are observed in the demographic registers every year between assignment and age 19 and who are observed in the demographic registers at the indicated age. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate) and municipality of assignment fixed effects. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. Vertical lines indicate 90% confidence intervals.

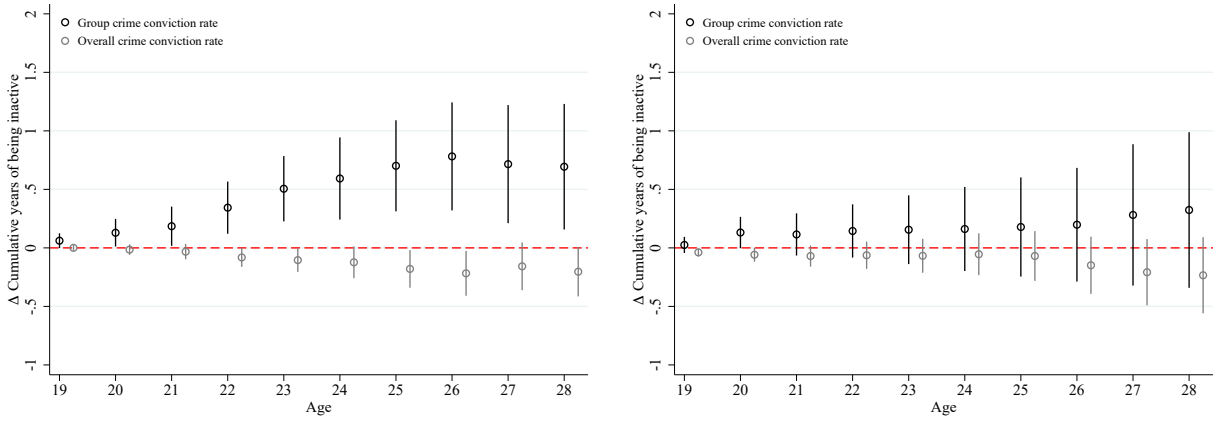
Figure 5: Inactivity at age 19-28 and municipality crime

Men Women

(a) Dependent variable: Indicator for inactivity



(b) Dependent variable: Years of inactivity from age 19 to the indicated age

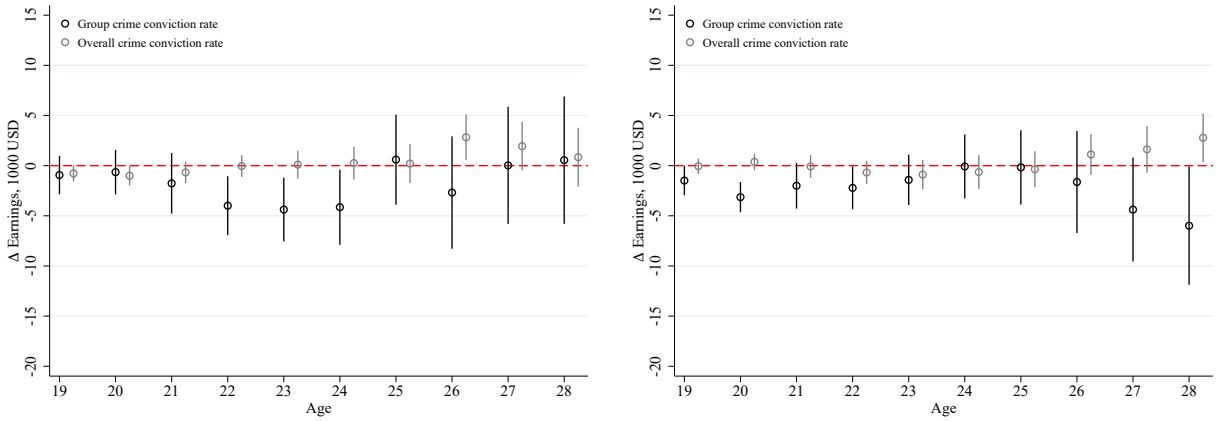


Note: The figure shows the estimated effect of assignment to a municipality with a one percentage point higher group (black) or overall (grey) crime conviction rate at assignment on the age specific probability of being inactive in Panel (a) and on years of inactivity since age 19 in Panel (b). The sample includes refugees assigned to a Danish municipality at age 0-14 from 1986-1998, who are observed in the demographic registers every year between assignment and age 19 and who are observed in the demographic registers at the indicated age. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate) and municipality of assignment fixed effects. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. Vertical lines indicate 90% confidence intervals.

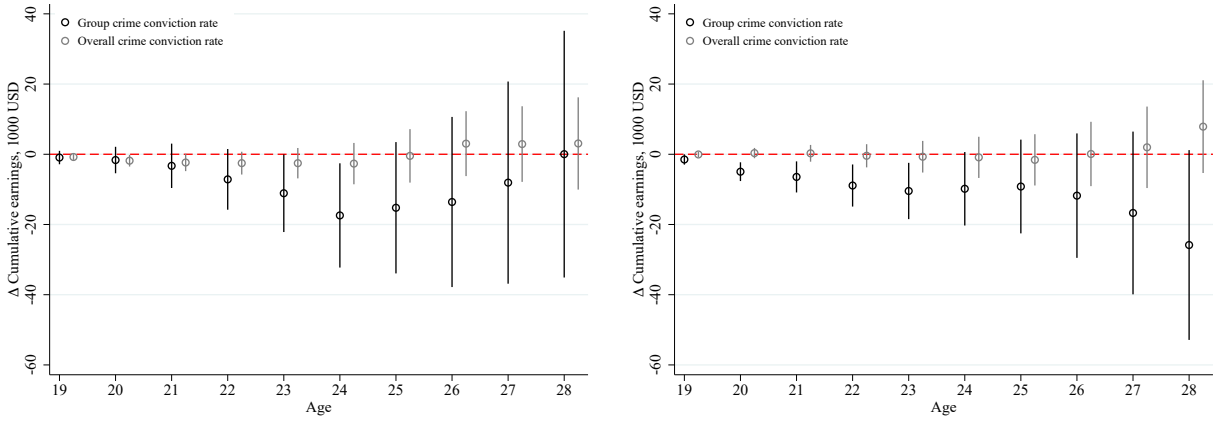
Figure 6: Earnings at age 19-28 and municipality crime

Men Women

(a) Dependent variable: Annual earnings in $1000



(b) Dependent variable: Cumulative earnings in $1000 from age 19 to the specified age

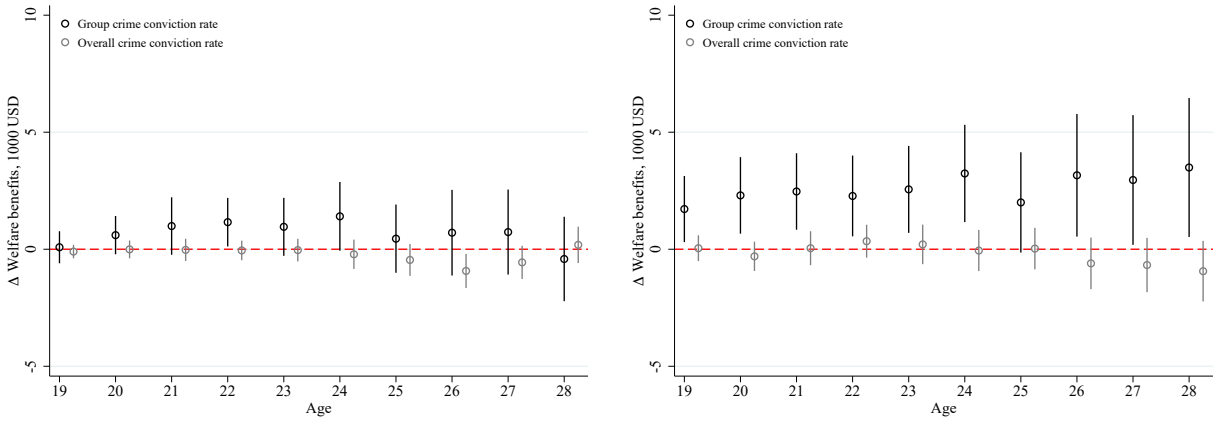


Note: The figure shows the estimated effect of assignment to a municipality with a one percentage point higher group (black) or overall (grey) crime conviction rate at assignment on age specific annual earnings in Panel (a) and on accumulated earnings since age 19 in Panel (b). The sample includes refugees assigned to a Danish municipality at age 0-14 from 1986-1998, who are observed in the demographic registers every year between assignment and age 19 and who are observed in the demographic registers at the indicated age. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate) and municipality of assignment fixed effects. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. Vertical lines indicate 90% confidence intervals.

