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The Peace Baby Boom: Evidence from Colombia's peace agreement with the FARC*

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Abstract

Violent environments are known to affect household fertility choices, demand for health services and health outcomes of newborns. Using administrative data with a difference-in-differences, we study how the end of the 50 years old Colombian conflict with FARC modified such decisions and outcomes in traditionally affected areas of the country. Results indicate that generalised reductions in total fertility rate were slowed down for municipalities traditionally affected by conflict as a result of the permanent ceasefire declared by the FARC insurgency. Total fertility rate observed a relative increase of 2.6% in the formerly conflict-affected areas, in all age groups. However, no impact was found for demand of health care services, neonatal and infant mortality rates, or birth outcomes such as the incidence of low weight at birth or the percentage of preterm births. Our evidence shows that municipalities with mines victims and expelled population by forced displacement before the ceasefire have significantly higher total fertility rate in the four years following the ceasefire. We argue that the mechanism behind this result is the optimism to raise the children in a better environment due to the reduction in victimisation in areas that experience FARC violence.

JEL Codes: I12; I15
Keywords: fertility; pregnancy; mortality; armed conflict; violence

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1 Introduction

Several countries are suffering for high rates of violence which have changed for decades the culture of entire communities around the world. Latin America and the Caribbean present some of the most extreme cases, with dramatic increases on homicides rates in countries such as Mexico, El Salvador or Venezuela. Persistent violent environments generate a context where several households long-term decisions such as fertility can be substantially different (Brück and Schindler, 2009). This is due to aspects such as uncertainty about the future and higher risks of mortality or disability. Moreover, conflict also impacts health systems and demand for health care, which in turn might result in worse mother and newborn outcomes. The end of the fifty-years long Colombian civil conflict, which we study in this article, provides a good scenario for disentangling the mechanisms behind post-conflicts' *baby booms*.

Concerning fertility, a possibility is that families are less willing to commit to long-term decisions such as fertility in a context of uncertainty and deprivation. This is undoubtedly the case for altruistic parents that would incorporate the welfare of future generations into their choices, as well as the emotional loss due to the death of a child and the raising children's cost (Birchenall and Soares, 2009). For this reason, the end of conflict might result in a *baby boom*, the well-known fertility trend in the post-war. It occurred as part of an unprecedented increase in welfare conditions of security and stability for households. Reasons behind this phenomenon have been documented in several contexts. For instance, the need to replace the loss of children during the conflict, as it the case of the post-genocide in Rwanda (Schindler and Bruck, 2011; Rutayisire, 2014; Kraehnert et al., 2018), and the fall of the Khmer Rouge in Cambodia (Heuveline and Poch, 2007). Other reasons are related to marriage markets: delayed marriage in Tajikistan (Shemyakina, 2009) and Bangladesh (Curlin et al., 1976), increased incidence and duration of marital separation, in Angola (Agadjanian and Prata, 2002) and Eritrea (Woldemicael, 2008), to avoid impoverishment in the short term, in Ethiopia (Lindstrom and Berhanu, 1999), and for the shortage of eligible men, in Cambodia (De Walque, 2006). Usually, there is evidence of a decline in fertility during the conflict and a rebound after it, as happens with natural disasters (Nobles et al., 2015; Finlay, 2009; Caldwell, 2006). In other words, *baby booms* are responses to the end of strong mortality events, marriage market dysfunction, and income shocks associated with conflict.

However, the demographic literature proposes alternative theories which are especially relevant for low-intensity long-lasting conflicts that result in weak local institutions. A traditional mechanism is the old-age security hypothesis, where parents may have more children as they could provide social well-being and economic help to their parents (Verwimp and Bavel, 2005). In the same line, couples may hoard more births than desired because the couple formed the expecta-

tion that some of their children may die (Schultz, 1997). Moreover, conflicts have direct impacts on health systems like the reduced access to maternal, sexual and reproductive health (Chukwuma and Ekhator-Mobayode, 2019; Gopalan et al., 2017; Tunçalp et al., 2015; Chi et al., 2015; Price and Bohara, 2013). These are common reasons to explain why conflict-affected areas have higher fertility rates than non-affected areas (Akseer et al., 2020; Torres and Urdinola, 2019; Urdal and Che, 2013). Therefore, peace might result in lower fertility rates and better child health. For instance, this is the case of Eritrea after their independence war (Clifford et al., 2010).

We contribute to this literature by studying how newborn health, fertility choices, and demand of health care of families living in conflict areas were affected by the declaration of the permanent ceasefire by the *Revolutionary Armed Forces of Colombia* (FARC from the Spanish acronym). This ceasefire put at end to a long-lasting conflict that historically affected specific rural areas of this middle-income country in South America. As attacks, homicides, and other violent events suddenly stopped in those areas, we study not only a single and intense mortality and economic shock, but also a structural change on violence and the way of living of these communities.

In order to provide causal estimates, we exploit the timing of the permanent ceasefire and the spatial distribution of FARC attacks between 2011 and 2014. This allows us to explore in detail information from vital statistics and administrative records from all interactions with the health system, given the presence of a universal health insurance scheme in the country.

In our analysis, we capture heterogeneous effects that can shed some light regarding the underlying mechanisms of the impact of conflict on fertility by focusing on three channels: (1) the health and survival chances of newborn, (2) the post-ceasefire baby boom of former FARC's rebels, and (3) the variation across municipal-level characteristics proxies of victimisation, coca suitability, and coca eradication.

In this paper, we show that FARC's inability to exert violence by their initiative, or to respond violently to actions perpetrated either by the military or other armed groups during the ceasefire, caused a small but precisely estimated increase in births. The results suggest that one standard deviation (SD) increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014, causes a statistically significant increase of 2.6% in the total fertility rate (TFR), after the ceasefire relative to the rest of municipalities.

Figure 1 summarises how the ceasefire modifies age-specific fertility rates (ASFR). Rather than a baby boom in its standard conception (an overall increase of TFR), what we observe is that fertility rates in former FARC municipalities decrease less than in the comparison municipalities, especially for women aged 20 to 24. Hence, even in the context of fertility decline, the fertility increase after the end of the conflict is observed.

Our evidence is consistent with the main mechanism being the substantial post-ceasefire re-

duction in victimisation. Indeed, the increase in the TFR is larger in places that had more land-mines before the ceasefire and where there were more people expelled by forced displacement.

Regarding pregnancy outcomes, the literature on intrauterine exposure to armed conflict has shown increases in mortality rates and the incidence of low weight at birth (LBW). Among others, this was the case of pregnancies exposed during the al-Aqsa Intifada (Mansour and Rees, 2012), during 11th September in New York (Eskenazi et al., 2007), and victims of land-mine explosions in Colombia (Camacho, 2008a). These studies consider psychological stress shocks, which involve conflict-related events but are also valid for natural disasters and other shocks (Aizer et al., 2016; Almond et al., 2018; Khashan et al., 2008). In this sense, we provide estimates for the case of a structural reduction on violence levels. We find no differences in these outcomes attributable to the ceasefire. For instance, Figure 2 shows that differences in the weight-at-birth distribution are preserved. Moreover, there are no differences in demand for health care services, mortality rates of newborns and infants, or changes on general public health events such as the incidence of transmissible diseases.

Finally, we contribute to the growing literature that studies the consequences of the end of the Colombian conflict. These papers highlight significant unintended negative consequences in terms of the security of local leaders (Prem et al., 2020b) and deforestation (Prem et al., 2020a), the positive consequences for school dropout rates (Namen et al., 2020), and the pervasive incentives on coca cultivation due to a naive policy announcement during the peace negotiation (Mejía et al., 2019).

The rest of the paper is organised as follows. Section 2 provides some context of Colombia's armed conflict and the health care system. Section 3 describes the data sources and measurement. Section 4 describes our empirical strategy to estimate the causal effect of the ceasefire on fertility. Section 5 reports our main results and discusses the potential mechanisms behind our main results. Finally, Section 6 concludes.

2 Context

2.1 Colombia's internal armed conflict and the peace process with the FARC

On October 2012 the Colombian government and left-wing guerrillas FARC started peace negotiations in Cuba. The conflict took place mostly in rural areas, affecting for decades civilian population in those areas (INS, 2017). While the constant ebb and flow characterised the four-year-long process, one of the most significant milestones was the establishment of a permanent ceasefire by FARC on the 20th December, 2014; which was replaced by the definitive bilateral ceasefire and the

subsequent disarmament of FARC in 2016. In fact, as a result of the bilateral ceasefire, FARC withdrew their troops to Transitory Normalisation Zones of Transformation, where military contact with government security forces and other armed groups was unlikely to take place. The aforementioned explains why FARC's offensive activities drop by 98% during this period (CERAC, 2016). The Transitory Normalisation Zones of Transformation was transformed into Territorial Training and Reincorporation Spaces (ETCR from the Spanish acronym), created to train the former FARC's rebels for their reincorporation into civilian life, develop productive projects, and fit the technical needs of the surrounding communities.

In Figure 3 we present the evolution of violence related to the conflict in municipalities exposed and non-exposed to FARC violence, in order to understand the dynamics of the conflict in the period of study. Panel (a) shows the average number of violent cases in a municipality, which includes selective murders, attacks on the population, terrorist attacks, damage to property and civilians, forced disappearance, massacres, kidnappings, sexual violence and recruitment. Panel (b) presents the victims from anti-personnel mines, and Panel (c) presents the victims from forced displacement. Those graphics show a sizeable reduction in the overall victimisation, and by 2016 the gap for violent cases and mines victims between the two types of municipalities is closed. Even though there is an increase in 2017 in victims from anti-personnel mines and forced displacement, the overall reduction is more significant.

2.2 Colombian health system

Article 44 and 49 of the Political Constitution establishes health care as a fundamental right and a public service whose provision is carried out under the direction, coordination and control of the State with the participation of public and private agents. Law 100 of 1993 creates the General System of Social Security in Health (SGSSS from the Spanish acronym). The mentioned Law introduced competition into both insurance and the provision of care through a managed-care model (Bardey and Buitrago, 2017), where public and private firms intervene, with two types of affiliation to the SGSSS that aim to cover the entire population: the contributory regime - for people with payment capacity- and the subsidised regime - for people without payment capacity or with particular priority for the government -.[1]

Both regimes had access to the same packages of health benefits. However, in practice, health insurers limit access to healthcare (Vargas et al., 2010). In 2019, 95,21% of the population was affiliated to the SGSSS, of which 45,38% are in the RC, 45,51% are in the RS, and 4,3% are in the

[1]Besides, there is a population that is part of a unique scheme: members of the military and police forces, teachers belonging to the teaching staff, people affiliated to the health system of the universities and public servants of the Colombian Petroleum Company SA.

special regime (MinSalud, 2019).

