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RESEARCH ARTICLE

# Weaponizing Kinship: A Demographic Analysis of Bereavement in the Colombian Conflict

ENRIQUE ACOSTA[†], DIEGO ALBUREZ-GUTIERREZ[†], MARIA GARGIULO AND CATALINA TORRES

*The ongoing Colombian armed conflict has produced widespread homicides and enforced disappearances, as armed actors used violence to terrorize communities and consolidate power. Family bereavement—one of the most pervasive and enduring consequences of this violence—remains critically understudied from a quantitative perspective. We quantify the population burden of bereavement—ever having lost a family member to conflict—using kinship demographic models applied to 1985–2018 data compiled by the Truth Commission and the Special Jurisdiction for Peace, corrected for under-registration. By 2018, an estimated 7.5% of Colombians had lost a close relative and about 40% had lost at least one family member to conflict. Even assuming an over-optimistic scenario with no post-2018 violence, demographic projections indicate that conflict-related bereavement will remain visible well into the 2080s. Results are robust to subnational heterogeneity and alternative "bereavement memory" specifications. Reading these estimates alongside the Commission's qualitative record underscores bereavement as a strategic mechanism of repression aimed at fracturing kin networks and community cohesion rather than a collateral by-product. Our demographic profiling of the bereaved informs population-health and psychosocial responses, including support for relatives of the disappeared, and can guide reparations and community-based programs that rebuild kin and neighborhood ties while strengthening guarantees of non-repetition.*

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## Introduction

Armed groups rarely exercise violence randomly; even seemingly indiscriminate attacks—such as the bombing of a residential building or the massacre of a village—typically follow strategic targeting criteria (Hoover Green 2018). Since violence against civilians carries significant financial and reputational costs, it generally serves calculated objectives, such as territorial control, intimidation, or shaping negotiations (Downes 2008; Schelling 1966). This paper examines "direct violence"—explicit acts like homicides and enforced disappearances[1] (Galtung 1969)—and the extent to which they function as instruments of psychological warfare designed to instill fear, fragment communities, and coerce compliance (Valentino 2013). In Latin American civil wars, state forces, insurgent groups, and paramilitaries systematically employed massacres, torture, enforced disappearances, and targeted killings to disrupt social cohesion, suppress dissent, and consolidate territorial and political control (Arjona, Kasfir, and Mampilly 2017).

We borrow the term "mechanism of terror" from the Guatemalan Truth Commission to refer to organizational and strategic practices that rely on extreme physical and psychological violence to maintain or alter an existing order. Truth commissions across Latin America have documented how such mechanisms were implemented by both state and non-state actors (Comisión de la Verdad y Reconciliación [CVR] 2003; Comisión para el Esclarecimiento Histórico [CEH] 1999; CONADEP 1984). These commissions have also emphasized the long-term societal consequences of terror, especially in how fear and distrust infiltrate everyday life, erode social bonds, and produce lasting psychological and collective traumas.

In this paper, we argue that family bereavement is not only a byproduct of violence but is often strategically inflicted as a mechanism of terror. Given that homicides and enforced disappearances are common instruments of terror, they necessarily produce substantial kin loss. Due to the multiplicative nature of kinship networks, a single violent death generates bereavement for multiple surviving relatives (Verdery et al. 2020). A recent study of the 16 most lethal conflicts in recent decades found that bereavement rates considerably exceed conflict-related mortality rates (Alburez-Gutierrez et al. 2024). In this sense, family networks serve as amplifiers of violence: a mechanism through which perpetrators can extend the reach of harm and social disruption beyond the immediate victim (CONADEP 1984).

