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A Peace Baby Boom? Evidence from Colombia's Peace Agreement*

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Abstract

Violence affects households' preferences, perceptions, and constraints regarding fertility choices. What happens when violence ends? Using administrative data from Colombia, we find that the end of a long internal conflict differentially increased fertility by 3.2 percent in areas exposed to violence. The effect is present across all reproductive ages and larger in municipalities with higher levels of violence exposure at baseline. This differential fertility increase is not driven by health supply indicators, by the mortality of newborns and infants, or by differential migration. We provide evidence consistent with an increased perception of security, higher returns for child-bearing, and more parental investment.

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

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1 Introduction

Crime and violence impose a magnificent economic and social burden. At the household level, violent environments shape long-term choices. Fertility decisions are a key example (Brück and Schindler, 2009): in contexts of high perceived risk of mortality and disability, and where the supply of health care services is disrupted, households may be unwilling to take actions that have specific long-term consequences, such as fertility. Indeed, violent conflicts may have profound impacts on the three categories of demographic and socioeconomic factors that shape fertility choices, as described by Kohler et al. (2006): socioeconomic incentives, social feedback effects, and institutional settings. Thus, events that mark the end of a period of violence may be followed by increases in fertility rates. Perhaps the most prominent historical example of the positive relationship between peace and fertility is the post-World War II *baby boom*.[1]

But we know less about the fertility response to the end of lower-intensity internal conflicts that span over decades. There, post-conflict fertility rebounds are not obvious given how inter-generational exposure to violence shapes how people learn to coexist with conflict, and thus changes long-term households' preferences, perceptions, and constraints. This reduces the scope of a post-conflict reversion to the pre-conflict mean.

Using detailed administrative data from vital statistics as well as the records from all individuals' interactions with the health system, this paper documents a differential increase in fertility rates in municipalities formerly exposed to the *Revolutionary Armed Forces of Colombia* (FARC from its Spanish acronym), after this insurgency stopped engaging in violence following peace negotiations with the Colombian government. We do so using a *difference-in-differences* empirical strategy that compares the evolution of fertility in areas traditionally more affected by FARC's violence to other places. We find that after the start of a permanent ceasefire declared in December 2014, Colombia's secular reduction of the total fertility rate slowed down in places that previously experienced more FARC violence. This translates into a differential fertility *increase*, which implies that Colombia's post-ceasefire *baby boom* is more nuanced than the historical instances of absolute fertility increases experienced in other contexts.

Quantitatively, we find that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused a statistically significant

[1] In general, episodes of fertility rebound have also been documented in the aftermath of other high-mortality episodes such as genocides or natural disasters (Schindler and Bruck, 2011; Kraehnert et al., 2018; Nobles et al., 2015; Finlay, 2009; Caldwell, 2006).

differential *increase* of 3.2 percent in the total fertility rate after the start of the ceasefire (when the violence substantially decreased).[2] This is robust to including municipality and department-year fixed effects, that flexibly control for any municipal-specific time-invariant heterogeneity and for any temporal shock that affects fertility rates of all the municipalities of a given department, respectively. The results are also largely unchanged when we control for pre-ceasefire municipal characteristics –including variables that account for the presence of illegal activities–interacted with year fixed effects, therefore accounting for differential changes across municipalities with different values of such attributes; or when we control for municipal-specific trends. They are largely unchanged if we change the baseline comparison group to municipalities a priory more comparable to those exposed to FARC violence, including among others the adoption of a synthetic difference-in-differences estimator recently proposed by Arkhangelsky et al. (2021). The estimates are also robust to using alternative definitions of exposure to FARC violence.

We explore whether the effect found for the total fertility rate is driven by specific age brackets. To that end, we compute age-specific fertility rates across five-year age groups over the age range of 15 to 44. We find that the ceasefire caused a differential fertility increase across the board, and the magnitude of the effect is similar for the different age brackets. We also study the effect of the ceasefire on the birth rate, which allows us to explore heterogeneous effects according to baseline mother characteristics such as education, marital status, and previous pregnancies. We document that the fertility increase is larger for unmarried and less educated women, who also had at least one prior child.

The municipal-level findings are complemented with individual-level micro-evidence that exploits the Colombia chapter of the Demographic Health Survey (DHS). We find that, within at most a year of the start of the ceasefire, and controlling for municipality fixed effects and a range of individual time-invariant characteristics, women in treated areas report a higher ideal number of children (a proxy of fertility preferences).

The validity of our estimates and the extent to which they can be interpreted as causal depend on the assumption that, absent the ceasefire, the fertility rate would have followed the same trend in municipalities highly exposed to FARC violence and control areas. We find evidence that is consistent with this assumption using a battery of both parametric and non-parametric techniques. In particular, we document that: i) prior to the ceasefire,

[2] After the ceasefire, FARC's offensive activity dropped by 98 percent (CERAC, 2016), and the cases of landmines explosions dropped by 76 percent. Indeed, by declaring a ceasefire, FARC signaled its unified command structure and its commitment to reaching a peace agreement by refraining from initiating attacks or responding violently to actions perpetrated either by the military or other armed groups.

the fertility rate did not feature any significant differential trend in places highly affected by FARC violence; ii) the coefficient associated with the interaction between the exposure to FARC violence and a linear trend is not significant over the pre-ceasefire period (Muralidharan and Prakash, 2017); iii) none of the placebo ceasefires estimated over the pre-treatment period yields significant results; iv) adjusting the pre-trends to take into account potential pre-testing bias does not lead us to reject the parallel trends assumption (Roth, 2022); v) estimating the 95% confidence set of our parameters of interest after allowing for reasonable deviations from the parallel trends assumption does not significantly change our results (Rambachan and Roth, 2023).

We also investigate the mechanisms associated with the differential increase in fertility rates following the ceasefire and find suggestive evidence consistent with: i) an increase in objective security (and presumably an improvement in the perception of safety) which allows households to take longer-term decisions, including those associated with fertility; an increase in the returns of childbearing given by an improvement in the economic and the employment prospects of the parents, as well as an enhancement of the education opportunities of the children; and an increase in parental investment potentially driven by lifting the burden of victimization risk. We argue that, taken together, these complementary mechanisms drive fertility choices in former FARC-exposed municipalities.

In turn, in the context of the end of a long-lasting civil war, we find no support for a number of alternative mechanisms previously explored in the literature and related to the economic rebound experienced after short but intense episodes of violence or natural disasters. First, previous literature has shown that parents may be inclined to replace the children lost during conflict (Schindler and Bruck, 2011; Rutayisire, 2014; Kraehnert et al., 2018; Heuveline and Poch, 2007). However, we find no significant heterogeneous effects in municipalities with higher levels of infant mortality before the start of the ceasefire. Indeed, in such places, child replacement would have been more likely to occur.

Second, conflict termination could restore the functioning of marriage markets that violence disrupted. Indeed, it has been shown that violence generates a shortage of eligible men (De Walque, 2006); delays marriage decisions (Shemyakina, 2009; Curlin et al., 1976); and increases the incidence of divorce (Agadjanian and Prata, 2002; Woldemicael, 2008).[3] Nonetheless, we find that the share of births from women who cohabit with their partner is not differentially affected by the ceasefire, and when looking at census-level data prior to and after the ceasefire, we find no differential change in the rate of married individuals

[3]The disruption of marriage markets can in turn feedback into the persistence and intensity of conflict, as it pushes young men to join the insurgency (Rexer, 2022).

in treated municipalities. In addition, as mentioned, the documented post-ceasefire differential fertility increase is not driven by the age windows at which most women marry in Colombia.

Third, the end of conflict may trigger the restoration of healthcare infrastructure and increase 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). We examine a range of variables related to health infrastructure and the operation of the health sector (such as the rate of birth attended by a qualified professional and the number of ambulances and hospital beds) and find that, by and large, they do not significantly improve after the ceasefire in treated municipalities.

Fourth, large violence drops may mechanically increase fertility rates if newborns die or their health deteriorates because of conflict. Indeed, a strand of the literature has found that intrauterine exposure to violence (Mansour and Rees, 2012; Eskenazi et al., 2007; Camacho, 2008; Leon, 2012; Brown, 2018) or to natural disasters (Aizer et al., 2016; Almond et al., 2018; Khashan et al., 2008) increases fetal mortality as well as the incidence of low birth weight. However, perhaps because of the low intensity and long duration of the Colombian conflict, we find no evidence that outcomes such as weight at birth or the mortality rate of newborns changed differentially after the ceasefire in areas more exposed to FARC violence.

Fifth, the differential fertility surge could be driven by the behavior of women who migrate to the newly peaceful areas after FARC stops exerting violence, rather than reflecting the choice of the women who actually experienced the violence during the preceding years. We find no evidence of this alternative explanation, as we document no differential post-agreement incoming migration neither of (returning) conflict-driven internal refugees nor of the general population. Moreover, we show that the share of births from mothers with different characteristics is also unaffected by the ceasefire, suggesting that any potential selective migration due to the reduction in violence did not change the demographic composition of mothers.

Finally, civil wars are often fought by insurgent groups that enforce strict rules about romantic partners and fertility, in which case the behavior of demobilized ex-combatants may drive post-conflict baby booms. While we find empirical support for the existence of a baby boom within areas where former combatants settled after the peace agreement, we also show that this does not drive the estimates that we obtain for the entire country.

It is worth noting that a different strand of the literature highlights mechanisms consistent with the opposite effect of peace on fertility, namely that fertility rates are higher in periods of high violence (Akseer et al., 2020; Castro Torres and Urdinola, 2019; Urdal and Che, 2013; Kreif et al., 2022) and decrease after the end of the conflict (Clifford et al., 2010). For instance, inasmuch as violence is negatively associated with economic development, parents may have more children in the context of high levels of violence under the expectation that children may provide care and economic aid down the road (Verwimp and Bavel, 2005). Similarly, in violent environments, couples may hoard more births than desired if they anticipate that some of their children may die (Schultz, 1997). Moreover, the documented excess of gender-based violence in conflict-prone areas (Svallfors, 2021b; Kreft, 2020; Wirtz et al., 2014) reduces access to contraception and hurts reproductive autonomy (Svallfors and Billingsley, 2019; Svallfors, 2021a).

The above discussion shows how our paper contributes to the extensive literature on the intersection of development economics, health, and demography on the relationship between violence –or other shocks such as natural disasters- on health outcomes in general and on fertility dynamics in particular. Specifically, as the previous literature has by and large exploited extreme events (such as genocide or natural disasters: Schindler and Bruck, 2011; Rutayisire, 2014; Akresh et al., 2011; Kraehnert et al., 2018; Finlay, 2009; Nobles et al., 2015), the mechanisms that have been highlighted are different from those that we find as most relevant in our case, marked by the end of a long-lasting civil war. For instance, previous papers find support for channels such as child replacement, disrupted marriage markets, or damaged health facilities, which we rule out in our context. Thus, one contribution is that the type of violence that is more prevalent in middle-income countries is related to fertility through mechanisms other than those traditionally highlighted in the literature. In particular, we find support for mechanisms related to reduced victimization and uncertainty, and increased opportunities and parental investment. Indeed, we posit that the quality-quantity trade-off conceptual framework of Becker (1960) is more appropriate for contexts such as those explored by the previous literature, which produce sudden and large demographic changes, rather than slower changes in economic and behavioral constraints.

In addition, this same literature has hardly combined rigorous quasi-experimental causal identification with micro-data. That is when household surveys are utilized in the analysis, most papers rely on longitudinal correlations (exceptions include Akresh et al., 2011; Nobles et al., 2015). Our contribution combines both aspects, which together offer credible estimates of the reduced form effects, as well as a careful analysis of the underlying mechanisms.

Moreover, this paper contributes to the growing literature that studies the consequences of conflict termination, particularly the end of the 5-decade-long conflict between FARC and the Colombian state. Other papers highlight unintended negative consequences of the peace agreement in terms of the security of social leaders (Prem et al., 2022) and the dynamics of deforestation and coca cultivation (Prem et al., 2020, 2023a); the reallocation of healthcare workers with no major changes in overall health outcomes (Mora-García et al., 2024); and the positive implications of peace and demining for saving lives, improve human capital, and boost entrepreneurship (Perilla et al., 2024; Prem et al., 2023b, 2024; Bernal et al., 2024; de Roux and Martinez, 2020).

2 Context

2.1 Colombia's internal armed conflict and the peace process

Colombia's internal armed conflict started with the launch of two nationwide guerrilla movements in the 1960s: FARC and the *National Liberation Army* (ELN from the Spanish acronym). Both groups claimed to represent the rights of peasants and workers and fought with the goal of overthrowing the government to build a socialist regime. While they were initially located in a few peripheral rural areas, they have sought to expand their territorial dominance over decades. In turn, territorial contestation with government forces as well as with illegal right-wing paramilitary groups, has resulted in violence throughout a large part of the country's territory. Violence is further shaped by the scope of illegal activities that fuel the conflict. These include kidnapping, extortion, looting, and the production and trafficking of illegal drugs. Consequentially, most of the almost 9 million officially recognized victims of the conflict are from rural areas.[4]

In October 2012, the Colombian government and FARC started peace negotiations in Cuba. One of the most significant milestones of the process was the establishment of a unilateral permanent ceasefire by FARC on December 20, 2014. While a temporal cease of hostilities was commonly announced by FARC to observe the Christmas festivities, a permanent ceasefire was unprecedented and unexpected. FARC did so to signal to the government negotiating team its unified nationwide command structure as well as its commitment to reaching a peace agreement. Ultimately, the ceasefire was largely met and it was replaced by the definitive bilateral ceasefire and the subsequent disarmament of FARC in mid-2016, when the final peace agreement was reached. This explains why

[4]Source: Victims' Registry, from the Unit for the Victims Assistance and Reparation, November 2020 figure. Available from: https://www.unidadvictimas.gov.co/en (last accessed 12/05/2022).

FARC's offensive activities dropped by 98% during this period (CERAC, 2016).[5] Thereafter, FARC soldiers withdrew from the guerrilla strongholds and settled in the so-called *Transitory Normalization Zones of Transformation* (ETCR from its Spanish acronym), where the reincorporation programs devised by the peace agreement were to be implemented.

To understand the dynamics of violence during our sample period Figure 1 plots the change in the incidence of different proxies of conflict-related violence before and after the start of the permanent ceasefire. There is a clear sharp decrease across all the measures.

2.2 The Colombian health system

Universal public health care in Colombia is a constitutional right (see articles 44 and 49 of the 1991 Constitution). Law 100 of 1993 created the General System of Social Security in Health (SGSSS from the Spanish acronym), which introduced competition in both insurance and care provision through a managed-care model that includes both public and private health providers (Bardey and Buitrago, 2017). SGSSS aims to cover the entire population by combining a *contributory* regime (for patients with payment capacity) with a *subsidized regime* (for patients without payment capacity or else for vulnerable communities prioritized by the government). In 2019, 95 percent of the population was affiliated with the SGSSS, with about 45 percent of the patients belonging to the contributory regime and a similar figure to the subsidized regime. The residual share of the population belonged to a special regime (MinSalud, 2019).[6] While, in principle, patients of both regimes have access to the same healthcare benefits, in practice, specific insurers limit access to certain benefits (Vargas et al., 2010).

Colombia's total fertility rate (TFR) was 1.82 children per woman during the period 2015-2020 (UN, 2019). While this figure is slightly smaller than the average of Latin America and the Caribbean (2.04), it lies close to the upper limit of the TFR range of OECD coun-

[5] While for our purposes the ceasefire is the most important regime change for the reasons mentioned, it was not the only milestone of the peace process. Others include the announcement of the peace negotiations in October 2012, partial agreements reached over the course of the negotiation on specific items of the negotiation agenda, the actual signature of the agreement in September 2016, its public rejection after a national referendum in October that year, and its definitive ratification by Congress in December. While we show empirical support for our choice of time heterogeneity, others have shown that for outcomes such as the demand for agricultural credit, the period given by the implementation of the agreement is more relevant (de Roux and Martinez, 2020).

[6] In addition, members of the military and police forces, public teachers with a staff contract, and employees of the Colombian Petroleum Company (ECOPETROL) have special public health schemes.

tries (from 1.4 to 1.9) (OECD, 2019).[7]

3 Data

In order to study the effect of the ceasefire on fertility rates as well as on intermediate outcomes related to the demand for health care and health-at-birth outcomes, we constructed a municipality-year-level panel with information from multiple sources. We focus on the period from 2011 to 2019, with the ceasefire taking place in December 2014. 2011 was the first full presidential year of President Juan Manuel Santos, who successfully managed to start formal peace talks with FARC and bring them to the point of declaring a permanent ceasefire. During this period, FARC's violent dynamics were quite different than during the years before, marked by President Uribe's (2002-2010) harsh anti-insurgent campaign that pushed FARC to retreat and reduce its violent activity. By defining the treatment during the four-year window before the ceasefire we are thus capturing the differential effect of the ceasefire on the areas that were most affected toward the end of the conflict with FARC.[8] The sample includes all Colombian municipalities except the large cities (with populations of at least 200,000 people in 2010 according to projections from DANE, Colombia's statistics bureau). The resulting number of municipalities is 1,092.[9] We now describe the main variables and their source. For a complete list of all the variables used in the paper, together with their source, we refer to Table A.1 in the Appendix.

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 2019 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.[10]

[7] In April 2020, Colombia officially became an OECD member.

[8] It is important to highlight, however, that our results are not just an artifact of the period picked for the treatment definition. They are robust to expanding the period all the way until the start of Uribe's first term (2002).

[9] While our choice to drop major cities and capitals seeks to make the sample more comparable, our results are robust to not excluding them.

[10] *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 organizations

For our treatment variable, we focus on FARC violence rather than *presence*. While the latter is conceptually important, as areas controlled by FARC likely experienced a change in governance after the ceasefire, it is extremely challenging to operationalize systematically and objectively with observable actions. Instead, while easier to record, violence is at best an imperfect predictor of territorial influence. Indeed, low violence levels can be consistent with rooted non-state governance. For instance, for the case of Colombia, Arjona and Otálora (2011) compare existing databases of civil war violence in Colombia to survey evidence on armed groups' presence (albeit for a small sub-sample of municipalities for which the latter is available) and conclude that violence is likely to underestimate territorial control. We thus focus on a treatment that is at least as important as presence, namely the effect of peace on fertility in the municipalities that experienced a reduction in violence.

Specifically, 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.[11] We standardized the continuous measure using the mean and standard deviation from the empirical distribution. While our main results will be based on this continuous treatment definition, for robustness we construct a second measure based on a dichotomous version of it. The latter would take the value of one if there was at least one violent case by FARC during the same period. Based on the latter treatment definition, 99 municipalities (9% of our sample) resulted as exposed to FARC violence before the ceasefire.

3.2 Vital statistics and health care

Civil registration and vital statistics (CRVS) systems are the most widespread source of health indicators. They are commonly used to study population dynamics, set public health goals, and conduct academic research. Colombia has a reliable vital statistics system, which registers around 95 percent of all births and 86 percent of the deaths that take place in the country (Colombia Implementation Working Group, 2018; Toro Roa et al., 2019). Vital statistics in Colombia are part of the administrative *Integrated Information System of the Ministry of Health and Social Protection* (SISPRO from the Spanish acronym).

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.

[11] Our results are robust to using longer periods for the treatment definition. See section 5.