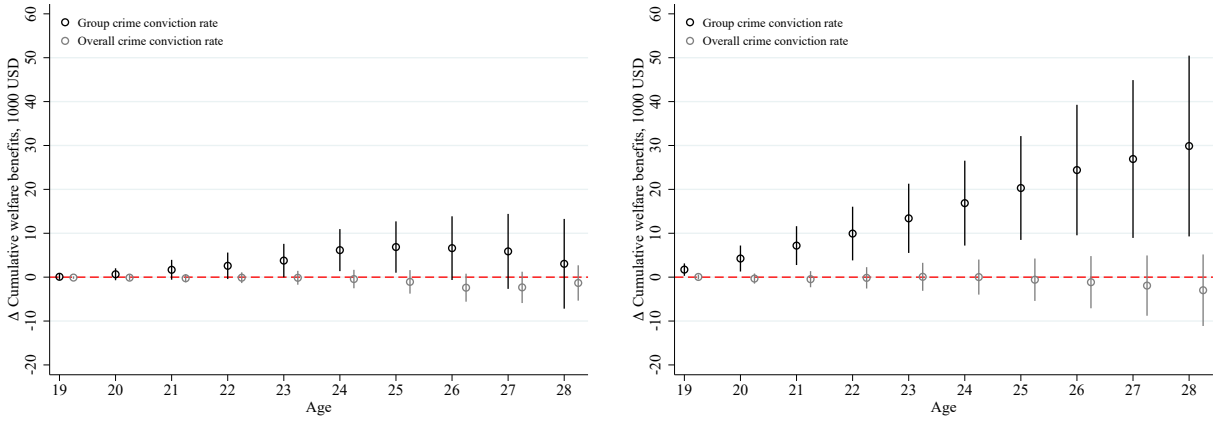
Figure 7: Welfare benefits at age 19-28 and municipality crime

Men Women

(a) Dependent variable: Annual welfare benefits in $1000



(b) Dependent variable: Cumulative welfare benefits in $1000 from age 19 to the specified age



Note: The figure shows the estimated effect of assignment to a municipality with a one percentage point higher group (black) or overall (grey) crime conviction rate at assignment on age specific welfare benefits in Panel (a) and on accumulated welfare benefits since age 19 in Panel (b). The sample includes refugees assigned to a Danish municipality at age 0-14 from 1986-1998, who are observed in the demographic registers every year between assignment and age 19 and who are observed in the demographic registers at the indicated age. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate) and municipality of assignment fixed effects. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. Vertical lines indicate 90%

Table 1: Municipality crime rates

	(1) Mean
Group crime conviction rate	0.484 (0.261)
Non-group crime conviction rate	3.531 (1.147)
Non-group violent crime conviction rate	0.357 (0.164)
Non-group property crime conviction rate	2.490 (0.863)
Non-group drug crime conviction rate	0.455 (0.384)
Other crime conviction rate	0.528 (0.264)
Overall crime conviction rate	4.015 (1.279)
Violent crime conviction rate	0.497 (0.229)
Violent group crime conviction rate	0.140 (0.121)
Property crime conviction rate	2.848 (0.973)
Drug crime conviction rate	0.482 (0.400)
Observations	8172

Note: Municipality crime conviction rates are measured as the percentage of males aged 15-25 convicted for a crime of a given type committed in a given year who lived in the municipality at the beginning of that year. Standard deviations are reported in parentheses.

Table 2: Summary statistics, assigned refugee children

	Refugee girls			Refugee boys		
	All	0-6 years old at arrival	7-14 years old at arrival	All	0-6 years old at arrival	7-14 years old at arrival
Panel A: Crime conviction rates at age 15-18						
Any crime	0.086	0.084	0.089	0.348	0.354	0.341
	(0.281)	(0.277)	(0.285)	(0.476)	(0.478)	(0.474)
Gang crime	0.005	.	.	0.100	0.108	0.091
	(0.069)	(.)	(.)	(0.300)	(0.310)	(0.288)
Violent crime	0.008	0.011	0.005	0.120	0.127	0.111
	(0.091)	(0.105)	(0.072)	(0.325)	(0.333)	(0.314)
Property crime	0.076	0.071	0.083	0.262	0.261	0.263
	(0.265)	(0.256)	(0.276)	(0.440)	(0.439)	(0.441)
Violent non-gang crime	0.005	.	.	0.087	0.093	0.080
	(0.069)	(.)	(.)	(0.282)	(0.291)	(0.271)
Property non-gang crime	0.075	0.070	0.082	0.243	0.241	0.245
	(0.264)	(0.255)	(0.275)	(0.429)	(0.428)	(0.430)
Drug non-gang crime	0.002	.	.	0.047	0.062	0.029
	(0.040)	(.)	(.)	(0.211)	(0.240)	(0.168)
Panel B: Refugee characteristics						
Teenage mother	0.048	0.031	0.068	0.005	0.005	0.005
	(0.214)	(0.173)	(0.253)	(0.071)	(0.071)	(0.071)
Age at assignment	6.239	2.955	10.174	6.251	3.003	10.151
	(4.166)	(1.959)	(2.270)	(4.141)	(1.964)	(2.286)
Observations	3792	2067	1725	4380	2390	1990
Panel C: Mother characteristics						
Age at assignment	32.508	29.074	36.682	32.333	29.173	36.162
	(7.782)	(5.930)	(7.727)	(7.621)	(5.968)	(7.654)
Arrived before father	0.218	0.180	0.265	0.213	0.188	0.244
	(0.413)	(0.384)	(0.441)	(0.410)	(0.391)	(0.430)
Education: general non-tertiary	0.487	0.494	0.479	0.492	0.504	0.476
	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)
Education: vocational non-tertiary	0.205	0.224	0.182	0.204	0.217	0.187
	(0.404)	(0.417)	(0.386)	(0.403)	(0.412)	(0.390)
Education: tertiary	0.145	0.144	0.147	0.141	0.135	0.148
	(0.352)	(0.351)	(0.354)	(0.348)	(0.341)	(0.356)
Education: missing	0.163	0.138	0.192	0.164	0.144	0.188
	(0.369)	(0.345)	(0.394)	(0.370)	(0.351)	(0.391)
Observations	3753	2059	1694	4309	2361	1948
Panel D: Father characteristics						
Age at assignment	37.138	33.824	41.423	37.185	33.974	41.223
	(8.600)	(6.798)	(8.792)	(8.570)	(6.955)	(8.702)
Arrived before mother	0.315	0.293	0.343	0.312	0.287	0.344
	(0.464)	(0.455)	(0.475)	(0.463)	(0.453)	(0.475)
Education: general non-tertiary	0.318	0.333	0.299	0.309	0.318	0.297
	(0.466)	(0.471)	(0.458)	(0.462)	(0.466)	(0.457)
Education: vocational non-tertiary	0.270	0.273	0.267	0.279	0.290	0.266
	(0.444)	(0.446)	(0.442)	(0.449)	(0.454)	(0.442)
Education: tertiary	0.214	0.216	0.211	0.208	0.207	0.209
	(0.410)	(0.411)	(0.408)	(0.406)	(0.405)	(0.407)
Education: missing	0.198	0.178	0.223	0.205	0.186	0.229
	(0.398)	(0.383)	(0.416)	(0.404)	(0.389)	(0.420)
Observations	3320	1872	1448	3850	2145	1705

Note: The table reports sample averages for the sample of refugee girls and refugee boys who were assigned to a municipality together with their parents over the period 1986-1998, and who were less than 15 years old at assignment in Panels A and B. A few entries are missing because they refer to a small population. It is a violation of the rules set forth by Statistics Denmark to display statistics that refer to population of less than 5 individuals. Panels C and D reports sample averages of the parents of refugee children. Since not all parents are observed, the observations in Panels C and D are slightly lower than the number of observations in Panels A and B. Standard deviations are reported in parentheses.