Despite its importance, bereavement remains a relatively understudied aspect of war. Much of the empirical literature on the demographic consequences of armed conflict focuses on mortality—quantifying death tolls and estimating excess mortality (Guillot et al. 2025; Hoover Green and Ball 2019; Tabeau and Bijak 2005; Walque 2006). However, recent studies have begun to highlight "excess bereavement": the additional kin loss that occurs as a result of a mortality crisis (Snyder et al. 2022). Bereavement

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matters because, as Bowlby (1980) notes, losing a close attachment figure can profoundly disrupt emotional security, identity, and social relationships, with enduring consequences for individuals and communities. There is extensive evidence showing that bereavement—especially when violent—can produce long-term effects on mental and physical health, psychological resilience, and social integration (Heeke et al. 2017; Kristensen, Weisæth, and Heir 2012; Morina, von Lersner, and Prigerson 2011; Schaal et al. 2010). Bonanno (2004) emphasizes that while grief responses are heterogeneous, violent or sudden losses increase the risk of prolonged psychological distress and complicated grief.

Bereavement also has collective implications. Liberation psychologists emphasize that such losses reverberate beyond the individual, producing what Martín-Baró (1989) called psychosocial trauma, while Lykes (1994) shows they also foster a "culture of fear" that destabilizes communities across generations. At the population level, bereavement shapes historical and demographic memory (Alburez-Gutierrez 2022; Denton and Spencer 2021). Beyond psychological and social impacts, kin loss entails acute material and structural consequences, disproportionately affecting children, women, and working-age adults (Mathers et al. 2023; Schlüter, Masquelier, and Jamaluddine 2025). Such losses intensify vulnerability and exacerbate existing inequalities, compounding the long-term harms of armed conflict (Comisión de la Verdad 2022e; Neal, Stone, and Ingham 2016).

In this paper, we consider the Colombian armed conflict (CAC), which has spanned more than six decades and produced immense and enduring suffering. Since the 1960s, hundreds of thousands of civilians have been killed, over 100,000 forcibly disappeared, and millions displaced (Comisión de la Verdad 2022b). Following the 2016 peace accord with the FARC-EP, the Colombian government established the Commission for the Clarification of Truth, Coexistence and Non-Repetition (the Colombian Truth Commission; CEV) to document human rights violations committed by all parties to the conflict. The CEV collected *testimonios*—first- and second-hand narratives of violence—and collaborated with the Special Jurisdiction for Peace (JEP) and the Human Rights Data Analysis Group (HRDAG) to form the JEP-CEV-HRDAG Joint Project, which compiled and analyzed more than 100 datasets on conflict-related human rights violations (Amado et al. 2025; JEP-CEV-HRDAG Joint Project 2025). Its final report, published in 2022, combines rich qualitative and quantitative analysis to reconstruct the social, structural, and historical dynamics of the conflict (Comisión de la Verdad 2022a). Critically, the CEV concluded that armed groups used direct violence to fragment family and community networks, weaken social cohesion, and consolidate territorial and economic control (Comisión de la Verdad 2022a).

We build on this body of work to pursue two main objectives. First, using the JEP-CEV-HRDAG Joint Project's integrated databases on

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human rights violations, we move beyond conventional measures of conflict-related mortality to estimate how many Colombians have lost a parent, child, sibling, cousin, grandparent, grandchild, niece, nephew, aunt, or uncle as a direct result of the conflict. We adopt a demographic definition of bereavement: the persistent state of ever having lost a family member to conflict-related mortality or enforced disappearance (Alburez-Gutierrez et al. 2024). For example, a person who lost a sibling to conflict—even decades ago—is considered bereaved. Second, we aim to provide quantitative evidence to support the argument that family bereavement was not merely an incidental consequence of violence but a strategic and deliberate mechanism used by armed groups to fragment families and destabilize communities, thereby amplifying the social and psychological impacts of violence beyond immediate victims. In the next section, we introduce the conceptual framework underlying our study.