Using these data, we construct municipality-year level TFR as follows:

$$TFR = 5 \times \sum_{a=15-19}^{40-44} f_a, \quad \text{where } f_a = \frac{\text{Births of women in age range } a}{\text{Total women in age range } a} \tag{1}$$

where f_a is the age-specific fertility rate (ASFR) of women whose age corresponds to the five-year age group a.[12] To compute it, we use the annual number of births based on the mother's municipality of residence. In addition to using the number of births as an input to compute the TFR, we also use the birth rate (number of live births per 1,000 inhabitants) as an alternative outcome.

Annual births are in turn computed from administrative birth registration counts. Birth registration is based on a live birth certificate issued by the health professional who attends the birth.[13] In the absence of a live birth certificate (for instance, because the child was born in a place other than a health care facility), the birth can be registered by a civil registry servant based on a sworn statement by two witnesses present at the birth (Toro Roa et al., 2019). Colombia's statistics bureau consolidates, validates, and processes information from all birth certificates (DANE, 2012). Importantly, birth certificates also include information on the mother's characteristics, namely age (as well as that of the father), number of past pregnancies, civil status, and education level.

We also use CRVS and SISPRO to construct a range of variables and indicators used to test potential mechanisms. For instance, CRVS also includes mortality data derived from vital statistics. From it, we compute a range of mortality rates using as a denominator 1,000 live births. These include fetal mortality rates (fetal deaths per 1,000 known pregnancies - live births plus fetal deaths-), neonatal mortality rates (deaths occurring during the first 28 days of life), infant mortality rates (deaths under the age of 1), and under-5 mortality rates. We also construct deaths associated with acute respiratory infections (ARI) and acute diarrhoeal disease (ADD) for children under 5 years. These are two of the most common causes of child death associated with poor socioeconomic conditions which correlate with a lack of access to basic health services (Alvis-Zakzuk et al., 2018).

CRVS further includes the number of antenatal care contacts during pregnancy (WHO recommends 8 prenatal care visits WHO, 2018), as well as outcomes associated with preg-

[12]In particular, we focus on the following six five-year age groups: 15 to 19; 20 to 24; 25 to 29; 30 to 34; 35 to 39; and 40 to 44.

[13]In most cases, the health professional can be a doctor, nurse, nursing assistant, or health promoter (DANE, 2012). Indigenous people have the Intercultural System of Indigenous Own Health (SISPI from the Spanish acronym) with health care facilities integrated into the General System of Social Security in Health (See `https://rb.gy/xfcck1` (last accessed 04/02/2024)).

nancy health such as the incidence of low birth weight (LBW, defined as less than 2,500 grams), preterm births (less than 37 weeks of gestation), the APGAR test, and C-sections. In turn, from SISPRO we obtain information related to the demand for health services that are covered by the mandatory health insurance system.

3.3 Municipalities characteristics

We complement these data with a large set of municipality characteristics from different sources. The primary source is the annual panel of Colombian municipalities, maintained and hosted by the *Center for Economic Development Studies* (CEDE from the Spanish acronym, Acevedo et al., 2014). We obtained the measures of the share of people living in rural areas, the distance of each municipality to the department's capital, and a multidimensional poverty index.

We also use proxies of the violent presence of illegal armed groups other than FARC in a municipality (from Prem et al., 2022), an indicator of the municipalities selected to host the ETCR (from the *Agency for Reincorporation and Normalization*), data on landmines victims (from the Office of the High Commissioner for Peace in Colombia), information on the number of children recruited by illegal groups (from Centro Nacional de Memoria Histórica –CNMH, Colombia's Truth Commission) and information on internal forced displacement (from Colombia's Victims' Registry).

Finally, we use administrative databases other than those described in the previous subsection, including the 2005 and 2018 population censuses (DANE, 2005, 2020) and information on the health infrastructure per municipality and per year (from the *Special Register of Health Service Providers*, REPS).

Table A.2 in the Appendix reports pre-ceasefire descriptive statistics of the main variables. During that period there were, on average, 1.6 live births per woman, and the highest ASFR was that of women in the 20 to 24-year-old window. In turn, Table A.3 reports the pre-ceasefire differences between treatment and control municipalities across all the main variables. Municipalities that experienced FARC violence were on average different from non-exposed areas in several characteristics. These level differences, however, do not prevent us from estimating the causal effect of the ceasefire on fertility rates and other intermediate outcomes and potential mechanisms, as we explain in the next section.

4 Empirical strategy

4.1 Main specification

To estimate the effect of the end of the conflict between the Colombian state and the FARC guerrilla, we exploit two sources of variation. First, the temporal variation is given by the timing of the permanent ceasefire announced by FARC on the 20th of December 2014. Second, the cross-sectional variation comes from the level of pre-ceasefire FARC violence across municipalities. More formally, using the subindex m to denote municipalities, d to denote departments, and t to denote years, we estimate the following *difference-in-differences* specification:

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

where y_{mdt} is the TFR in municipality m, located in department d, during 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 (hence 2015 onward) and $FARC_m$ measures pre-ceasefire exposure to FARC violence.[14] 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 interest, driven by these municipality features. Finally, ε_{mdt} is the error term clustered at the municipality level.[15] Our coefficient of interest, β, captures the differential change in the TFR after the start of the ceasefire relative to before, in municipalities more exposed to FARC violence relative to those less exposed to it.

Throughout the paper, all regressions are weighted by the number of live births prior to the ceasefire (from 2011 to 2014) for each age group. We do so based on the mother's municipality of residence. This weighting procedure assigns more importance to municipalities that traditionally contribute more to fertility rates in the country, thus minimizing the role of atypical fertility rates in small municipalities. Moreover, for outcomes based on averages of individual births, this procedure gives equal importance to each newborn in the sample. As robustness, however, we also consider other weighting variables such

[14] As discussed in section 2, we take the ceasefire as the main temporal shock that can affect fertility choices. While in our dynamic specifications, we are more agnostic about this choice, the semi-parametric analysis ultimately confirms it.

[15] We also show the robustness to controlling for spatial and first-order time correlation (see Conley, 1999, Conley, 2016).

as the total population in 2014 and the total number of women in that same year. We also show that the unweighted estimates are very similar to the weighted ones.

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 more exposed to FARC violence would have evolved similarly to those in municipalities less exposed. The validity of this *parallel trends* assumption can be partially assessed by estimating the following dynamic version of the main specification:

$$y_{mdt} = \alpha_m + \delta_{dt} + \sum_{j \in T} \beta_j (FARC_m \times \delta_j) + \sum_{c \in X_m} \gamma' c \times Cease_t + \varepsilon_{mdt} \tag{3}$$

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 more exposed to FARC attacks compared to municipalities less exposed, in year j relative to the year right before the ceasefire started.

4.3 Disentangling 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 ETCR) be a potential mechanism of interest. We estimate:

$$\begin{aligned} y_{mdt} = \alpha_m + \delta_{dt} + \beta_1 (Cease_t \times FARC_m \times Z_m) + \beta_2 (Cease_t \times Z_m) \\ + \beta_3 (FARC_m \times Z_m) + \beta_4 (FARC_m \times Cease_t) + \sum_{c \in X_m} \gamma' c \times Cease_t + \varepsilon_{mdt} \end{aligned} \tag{4}$$

Our coefficient of interest, β_1, captures the differential change in the outcome variable in places more exposed to FARC attacks and with municipality characteristic Z_m. In addition, to interpret this coefficient in a causal way, a similar "parallel trends" assumption has to hold but for municipalities both more exposed to FARC violence prior to the ceasefire and with municipality characteristics Z_m. Hence, to partially assess the validity of this assumption we estimate a version of equation (3) but for the triple interaction.

Using the above specifications, we estimate the differential impact of the permanent ceasefire on the TFR in areas previously exposed to FARC violence (equation 2), the dynamic evolution of this effect (equation 3), and heterogeneous effects given by an array of municipality characteristics (equation 4). The next section reports the estimated results, together with a large set of robustness checks.

5 Results

5.1 Main results and robustness

5.1.1 Average fertility rate

Table 1 reports the empirical estimates of equation (2). Columns 1 to 4 report estimated coefficients on the baseline sample and Columns 5 to 8 refine, following different techniques, the control group to municipalities more similar to those affected by FARC. We do so in order to address a potential threat to identification, namely that municipalities exposed to FARC violence are different from not-exposed areas along with unobserved characteristics that may have varied after 2014 for reasons other than the start of the ceasefire.

Within the baseline sample, Column 1 includes municipality and year fixed effects, Column 2 includes municipality and department $\times$ year fixed effects, and Column 3 builds on the specification of Column 2 and further controls for differential changes in the TFR after the ceasefire, parametrized by several pre-ceasefire municipality characteristics.[16] Finally, in Column 4, we address the fact that, after the ceasefire, other armed groups took advantage of the vacuum of power in former FARC strongholds to expand their territorial presence (Prem et al., 2022), thus increasing illegal activities. To that end, we include an additional set of controls that capture differential changes in fertility rates parametrized by variables associated with the incidence of violence and illegal activities.[17]

Our estimates, which are robust in terms of magnitude and significance to estimating the more demanding models of Columns 2 to 4, suggest that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused a differential increase in the TFR of 0.05 births per woman in their reproductive period (15 to 44 years old) after the ceasefire. This effect is statistically significant and

[16] These include the infant mortality rate, the number of victims related to anti-personnel landmines, the share of the rural population, the distance from each municipality's centroid to its department capital, a poverty index, and the logarithm of the 2010 municipal population.

[17] These include the suitability to grow coca (used to produce cocaine, of which Colombia is the world's top exporter), gold suitability, and an indicator of whether the municipality witnessed any attack by another armed group during the pre-ceasefire period from 2011 to 2014.

equivalent to 0.08 standard deviations (=0.05/0.604), or to 3.2 percent of the TFR sample mean (=0.05/1.541).[18]

The estimated effect of the ceasefire on fertility rates is robust to refining the set of comparison municipalities in different ways. In Column 5, the control group is composed only of municipalities that, over the period 2011-2014, experienced violence perpetrated by other illegal armed groups. This is important to ensure that our findings do not just reflect a differential trend in conflict-affected *vis-à-vis* peaceful areas. Alternatively, to avoid potential contamination of the control group, Column 6 excludes all municipalities that share a border with a treated (FARC-affected) area. In addition, following Crump et al. (2009), in Column 7, we truncate the sample in order to increase the overlap of treated and control municipalities in terms of various municipal characteristics. In the three cases, we find point estimates that are significant and virtually unchanged in terms of magnitude relative to our baseline specification. Finally, in Column 8, we implement a recently developed synthetic difference-in-differences estimator (Arkhangelsky et al., 2021), finding similar results in terms of magnitude and significance.

Figure A.1 of the Appendix reports the dynamic version of the synthetic difference-in-differences estimate. It can be seen how, prior to the start of the ceasefire, the evolution of the TFR in FARC-exposed municipalities and in their synthetic counterpart is indistinguishable from one another. However, starting in 2015 the lines significantly diverged. Section 5.2 uses the toolkit developed for difference-in-differences methodologies to further explore the validity of the parallel trends assumption.

5.1.2 Age-specific fertility rate

Table 2 reports the effect of the start of the permanent ceasefire on various age-specific fertility rates to explore whether the effect found for the TFR is driven by particular age brackets. We measure the ASFR in five-year age groups, covering the range of 15 to 44. We find that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused a differential increase in the ASFR across the board.[19] Moreover, the magnitude of the effect size –the ratio of the coefficient over the average of the dependent variable– is similar across all age groups. The highest increase is observed for the 20-24 age range, with an increase in the fertility rate of 4 percent of the

[18] In square brackets, we present the p-values for standard errors control for spatial and first-order time correlation (see Conley, 1999, Conley, 2016). If we allow for spatial correlations ranging from 0 to 250Km, the `p-values` range from 0.001 to 0.002

[19] We also include in the table p-value adjusted for the false discovery rate due to multiple hypotheses testing. To do so, we follow Westfall and Young (1993) and Jones et al. (2019).

sample mean (0.0034 additional births per woman).

5.1.3 Birth rate

While the TFR relates to the average number of children that a woman would have over her reproductive years, an alternative relevant outcome is the birth rate. This is because women who had decided against having children because of the violence may decide to have them after the start of the ceasefire, without this decision having any effect on their lifetime fertility. We study the effect of the ceasefire on the birth rate and report our findings in Table A.4 of the Appendix. Based on the most demanding specification, which includes both municipality and department-year fixed effects, as well as differential changes parametrized by various predetermined controls, we find that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused an additional 0.43 live births per 1,000 inhabitants after the start of the ceasefire. This corresponds to nearly 3.6% of the average municipality birth rate.

We can use the dynamic estimates (reported in Figure A.3 and discussed in section 5.2) to compute the total excess births caused by the ceasefire in FARC-affected areas between 2015 and 2019 (the post-ceasefire period). To that end we: i) take the female population of treated municipalities for 2014 (the last year before the start of the ceasefire), focusing on women of reproductive ages (15 to 44); ii) aggregate this count across all treated municipalities and divide by 1,000 (given that our computed birth rate normalizes by this number); iii) Take the estimated coefficients of the effect of the ceasefire on the birth rate for every year of the post-ceasefire period (2015-2019) in the dynamic specification (Figure A.3) and interact each such coefficient with the normalized number of women in treated municipalities; iv) sum across post-ceasefire years to obtain the estimated number of excess children owing to the ceasefire. We estimate that about 1,724 additional children were born in FARC-affected municipalities over the period 2015-2019 because of the ceasefire. This translates into around 1 additional birth for every 100 births.

Focusing on the birth rate also allows us to explore key heterogeneity regarding women's marital status, education level, and number of previous children. As this information is available only for birth-giving mothers (that is, we do not observe women who do not give birth), we cannot estimate heterogeneous effects on the probability of giving birth. This also implies that in the absence of an individual-level control group, the heterogeneity that we can test using these data can only be explored at the aggregate municipal level, using rates.[20] We, therefore, computed municipal birth rates according to the aforementioned characteristics and tested whether these rates changed disproportionately after the start of the ceasefire in treated municipalities relative to the control.[21]

Table A.5 of the Appendix examines these heterogeneities and documents the following patterns: First, after the start of the ceasefire, a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused an additional 0.36 (0.07) live births from married (single) women per 1,000 women in the municipality. This corresponds to 3.5% (4.6%) of the average birth rate of married (single) women–relative to all women–in the municipality (Columns 1 and 2). Second, an equivalent increase in exposure to the violence treatment caused an additional 0.15, 0.13, 0.07, and 0.02 live births from women with a level of education 1, 2, 3, and 4 respectively, per 1,000 women in the municipality (Columns 3 to 6).[22] These effects correspond to 4.6%, 4%, 2%, and 1.4% of the average birth rate of women with education levels 1, 2, 3, and 4 respectively, relative to all women in the municipality. The latter coefficient is not significant. Third, an equivalent increase in exposure to the violence treatment caused an additional 0.12 (0.31) live births from women with no (at least one) previous child per 1,000 women in the municipality. This corresponds to 2.4% (4.5%) of the average birth rate of women with no (at least one) previous child–relative to all women–in the municipality (Columns 7 and 8). We conclude that the effect of the ceasefire on the birth rate is driven especially by unmarried and low-educated women, who however had at least one previous child.

Incidentally, the fact that the fertility response to the ceasefire is higher for less educated treated women is consistent with the idea that the marginal utility of additional income should be largest for lower-income households. Indeed, if the ceasefire increased the income of treated municipalities (of we show evidence in section 6.2), then we might expect larger effects for initially poorer households. Note that this conclusion relies on two key assumptions: that education levels are related to initial income, and that the income gains of the ceasefire benefit households across the entire income distribution.

[20] We compute such rates using as the denominator the total number of women (aged 15 to 44) in a municipality. Unfortunately, the denominator can not be refined for each characteristic since we do not have disaggregated municipal population counts for characteristics other than gender and age. That is, we cannot compute the share of married women who give birth in a given year relative to all married women in the municipality, but rather relative to all women in the municipality in the reproductive age range.

[21] This analysis is closer to the main specifications where we split the sample into age groups (Table 2).

[22] Level 1 corresponds to low education levels, elementary or lower. Level 2 to middle school, level 3 to high school, and level 4 to tertiary or postgraduate education.

5.1.4 Individual micro-evidence

The evidence presented so far exploits municipal variation on pre-ceasefire exposure to FARC violence and examines the effect of the permanent ceasefire on municipal fertility aggregates. In this section, we complement those results with individual-level data (that however relies on the same aggregate treatment definition. To that end, we exploit the two waves of the DHS available for Colombia during our sample period. The first such wave was conducted in 2010/2011 and the second in 2015/2016 (just after the start of the ceasefire). The survey, which includes information on intra-household choices, including fertility preferences, is representative at the department (state) level and covers in each round about a third of the over 1,100 Colombian municipalities.[23] We use the DHS with the caveat that it is not representative at the municipal level.[24]

We re-estimate our baseline results on the sub-sample of municipalities from the DHS panel. The results are reported in Table A.6 of the Appendix. The estimated effect of the ceasefire on the TFR in this sub-sample is remarkably similar to the baseline effects. If anything, in our preferred specification the magnitude of the effect is somewhat larger. A one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused a differential increase in the TFR of 0.08 births per woman in their reproductive period (15 to 44 years old) after the ceasefire. This effect is statistically significant and equivalent to 0.13 standard deviations (=0.08/0.624), or to 5 percent of the TFR sample mean (=0.08/1.597). This is reassuring of our baseline results and also suggests that any additional information provided by the DHS/individual-level regressions (which we use in the analysis of the mechanisms below) can be confidently interpreted as suggestive of the effects of the ceasefire on individual-level preferences and choices regarding fertility.

Indeed, with the DHS data we study the effect of the ceasefire on the reported ideal number of children (a proxy of fertility preferences). Unfortunately, we cannot study the effect of the ceasefire on actual individual-level pregnancy or childbearing outcomes. This is because the fieldwork of the second DHS survey available during our sample period took place between January 2015 and March 2016, so the time elapsed between the start of the

[23]Since some municipalities are not present in both rounds, in our analysis we kept the 384 that are.

[24] Most of the other alternative household surveys (such as labor force surveys, quality of life surveys, or the longitudinal survey of Universidad de los Andes -ELCA) target metropolitan areas and aggregate rural areas into larger regions, thus resulting in few observations in FARC-affected municipalities. For instance, less than 2% of the municipalities affected by FARC violence according to our treatment definition are covered by the ELCA panel. This is reasonable as the survey was launched in 2010, well before the ceasefire and thus when conflict levels were high in large parts of the country. In addition, for privacy reasons in most surveys municipal codes are not available to researchers.

ceasefire and the survey collection ranges between one and 14 months. The estimates of the effect of the ceasefire on the ideal number of children, controlling for municipality fixed effects, department-year fixed effects, and individual age dummies, are reported in Columns 1 to 3 of Table 3. Column 1 focuses on all women 15 to 44. We find that, after the ceasefire, treated women report ideally wanting 0.04 additional children on average, relative to women in control areas. This is statistically significant at the 5% level and equivalent to 1.7% of the sample mean. Columns 2 and 3 show that this effect is driven by women older than 25. For them, following the ceasefire, treated women report ideally wanting 0.06 additional children on average, relative to women in control areas. This is 2.3% of the mean (Column 3).