Table 3: Balancing Test, municipality of assignment crime conviction rates and characteristics of refugee parents'

	(1) Overall crime conviction rate	(2) Gang crime conviction rate	(3) Property crime conviction rate	(4) Violent crime conviction rate
	Panel A: Not conditional on municipality fixed effects			
Joint significance of educational dummies				
F-statistic	0.435	0.440	0.336	0.297
P-value	0.856	0.852	0.918	0.938
Joint significance of educational dummies, age, number of children and marriage indicator				
F-statistic	1.997	0.961	2.010	0.911
P-value	0.021	0.484	0.020	0.535
Joint significance of educational dummies, age and marriage indicator				
F-statistic	0.903	0.480	1.069	0.560
P-value	0.530	0.904	0.382	0.848
Number of observations	3,759	3,759	3,759	3,759
Country of origin FE	YES	YES	YES	YES
Year of immigration FE	YES	YES	YES	YES
Municipality FE	NO	NO	NO	NO
	Panel B: Conditional on municipality fixed effects			
Joint significance of educational dummies				
F-statistic	0.778	0.192	1.035	0.408
P-value	0.587	0.979	0.401	0.874
Joint significance of educational dummies, age, number of children and marriage indicator				
F-statistic	1.153	0.407	1.332	0.965
P-value	0.312	0.961	0.193	0.480
Joint significance of educational dummies, age and marriage indicator				
F-statistic	1.372	0.455	1.498	0.722
P-value	0.187	0.919	0.133	0.704
Number of observations	3,759	3,759	3,759	3,759
Country of origin FE	YES	YES	YES	YES
Year of immigration FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES

Note: Characteristics of the municipality of assignment in the year of assignment are regressed on characteristics of the parents of assigned refugee children, measured at assignment. The table reports F-tests for the joint significance of education dummies, of all family characteristics, and of all family characteristics excluding the number of children. We condition on municipality of assignment fixed effects in Panel B.

Table 4: Crime conviction probability and municipality crime

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Crime		Violent crime		Group crime		Property crime	
	Convicted for a committed in age range 15-18							
	Panel A: Average effect							
Boys; Overall crime conviction rate	-0.026**	-0.029	-0.008	-0.020	-0.006	-0.015	-0.031***	-0.026
	(0.012)	(0.021)	(0.008)	(0.014)	(0.009)	(0.013)	(0.009)	(0.018)
Boys; Group crime conviction rate	0.121***	0.141***	0.065**	0.129***	0.062**	0.108***	0.081**	0.081*
	(0.038)	(0.050)	(0.029)	(0.035)	(0.026)	(0.030)	(0.035)	(0.045)
Girls; Overall crime conviction rate	-0.005	0.005	0.001	0.005	0.001	0.002	-0.007	0.003
	(0.007)	(0.014)	(0.002)	(0.005)	(0.002)	(0.005)	(0.007)	(0.013)
Girls; Group crime conviction rate	-0.022	-0.030	-0.001	0.006	0.001	0.002	-0.023	-0.038
	(0.022)	(0.032)	(0.009)	(0.009)	(0.006)	(0.008)	(0.022)	(0.032)
Mean of dependent variable, boys	0.348	0.348	0.120	0.120	0.100	0.100	0.262	0.262
Mean of dependent variable, girls	0.086	0.086	0.008	0.008	0.005	0.005	0.076	0.076
	Panel B: By age at assignment							
Boys; Overall crime conviction rate *assigned when 0-6 years old	-0.020*	-0.023	-0.003	-0.014	-0.003	-0.013	-0.024**	-0.019
	(0.012)	(0.022)	(0.009)	(0.014)	(0.010)	(0.014)	(0.010)	(0.018)
Boys; Overall crime conviction rate *assigned when 7-14 years old	-0.031**	-0.035*	-0.014*	-0.026*	-0.010	-0.017	-0.038***	-0.034*
	(0.013)	(0.021)	(0.009)	(0.014)	(0.009)	(0.013)	(0.011)	(0.018)
Boys; Group crime conviction rate *assigned when 0-6 years old	0.054	0.066	0.024	0.080**	0.033	0.088**	0.022	0.023
	(0.044)	(0.060)	(0.032)	(0.038)	(0.032)	(0.037)	(0.039)	(0.050)
Boys; Group crime conviction rate *assigned when 7-14 years old	0.209***	0.220***	0.119***	0.180***	0.100***	0.130***	0.156***	0.141**
	(0.054)	(0.069)	(0.038)	(0.046)	(0.035)	(0.041)	(0.054)	(0.064)
Girls; Overall crime conviction rate *assigned when 0-6 years old	-0.006	0.004	0.003	0.006	0.002	0.003	-0.009	0.001
	(0.007)	(0.015)	(0.003)	(0.005)	(0.002)	(0.005)	(0.007)	(0.013)
Girls; Overall crime conviction rate *assigned when 7-14 years old	-0.004	0.007	-0.001	0.002	-0.000	0.001	-0.004	0.008
	(0.008)	(0.015)	(0.003)	(0.005)	(0.002)	(0.005)	(0.008)	(0.014)
Girls; Group crime conviction rate *assigned when 0-6 years old	-0.019	-0.017	-0.013	-0.006	-0.002	0.000	-0.010	-0.013
	(0.030)	(0.039)	(0.009)	(0.010)	(0.010)	(0.012)	(0.029)	(0.038)
Girls; Group crime conviction rate *assigned when 7-14 years old	-0.026	-0.045	0.016	0.021	0.003	0.005	-0.041	-0.067
	(0.041)	(0.050)	(0.019)	(0.018)	(0.008)	(0.010)	(0.036)	(0.046)
Mean of dep. variable, boys assigned at age 0-6	0.354	0.354	0.127	0.127	0.108	0.108	0.261	0.261
Mean of dep. variable, boys assigned at age 7-14	0.341	0.341	0.111	0.111	0.091	0.091	0.263	0.263
Mean of dep. variable, girls assigned at age 0-6	0.084	0.084	0.011	0.011	0.007	0.007	0.071	0.071
Mean of dep. variable, girls assigned at age 7-14	0.089	0.089	0.005	0.005	0.002	0.002	0.083	0.083
Own and HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES
Number of observations	8,172	8,172	8,172	8,172	8,172	8,172	8,172	8,172

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates on the probability of being convicted for the indicated crime committed at age 15-18. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table 5: Teenage motherhood and municipality crime

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Average effect			
Overall crime conviction rate	-0.002	0.001			-0.011**	-0.014
	(0.005)	(0.011)			(0.005)	(0.011)
Group crime conviction rate			0.037*	0.076**	0.056**	0.089***
			(0.020)	(0.030)	(0.023)	(0.031)
Mean of dependent variable	0.048	0.048	0.048	0.048	0.048	0.048
			Panel B: By age at assignment			
Overall crime conviction rate*assigned when 0-6 years old	-0.003	-0.001			-0.009*	-0.013
	(0.005)	(0.011)			(0.006)	(0.011)
Overall crime conviction rate*assigned when 7-14 years old	0.000	0.003			-0.013**	-0.017
	(0.005)	(0.011)			(0.006)	(0.012)
Group crime conviction rate*assigned when 0-6 years old			0.020	0.057*	0.030	0.059*
			(0.020)	(0.031)	(0.024)	(0.035)
Group crime conviction rate*assigned when 7-14 years old			0.061**	0.097***	0.091**	0.125***
			(0.025)	(0.033)	(0.036)	(0.041)
Mean of dependent variable, assigned at age 0-6	0.031	0.031	0.031	0.031	0.031	0.031
Mean of dependent variable, assigned at age 7-14	0.068	0.068	0.068	0.068	0.068	0.068
Own and HH characteristics	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES
Number of observations	3,792	3,792	3,792	3,792	3,792	3,792

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on the incidence of teenage motherhood. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table 6: Conviction probabilities, teenage motherhood and neighborhood characteristics