According to INS (2017), between 1998 and 2015, there was a direct positive relationship between fertility in adolescents and the conflict intensity index, showing higher fertility as the conflict index quintile increased. They found that children born of girls aged 10 to 14 years old had the highest proportions of low birth weight births.[2] Additionally, there was a higher proportion of low birth weight in the quintiles of municipalities with less intensity of the conflict. The study posits the central dynamics of armed conflict that could have affected health in Colombia: the modalities of violence,[3] direct attacks on health services, and the ways to obtain resources for war.[4]

Colombia is an interesting case study because it has a total fertility rate (TFR) of 1.82 children per woman, for the period 2015-2020 (UN, 2019). Similarly, in Latin America and the Caribbean, the TFR is 2.04 children per woman, and the average across countries of the Organisation for Economic Cooperation and Development is somewhere between 1.4 and 1.9 children per woman (OECD, 2019). We can observe that the TFR in Colombia is similar to the region, so it is a good reflection of these low and middle-income countries. Bearing in mind the conflict context of Colombia, it is essential to study if the ceasefire has an effect on that outcome.

3 Data

To investigate the effect of the ceasefire on fertility, demand for health care, and health at birth outcomes, we build a municipality-year level panel with data from different sources. We focus on the 2011 to 2018 window as the ceasefire started in 2014. The sample includes 1,092 municipalities, of the 1,122 municipalities in Colombia, with a population of less than 200,000 in the year 2010, based on the National Administrative Department of Statistics (DANE from the Spanish acronym) projections. We drop mayor cities and capitals to make the municipalities more comparable with the ones where the ceasefire took place. We weight the municipalities by the number of live births between 2011 to 2014 for women between 15 and 49 years old. We now describe the main variables

[2]The minimum age of sexual consent is an age established by some governments to protect teenagers from abuse by older people, and the consequences that may occur when they are not fully aware of their rights and body development. In Colombia, sex with anyone below 14 years old is considered a criminal offence.

[3]The National Centre for Historical Memory documented 14 modalities of violence: 1. Selective killings, 2. Massacres, 3. Deaths of civilians in war actions, 4. Terror attacks, 5. Attacks to populations, 6. Attacks on the property of civils, 7. Kidnapping, 8. Torture, 9. Forced disappearance, 10. Forced displacement, 11. Sexual violence, 12. Antipersonnel mines, 13. Illegal recruitment and 14. Threat.

[4]Illicit crops and drug trafficking, illegal mining, the capture of public revenues, kidnapping, and extortion. The analysis of the health consequences of aerial spraying of illicit crops with glyphosate has been studied by Camacho and Mejía (2014). They found three groups of diseases potentially related to aerial spraying: dermatological problems, respiratory diseases, and abnormalities during pregnancy-abortion.

and data sources.[5]

3.1 Conflict data

To construct a measure of exposure to FARC violence before the start of the ceasefire, we use the conflict dataset originally compiled by Restrepo et al. (2003), and updated through 2014 by Universidad del Rosario. This dataset codes violent events recorded in the *Noche y Niebla* reports from the NGO Center for Research and Popular Education (CINEP from the Spanish acronym), which provides a detailed description of the violent event, its date of occurrence, the municipality in which it took place, the identity of the perpetrator, and the count of the victims involved in the incident.[6]

To measure FARC attacks, we first created a continuous measure based on the total number of FARC attacks over 10,000 inhabitants that took place from 2011 to 2014 in a municipality. We standardised the continuous measure using the mean and standard deviation from the empirical distribution. Second, we created a discrete version of *exposure to FARC violence*. It is a binary variable that takes the value of 1 if there was at least one violent case by FARC in the same period mentioned before. Based on our last definition, we define 99 municipalities (9% of our sample) as municipalities exposed to FARC violence before the ceasefire. Our main results will be based on the continuous version given the high variance of exposure to the conflict, but in Appendix Table A.2 we present results with the discrete alternative.

3.2 Vital statistics and health care

Civil registration and vital statistics (CRVS) systems are the most widespread and abundant source of information with which to estimate health indicators to study the dynamics of the population, set public health goals and policy, and to direct research and resources. Colombia has a reliable vital statistics system, which registers around 95% of births and 86% of deaths (Colombia Implementation Working Group, 2018; Toro Roa et al., 2019). This administrative data is part of the Colombian nationally health data from the Integrated Information System of the Ministry of Health and Social Protection (SISPRO from the Spanish acronym). We take advantage of that to

[5] A detailed description of all the variables and their sources is available in Appendix Table A.1.

[6] *Noche y Niebla* sources include 1. Press articles from more than 20 daily newspapers of both national and regional coverage. 2. Reports gathered directly by members of human rights NGOs and other organisations on the ground, such as local public ombudsmen and, particularly, the clergy (Restrepo et al., 2003). Notably, since the Catholic Church is present in even the most remote areas of Colombia, we have extensive coverage of violent events across the entire country.

construct the municipality-level TFR as follows:

$$TFR = \frac{\sum_{a=15-19}^{45-49} f_a}{1000} \tag{1}$$

Where f_a is the ASFR for women whose age corresponds to the five-year age group a. The following seven five-year age groups are utilised: 15 to 19; 20 to 24; 25 to 29; 30 to 34; 35 to 39; 40 to 44; and 45 to 49. We calculate the annual number of births based on the mother's municipality of residence, not the baby's place of birth.

The process of birth registration is made based on the certificate of live birth issued by the health professional after a child is born.[7] In the absence of a certificate of live birth, the birth can be registered by civil registry employees based on a sworn statement by two witnesses present at the birth or with direct and reliable news of the birth. Colombia's National Department of Statistics consolidates, validates, and processes information from certificates of live births entered digitally or filled out manually by authorised health professionals and civil registry employees (DANE, 2012).

Table 1 reports descriptive statistics of the main variables during the part of the sample period that preceded the ceasefire (2011-2014). During that period, there were 1.6 live births per women, and the highest ASFR was for girls aged 20 to 24 years old. Also, the majority of the deliveries were attended by health professionals (97 vs 3 per 100 live births by traditional midwives and others). Regarding childbearing in early adolescence (15 to 19 years old), Table 2 shows that, consistent with the findings of Sanchez-Cespedes (2018), municipalities exposed to FARC violence had higher early childbearing rates. In Figure 1 we present, on a graphic bar, the mean of ASFR before and after the ceasefire. The darker colours are for the period before the ceasefire, while the lighter colours represent the period after the ceasefire. We can observe that the difference in the ASFR between municipalities with FARC attacks and without FARC attacks widens after the ceasefire, suggesting an increase in the ASFR in municipalities suffering FARC attacks relative to the other municipalities.

CVRS statistics include as well information from mortality, from which we compute the neonatal mortality (deaths during the first 28 days of life), and infant mortality (deaths under the age of 1) rates (deaths per 1000 live births). In FARC affected municipalities there was more infant than

[7] The doctors of the health facilities are responsible for the certificates of live birth and death. In those places where there is no doctor, the function corresponds to nurses, nursing assistants, or health promoters (DANE, 2012). Indigenous people have the Intercultural System of Indigenous Own Health (SISPI from the Spanish acronym) with health care facilities integrated to the General System of Social Security in Health (See https://www.minsalud.gov.co/proteccionsocial/promocion-social/Paginas/Pueblos-indigenas.aspx (last accessed 31/08/2020)).

neonatal mortality (25 per 100 000 live births vs 8 per 100 000 live births).

Records also include information such as the number of antenatal care contacts during pregnancy which is on average 6 -eight is the recommended number by WHO (Organization et al., 2018)- and less than that in former conflict-affected areas. Pregnancy health outcomes are the opposite: incidence of LWB (less than 2500 grams) and preterm births (less than 37 weeks of gestation) are smaller in the affected areas, and APGAR tests are slightly better. At the same time, cesarean sections are less common. These results could be the result of higher fetal mortality rates which induce *positive* health selection of newborns. SISPRO also has information on the demand for health services associated with the mandatory health insurance system. As the conflict involved mainly rural areas, usually near jungles and other tropical ecosystems, we computed the number of people with diseases generally recognised as transmissible (infectious and parasitic diseases) for every 1000 inhabitants. There is no pre-existent difference on this variable.

3.3 Municipalities characteristics

We complement these data with a set of municipality-level characteristics from different sources. The primary source is the annual panel of Colombian municipalities, maintained and hosted by the Centre for Economic Development Studies (CEDE from the Spanish acronym), where we obtained the measures of rural share, distance to the department's capital, poverty index, and coca eradication.

We also use as measures of victimisation, the presence of other armed groups as in Prem et al. (2020a), to measure the total number of attacks by armed groups, except for FARC, in the municipality. We use the measure of coca soil and climate suitability at the municipality level from Mejía and Restrepo (2013), a standardised index for coca suitability, and a dummy that equals one for municipalities above the median of the empirical coca suitability distribution. Finally, we use data of the Agency for Reincorporation and Standardization for the ETCRs, the Office of the High Commissioner for Peace - Decontaminate Colombia for the mines victims dataset, and the Victims' Registry for the forced displacement dataset.

Table 2 suggests that municipalities that experienced FARC violence before the ceasefire were, on average, different from non-exposed municipalities in several characteristics. These include the share of the rural population, the distance to the department's capital and the poverty index.

4 Empirical strategy

4.1 Main specification

We exploit the timing of the permanent ceasefire announced by FARC on the 20th December 2014, as well as FARC attacks across municipalities before the ceasefire. More formally, using the subindex m to denote municipalities, d to denote departments, and t to denote time, we estimate the following *difference-in-differences* model:

$$y_{mdt} = \alpha_m + \delta_{dt} + \beta_1 \left(Cease_t \times FARC_m \right) + \sum_{c \in X_m} \gamma' c \times Cease_t + \varepsilon_{mdt}, \tag{2}$$

Where y_{mdt} is our measure of TFR in municipality m, in department d at year t. α_m and δ_{dt} are municipal and department-time fixed effects that capture any time-invariant municipal level heterogeneity and any aggregate department-level time shock, respectively. $Cease_t$ is a dummy that equals one after the start of the permanent ceasefire in 2014 and $FARC_m$ measures pre-ceasefire exposure to FARC violence. X_m are municipality characteristics measured before the ceasefire. We interact these characteristics with the $Cease_t$ dummy to account for differential changes after the ceasefire in our outcome of interested driven by these municipality features. ε_{mdt} is the error term clustered at the municipality level.

All regressions are weighted by the number of live births between 2011 to 2014 for each age group, based on the mother's municipality of residence. This weighting procedure gives more importance to municipalities that traditionally contribute more to fertility rates in the country, minimising the role of atypical records in small municipalities. Moreover, for outcomes that are based on averages of individual births, this procedure gives similar importance to each newborn in the sample. As robustness, we consider as well unweighted estimates in Appendix Tables A.2 and A.3. Our coefficient of interest, β_1, captures the differential change in our outcome variable after the start of the ceasefire relative to before, in municipalities more exposed to FARC violence relative to those less exposed to it.