5.1.5 Additional robustness

Our estimates on the effect of the ceasefire on the total fertility rate are robust to additional tests that we describe next. First, while our baseline treatment definition uses the continuous per capita measure of FARC attacks over the period 2011-2014, our results are robust to using several alternative measures of exposure to FARC violence. For instance, when we use a discrete version of the treatment based on the extensive margin of FARC attacks (a measure that may also partly capture FARC presence, see section 3 for a discussion), we find that municipalities that experienced at least one attack by FARC over the period 2011-2014 witnessed a differential increase of 0.08 children per woman after the start of the ceasefire, equivalent to 5.2 percent of the TFR sample mean (see Appendix Table A.7, Columns 1 to 3). Alternatively, we rule out the possibility that our results are driven by a few outliers that experienced an unusually high number of FARC attacks prior to the ceasefire. Appendix Table A.8 reports the robustness of our baseline finding to drop from our estimation sample up to the top 8 FARC-affected municipalities. Finally, we can extend the measure of pre-ceasefire exposition to FARC violence over longer time windows, to show that the results are not an artifact of our baseline treatment definition. Specifically, we backdate our sample period to 2006 (2002), the year that marks the first year of President Alvaro Uribe's second (first) presidential term. Measuring the exposition to FARC violence during these alternative periods produces remarkably similar results, as shown in Appendix Table A.9.

Second, recall that for our baseline results, we estimate equation (2) weighting the observations by the number of live births between 2011 and 2014. However, the results are very similar if we use other weighting variables such as the total population in 2014 or the female population in that same year (see Appendix Table A.10). They are also largely unchanged when we estimate the unweighted counterpart, which yields the average effect of the ceasefire on the TFR across municipalities regardless of their size (see Appendix Table A.7, Columns 4 to 9).

5.2 Identifying assumption

Recall that the validity of our empirical strategy relies on the assumption that, absent the ceasefire, fertility rates would have followed the same trend in treated and control municipalities. In this subsection, we show empirical evidence consistent with this assumption.

First, in Figure 2, we plot the estimated coefficients –together with the 95 percent confidence interval–obtained from estimating equation (3). The figure has the same structure as the first four columns of Table 1, which relies on the baseline sample: the estimates in Panel (a) include municipality and year fixed effects; those in Panel (b) include municipality and department×year fixed effects; Panel (c) adds to the latter specification a set of pre-ceasefire baseline controls interacted with the year fixed effects; and Panel (d) includes, in addition, controls associated with violent and illegal activities. All panels suggest that the estimated coefficients are not statistically significant before the start of the ceasefire, in fact, the point estimates are close to 0, and the p-values for the joint significance test do not reject the null of all the pre-ceasefire coefficients being equal to zero at conventional levels. This result points to the absence of differential trends in the TFR before the ceasefire between municipalities more exposed to FARC violence and places that were less exposed. Moreover, the point estimates increase in magnitude and become significant after the start of the permanent ceasefire, and the magnitude increases over time.[25]

We also study the equivalent dynamics for the specifications that: i) define the exposure-to-FARC treatment over different pre-ceasefire periods; ii) explore the ASFR for different age brackets; and ii) investigate the birth rate. The results for i) are reported in Figure A.4; for ii) in Figure A.5; and for iii) in Figure A.3. The results confirm the absence of pre-trends and the increasing post-ceasefire dynamics regardless of the period used to define exposure, the specific age bracket, or using the birth rate instead of the TFR.

[25]To explore the precise timing of the increase relative to the start of the ceasefire we computed quarterly-level fertility rates from our administrative data and repeated the analysis at a higher frequency. Figure A.2 of the Appendix, in which the omitted period is the last quarter of 2014, suggests that the fertility increase started in the second quarter of 2015. This is consistent with the idea that at least since August 2014, when the military command arrived in Havana to discuss with FARC a potential bilateral ceasefire, FARC's offensive activity decreased. Ultimately. however, President Santos opposed the idea of a bilateral ceasefire and FARC ended up doing it unilaterally. For details see https://shorturl.at/ewPQZ and https://shorturl.at/psGPV (last accessed (04/02/2024).

Second, following Muralidharan and Prakash (2017), we conduct a more parametric test for the existence of differential linear pre-trends between 2011 and 2014. We do so by interacting a linear trend with our measure of exposure to FARC violence and testing the significance of the associated coefficient before the ceasefire.[26] The results are reported in Panel A of Table A.11 in the Appendix, and show no evidence of differential trends before the ceasefire, neither for the TFR nor for most of the ASFR.

Third, we perform a placebo exercise in which we estimate the main specification (equation 2) limited to the pre-ceasefire period (2011-2014), and use as *placebo ceasefire* a series of dummies that equal 1 starting each year from 2012 to 2014. The results are shown in Tables A.12, A.13, and A.14 of the Appendix for placebo treatment years 2012, 2013, and 2014 respectively. We find that there is no differential change neither in the TFR nor in any of the ASFR in areas more exposed to FARC attacks relative to other areas. Again, these results are consistent with the absence of differential pre-trends before the ceasefire.

Fourth, while our baseline sample period starts in 2011, we find no differential pre-trends once we add more pre-ceasefire years. Appendix Figure A.6 shows the non-parametric estimates extending the start year of the sample period 4 years, from 2011 to 2007.[27] The absence of any differential pre-trend gives extra support for our empirical design. It also supports our choice of the December 2014 permanent ceasefire as the main temporal treatment rather than any event taking place prior to it, including the start of the peace negotiations or some of the partial agreements reached early on during the peace talks.

Fifth, following Roth (2022), we use the precision of our estimates in the pre-treatment period (specifically in the extended sample) to compute the pre-trend that has an 80% power of being detected, as well as the adjusted pre-trend that takes into account the pre-testing bias that arises from the fact that the reported analysis is conditional on passing a pre-test. The estimated pre-trend is 0.005, leading to an average bias in the post-period of 0.015 which corresponds to 25% of our estimated coefficient. Similarly, the average bias that takes into account pre-testing bias is 0.011, 19% of our estimated coefficient.

Sixth, we follow Rambachan and Roth (2023) and estimate the 95% confidence set for our parameters of interest after allowing for linear and non-linear deviations from the parallel trends assumption. We estimate such confidence set for the average coefficient

[26] The specification we run is $y_{mdt} = \alpha_m + \lambda_{dt} + \beta(FARC_m \times Trend_t) + \epsilon_{mdt}$, where $Trend_t$ is a linear trend and we restrict the sample to the years 2011 to 2014. Our parameter of interest, β, shows whether there are differential linear trends in municipalities more exposed to FARC's violence.

[27] Appendix Table A.15 Columns 1 and 2 show the average effect for this sample. Moreover, Columns 3 and 4 show that these estimates are also robust to adding municipal-level trends. Unfortunately, we cannot estimate this extended version for the other outcomes due to data availability.

post-ceasefire. In the case of non-linear deviations, we allow the change in the trend from consecutive periods to be as large as ten times the size of the pre-trend that has an 80% power of being detected given the precision of the estimates in the pre-treatment period (as in Roth, 2022). Appendix Figure A.7 reports the confidence sets. We find significant results after allowing for both linear (M = 0) and non-linear deviations (M > 0) of the parallel trends assumption.

Seventh, we implement the Dette and Schumann (2024)'s equivalence test. The intuition of the test is that instead of testing against the pre-ceasefire absence of differential trends, one tests for evidence in favor of the absence of differential trends[28]. Following the authors, we use the average of the pre-ceasefire coefficients to find the minimal bound that would lead to the rejection of the null hypothesis of non-negligible pre-trend differences at 10%. We find that the minimal bound is 0.0148, thus representing 25% of the average of the coefficients in the post-period.

Taken together, this set of results largely validates our empirical strategy and provides credibility to our main result, namely that FARC's permanent ceasefire triggered a differential increase in fertility rates in treated areas.

6 Mechanisms

This section explores the empirical relevance of several potential mechanisms through which the start of the ceasefire differentially increased the TFR, the ASFR, and the birth rate in municipalities previously affected by FARC violence. Understanding the potential mechanisms is essential for developing policy responses to take advantage of the ceasefire's positive effects, as well as counteracting its potentially adverse consequences.

6.1 The reduction in victimization and the perception of security

Illegal armed groups engage in violent coercion to influence various domains of local life in the communities where they are present. By doing so, they influence politics, economics, social relations, and even people's private life. In the specific case of the Colombian conflict, the available evidence suggests that illegal armed actors often regulate mobility, establishing rules about when civilians could be outside their homes, travel, or cross a municipal border. This largely limits the extent of social interactions within conflict-

[28]Note that usually, the null hypothesis is that the pre-treatment coefficients are all 0. Thus, when not rejecting the null hypothesis does not imply that the null hypothesis holds

affected communities (Arjona, 2016). In addition, territorial contestation often entails the use of violence (selective or collective) against civilians. Thus, for reasons either related to territorial dispute or territorial control, people living in conflict-affected areas likely face a non-negligible risk of victimization (Kalyvas, 2006). Colombia's long conflict is not the exception. It resulted in almost 9 million victims registered with the government, about 17 percent of the country's population.[29]

In such contexts of uncertainty and deprivation, parents who must cope with conflict may be less willing to take actions that have specific long-term consequences, such as fertility. In turn, the end of conflict reduces the risk that children may be murdered, injured, or abducted, which likely influences fertility decisions, differentially so in the areas more affected by violence.

We assess the empirical relevance of this potential mechanism in different ways. First, we estimate equation (4) to explore if there are any heterogeneous effects in municipalities that suffered exceptionally high levels of violence prior to the ceasefire. We do so by looking at differential effects based on episodes of the explosion of landmines, instances of internal forced displacement of civilians, and the intensity of children's recruitment by illegal armed groups. All these variables are measured prior to the ceasefire and capture different forms of conflict intensity.[30] The results from these tests are reported in Columns 1 to 3 of Table 4. We find that the differential increase in fertility rates is larger in places that witnessed more landmine explosions (Column 1), in areas that expelled more internal refugees (Column 2), and in places that experienced higher child recruitment prior to the start of the ceasefire (Column 3). This is relevant because Colombia was the second country with the most accidents registered with anti-personnel landmines in 2014 (after Afghanistan), with 286 recorded casualties (Monitor, 2015; Vargas et al., 2024). Colombia is also the second country with the largest refugee population after Palestine,[31] and had one of the highest numbers of child soldiers in the world (Coalition to Stop the Use of Child Soldiers, 2008).[32]

Panels (a.1) to (a.3) of Figure A.8 show the dynamic difference-in-differences specification

[29] The Victim's Registry is a mechanism created by the government to assist and provide reparations to conflict victims. Its scope is only partial because the Registry's legal framework only recognizes victims as of 1st January 1985.

[30] Indeed, they are not very highly correlated. All the cross-correlations are 0.2 with the exception of that of landmines and forced displacement which is 0.7.

[31] See `https://rb.gy/jigrmh` (last accessed 04/02/2024).

[32] Moreover, between 1960 and 2016 almost 17,000 cases of illegal child recruitment into armed groups were recorded in Colombia (CNMH, 2017). While most of these children were boys (68%), girls were also commonly abducted by armed groups.

for each of these heterogeneous effects. We observe that differences prior to the ceasefire for all of them are not significant (with the exception of one year for the incidence of land-mine victims). However, after the start of the ceasefire, there was a differential increase in the TFR in municipalities that had plausibly experienced higher levels of victimization (as parametrized by these variables).

Second, Appendix Table A.16 divides the continuous FARC-exposure measure into terciles and includes indicators of the second and third terciles with the ceasefire period dummy to estimate their differential effect on the TFR relative to the (omitted) first tercile. We find that the effect of FARC exposure is substantially larger in municipalities that were subject to the top tercile of the FARC violence intensity during the period 2011-2014. There, the increase in the TFR after the start of the ceasefire (when these extremely high violence levels disappeared) is 0.26 (0.20+0.06) children per woman. This is equivalent to four times the documented average effect, or 17 percent of the sample mean.

The former two tests suggest that the ceasefire produced larger fertility increases in areas with higher pre-ceasefire FARC violence intensity. This is because these areas experienced larger security gains following the ceasefire. The third test complements this evidence by confirming the inverse: in areas that experienced smaller security improvements (because they were exposed also to violence from other armed groups that were not part of the ceasefire) the fertility increase is mitigated. We show this in Table A.17 of the Appendix. First, we corroborate that, controlling for the interaction of FARC exposure and the ceasefire, the ceasefire had no effect on the total fertility rate in areas exposed to violence by paramilitary groups (Column 1), by the ELN (Column 3) or by both (Column 5). This is consistent with the ceasefire being a regime change that was decided by FARC, and thus exclusive to its areas of influence. Second, the triple interaction is negative in all cases, suggesting that areas affected by FARC and paramilitaries (Column 2), by FARC and the ELN (column 4), or by FARC and both these groups (Column 6) experience a somewhat smaller differential fertility increase.[33]

Fourth, we also show that in communities that were more supportive of the peace agreement with FARC, the differential fertility increase is disproportionately larger. Indeed, after a final agreement was reached in September 2016, Colombia's president asked for the citizen's validation of the agreement in a national referendum that took place on October 2 of that year. We estimate equation (4) to explore potential heterogeneous effects in municipalities with a higher share of the 'Yes' vote, hence where more voters counter-

[33] Although not statistically significant at conventional levels, the p-values for the triple interaction are 15.5% in Column 4 and 10.2% in Column 6.

signed the peace agreement. The results are reported in Column 4 of Table 4.[34]

Fifth and finally, we study a period heterogeneity that is potentially informative of the proposed mechanism. In the first two years after the start of the ceasefire (2015-2016), the peace negotiations were still ongoing and FARC was still present in its strongholds. However, from 2017 onward the implementation phase of the peace agreement started and FARC troops concentrated in a few areas that were targeted to receive reincorporation programs as established by the peace agreement (called ETCR). In this sense, while the first sub-period was characterized by a large reduction in violence following the ceasefire, during the second the perception of security may have further improved due to the departure of former FARC combatants. Relatedly, the withdrawal of FARC may have changed the local norms and informal institutions in its former strongholds. To test this temporal heterogeneity, we estimate a version of equation (2) that adds an interaction between a dummy that equals one since 2017 and the measure of high exposure to FARC violence. The results are reported in Appendix Table A.18. Focusing on the most demanding specification (Column 3), we find that the effect for the initial two years after the start of the ceasefire is 0.02 additional births per woman, and the total effect for the latter period is 0.07 (0.02+0.05).[35] This implies that violence reduction causes a differential fertility increase in treated municipalities that is 29 percent ($= 0.02/0.07$) of the effect caused by both violence reduction *and* the additional perception of security that the departure of FARC may have induced.

6.2 Higher returns for childbearing

A second and related mechanism of our finding regarding the effect of the ceasefire on fertility is the possibility that conflict termination increases the returns of childbearing. This could happen, for instance, if children were normal goods and conflict termination improved economic conditions, or simply if the reduction in conflict activity reduced uncertainty and thus increased both investment and schooling.

We are agnostic about the first option given both the conflicting empirical evidence about the income-to-fertility relationship as well as our inability to test the children-as-normal-goods hypothesis in our context. Regarding the empirical evidence, while evidence based on cross-sectional correlations tends to conclude that children are an inferior good, that

[34] As the peace referendum occurred after the ceasefire. This heterogeneous effect should be interpreted with caution.

[35] In this sense, the average effect for the entire ceasefire period (equal to 0.05, see Table 1) is a weighted average of these two numbers.

based on quasi-experimental causal inference tends to find a positive relationship between income and fertility (e.g. Schaller, 2016 and Lovenheim and Mumford, 2013).[36] Regarding the impossibility of directly testing the hypothesis in our context, this is mainly due to the lack of an individual/household panel data set that includes both an income proxy and fertility choices.[37]

However, there is recent causal evidence that, in Colombia, the ceasefire reduced uncertainty, which in turn improved schooling and promoted local-level entrepreneurship. Indeed, Prem et al. (2023b) document that the ceasefire ignited large differential improvements in a number of educational outcomes in areas formerly affected by FARC's violence, and differentially so in places with more mine victims and forced displacement prior to the ceasefire. Moreover, Bernal et al. (2024) find that the ceasefire triggered a differential creation in FARC-affected areas of new (formal and informal) firms across all economic sectors, and increased local employment levels. Moreover, they provide suggestive evidence about the main mechanism being an overall reduction in uncertainty. Consistently, de Roux and Martinez (2020) find that in these areas the peace agreement increased the demand for agricultural credits.

In addition to this existing evidence, we use the DHS micro data to explore whether treated women have a higher probability of work after the ceasefire, relative to women in control areas. If the ceasefire translated into (at least short-term) employment opportunities, this would be consistent with the proposed mechanism, namely that the ceasefire increased the economic prospects of people in treated areas. We report these results in Columns 4 to 6 of Table 3. We find that the ceasefire increased the probability that women work, but only for women older than 25 (which are incidentally those for which the positive effect on the ideal number of children is the highest). This increment is 0.02 percentage points, equivalent to 3.3% of the sample mean. To the extent that higher short-term employment opportunities for women can at least partially translate into higher income down the road, this is suggestive of the proposed mechanism.

Overall, the evidence of this section suggests that in addition to becoming a safer place to raise children, municipalities previously exposed to FARC violence also became a better place to reap the returns from childbearing with better economic opportunities and improved schooling. While we acknowledge that better economic and labor market proxies

[36] The income-fertility relationship can also be a function of the time lapsed. Considering a permanent income shock, Lindo (2010) finds that households respond with a reduction in the number of children in the short run, but with an increase in the long run.

[37] The DHS, for instance, is not a panel. The only household panel survey in Colombia is the ELCA, but there is virtually no overlap with our treatment definition (see footnote 24).

may also increase the opportunity cost of childbearing and thus *reduce* fertility, what is the dominant effect is an empirical question. In our context, recall the fertility increase in FARC-affected areas after the start of the ceasefire is driven by a differential deceleration of a fertility downward trend relative to the rest of the country and not by an absolute fertility increase. So, our findings are not contradictory with the idea that secular increases in income reduce fertility.

6.3 Parental investment

Also related to the idea that parents who must cope with the risks and uncertainty associated with conflict are less likely to take long-term fertility actions, is the notion that such parents may have less time and emotional leeway to invest quality time with their children. Therefore, when violence is no longer a worry that entertains parents, they may have more time to allocate to raising children, which in turn affects fertility decisions. We empirically explore this third potential mechanism using the individual-level DHS data and specifically the questions about parental investment that are common to the 2010 and 2015 waves. In particular, we explore the pre-defined set of answers to the questions on *who takes care of the children when the mother leaves the home*, and *who punishes the children*. For the first question, we distinguish between actors that are external to the household –but conditional on the caring taking place outside the school– (such as neighbors or friends) and the partner of the interviewed woman (who is likely the children's father). For the second, we distinguish between the options: 'mother or father', 'mother and father', and 'nobody'. With nuances that distinguish among them, the first two options pick up the idea that either the father or the mother (or both) are involved in sanctions, whereas the third suggests that misbehavior goes unpunished.

The results are reported in Table 5. Controlling for municipal and department-year fixed effects as well as for time-invariant individual-level characteristics of the interviewed woman, we find that in households located in the treated area, the probability that they are taken care of by the woman's partner increases after the ceasefire. Moreover, the probability that children go unpunished decreases, and the probability that either the mother or the father (or both) sanction them increases. Without delving into questions regarding the type of punishment inflicted by parents (mainly because of lack of data), both these findings suggest that parental investment increases in treated municipalities after the ceasefire.

