The Strategic Use of Violence: The Impact of the War on Drugs on Civilian Victimization in Colombia*

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Abstract

Exploring the intricate relationship between territorial control and violence during the Colombian civil war, this study recognizes that the choice of tactics and targets in acts of violence can provide insights into the aims of violent actors. It specifically investigates the impact of aerial eradication operations on civilian victimization perpetrated by non-state armed groups, with a particular emphasis on the FARC insurgency and paramilitary groups. Utilizing a stacked difference-in-differences model, the findings reveal an interesting pattern: aerial eradication operations, though ostensibly targeting illicit drug cultivation, paradoxically contribute to heightened violence against civilians by these armed groups. The study uncovers a key distinction in victimization strategy between these two non-state actors. While the FARC insurgency employs non-lethal tactics, paramilitary groups adopt a more lethal approach. The extent and nature of violence perpetrated hinges upon two critical factors: the strategic importance of the contested territory and the level of collaboration between combatants and the civilian population.

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Political violence has killed approximately 100 million people worldwide since the turn of the XX century (Valentino, 2004). During the Vietnam War, two million Vietnamese civilians were killed (Shenon, 1995). Recent conflicts, including those in Afghanistan and Iraq, have resulted in the deaths of 26,000 and 134,000 civilians, respectively (Crawford, 2011; Iraq Body Count, 2005). Between 1958 and 2012, Colombia's armed conflict, which until recently was the longest-running civil war in the Western Hemisphere, killed at least 220,000 people (Centro Nacional de Memoria Histórica, 2013). The reason why armed actors utilize violence against civilians is that they see civilian population targeting as a strategy of attaining specific goals.

Civilians do not often serve as neutral actors in civil conflicts. In practice, they frequently supply economic and social resources, intelligence, recruiting, and other crucial inputs to those who fought (Valentino, 2014). Armed actors are encouraged to foster relationships with civilians in order to establish trust, communicate their objectives and intentions, and gain local support (Wood, 2014a; Wimmer and Miner, 2019). There may be occasions where armed groups may not need to resort to violence against civilians. This can happen when civilians have been seen as potential supporters and an armed actor has established its position (Wood, 2014b). Alternatively, armed actors may use violence against civilians in retaliation for perceived transgressions, such as assisting enemies or providing information to state authorities (Wood, 2014b; Schwartz and Straus, 2018).

Do non-state armed groups employ strategic violence? This is an urgent issue to address because it might help governments and humanitarian organizations in developing plans for protecting civilians and giving assistance where it is needed. Also, if non-state armed groups are using violence to achieve specific political or strategic goals, this information can be used to develop targeted interventions that address the root causes of the conflict and prevent further violence. The purpose of this paper is to analyze whether the use of violence in a civil war is restricted by the need to secure territorial control. Specifically, the paper examines the causal effect of aerial eradication operations to eradicate coca cultivation on patterns of civilian victimization perpetrated by the FARC insurgency and paramilitary groups, two of Colombia's most well-known non-state armed groups. Shocks to coca production have been shown to influence conflict outcomes in Colombia (Dube and Vargas, 2013; Abadie et al., 2015; Dube and Naidu, 2015; Wright, 2020).

This paper exploits municipal-weekly data on aerial eradication operations launched to destroy coca cultivation. Because the FARC and paramilitary groups were both involved in illegal drug trafficking, such actions may be considered as a negative economic shock for non-state armed groups' rents (Saab and Taylor, 2009; Abadie et al., 2015). Furthermore, because eradication operations are often supported by security forces, these operations may be characterized as a military shock which facilitates government presence in locations where state institutions have previously been absent. Because insurgencies and paramilitary groups are militarily weaker than security forces, aerial eradication operations end up jeopardizing the FARC and paramilitary groups' territorial control over areas where operations are carried out. As a result, non-state armed organizations are striving to consolidate territorial control in these areas.

The paper adopts the military shock interpretation to show how aerial eradication operations drove non-state armed groups to consolidate territorial dominance in strategic areas. The contest for territorial domination resulted in violence against the local population living in those territories. The study makes use of unique microdata on the repertoires of violence perpetrated by non-state armed groups in Colombia, distinguishing between non-lethal and lethal violence, as well as attacks on the general public, local officials, social leaders, and adversaries' informants. The types and targets of violence shifted dramatically over time, across municipalities, and across non-state armed groups, consistent with a logic of strategic use of violence.

Based on a stacked difference-in-differences approach, the results show that aerial eradication operations trigger violence against civilians. The sharp rise in violence is the result of paramilitary groups using lethal tactics to attacks. Such violence was directed indiscriminately towards the general public. Unlike paramilitary groups, the FARC used non-lethal violence against the general public. Finally, despite both the FARC and paramilitary groups being equally involved in illicit drug activities, the findings reveal that they reacted differently to the same event. Acts of violence are sparked by a series of incentives affecting the behavior of non-state armed groups. In this instance, the FARC relied on local civilian support more than paramilitary groups to expand its illegal activity. As a result, local populations are less vulnerable to FARC-related violence than paramilitary violence since they have some degree of

agency in opposition to the FARC's mandate.

Non-state armed groups respond to the government's *de facto* presence in places where it has previously been absent. Combats between security personnel and irregular elements increased in areas where aerial eradication operations were carried out. Overall, the findings appear to show that non-state armed groups engaged in clashes with security forces before eradication operations. The presence of the government compelled the FARC and paramilitary groups to operate under severe constraints within municipalities they controlled, and drove them to consolidate territorial control. To prevent losing territory, violent actors needed to use violence strategically. Thereby, non-state armed groups' military capability and the presence of security personnel drive patterns of violence against civilians.

This paper contributes to the current literature in several ways. First, it directly addresses the research on civilian victimization by outlining the factors that may influence the use of violence against civilians in ongoing civil wars. Second, the paper illustrates the shortcomings of utilizing aggregate indicators of violence to investigate the dynamics of civil conflicts. The assumption that all forms of violence are similar and that a non-state armed group deploys them without concern for strategy is misleading. The findings show that non-state armed groups' willingness to inflict violence on civilians is constrained by their strategic goals. Finally, the study discusses the research on the unintended consequences of the war on drugs and how such policies may backfire if they provide violent actors incentives to punish and coerce civilians.

There are various challenges to studying the strategic use of violence in ongoing civil conflicts. The most significant issue is a lack of data or the limitations of current information (Blattman and Miguel, 2010). Abadie et al. (2015) previously conducted an econometric evaluation of Plan Colombia, examinig the impact of aerial eradication operations on the dynamics of violence in Colombia between 1999 and 2005 at the local level. They found an increase in guerrilla attacks following eradication in sprayed regions in both the short and long run. Battles between security forces and insurgents, as well as the killing of combatants and civilians, are driving the upsurge in violence. While Abadie et al. (2015) have focused only on the impact of aerial eradication on guerrilla violence, this study examines the impact of aerial eradication on guerrilla violence as well as violence committed by other armed actors.

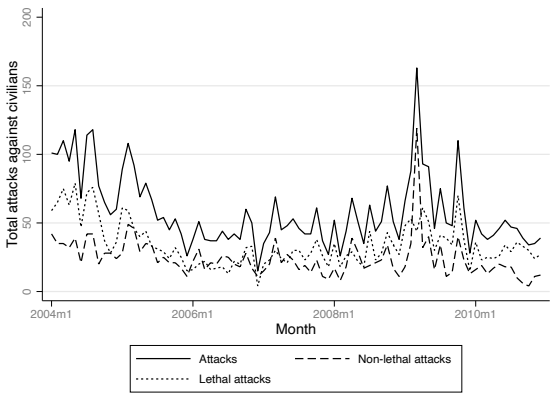
A number of questions remain unanswered. This paper focuses on the causal effect of aerial eradication operations on violence against civilians perpetrated by armed actors. Other sorts of unexpected shocks are likely to have driven non-state armed groups to resort to different victimization strategies. In addition, this paper does not investigate the causal effect of civilian victimization on civilian collaboration. Further research should help in determining whether civilian victimization is an effective way for non-state armed groups to gain territorial control and civilian collaboration (Kalyvas, 2006; Lyall, 2009; Condra et al., 2010; Condra and Shapiro, 2012; Condra and Wright, 2019; Wright et al., 2019; Prem et al., 2022).

1 Theory and empirical expectations

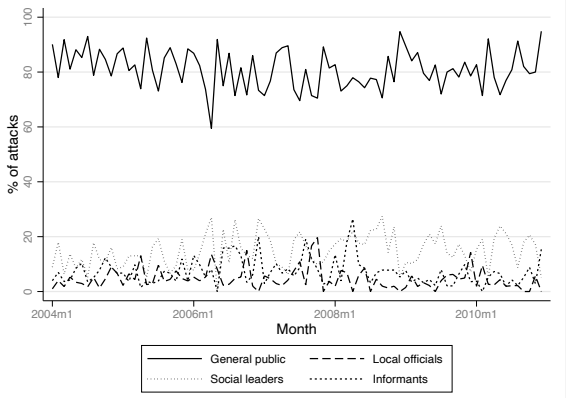
During an ongoing civil conflict, civilian victimization varies substantially over time. Panel (a) in Figure 1 depicts a temporal variation in the number of attacks on civilians by non-state armed groups in Colombia from 2004 to 2010. It displays time periods in which lethal violence is the most common type of victimization, whereas non-lethal violence is used in a few other instances. For example, non-lethal violence escalates in 2009, but lethal violence peaks in 2004.

Figure 1. Attacks perpetrated by non-state armed groups against civilians in Colombia, 2004-2010.

(a) Lethal and non-lethal attacks



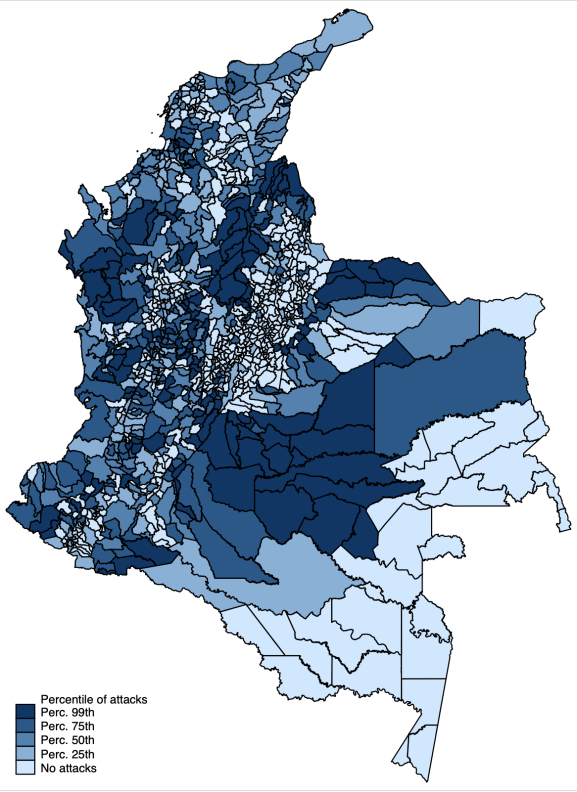
(b) Attacks by type of target



This figure presents the evolution of attacks against civilians in Colombia from 2004 to 2010. Panel (a) presents the number of total attacks distinguishing between lethal and non-lethal violence. Panel (b) splits the sample by type of target.