4.2 Identifying assumption

The main assumption behind the *difference-in-differences* model is that in the absence of the ceasefire, the TFR in municipalities exposed to FARC violence would have evolved similarly to those in municipalities non-exposed to FARC violence. The validity of this *parallel trends* assumption can

be partially assessed by estimating the following dynamic version of the main specification:

$$y_{mdt} = \alpha_m + \delta_{dt} + \sum_{j \in T} \beta_j (FARC_m \times \delta_j) + \varepsilon_{mdt}, \tag{3}$$

Where T includes all years of our sample period except 2014, which is the year right before the ceasefire. Therefore the parameters β_j can be interpreted as the difference in the TFR in municipalities exposed to FARC attacks compared to municipalities non-exposed, in year j relative to the year right before the ceasefire started (2014).

4.3 Potential mechanisms

We augment the main specification in equation (2) to test for heterogeneous effects by municipal-level characteristics. We do so by adding a third interaction term. Specifically, let the municipality characteristic Z_m (measured before the ceasefire, except for the Territorial Training and Reincorporation Spaces), be a potential mechanism of interest. We estimate:

$$\begin{aligned} y_{mdt} = \alpha_m + \delta_{dt} + \beta_1 (Cease_t \times FARC_m \times Z_m) + \beta_2 (Cease_t \times Z_m) \\ + \beta_3 (FARC_m \times Z_m) + \beta_4 (FARC_m \times Cease_t) + \varepsilon_{mdt}. \end{aligned} \tag{4}$$

Our coefficient of interest, β_1, captures the differential change in the outcome variable in places exposed to FARC attacks and with municipality characteristic Z_m. More specifically, we assess potential heterogeneous effects given by the Territorial Training and Reincorporation Spaces and municipal-level proxies of victimisation, forced displacement, coca suitability, and coca eradication. We have described these variables in section 3 and Appendix Table A.1. Note that the results coming from this test are suggestive about potential mechanisms, but not necessarily causal. They have to be interpreted with caution.

Using the above specifications, we estimate the impact of the 20th December 2014 permanent ceasefire, in the TFR in areas previously exposed to FARC violence (equation (2)), the dynamic persistence of this effect (equation (3)), and heterogeneous effects given by municipality characteristics (equation (4)). The next section reports the estimated results.

5 Results and Discussion

5.1 Fertility

As a first step, we investigate the effects of the ceasefire in the TFR. Recall that our main coefficient of interest is the interaction between a continuous (pre-ceasefire) FARC exposure to violence indicator and a time dummy that captures the period after the announcement of the permanent ceasefire (2015-2018). In Table 3 we report the estimates from estimating equation (2). Column 1 includes municipality and year fixed effects, Column 2 includes municipality and department $\times$ year fixed effects, and Column 3 includes the latter but also control for differential changes in the TFR after the ceasefire due to several pre-ceasefire municipality characteristics. The controls include the infant mortality rate, number of victims related to anti-personnel mines, the share of the rural population, distance to the department capital, a poverty index, and logarithm of the population in 2010.

We find that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014, causes a statistically significant increase in the TFR of 0.04 births per women after the ceasefire relative to the rest of municipalities. This effect is equivalent to 0.07 SD (=0.04/0.598), or 2.6% (=0.04/1.55) of the mean TFR and is statistically significant at 1%. The magnitude and the statistical significance are robust to estimating the more demanding models, which include department $\times$ year fixed-effects (Column 2), and differential changes parametrised by pre-ceasefire controls (Column 3).

Next, in Table 4 we consider the age-specific fertility rates for the five-year age groups to analyse the increase in fertility.[8] We find an increase across the board in the five-year age groups, and we cannot reject that the increases are the same across all groups.

The results in the TFR are aligned with the micro-level studies that found a baby boom in the regions exposed to conflict when the conflict ends (Curlin et al., 1976; Verwimp and Bavel, 2005; Heuveline and Poch, 2007; Schindler and Bruck, 2011; Rutayisire, 2014; Kraehnert et al., 2018). Conversely, regarding the findings in early childbearing, our results differ with the scarce literature, which has found that reduced levels of violence reduce the likelihood of having children at early ages (Sanchez-Cespedes, 2018).

Even though these findings may seem small, it must be taken into account that long-lasting conflicts, as the Colombian one, are more likely to affect macro-level conditions which can not be tackled in the post-conflict short-term.

We report the coefficients from estimating equation (3) in Figure 4, where we plot the point

[8] In Figure 5 we show the increase on ASFR as a proportion of their 2013 level of fertility.

estimates associated with the interaction of interest, together with the 95% confidence interval. Panel (a) shows the results with municipality and year fixed effects, Panel (b) controls for department × year fixed effects, and Panel (c) includes controls, municipality and department × year fixed effects.[9] It can be seen in all panels that before the ceasefire the coefficients are not statistically significant, and the point estimates move around 0. This result points to the absence of differential trends in the TFR before the ceasefire between municipalities that were exposed to FARC violence and places that were not. Thus, this supports our choice of *difference-in-differences* as our empirical strategy. The Panels also show that the point estimates increase in magnitude and become significant after the start of the permanent ceasefire.

5.2 Demand for health care services

Table 5 considers two strands of demand for health care services. First, we consider antenatal care visits. Once controls are taken into account, there is an increase of 0.03 visits, relative to the average of 5.7 visits. Thus, this impact is small. Second, we consider whether the birth was attended by a health professional or a traditional midwife. There is no impact on this margin.

Hence, we do not obtain evidence of a sudden change in demand for health care services due to the ceasefire. This evidence contrasts with the literature on the topic, where conflict usually has negative impacts on access to health care services. Our results are probably explained because (i) adequate access to health services take longer to be expanded, and (ii) the pre-ceasefire status of the Colombian conflict did not affect access to neonatal services. The first one is likely to be in place since adequate access requires investments on infrastructure like roads, health centres, and the arrival of more health professionals. In the second case, while there were cases in which health professionals were attacked in the middle of conflict, they were usually allowed to attend civil population (Arjona, 2016).

5.3 Health outcomes at birth

Taking into account the conceptual framework, we consider the ceasefire association with the survival chances of the newborn, and to the health characteristics of newborns. As before, we report the *difference-in-differences* coefficients from estimating equation (2) to analyse the changes that could be associated with the main finding.

Concerning mortality, in Table 6 we observe differences in general neonatal (Columns 1-4) and infant mortality (Columns 5-8). First, we consider the rates (Columns 1, 2, 5 and 6), and a binary variable that indicates if the municipality rate is above the 2015 LAC region averages (10

[9] In Appendix Figure A.1, we report the coefficients from estimating equation (3) for the years 2007 to 2018.

for neonatal mortality, and 18 for infant mortality). Once controls are taken into account, there is no evidence of differential mortality. Finally, there are no changes in public health areas such as rates of infection of infectious and parasitic diseases on the overall population, such as Dengue, Zika, Malaria, Chagas, among other tropical diseases.

While there is no selection on survival and access to health services are unchanged, health outcomes of newborns could be impacted. For instances, their mothers might be under less stress (fetal origins literature), or simply there might be a change on the composition of the mothers relative to the non-FARC areas (on average, younger mothers tend to have healthier babies). Table 7 presents results on classic indicators of newborn health. We observe no changes on the percentage of children who weighed less than 2500 grams (low birth weight), no differences on APGAR tests at 1 or 5 minutes, neither the proportion born before 37 gestational weeks (preterm) of the percentage who required a C-section. These results are in line with Figure 2, showing basically that distribution of weight at birth remains unaffected by the end of the conflict.

5.4 Robustness checks

We now present robustness to our choice of using weights by the number of live births in the period before the ceasefire, using the discrete definition of FARC attacks, and the civil registration of births.

First, we consider an analysis based on estimating equation (2) without weights. The coefficient can be interpreted as the average effect of the ceasefire in the TFR across municipalities, regardless of their size. We show that the results are similar to the main estimates (see Appendix Table A.2).

Second, we also consider the discrete version of the exposure to FARC violence, both with and without weights. The result is an average increase of 0.08 children per women (TFR) in those municipalities which experienced at least one violent case (see Appendix Table A.2). The average conflict intensity in the FARC affected areas (at least 1 case of violence) is of 1.31 standard deviations. Therefore, the average impact on these areas using the estimate based on the continuous variable would be of 0.0524 (=0.04*1.31). This is within the 95% confidence interval of the discrete version of the estimate (0.0016 to 0.154).

Furthermore, we consider discrete versions for the heterogeneous results, by interacting with discrete definitions of mine victims and forced displacement areas (see Appendix Table A.4). Results are in line with the main estimates, and are stable with several definitions of the interaction dummies. However, standard errors are larger by not exploiting the continuous variation of these variables. We also show that results on health outcomes are similar if we consider this heterogene-

ity (see Appendix Tables A.5 and A.6).

Third, a potential concern could be that rather than an actual increase in the TFR, we observed a *formal* increase in the TFR. In other words, an increase in the usage of civil registration. This could be the case, for instance, if a higher proportion of births are attended by health professionals (which was already 97% of births).[10] As there is no change in such proportion, as shown in Table 5, we can partially rule out this possibility.

5.5 *Baby boom* mechanisms

In this section, we explore the empirical relevance of several potential mechanisms through which the absence of violent conflict increases TFR in municipalities previously affected by FARC violence. So far, we have seen that survival chances of newborns are mildly affected by the peace process; therefore, changes in health conditions and survival are not the main reasons behind the differential fertility trends.

We now explore the FARC's ex-members baby boom and the role of the overall victimisation of civilians in areas affected by FARC violence. Understanding the potential mechanisms is essential for developing policy responses to take advantage of the positive effects of the ceasefire and to minimise the adverse effects.

5.5.1 FARC's ex-combatants baby boom

It has been documented that FARC interfered in the private lives of their members, including determining whether couples remain together and even deciding if they can have or raise their children (Arjona and Kalyvas, 2008). After the demobilisation of FARC's ex-combatants, the possibility of having and raising their children could be one of the reasons why there was a baby boom by the rebels of FARC's army.[11] We explore heterogeneous effects estimating equation (4) using the ETCRs as a municipality characteristic (where approximately 25% of children live).[12] The results are reported in Column 1 of Table 8. We find that there is no differential increase in the TFR in municipalities with ETCRs. This result shows that the FARC's ex-combatants baby boom does not explain our results and that there are other mechanisms more relevant empirically that we will analyse in the next subsection.

[10] In the cases that a traditional midwife or others attend the delivery, the birth can be registered by civil registry employees based on a sworn statement by two witnesses present at the birth or with direct and reliable news of the birth (Toro Roa et al., 2019).

[11] See https://www.theguardian.com/world/2017/feb/10/farc-peace-deal-baby-boom-pregnancy-ban (last accessed 18/11/2019).

[12] See https://www.rcnradio.com/politica/durante-proceso-de-paz-cuantos-bebes-nacieron-de-excombatientes-de-las-farc (last accessed 28/08/2020).