6.4 Child replacement

A fourth potential reason behind the observed post-ceasefire dynamics in fertility rates in treated and control municipalities has to do with the *child replacement* theory. In other contexts, it has been documented how parents may want to replace children who were lost as a result of the conflict (Schindler and Bruck, 2011; Rutayisire, 2014; Kraehnert et al., 2018; Heuveline and Poch, 2007).

While this theory generally refers to the behavior after events that lead to very high levels of child mortality in relatively short periods, rather than to low-intensity and long-lasting conflicts such as Colombia's, we test it by estimating equation (4) to explore if there are any heterogeneous effects in municipalities where infant mortality was higher prior to the start of the ceasefire.[38] Indeed, in such places child replacement would have been more likely to occur. Column 5 of Table 4 shows this is not the case. Further, Panel (a.4) of Figure A.8 shows that this differential effect was zero for all the years before the start of the ceasefire, as well as afterward. Hence, we find no empirical support for this mechanism.[39]

6.5 Marriage markets

There is evidence that conflict may disrupt marriage markets, as it generates a shortage of eligible men (De Walque, 2006); delays marriage decisions (Shemyakina, 2009; Curlin et al., 1976); and increases the incidence of divorce (Agadjanian and Prata, 2002; Woldemicael, 2008). In turn, conflict termination could restore the functioning of these disrupted markets and therefore have a positive effect on fertility.

Our assessment of this potential mechanism is threefold. First, we test whether the places that were more affected by FARC violence witnessed after the ceasefire a differential increase in the share of births from mothers cohabiting with their partner (whether or not formally married). The results are reported in Table 6. In Column 1, we find that this effect is indeed positive, but rather small (0.2 percent of the variable's mean) and not statistically significant.

Second, we explore whether there was a differential increase in the rate of married individuals in FARC-affected areas after the start of the ceasefire. To that end, we estimate

[38] This is defined as the number of deaths of children under 1 year per 1,000 live births, between 2011 and 2014.

[39] However, this should be interpreted cautiously given the long nature of the Colombian conflict. If households are willing to replace children who died several years ago, this test will not be enough as child mortality rates might differ over time.

a version of equation (2) using as a dependent variable the census-based proportion of married (or cohabiting with a partner) individuals between 18 and 49 years of age.[40] In Columns 2 to 7 of Table 6, we find no differential change in the rate of married or cohabiting individuals in treated municipalities.[41]

Third, and more qualitatively, we use data from MinSalud and Profamilia (2017) to estimate that the median age at which women marry or start cohabiting in Colombia is 21.4 years. However, recall from Table 2 that the differential increase in the TFR in treated municipalities is not driven by the 20-24 age window (nor by any specific age bracket for that matter). Overall, we conclude that the empirical evidence for this alternative mechanism is, at best, very weak.

6.6 Healthcare delivery systems

Fertility rates may have differentially increased in treated municipalities due to a proportionally better improvement in the quality of health services in these areas relative to places less exposed to FARC violence. This may be the case, for instance, if post-conflict investment in public goods and basic services targeted former FARC strongholds more than other areas. If so, this may have resulted in increased access to maternal, sexual, and reproductive health.

We test this hypothesis by estimating equation (2), examining the dynamics of a range of variables related to health infrastructure and the functioning of the health sector before and after the start of the ceasefire and in treated municipalities relative to the control. The results are reported in Table 7. Column 1 looks at the number of prenatal care visits and finds a statistically significant differential increase of 0.03 visits in treated municipalities after the start of the ceasefire, but only when the baseline controls are included (Panel B). Moreover, this effect is very small, equivalent to 0.5 percent of the mean. Column 2 considers the proportion of births attended by a healthcare professional or a traditional midwife. The lack of a significant effect rules out that the observed increase in the TFR is explained by the behavior of formal birth and registration channels rather than by an

[40] Limited by the census years, this regression uses only two years of data: one prior to the start of ceasefire (the 2005 census) and one afterward (the 2018 census). Hence, the dynamic specification cannot be estimated for this outcome.

[41] One potential caveat of using two census cross-sections for this analysis is that the ex-post minimum detectable effect (MDE) is larger relative to that of our main analysis. Specifically, the ex-post MDE of Column 2 is 0.26 standard deviations, five times larger than that of Column 1 of Table 1.

actual differential fertility increase.[42]

Further, Columns 3 to 6 examine variables related to health services and infrastructure (normalized by 1,000 inhabitants). We find that, after adding the baseline controls, the ceasefire did not translate into a significant differential improvement in the number of maternal therapeutic support, the number of hospital beds, or the number of hospital wards in treated municipalities. The number of ambulances does significantly increase, but the magnitude of the effect is very small (equivalent to 4 percent of the mean).

In addition, Figure A.9 reports the dynamic non-parametric estimates for these outcomes, confirming graphically that most of them do not react to the ceasefire by changing differentially in treated municipalities. If anything, the availability of some healthcare services might have differentially declined.[43]

The lack of empirical validity of this mechanism is probably due to the fact that long-lasting, low-intensity conflicts such as Colombia's are less destructive of key social infrastructure and thus less disruptive of basic services such as education and health. For instance, while there were cases in which health professionals were caught in the middle of conflict, they were usually allowed to work (Arjona, 2016). Moreover, any service disruption may take a long time to overcome, while our post-ceasefire sample period only lasts four years.[44]

6.7 Child health improvement

Related to the previous mechanism, conflict affects the health of existing children as well as that of newborns (Mansour and Rees, 2012; Leon, 2012; Camacho, 2008). If so, then large violence drops may mechanically increase fertility rates. Moreover, improvements in the health of children may increase the returns of fertility.

We test the empirical relevance of this potential mechanism by looking at the extent to which the ceasefire differentially affected the survival of children, an outcome typically associated with better health services. Specifically, we estimate equation (2) on maternal mortality, fetal mortality, neonatal mortality rate, infant mortality rate, and under-5

[42]In fact, as reported in Table A.2, the proportion of births attended by healthcare professionals was already 97 percent before the ceasefire.

[43]The parametric test for differential pre-trends is presented in Table A.11 and the placebo tests are presented in Tables A.12, A.13, and A.14. In both cases, we do not find evidence of differential pre-trends.

[44]Note that, while there are a couple of negative and significant estimates in Table 7, specifically in the specification that adds no controls (Panel A), in these cases the direction of the coefficients go against the potential relevance of this channel.

mortality rate. For the latter outcome, we distinguish between the overall mortality rate, the mortality rate due to acute diarrhea disease (ADD), and that due to acute respiratory infection (ARI). ADD and ARI are two of the most common underlying causes of death for children under the age of 5. The results are reported in Table 8. Perhaps owing to the low intensity and long duration of the conflict, we find no significant differential change in any of the mortality rates in treated municipalities after the start of the ceasefire. Figure A.10 reports the non-parametric estimates for these outcomes, confirming graphically that neither of them presented differential pre-trends prior to the ceasefire, and that most of them do not react to the ceasefire by changing differentially in treated municipalities.[45]

A second channel through which this mechanism may operate is through improvements in the health conditions of newborns. For instance, if the reduction in violence results in mothers experiencing less stress, or else if the age composition of mothers changed in treated municipalities, then fertility may increase via better health outcomes for babies at birth. Table 9 shows the results of estimating the main specification (equation 2) on classic indicators of newborn health. We find no significant differential effect of the ceasefire on low birth weight (LBW, defined as less than 2,500 grams at birth), on the 1 or 5 minutes APGAR, on preterm births (defined as births taking place before week 37 of pregnancy), or on the share of births through C-section. In turn, Figure A.11 shows that there are no differential pre-trends or post-ceasefire effects for most of these outcomes.[46]

6.8 Selective migration

Instead of being driven by the renewed optimism and sense of safety of the households that were exposed to FARC's violence prior to the start of the ceasefire, the differential increase in fertility could be driven by the arrival of migrants coming from other parts of the country. On the one hand, once FARC ceases to be a threat, formerly displaced households may return to their land. On the other, the new economic opportunities generated by the post-ceasefire entrepreneurship dynamics (Bernal et al., 2024) could attract economic migrants.

In Table 10, we test the empirical relevance of this alternative explanation. First, using our most demanding specification, we show that the start of the ceasefire did not translate into a differential rate of formerly displaced returning households. The point estimate

[45]The parametric test for differential pre-trends is presented in Table A.11, and the placebo tests are presented in Tables A.12, A.13, and A.14. In both cases, we do not find evidence of differential pre-trends.

[46]The parametric test for differential pre-trends is presented in Table A.11, and the placebo tests are presented in Tables A.12, A.13, and A.14. In both cases, we do not find evidence of differential pre-trends.

is actually small when compared with the sample mean (Column 1).[47]

Second, we look at the 2018 population census (the first after 2005) and show that, in the cross-section, our measure of FARC exposure is not correlated with the arrival of migrants, neither in the past five years (Column 2) nor in the last 12 months (Column 3). Moreover, we find similar results when splitting the population into those younger or older than 30 years old (see Columns 4 to 7). Overall, the evidence suggests that migration is not a likely driver of our findings.

6.9 Changes in the fertility of ex-combatants

The final mechanism that we consider is related to post-ceasefire changes in the fertility of former FARC soldiers. As with many other insurgencies, evidence suggests that FARC interfered in the private lives of their members, prohibiting romantic relationships and interrupting pregnancies to avoid having small children in their camps (Arjona and Kalyvas, 2008). Several anecdotal accounts suggest that, after the start of the ceasefire, the possibility of raising their children encouraged some FARC members to have babies.[48] This could, at least partially, explain our findings.

We test this potential mechanism by estimating equation (4) to look at heterogeneous effects in the municipalities in which FARC concentrated on receiving reincorporation programs and benefits (the ETCR). This indicator, however, only takes value one since the ETCR actually became binding, in 2017; so it varies both in the cross-section and over time. In this sense, the coefficient of the triple interaction between the ceasefire period dummy, the FARC exposure measure, and the ETCR dummy captures the differential fertility change in FARC-affected areas that became ETCR from 2017 onward, and the pre-2017 change in such places is picked up by the double interactions that saturate the regression model.

The results are reported in Column 5 of Table 4. Note that the coefficient associated with the interaction between the FARC-affected areas and the ceasefire period is still significant and only slightly smaller in magnitude than the baseline estimate (0.034 versus 0.042 as reported in Table 1). However, the coefficient associated with the triple interaction is almost four times as large. This suggests that while FARC ex-combatants indeed seem

[47] Note that this is a reliable figure because it comes from the official Victims' Registry of the Colombian government (RUV from the Spanish acronym). Internal refugees as well as other types of victims have incentives to register in order to get reparations and other benefits from the government.

[48] See https://rb.gy/j2a3pw, https://rb.gy/2pb645, and https://rb.gy/9mcsiw (last accessed 04/02/2024).

to have experienced a large baby boom after their demobilization, this phenomenon can only explain a rather small proportion of the documented average effect for the entire country. Moreover, Panel (a.5) of Figure A.8 reports the dynamic estimates of this heterogeneity. The figure shows no differential TFR pre-trends in treated municipalities before the ceasefire and during the first two years after its enactment. However, starting in 2017, there is a small –albeit no significant–differential increase in FARC areas assigned to ETCR.

7 Conclusion

This paper contributes to the intersection of demography, health, and economics to study a policy-relevant research question: What is the short-term effect of the end of a long-lasting, low-intensity civil conflict on fertility? While we study the case of the recent peace agreement between the Colombian government and the FARC insurgency, this research question is potentially very relevant in other contexts as well. Indeed, Fearon (2004) documents that even in the context of a declining civil war incidence since the end of the Cold War, the average duration of internal conflicts has steadily increased over time. As of today, there are several other active long-lasting low-intensity conflicts, such as those of the Philippines, Chad, and Sudan (Pettersson et al., 2021; Harbom et al., 2008).

To answer this question, we exploit the temporal variation given by the permanent ceasefire declared by FARC in December 2014, as well as the cross-sectional variation given by the pre-ceasefire exposure to FARC's violence. We find that a one-standard-deviation increase in the number of FARC attacks per 10,000 inhabitants over the period 2011-2014 caused a statistically significant differential increase of 0.05 births per woman after the start of the ceasefire, equivalent to a 3.2 percent of the average total fertility rate. Moreover, an effect of similar size (2 to 4 percent of the average rate) is also present across a wide range of age-specific fertility rates, from 15 to 44 years.

This relative *baby boom* took place in a general context of declining fertility rates in Colombia. Thus, rather than an absolute increase in fertility, it represents a smaller fertility reduction in violence-affected areas during the post-ceasefire period.

We also shed light on the underlying mechanisms that explain the differential fertility increase in the violence-affected municipality after the start of the ceasefire. Unlike the instances in which fertility is shown to increase *during* violent periods, the positive post-conflict fertility response documented in this paper is not concomitant to the deterioration of newborn outcomes. We also rule out a number of the mechanisms traditionally highlighted by the literature to explain the baby booms observed after the end of high-intensity and short conflicts or following natural disasters. These include the replacement of lost children, the recovery of marriage markets, and improved health infrastructure and services. Instead, we find supporting evidence favoring a less studied mechanism: Our results are consistent with a differential fertility surge driven by improvements in security, improvements in economic and education prospects that increase the returns of childbearing, and increases in parental investments.

Our findings, therefore, shed light on the broader question of how peaceful environments shape household decisions. While conflicts are aggregate shocks –and thus have the potential to modify several socio-economic determinants of fertility–we document that the main driver of the observed *relative* baby boom is the improved security and the concomitant peace dividends related to economic activity and educational opportunities: Families are more willing to have children when they witness improvements in the environmental conditions that favor their nurture and development. A safer environment where the returns to education can be harvested in the long run in favor of more productive citizens and there are better economic opportunities may naturally shape fertility choices. This is in line with the literature that documents a negative aggregate relationship between economic insecurity (triggered for instance by a large recession) and fertility (Schneider, 2015; Ananat et al., 2013), and with the literature about the same sort of relationship between household-specific income uncertainty and fertility choices (Sommer, 2016). This paper documents that an aggregate *positive* shock (the end of a conflict) mitigates the secular fertility reduction of exposed areas.

Clearly, however, the extent to which differential fertility increases are able to generate better outcomes down the road also depends on the role of local and federal governments in consolidating instances of early childhood stimulation programs that may reduce externalizing behaviors and boost socio-emotional skills (Walker et al., 2011; Attanasio et al., 2016). This is also key to breaking the current epidemic of violence that sieges Latin America and the Caribbean.

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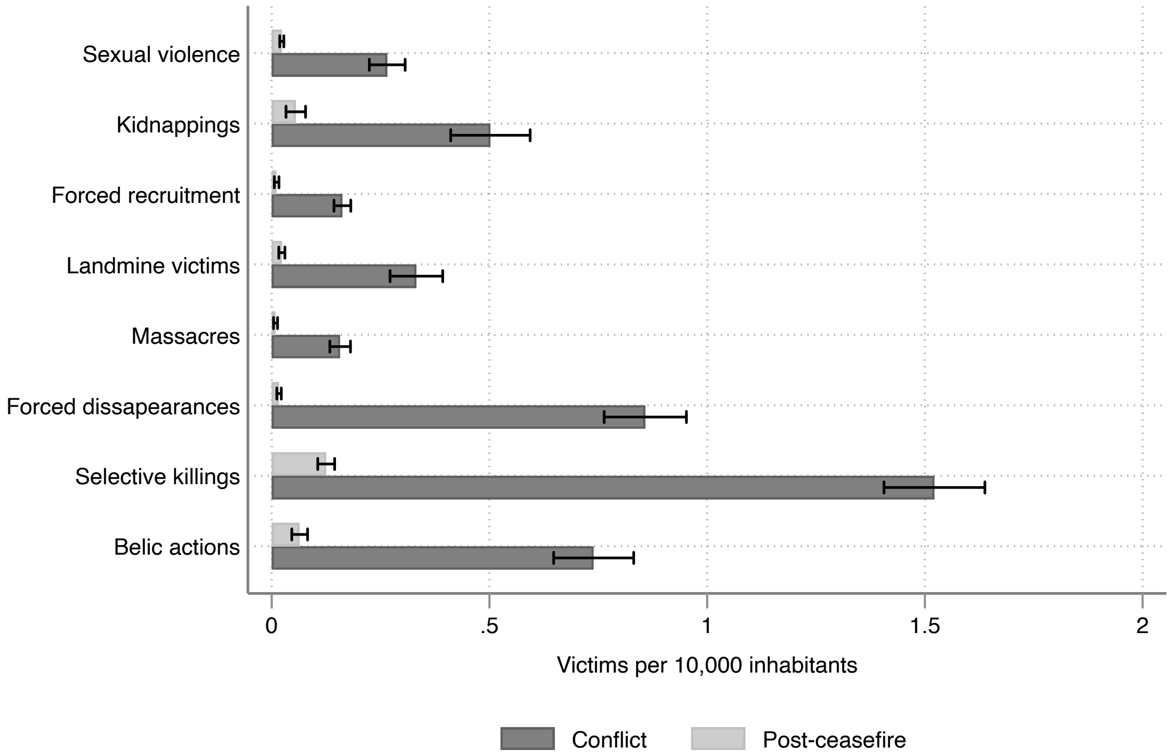
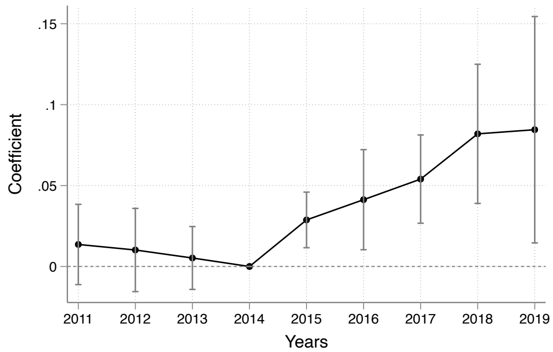
Figure 1: Change in conflict after ceasefire

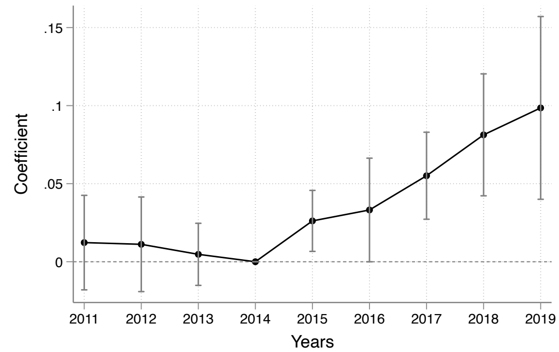


Notes: This figure presents the change in conflict related events after the ceasefire. We present average across municipalities and 95% confidence intervals.