The percentage of attacks by target category is depicted in panel (b) of Figure 1. These targets are the general public, local officials, social leaders, and informants. It shows how the target of attacks shifts over time. Though the majority of victims are members of the general public, non-state armed groups also target specific groups of people: civilian leaders. Furthermore, there are spatial patterns in civilian victimization in Colombia. Figure 2 divides Colombian municipalities into quartiles based on the total number of civilian attacks per 100,000 population between 2004 and 2010. The most violent municipalities are those with the darkest blue. As depicted, violence against civilians is highly localized. The attacks appear to be concentrated in Chocó, Antioquia, Bolvar, Santander, Norte de Santander, Arauca, Meta, Nariño, and Putumayo.

Figure 2. Distribution of attacks against civilians at the municipal level in Colombia, 2004-2010

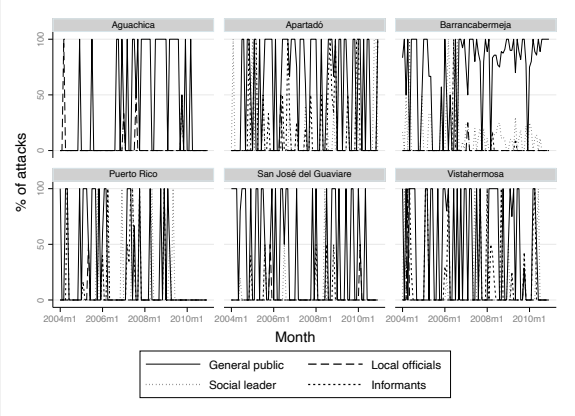


This figure presents the number of attacks at the municipal level in Colombia by percentile of its empirical distribution.

Finally, the targets of violent attacks differ on a local level. Figure 3 depicts the percentage of attacks classified by kind of target in Colombia's six most violent

municipalities between 2004 and 2010. It demonstrates how the target of civilian victimization varies by municipality. For example, violence in Apartadó (Antioquia) primarily targets the general public and informants, but violence in Barrancabermeja (Santander) targets the general public and social leaders. With the exception of Barrancabermeja, almost every other municipality reports a high degree of violence against local officials. Violence against informants and social leaders appears to be irrelevant in Aguachica (Cesár).

Figure 3. Target of attacks against civilians in Colombia, 2004-2010.



This figure presents the number of attacks at the municipal level in Colombia by type of target.

What characteristic accounts for the temporal and spatial fluctuations observed in the types of violence employed and the targets of violence throughout every phase of a civil conflict? This paper examines the factors influencing territorial control, specifically focusing on two conditions: the strategic significance of territory and the level of civilian collaboration with combatants or armed actors in general. Territorial disputes constitute a significant source of global conflict, playing a pivotal role in shaping the initiation and duration of armed wars (Toft, 2014). Non-state armed groups necessitate a designated spot where they can securely construct bases for conducting military activities, formulate strategic plans, safeguard themselves against rival assaults, and store their weaponry (De La Calle and Sánchez-Cuenca, 2015). The capacity to exert territorial dominance serves as an indicator of the military strength possessed by a non-state armed group (Carter, 2010).

1.1 The strategic value of territory

Armed groups frequently exhibit interest in capturing territories that possess vital resources, including but not limited to agricultural land, water sources, minerals, and crucial transit routes. The presence of these resources can lead armed groups to establish control over such areas. In turn, this control shapes interactions with civilians and allows armed groups to exert influence over the local population. To maintain and solidify this control, they may use violence to suppress dissent, eliminate perceived threats, and instill fear among civilians. In some cases, armed groups may seek to establish a form of governance in the territories they control by providing certain services, such as dispute resolution, education, or healthcare, to gain the support or acquiescence of the population.

When an armed groups relinquishes control over a particular area, it frequently results in the the loss of significant resources, including land, income-generating operations (such as illicit trade or mining), and the ability to utilize crucial transportation networks. The sudden lack of resources may prompt the armed group to employ violent measures against civilians as a means of conveying a message of reprisal and showcasing its resilience. Furthermore, it is possible that the perpetration of such acts of violence is intended to discourage civilian support for rival armed factions or governmental forces.

Hypothesis 1. *Disrupting the territorial control of a non-state armed group fosters violence against civilians.*

The loss of territory can lead armed groups to adopt more brutal and extreme tactics in an attempt to maintain control over their remaining strongholds. Hence, non-state armed groups use violence to enforce their rules and maintain social order.

1.2 Collaboration between combatants and civilians

When a non-state armed group enjoys strong support from the local population, it has a vested interest in preserving that support (Humphreys and Weinstein, 2006; Wood, 2014b,a). Indiscriminate violence, such as attacks that cause widespread civilian casualties, can quickly erode the trust and backing of the very population it relies on for various forms of support, including recruitment, intelligence, and resource provision. This loss of support can weaken the group's overall position and hinder its long-term objectives. Additionally, indiscriminate violence can disrupt government

functions assumed by non-state actors and damage their reputation as effective rulers.

Selective violence can be more strategically advantageous. By targeting specific individuals or groups that are perceived as threats or obstacles to the group's goals, they can achieve their objectives while minimizing harm to the broader civilian population. Local support provides armed groups with a network of informants and sources of intelligence within the community. This enables them to identify and target specific individuals or groups without resorting to indiscriminate methods.

Hypothesis 2. *Conditional on enjoying strong support from the local population, a non-state armed group is more likely to resort to selective violence rather than indiscriminate violence.*

Indiscriminate violence carries the risk of generating outrage and backlash, not only from the local population but also from the international community and potential external backers. Non-state armed groups with local support may seek to avoid such repercussions.

As indiscriminate violence attracts significant attention, lethal violence does too. A non-state armed group that benefits from strong local support is likely to prioritize maintaining and bolstering that support. Lethal violence, which results in loss of life, can quickly erode the trust and backing of the local population. For those armed actors interested in economic gains, local support often involves economic contributions from the civilian population, including resource provision or financial support. Lethal violence can disrupt economic activities and reduce the ability of the civilian population to provide for the armed group. Non-lethal violence, in the form of extortion, taxation, or forced labor, can be used to extract resources without causing fatalities.

Hypothesis 3. *Conditional on enjoying strong support from the local population, a non-state armed group is more likely to resort to non-lethal violence rather than lethal violence.*

Non-lethal violence can serve as a means of coercion and control without escalating the conflict to a more intense and destructive level. This can be desirable for armed groups that aim to maintain a stable status quo in their territories, particularly for those groups that set a system of local governance. Non-lethal violence, such as

coercion, intimidation, and forced labor, can be employed to enforce their rules and maintain order without causing the death of community members. This can help sustain their governance efforts

2 The Colombian civil war

The Colombian civil war has complex and multifaceted origins that stretch back several decades. The emergence of leftist rebel groups, such as the Revolutionary Armed Forces of Colombia (FARC) and the National Liberation Army (ELN), can be traced back to the mid-20th century. These groups were founded with the aim of addressing issues related to land reform, social inequality, and political representation. Their insurgency against the government marked the beginning of the armed conflict (Centro Nacional de Memoria Histórica, 2013).

The 1980s were a crucial and tumultuous decade in the Colombian civil war, marked by significant developments, violence, and changes in the conflict dynamics. It saw the dramatic rise of powerful drug cartels in Colombia, including the Medellín Cartel led by Pablo Escobar and the Cali Cartel. These cartels played a central role in the Colombian conflict by funding and arming various armed groups, particularly leftist guerrillas. Paramilitary groups, often aligned with drug traffickers and landowners, expanded their influence during the 1980s. They emerged as formidable counterinsurgency forces and engaged in brutal campaigns against rebel groups and suspected sympathizers. One of the most prominent paramilitary leaders, Carlos Castaño, founded the paramilitary group known as the Peasant Self-Defense Forces of Córdoba and Urabá (ACCU) in the late 1980s (Romero, 2003; Centro Nacional de Memoria Histórica, 2013).

Both the FARC and ELN continued to engage in guerrilla activities, including attacks on military and police targets, infrastructure, and economic assets. Amid the ongoing conflict, there were sporadic attempts at peace negotiations. These efforts, however, were often short-lived and did not lead to lasting peace agreements. Landowners, especially those with large landholdings, were alarmed by the guerrilla presence in rural areas as these groups often demanded "revolutionary taxes" from them and sometimes seized their land. As as the guerrilla threat escalated, some individuals and communities in rural areas began forming self-defense groups to protect

themselves from guerrilla attacks. These groups were initially local and autonomous, operating independently to safeguard their interests. In 1997, several of these self-defense groups joined forces to create a more coordinated and powerful paramilitary organization known as the Autodefensas Unidas de Colombia (AUC), led by Carlos Castaño (Romero, 2003).

Both the FARC and AUC got involved in drug trafficking (Saab and Taylor, 2009). The FARC initially funded their revolutionary activities through kidnappings, extortion, and protection rackets. As the FARC established a presence in regions of Colombia known for coca cultivation and cocaine production, they taxed coca farmers and coca paste producers in these areas, effectively gaining a share of the drug profits. Over time, the FARC became directly involved in cocaine production by processing coca paste into cocaine hydrochloride. They also provided protection to drug traffickers and laboratories operating within areas under their influence in exchange for financial support and weapons. Like the FARC, the AUC initially presented itself as a paramilitary group fighting against guerrilla groups and drug traffickers. However, some AUC leaders formed alliances with powerful drug cartels, such as the Medellín Cartel and Cali Cartel, providing protection and logistical support in exchange for a share of the drug profits. Eventually, the AUC became increasingly involved in criminal activities related to drug trafficking, including drug production, trafficking, and money laundering. While drug trafficking revenues made up 48% of FARC's income, they made up 70% of AUC's income (Saab and Taylor, 2009; Abadie et al., 2015; Fisher and Meitus, 2017).