	(1) Teenage motherhood rate	(2) Immigrants share same source country	(3) Immigrant share other source country	(4) Log(number of residents)	(5) Employment rate	(6) Relative poverty rate	(7) Share of immigrants relying on welfare benefits
	Panel A: Boys crime conviction						
Group crime conviction rate	0.098**	0.097**	0.099**	0.093**	0.098**	0.098**	0.095**
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.040)	(0.041)
Overall crime conviction rate	-0.007	-0.005	-0.006	-0.004	-0.005	-0.006	-0.004
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Municipality characteristic	0.003	-0.006	0.003	-0.007	0.001	-0.011	-0.004
	(0.008)	(0.008)	(0.012)	(0.010)	(0.012)	(0.010)	(0.010)
	Panel B: Boys; crime conviction, conditional on municipality fixed effects						
Group crime conviction rate	0.140***	0.143***	0.140***	0.140***	0.141***	0.140***	0.139***
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
Overall crime conviction rate	-0.028	-0.029	-0.027	-0.028	-0.027	-0.029*	-0.028
	(0.017)	(0.018)	(0.019)	(0.017)	(0.018)	(0.017)	(0.017)
Municipality characteristic	0.002	-0.007	0.002	0.041	0.023	-0.014	-0.008
	(0.012)	(0.011)	(0.053)	(0.786)	(0.054)	(0.032)	(0.024)
	Panel C: Girls; Teenage motherhood						
Group crime conviction rate	0.057**	0.058**	0.060***	0.061***	0.060**	0.058**	0.059**
	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.023)
Overall crime conviction rate	-0.009**	-0.009**	-0.012***	-0.010**	-0.011**	-0.008*	-0.009**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Municipality characteristic	0.000	0.002	0.014***	0.006**	-0.008**	0.012***	0.003
	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)
	Panel D: Girls; Teenage motherhood, conditionally on municipality fixed effects						
Group crime conviction rate	0.085***	0.085**	0.086***	0.086***	0.086***	0.088***	0.085***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.032)
Overall crime conviction rate	-0.016**	-0.016*	-0.017*	-0.017**	-0.016**	-0.015*	-0.016**
	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
Municipality characteristic	-0.002	0.001	-0.008	-0.165	-0.006	0.019	-0.003
	(0.005)	(0.005)	(0.017)	(0.309)	(0.024)	(0.014)	(0.011)

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates, and a one standard deviation higher municipality characteristic as indicated in the column header, on the probability that boys are convicted for a crime committed at age 15-18 in panels A and B and on the incidence of teenage motherhood for girls in panels C and D. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen). In panels B and D we condition on municipality fixed effects in addition. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table 6: Conviction probabilities, teenage motherhood and neighborhood characteristics (continued)

	(8) Teacher hours per pupil	(9) Share with no more than lower-secondary education	(10) Share with upper-secondary education	(11) Share with vocational non-tertiary education	(12) Police officers per 1,000 residents	(13) Crime detection rate	(14) Conviction rate
	Panel A: Boys crime conviction						
Group crime conviction rate	0.098**	0.100**	0.096**	0.100**	0.101**	0.104**	0.099**
	(0.041)	(0.040)	(0.041)	(0.040)	(0.040)	(0.041)	(0.040)
Overall crime conviction rate	-0.005	-0.006	-0.005	-0.009	-0.007	-0.008	-0.004
	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Municipality characteristic	-0.001	-0.006	-0.007	0.014	0.013	0.012	0.058**
	(0.008)	(0.010)	(0.008)	(0.009)	(0.020)	(0.008)	(0.022)
	Panel B: Boys; crime conviction, conditional on municipality fixed effects						
Group crime conviction rate	0.140***	0.138***	0.140***	0.140***	0.134***	0.147***	0.144***
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.052)	(0.050)
Overall crime conviction rate	-0.023	-0.025	-0.027	-0.030*	-0.022	-0.031*	-0.028
	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.017)	(0.017)
Municipality characteristic	-0.037**	-0.154	0.007	0.012	-0.080	0.022	0.046
	(0.014)	(0.101)	(0.116)	(0.043)	(0.100)	(0.015)	(0.034)
	Panel C: Girls; Teenage motherhood						
Group crime conviction rate	0.057**	0.059**	0.059**	0.056**	0.059**	0.056**	0.057**
	(0.023)	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)	(0.023)
Overall crime conviction rate	-0.008**	-0.009**	-0.009**	-0.007	-0.010***	-0.008**	-0.009**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Municipality characteristic	-0.001	-0.006	0.008**	-0.007*	0.016*	-0.003	-0.014
	(0.004)	(0.004)	(0.003)	(0.004)	(0.009)	(0.003)	(0.011)
	Panel D: Girls; Teenage motherhood, conditionally on municipality fixed effects						
Group crime conviction rate	0.086***	0.086***	0.085**	0.086***	0.085**	0.086***	0.085***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Overall crime conviction rate	-0.017**	-0.017**	-0.015*	-0.014	-0.016	-0.016**	-0.016**
	(0.008)	(0.008)	(0.009)	(0.010)	(0.010)	(0.008)	(0.008)
Municipality characteristic	0.003	0.018	0.019	-0.013	-0.010	0.000	-0.014
	(0.006)	(0.036)	(0.036)	(0.020)	(0.045)	(0.006)	(0.014)

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates, and a one standard deviation higher municipality characteristic as indicated in the column header, on the probability that boys are convicted for a crime committed at age 15-18 in panels A and B and on the incidence of teenage motherhood for girls in panels C and D. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen). In panels B and D we condition on municipality fixed effects in addition. All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table 7: Robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Teenage motherhood, assigned when aged 7-14									
	Baseline		Violent crime		Joint non-group crime		Alternative group crime definition		Excluding urban municipalities	
Overall crime conviction rate	-0.013**	-0.017	-0.001	0.000	0.000	0.003	-0.006	-0.006	-0.013*	-0.010
	(0.006)	(0.012)	(0.005)	(0.011)	(0.007)	(0.014)	(0.005)	(0.011)	(0.007)	(0.013)
Group crime conviction rate	0.091**	0.125***							0.082**	0.115***
	(0.036)	(0.041)							(0.037)	(0.044)
Violent crime conviction rate			0.014	0.020						
			(0.029)	(0.034)						
Joint crime conviction rate					0.003	0.002				
					(0.023)	(0.027)				
Group crime conviction rate, more than 2 offenders							0.108**	0.135**		
							(0.054)	(0.057)		
Mean of dep. variable	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.062	0.062
Own and HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Number of observations	3,792	3,792	3,792	3,792	3,792	3,792	3,792	3,792	2,607	2,607

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on the incidence of teenage motherhood for refugee girls who were between 7 and 14 years old at assignment. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. The five largest municipalities excluded in columns 9-10 are Copenhagen, Aarhus, Odense, Aalborg, and Frederiksberg. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table 8: Municipality crime and first birth of refugee women aged 15-20 at assignment

	(1)	(2)	(3)	(4)	(5)	(6)
Overall crime conviction rate	0.002	0.020			0.000	0.022
	(0.018)	(0.038)			(0.021)	(0.039)
Group crime conviction rate			0.015	0.001	0.015	-0.018
			(0.057)	(0.100)	(0.067)	(0.103)
Mean of dep. variable	0.251	0.251	0.251	0.251	0.251	0.251
Own and HH characteristics	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES
Number of observation	1,169	1,169	1,169	1,169	1,169	1,169

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on the probability of giving birth within 4 years of the assignment date. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

A Appendix

Table A.1: Share of assigned refugee children living in the municipality of assignment

Years since assignment	Share residing in assignment municipality
1	1
2	0.762
3	0.704
4	0.663
5	0.623
6	0.594
7	0.570
8	0.545
9	0.526
10	0.508
N	8172

Note: The table reports the share of assigned refugee children living in their assignment municipality by years since assignment. The sample of assigned refugee children includes children of immigrants from refugee-sending countries (Afghanistan, Ethiopia, Iraq, Iran, Lebanon, Somalia, Sri Lanka, Vietnam) who were assigned to a Danish municipality over the period 1986-1998, who immigrated at most one year later than the refugee parent(s), who were less than 15 years old at immigration, and who are observed in the administrative registers continually up until age 19.

Table A.2: Correlations between group crime and other municipality crime measures, 1986-1998

	Group crime conviction rate
Non-group crime conviction rate	0.419
Non-group violent crime conviction rate	0.211
Non-group property crime conviction rate	0.411
Non-group drug crime conviction rate	0.258
Other crime conviction rate	0.285
Overall crime conviction rate	0.580
Violent crime conviction rate	0.480
Violent group crime conviction rate	0.619
Property crime conviction rate	0.562
Drug crime conviction rate	0.278
Observations	8172

Note: The table reports correlations between the municipality group crime conviction rate and other municipality crime conviction rates. Municipality crime conviction rates are measured as the percentage of males aged 15-25 convicted for a crime of a given type committed in a given year who lived in the municipality at the beginning of that year.