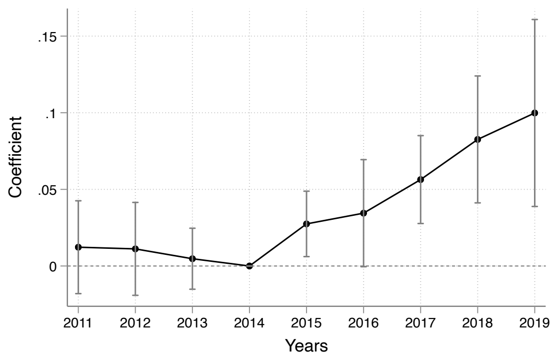
Figure 2: Dynamic difference-in-differences for total fertility rate



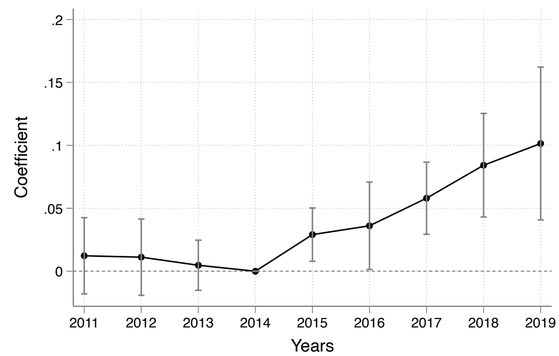
(a) Baseline



(b) Adds dept-year FE



(c) Adds dept-year FE and baseline controls



(d) Adds dept-year FE, and baseline and illegal activities controls

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

Table 1: Total fertility rate and ceasefire

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Total Fertility Rate							
	Baseline sample				Alternative controls			
Cease × FARC	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.06***	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	
Observations	9,828	9,828	9,828	9,828	4,968	8,136	4,851	9,828
R-squared	0.880	0.913	0.915	0.915	0.920	0.914	0.924	
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year FE	Yes	No	No	No	No	No	No	
Dept-Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	
Baseline controls	No	No	Yes	Yes	No	No	No	
Extended controls	No	No	No	Yes	No	No	No	
Municipalities	1092	1092	1092	1092	552	904	539	1092
Mean Dep. Var.	1.541	1.541	1.541	1.541	1.602	1.543	1.585	1.541
Std. Dev. Dep. Var.	0.604	0.604	0.604	0.604	0.626	0.593	0.628	0.604

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. *Total Fertility Rate* is the number of live births from a hypothetical woman in her reproductive life (15-45 years of age). It is computed as the sum of age-specific fertility rates weighted by the number of years in each age group (i.w, multiplied by 5), divided by 1,000. Column 3 adds predetermined municipal controls interacted with the ceasefire dummy. These 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. In column 4, we add as additional controls coca and gold suitability and a dummy for any attacks of other armed groups from 2011 to 2014. In column 5, we restrict the sample to only municipalities that experienced at least one attack from an illegal armed group between 2011 and 2014. In column 6, we exclude from the control municipalities those that were neighbors of FARC-affected municipalities. In column 7, we estimate a propensity score using all the previously mentioned covariates and then truncate the empirical distribution of the propensity score using the optimal cut by Crump et al. (2009). In column 8, we estimate a synthetic difference-in-differences model following Arkhangelsky et al. (2021). Clustered robust standard errors at the municipality level are presented in parentheses. In square brackets, we present the p-values for standard errors control for spatial and first-order time correlation (see Conley, 1999, Conley, 2016). We allow spatial correlation to extend to up to 100 km from each municipality's centroid, which is the average distance from one municipality to all the rest. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table 2: Age-specific fertility rates and ceasefire

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44
Panel A						
Cease × FARC	0.0022***	0.0034***	0.0023***	0.0012**	0.0006*	0.0006**
	(0.0007)	(0.0010)	(0.0009)	(0.0006)	(0.0004)	(0.0003)
R-squared	0.862	0.878	0.853	0.823	0.760	0.626
Panel B: Adding baseline controls						
Cease × FARC	0.0019***	0.0033***	0.0026***	0.0014**	0.0010**	0.0006**
	(0.0007)	(0.0011)	(0.0009)	(0.0007)	(0.0004)	(0.0003)
R-squared	0.865	0.879	0.857	0.825	0.764	0.628
Observations	9,791	9,792	9,801	9,765	9,783	9,783
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1089	1088	1089	1085	1087	1087
Mean Dep. Var.	0.0677	0.0847	0.0720	0.0558	0.0309	0.0103
Std. Dev. Dep. Var.	0.0280	0.0347	0.0322	0.0267	0.0167	0.00845
p-value MHT	0.11	0.05	0.06	0.11	0.11	0.11
Effect size	0.0677	0.0937	0.0817	0.0817	0.0572	0.0759

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. *Age-specific fertility rate* is the number of live births to women in the age-group per woman in the same age range in the municipality each year. All columns add predetermined municipal controls interacted with the ceasefire dummy. These 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. *Effect size* is computed as the coefficient for Cease *times* FARC in Panel B divided by the standard deviation of the dependent variable. *p-value MHT* shows the p-value that controls for the false discovery rate due to multiple hypothesis testing following Jones et al. (2019) and Westfall and Young (1993). Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 3: Effect of the ceasefire on the ideal number of children and on the probability of working – DHS sample

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Ideal number of children			Woman works		
	All	15-25	25+	All	15-25	25+
Cease × FARC	0.04**	-0.01	0.06***	-0.001	-0.03*	0.02*
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Observations	50,032	17,715	32,314	50,032	17,715	32,314
R-squared	0.146	0.116	0.130	0.136	0.135	0.081
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Department-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	384	379	384	384	379	384
Mean Dep. Var.	2.392	2.019	2.598	0.516	0.350	0.608
Std. Dev. Dep. Var.	1.359	0.891	1.519	0.500	0.477	0.488

Notes: This table presents the results from the main specification in equation (2) using data from the 2010 and 2015 DHS surveys. All regressions are by the survey weights. *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. Baseline controls include age, marital status, and education level fixed effects. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table 4: Heterogeneous effects by municipality characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Total fertility rate					
Z:	Mines victims	Forced displacement	Child recruitment	Vote share pro-peace	Infant mortality	ETCR
Cease × FARC × Z	0.01**	0.03***	0.01	0.02**	0.01	0.15**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.07)
Cease × FARC	0.04**	0.03**	0.05***	0.04**	0.05***	0.04***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Cease × Z	-0.02**	-0.04***	-0.01	-0.00	0.05**	-0.06
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.07)
Observations	9,828	9,828	9,828	9,819	9,828	9,828
R-squared	0.913	0.913	0.913	0.913	0.913	0.914
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1091	1092	1092
Mean Dep. Var.	1.606	1.606	1.606	1.607	1.606	1.606
Std. Dev. Dep. Var.	0.596	0.596	0.596	0.594	0.596	0.596

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. *Mines victims* is a standardized measure of the number of victims related to antipersonnel landmines between 2011 and 2014 over the population. *Forced displacement* is the number of population expelled in a municipality due to forced displacement between 2011 and 2014 over the population. *Child recruitment* is a standardized measure of the number of children recruited by illegal armed groups in 2014 over the population. *Vote share pro-peace* is the standardized vote share in favor of the peace agreement in the 2016 Plebiscite. *Infant mortality* is the number of deaths of children under 1 year old between 2011 and 2014 per 1,000 live births. *ETCR* is a dummy that takes the value for municipalities with Territorial Training and Reincorporation Spaces. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table 5: Effect of the ceasefire on parenting decisions

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Who takes care of children when mother leaves		Who punish children		
	Outside family or school	Partner	Father or mother	Father and mother	Nobody
Cease × FARC	-0.003	0.03**	0.02***	0.03***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	16,446	16,446	35,622	35,622	35,622
R-squared	0.087	0.114	0.135	0.217	0.131
Municipality FE	Yes	Yes	Yes	Yes	Yes
Department-Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Municipalities	380	380	383	383	383
Mean Dep. Var.	0.159	0.152	0.877	0.411	0.101
Std. Dev. Dep. Var.	0.365	0.359	0.328	0.492	0.302

Notes: This table presents the results from the main specification in equation (2) using data from the 2010 and 2015 DHS surveys. All regressions are by the survey weights. The sample is restricted to women who had at least one child/step-child living with them during the last year. For columns (1) and (2) the question is "Who usually takes care of the child when you leave the house?". It is a single-response question with items: (i) Interviewee carries it with her; (ii) Husband/partner; (iii) an older female child; (iv) an older male child; (v) grandparents; (vi) other relatives; (vii) Neighbours; (viii) Friends; (ix) Domestic worker; (x) Child is in school; (xi) ICBF care; (xii) Other institution; (xiii) Other. Column (1) corresponds to responses (vi) to (xiii), excluding (x); while column (2) corresponds to option (ii). For columns (3) to (5), the question is "Who punishes (punished) your children (or step-children) in the household". This is a multiple choice question where the responses are father/step-father, mother(interviewed person)/step-mother, other person, nobody/they are not punished. *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. Baseline controls include age, marital status, and education level fixed effects. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table 6: Marriage markets

Dependent variable:	(1) Share births cohabiting parents	(2) Share pop. ever married (Census)	(3)	(4)	(5)	(6)	(7)
		All		Between 18 and 29		Between 30 and 49	
Cease × FARC	-0.018	0.006	0.005	0.002	0.005	0.005	0.001
	(0.143)	(0.007)	(0.005)	(0.008)	(0.006)	(0.006)	(0.006)
Observations	9,828	2,166	2,166	2,166	2,166	2,166	2,166
R-squared	0.766	0.877	0.910	0.898	0.928	0.865	0.894
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department-Year FE	Yes	No	Yes	No	Yes	No	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	81.19	0.521	0.521	0.334	0.334	0.716	0.716
Std. Dev. Dep. Var.	10.06	0.0504	0.0504	0.0608	0.0608	0.0546	0.0546

Notes: This table presents the results from the main specification in equation (2). In column 1, the dependent variable is the share of births from cohabiting parents. In columns 2 to 7, the dependent variable is the share of the population ever married using data from the 2005 and 2018 Census. Columns 2 and 3 show the results for people between 18 and 49 years old, columns 4 and 5 for people between 18 and 29 years old, and columns 6 and 7 for people between 30 and 49 years old. *Cease* is a dummy that takes the value for the period after 2014. *FARC* a dummy variable that takes the value one if there was at least one violent case by FARC. All columns add predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table 7: Infrastructure and operation of the health sector

Dependent variable:	(1) Antenatal care	(2) Births attended by health prof	(3) Ambulances	(4) Therapeutic support	(5) Hospital beds	(6) Medical wards
Panel A						
Cease × FARC	-0.006	-0.063	0.007**	-0.009***	-0.019	-0.007**
	(0.023)	(0.167)	(0.003)	(0.003)	(0.016)	(0.003)
R-squared	0.921	0.995	0.883	0.690	0.894	0.699
Panel B: Adding baseline controls						
Cease × FARC	0.032**	-0.084	0.007**	-0.001	-0.006	0.001
	(0.014)	(0.177)	(0.003)	(0.003)	(0.017)	(0.003)
Observations	9,828	9,828	8,678	8,678	8,678	8,678
R-squared	0.924	0.995	0.885	0.747	0.897	0.720
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	5.753	97	0.162	0.000969	0.827	0.0941
Std. Dev. Dep. Var.	1.096	9.113	0.179	0.0135	1.042	0.102
p-value MHT	0.26	0.97	0.30	0.97	0.97	0.97

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 and 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* refers to the average of ante-natal care visits in the municipality per 100 live births in the municipality each year. *Births attended by health professionals* is the proportion of live births that were attended by doctors, nurses, health promoters, and nursing assistants. *Ambulances* is the number of ambulances for every 1,000 inhabitants. *Therapeutic support* is the number of therapeutic chairs for every 1,000 inhabitants. *Hospital beds* is the number of hospital beds for every 1,000 inhabitants. *Medical wards* is the number of medical wards (delivery room, procedure room, and operating room) for every 1,000 inhabitants. All columns in panel B add predetermined municipal controls interacted with the ceasefire dummy. These 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. *p-value MHT* shows the p-value that controls for the false discovery rate due to multiple hypothesis testing following Jones et al. (2019) and Westfall and Young (1993). Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 8: Maternal, Neonatal, and infant mortality

Dependent variable:	(1) Maternal mortality	(2) Fetal mortality	(3) Neonatal mortality	(4) Infant mortality	(5) Under-5 mortality	(6)	(7)
					Overall	ADD	ARI
Panel A							
Cease × FARC	0.63	0.29	-0.21*	-0.62**	-0.21	-0.60	0.41
	(4.03)	(1.09)	(0.12)	(0.30)	(0.20)	(0.54)	(0.98)
R-squared	0.218	0.743	0.346	0.431	0.443	0.450	0.354
Panel B: Adding baseline controls							
Cease × FARC	0.06	1.03	-0.02	0.05	0.10	-0.82	0.61
	(4.14)	(1.08)	(0.12)	(0.22)	(0.18)	(0.55)	(1.06)
Observations	9,828	9,813	9,828	9,828	9,828	9,828	9,828
R-squared	0.219	0.744	0.372	0.468	0.465	0.451	0.355
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	107	43.02	7.540	25.23	16.07	3.927	12.89
Std. Dev. Dep. Var.	1546	43.93	10.46	29.41	17.59	26.81	40.78
p-value MHT	0.99	0.90	0.99	0.99	0.96	0.68	0.96

Notes: This table presents the results from the main specification in equation (2). *Maternal mortality rate* is the mother's mortality rate within 42 days of giving birth. *Fetal mortality rate* is the number of fetal deaths, regardless of the gestational age of the fetus, per 1,000 known pregnancies. *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. *Under-five mortality rate* is the number of deaths under 5 years old per 1,000 live births per year. ADD and ARI means Acute Diarrhoeal Disease and Acute Respiratory Infections, respectively. All regressions are weighted by the number of live births between 2011 and 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. All columns in panel B add predetermined municipal controls interacted with the ceasefire dummy. These controls include the number of victims related to anti-personnel mines, the share of the rural population, distance to the department capital, poverty index, and logarithm of the population in 2010. *p-value MHT* shows the p-value that controls for the false discovery rate due to multiple hypothesis testing following Jones et al. (2019) and Westfall and Young (1993). Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 9: Newborn health

	(1)	(2)	(3)	(4)	(5)
		APGAR			
Dependent variable:	LBW	1 min	5 min	Preterm birth	C-Section delivery
Panel A					
Cease × FARC	-0.075	0.005	0.000	-0.293**	-0.118
	(0.069)	(0.004)	(0.003)	(0.126)	(0.209)
R-squared	0.560	0.803	0.753	0.631	0.920
Panel B: Adding baseline controls					
Cease × FARC	-0.067	0.005	-0.002	-0.293**	0.124
	(0.075)	(0.004)	(0.004)	(0.129)	(0.164)
Observations	9,828	9,827	9,827	9,828	9,828
R-squared	0.560	0.804	0.754	0.633	0.922
Municipality FE	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1092	1092
Mean Dep. Var.	7.795	8.116	9.541	17.03	35.19
Std. Dev. Dep. Var.	4.251	0.577	0.639	5.953	14.62
p-value MHT	0.74	0.74	0.74	0.16	0.74

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 and 2014, and is standardized 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 birth* corresponds to the percentage of babies who were born alive before 37 gestational weeks. *C-Section delivery* is the number of babies delivered by cesarean per 100 live births. All columns in panel B add predetermined municipal controls interacted with the ceasefire dummy. These 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. *p-value MHT* shows the p-value that controls for the false discovery rate due to multiple hypothesis testing following Jones et al. (2019) and Westfall and Young (1993). Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table 10: Migration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Forcibly	2018 Census migrants					
	displaced	All		Age < 30		Age > 30	
	returnees	5 years ago	1 year ago	5 years ago	1 year ago	5 years ago	1 year ago
Cease × FARC	0.03						
	(0.09)						
FARC		0.50	0.08	0.60	0.11	0.38	0.03
		(0.43)	(0.15)	(0.44)	(0.19)	(0.43)	(0.13)
Observations	9,828	19,487,792	19,487,792	9,021,286	9,021,286	10,466,506	10,466,506
Municipalities	1092	1092	1092	1092	1092	1092	1092
R-squared	0.481	0.027	0.007	0.027	0.008	0.032	0.008
Municipality FE	Yes						
Year FE	No						
Dept-Year FE	Yes						
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department FE		Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.999	9.623	2.838	10.56	3.453	8.840	2.323
Std. Dev. Dep. Var.	2.885	29.49	16.60	30.73	18.26	28.39	15.06

Notes: This table presents the results from two different specifications. In column 1, we present results using the main specification in equation (2). The dependent variable in this column is the share of the number of people forcibly displaced that returned to their municipality of origin over the population. In columns 2 and 3, we present a cross-section regression using data from the 2018 Census. The dependent variable in column 2 (3) is a dummy that takes the value 100 if an individual was in a different municipality to the one where it is being surveyed five (one) years ago. Columns 4 and 5 (6 and 7) restrict the Census sample to people younger (older) than 30 years old. *Cease* is a dummy that takes the value for the period after 2014. *FARC* a dummy variable that takes the value one if there was at least one violent case by FARC. All columns add predetermined municipal controls, and in column 1, we interact them with the ceasefire dummy. These 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. In columns 2 to 7, we also add individual-level controls that include age, a dummy for urban location, and gender. Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Online Appendix (Not for publication)

A Peace Baby Boom? Evidence from Colombia's Peace Agreement

María Elvira Guerra-Cújar, Mounu Prem, Paul Rodriguez-Lesmes and Juan F. Vargas

Data appendix: Description of variables and sources

Dependent variables. We used four different databases to create the dependent variables: The source for creating the fertility and health variables is 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 health sector's infrastructure data is collected by the Special Register of Health Service Providers (REPS from the Spanish acronym), the official database where all health service providers in the country and their services are registered. Finally, to obtain information on marital status, we used the censuses conducted between 2005 and 2018.

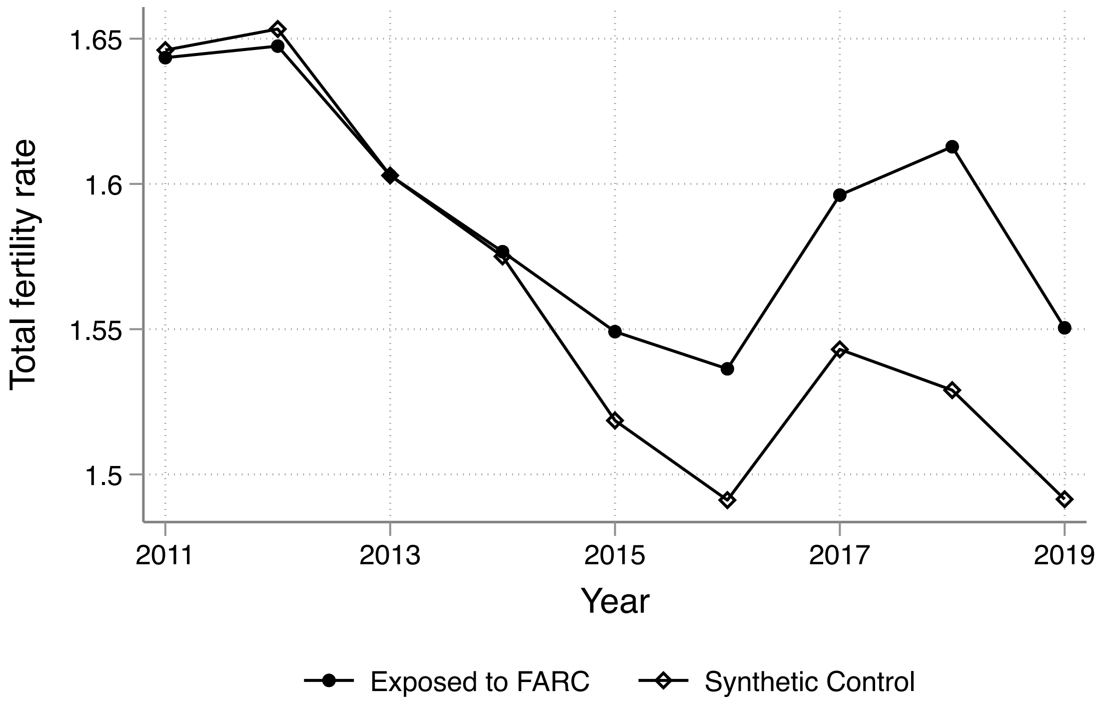
The rates are computed per year at the municipal level based on the Public Health Surveillance Protocols. This guide standardizes the criteria, procedures, and activities to systematize the surveillance of events of interest in public health by the National Institute of Health (Colombia). It contains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

The violence dataset was originally compiled by Restrepo et al. (2003) 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 and municipality characteristics. The primary source of these databases is the annual panel of Colombian municipalities, maintained and hosted by the Center For Economic Development Studies (CEDE from the Spanish acronym, Acevedo et al., 2014), a think-tank at Universidad de los Andes. Also, we use the Decontaminate Colombia database hosted by the Office of the High Commissioner for Peace, the Victim's Registry database, the Centro Nacional de Memoria Histórica, and the Agency for Reincorporation and Standardization database.