In terms of the Colombian drug trade, the AUC set itself up to protect its hold on large tracts of land by encouraging systematic land expropriations against the local populace. Anecdotal evidence suggests that paramilitary groups killed peasants as they took over control of a region, subsequently taking control of land holdings and trafficking routes. The AUC simultaneously traded its product in foreign markets while growing, processing, and transporting its own cocaine shipments (Saab and Taylor, 2009). The FARC, on the other hand, beneficharged against local coca growers and by outsourcing the marketing of its produce in foreign markets to small external criminal organizations (Saab and Taylor, 2009; Fisher and Meitus, 2017).

In the second part of the 1990s, as Colombia's civil conflict peaked, coca fields

significantly increased. Between 1990 and 2000, the planting rate of coca bushes increased from 19% to 74%, making Colombia one of the world's major producers of coca leaves (Rozo, 2012; Mejía, 2016). This production was spread throughout 200 municipalities, with about half of all coca crops concentrated inside ten municipalities (Mejía, 2016). Colombia was the world's leading cocaine exporter in 2009, accounting for 60% to 80% of global supply (Fisher and Meitus, 2017; Mejía, 2016). According to Mejía (2016), 55% of cocaine production was exported to North America, while the rest went to Europe.

Colombia's government initiated a campaign in 1999 to curb cocaine production and fight the territorial domination of non-state armed groups. This plan was known as *Plan Colombia* and had outlined a concrete set of goals, including: i) reducing cocaine production and trafficking by half over a six-year period, and ii) improving local security in Colombia by gaining control of areas traditionally dominated by non-state armed groups (Mejía, 2011, 2016; DNP, 2006). Between 2000 and 2008, the *Plan Colombia* budget averaged US$540 million per year, in addition to the Colombian government's annual investment of US$812 million. In the end, *Plan Colombia* accounted for over 1.1% of Colombia's annual GDP (Mejía, 2016).

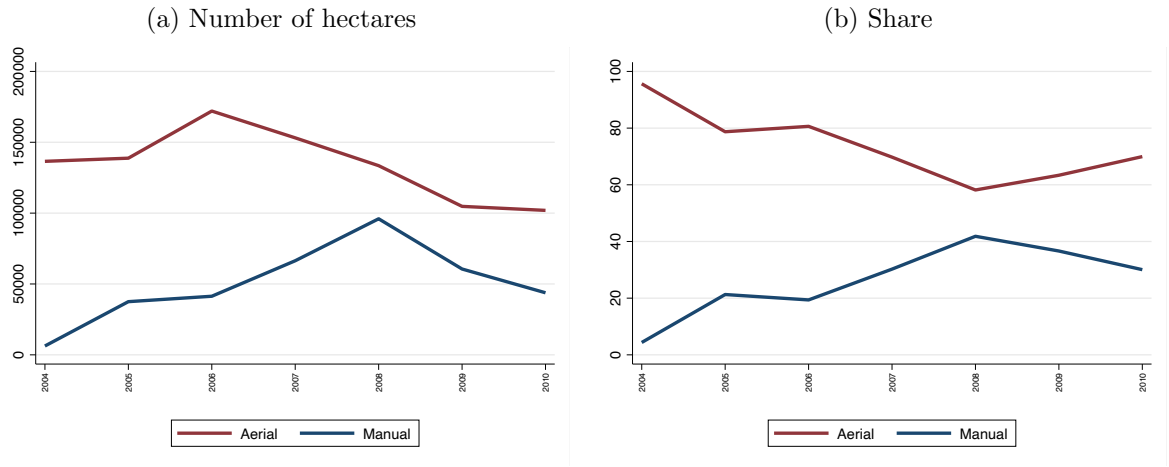
2.1 Plan Colombia: aerial spraying of coca crops

The aerial and manual eradication of coca crops has been the major strategy to diminish cocaine production. More than two million hectares of coca bushes have been eradicated, with 1.6 million hectares eradicated via aerial spraying and the remaining hectares eradicated via manual methods (Mejía, 2016).

Since 1978, the Colombian government has made efforts to halt coca cultivation through the utilization of aerial herbicide spraying, predominantly employing glyphosate. It constituted almost 40% of the aggregate public expenditure allocated towards anti-drug initiatives (Rozo, 2012). Figure 4 depicts the evalution of eradication operations in Colombia from 2004 to 2010. The majority of eradication attempts in the year 2004 were substantially dependent on the use of aerial spraying means. However, the significance of manual eradication operations has increased since 2004, constituting over 40% of eradication activities in 2008. The extent of aerial spraying operations experienced a stabilization at approximately 100,000 hectares in the year 2010, representing a decline from the previous level of 170,000 hectares observed in

2006. Throughout 2004 to 2010, the prevailing method employed for the destruction of coca plants was aerial eradication.

Figure 4. Hectares of coca eradicated in Colombia, 2004-2010.



This figure presents the evolution of eradication operations from 2004 to 2010. Panel (a) presents the number of hectares eradicated by type of operation. Panel (b) presents the share of each type of operation.

The process of aerial spraying is facilitated through the utilization of satellite imagery. Consequently, due to their heightened visibility, regions characterized by a greater reported expanse of coca plantations are more prone to being selected as targets for eradication initiatives (Rozo, 2012). Figure 5 shows the spatial distribution of coca production and eradication, which confirms this pattern. With the exception of select jurisdictions located in the southern area of the country and the Pacific region, the maps exhibit a remarkably close resemblance. The cultivation of coca plants was widely disseminated across several regions, including the Pacific, Magdalena Medio, Norte de Santander, Arauca, La Guajira, and the Amazon. The regions of the Pacific (Cauca and Nariño), the central area of the country, Magdalena Medio, Norte de Santander, Arauca, and La Guajira have been subjected to the most substantial levels of aerial spraying.

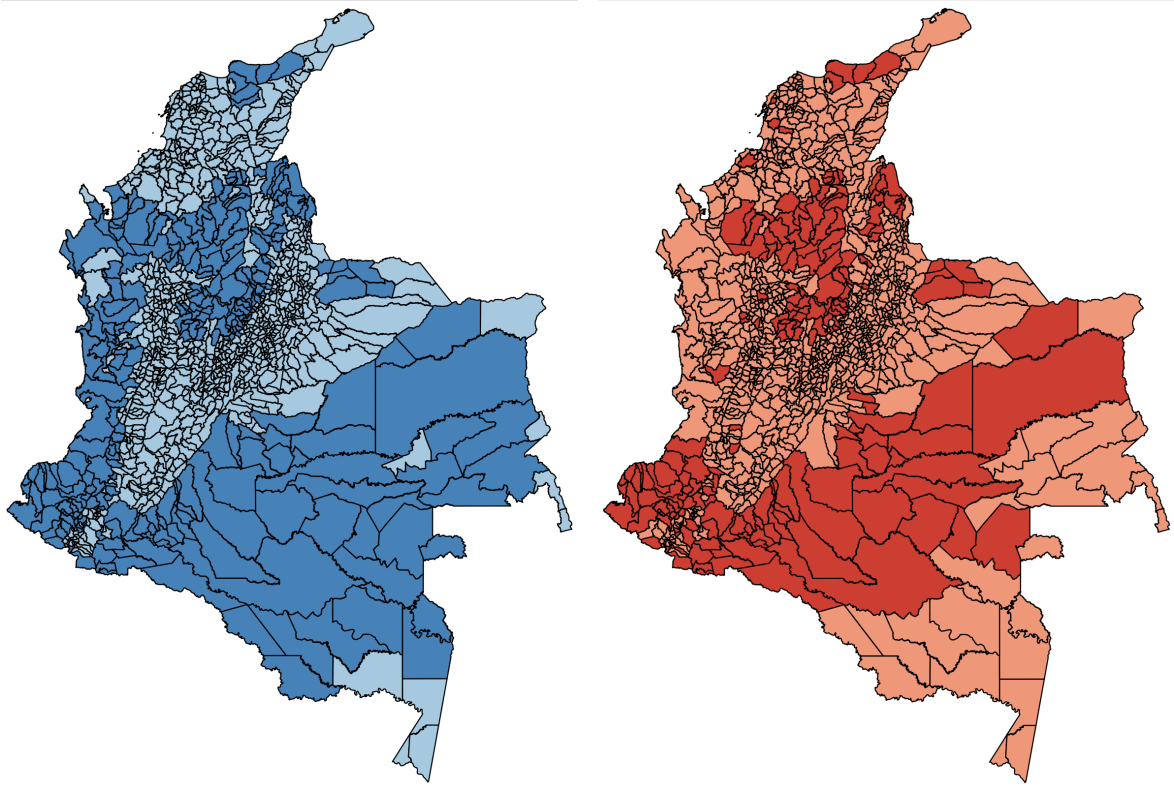
Despite concerted efforts to mitigate coca cultivation, a consensus over the comprehensive significance of the strategy remains unclear. There is evidence indicating that the implementation of aerial eradication efforts did not yield any significant impact on the total area of coca cultivation. Reyes (2014) concludes that a 1% increase in coca eradication contributes to a 1% rise in coca-cultivated area. Rozo

(2012), on the other hand, reveals that following fumigation, harvested area reduces by 1.09 hectares. Aerial spraying has little long-term impact on bushes productivity because coca producers become more skilled and capable of adapting to new security conditions (Rozo, 2012; Mejía and Restrepo, 2009). Mejía et al. (2017) found that spraying 1 hectare reduces coca cultivation by between 0.022 and 0.03 hectares. They find that aerial spraying is not a cost-effective strategy for combating cocaine production in Colombia. The lack of observable influence of aerial spraying on cocaine production can be mostly attributed to the ineffectiveness of eradication operations in influencing cocaine retail prices. Because of their market dominance, non-state armed groups act as a monopoly and have the ability to set cocaine prices (Gallego and Rico, 2013).

Figure 5. Hectares of coca cultivated and eradicated by municipality in Colombia, 2004-2010.

(a) Coca production

(b) Aerial eradication



This figure presents the spatial distribution of cultivation and eradication of coca crops.