5.5.2 The reduction in victimisation

Armed groups influence many domains of local life, permeating politics, economics, social relations, and even private life. In Colombia, armed actors often regulate mobility, establishing rules about when civilians could be outside their homes, travel, or enter a municipality, limiting their extent of social interactions (Arjona, 2016). These regulations are quite relevant for our results, taking into account that Colombia's five-decade-long conflict left 8.910.526 victims to 2019 according to the Victims' Registry (RUV), which is over 17% of the country's population.[13]

Overall, people living in conflict-affected areas faced a non-negligible risk of victimisation. We assess whether our main results are driven by the substantial reduction of victimisation and the subsequent optimism following the ceasefire. To that end, we estimate equation (4) to explore if there are any heterogeneous effects in municipalities that suffered exceptionally high levels of violence before the ceasefire. We do so by looking at the violence perpetrated by other armed groups (in addition to FARC), as well as at episodes of the explosion of land-mines, forced displacement, the potential mitigating effect of profitable economic opportunities and the poverty index. This is relevant in the Colombian context as it was the second country with the most accidents registered with anti-personnel mines in 2014 with 286 recorded casualties, only behind Afghanistan (Monitor, 2015).

The results from these test are reported in Table 8. They suggest that, indeed, the increase in the TFR following the start of the ceasefire are more substantial in municipalities that faced more violence during the period 2011-2014. Specifically, the increase in the TFR is larger in places that have anti-personnel mines victims before the ceasefire (Column 3) and where inhabitants were expelled by forced displacement (Column 4). Also, in the more marginalised municipalities with high poverty index (Column 7), these are places that have higher levels of infant mortality and other deprivation characteristics (INS, 2017). Victimisation and poverty are correlated; for instance, places with higher poverty rates tend to have more victims due to land-mines (Duttine and Hottentot, 2013).

We consider as well the role of coca production. The country is the largest producer of coca leaves and as a result, the primary source of the massive illegal transnational cocaine trade. An essential share of FARC funding was related to controlling both coca-leaf crops and cocaine trade routes (Richani, 2013). Given this, the concentration of FARC members in the ETCR areas intro-

[13]The RUV was created as a mechanism to guarantee the attention and adequate reparation of the victims from armed conflict (except for victims linked to an armed outlaw group). The system brings together people who individually or collectively have suffered from homicide, massacres, kidnapping, forced disappearance, torture, anti-personnel mines, unexploded ammunition and improvised explosive device, terrorist acts, fighting, confrontations and harassment, forced displacement and forced dispossession of land crimes against freedom and sexual integrity in the conflict context. Victim's data is partial because the legal framework only recognises victims as of 1st January 1985.

duced a significant change in the industry. Therefore, households perception of the future might be modified as a result of the expectations of the entrance of new players into the business and of Government programs for crop's substitution, which might change families income and prospects of security in the future.[14] We use a measure of municipal-level coca suitability to analyse if there are heterogeneous effects in these places. We find no differential effect based on coca suitability nor coca eradication (Columns 5 and 6). Thus, the increase in the TFR occurs mainly in places where there was war, which are not necessarily the same as those suitable for coca cultivation.

After the ceasefire, the control points, the rules about mobility, the permission to leave the municipality, and the victimisation to the medical personnel no longer exist. In the post-conflict period, there is a positive atmosphere to raise the children, send them to the school (Namen et al., 2020) and offer them to grow in a safer environment, which we argue that contribute to the increase in fertility.

6 Conclusion

In this paper, we study the short-term effects of Colombia's FARC ceasefire on fertility, demand for health services and newborn health using municipal-level vital statistics, administrative health services usage records from the Integrated Information System of Social Protection, and the conflict dataset originally compiled by Restrepo et al. (2003), in order to estimate a difference-in-differences model. We exploit the temporal variation given by the ceasefire and analyses potential heterogeneous effects by municipal-level variation across specific characteristics.

Our findings show that the permanent ceasefire declared by the FARC guerilla triggered a small but precisely estimated increase in the TFR. We find a statistically significant increase of 0.04 births per women in their lifetime (0.07 standard deviations of the TFR) per standard deviation of FARC attacks in the municipality during the 2011-2014 period, which corresponds to a 2.6% of the mean TFR. Another view is that the ceasefire increased in 0.08 births per women, on average, the TFR in those areas with at least one case of FARC violence in the 2011-2014 period, relative to those areas without registers of such event. This is in a general context of declining fertility in the country. Therefore, rather than an actual increase in the number of births, it is a smaller reduction of the TFR on those FARC affected areas. When considering ASFR, there is an increase between 1 to 2 births per women per year per standard deviation of FARC violence. As well, this is an increase of around 2% to 4%. In context, the Zika virus epidemic that threatened with a terrible disease for newborns (microcephaly) in urban areas of the country in 2016, reduced birth rates in

[14] For example, Mejía et al. (2019) find that after the announcement of the crop's substitution program, there was a surge in coca cultivation in the country.

10% (Gamboa and Lesmes, 2019).

We find evidence that the substantial reduction of victimisation and the subsequent optimism following the ceasefire influence post-ceasefire fertility outcomes. We find that the increase in the TFR is larger in places that had victims of land-mines before the ceasefire, and where there were more people expelled by forced displacement.

For the case of teenage pregnancy, it is essential to remark that affected areas had higher ASFR in the 15-19 age group, which has been associated in the literature with violence (Sanchez-Cespedes, 2018). Our results show that the reduction of this ASFR was smaller in these municipalities due to the sudden reduction of violence levels derived from the ceasefire. Bearing in mind that complications of pregnancy and childbirth are the leading cause of mortality among girls of those ages globally (WHO, 2016) and that Colombia ASFR for girls aged 15 to 19 is above the average in Latin America and the Caribbean,[15] we argue that the increase in early childbearing constitutes an unintended negative consequence of the peace process. Hence, beyond the reduction of homicide rates, extra efforts will be needed for obtaining substantial gains in this area. For instance, authorities should provide comprehensive sex education (Kohler et al., 2008), formal educational opportunities for girls (Vargas Trujillo et al., 2019), decrease in the cost of birth control (WHO, 2012) and optimise health services, taking advantage of the new scenario generated by the peace negotiation.

Concerning the demand for health services, pregnancy and health outcomes, we found no impacts. In particular, pre-existent differences in the number of antenatal consultancies, weight at birth, and infant mortality are unaffected. These results contrast the literature, which suggests that positive impacts will follow after the end of the conflict. Part of it is because we are not exploring specific "acute" events that trigger psychological stress such as land-mines explosions (Camacho, 2008b) or terrorist attacks (Eskenazi et al., 2007). The other is probably because access to health services is not immediately affected by the end of the conflict as physical infrastructure and health staff expansion will take time to be observed after the consolidation of institutions. However, there are other outcomes that take time to be observed and which are directly linked to violent environments. This is the case of externalising behaviours and other socio-emotional skills. Walker et al. (2011) and Attanasio et al. (2016) have shown that early childhood stimulation programs might reduce externalising behaviours, which would reproduce the epidemic of violence suffered by several countries in Latin America and the Caribbean.

[15] Colombia ASFR for girls aged 15 to 19 is 66.7 (per 1,000 girls aged 15 to 19) for the period 2015-2020 (UN, 2019), whereas for Latin America and the Caribbean is 63, and the average across countries of the OECD is at just 11.8 (OECD, 2019)

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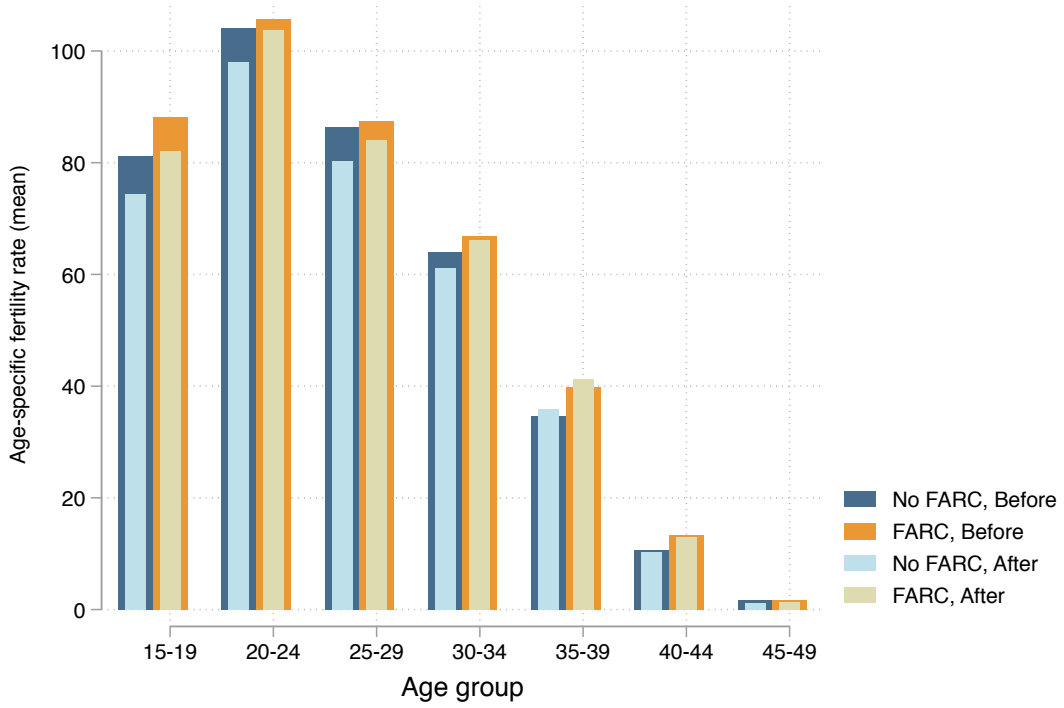
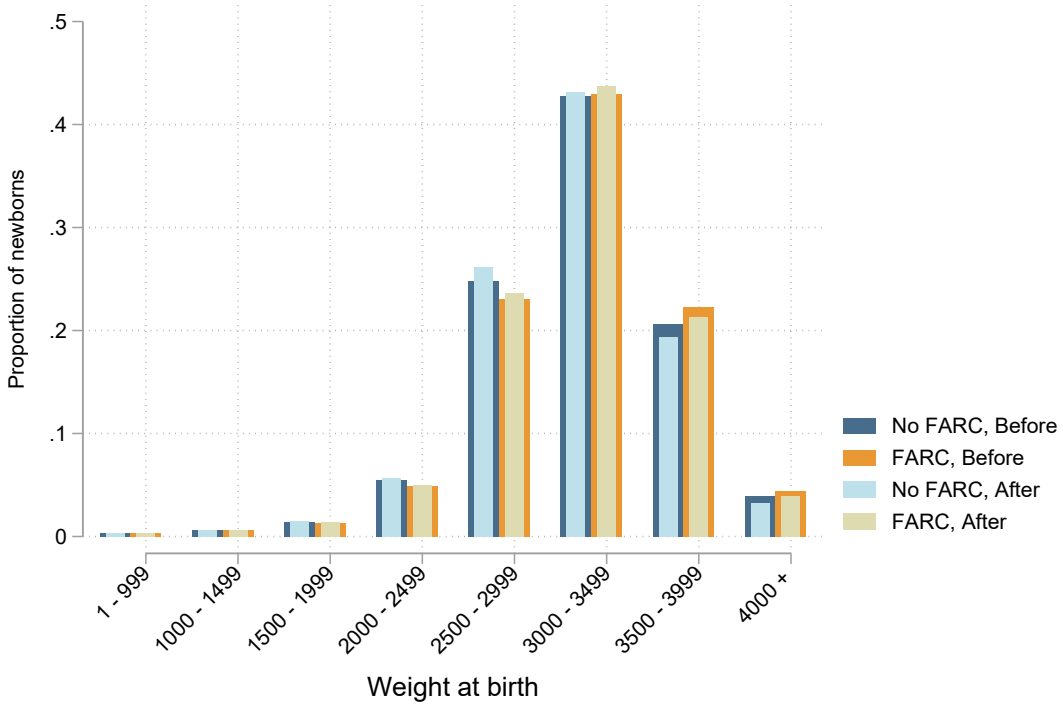
Figure 1: Evolution of age-specific fertility rates