Table A.3: Summary statistics, fathers of the children born to assigned refugee girls

	All		Mother aged 0-6 at assignment		Mother aged 7-14 at assignment	
	Gave birth when aged 15-18	Gave birth when aged 19 or more	Gave birth when aged 15-18	Gave birth when aged 19 or more	Gave birth when aged 15-18	Gave birth when aged 19 or more
Father's ID can be matched	0.890	0.876	0.828	0.857	0.924	0.890
	(0.314)	(0.330)	(0.380)	(0.351)	(0.267)	(0.313)
Fathers' age	24.29	28.93	23.65	28.29	24.59	29.41
	(3.207)	(5.175)	(3.078)	(4.538)	(3.235)	(5.559)
Father is from the same origin country as the mother	0.734	0.620	0.700	0.587	0.750	0.646
	(0.443)	(0.485)	(0.463)	(0.493)	(0.435)	(0.479)
Observations	182	1944	64	851	118	1093

Note: The table reports characteristics of the fathers of the first child of assigned refugee girls. The statistics are grouped by the mothers' age at birth and by their age at immigration. Standard deviations are reported in parentheses.

Table A.4: Variable description

Variable	Description	Sources
Teenage motherhood rate	The number of girls aged 13 to 18 in the beginning of the year of assignment who where a mother.	The population register
Immigrant share, same source country	The share of immigrants living in the municipality in the beginning of the year who are from the same origin country as the assignee.	The population register
Immigrant share, other source country	The share of immigrants living in the municipality in the beginning of the year who are from a different origin country than the assignee.	The population register
Log(number of inhabitants)	log of the number of inhabitants in the beginning of the year.	The population register
Employment rate (18-65 year olds)	The share of inhabitants living in the municipality in the beginning of the year, aged 18 to 65 who are employed in the beginning of the year.	The population register
Relative poverty rate	Share of adults in the municipality who have equivalence-scaled disposable household income below 50% of the national median equivalence-scaled disposable household income.	The income register
Share of immigrants relying on welfare benefits	The share of immigrants, aged 18-65, residing in the municipality in the beginning of the year who are unemployed or outside the labor force in the beginning of the year.	The population and labor force registers
Teacher hours per pupil	Weekly number of teacher wage hours per pupil in the municipality in the given school year.	"Folkeskolen i de enkelte kommuner", Ministry of Education (1989/90, 1990/91, 1991/92, 1992/93) and "Folkeskolen i tal", Ministry of Education (1993/94, 1994/95, 1995/96, 1996/97, 1997/98, 1998,/99).
Share with no more than lower-secondary education	The share of individuals, aged 18-65, residing in the municipality in the beginning of the year, who have completed no more than lower-secondary education in the beginning of the year.	The population and education registers
Share with upper-secondary education	The share of individuals, aged 18-65, residing in the municipality in the beginning of the year, who's highest completed education in the beginning of the year is upper-secondary education.	The population and education registers
Share with vocational non-tertiary education	The share of individuals, aged 18-65, residing in the municipality in the beginning of the year, who's highest completed education in the beginning of the year is a vocational non-tertiary education.	The population and education registers
Police officers per 1,000 inhabitants	The number of detectives and uniformed police officers employed in the police district per 1000 inhabitants.	Annual reports from the Police (1986-1999). From 1986-1998 there are 54 police districts covering a total of 275 municipalities.
Crime detection rate	Annual number of charges divided by the annual number of reported crimes in the municipality (or police district). The crime clearance rate is available at the police district level from 1986-1989 and at the municipality level from 1990-1998.	Statistiske Efterretninger om social sikring og retsvæsen, Statistics Denmark (1986-1999).
Conviction rate	The number of convictions divided by the number of charges faced by municipality residents for crimes committed that year.	Police and conviction registers

Table A.5: Municipality characteristics

	(1) Unweighted	(2) Weighted
Share of immigrants from refugee sending countries	0.004	0.008
	(0.005)	(0.008)
Immigrant share	0.028	0.048
	(0.024)	(0.036)
Employment rate	0.759	0.743
	(0.046)	(0.049)
Relative poverty rate	6.188	6.809
	(1.649)	(1.936)
Teacher hours per pupil	2.378	2.453
	(0.224)	(0.239)
Police officers per 1,000 residents	0.125	0.156
	(0.045)	(0.094)
Crime detection rate	19.984	20.310
	(4.940)	(4.041)
Log(number of residents)	9.390	10.488
	(0.784)	(1.313)
Teenage motherhood rate	0.003	0.004
	(0.004)	(0.003)
Share with no more than lower-secondary education	0.449	0.401
	(0.084)	(0.087)
Share with upper-secondary education	0.051	0.080
	(0.023)	(0.046)
Share with vocational non-tertiary education	0.383	0.379
	(0.044)	(0.045)
Share with tertiary education	0.117	0.141
	(0.046)	(0.057)
Share of immigrants relying on welfare benefits, %	44.582	48.799
	(10.342)	(10.218)
Conviction rate	0.554	0.531
	(0.209)	(0.199)
Observations	3575	3575

Note: The table reports average municipality characteristics from 1986-1998. A detailed description of each variable can be found in Appendix Table A4. In column (2) we weight municipalities by their population size. Standard deviations are reported in parentheses.

Table A.6: Probability of residing in assignment municipality at age 19 and municipality crime

Dependent variable:	(1)	(2)	(3)	(4)
	Resides in assignment municipality at age 19			
	Boys		Girls	
	Panel A: Average effect			
Overall crime conviction rate	0.007	0.002	-0.008	0.019
	(0.016)	(0.021)	(0.014)	(0.024)
Group crime conviction rate	-0.084**	-0.008	-0.016	-0.021
	(0.042)	(0.052)	(0.050)	(0.065)
Mean of dependent variable	0.487	0.487	0.458	0.458
	Panel B: By age at assignment			
Overall crime conviction rate*assigned when 0-6 years old	0.004	-0.002	-0.013	0.017
	(0.017)	(0.022)	(0.015)	(0.024)
Overall crime conviction rate*assigned when 7-14 years old	0.010	0.005	-0.003	0.023
	(0.016)	(0.021)	(0.016)	(0.025)
Group crime conviction rate*assigned when 0-6 years old	-0.063	0.025	0.032	0.016
	(0.047)	(0.061)	(0.054)	(0.072)
Group crime conviction rate*assigned when 7-14 years old	-0.110**	-0.043	-0.079	-0.064
	(0.054)	(0.057)	(0.061)	(0.073)
Mean of dep. variable, assigned at age 0-6	0.444	0.444	0.430	0.430
Mean of dep. variable, assigned at age 7-14	0.539	0.539	0.492	0.492
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES
Number of observations	4,380	4,380	3,792	3,792

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on the probability of residing in the assignment municipality at age 19. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.7: Crime conviction probability and alternative municipality crime conviction rates (boys)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Crime		Violent crime		Group crime		Property crime	
	Convicted for a committed in age range 15-18							
	Panel A: Crime conviction rates							
Overall crime conviction rate	-0.004	-0.006	0.003	0.001	0.005	0.002	-0.017*	-0.013
	(0.010)	(0.020)	(0.007)	(0.012)	(0.007)	(0.011)	(0.009)	(0.017)
Non-group crime conviction rate	-0.017	-0.031	-0.003	-0.022	-0.001	-0.016	-0.026***	-0.027
	(0.011)	(0.021)	(0.008)	(0.014)	(0.008)	(0.013)	(0.009)	(0.018)
Violent crime conviction rate	0.111***	0.084	0.042	0.052	0.058**	0.058**	0.055*	0.037
	(0.041)	(0.052)	(0.028)	(0.034)	(0.024)	(0.027)	(0.032)	(0.042)
Property crime conviction rate	-0.016	-0.015	0.003	0.004	0.001	0.001	-0.022**	-0.019
	(0.012)	(0.021)	(0.008)	(0.012)	(0.008)	(0.013)	(0.011)	(0.019)
Drug crime conviction rate	-0.041	-0.030	-0.030	-0.074**	-0.008	-0.020	-0.074***	-0.052
	(0.029)	(0.051)	(0.022)	(0.037)	(0.022)	(0.034)	(0.026)	(0.045)
Group crime conviction rate	0.080**	0.114**	0.052**	0.110***	0.052**	0.094***	0.031	0.056
	(0.032)	(0.046)	(0.025)	(0.030)	(0.021)	(0.026)	(0.030)	(0.042)
	Panel B: Violent and violent group crime conviction rates							
Violent group crime conviction rate	0.213**	0.322***	0.111	0.226**	0.138**	0.236***	0.146	0.288**
	(0.102)	(0.124)	(0.068)	(0.089)	(0.068)	(0.076)	(0.097)	(0.114)
Violent crime conviction rate	0.018	-0.057	-0.007	-0.047	-0.002	-0.046	-0.008	-0.089
	(0.060)	(0.070)	(0.039)	(0.050)	(0.037)	(0.044)	(0.053)	(0.064)
Mean of dep. variable	0.348	0.348	0.120	0.120	0.100	0.100	0.262	0.262
Own and HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES
Number of observations	8,172	8,172	8,172	8,172	8,172	8,172	8,172	8,172