In addition to the inefficacy of aerial eradication operations in addressing coca cultivation, the utilization of herbicides, such as glyphosate, gives rise to unanticipated

health and environmental impacts (Relyea, 2005; Cox, 2005; Imming, 2010; Camacho and Mejía, 2017). Insufficient emphasis has been devoted to examining the effects of aerial eradication on conflict outcomes. According to Mejía (2016), drug-related homicides accounted for 25% of all homicides committed between 1994 and 2008, reporting for around 57.000 victims. Abadie et al. (2015) investigates the impact of aerial spraying of coca crops on conflict dynamics at the local level in Colombia. They demonstrate that guerrilla activity increases after eradication in a given area, lending credence to the theory that guerrilla groups attempt to maintain control of coca fields.

2.2 Empirical predictions of the theory adapted to the Colombian case

Aerial spraying activities were commonly conducted in tandem with military actions. The lack of combat readiness in the aircraft utilized for coca field spraying is a significant vulnerability, as their deployment without adequate protection increases the likelihood of being targeted and shot down (Reyes, 2014; Wright, 2020). In order to enhance the security of eradication operations, security forces establish protective perimeters to ensure the accurate targeting of herbicides dispensed from small aircraft onto designated locations for eradication purposes. In addition, they provide defense mechanisms to safeguard aircraft against any hostile actions (Policía Nacional de Colombia, 2014).

Rebel forces consistently engage in resistance when state security forces endeavor to establish optimal circumstances for conducting aerial eradication operations. However, it is important to note that state forces possess a significant edge in terms of military capability, which allows them to swiftly suppress any form of resistance. The engagement in aerial spraying operations serves as a means for drawing the government's attention, thereby pressuring non-state armed groups to uphold territorial dominance, even in the face of military inferiority compared to state security forces. The empirical predictions of the theoretical argument in section 1 are predicated on the notion that unanticipated aerial eradication operations function as a military shock, prompting non-state armed organizations to pursue territorial control. This study aims to examine the influence of dispute over territory on the strategies employed by two distinct non-state armed groups in Colombia, namely the Revolutionary Armed Forces of Colombia (FARC) and paramilitary groups. Specifically, it seeks to analyze the extent to which these territorial disputes shape the repertoires of violence

utilized by these groups to establish and maintain order and control at the local level.

Although the FARC and paramilitary groups were heavily dependent on coca crops as a source of financing, it is possible that these non-state armed groups employed distinct victimization methods in order to acquire and consolidate territorial control. The FARC, primarily focused on safeguarding the crops of rural coca producers, established partnerships with other criminal enterprises possessing the expertise to facilitate the expansion of the global illicit drug trade. Paramilitary organizations implemented a strategy of vertical integration within the cocaine production chain, so acquiring the needed capacity to autonomously engage in commercial activities (Saab and Taylor, 2009). Paramilitary groups shown reduced dependence on civilian support and cooperation in the production and distribution of cocaine to global markets. In contrast, the FARC insurgency predominantly relied on the cooperation of local producers to ensure a consistent provision of resources and the production of cocaine for external customers. Given the previously stated premise and assuming the validity of the argument presented in section 1, the empirical evidence can be outlined as follows:

1. Aerial eradication efforts exacerbate territorial disputes among various non-state armed groups, resulting in a rise in civilian victimization within municipalities involved in coca production.

2. The victimization strategies employed by the FARC, selective and non-lethal violence, in municipalities involved in coca production are further intensified due to the implementation of aerial eradication operations.

3. Aerial eradication operations contribute to the exacerbation of indiscriminate and lethal victimization of civilians by paramilitary groups in municipalities involved in coca production.

3 Empirical design

3.1 Data

3.1.1 Civilian victimization

The paper analyzes data from Universidad del Rosario. This dataset is based on reports from *Noche y Niebla* from the *Centro Nacional de Investigaciones y Educación*

Popular (CINEP) to investigate why civilian victimization perpetrated by non-state armed gorups varies the way it does. The reports document daily conflict-related incidents in Colombia at the local level from 1996 through 2023. The information details each incident in such a way that the type of violence perpetrated by the FARC and paramilitary groups can be classified. The dataset detects the following types of violent repertoires:

- Non-lethal violence: Non-lethal violence refers to acts of physical harm or force that do not result in the immediate death of the victim. In the context of the Colombian armed conflict, this includes acts such as threats, torture, sexual violence, forced displacement, kidnappings, or other forms of harm that cause suffering, injury, or trauma to individuals or communities such as the destruction of property.

- Lethal violence: Lethal violence, in the context of the Colombian armed conflict, refers to acts of violence that result in the death of one or more individuals. This category encompasses a wide range of deadly actions, including homicides, executions, assassinations. It excludes combat-related deaths.

- Selective violence: Selective violence involves the deliberate targeting of specific individuals or groups based on their perceived affiliation, identity, or activities. Selective violence includes the intentional targeting of individuals such as human rights defenders, community leaders, local officials, and or retaliation directed at individuals who expose wrongdoing, misconduct, or illegal activities within organizations, better known as whistleblowers.

- Indiscriminate violence: Indiscriminate violence encompasses acts of violence that lack differentiation based on the victims' identity, or activity. Within the framework of this study, this type of violence pertains to acts of aggression directed towards individuals who do not fall under the categories of human rights defenders, community leaders, local officials, or whistleblowers.

The classification of indicators related to civilian victimization is based on the categorization of armed actors involved. Specifically, the FARC and paramilitary groups. The study collected a dataset on a weekly basis at the municipal level, spanning from January 2004 to December 2010. All measures are standardized to a population size of 100,000.

3.1.2 Aerial eradication operations

This study evaluates the impact of eradication efforts in Colombia by analyzing data obtained from the Ministry of National Defense. This report provides an account of the daily aerial eradication operations conducted at the municipal level from 2003 to 2014. Additionally, it presents data on the extent of coca eradication achieved in each operation, measured in hectares. The study comprises a dataset of aerial eradication operations conducted on a weekly basis at the municipal level, spanning from January 2004 to December 2010. The treatment variable of the main empirical model will be determined by using the area being eradicated and the number of days in between operation.

3.1.3 Additional information

The paper encompasses an array of socioeconomic characteristics obtained from a municipal panel from CEDE at Universidad de Los Andes. These attributes encompass factors such as municipality size, population, a rurality index, distance in kilometers to the department's capital, distance in kilometers to Bogotá, GDP per capita, tax income, government spending, government spending in justice, demobilized combatants, and killed combatants.

Aerial eradication of coca crops in the context of drug control efforts, particularly in countries like Colombia, depended heavily on logistical factors, including the distance to dispatching airports and weather conditions. The distance to dispatching airports is a crucial logistical consideration because it impacts the range and flight time of the aircraft involved in eradication efforts. The aircraft used for aerial eradication missions need to be able to travel to and from the target areas within their operational range. In regions with significant coca cultivation, remote airports may lack adequate security or infrastructure. Ensuring the safety of eradication teams, pilots, and support personnel is essential. Finally, aerial eradication operations require good visibility for accurate targeting of coca crops, wind speed and direction must be carefully monitored, and The weather is forecast in to ensure the safety of pilots and crew.

The dataset encompasses several variables, namely the distance in kilometers to military brigades, the distance in kilometers from the location where aerial eradica-

tion operations are deployed, and a range of weather conditions. The weather data included in this study comes from the NCEP Climate Forecast System Reanalysis (CFSR) for the period spanning from January 2004 to December 2010. It includes: precipitation rates, cloud covering (low and middle cloud layers), and temperature at different isobaric surfaces (1000 mbar, 850 mbar, 700 mbar, 500 mbar, 200 mbar, 50 mbar, and 2 mbar). Table 1 shows some summary statistics on civilian victimization by the FARC and paramilitary groups during the sample period, as well as summary statistics on aerial eradication operations in Colombia.

Table 1. Summary statistics.

	Mean	Std. Dev.	Min	Max
Aerial eradication operations				
Dummy indicator for any aerial eradication operation	0.021	0.143	0.000	1.000
Number of aerial eradication operations	0.063	0.585	0.000	18.000
Municipal area share affected by aerial eradication operations	0.006	0.078	0.000	6.799
Attacks against civilians within municipality (per 100.000 population)				
Number of total attacks	0.172	1.505	0.000	67.889
Number of total attacks by FARC	0.063	0.936	0.000	57.339
Number of total attacks by paramilitary groups	0.109	1.137	0.000	67.889

This table presents summary statistics of the number of eradication operations conducted by the Colombian government, as well as the attacks done by both the FARC and paramilitary groups, over the period spanning from 2004 to 2010.

The concentration of aerial spraying operations in Colombia has been notably focused, on average, on approximately 2% of the municipalities, encompassing nearly 0.6% of the total municipal area. The lethality of paramilitary violence seems to surpass that of insurgent violence, especially in regions where coca cultivation is prevalent (Gutiérrez-Sanín, 2008). Table 2 examines the disparities between municipalities engaged in coca cultivation and those abstaining from such activities, taking into account a range of distinct local attributes. Coca plantations are prevalent in communities situated within the Amazonic and Andean areas. The communities involved in the production of coca exhibit characteristics such as smaller population sizes, predominantly rural settings, and lower elevations.

Table 2. Summary statistics: differences between municipalities engaged in coca production and those not involved in such activities.