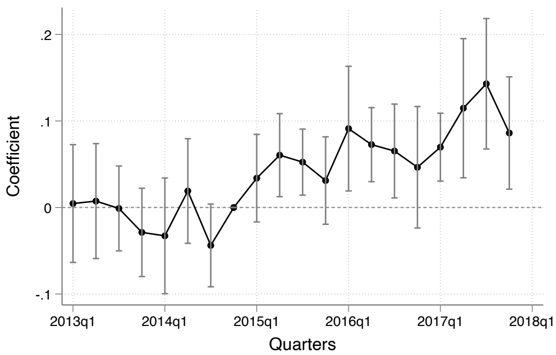
Additional Figures and Tables

Figure A.1: Synthetic difference-in-differences for the total fertility rate

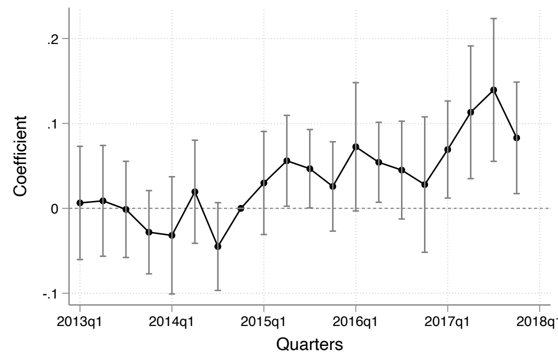


Notes: In this figure, we estimate a synthetic difference-in-differences model following Arkhangelsky et al. (2021).

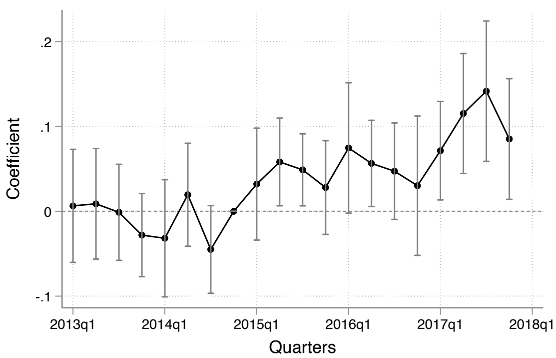
Figure A.2: Dynamic difference-in-differences for total fertility rate with quarterly data



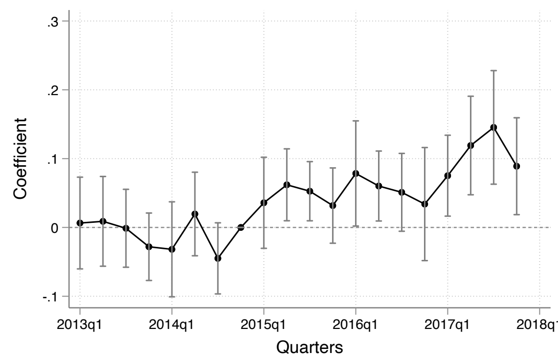
(a.1) Baseline



(a.2) Adds dept-year FE



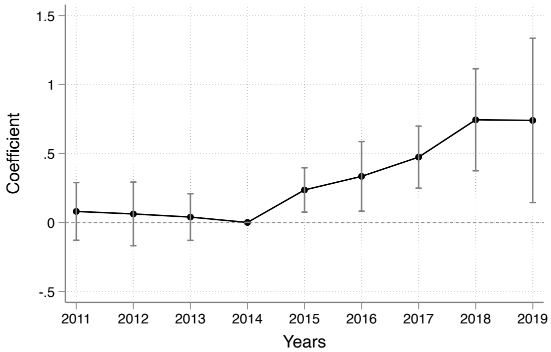
(a.3) Adds dept-year FE and baseline controls



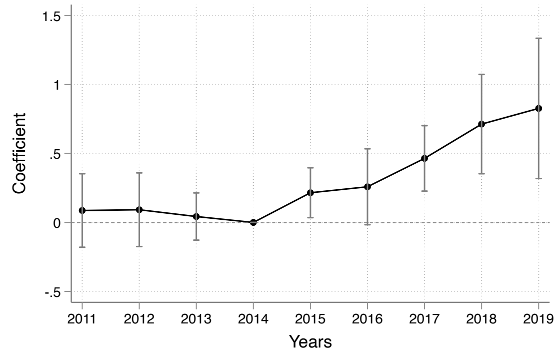
(a.4) Adds dept-year FE, and baseline and illegal activities controls

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 municipality and department/year fixed effects, Panel (a.3) includes municipality and department/year fixed effects, and baseline controls, and Panel (a.4) includes municipality and department/year fixed effects, and baseline controls and controls associated with violent and illegal activities. We present the point estimates of the regressions and the 95% confidence interval.

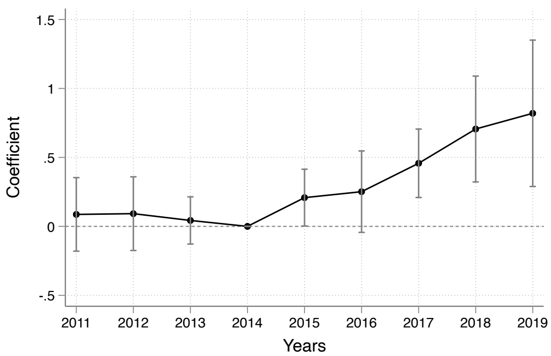
Figure A.3: Dynamic difference-in-differences for birth rate



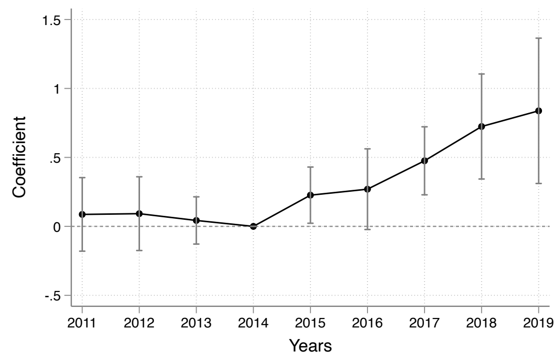
(a.1) Baseline



(a.2) Adds dept-year FE



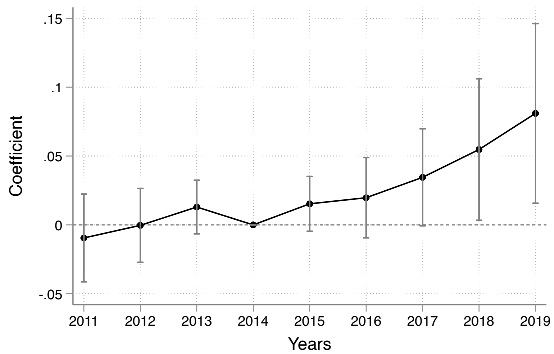
(a.3) Adds dept-year FE and baseline controls



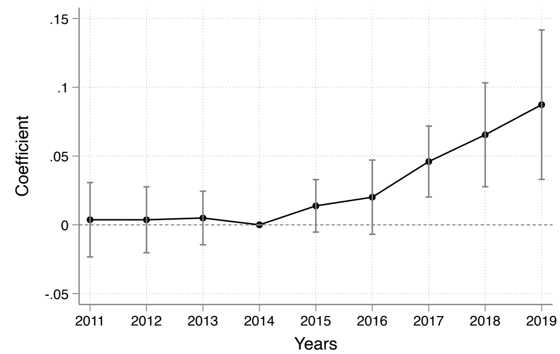
(a.4) Adds dept-year FE, and baseline and illegal activities controls

Notes: These figures present the coefficients from our specification presented in equation (3) for birth rate. Panel (a) includes municipality and year fixed effects, Panel (b) includes municipality and department/year fixed effects, Panel (c) includes municipality and department/year fixed effects, and baseline controls, and Panel (d) includes municipality and department/year fixed effects, and baseline controls and controls associated with violent and illegal activities. We present the point estimates of the regressions and the 95% confidence interval.

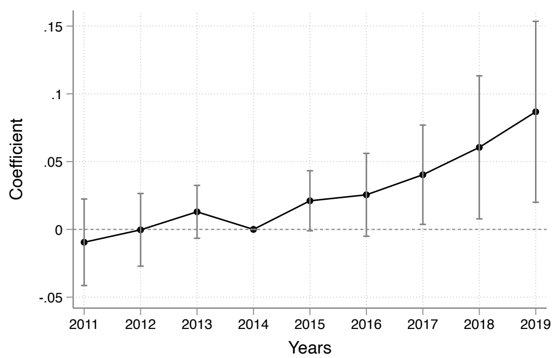
Figure A.4: Dynamic difference-in-differences for FARC measured over other time windows



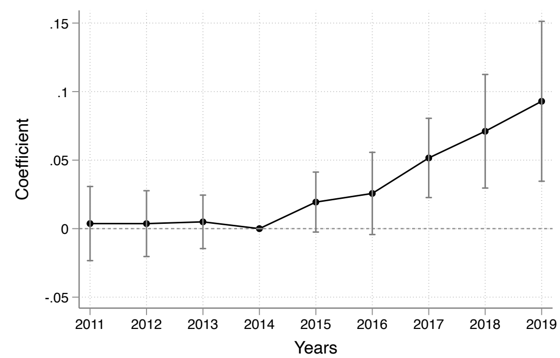
(a.1) Window 2002-2014, dept-year FE



(a.2) Window 2006-2014, dept-year FE, and controls



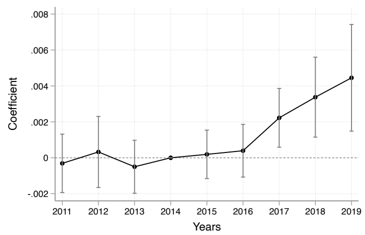
(a.3) Window 2002-2014, dept-year FE



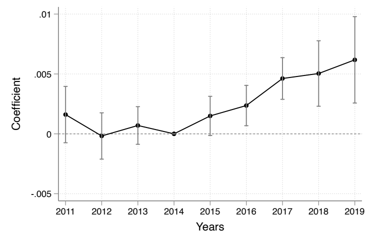
(a.4) Window 2006-2014, dept-year FE, and controls

Notes: These figures present the coefficients from our specification presented in equation (3). Panels A and B (C and D) measure FARC over the years 2002 and 2014 (2006 and 2014) All figures include municipality and department/year fixed effects, and Panels B and D add municipality characteristics interacted with time fixed effects. The dependent variable in all panels is the total fertility rate. We present the point estimates of the regressions and the 95% confidence interval.

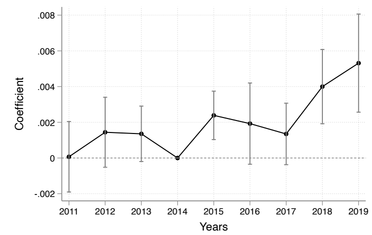
Figure A.5: Dynamic difference-in-differences for age-specific fertility rates



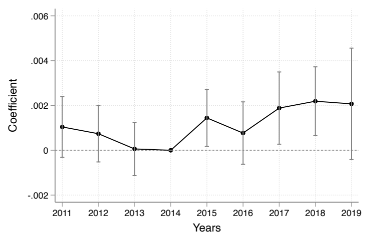
(a.1) Age between 15 and 19



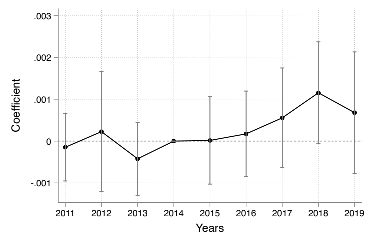
(a.2) Age between 20 and 24



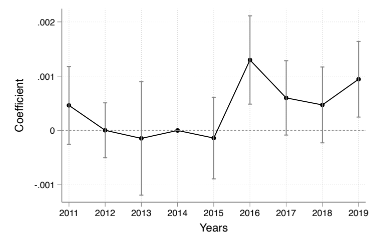
(a.3) Age between 25 and 29



(a.4) Age between 30 and 34



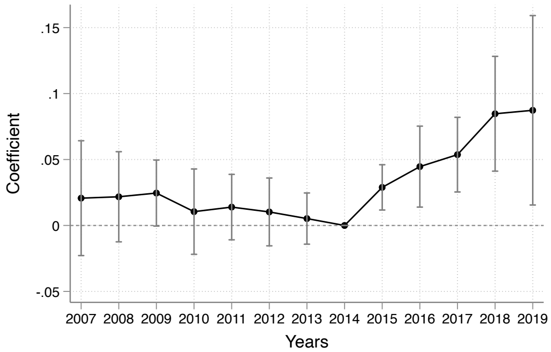
(a.5) Age between 35 and 39



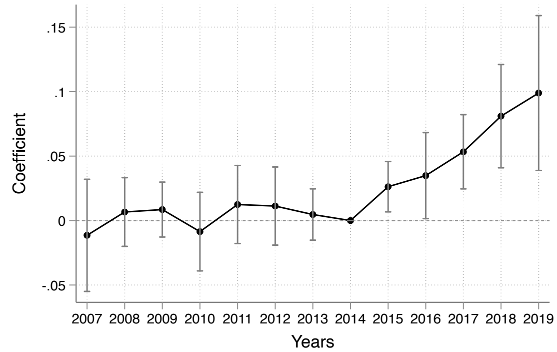
(a.6) Age between 40 and 44

Notes: These figures present the coefficients from our specification presented in equation (3). The dependent variable is age-specific fertility rates. All panels include municipality and department/year fixed effects. We present the point estimates of the regressions and the 95% confidence interval.

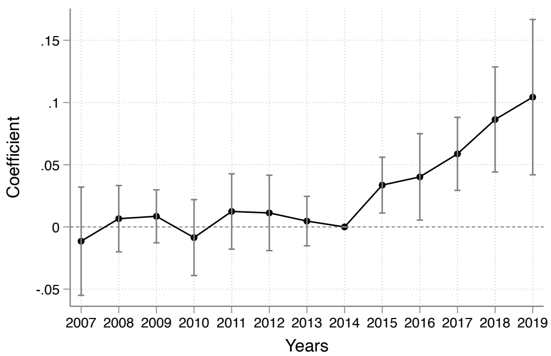
Figure A.6: Dynamic difference-in-differences for total fertility rate in an extended sample



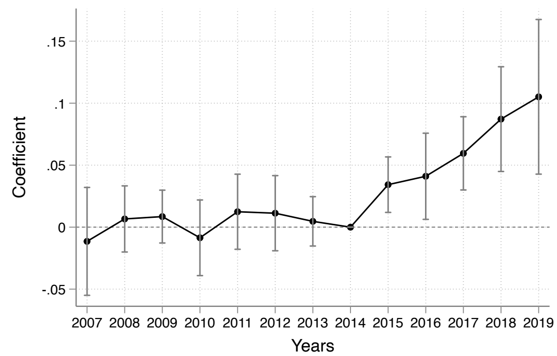
(a.1) Baseline



(a.2) Adds dept-year FE



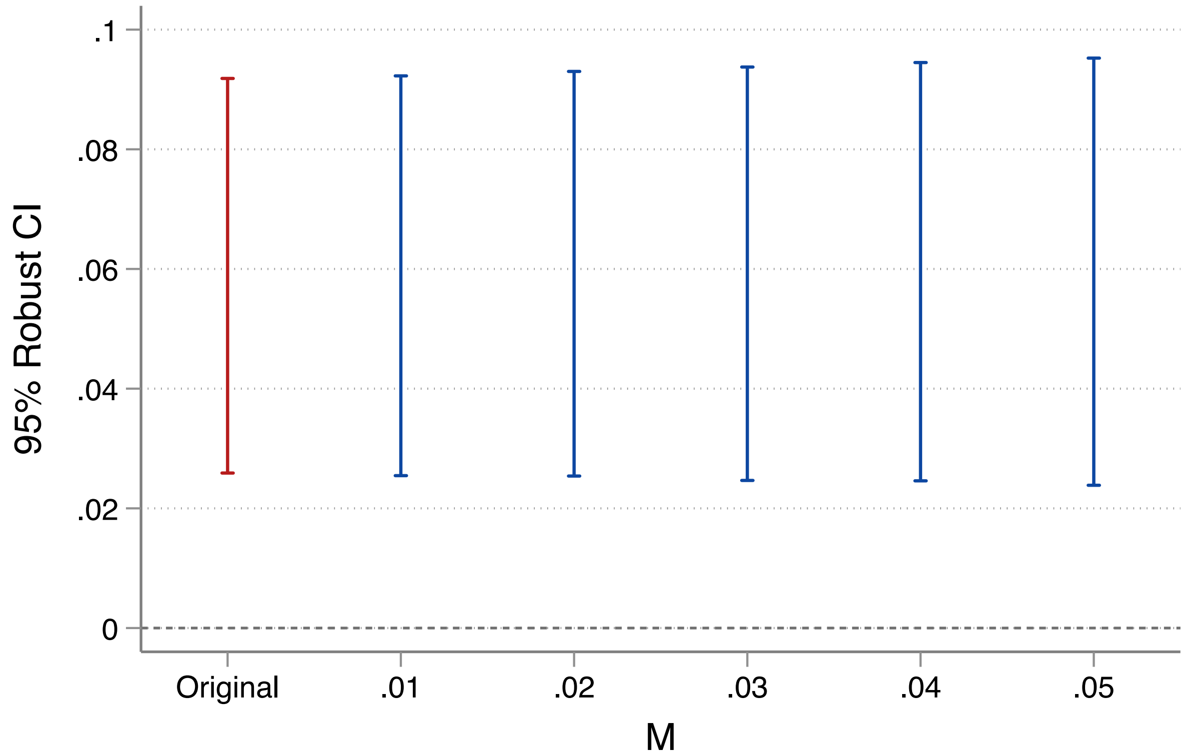
(a.3) Adds dept-year FE and baseline controls



(a.4) Adds dept-year FE, and baseline and illegal activities controls

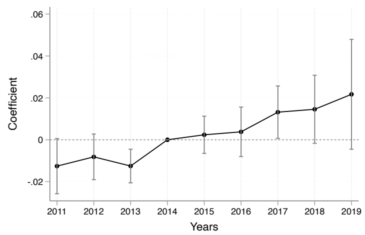
Notes: These figures present the coefficients from our specification presented in equation (3), but for an extended period. Panel (a.1) includes municipality and year fixed effects, Panel (a.2) includes municipality and department/year fixed effects, Panel (a.3) includes municipality and department/year fixed effects, and baseline controls, and Panel (a.4) includes municipality and department/year fixed effects, and baseline controls and controls associated with violent and illegal activities. We present the point estimates of the regressions and the 95% confidence interval.