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates on the probability of being convicted for the indicated crime committed at age 15-18 for boys. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.8: Crime conviction probability and group crime conviction types (boys)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Crime		Violent crime		Group crime		Property crime	
	Convicted for a committed in age range 15-18							
Boys; Violent group crime conviction rate	0.033***	0.033***	0.013**	0.022***	0.017***	0.023***	0.022***	0.025***
	(0.009)	(0.011)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.009)
Boys; Property group crime conviction rate	0.005	0.014	0.007	0.022**	0.004	0.015*	0.004	-0.000
	(0.009)	(0.011)	(0.007)	(0.009)	(0.006)	(0.008)	(0.009)	(0.010)
Boys; Drug and weapon group crime conviction rate	0.008	-0.004	0.009	-0.001	0.002	-0.005	0.003	-0.003
	(0.008)	(0.011)	(0.006)	(0.008)	(0.005)	(0.006)	(0.006)	(0.008)
Boys; Overall crime conviction rate	-0.029**	-0.033	-0.010	-0.024	-0.007	-0.018	-0.037***	-0.030
	(0.014)	(0.026)	(0.010)	(0.017)	(0.011)	(0.016)	(0.012)	(0.022)
Mean of dependent variable, boys	0.348	0.348	0.120	0.120	0.100	0.100	0.262	0.262
Own and HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES
Number of observations	8,172	8,172	8,172	8,172	8,172	8,172	8,172	8,172

*Note: The table reports estimates of the effect of one standard deviation higher municipality crime conviction rates at assignment on the probability of being convicted for the indicated crime committed at age 15-18 for boys. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.9: Teenage fatherhood and municipality crime

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Average effect					
Overall crime conviction rate	0.000	-0.002			0.001	-0.001
	(0.001)	(0.001)			(0.001)	(0.002)
Group crime conviction rate			-0.002	-0.005	-0.003	-0.004
			(0.002)	(0.004)	(0.003)	(0.004)
Mean of dependent variable	0.005	0.005	0.005	0.005	0.005	0.005
	Panel B: By age at assignment					
Overall crime conviction rate*assigned when 0-6 years old	0.001	-0.001			0.001	-0.000
	(0.001)	(0.001)			(0.002)	(0.002)
Overall crime conviction rate*assigned when 7-14 years old	-0.000	-0.002			-0.000	-0.002
	(0.001)	(0.001)			(0.001)	(0.002)
Group crime conviction rate*assigned when 0-6 years old			-0.000	-0.002	-0.005	-0.005
			(0.002)	(0.003)	(0.004)	(0.006)
Group crime conviction rate*assigned when 7-14 years old			-0.005	-0.008	-0.002	-0.003
			(0.005)	(0.006)	(0.006)	(0.006)
Mean of dependent variable, assigned at age 0-6	0.005	0.005	0.005	0.005	0.005	0.005
Mean of dependent variable, assigned at age 7-14	0.005	0.005	0.005	0.005	0.005	0.005
Own and HH characteristics	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES
Number of observations	4,380	4,380	4,380	4,380	4,380	4,380

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on the incidence of teenage fatherhood. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.10: Conviction probabilities, teenage motherhood and municipality characteristics

	(1)	(2)	(3)	(4)
	Crime		Teenage mother	
Group crime conviction rate	0.121***	0.141***	0.056**	0.089***
	(0.038)	(0.050)	(0.023)	(0.031)
Overall crime conviction rate	-0.026**	-0.029	-0.011**	-0.014
	(0.012)	(0.021)	(0.005)	(0.011)
Teenage motherhood rate	0.010	0.003	-0.002	-0.003
	(0.009)	(0.011)	(0.004)	(0.005)
Immigrants share same source country	-0.007	-0.008	-0.000	-0.001
	(0.009)	(0.013)	(0.004)	(0.005)
Immigrant share other source country	0.013	0.004	0.012*	-0.051
	(0.017)	(0.055)	(0.007)	(0.032)
Log(population size)	-0.016	0.989	0.002	-0.594*
	(0.025)	(0.879)	(0.009)	(0.349)
Employment rate	-0.033	0.006	-0.010	-0.018
	(0.022)	(0.065)	(0.008)	(0.031)
Relative poverty rate	-0.010	-0.000	0.013	0.030*
	(0.020)	(0.042)	(0.009)	(0.018)
Share of immigrants relying on welfare benefits	-0.001	-0.011	-0.007	-0.000
	(0.016)	(0.025)	(0.007)	(0.013)
Teacher hours per pupil	-0.006	-0.037**	-0.002	0.004
	(0.009)	(0.016)	(0.004)	(0.006)
Share with no more than lower-secondary education	-0.052*	-0.278	-0.008	0.019
	(0.027)	(0.175)	(0.009)	(0.100)
Share with upper-secondary education	-0.028	-0.197	-0.017	0.035
	(0.039)	(0.159)	(0.015)	(0.099)
Share with vocational non-tertiary education	0.013	-0.017	-0.001	-0.018
	(0.016)	(0.066)	(0.006)	(0.047)
Police officers per 1,000 residents	-0.001	-0.036	0.005	-0.040
	(0.021)	(0.104)	(0.010)	(0.055)
Crime detection rate	0.015	0.025	-0.002	-0.001
	(0.009)	(0.015)	(0.004)	(0.006)
Conviction rate	0.062**	0.062*	-0.016	-0.020
	(0.025)	(0.034)	(0.012)	(0.015)
Observations	4380	4380	3792	3792
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates, and a one standard deviation increase in other municipality characteristics, on the probability of being convicted for a crime committed at age 15-18 for boys (columns 1-2) and the incidence of teenage motherhood for girls (columns 3-4). We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.11: Coefficient stability, Oster test, crime conviction probability and teenage motherhood

	(1)	(2)	(3)	(4)
	Crime		Teenage motherhood	
	No controls	Controls	No controls	Controls
Boys; Group crime conviction rate	0.098**	0.121***		
	(0.041)	(0.038)		
Girls; Group crime conviction rate			0.057**	0.056**
			(0.023)	(0.023)
N	4380	4380	3792	3792
R^2	0.065	0.071	0.058	0.061
R_max		0.092		0.080
$\hat{\delta}$ for $\beta = 0$ given R_max		2.228^a		1.596

*Note: The table reports estimates of the effect of a one percentage point higher municipality group crime conviction rate at assignment on the probability of being convicted for a crime committed at age 15-18 for boys in columns 1-2 and on the incidence of teenage motherhood for girls in columns 3-4. Furthermore, the table reports estimates of the coefficient of proportionality (δ), indicating how important unobservable characteristics would have to be relative to observable characteristics to explain away the effect of group crime on the outcome for a given maximum R^2, R_{max}. We set R_{max} equal to the $1.3 \times R^2$ in the model including controls as suggested in Oster (2019). In the baseline specification ("No controls") we condition on the overall crime conviction rate, the group crime conviction rate and individual level characteristics (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen). In the second specification ("Controls") we further condition on municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Superscript a indicates that the estimated $\delta < 0$. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.12: Abortions and municipality crime

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	At least one abortion when aged 15-18, assigned when aged 7-14					
Overall crime conviction rate	0.011**	0.016			0.011	0.019
	(0.005)	(0.010)			(0.007)	(0.012)
Group crime conviction rate			0.011	-0.010	0.004	-0.020
			(0.024)	(0.030)	(0.040)	(0.045)
Mean of the dep. variable	0.039	0.039	0.039	0.039	0.039	0.039
Own and HH characteristics	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES
Number of observations	3,063	3,063	3,063	3,063	3,063	3,063