	Coca	Non-Coca	Difference
Andean region	0.215	0.608	-0.393
	(0.411)	(0.488)	[0.000]
Caribbean region	0.141	0.170	-0.029
	(0.348)	(0.376)	[0.000]
Pacific region	0.225	0.147	0.078
	(0.418)	(0.354)	[0.000]
Orinoquia region	0.119	0.046	0.073
	(0.324)	(0.210)	[0.000]
Amazonic region	0.300	0.028	0.272
	(0.458)	(0.166)	[0.000]
Total population	31525.200	40462.185	-8936.985
	(52396.711)	(253347.830)	[0.000]
Rurality index	0.668	0.589	0.079
	(0.193)	(0.242)	[0.000]
Municipal area (km^2)	4712.983	663.032	4049.951
	(8548.005)	(1672.962)	[0.000]
Altitude (km)	498.514	1222.773	-724.259
	(672.000)	(1175.676)	[0.000]
Distance to departmental capital (km)	137.472	75.693	61.780
	(86.871)	(53.994)	[0.000]
Distance to Bogotá (km)	412.684	307.470	105.214
	(126.194)	(192.696)	[0.000]
Per capita GDP	3498301.515	6782543.160	-3284241.645
	(2526007.891)	(5796802.911)	[0.000]
Total municipal income	9102.223	14678.784	-5576.561
	(14169.897)	(129143.933)	[0.000]
Total municipal expenditure	8626.448	15037.505	-6411.058
	(12566.602)	(136535.666)	[0.000]
Municipal development index	26.198	35.316	-9.118
	(7.002)	(9.383)	[0.000]
Municipal investment	7258184.878	12598321.890	-5340137.012
	(10328463.898)	(126376490.474)	[0.000]
Lenguage test	45.209	47.332	-2.123
	(3.261)	(3.225)	[0.000]
Math test	48.341	48.885	-0.544
	(1.603)	(1.693)	[0.000]
Low birth weight	27.057	52.070	-25.014
	(67.297)	(456.073)	[0.000]
Homicides per 100.000 population	71.372	60.340	11.032
	(94.863)	(85.199)	[0.000]
Forced migration cases per 100.000 population	4563.362	2201.699	2361.663
	(6254.130)	(5245.738)	[0.000]
Kidnapping cases per 100.000 population	40.245	39.386	0.859
	(63.257)	(198.458)	[0.517]
Abandoned land cases per 100.000 population	16.849	114.505	-97.656
	(12.415)	(326.165)	[0.000]

This table presents summary statistics of the difference in an array of municipal socioeconomic characteristics between municipalities engaged in coca cultivation activities and those that do not. The estimates are derived from the sample data collected between the years 2004 and 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

3.2 Identification

The objective of this study is to examine the relationship between aerial eradication operations and civilian victimization in Colombia carried out by non-state armed groups. The available evidence indicates that eradication operations are not implemented in a random way. Coca cultivation tends to occur in rural regions of the country characterized by limited government presence, widespread poverty, and a lack of incentives for the establishment of legal businesses (see Table 2). Excluding additional factors linked to both the dependent and independent variables in an ordinary least squares estimation of the effect of aerial eradication on civilian victimization by non-state armed groups will lead to a biased estimate of the actual impact of implementing such a program.

There are other obstacles that may arise in the context of causal inference because of reverse causality issues. The potential effects of civilian victimization on aerial eradication operations should be taken into consideration. In regions characterized by high levels of violence and under the control of non-state actors, there is a potential for local and government officials to place emphasis on the implementation of pacification initiatives. As an illustration, implementing anti-narcotics policies, often involving aerial eradication, is commonly associated with efforts to enhance governmental presence.

The paper exploits the spatial distribution of coca crops and the timing of aerial eradication operations episodes. Since it is interested on how violence against civilians changed after eradication operations took place, the main empirical strategy is based on a *stacked difference-in-differences* model (Dube et al., 2022; Baker et al., 2021). To identify an episode of aerial eradication, the paper considers two specifics conditions. First, the number of days between eradication operations must be greater than the 80th percentile of its empirical distribution across Colombian municipalities. Second, the area that is eradicated during an operation is greater than the 80th its empirical distribution across Colombian municipalities.

For each eradication episode e, the paper forms the episode-specific dataset by combining all treated municipality-weeks within the 17-week event window with the sample of never-treated units or control group (Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021). Next, it stacks each episode into a single dataset and center event-

times around the episode date. It then applies the *stacked difference-in-differences* to the civilian victimization data. Formally, using the subindex i to denote municipalities, t to denote time, and e to denote each eradication episode, the paper estimates:

$$y_{ite} = \alpha_i \times \tau_i + \delta_t \times \tau_i + \beta_1 \times Post_{te} \times D_{ie} + \varepsilon_{ite} \tag{1}$$

where y_{ite} is one of the outcomes related to civilian victimization, $Post_{te}$ is a dummy indicator that takes the value of one after an eradication operation is conducted, D_{ie} is a dummy indicator that takes the value of one if an eradication operation is conducted in municipality i, and $\alpha_i \times \tau_i$ and $\delta_t \times \tau_i$ are episode-specific municipality and time fixed effects that capture any time-invariant municipal-episode-level heterogeneity and any aggregate time shock at the municipal-episode level. Finally, the error term ε_{ite} is allowed to be timely correlated at the municipal-episode level.

The coefficient of interest is β_1 which captures the differential change in civilian victimization perpetrated by non-state armed groups after an aerial eradication operation is conducted after accounting by: i) any differential effect driven by any municipal-episode fixed characteristic, and ii) any aggregate time shock at municipal-episode level. The main identification assumption is parallel trends, that is, in the absence of an eradication operation, civilian victimization in municipalities where eradication operations were conducted would have evolve the same way in the treatment and control groups. To test this identifying assumption, the paper estimates an event-study to correct by potential bias coming from pre-treatment differential trends and the robustness of the results to moderate linear and non-linear violations of the parallel trends assumption (Roth, 2022; Rambachan and Roth, 2023).

4 Results

4.1 Main results

The paper begins by considering the overall impact of aerial eradication operations on civilian victimization perpetrated by the FARC insurgency and paramilitary groups between 2004-2010. According to the definition of the treatment, the stacked dataset contains 138 individual episodes of aerial eradication operations that satisfy the conditions set above. As eradication operations are anticipated, the $Post_{te}$ dummt indicator takes the value of one starting at week -1. Table 3 provides the weekly average

effects for each specification. Eradication operations have an impact on civilian victimization with a statistically significant point estimate of 0.0096 additional attacks according to the main model in column (1). The remaining columns support this hypothesis. Column (2) interacts the episode-time fixed effect with a fixed effect that tries to control by the impact of the size of coca cultivation in a municipality the year before of an eradication episode. In column (3) the additional fixed effect controls by the cumulative effect of the number of operations before an specific episode. Both fixed effects are included simultaneously in column (4). The point estimate in column (4) displays a statistical significant effect at the 1% level and is also economically significant, as it is three times higher than the average number of attacks during the sample period.

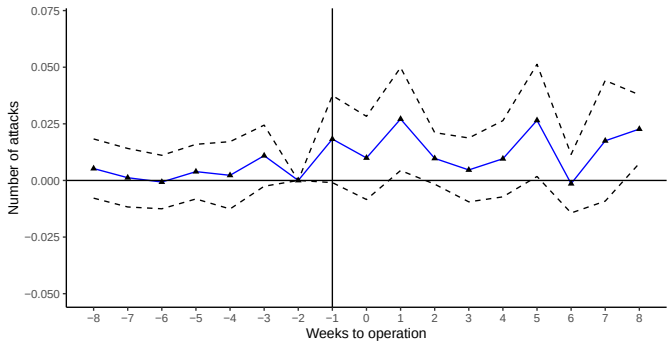
Table 3. Aerial eradication operations and civilian victimization (2004-2010)

	Dependent variable: Attacks against civilians			
	(1)	(2)	(3)	(4)
Post × Treated	0.0096**	0.0103***	0.0098**	0.0112***
	(0.0038)	(0.0039)	(0.0041)	(0.0041)
Dependent variable mean	0.0035	0.0035	0.0035	0.0035
Adjusted R^2	0.0423	0.0459	0.0434	0.0459
Observations	2,364,768	2,364,326	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event FE	Yes	No	No	No
Date × Event × Coca crops FE	No	Yes	No	Yes
Date × Event × Prior operations FE	No	No	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for a different set of fixed effect, indicated in the end of the table. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 6 correspondingly shows the dynamic event study coefficients of Equation 1 of column (4) in Table 3. This plot provides evidence of parallel trends, with most post-event coefficients positive and statistically significant, as all pre-event coefficient are not statistically different from zero. Clearly, it is observed a parallel pre-trend, followed by a positive trend in civilian victimization after an aerial eradication operation has been conducted.

Figure 6. Event-study: Aerial eradication operations and civilian victimization (2004-2010).



This figure shows coefficients from stacked event-study regressions described in section 3.2 on weekly civilian victimization data. Standard errors are clustered at the municipal level.

As argued in section 2.2, the FARC insurgency and paramilitary groups developed various means to collaborate with the local population in communities involved in coca cultivation. Consequently, both non-state armed groups encountered distinct constraints and motivations in their use of violence against civilians. The increase in civilian victimization documented in Table 3 conceals various victimization strategies employed by these non-state actors, as corroborated in Table 4.

Table 4. Aerial eradication operations and civilian victimization (2004-2010): Type and target of violence

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0034	0.0078***	0.0033*	0.0079***
	(0.0022)	(0.0030)	(0.0019)	(0.0028)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The results of Table 4 support the hypothesis that the overall increase in violence depicted in Figure 6 is driven by a differential increase of victimization strategies in terms of type (non-lethal vis-à-vis lethal) and targets (selective vis-à-vis indiscriminate) of violence. As Table 4 illustrates, there is a positive and statistically significant impact of eradication operations on lethal violence perpetrated by non-state armed groups. That is not the case for non-lethal victimization strategies. In relation to the nature of the intended victims, eradication operations result in both selective and indiscriminate victimization, with the latter exhibiting a more than twofold rise in comparison to the former in terms of violent acts. The increase in lethal and indiscriminate violence is statistically significant at the 1% level. Figure A1 depicts the event study plot of Table 4.

One concern is that the findings shown in Table 4 is the potential for efforts to eradicate coca crops to induce territorial control disruption, leading non-state armed groups to adapt and adjust to this altered dynamic. Hence, these non-state actors escalate their military operations, resulting in civilian victimization as a collateral outcome of their unilateral use of force (one-sided violence). To address this, the paper estimates a stacked triple differences model where the triple interaction coefficient includes a dummy indicator for the presence of one-sided violence. Point estimates remain unchanged in Table A1, at least for lethal and indiscriminate violence. Table A2 shows that civilian victimization is not driven by an outbreak of extreme forms of violence.

Pre-trends test as depicted in Figure 6 may be underpowered, meaning parallel trends violations are not detectable (Roth, 2022). Figure A2 considers the sensitivity of the results to linear pre-trends at different levels of statistical power. Linear trends are detected with 50% and 80% power, event after accounting for pre-trends bias. Then, the paper estimates the robustness of the results to linear and non-linear violations from the parallel trends assumption as proposed by Rambachan and Roth (2023). Figure A2 finds a significant results after allowing for a linear deviation of the parallel trends assumption. The breakdown value for a significant effect is $M \approx 0.2$. Finally, the results are not robust to a non-linear violation of the parallel trends. Overall, the results of Figure 6 are robust to pre-test bias and linear violations of the parallel trends assumption.

4.2 Mechanisms

The theoretical model's empirical predictions indicate that eradication operations result in a rise in civilian victimization. Such pattern should be driven by the fact that the FARC insurgency employs non-lethal selective violence, while paramilitary groups employ lethal indiscriminate violence. In this section, the paper delves deeper into the study of these relationships.