Figure A.7: Violations of the Parallel Trends Assumption

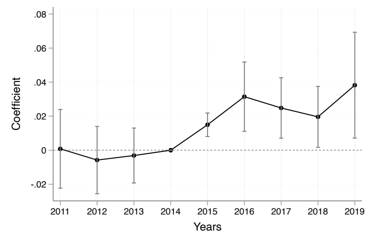


Notes: This figure presents the confidence set at 95% for linear and non-linear violation of the parallel trends assumption (Rambachan and Roth, 2023). The figure is shown for the average coefficient after the ceasefire. M measures the size of the change in the trend between consecutive periods. Thus, $M = 0$ is a linear violation of the parallel trend assumption. The maximum value of M is equal to ten times the trend that has an 80% power of being detected given the precision of the estimates in the pre-period (Roth, 2022).

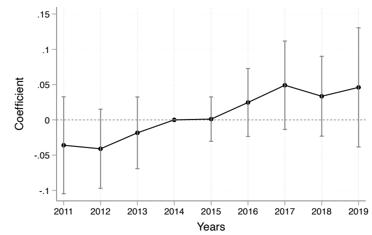
Figure A.8: Dynamic difference-in-differences for heterogeneous effects



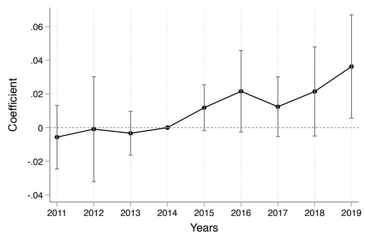
(a.1) Mines victims



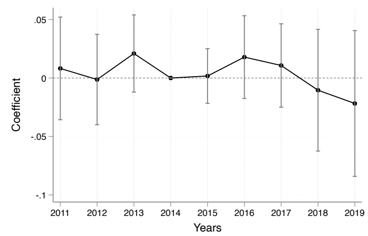
(a.2) Forced displacement



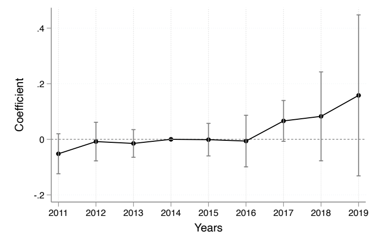
(a.3) Children recruitment



(a.4) Vote share pro peace



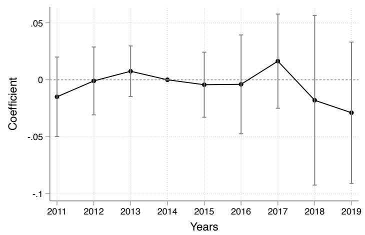
(a.5) Infant mortality



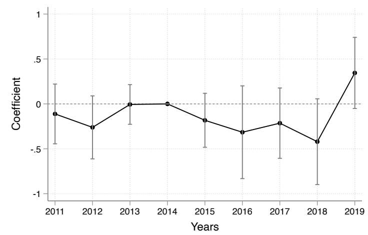
(a.6) ETCR

Notes: These figures present the coefficients from a dynamic version of the specification presented in equation (4). The dependent variable for all panels is the total fertility rate. We present the point estimates of the regressions and the 95% confidence interval.

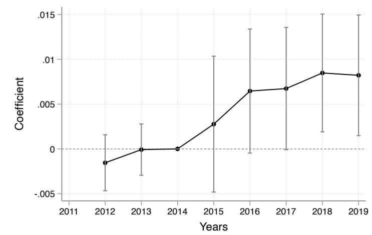
Figure A.9: Dynamic difference-in-differences for infrastructure and operation of the health sector



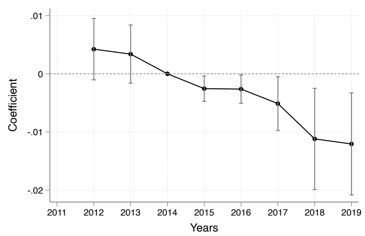
(a.1) Antenatal care visits



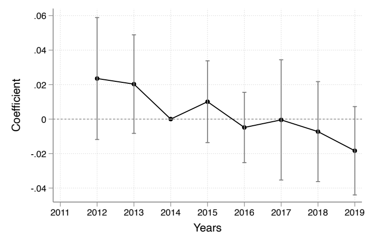
(a.2) Births attended by health professional



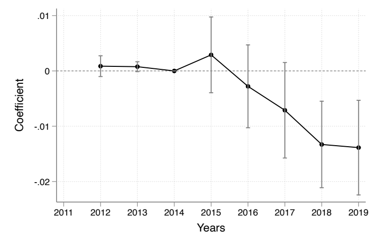
(a.3) Ambulances



(a.4) Therapeutic support



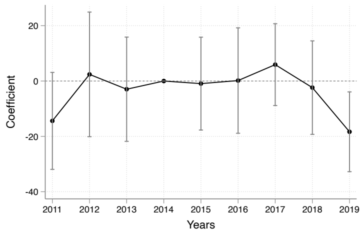
(a.5) Hospital beds



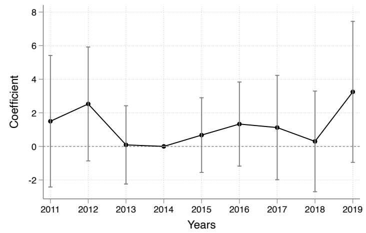
(a.6) Medical wards

Notes: These figures present the coefficients from our specification presented in equation (3). All figures include municipality and department/year fixed effects. The descriptions for each dependent variable are presented in Table 7. We present the point estimates of the regressions and the 95% confidence interval.

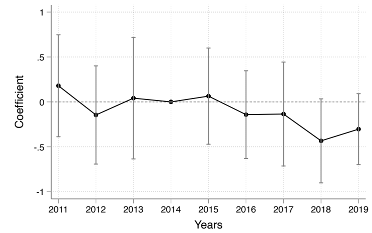
Figure A.10: Dynamic difference-in-differences for maternal, neonatal, and infant mortality



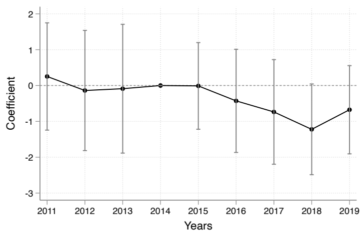
(a.1) Maternal mortality rate



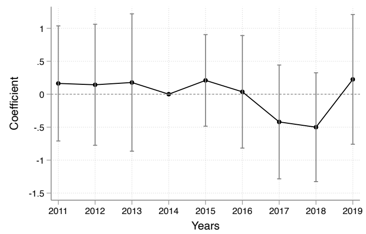
(a.2) Fetal mortality rate



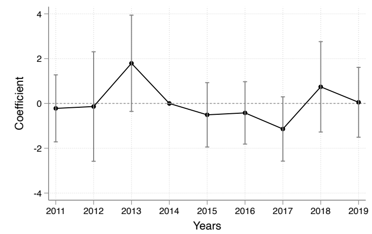
(a.3) Neonatal mortality rate



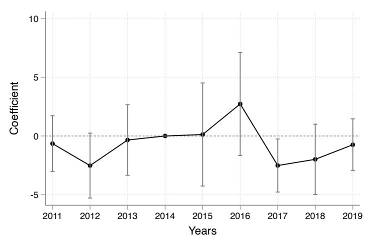
(a.4) Infant mortality rate



(a.5) Under-five mortality rate



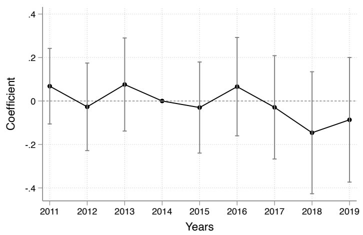
(a.6) Under-five mortality rate due to acute diarrheal disease



(a.7) Under-five mortality rate due to acute respiratory infection

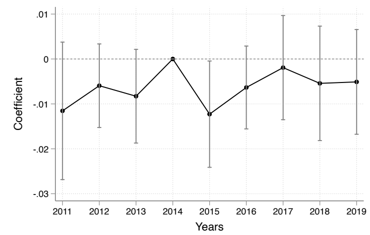
Notes: These figures present the coefficients from our specification presented in equation (3). All panels include municipality and department/year fixed effects. The descriptions for each dependent variable are presented in Table 8. We present the point estimates of the regressions and the 95% confidence interval.

Figure A.11: Dynamic difference-in-differences for newborn health

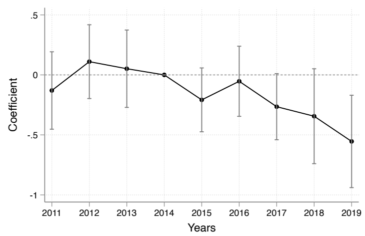


(a.1) Low birth weight

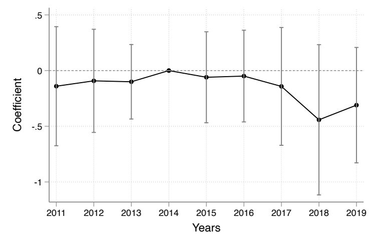
(a.2) Apgar 1 min



(a.3) Apgar 5 min



(a.4) Preterm birth



(a.5) C-Section delivery

Notes: These figures present the coefficients from our specification presented in equation (3). All figures include department/year fixed effects. The descriptions for each dependent variable are presented in Table 9. We present the point estimates of the regressions and the 95% confidence interval.

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	SISPRO and DANE
Variables: Infrastructure and operation of the health sector		
Antenatal care visits	Average number of antenatal care visits	SISPRO and DANE
Births attended by health professionals	Number of deliveries attended by doctors, nurses, health promoters, and nursing assistants per 100 live births	SISPRO and DANE
Ambulances	Number of ambulances for every 1,000 inhabitants	REPS and DANE
Therapeutic support	Number of therapeutic chairs (hemodialysis chairs and chemotherapy chairs) for every 1,000 inhabitants	REPS and DANE
Hospital beds	Number of hospital beds (adult beds, neonatal care beds, pediatric beds, mental care beds, drug dependence beds, chronic patients beds, obstetrics beds, Hematopoietic stem cell transplantation beds) for every 1,000 inhabitants	REPS and DANE
Medical wards	Number of medical wards (delivery room, procedure room, and operating room) for every 1,000 inhabitants	REPS and DANE

Continued on next page

Variable	Description	Source
Variables: Neonatal, infant mortality and diseases		
Fetal mortality rate	Number of fetal deaths, regardless of gestational age, per 1,000 known pregnancies (live births + fetal deaths) in a year	SISPRO and DANE
Neonatal mortality rate	Number of deaths of babies under 28 days per 1,000 live births in a year	SISPRO and DANE
Infant mortality	Number of deaths of children under 1-year-old per 1,000 live births in a year	SISPRO and DANE
Under-5 mortality	Number of deaths of children under 5 years old per 1,000 live births in a year	SISPRO and DANE
Under-5 mortality ADD	Number of deaths of children under 5 years old due to acute diarrhoeal disease per 1,000 live births in a year	SISPRO and DANE
Under-5 mortality ARI	Number of deaths of children under 5 years old due to Acute respiratory infection per 1,000 live births	SISPRO and DANE
Infectious and parasitic diseases	Number of people with diseases generally recognized as communicable or transmissible for every 1,000 inhabitants	SISPRO and DANE
Variables: Newborn health		
Low birth weight	percentage of live births with weight less than 2,500 grams	SISPRO
APGAR 1 min	Mean APGAR test after 1 minute	SISPRO
APGAR 5 min	Mean APGAR test after 5 minutes	SISPRO
Preterm birth	Number of live births who were born alive before 37 gestational weeks per 100 live births	SISPRO and DANE
C-Section delivery	Number of babies delivered by cesarean per 100 live births	SISPRO and DANE
Variables: Marriage		
Marriage	Share of the population ever married	2005 and 2018 Colombian Census

Continued on next page

Variable	Description	Source
Variables: Control variables		
Rural share	percentage of the population outside the urban center in the municipality.	CEDE, based DANE information
Distance to capital	Straight line distance to the capital (in Km) of the department in which the municipality is located.	CEDE, based on Agustin Codazzi Geographic Institute information
Antipersonnel landmines victims	Standardized measure of the number of victims related to antipersonnel landmines.	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
Coca suitability	Based on household survey and municipal geographic and weather characteristics.	Mejía and Restrepo (2015)
Gold suitability	Measure of geochemical anomalies of the municipal soil associated with the presence of gold deposits.	Idrobo et al. (2014)
Variables: Exposure to FARC violence		
FARC and other armed groups attacks	Total number of FARC attacks per 10,000 inhabitants in the municipality, from 2011 to 2014, standardized 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 2019 by Universidad del Rosario

Continued on next page

Variable	Description	Source
Variables: Municipality characteristics		
Forced displacement (returnees)	Population expelled in a municipality due to forced displacement that returned to their origin municipality.	Victims' Registry
Child soldering	Number of children forcibly recruited by municipality.	Centro Nacional de Memoria Histórica (CNMH)
ETCR	Dummy that takes the value for municipalities with Territorial Training and Reincorporation Spaces, which are the places created to train the former FARC members for their reincorporation into civil life.	Agency for Reincorporation and Standardization
Variables: 2018 Census		
Migrant 5 years ago	An individual that was living in a different municipality from the one where it was surveyed 5 years ago.	2018 Census
Migrant 1 year ago	An individual that was living in a different municipality from the one where it was surveyed 1 year ago.	2018 Census
Variables: Mother characteristics		
Cohabiting parents	Proportion of births from mothers who report being married or living with the father of the newborn	Vital statistics (DANE)
First time mothers	Proportion of births from mothers who were pregnant for the first time	Vital statistics (DANE)
Educational level	Proportion of births from mothers according to the self-reported education level. Secondary or less corresponds to 'Secundaria Media (grado 9)'; High School to 'Bachillerato'; and College and above to 'Tecnico, tecnologico, profesional' tertiary education degrees, and any subsequent academic level	Vital statistics (DANE)

Table A.2: 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	0.08	0.07	0.03	0.08	0.00	0.21
ASFR for women aged 20-24	0.10	0.08	0.03	0.10	0.00	0.28
ASFR for women aged 25-29	0.09	0.07	0.03	0.08	0.00	0.38
ASFR for women aged 30-34	0.06	0.06	0.02	0.06	0.00	0.45
ASFR for women aged 35-39	0.04	0.03	0.01	0.03	0.00	0.20
ASFR for women aged 40-44	0.01	0.01	0.01	0.01	0.00	0.10
Total births per municipality	980.26	297.96	974.07	581.00	0.00	4678
Birth rate per 10,000 individuals	15.48	12.42	4.98	14.96	0.00	49
Average of antenatal care visits	5.86	5.75	0.93	5.90	0.00	8.51
Births attended by health professional	98.08	97.00	5.59	99.59	0.00	100
Births attended by traditional midwife	1.92	2.73	5.58	0.41	0.00	100
Fetal mortality rate	44.30	43.02	40.33	27.47	0.00	1000
Maternal mortality rate	77.74	106.99	192.44	0.00	0.00	100000
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
Under-five mortality	15.40	16.07	10.04	13.99	0.00	318.18
ADD mortality in children under 5	4.46	3.93	19.27	0.00	0.00	830.26
ARI mortality in children under 5	15.32	12.89	28.46	0.00	0.00	581.40
Infectious and parasitic diseases rate	117.19	91.65	94.86	97.85	0.00	2418.51
Perc. of low weight at birth (<2500 grs)	7.76	7.79	2.43	7.51	0.00	100
Mean APGAR Test 1 Minute	8.20	8.12	0.27	8.20	0.00	9.12
Mean APGAR Test 5 Minutes	9.58	9.54	0.21	9.62	0.00	10
Preterm birth (<37 weeks)	17.34	17.03	4.20	17.17	0.00	100
C-section births	39.88	35.19	14.29	37.90	0.00	100
Ambulances	0.11	0.16	0.15	0.08	0.00	2.87
Therapeutic support	0.01	0.00	0.03	0.00	0.00	0.42
Beds	1.07	0.83	1.02	0.75	0.00	15.03
Medical wards	0.08	0.09	0.07	0.07	0.00	1.02
FARC attacks per 10,000 inhab	0.11	0.12	0.47	0.00	0.00	9.80
Victims of anti-personnel mines	4.05	1.69	17.67	0.00	0.00	165
Rural share	0.42	0.59	0.25	0.41	0.02	1
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
Population	59,949	21,434	52,582	38,498	298	217,343
Municipalities		1092				

Notes: This table presents summary statistics for the main variables of interest between 2011 and 2014. All 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 A.3: 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 women aged 15-19	0.08	0.00***	0.01***
	(0.03)	(0.00)	(0.00)
ASFR for women aged 20-24	0.10	-0.00	0.00
	(0.03)	(0.00)	(0.00)
ASFR for women aged 25-29	0.09	-0.00**	0.00
	(0.03)	(0.00)	(0.00)
ASFR for women aged 30-34	0.06	-0.00	0.00
	(0.02)	(0.00)	(0.00)
ASFR for women aged 35-39	0.03	0.00***	0.01***
	(0.01)	(0.00)	(0.00)
ASFR for women aged 40-44	0.01	0.00***	0.00***
	(0.01)	(0.00)	(0.00)
Antenatal care visits	5.93	-0.17***	-0.50***
	(0.93)	(0.02)	(0.06)
Births attended by health professional	98.28	-0.81***	-1.42***
	(5.72)	(0.12)	(0.30)
Births attended by traditional midwife	1.72	0.81***	1.42***
	(5.71)	(0.12)	(0.30)
Maternal mortality rate	74.85	5.12	20.76**
	(191.04)	(3.49)	(9.24)
Fetal mortality rate	42.84	3.68***	10.51***
	(39.42)	(1.09)	(3.78)
Neonatal mortality	7.42	0.32***	1.32***
	(5.77)	(0.12)	(0.34)
Infant mortality	24.19	1.26***	4.14***
	(16.57)	(0.35)	(0.92)
Under-five mortality	14.99	0.89***	2.96***
	(10.02)	(0.21)	(0.55)
ADD mortality in children under 5	4.20	0.69*	1.85**
	(20.01)	(0.41)	(0.86)
ARI mortality in children under 5	15.06	0.89	1.82
	(29.24)	(0.59)	(1.66)
Infectious, parasitic diseases	113.59	3.84	25.85***
	(90.73)	(2.98)	(9.26)
Low birth weight	7.86	-0.24***	-0.71***
	(2.51)	(0.04)	(0.13)
Mean APGAR Test 1 Minute	8.18	0.03***	0.11***
	(0.27)	(0.01)	(0.02)
Mean APGAR Test 5 Minute	9.58	0.02***	0.07***
	(0.22)	(0.00)	(0.02)
Preterm birth	17.55	-0.40***	-1.54***
	(4.25)	(0.07)	(0.27)
Delayed term	0.55	0.05***	0.14***
	(0.66)	(0.02)	(0.05)
C-section births	40.76	-1.90***	-6.26***
	(14.47)	(0.32)	(1.17)
Ambulances	0.11	0.00	-0.02***
	(0.15)	(0.00)	(0.01)
Therapeutic support	0.01	-0.00	0.01
	(0.03)	(0.00)	(0.01)
Beds	1.10	-0.11***	-0.17**
	(1.07)	(0.01)	(0.08)
Medical wards	0.08	-0.01***	-0.01***
	(0.07)	(0.00)	(0.00)
Victims of anti-personnel mines	1.02	6.89***	21.73***
	(4.69)	(1.71)	(4.92)
Rural share	0.41	0.04***	0.07***
	(0.25)	(0.00)	(0.02)
Distance to capital	79.31	4.40***	16.23**
	(62.74)	(1.56)	(6.80)
Poverty index	63.69	3.33***	9.19***
	(19.89)	(0.42)	(1.23)
Log 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 (without any violent event by FARC between 2011 and 2014). Columns 2 and 3 present estimated coefficients and standard errors from univariate regressions for the continuous and discrete treatment.