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates at assignment on an indicator variable for having at least one abortion between age 15-18 for girls assigned at age 7-14. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. The data from hospitals are available from 1995 to 2014, which restricts the sample to girls we observe from age 15 to 19 within these years. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.13: Group crime intensity, crime conviction probability and teenage motherhood

	(1)	(2)	(3)	(4)
	Crime		Teenage motherhood	
Boys: Number of group crime convictions per 100 residents	0.115***	0.135***	0.000	0.000
	(0.037)	(0.048)	(.)	(.)
Girls: Number of group crime convictions per 100 residents	-0.018	-0.024	0.051**	0.079***
	(0.021)	(0.031)	(0.021)	(0.029)
Observations	8172	8172	3792	3792
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES

*Note: The table reports estimates of the effect of one more group crime committed by municipality residents per 100 residents on the probability that boys are convicted for a crime committed at age 15-18 in columns 1-2 and on the incidence of teenage motherhood for girls in columns 3-4. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.14: Robustness checks, crime conviction probability and teenage motherhood

Crime	(1)	(2)	(3)	(4)
	Teenage motherhood			
Panel A: Baseline specification				
Boys; Group crime conviction rate	0.121***	0.141***	0.000	0.000
	(0.038)	(0.050)	(.)	(.)
Girls; Group crime conviction rate	-0.022	-0.030	0.056**	0.089***
	(0.022)	(0.032)	(0.023)	(0.031)
Observations	8172	8172	3792	3792
Panel B: Not conditioning on conviction rate				
Boys; Group crime conviction rate	0.116***	0.136***	0.000	0.000
	(0.039)	(0.051)	(.)	(.)
Girls; Group crime conviction rate	-0.020	-0.030	0.057**	0.089***
	(0.023)	(0.033)	(0.023)	(0.032)
Observations	8172	8172	3792	3792
Panel C: Assigned post 1989				
Boys; Group crime conviction rate	0.172***	0.167***	0.000	0.000
	(0.048)	(0.061)	(.)	(.)
Girls; Group crime conviction rate	-0.016	-0.030	0.066***	0.083***
	(0.030)	(0.045)	(0.023)	(0.024)
Observations	5120	5120	2414	2414
Panel D: Not conditioning on crime detection				
Boys; Group crime conviction rate	0.163***	0.164***	0.000	0.000
	(0.050)	(0.062)	(.)	(.)
Girls; Group crime conviction rate	-0.013	-0.030	0.065***	0.085***
	(0.030)	(0.044)	(0.023)	(0.024)
Observations	5120	5120	2414	2414
Panel E: Conditional on number of reported crimes per 100 residents				
Boys; Group crime conviction rate	0.121***	0.142***	0.000	0.000
	(0.038)	(0.050)	(.)	(.)
Boys: Reported crime rate	-0.000	-0.002	0.000	0.000
	(0.005)	(0.007)	(.)	(.)
Girls; Group crime conviction rate	-0.022	-0.030	0.056**	0.089***
	(0.022)	(0.032)	(0.022)	(0.031)
Girls: Reported crime rate	0.001	0.000	-0.001	-0.000
	(0.003)	(0.004)	(0.001)	(0.002)
Observations	8172	8172	3792	3792
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates on the probability that boys are convicted for a crime committed at age 15-18 in columns 1-2 and on the incidence of teenage motherhood for girls in columns 3-4. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Panel A reports estimates from our baseline specification. Panel B reports estimates where we do not condition on the conviction rate. Panel C reports estimates where we only include refugees assigned after 1989. Panel D reports estimates for refugees assigned after 1989 when we do not condition on the crime detection rate. Panel E reports estimates when we condition on the number of reported crimes per 100 municipality residents, measured at the police district level from 1986-1989 and at the municipality level from 1990 onwards. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.15: Crime conviction and charge probabilities, and municipality crime

	(1)	(2)	(3)	(4)
	Crime conviction		Criminal charge	
Boys; Group crime conviction rate	0.121***	0.141***	0.153***	0.168***
	(0.038)	(0.050)	(0.039)	(0.054)
Girls; Group crime conviction rate	-0.022	-0.030	-0.018	-0.049
	(0.022)	(0.032)	(0.024)	(0.034)
Observations	8172	8172	8172	8172
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates on the probability of being convicted (column 1-2) or charged (column 3-4) for a crime committed at age 15-18. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.16: Probability of being in the sample by age 28 and municipality crime

Dependent variable:	(1)	(2)	(3)	(4)
	Observed in registers at age 28			
	Boys		Girls	
	Panel A: Average effect			
Overall crime conviction rate	-0.004	-0.023	0.006	0.022
	(0.008)	(0.015)	(0.013)	(0.024)
Group crime conviction rate	-0.015	-0.028	-0.022	-0.039
	(0.024)	(0.040)	(0.043)	(0.056)
Mean of dependent variable	0.915	0.915	0.865	0.865
	Panel B: By age at assignment			
Overall crime conviction rate*assigned when 0-6 years old	0.001	-0.018	0.000	0.016
	(0.008)	(0.015)	(0.013)	(0.024)
Overall crime conviction rate*assigned when 7-14 years old	-0.008	-0.028*	0.012	0.028
	(0.009)	(0.015)	(0.014)	(0.025)
Group crime conviction rate*assigned when 0-6 years old	-0.015	-0.043	-0.011	-0.027
	(0.024)	(0.038)	(0.044)	(0.054)
Group crime conviction rate*assigned when 7-14 years old	-0.017	-0.017	-0.029	-0.048
	(0.035)	(0.050)	(0.062)	(0.074)
Mean of dep. variable, assigned at age 0-6	0.932	0.932	0.850	0.850
Mean of dep. variable, assigned at age 7-14	0.901	0.901	0.877	0.877
Own and HH characteristics	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES
Number of observations	3,502	3,502	2,994	2,994

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates on the probability of being in the sample by age 28 among those refugees children who are at least 28 years old by the end of the sample period. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.17: Characteristics of assignees at assignment by attrition at age 28

	(1) In sample at age 28 mean/sd	(2) Not in sample at age 28 mean/sd	(3) Difference b/se
Age at assignment	7.135	7.319	0.183
	(4.059)	(4.011)	(0.162)
Father education: general non-tertiary	0.269	0.250	-0.019
	(0.444)	(0.434)	(0.018)
Father education: vocational non-tertiary	0.229	0.255	0.026
	(0.420)	(0.436)	(0.017)
Father education: tertiary	0.184	0.164	-0.020
	(0.387)	(0.370)	(0.015)
Father education: missing	0.318	0.331	0.013
	(0.466)	(0.471)	(0.019)
Mother education: general non-tertiary	0.475	0.478	0.003
	(0.499)	(0.500)	(0.020)
Mother education: vocational non-tertiary	0.194	0.202	0.008
	(0.396)	(0.402)	(0.016)
Mother education: tertiary	0.138	0.159	0.021
	(0.345)	(0.366)	(0.014)
Mother education: missing	0.192	0.161	-0.032**
	(0.394)	(0.368)	(0.016)
N	5793	703	6496

*Note: The table reports the mean and standard deviation (in parentheses) of the characteristics of assigned refugee children and their parents measured at assignment, among refugees who are at least 28 years old by the end of our sample period. The statistics are reported separately for those we do and those we do not observe in the registers at age 28 in columns 1 and 2 respectively. Column 3 reports the difference in mean characteristics and reports if they are significantly different. *** p<0.01, ** p<0.05, * p<0.1*