Table 5. Aerial eradication operations and civilian victimization (2004-2010): Type of actor

	Dependent variable: Attacks against civilians		
	FARC	ELN	Paramilitary groups
	(1)	(2)	(3)
Post × Treated	0.0041**	0.0001	0.0074**
	(0.0017)	(0.0005)	(0.0033)
Dependent variable mean	0.0013	0.0002	0.0020
Adjusted R^2	0.0200	0.0026	0.0672
Observations	2,362,048	2,362,048	2,362,048
Events	138	138	138
Municipalities	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different perpetrators, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The Colombian government's aerial eradication efforts should only elicit a response from non-state armed groups involved in the drug trafficking industry. Based on this particular assumption, it is anticipated that episodes of eradication will incite acts of violence carried out by the FARC insurgency and paramilitary groups, whereas the ELN is not likely to engage in violent actions against the civilian population. The level as well as aspects of the ELN's participation in drug trafficking throughout the period in question, like other armed groups in Colombia, varied over time and across different regions. From 2004 to 2010, there exists no detailed concrete proof to support the claim that the ELN engaged in organized drug trafficking activities. According to Table 5, it is evident that the FARC insurgency and paramilitary groups

are the only two armed groups that respond to episodes of eradication operations. The average increase in victimization is larger for the former than the latter.

Table 6. Aerial eradication operations and civilian victimization by FARC (2004-2010)

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0019*	0.0021	0.0010	0.0031**
	(0.0011)	(0.0014)	(0.0010)	(0.0015)
Dependent variable mean	0.0007	0.0006	0.0003	0.0010
Adjusted R^2	0.0297	0.0035	0.0070	0.0174
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets perpetrated by the FARC, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Aerial eradication operations and civilian victimization by paramilitary groups (2004-2010)

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0020	0.0054**	0.0023	0.0051**
	(0.0015)	(0.0026)	(0.0017)	(0.0022)
Dependent variable mean	0.0007	0.0012	0.0004	0.0015
Adjusted R^2	0.0732	0.0469	0.0362	0.0521
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets perpetrated by paramilitary groups, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The findings from Table 6 and Table 7 provide empirical evidence supporting the claim that the rise in civilian victimization subsequent to an eradication episode can be attributed to the distinct victimization strategies employed by the FARC insurgency and paramilitary groups. In the context of the FARC insurgency, empirical predictions suggested that eradication operations result in the occurrence of non-lethal selective victimization. However, according to the findings presented in Table 6, it can be observed that while the FARC did indeed utilize non-lethal violence, it did so an indiscriminate manner. This contradicts the anticipated results suggested by the theoretical model discussed in in section 2.2. On the contrary, and as expected, paramilitary groups generated lethal violence in an indiscriminate manner after an episode of eradication, as Table 7 seems to confirm.

Territories often hold strategic value, whether in terms of geographic location, access to resources, or logistical advantages. Armed groups may perceive control over these territories as vital to their objectives, whether political, economic, or military. According to the evidence presented in Table A3, the occurrence of targeted violence against civilians may primarily be attributed to the emergence of territorial disputes among armed actors. In this particular scenario, incidents of conflict in the recent time involving state forces and paramilitary groups, as well as combats between paramilitary groups and the FARC insurgency, have notably intensified the levels of violence inflicted upon the civilian population.

4.3 Robustness checks

Causal relationships involving government actions and violence are often complex and multifaceted. Eradication operations may be just one factor among many that contribute to attacks against civilians. Other factors, such as the presence of armed groups, political dynamics, and social conditions, can also influence violence.

Eradication operations in one area can lead to spillover effects in neighboring regions. For example, if coca cultivation is reduced or disrupted in one area due to eradication, coca farmers and drug traffickers may relocate to nearby areas. This can lead to an increase in drug-related violence and criminal activity in those neighboring regions as competition among armed groups or criminal organizations for the remaining cultivation sites grows. Table A4 estimates the same empirical model of Table 4 but includes fixed effects accounting the extent of coca cultivation and eradication

operations conducted in neighboring municipalities. The results remain unchanged.

Both eradication operations and operations targeting primary inputs and cocaine labs share the overarching goal of disrupting the illegal drug trade. They are often part of broader counter-narcotics strategies aimed at reducing drug production and trafficking. As a result, these operations may occur concurrently in the same areas. If this is indeed the case, the statistical significance of the observed effects can be attributed to a more comprehensive understanding of counter-narcotics policy, rather than solely relying on the significance of aerial eradication efforts. Table A5 appears to refute the idea altogether.

Weather conditions, such as heavy rain, fog, or adverse temperatures, can pose operational challenges for eradication efforts. These challenges can affect the timing, scope, and success of eradication operations. When operations face difficulties due to weather, they may extend longer or be perceived as less effective. Table A6 include interactions with an array of weather conditions expected to affect the logistical readiness of eradication operations such as cloud cover, temperature, precipitation, and wind speed. Overall, weather conditions around the timing of aerial eradication episodes do not affect the main findings.

The protracted confrontations stemming from territorial disputes can have a detrimental impact on the enduring capacities of non-state armed groups, mostly due to the attrition of their combatants resulting from either fatalities in combat or demobilization as a consequence of various government-led disarmament initiatives. In response, non-state armed groups may resort to violence against civilians as a means of demonstrating strength or compensating for diminished resources. Tables A7 and A8 demonstrate that the findings remain robust even when considering the count of combatant fatalities or the count of combatants who have voluntarily surrendered to members of state forces.

The state's presence can intersect with territorial control by non-state armed groups. Eradication operations may occur in areas where these groups hold sway. As a result, tensions between the state and these groups can lead to violence, with civilians caught in the crossfire. In some cases, eradication operations may be part of broader counterinsurgency or counter-narcotics strategies. The use of military force

to eradicate illicit crops may be seen as repressive by local communities, leading to resistance and violence as a response to perceived state oppression. Tables A9 and A10 show that the results are not affected when proxies of state presence such as the police reinforcement carried out in the beginning of 2004 during the Democratic Security policy era or different distances to government institutions are included.

Municipalities with lower GDP and tax income may have populations that are more economically vulnerable. In these areas, the cultivation of illicit crops, such as coca, may be a significant source of income for local residents. Eradication operations that disrupt this economic activity can exacerbate economic hardship and potentially lead to violence as affected communities seek to protect their livelihoods. Also, municipalities with lower tax income and public spending may have limited government presence and access to essential services. Table A11 reports that the results remain unchanged even when municipal socioeconomic characteristics that vary over time are included.

Past eradication operations that escalated into violence may set a precedent for future confrontations. Communities and armed groups may anticipate or prepare for violence in response to eradication, perpetuating a cycle of conflict. Armed groups may adjust their strategies based on past interactions with eradication efforts. If past operations weakened their economic interests or territorial control, they may respond more aggressively in subsequent eradication attempts. That is not the case according to the findings in Table Table A12. Finally, the findings do not depend on the two conditions used to define an episode of eradication (see Table A13).

5 Conclusion

Civil war specialists are primarily concerned with the occurrence of violence during an outbreak. The strategic employment of violence is often disregarded in examinations of internal warfare. Several variables can potentially impact the nature of violence perpetrated against civilians by a non-state armed group in this context. There are various factors that can be considered while analyzing a military entity, such as its endowments, capabilities, political identities, personal conflicts, level of public support, economic and social resources, internal structure, governance systems, and ideological framework. Due to an overwhelming number of plausible explanations, the identifi-

cation of reliable theories to elucidate the strategic employment of violence poses a challenging task. In what scenarios might a non-state armed group opt to engage in acts of violence against civilian populations?

The escalation of violence against civilians is driven by territorial conflicts. This study argues that the victimization choices made by non-state armed groups are shaped by two key factors: the strategic importance of the region and the level of collaboration between civilians and combatants. This study examines the utilization of diverse forms of violence by the FARC insurgency and paramilitary groups in their targeting of civilian populations during the Colombian civil war. The analysis is based on data derived from conflict events. This study aims to analyze the impact of aerial eradication operations on the nature of violence perpetrated against civilians by the Revolutionary Armed Forces of Colombia (FARC) and paramilitary groups. For example, the implementation of aerial eradication operations has been documented to incite armed confrontations between security forces and non-state armed groups. Due to the perceived threat posed by the government's military presence, both the FARC and paramilitary groups are motivated to consolidate their territorial control. This situation gives rise to territorial disputes in municipalities where coca crops are present. This particular form of conflict intensifies the occurrence of violence directed at non-combatant individuals.

Although the FARC and paramilitary groups employ violence as a means to establish territorial dominance, research indicates that both of these groups employ diverse tactics of civilian victimization to further their objectives. The FARC utilized non-lethal forms of violence, while paramilitary groups deployed lethal forms of violence. However, there exists no difference in the targets of violence among non-state armed groups as both actors exerted violence in a indiscriminate way.

The contribution of the paper is to provide a variety of causal mechanisms for tracing the path of violence against civilians during ongoing armed conflicts, based on rich data that enables the identification of diverse repertoires of violence used by non-state armed groups. In this way, the study goes beyond the binary dichotomy of all-forms-of-violence vis-á-vis no-violence and investigates how non-state armed groups strategically substitute different types of violence. The analysis exhibits specific shortcomings as well. It focuses primarily on the causes of civilian victimization

caused by aerial eradication operations. It does not rule out the possibility that other types of shocks would produce different dynamics of victimization. Moreover, there are still unresolved questions that are pertinent to this particular instance. For example, does the victimization of civilians effectively accomplish its objectives? The exploration of this topic should be the primary objective of forthcoming scholarly endeavors.