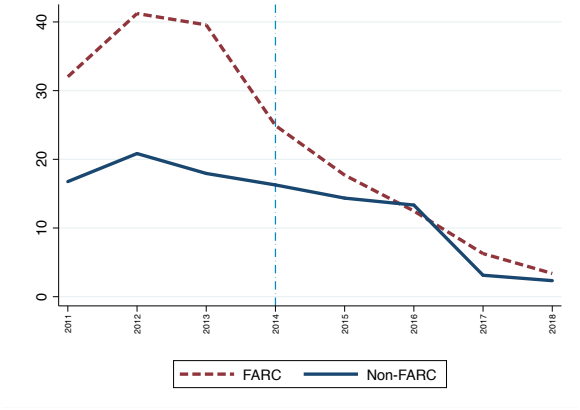
Notes: This figure presents the mean of age-specific fertility rates for municipalities exposed and non-exposed to FARC attacks in the period before (2011-2014) and after (2015-2018) the ceasefire. A municipality is considered as exposed if there was at least one violent event by FARC between 2011 and 2014.

Figure 2: Evolution of the distribution of weight-at-birth

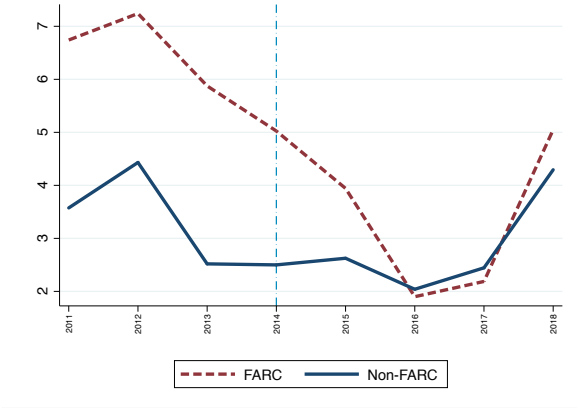


Notes: This figure presents the distribution of weight-at-birth for municipalities exposed and non-exposed to FARC attacks in the period before (2011-2014) and after (2015-2017) the ceasefire. A municipality is considered as exposed if there was at least one violent event by FARC between 2011 and 2014.

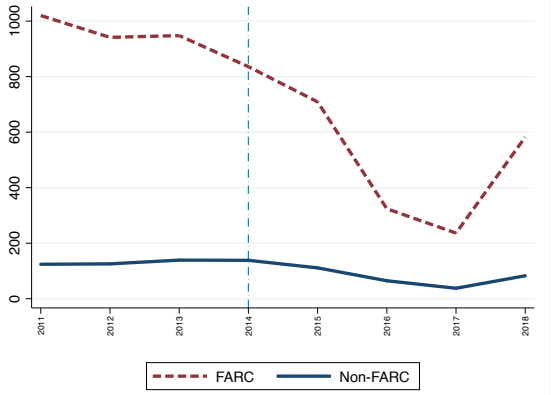
Figure 3: Evolution of conflict



(a) Violent cases



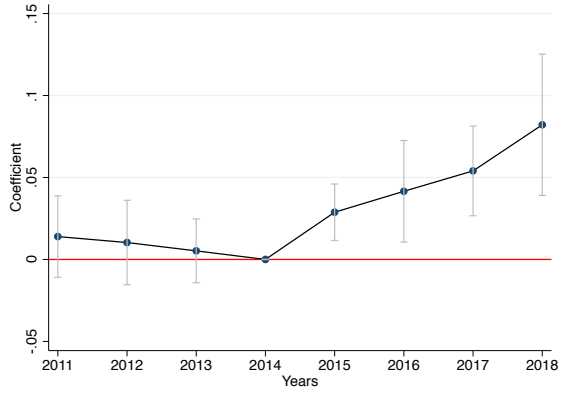
(b) Mines victims



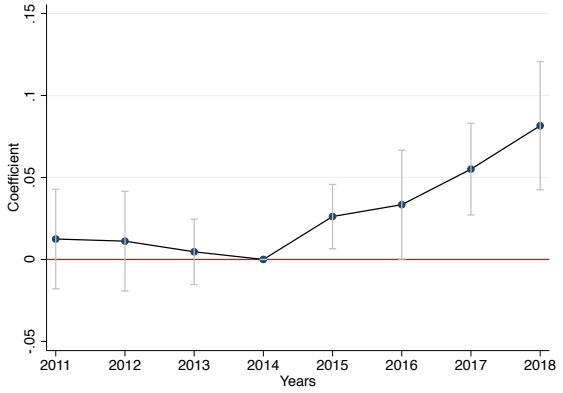
(c) Forced displacement

Notes: This figure presents the evolution of conflict for exposed and non-exposed municipalities to FARC attacks. A municipality is considered as exposed if there was at least one violent event by FARC between 2011 and 2014. Panel (a) presents the average number of violent cases in a municipality (including selective murders, attacks on populations, terrorists attacks, damage to propery and civilians, forced disappearance, massacres, kidnappings, sexual violence and recruitment) as recorded by the Centro Nacional de Memoria Historica. Panel (b) presents the average number of victims from anti-personnel mines and unexploded ammunitions in a municipality, as recorded by the Office of the High Commissioner for Peace. Finally, Panel (c) presents the average number of victims expelled from a municipality due to forced displacement, based on information provided by the Victim's Registry.

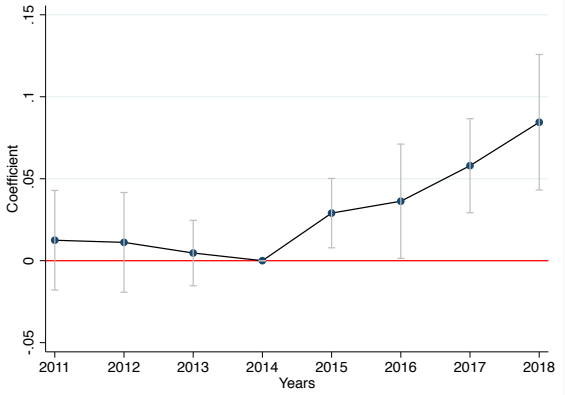
Figure 4: Dynamic difference-in-differences



(a) TFR including municipality and year fixed effects



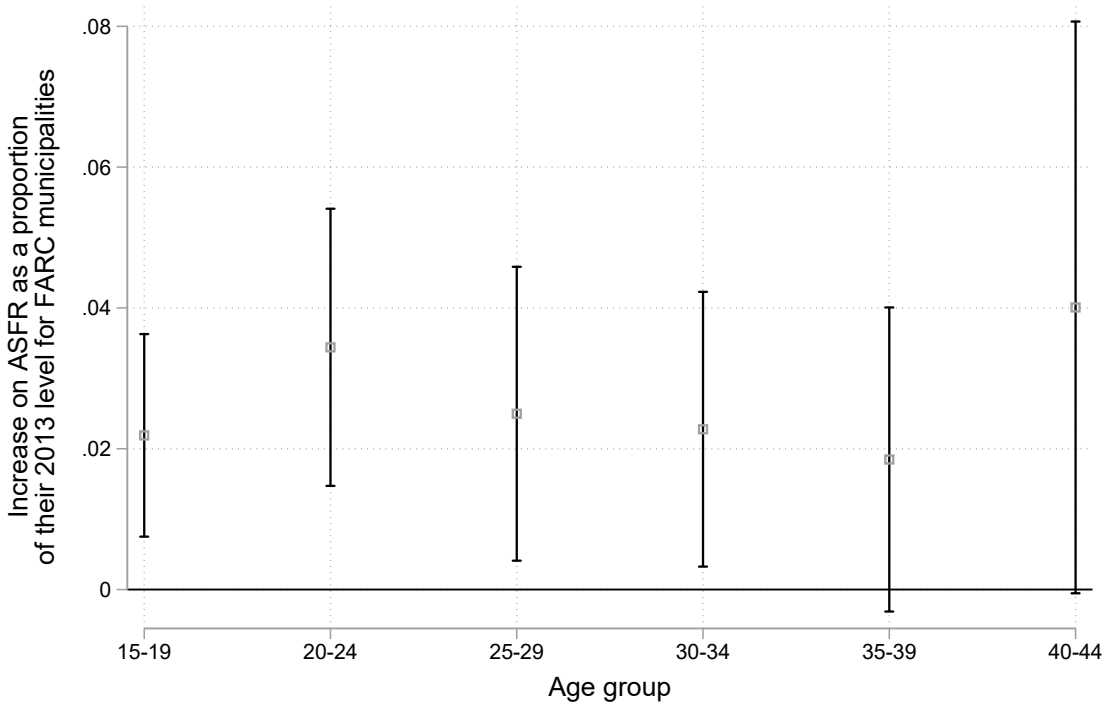
(b) TFR including municipality, department and year fixed effects



(c) TFR including controls, municipality, department and year fixed effects

Notes: These figures present the coefficients from our specification presented in equation (3). Panel (a) includes municipality and year fixed effects, Panel (b) includes department/year fixed effects, Panel (c) includes controls and department/year fixed effects. We present the point estimates of the regressions and the confidence of interval at 95%.

Figure 5: Effect by age-specific fertility rate



Notes: This figure presents the estimated increase on age-specific fertility rates as a proportion of their 2013 level for municipalities exposed to FARC violence. A municipality is considered as exposed if there was at least one violent event by FARC between 2011 and 2014..