Table A.18: Labor market outcomes at age 22 and neighborhood characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Men						Women					
	Inactivity		Earnings		Transfers		Inactivity		Earnings		Transfers	
Group crime conviction rate	0.097***	0.151***	-2.506*	-3.990**	0.780*	1.157*	0.028	0.034	-1.930*	-2.215*	1.561*	2.276**
	(0.035)	(0.046)	(1.314)	(1.819)	(0.468)	(0.643)	(0.031)	(0.043)	(1.108)	(1.328)	(0.806)	(1.076)
Overall crime conviction rate	-0.043***	-0.051***	0.681*	-0.039	-0.138	-0.051	-0.010	-0.004	0.115	-0.678	-0.057	0.343
	(0.009)	(0.017)	(0.390)	(0.670)	(0.130)	(0.259)	(0.012)	(0.021)	(0.452)	(0.716)	(0.253)	(0.438)
Teenage motherhood rate	0.007	-0.003	0.158	0.488	0.129	-0.176	-0.013	-0.019	0.479	0.742**	-0.318*	-0.291
	(0.007)	(0.010)	(0.348)	(0.481)	(0.144)	(0.171)	(0.009)	(0.012)	(0.310)	(0.368)	(0.175)	(0.252)
Immigrants share same source country	-0.005	-0.005	0.027	0.339	0.261	0.212	-0.012	-0.015	-0.263	-0.551	-0.336*	-0.369
	(0.008)	(0.010)	(0.389)	(0.427)	(0.160)	(0.184)	(0.008)	(0.011)	(0.371)	(0.458)	(0.198)	(0.281)
Immigrant share other source country	0.003	0.040	0.370	-1.949	-0.286	-0.523	0.009	0.071	-0.162	-2.871	0.213	-0.390
	(0.018)	(0.069)	(0.708)	(2.420)	(0.276)	(0.773)	(0.017)	(0.075)	(0.576)	(2.229)	(0.354)	(1.690)
Log(population size)	-0.010	-0.651	0.388	3.018	-0.154	-10.921	0.055**	-2.081**	-1.442*	37.573	0.590	-34.570
	(0.018)	(0.812)	(0.866)	(30.829)	(0.283)	(14.845)	(0.025)	(0.863)	(0.789)	(39.761)	(0.524)	(24.223)
Employment rate	-0.021	0.011	0.727	-1.542	-0.480*	0.190	-0.011	0.036	0.171	-2.238	-0.240	1.841
	(0.016)	(0.053)	(0.701)	(2.313)	(0.273)	(0.942)	(0.018)	(0.069)	(0.744)	(1.942)	(0.447)	(1.683)
Relative poverty rate	0.007	0.034	0.247	0.868	0.004	-0.174	-0.007	0.009	0.480	-1.064	0.110	1.119
	(0.018)	(0.032)	(0.979)	(1.500)	(0.301)	(0.517)	(0.018)	(0.042)	(0.668)	(1.285)	(0.464)	(0.756)
Share of immigrants relying on welfare benefits	-0.018	-0.038	-0.018	0.223	-0.396*	0.547*	-0.014	0.021	-0.029	-0.029	-0.376	-0.328
	(0.013)	(0.024)	(0.602)	(0.810)	(0.213)	(0.305)	(0.014)	(0.028)	(0.532)	(0.878)	(0.348)	(0.515)
Teacher hours per pupil	0.008	0.015	-0.292	-0.744**	0.116	-0.040	-0.007	0.005	-0.132	-0.462	0.080	0.394*
	(0.006)	(0.011)	(0.325)	(0.355)	(0.138)	(0.211)	(0.007)	(0.012)	(0.285)	(0.454)	(0.172)	(0.222)
Share with no more than lower-secondary education	0.029	-0.251	-1.567*	10.504	0.555	-1.433	-0.011	-0.009	-1.156	0.094	0.156	6.745
	(0.024)	(0.155)	(0.899)	(7.258)	(0.350)	(3.098)	(0.031)	(0.211)	(0.838)	(6.678)	(0.509)	(4.509)
Share with upper-secondary education	0.071*	-0.167	-2.872**	7.131	0.671	0.314	-0.059	-0.183	0.122	1.747	-0.352	4.341
	(0.036)	(0.139)	(1.359)	(6.691)	(0.440)	(2.906)	(0.048)	(0.220)	(1.386)	(5.755)	(0.916)	(4.541)
Share with vocational non-tertiary education	0.036**	-0.021	-0.521	4.473*	0.173	-0.686	-0.034	-0.095	0.592	-1.606	-0.597*	0.679
	(0.016)	(0.056)	(0.553)	(2.594)	(0.219)	(1.212)	(0.023)	(0.090)	(0.497)	(2.467)	(0.327)	(2.232)
Police officers per 1,000 residents	-0.012	0.106	-0.051	-4.409	0.149	0.736	0.031**	-0.052	-0.549	1.894	0.364	-2.578
	(0.018)	(0.065)	(0.619)	(2.881)	(0.270)	(1.193)	(0.016)	(0.080)	(0.788)	(2.998)	(0.395)	(2.032)
Crime detection rate	0.010	0.028**	-0.533*	-0.355	-0.099	0.161	0.008	-0.003	-0.222	0.011	-0.002	-0.300
	(0.007)	(0.012)	(0.308)	(0.532)	(0.106)	(0.200)	(0.008)	(0.012)	(0.322)	(0.389)	(0.190)	(0.314)
Conviction rate	0.055***	0.064**	-0.726	-1.185	0.207	0.351	-0.030	-0.061*	0.576	0.078	-0.476	-0.514
	(0.019)	(0.029)	(0.828)	(0.997)	(0.310)	(0.449)	(0.020)	(0.034)	(0.799)	(1.056)	(0.576)	(0.819)
Observations	4127	4127	4127	4127	4127	4127	3464	3464	3464	3464	3464	3464
Own and HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Municipality FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES

*Note: The table reports estimates of the effect of one percentage point higher municipality crime conviction rates, and a one standard deviation increase in other municipality characteristics on the probability of being inactive, annual earnings and annual transfers at age 22 for men in columns 1-3 and for women in columns 4-6. We condition on individual background (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen) and municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*

Table A.19: Coefficient stability, Oster test and long run outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Inactivity at age 22		Earnings at age 22		Transfers at age 22	
	No controls	Controls	No controls	Controls	No controls	Controls
			Panel A: Boys			
Group crime conviction rate	0.085**	0.097***	-1.843	-2.506*	0.948*	0.780*
	(0.035)	(0.035)	(1.231)	(1.314)	(0.499)	(0.468)
N	4127	4127	4127	4127	4127	4127
R^2	0.045	0.050	0.036	0.042	0.016	0.021
R_max		0.065		0.054		0.028
$\hat{\delta}$ for $\beta = 0$ given R_max		16.909^a		2.218^a		2.179
			Panel B: Girls			
Group crime conviction rate	0.011	0.028	-1.210	-1.930*	1.589**	1.561*
	(0.030)	(0.031)	(1.091)	(1.108)	(0.777)	(0.806)
N	3464	3464	3464	3464	3464	3464
R^2	0.113	0.119	0.038	0.046	0.103	0.109
R_max		0.155		0.060		0.141
$\hat{\delta}$ for $\beta = 0$ given R_max		0.317^a		1.627^a		1.426

*Note: The table reports estimates of the effect of one percentage point higher municipality group crime conviction rate at assignment on the probability of being inactive, annual earnings and annual transfers at age 22 for men in columns 1-3 and for women in columns 4-6. Furthermore, the table reports estimates of the coefficient of proportionality (δ), indicating how important unobservable characteristics would have to be relative to observable characteristics to explain away the effect of group crime on the outcome for a given maximum R^2, R_{max}. We set R_{max} equal to the $1.3 \times R^2$ in the model including controls as suggested in Oster (2019). In the baseline specification ("No controls") we condition on the overall crime conviction rate, the group crime conviction rate and individual level characteristics (Individual characteristics include age at immigration, characteristics of the mother and father at the time of assignment (gender, age, dummy for being legally-married, education dummies, indicator for being a single-parent household, number of children and an indicator for the parent being the first one to arrive to Denmark as well as an indicator for information on the parent being missing), year of assignment fixed effects, country of origin fixed effects, and a dummy for having been assigned to Copenhagen). In the second specification ("Controls") we further condition on municipality characteristics (log of the number of inhabitants, the share of immigrants from other countries in the municipal population, the share of immigrants from the same source country, the employment rate, the relative poverty rate, weekly number of teacher wage hours per pupil, the crime detection rate, the number of police officers per capita, the teenage motherhood rate in the municipality, the share of immigrants relying on welfare benefits, the share with lower-secondary education or less, the share with upper-secondary education, the share with a vocational non-tertiary education and the conviction rate). All characteristics refer to the assignment year. Superscript a indicates that the estimated $\delta < 0$. Standard errors, reported in parentheses, are clustered at the assignment municipality level. *** p<0.01, ** p<0.05, * p<0.1*