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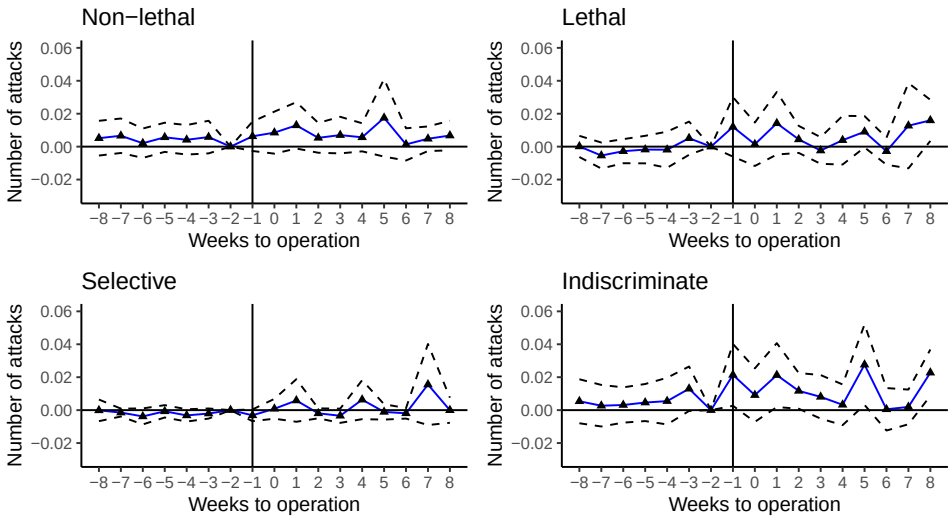
A Appendix Tables and Figures

Appendix Figure A1. Event study: Aerial eradication operations and civilian victimization by type and target of violence (2004-2010).



This figure shows coefficients from stacked event-study of Table 3. Standard errors are clustered at the municipal level. The confidence intervals are set at 90%.

Appendix Table A1. Aerial eradication operations and civilian victimization (2004-2010): One-sided violence

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0030*	0.0056***	-0.0006	0.0093***
	(0.0017)	(0.0015)	(0.0012)	(0.0023)
Post × Treated × Paramilitaries	-0.0667	-0.9545***	0.1148	-1.1360***
	(0.0507)	(0.1034)	(0.1638)	(0.2097)
Post × Treated × State forces	0.1850	0.0226	-0.0133	0.2209
	(0.1887)	(0.0356)	(0.0290)	(0.1955)
Post × Treated × FARC	-0.2047**	-0.2203	-0.0108	-0.4142*
	(0.1005)	(0.1772)	(0.1289)	(0.2166)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0708	0.3143	0.0442	0.2658
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

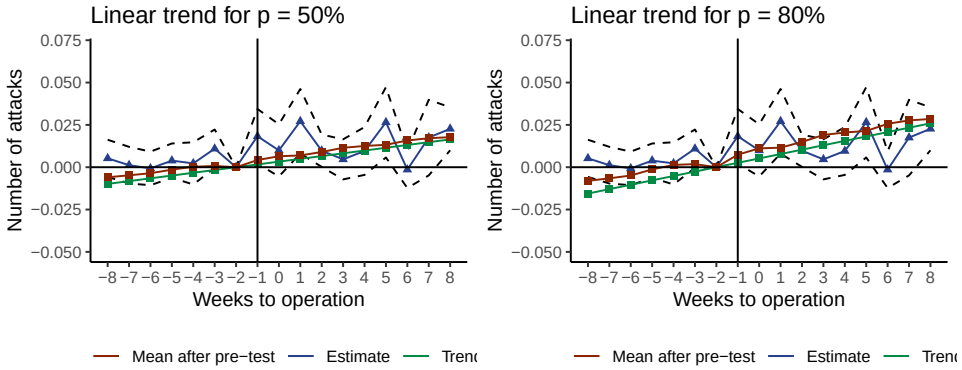
Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. Paramilitaries, State forces, and FARC refers to a dummy indicator that takes the value of one if one-sided attacks are reported for those armed actors. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A2. Aerial eradication operations and civilian victimization (2004-2010): Patterns of violence

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0036*	0.0063**	0.0021	0.0077***
	(0.0020)	(0.0025)	(0.0016)	(0.0027)
Post × Treated × War actions	-0.2742	0.1990	-0.1886	0.1134
	(0.2196)	(0.2055)	(0.2467)	(0.2286)
Post × Treated × Massacres	-0.0091	0.0653***	0.0544*	0.0018
	(0.0068)	(0.0220)	(0.0298)	(0.0433)
Post × Treated × Landmines	0.0384	-0.0069	0.0215	0.0101
	(0.0294)	(0.0227)	(0.0171)	(0.0346)
Post × Treated × Kidnappings	-0.0193*	-0.0193**	-0.0078	-0.0308**
	(0.0104)	(0.0079)	(0.0071)	(0.0122)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0555	0.0311	0.0185	0.0426
Observations	2,361,649	2,361,649	2,361,649	2,361,649
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

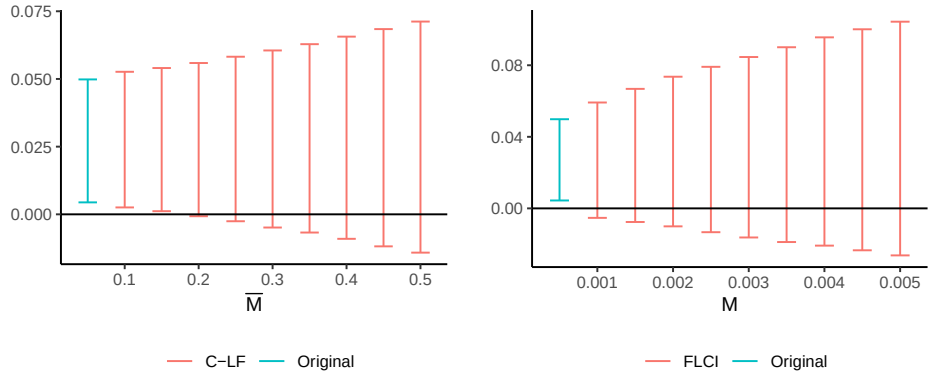
Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. War actions, Massacres, Landmines, Kidnappings refers to a dummy indicator that takes the value of one if that type of violence is reported. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Figure A2. Parallel trends power analysis.



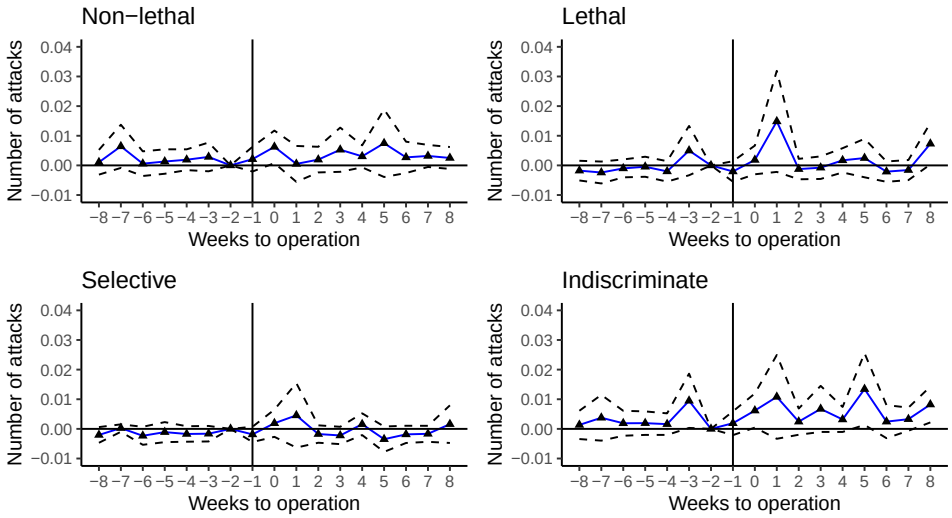
This figure shows pre-test power analysis from Roth (2022) using event-study coefficients from Figure 6. Overlaid are hypothesized linear trends before and after pretesting, with slopes detectable with 0.5 and 0.8 power (top left and right, respectively). The confidence interval is set at 90%.

Appendix Figure A3. Sensitivity analysis using relative magnitudes and smoothing restrictions.



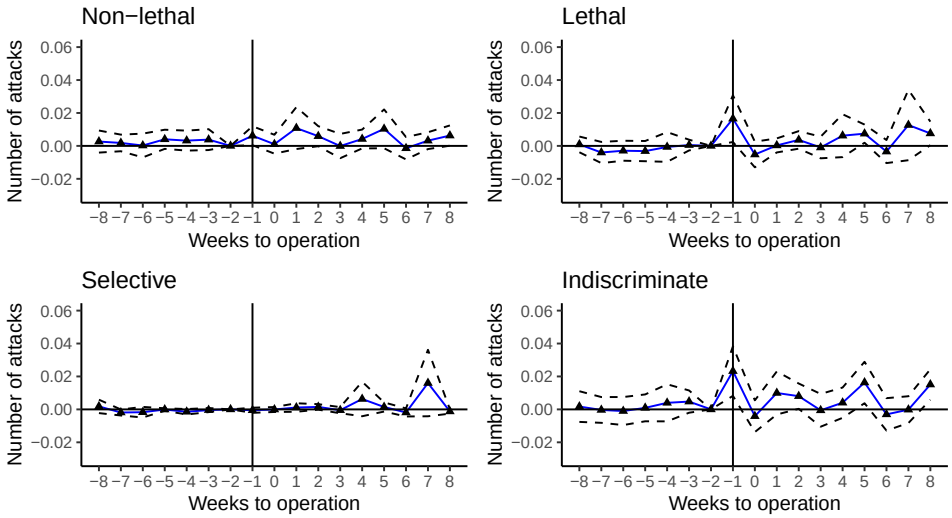
This figure presents the confidence intervals at 90% for linear and non-linear violations of the parallel trends assumption (Rambachan and Roth, 2023). M measures the size of the change in the trend between consecutive periods. Thus $M = 0$ is a linear violation of the parallel trend assumption.

Appendix Figure A4. Event study: Aerial eradication operations and civilian victimization by FARC (2004-2010).



This figure shows coefficients from stacked event-study of Table 6. Standard errors are clustered at the municipal level. The confidence intervals are set at 90%.

Appendix Figure A5. Event study: Aerial eradication operations and civilian victimization by paramilitary groups (2004-2010).



This figure shows coefficients from stacked event-study of Table 7. Standard errors are clustered at the municipal level. The confidence intervals are set at 90%.