Table A.4: Birth rate and ceasefire

	(1)	(2)	(3)
Dependet variable:		Birth rate	
Cease × FARC	0.46***	0.44***	0.43***
	(0.16)	(0.14)	(0.15)
Observations	9,828	9,828	9,828
R-squared	0.892	0.922	0.924
Municipality FE	Yes	Yes	Yes
Year FE	Yes	No	No
Dept-Year FE	No	Yes	Yes
Baseline controls	No	No	Yes
Municipalities	1092	1092	1092
Mean Dep. Var.	11.87	11.87	11.87
Std. Dev. Dep. Var.	4.875	4.875	4.875

Notes: This table presents the results from the main specification in equation (2) but uses as a dependent variable the birth rate. 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. *Birth Rate* is computed as the total number of births per 1,000 individuals. Column 3 adds predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.5: Birth rate by mother demographics

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Birth rate							
	Married		Education				Previous children	
	No	Yes	Primary or less	Secondary	High school	College or above	No	Yes
Cease × FARC	0.36**	0.07***	0.15*	0.13***	0.07*	0.02	0.12**	0.31***
	(0.14)	(0.02)	(0.08)	(0.05)	(0.04)	(0.02)	(0.06)	(0.11)
Observations	9,828	9,828	9,828	9,828	9,828	9,828	9,828	9,828
R-squared	0.925	0.902	0.903	0.878	0.858	0.937	0.878	0.914
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	10.35	1.521	3.291	3.258	3.440	1.430	5.046	6.824
Std. Dev. Dep. Var.	4.504	1.242	2.251	1.755	1.700	1.193	2.105	3.136

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. In this table, birth rates are computed for specific populations of interest that can be identified according to the birth registry. Columns 1 and 2 divide the population by the marital status of the mother, where married corresponds to cohabitation with the partner. Columns 3 to 6 correspond to the highest education level attained by the mother. *Secondary school* refers to 'Básica Secundaria' (9th grade), *High school* to 'Media académica o clásica (Bachillerato)' (11th grade), and *College or above* includes both vocational and professional degrees. Lastly, Columns 7 and 8 consider whether the mother had at least one child born alive. For instance, Column 2 refers to the number of live births whose mothers reported being married or living with their partners (could be or not the father of the newborn), divided by the total number of inhabitants in that municipality projected by DANE using the 2008 population census. Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.6: Total fertility rate effects in the DHS sample

	(1)	(2)	(3)
Dependent variable:	Total Fertility Rate		
Cease $\times$ FARC	0.06**	0.06**	0.08***
	(0.03)	(0.03)	(0.03)
Observations	3,456	3,456	3,456
R-squared	0.882	0.931	0.933
Municipality FE	Yes	Yes	Yes
Year FE	Yes	No	No
Dept-Year FE	No	Yes	Yes
Baseline controls	No	No	Yes
Municipalities	384	384	384
Mean Dep. Var.	1.597	1.597	1.597
Std. Dev. Dep. Var.	0.624	0.624	0.624

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 adds predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.7: Total fertility rate and ceasefire: Weights and discrete treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Total fertility rate								
	Weighted			Unweighted					
	Discrete measure			Continuous measure			Discrete measure		
Cease × FARC	0.05	0.08**	0.08*	0.05***	0.05***	0.05***	0.07**	0.07**	0.08**
	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)
Observations	9,828	9,828	9,828	9,828	9,828	9,828	9,828	9,828	9,828
R-squared	0.879	0.912	0.914	0.880	0.913	0.915	0.850	0.871	0.872
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	No	No	Yes	No	No
Dept-Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Baseline controls	No	No	Yes	No	No	Yes	No	No	Yes
Extended controls	No	No	No	No	No	No	No	No	No
Municipalities	1092	1092	1092	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	1.541	1.541	1.541	1.541	1.541	1.541	1.541	1.541	1.541
Std. Dev. Dep. Var.	0.604	0.604	0.604	0.604	0.604	0.604	0.604	0.604	0.604

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, 6, and 9 add predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are in parentheses, *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.8: Drop most FARC-affected municipalities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Total fertility rate							
	Drop top FARC affected municipalities							
	Top 2		Top 4		Top 6		Top 8	
Cease × FARC	0.05***	0.05***	0.05**	0.05**	0.06**	0.06**	0.06*	0.07**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Observations	9,810	9,810	9,792	9,792	9,774	9,774	9,756	9,756
R-squared	0.880	0.913	0.880	0.913	0.880	0.913	0.880	0.913
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No
Dept-Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Municipalities	1090	1090	1088	1088	1086	1086	1084	1084
Mean Dep. Var.	1.540	1.540	1.539	1.539	1.539	1.539	1.538	1.538
Std. Dev. Dep. Var.	0.604	0.604	0.603	0.603	0.603	0.603	0.603	0.603

Notes: This table presents the results from the main specification in equation (2), but dropping the most FARC-affected municipalities. 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. Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.9: Different time windows for measuring FARC

	(1)	(2)	(3)	(4)
Dependent variable:	Total fertility rate			
	FARC measured over:			
	2002-2014		2006-2014	
Cease × FARC	0.04**	0.05**	0.04***	0.05***
	(0.02)	(0.02)	(0.02)	(0.02)
Observations	9,828	9,828	9,828	9,828
R-squared	0.912	0.914	0.913	0.915
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.	1.606	1.606	1.606	1.606
Std. Dev. Dep. Var.	0.596	0.596	0.596	0.596

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. In columns 1 and 2 (3 and 4), *FARC* is a continuous measure of the total number of FARC attacks over 10,000 inhabitants from 2002 to 2014 (2006 to 2014), and is standardized by the mean and standard deviation to ease interpretation. Columns 2 and 4 add predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.10: Total fertility rate and ceasefire: Other weights

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Total fertility rate					
Weight:	All population			Female population		
Cease × FARC	0.04***	0.05***	0.05***	0.04***	0.05***	0.05***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
Observations	9,828	9,828	9,828	9,828	9,828	9,828
R-squared	0.885	0.911	0.914	0.885	0.912	0.914
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	No	No
Dept-Year FE	No	Yes	Yes	No	Yes	Yes
Baseline controls	No	No	Yes	No	No	Yes
Extended controls	No	No	No	No	No	No
Municipalities	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	1.541	1.541	1.541	1.541	1.541	1.541
Std. Dev. Dep. Var.	0.604	0.604	0.604	0.604	0.604	0.604

Notes: This table presents the results from the main specification in equation (2), but using different weights. Columns 1 to 3 use the total population as weight, while columns 4 to 6 use the female population, both measured in 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. Columns 3 and 6 add predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are in parentheses, **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.11: Test for differential pre-trends

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Dependent variable:		ASFR for women aged between:							
	TFR	15-19	20-24	25-29	30-34	35-39	40-44		
Linear trend × FARC	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00**		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
R-squared	0.945	0.899	0.922	0.892	0.858	0.798	0.671		
Panel B									
							Under-5 mortality		
Dependent variable:	Antenatal care visits	Births attended by health prof	Maternal mortality	Fetal mortality	Neonatal mortality	Infant mortality	Overall	ADD	ARI
Linear trend × FARC	0.01	0.09*	4.58	-1.01	-0.03	-0.07	-0.04	0.13	0.42
	(0.01)	(0.05)	(3.10)	(0.62)	(0.11)	(0.29)	(0.16)	(0.26)	(0.50)
R-squared	0.953	0.923	0.353	0.831	0.360	0.451	0.517	0.494	0.485
Panel C									
Dependent variable:	New born health					Infrastructure and operation of the health sector			
	LBW	APGAR 1 min	APGAR 5 min	Preterm birth	C-Section delivery	Ambulances	Therapeutic support	Beds	Medical wards
Linear trend × FARC	-0.02	0.00	0.00	0.05	0.06	0.00	-0.00*	-0.01	-0.00
	(0.03)	(0.00)	(0.00)	(0.06)	(0.10)	(0.00)	(0.00)	(0.01)	(0.00)
R-squared	0.643	0.859	0.813	0.714	0.943	0.969	0.516	0.955	0.955
Observations	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Municipalities	1092	1089	1088	1090	1090	1049	1049	1049	1049
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from a regression in the pre-ceasefire period (2011-2014) where the coefficient of interest is the interaction between a linear trend and FARC, and we include municipality and department-year fixed effects. All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *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. The dependent variables are the ones presented in Tables 1, 2, 7, 8, and 9. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.12: Placebo treatment in 2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Dependent variable:		ASFR for women aged between:							
	TFR	15-19	20-24	25-29	30-34	35-39	40-44		
Placebo × FARC	-0.01	0.00	-0.00	0.00	-0.00	-0.00	-0.00**		
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
R-squared	0.945	0.899	0.922	0.892	0.858	0.798	0.671		
Panel B									
Dependent variable:							Under-5 mortality		
	Antenatal care visits	Births attended by health prof	Maternal mortality	Fetal mortality	Neonatal mortality	Infant mortality	Overall	ADD	ARI
Placebo × FARC	0.02	0.02	14.21**	-0.62	-0.21	-0.33	-0.06	0.77	-0.31
	(0.01)	(0.13)	(6.70)	(1.28)	(0.29)	(0.79)	(0.46)	(0.79)	(1.17)
R-squared	0.953	0.923	0.353	0.830	0.360	0.451	0.517	0.494	0.485
Panel C									
Dependent variable:	New born health					Infrastructure and operation of the health sector			
	LBW	APGAR 1 min	APGAR 5 min	Preterm birth	C-Section delivery	Ambulances	Therapeutic support	Beds	Medical wards
Placebo × FARC	-0.05	0.00	0.01	0.18	0.08				
	(0.07)	(0.01)	(0.01)	(0.13)	(0.22)				
R-squared	0.643	0.859	0.813	0.714	0.943				
Observations	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from the main specification in equation (2), but restricts the sample to the pre-ceasefire period (2011-2014). All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *Placebo* is a dummy that takes the value for the years 2012, 2013, and 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. The dependent variables are the ones presented in Tables 1, 2, 7, 8, and 9. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.13: Placebo treatment in 2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Dependent variable:		ASFR for women aged between:							
	TFR	15-19	20-24	25-29	30-34	35-39	40-44		
Placebo × FARC	-0.01	-0.00	-0.00	-0.00	-0.00*	-0.00	-0.00		
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
R-squared	0.945	0.899	0.922	0.892	0.858	0.798	0.671		
Panel B									
Dependent variable:							Under-5 mortality		
	Antenatal care visits	Births attended by health prof	Maternal mortality	Fetal mortality	Neonatal mortality	Infant mortality	Overall	ADD	ARI
Placebo × FARC	0.01	0.18	4.52	-1.97	0.00	-0.10	-0.06	1.07	1.41
	(0.01)	(0.13)	(6.73)	(1.44)	(0.24)	(0.54)	(0.31)	(0.99)	(1.20)
R-squared	0.953	0.923	0.353	0.830	0.360	0.451	0.517	0.495	0.485
Panel C									
Dependent variable:	New born health					Infrastructure and operation of the health sector			
	LBW	APGAR 1 min	APGAR 5 min	Preterm birth	C-Section delivery	Ambulances	Therapeutic support	Beds	Medical wards
Placebo × FARC	0.02	-0.00	0.00	0.04	0.07	0.00	-0.00*	-0.01	-0.00
	(0.06)	(0.00)	(0.01)	(0.13)	(0.20)	(0.00)	(0.00)	(0.01)	(0.00)
R-squared	0.643	0.859	0.813	0.714	0.943	0.969	0.515	0.955	0.955
Observations	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from the main specification in equation (2), but restricts the sample to the pre-ceasefire period (2011-2014). All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *Placebo* is a dummy that takes the value for the years 2013 and 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. The dependent variables are the ones presented in Tables 1, 2, 7, 8, and 9. Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.14: Placebo treatment in 2014

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Dependent variable:		ASFR for women aged between:							
	TFR	15-19	20-24	25-29	30-34	35-39	40-44		
Placebo × FARC	-0.01	0.00	-0.00	-0.00	-0.00	0.00	-0.00		
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
R-squared	0.945	0.899	0.922	0.892	0.858	0.798	0.671		
Panel B									
Dependent variable:							Under-5 mortality		
	Antenatal care visits	Births attended by health prof	Maternal mortality	Fetal mortality	Neonatal mortality	Infant mortality	Overall	ADD	ARI
Placebo × FARC	0.00	0.13	4.99	-1.37	-0.03	-0.01	-0.16	-0.48	1.17
	(0.01)	(0.13)	(8.42)	(1.52)	(0.23)	(0.67)	(0.38)	(0.62)	(0.98)
R-squared	0.953	0.923	0.353	0.830	0.360	0.451	0.517	0.494	0.485
Panel C									
Dependent variable:	New born health					Infrastructure and operation of the health sector			
	LBW	APGAR 1 min	APGAR 5 min	Preterm birth	C-Section delivery	Ambulances	Therapeutic support	Beds	Medical wards
Placebo × FARC	-0.04	0.01	0.01*	-0.01	0.11	0.00	-0.00	-0.02	-0.00
	(0.09)	(0.01)	(0.00)	(0.14)	(0.19)	(0.00)	(0.00)	(0.01)	(0.00)
R-squared	0.643	0.860	0.813	0.714	0.943	0.969	0.515	0.955	0.955
Observations	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from the main specification in equation (2), but restricts the sample to the pre-ceasefire period (2011-2014). All regressions are weighted by the number of live births between 2011 to 2014 for each age group. *Placebo* is a dummy that takes the value for the year 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. The dependent variables are the ones presented in Tables 1, 2, 7, 8, and 9. Clustered robust standard errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.15: Extended sample and adding municipality-level trends

	(1)	(2)	(3)	(4)
Dependent variable:	Total Fertility Rate			
	Main specification		Muninicipality trends	
Cease × FARC	0.05*	0.06**	0.04***	0.03**
	(0.03)	(0.03)	(0.01)	(0.01)
Observations	16,273	16,273	16,273	16,273
R-squared	0.765	0.775	0.878	0.879
Municipality FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Linear trend by municipality	No	No	Yes	Yes
Municipalities	1090	1090	1090	1090
Mean Dep. Var.	1.669	1.669	1.669	1.669
Std. Dev. Dep. Var.	0.618	0.618	0.618	0.618

Notes: This table presents the results from an estimation sample from 2007 to 2019 of the main specification in equation (2). In columns 3 and 4, we estimate an augmented version that adds municipality-level linear trends. 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. *Total Fertility Rate* is computed as the sum of age-specific fertility rates weighted by the number of years in each age group, divided by 1,000. Columns 2 and 4 add predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.

Table A.16: Treatment intensity and potential non linear effects

	(1)	(2)
Dependent variable:	Total Fertility Rate	
Cease × Any FARC attack	0.06	0.06
	(0.06)	(0.06)
Cease × FARC attack in the 2nd tercile	-0.05	-0.06
	(0.07)	(0.06)
Cease × FARC attack in the 3rd tercile	0.22*	0.20*
	(0.11)	(0.11)
Observations	9,828	9,828
R-squared	0.913	0.915
Municipality FE	Yes	Yes
Year FE	No	No
Dept-Year FE	Yes	Yes
Controls	No	Yes
Municipalities	1092	1092
Mean Dep. Var.	1.541	1.541
Std. Dev. Dep. Var.	0.604	0.604

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. *Any FARC attack* is a dummy that takes the value one if a municipality had at least one FARC attack attack between 2011 and 2014. *FARC attack in 2nd (3rd) tercile* is a dummy that takes the value one if a municipality is in the 2nd (3rd) tercile of the empirical distribution of FARC attacks between 2011 and 2014 over total population. *Total Fertility Rate* is computed as the sum of age-specific fertility rates weighted by the number of years in each age group, divided by 1,000. Column 2 adds predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is sinificant at the 5% level, ***p is significant at the 1% level.

Table A.17: Heterogeneous effects by presence of other armed groups

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Total fertility rate					
Z:	Paramilitary		ELN		Paramilitaries & ELN	
Cease × FARC × Z		-0.002		-0.002		-0.004
		(0.012)		(0.001)		(0.002)
Cease × FARC	0.052***	0.052***	0.053***	0.056***	0.052***	0.058***
	(0.016)	(0.016)	(0.016)	(0.018)	(0.016)	(0.018)
Cease × Z	0.000	-0.000	-0.015*	-0.009	-0.003	-0.002
	(0.014)	(0.014)	(0.009)	(0.009)	(0.017)	(0.017)
Observations	9,828	9,828	9,828	9,828	9,828	9,828
R-squared	0.913	0.913	0.913	0.913	0.913	0.913
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Dept-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipalities	1092	1092	1092	1092	1092	1092
Mean Dep. Var.	1.606	1.606	1.606	1.606	1.606	1.606
Std. Dev. Dep. Var.	0.596	0.596	0.596	0.596	0.596	0.596

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. *Paramilitary* is a continuous measure of the total number of attacks by paramilitary groups over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. *ELN* is a continuous measure of the total number of ELN attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. *ELN and OAG* is a continuous measure of the total number of ELN and other smaller guerrilla attacks over 10,000 inhabitants from 2011 to 2014, and is standardized by the mean and standard deviation to ease interpretation. Clustered robust standard errors at the municipality level are presented in parentheses. *p is significant at the 10% level, **p is significant at the 5% level, ***p is significant at the 1% level.

Table A.18: Differential effects after implementation

	(1)	(2)	(3)
Dependent variable:	Total Fertility Rate		
Implementation × FARC	0.04**	0.05***	0.05***
	(0.02)	(0.01)	(0.01)
Cease × FARC	0.03**	0.02**	0.02*
	(0.01)	(0.01)	(0.01)
Observations	9,828	9,828	9,828
R-squared	0.880	0.913	0.915
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.	1.541	1.541	1.541
Std. Dev. Dep. Var.	0.604	0.604	0.604

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, while *Implementation* is a dummy that takes the value of one for 2017 and 2018. *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 adds predetermined municipal controls interacted with the ceasefire dummy. These 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 errors at the municipality level are presented in parentheses. **p* is significant at the 10% level, ***p* is significant at the 5% level, ****p* is significant at the 1% level.