Table 1: Summary Statistics

	(1) Mean	(2) Mean unweighted	(3) Standard deviation	(4) Median	(5) Min	(6) Max
Total fertility rate	1.90	1.61	0.59	1.83	0.00	8.06
ASFR for girls aged 15-19	82.27	67.46	26.18	80.70	0.00	208.33
ASFR for women aged 20-24	104.26	84.60	34.04	100.11	0.00	275.00
ASFR for women aged 25-29	86.55	71.98	30.41	81.75	0.00	379.31
ASFR for women aged 30-34	64.45	55.58	23.37	61.48	0.00	450.00
ASFR for women aged 35-39	35.40	30.88	14.65	33.33	0.00	200.00
ASFR for women aged 40-44	10.95	10.32	6.44	9.80	0.00	100.00
ASFR for women aged 45-49	1.77	1.02	2.54	1.04	0.00	71.43
Average of antenatal care visits	5.78	5.68	0.95	5.84	0.00	8.51
Births attended by health professional	98.08	97.26	5.58	99.59	0.00	100.00
Births attended by traditional midwife	1.92	2.74	5.58	0.41	0.00	100.00
Neonatal mortality rate	7.61	7.54	5.76	6.99	0.00	136.36
Infant mortality rate	24.77	25.23	16.56	22.81	0.00	545.45
Infectious and parasitic diseases rate	117.19	91.65	94.86	97.85	0.00	2418.51
Percentage of low weight at birth (<2500 grs)	7.76	7.79	2.43	7.51	0.00	100.00
Mean APGAR Test 1 Minute	8.20	8.15	0.26	8.20	4.00	9.12
Mean APGAR Test 5 Minutes	9.59	9.58	0.21	9.62	6.00	10.00
Preterm birth (<37 weeks)	17.34	17.08	4.20	17.17	0.00	100.00
C-Section delivery	39.88	35.29	14.29	37.90	0.00	100.00
FARC attacks per 10,000 inhab	0.11	0.12	0.47	0.00	0.00	9.80
Victims of anti-personnel mines	7.18	4.88	10.93	3.00	1.00	52.00
Rural share	0.42	0.59	0.25	0.41	0.02	1.00
Distance to capital	81.57	83.32	63.45	65.63	0.00	493.08
Poverty index	64.97	70.35	19.39	68.77	14.27	100.00
Ln population	59,949.32	21,434.20	52,581.85	38,498.00	298.00	217,343.00
Municipalities		1092				

Notes: This table presents summary statistics for the main variables of interest before 2014. All the columns present weighted (by the number of live births between 2011 to 2014 for each age group) versions of the summary statistics, except for Column 2.

Table 2: Municipality characteristics by exposure to FARC violence before the ceasefire

	(1)	(2)	(3)
		Exposure to FARC violence	
	Avg without FARC	Continuous	Discrete
Total fertility rate	1.88	0.01	0.11
	(0.57)	(0.01)	(0.07)
ASFR for girls aged 15-19	81.21	2.11***	6.95***
	(26.19)	(0.53)	(1.90)
ASFR for women aged 20-24	104.05	-0.81	1.58
	(33.83)	(0.79)	(3.51)
ASFR for women aged 25-29	86.41	-1.55**	1.07
	(30.06)	(0.62)	(3.75)
ASFR for women aged 30-34	64.09	-0.63	2.78
	(22.39)	(0.43)	(3.38)
ASFR for women aged 35-39	34.70	0.76***	5.20***
	(13.91)	(0.29)	(1.95)
ASFR for women aged 40-44	10.58	0.70***	2.77***
	(6.32)	(0.17)	(0.64)
ASFR for women aged 45-49	1.77	0.03	-0.03
	(2.65)	(0.06)	(0.14)
Average of antenatal care visits	5.85	-0.19***	-0.52***
	(0.94)	(0.02)	(0.06)
Births attended by health professional	98.28	-0.81***	-1.42***
	(5.71)	(0.12)	(0.30)
Births attended by traditional midwife	1.72	0.81***	1.42***
	(5.71)	(0.12)	(0.30)
Neonatal mortality rate	7.42	0.33***	1.32***
	(5.77)	(0.12)	(0.34)
Infant mortality rate	24.19	1.25***	4.14***
	(16.57)	(0.35)	(0.92)
Infectious and parasitic diseases rate	113.59	3.90	25.85***
	(90.73)	(2.99)	(9.26)
Percentage of low weight at birth (<2500 grs)	7.86	-0.24***	-0.71***
	(2.51)	(0.04)	(0.13)
Mean APGAR Test 1 Minute	8.18	0.03***	0.11***
	(0.26)	(0.01)	(0.02)
Mean APGAR Test 5 Minutes	9.58	0.02***	0.07***
	(0.21)	(0.00)	(0.02)
Preterm birth (<37 weeks)	17.55	-0.40***	-1.54***
	(4.25)	(0.07)	(0.27)
C-Section delivery	40.75	-1.89***	-6.26***
	(14.46)	(0.32)	(1.17)
Victims of anti-personnel mines	3.61	1.12**	6.27***
	(5.29)	(0.43)	(2.09)
Rural share	0.41	0.04***	0.07***
	(0.25)	(0.00)	(0.02)
Distance to capital	79.31	4.47***	16.23**
	(62.74)	(1.57)	(6.80)
Poverty index	63.69	3.33***	9.19***
	(19.89)	(0.43)	(1.23)
Ln population	10.52	-0.06***	0.28***
	(0.98)	(0.02)	(0.08)

Notes: This table presents univariate regressions based on municipality characteristics before the ceasefire. Column 1 presents the average of each variable before the ceasefire for municipalities non-exposed to FARC violence. A municipality is considered as exposed if there was at least one violent event by FARC between 2011 and 2014. Columns 2 and 3 present estimated coefficient and standard errors from univariate regressions for the continuous and discrete treatment.

Table 3: TFR and ceasefire

	(1)	(2)	(3)
	Total Fertility Rate		
Cease × FARC	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)
Observations	8,736	8,736	8,736
Municipalities	1,092	1,092	1,092
R-squared	0.899	0.919	0.921
Municipality FE	Yes	Yes	Yes
Year FE	Yes	No	No
Dept-Year FE	No	Yes	Yes
Controls	No	No	Yes
Municipalities	1092	1092	1092
Mean Dep. Var.	1.551	1.551	1.551
Std. Dev. Dep. Var.	0.598	0.598	0.598

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. Column 3 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 4: Age-specific fertility rates and ceasefire

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	ASFR 15-19		ASFR 20-24		ASFR 25-29		ASFR 30-34		ASFR 35-39		ASFR 40-44		ASFR 45-49	
Cease × FARC	1.63***	1.32**	2.83***	2.75***	1.70**	2.22***	1.18**	1.45***	0.57*	0.92***	0.48*	0.57**	-0.04	-0.05
	(0.55)	(0.58)	(0.83)	(0.89)	(0.73)	(0.77)	(0.51)	(0.56)	(0.34)	(0.35)	(0.25)	(0.26)	(0.09)	(0.09)
Observations	8,712	8,712	8,700	8,700	8,704	8,704	8,680	8,680	8,690	8,690	8,690	8,690	5,676	5,676
Municipalities	1,089	1,089	1,088	1,088	1,089	1,089	1,085	1,085	1,087	1,087	1,087	1,087	710	710
R-squared	0.864	0.866	0.885	0.887	0.858	0.862	0.826	0.828	0.761	0.765	0.628	0.631	0.400	0.410
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Mean Dep. Var.	67.58	67.58	84.66	84.66	71.92	71.92	55.77	55.77	30.99	30.99	10.33	10.33	1.565	1.565
Std. Dev. Dep. Var.	28.19	28.19	34.69	34.69	32.25	32.25	26.75	26.75	16.82	16.82	8.540	8.540	3.004	3.004

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. Columns 2, 4, 6, 8, 10, 12, 14 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 5: Ceasefire and demand of health care services

	(1)	(2)	(3)	(4)
	Antenatal care visits		Births attended by health professional	
Cease × FARC	-0.01	0.03**	-0.14	-0.17
	(0.02)	(0.01)	(0.18)	(0.19)
Observations	8,736	8,736	7,628	7,628
R-squared	0.921	0.924	0.889	0.890
Municipality FE	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092
Mean Dep. Var.	5.667	5.667	97.21	97.21
Std. Dev. Dep. Var.	1.138	1.138	7.733	7.733

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation.*Ante-natal care visits* is defined as the average of ante-natal care visits in the municipality per 100 live births in the municipality each year. *Births attended by health professional* is defined as the proportion of live births that were attended by a doctors, nurses, health promoters and nursing assistants. Columns 2, and 4 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 6: Ceasefire association with neonatal and infant mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Neonatal mortality rate		Neonatal mortality above 10		Infant mortality rate		Infant mortality rate above 18		Infectious, parasitic diseases	
Cease × FARC	-0.19	-0.04	-0.02	0.00	-0.58*	-0.00	-0.00	0.00	-4.98*	-3.27
	(0.13)	(0.13)	(0.01)	(0.01)	(0.31)	(0.27)	(0.01)	(0.01)	(2.66)	(2.80)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
R-squared	0.257	0.281	0.313	0.325	0.419	0.451	0.398	0.411	0.726	0.727
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	7.531	7.531	0.275	0.275	25.22	25.22	0.559	0.559	91.29	91.29
Std. Dev. Dep. Var.	10.46	10.46	0.447	0.447	29.49	29.49	0.497	0.497	114.4	114.4

Notes: This table presents the results from the main specification in equation (2). Neonatal mortality rate refers to the number of newborns who died before 28 days of life per 1,000 live births per year. Infant mortality rate is the number of deaths under 1 year old per 1,000 live births per year. The Latin America and the Caribbean mean rates were 10 and 18, respectively. All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardised by the mean and standard deviation to ease interpretation. Columns 2, 4, 6, 8, and 10 add predetermined municipal controls interacted with the ceasefire dummy. This controls include number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Also, column 10 includes the infant mortality rate as a control variable. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 7: Ceasefire association with newborn health

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	LBW		APGAR 1 min		APGAR 5 min		Preterm birth		C-Section delivery	
Cease × FARC	-0.07	-0.06	0.00	0.00	-0.00	-0.00	-0.18	-0.17	-0.01	0.14
	(0.06)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)	(0.12)	(0.12)	(0.19)	(0.18)
Observations	8,736	8,736	7,622	7,622	7,620	7,620	7,627	7,627	7,628	7,628
R-squared	0.562	0.563	0.828	0.829	0.777	0.779	0.648	0.649	0.927	0.929
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1091	1091	1092	1092	1092	1092
Mean Dep. Var.	7.783	7.783	8.145	8.145	9.578	9.578	17.10	17.10	35.24	35.24
Std. Dev. Dep. Var.	4.257	4.257	0.302	0.302	0.229	0.229	5.925	5.925	14.55	14.55