Appendix Table A3. Aerial eradication operations and civilian victimization (2004-2010): Two-sided violence during the year before

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0010	0.0040	0.0006	0.0044*
	(0.0014)	(0.0027)	(0.0014)	(0.0023)
Post × Treated × State - Paramilitaries	0.1334***	0.0726***	0.0830***	0.1230***
	(0.0179)	(0.0238)	(0.0130)	(0.0286)
Post × Treated × State - FARC	0.0002	0.0033	0.0031	0.0004
	(0.0015)	(0.0028)	(0.0019)	(0.0021)
Post × Treated × Paramilitaries - Guerrilla	0.0068	0.1014**	-0.0070	0.1152***
	(0.0087)	(0.0466)	(0.0081)	(0.0378)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0260	0.0180	0.0379
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes dummy indicators referring to clashes among armed actors. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A4. Aerial eradication operations and civilian victimization (2004-2010): Clusters of eradication

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0027	0.0085***	0.0030	0.0083***
	(0.0024)	(0.0033)	(0.0021)	(0.0030)
Dependent variable mean	0.0015	0.0020	0.0009	0.0026
Adjusted R^2	0.0539	0.0242	0.0162	0.0379
Observations	2,358,687	2,358,687	2,358,687	2,358,687
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes
Date × Event × Neighbors FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a fixed effect that accounts for coca cultivation and eradication operations conducted in neighboring municipalities. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A5. Aerial eradication operations and civilian victimization (2004-2010): War on drugs

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0037*	0.0082***	0.0035*	0.0084***
	(0.0020)	(0.0030)	(0.0019)	(0.0026)
Leaves seizure × Treated	0.0039**	0.0024***	0.0018***	0.0045**
	(0.0017)	(0.0009)	(0.0007)	(0.0018)
Base seizure × Treated	-0.0935***	-0.0492***	-0.0520***	-0.0906***
	(0.0161)	(0.0154)	(0.0150)	(0.0159)
Hydrochloride labs × Treated	0.9911	-0.5110	0.0364	0.4437
	(2.4001)	(1.8863)	(1.6057)	(2.3843)
Primary production labs × Treated	-1.3573*	-1.0612**	-0.6587*	-1.7597**
	(0.7013)	(0.4864)	(0.3403)	(0.6934)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes other dummy indicators related to the war on drugs. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A6. Aerial eradication operations and civilian victimization (2004-2010): Weather conditions

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0038	0.0091**	0.0041*	0.0088***
	(0.0024)	(0.0037)	(0.0023)	(0.0032)
Low-level clouds × Treated	0.0000	-0.0001**	-0.0001**	-0.0001
	(0.0000)	(0.0001)	(0.0000)	(0.0001)
Mid-level clouds × Treated	0.0000	-0.0001	0.0000	-0.0001
	(0.0000)	(0.0001)	(0.0000)	(0.0001)
Precipitation × Treated	-2.2490	-0.8794	-0.5499	-2.5784
	(2.3899)	(4.4349)	(1.4387)	(4.5866)
2 mbar level temperature × Treated	-0.0002	-0.0006	0.0000	-0.0008*
	(0.0002)	(0.0004)	(0.0002)	(0.0005)
50 mbar level temperature × Treated	0.0000	-0.0006	-0.0001	-0.0004
	(0.0004)	(0.0014)	(0.0003)	(0.0013)
200 mbar level temperature × Treated	-0.0014	0.0063*	0.0021	0.0028
	(0.0015)	(0.0034)	(0.0016)	(0.0033)
500 mbar level temperature × Treated	0.0012	-0.0028*	0.0003	-0.0019
	(0.0012)	(0.0016)	(0.0010)	(0.0020)
700 mbar level temperature × Treated	0.0020	-0.0036	-0.0012	-0.0004
	(0.0016)	(0.0030)	(0.0014)	(0.0034)
850 mbar level temperature × Treated	-0.0003	-0.0007	0.0009	-0.0019
	(0.0011)	(0.0016)	(0.0008)	(0.0019)
1000 mbar level temperature × Treated	-0.0003	-0.0009	-0.0011**	-0.0001
	(0.0007)	(0.0018)	(0.0005)	(0.0019)
10m wind speed × Treated	-0.0056*	0.0002	0.0006	-0.0059
	(0.0030)	(0.0037)	(0.0021)	(0.0044)
30m wind speed × Treated	-0.0005	-0.0002	-0.0018	0.0011
	(0.0016)	(0.0035)	(0.0022)	(0.0028)
200m wind speed × Treated	-0.0001	0.0003	-0.0001	0.0003
	(0.0002)	(0.0003)	(0.0002)	(0.0004)
500m wind speed × Treated	0.0000	-0.0007	-0.0009*	0.0002
	(0.0004)	(0.0006)	(0.0005)	(0.0007)
700m wind speed × Treated	-0.0002	0.0007	0.0009	-0.0003
	(0.0005)	(0.0008)	(0.0006)	(0.0009)
850m wind speed × Treated	0.0001	0.0004	0.0009	-0.0003
	(0.0005)	(0.0012)	(0.0006)	(0.0011)
1000m wind speed × Treated	0.0039	-0.0042	0.0015	-0.0018
	(0.0031)	(0.0076)	(0.0043)	(0.0068)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,048	2,362,048	2,362,048	2,362,048
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A7. Aerial eradication operations and civilian victimization (2004-2010): Demobilization from armed groups

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0032	0.0080***	0.0032*	0.0080***
	(0.0022)	(0.0030)	(0.0019)	(0.0028)
FARC demobilization × Treated	-0.0005	0.0007	-0.0002	0.0004
	(0.0013)	(0.0011)	(0.0007)	(0.0014)
Paramilitary demobilization × Treated	0.0028	-0.0022	0.0016	-0.0010
	(0.0071)	(0.0018)	(0.0029)	(0.0039)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a set of dummy indicators related to the number of combatants demobilized from the FARC insurgency and paramilitary groups. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A8. Aerial eradication operations and civilian victimization (2004-2010): Combatants killings

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0034	0.0078***	0.0033*	0.0079***
	(0.0022)	(0.0030)	(0.0019)	(0.0028)
FARC combatants × Treated	0.0015	0.0034***	0.0015*	0.0035***
	(0.0010)	(0.0013)	(0.0008)	(0.0012)
Paramilitary combatants × Treated	-0.0485***	-0.0102***	-0.0044*	-0.0544***
	(0.0029)	(0.0039)	(0.0025)	(0.0036)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a set of dummy indicators related to the number of combatants killed in clashes with state forces. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A9. Aerial eradication operations and civilian victimization (2004-2010): Democratic Security policy

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0010	0.0058**	0.0012	0.0056**
	(0.0016)	(0.0027)	(0.0015)	(0.0026)
Post × Treated × Police reinforment	0.0113	0.0095	0.0101	0.0107
	(0.0089)	(0.0106)	(0.0074)	(0.0099)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a dummy indicator of police reinforcements due to the Democratic Securiy policy. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A10. Aerial eradication operations and civilian victimization (2004-2010): State presence

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0033	0.0078***	0.0033*	0.0078***
	(0.0022)	(0.0030)	(0.0019)	(0.0028)
Post × Distance to capital	0.0015	0.0005	0.0022**	-0.0002
	(0.0011)	(0.0020)	(0.0010)	(0.0022)
Post × Distance to Bogota	0.0005	0.0003	0.0003	0.0005
	(0.0004)	(0.0005)	(0.0003)	(0.0007)
Post × Distance to brigade	-0.0018	-0.0043	-0.0031*	-0.0030
	(0.0020)	(0.0034)	(0.0017)	(0.0039)
Post × Distance to airport	-0.0012	0.0000	-0.0002	-0.0010
	(0.0010)	(0.0013)	(0.0006)	(0.0017)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a set of variables that estimate the geodesic distance from a municipality centroid to the department's capital, Bogotá, the nearest military brigade, and the nearest anti-narctic airport. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A11. Aerial eradication operations and civilian victimization (2004-2010): Municipal characteristics

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0036	0.0090***	0.0034*	0.0091***
	(0.0023)	(0.0030)	(0.0020)	(0.0029)
Rurality × Treated	0.2002	0.1707	-0.2587	0.6295
	(0.3739)	(0.6546)	(0.2611)	(0.6246)
Justice × Treated	0.0004	0.0157***	-0.0007	0.0167**
	(0.0062)	(0.0048)	(0.0034)	(0.0070)
GDP per capita × Treated	-0.0006	-0.0009	-0.0010	-0.0005
	(0.0009)	(0.0009)	(0.0007)	(0.0011)
Government spending × Treated	-0.0003	-0.0058***	-0.0009	-0.0052***
	(0.0013)	(0.0019)	(0.0017)	(0.0015)
Dependent variable mean	0.0016	0.0020	0.0009	0.0027
Adjusted R^2	0.0536	0.0259	0.0183	0.0380
Observations	2,273,961	2,273,961	2,273,961	2,273,961
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a set of municipal socioeconomic characteristics. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A12. Aerial eradication operations and civilian victimization (2004-2010): Eradication programs

	Dependent variable: Attacks against civilians			
	Non-lethal	Lethal	Selective	Indiscriminate
	(1)	(2)	(3)	(4)
Post × Treated	0.0025	0.0076***	0.0029	0.0072***
	(0.0017)	(0.0029)	(0.0018)	(0.0025)
Aerial eradication × Treated	-0.0154	0.0036	-0.0057	-0.0061
	(0.0112)	(0.0049)	(0.0058)	(0.0089)
Manual eradication × Treated	0.0202***	0.0110**	0.0130***	0.0181**
	(0.0069)	(0.0055)	(0.0039)	(0.0083)
Dependent variable mean	0.0015	0.0020	0.0008	0.0026
Adjusted R^2	0.0523	0.0259	0.0179	0.0378
Observations	2,362,034	2,362,034	2,362,034	2,362,034
Events	138	138	138	138
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of treatment effects for different definitions of violence against civilians, indicated in the table header. It includes a set of dummy indicators associated to different eradication strategies in the past. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A13. Aerial eradication operations and civilian victimization (2004-2010): Intensity of treatment

	Dependent variable: Attacks against civilians			
	75th	85th	90th	95th
	(1)	(2)	(3)	(4)
Post × Treated	0.0084**	0.0104*	0.0148*	0.0159*
	(0.0039)	(0.0054)	(0.0086)	(0.0096)
Dependent variable mean	0.0040	0.0040	0.0040	0.0040
Adjusted R^2	0.0472	0.0447	0.0508	0.0490
Observations	3,436,548	1,642,846	1,006,281	507,314
Events	204	95	57	28
Municipalities	1,090	1,090	1,090	1,090
Municipality × Event FE	Yes	Yes	Yes	Yes
Date × Event × Coca crops FE	Yes	Yes	Yes	Yes
Date × Event × Prior operations FE	Yes	Yes	Yes	Yes

Standard errors in parentheses clustered at the municipal level. Sample is weekly municipal panel in stacked event-specific datasets. Outcome variable is the number of attacks against civilian targets, normalized to a population size of 10,000. Each column provides estimates of different treatment definitions, indicated in the table header. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.