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardised by the mean and standard deviation to ease interpretation. *LBW* is the percentage of newborns who weighted less than 2500 grams. *APGAR1* is the mean APGAR test after 1 minute, and *APGAR5* is after 5 minutes. *Preterm* corresponds to the percentage of babies who were born alive before 37 gestational weeks. Columns 2, 4, 6, 8 and 10 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 8: Heterogeneous effects by municipality characteristics

	Dependent variable: Total fertility rate; Columns correspond to variable Z						
	(1) ETCR	(2) OAG	(3) Mines victims	(4) Forced displacement	(5) Coca suitability	(6) Coca eradication	(7) Poverty index
Cease × FARC × Z	0.06	0.01	0.01**	0.02***	-0.01	0.01	0.04***
	(0.05)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Cease × FARC	0.03***	0.04***	0.03**	0.03*	0.05***	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Cease × Z	-0.02	-0.01	-0.02**	-0.04***	-0.02	-0.03**	-0.04***
	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736
Municipalities	1,092	1,092	1,092	1,092	1,092	1,092	1,092
R-squared	0.919	0.919	0.919	0.920	0.919	0.919	0.921
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No	No	No
Mean Dep. Var.	1.604	1.604	1.604	1.604	1.604	1.553	1.604
Std. Dev. Dep. Var.	0.598	0.598	0.598	0.598	0.598	0.599	0.598

Notes: This table presents the results from our specification presented in equation 4. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. *ETCR* is a dummy that takes the value one for municipalities with Territorial Training and Reincorporation Spaces. *OAG* is a measure of exposure to other armed groups as in (Prem et al., 2020a). *Mines victims* is a standardize measure of the number of victims related to mines. *Forced displacement* is the number of population expelled or received in a municipality due to forced displacement. *Coca suitability* includes the standardize index for coca suitability from Mejía and Restrepo, 2015. *Coca eradication* is a standardized measure of the total area air spayed during 2011-2014 over the municipality area. *Triple interaction* is the interaction between the poverty index, the infant mortality and the victims related to anti-personnel mines. Robust standard errors are clustered at the municipality level and presented in parenthesis. Clustered robust standard error at the municipality level in parenthesis, *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Appendix

Data appendix: Description of variables and sources

Dependent variables. The source for creating the fertility and health variables are the integrated system of the Ministry of Health and Social Protection (SISPRO) and Colombia's National Department of Statistics (DANE). The former system receives and processes data, in a single warehouse, from the institutions of the Social Protection sector: health, pensions, professional risks, and social promotion. The latter is in charge of planning, implementing and evaluating processes for the production and communication of statistical information at the national level, which support the understanding and solution of the country's social, economic and environmental problems, and serve as a basis for public and private decision-making.

The rates are computed per year at the municipal level based on the Public Health Surveillance Protocols, the guide that standardizes the criteria, procedures and activities to systematize the surveillance of events of interest in public health by the National Institute of Health (Colombia). It contains the formulas for calculating the indicators based on the criteria established by the World Health Organisation and the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD10).

The violence dataset was originally compiled by Restrepo, Vargas and Spagat (2004), and was updated through 2014 by Universidad del Rosario. This dataset codes violent events recorded in the Night and Fog reports from the NGO Center for Research and Popular Education (CINEP), which provides a detailed description of the violent event, its date of occurrence, the municipality in which it took place, the identity of the perpetrator, and the count of the victims involved in the incident.

Control variables. The information on municipal characteristics comes from an annual panel of Colombian municipalities, maintained and hosted by the Center For Economic Development Studies (CEDE from the Spanish acronym) a think-tank at Universidad de los Andes.

Table A.1: Variables description and sources

Variable	Description	Source
Variables: Total fertility rate and age-specific fertility rate		
Total fertility rate	Mean number of children a woman would have by age 50 if she survived to age 50 and were subject, throughout her life, to the age-specific fertility rates observed in each year. It is computed as the sum of age-specific fertility rates weighted by the number of years in each age group, divided by 1,000.	SISPRO and DANE
Age-specific fertility rate	Number of live births to women in the age-group per 1,000 population of women in the same age range in the municipality each year.	SISPRO and DANE
Variables: Health care services		
Ante-natal care visits	Average number of ante-natal care visits in the municipality.	SISPRO and DANE
Births attended by health professional	Number of deliveries attended by doctors, nurses, health promoters and nursing assistants per 100 live births in the municipality each year.	SISPRO and DANE
Births attended by traditional midwives	Number of deliveries attended by traditional midwives or other people who are not health professionals per 100 live births in the municipality each year.	SISPRO and DANE
Variables: Neonatal, infant mortality and diseases		
Neonatal mortality rate	Number of deaths of babies under 28 days per 1,000 live births in the municipality each year.	SISPRO and DANE
Infant mortality	Number of deaths of children under 1 year old per 1,000 live births in the municipality each year.	SISPRO and DANE
Infectious and parasitic diseases	Number of people with diseases generally recognised as communicable or transmissible for every 1,000 inhabitants in the municipality each year.	SISPRO and DANE

Continued on next page

Variables description and sources, continued from previous page

Variable	Description	Source
Variables: Newborn health		
Low birth weight	Percentage of live births with weight less than 2,500 grams in the municipality each year.	SISPRO
APGAR 1 min	Mean APGAR test after 1 minute in the municipality each year.	SISPRO
APGAR 5 min	Mean APGAR test after 5 minutes in the municipality each year.	SISPRO
Preterm birth	Number of live births who were born alive before 37 gestational weeks per 100 live births in the municipality each year.	SISPRO and DANE
C-Section delivery	Number of babies delivered by caesarean per 100 live births in the municipality each year.	SISPRO and DANE
Variables: Control variables		
Rural share	Percentage of the population outside the urban centre in the municipality.	CEDE, based DANE information
Distance to capital	Straight line distance to the capital of the department in which the municipality is located.	CEDE, based on Agustin Codazzi Geographic Institute information
Mines victims	Standardize measure of the number of victims related to anti-personnel mines.	Office of the High Commissioner for Peace - Decontaminate Colombia
Poverty index	Percentage of the population in poverty according to the multidimensional index.	CEDE, based on DANE information
Ln population	Demographic projections based on the results of the 2005 Census and the Census Reconciliation 1985 - 2005, as well as the analyses on the behavior of the variables determining the demographic evolution.	DANE

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Variables description and sources, continued from previous page

Variable	Description	Source
Variables: Exposure to FARC violence		
FARC attacks	Total number of FARC attacks per 10,000 inhabitants in the municipality, from 2011 to 2014, standardised by the mean and standard deviation from 2014. Attacks are defined according to Restrepo et al., 2003: a violent event in which there is no direct, armed combat between two groups.	Restrepo et al., 2003, updated until 2014 by Universidad del Rosario
Variables: Municipality characteristics		
ETCR	Dummy that takes the value one for municipalities with Territorial Training and Reincorporation Spaces, which are the places created to train the former FARC's rebels for their reincorporation into civil life.	Agency for Reincorporation and Standardization
Other armed groups	Interaction of the total number of attacks, by armed groups except for FARC, in the municipality during the period 2011-2014, and a vector of (distance-penalized) neighboring municipalities.	Prem et al. 2019
Forced displacement	Population expelled in a municipality due to forced displacement.	Victims' Registry
Coca suitability	Standardize index for coca suitability from Mejía and Restrepo, 2015.	Mejía and Restrepo, 2015
Coca eradication	Total area air spayed during 2011-2014 over the the municipality area, standardised by the average and standard deviation.	Estimates by CEDE, based on information provided by the Department of Integral Action against Anti-Personnel Mines

Table A.2: Total fertility rate and ceasefire

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Weighted						Unweighted					
	Continuous measure			Discrete measure			Continuous measure			Discrete measure		
Cease × FARC	0.04***	0.04***	0.04***	0.05	0.07**	0.08*	0.03*	0.03*	0.03*	0.07***	0.06**	0.07**
	(0.01)	(0.01)	(0.01)	(0.04)	(0.03)	(0.04)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
Municipalities	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092
R-squared	0.899	0.919	0.921	0.898	0.919	0.921	0.858	0.876	0.877	0.858	0.875	0.876
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
Dept-Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Mean Dep. Var.	1.551	1.551	1.551	1.551	1.551	1.551	1.551	1.551	1.551	1.551	1.551	1.551
Std. Dev. Dep. Var.	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598

Notes: This table presents the results from the main specification in equation (2). *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation; and a discrete measure if there was at least one violent case by FARC in the same period mentioned before. Columns 3 and 6 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis, *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.3: Age-specific fertility rates and ceasefire unweighted. Continuous measure.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	ASFR 15-19		ASFR 20-24		ASFR 25-29		ASFR 30-34		ASFR 35-39		ASFR 40-44		ASFR 45-49	
Cease × FARC	0.81	0.77	1.20	1.30	1.24**	1.39***	1.41	1.53	0.41	0.47	0.68***	0.73***	0.14	0.14
	(0.86)	(0.92)	(1.08)	(1.19)	(0.53)	(0.54)	(0.87)	(0.94)	(0.38)	(0.42)	(0.21)	(0.22)	(0.09)	(0.09)
Observations	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720	8,720
Municipalities	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092	1,092
R-squared	0.778	0.779	0.801	0.802	0.733	0.735	0.667	0.668	0.571	0.572	0.414	0.415	0.273	0.274
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Mean Dep. Var.	67.63	67.63	84.50	84.50	71.86	71.86	55.53	55.53	30.92	30.92	10.35	10.35	1.020	1.020
Std. Dev. Dep. Var.	28.15	28.15	34.85	34.85	32.31	32.31	26.94	26.94	16.87	16.87	9.011	9.011	2.537	2.537

Notes: This table presents the results from the main specification in equation (2). *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. Columns 2, 4, 6, 8, 10, 12, 14 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis, *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.4: Ceasefire heterogeneity with discrete variables definitions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cut at 0.05		Cut at 0.1		Cut at 0.2		Cut at 1	
Panel A. Mine Victims index (Z): domain re-scaled from 0 to 10								
Cease × FARC	0.02	0.02	0.02	0.03	0.01	0.02	0.03**	0.04**
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Cease × FARC × $(D = Z > Cut)$	0.04	0.03	0.04	0.03	0.04	0.04	0.05	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Cease × $(D = Z > Cut)$	-0.06**	-0.05	-0.08**	-0.07*	-0.02	-0.01	-0.08*	-0.07
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
R-squared	0.919	0.921	0.919	0.921	0.919	0.921	0.919	0.921
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	1.604	1.604	1.604	1.604	1.604	1.604	1.604	1.604
Std. Dev. Dep. Var.	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598
Proportion above the cut of Z (E[D=1])	0.168	0.168	0.125	0.125	0.0850	0.0850	0.0310	0.0310
Panel B. Forced displacement index (Z): domain re-scaled from 0 to 10								
Cease × FARC	0.00	0.01	0.01	0.01	-0.01	-0.00	0.04***	0.04***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
Cease × FARC × $(D = Z > Cut)$	0.04*	0.04	0.04*	0.03	0.06***	0.06***	0.08*	0.03
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.06)
Cease × $(D = Z > Cut)$	-0.03	-0.02	-0.00	0.02	-0.00	0.02	-0.17***	-0.15***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
R-squared	0.919	0.921	0.919	0.921	0.919	0.921	0.920	0.922
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	1.604	1.604	1.604	1.604	1.604	1.604	1.604	1.604
Std. Dev. Dep. Var.	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598
Proportion above the cut of Z (E[D=1])	0.371	0.371	0.257	0.257	0.160	0.160	0.0220	0.0220

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardised by the mean and standard deviation to ease interpretation. *LBW* is the percentage of newborns who weighted less than 2500 grams. *APGAR1* is the mean APGAR test after 1 minute, and *APGAR5* is after 5 minutes. *Preterm* corresponds to the percentage of babies who were born alive before 37 gestational weeks. Columns 2, 4, 6, 8 and 10 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.5: Ceasefire association with neonatal and infant mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Neonatal mortality rate		Neonatal mortality above 10		Infant mortality rate		Infant mortality rate above 18		Infectious, parasitic diseases	
Panel A. Mine Victims										
Cease × FARC	-0.11	0.06	-0.01	-0.00	0.04	0.74	-0.02	-0.02	0.52	1.29
	(0.48)	(0.46)	(0.03)	(0.03)	(1.01)	(0.93)	(0.02)	(0.02)	(5.87)	(5.79)
Cease × FARC × M. victims	-0.08	-0.13	-0.01	0.00	-0.64	-0.85	0.03	0.03	-6.32	-5.46
	(0.50)	(0.48)	(0.03)	(0.03)	(1.07)	(0.96)	(0.02)	(0.02)	(6.59)	(6.56)
Cease × M. victims	-0.07	0.03	-0.01	0.01	-0.65	-0.31	-0.04	-0.01	-1.45	-0.18
	(0.36)	(0.33)	(0.04)	(0.04)	(0.92)	(0.77)	(0.04)	(0.04)	(6.19)	(6.71)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
R-squared	0.257	0.281	0.313	0.325	0.419	0.451	0.398	0.411	0.727	0.728
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	7.531	7.531	0.275	0.275	25.22	25.22	0.559	0.559	91.29	91.29
Std. Dev. Dep. Var.	10.46	10.46	0.447	0.447	29.49	29.49	0.497	0.497	114.4	114.4
Panel B. Forced displacement										
Cease × FARC	-0.20	-0.15	0.00	0.01	-0.65	-0.39	0.01	-0.00	-5.94	-5.05
	(0.75)	(0.70)	(0.03)	(0.03)	(1.03)	(0.85)	(0.02)	(0.02)	(4.64)	(4.56)
Cease × FARC × F. Displacement	0.02	0.11	-0.02	-0.01	0.09	0.41	-0.01	0.00	0.84	1.80
	(0.77)	(0.72)	(0.03)	(0.03)	(1.08)	(0.89)	(0.02)	(0.02)	(5.34)	(5.35)
Cease × F. Displacement	-0.16	0.14	0.01	0.03	-0.40	0.57	-0.02	0.06	7.83	5.95
	(0.36)	(0.32)	(0.03)	(0.03)	(0.79)	(0.66)	(0.04)	(0.04)	(5.54)	(5.44)
Observations	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736	8,736
R-squared	0.257	0.281	0.313	0.325	0.419	0.451	0.398	0.411	0.727	0.728
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	7.531	7.531	0.275	0.275	25.22	25.22	0.559	0.559	91.29	91.29
Std. Dev. Dep. Var.	10.46	10.46	0.447	0.447	29.49	29.49	0.497	0.497	114.4	114.4

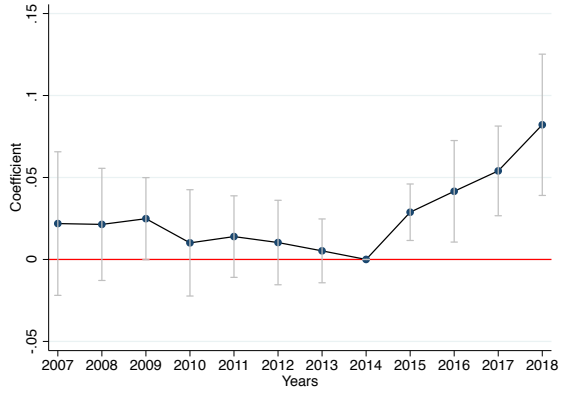
Notes: This table presents the results from the main specification in equation (2). Neonatal mortality rate refers to the number of newborns who died before 28 days of life per 1,000 live births per year. Infant mortality rate is the number of deaths under 1 year old per 1,000 live births per year. The Latin America and the Caribbean mean rates were 10 and 18, respectively. All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardised by the mean and standard deviation to ease interpretation. Columns 2, 4, 6, 8, and 10 add predetermined municipal controls interacted with the ceasefire dummy. This controls include number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Also, column 10 includes the infant mortality rate as a control variable. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.6: Ceasefire association with newborn health

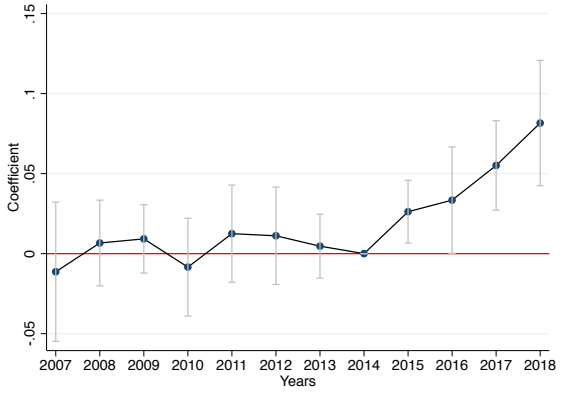
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	LBW		APGAR 1 min		APGAR 5 min		Preterm birth		C-Section delivery	
Panel A. Mine Victims										
Cease × FARC	-0.00	-0.01	0.00	0.00	-0.01	-0.01	-0.52***	-0.50**	-0.21	-0.36
	(0.17)	(0.16)	(0.01)	(0.01)	(0.01)	(0.01)	(0.20)	(0.21)	(0.45)	(0.46)
Cease × FARC × M. victims index 0-10	-0.06	-0.05	-0.00	-0.00	0.01	0.01	0.44*	0.42*	0.36	0.66
	(0.18)	(0.18)	(0.01)	(0.01)	(0.01)	(0.01)	(0.24)	(0.25)	(0.51)	(0.51)
Cease × M. victims index 0-10	-0.08	-0.05	0.02	0.02	-0.01	-0.00	-0.26	-0.23	-0.81	-0.61
	(0.12)	(0.13)	(0.02)	(0.02)	(0.01)	(0.02)	(0.32)	(0.34)	(0.67)	(0.73)
Observations	8,736	8,736	7,622	7,622	7,620	7,620	7,627	7,627	7,628	7,628
R-squared	0.562	0.563	0.828	0.829	0.778	0.779	0.648	0.649	0.928	0.929
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1091	1091	1092	1092	1092	1092
Mean Dep. Var.	7.783	7.783	8.145	8.145	9.578	9.578	17.10	17.10	35.24	35.24
Std. Dev. Dep. Var.	4.257	4.257	0.302	0.302	0.229	0.229	5.925	5.925	14.55	14.55
Panel B. Forced displacement										
Cease × FARC	-0.26**	-0.26**	-0.00	-0.00	0.01*	0.01	-0.68**	-0.67**	0.51***	0.37***
	(0.10)	(0.10)	(0.00)	(0.00)	(0.01)	(0.01)	(0.31)	(0.33)	(0.09)	(0.12)
Cease × FARC × F. Displacement	0.21*	0.23*	0.00	0.01	-0.02*	-0.01	0.54*	0.55	-0.57***	-0.27
	(0.12)	(0.13)	(0.01)	(0.01)	(0.01)	(0.01)	(0.33)	(0.35)	(0.22)	(0.22)
Cease × F. Displacement	-0.24*	-0.22	0.01	0.01	-0.00	0.01	-0.25	-0.19	0.51	0.82
	(0.12)	(0.15)	(0.02)	(0.02)	(0.02)	(0.02)	(0.30)	(0.30)	(0.56)	(0.63)
Observations	8,736	8,736	7,622	7,622	7,620	7,620	7,627	7,627	7,628	7,628
R-squared	0.563	0.563	0.828	0.829	0.778	0.779	0.648	0.649	0.928	0.929
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1092	1092	1092	1092	1091	1091	1092	1092	1092	1092
Mean Dep. Var.	7.783	7.783	8.145	8.145	9.578	9.578	17.10	17.10	35.24	35.24
Std. Dev. Dep. Var.	4.257	4.257	0.302	0.302	0.229	0.229	5.925	5.925	14.55	14.55

Notes: This table presents the results from the main specification in equation (2). All regressions are weighted by the number of live births between 2011 to 2014. *Cease* is a dummy that takes the value for the period after 2014. *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2011 to 2014, and is standardised by the mean and standard deviation to ease interpretation. *LBW* is the percentage of newborns who weighted less than 2500 grams. *APGAR1* is the mean APGAR test after 1 minute, and *APGAR5* is after 5 minutes. *Preterm* corresponds to the percentage of babies who were born alive before 37 gestational weeks. Columns 2, 4, 6, 8 and 10 add predetermined municipal controls interacted with the ceasefire dummy. This controls include infant mortality rate, number of victims related to anti-personnel mines, share of rural population, distance to the department capital, poverty index and logarithm of the population in 2010. Clustered robust standard error at the municipality level is in parenthesis. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

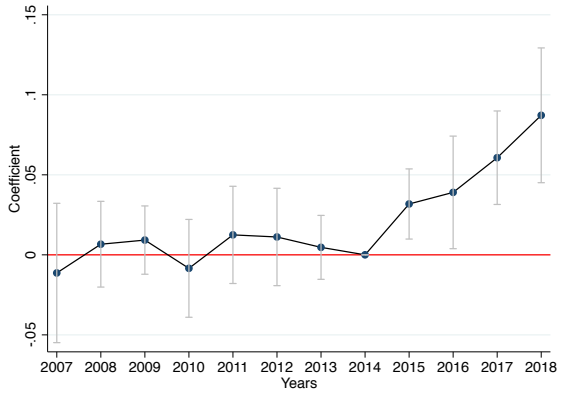
Figure A.1: Dynamic difference-in-differences



(a.1) TFR including municipality and year fixed effects



(a.2) TFR including municipality, department and year fixed effects



(a.3) TFR including controls, municipality, department and year fixed effects

Notes: These figures present the coefficients from our specification presented in equation (3), but for an extended period. Panel (a.1) includes municipality and year fixed effects, Panel (a.2) includes department/year fixed effects, Panel (a.3) includes controls and department/year fixed effects. We present the point estimates of the regressions and the confidence of interval at 95%.