## Mechanisms of terror

We define mechanisms of terror as systematic and strategic acts of violence specifically targeting unarmed noncombatants to achieve domination. Such acts include selective executions, massacres, enforced disappearances, torture, sexual violence, scorched earth campaigns, psychological warfare, forced recruitment, public displays of cruelty, and the forcible transfer of children (Schelling 1966). These tactics, far from isolated incidents, constitute organized practices aimed at controlling populations, creating a "culture of fear" to suppress dissent and subdue entire populations (Lykes 2002), as extensively documented by various Truth Commissions (Hayner 2011). Mechanisms of terror are effective not only because they target individuals but because they destabilize entire social structures, reverberating across communities and generations (Lykes 1994). Consider a single homicide: beyond ending a life, it potentially removes a parent, spouse, sibling, teacher, or community leader—roles embedded across multiple social spheres (Alburez-Gutierrez et al. 2024; Smith-Greenaway, Verdery, and Carr 2025). Psychosocial research shows that prolonged conflicts generate "normal abnormal" states, where terror is intentionally cultivated to normalize fear, silence dissent, and dismantle community cohesion. This layered impact disrupts the emotional, symbolic, and practical ties that hold communities together (Martín-Baró 1989).

Let us consider two mechanisms of terror that have been widely used in recent Latin American conflicts and in Colombia in particular. The first is enforced disappearance, which is intended to silence dissent, dismantle opposition, and instill widespread fear (Gatti 2014). This mechanism enables perpetrators to conceal the scale of their violence without relinquishing its terrorizing effects (CNMH 2013a). The uncertainty surrounding the fate of the disappeared leaves families in a state of suspended grief.

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They experience what Boss (1999) terms "ambiguous loss"—a psychological limbo where mourning cannot proceed and healing is delayed. These "deaths without mourning" (Comisión de la Verdad 2022e) amplify trauma across the population, reinforcing the power of perpetrators while denying victims recognition and closure. The feeling has been captured in a poem by Polish poet Zbigniew Herbert (1987): "ignorance about those who have disappeared / undermines the reality of the world." This feeling can also spark resistance and galvanize powerful movements for truth and accountability, as exemplified by the activism of the *Madres and Abuelas de Plaza de Mayo* in Argentina (Crenzel 2016) and the *Madres de Falsos Positivos* (MAFAPO) in Colombia (Agamez Panesso 2019).

The second example are massacres, which the Colombian Truth Commission defines as the intentional killing of three or more unarmed people in the same violent event (Comisión de la Verdad 2022b). Massacres are often carefully staged displays of brutality aimed at intimidating communities and coercing compliance. Designed for maximum visibility and psychological impact, massacres send a clear message: resistance will be met with severe consequences (Card 2003; Hoover Green 2018; Kalyvas 2006). Public displays of cruelty—such as mutilation or the exposure of bodies—intensify this effect by transforming death into a socially indecent spectacle (Foucault 1995; Sánchez and Meertens 2001). These acts not only fracture community bonds (Arjona et al. 2017; Fujii 2011) but also inflict what Card (2003) terms "social death," stripping victims and survivors of mourning rituals and the symbolic means to process loss.

Despite its centrality to war and repression, family bereavement has rarely been theorized as a mechanism of terror. This gap is partly due to empirical constraints. Even seemingly concrete outcomes such as homicides and disappearances are difficult to measure accurately in conflict settings, given widespread underreporting, fragmented data, and political manipulation (Price and Ball 2015). Measuring bereavement is even more complex, as it requires linking individual deaths to kinship networks to trace the distributed effects of violence across families and communities. In theory, population-based surveys could capture wartime bereavement, but ethical, security, logistical, and technical challenges remain significant as trauma, stigma, and fear often inhibit disclosure. Conceptually, bereavement has not been regarded as a mechanism of terror because of its "second-order" nature, as a by-product of violence. Yet, other processes like forced displacement, which is often also the by-product of violence, have received much more attention in the literature (Shultz et al. 2014; United Nations High Commissioner for Refugees [UNHCR] 2024). Recognizing bereavement as a deliberate tactic of war reveals its profound role in extending violence well beyond immediate victims.

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## The Colombian armed conflict

The CAC is one of the longest-running civil wars in modern history, with roots extending back to the mid-20th century. This section summarizes the conflict's origins and evolution, focusing on the distinct strategies of guerrilla groups, paramilitaries,[2] and state forces that contributed to widespread civilian targeting and kin loss.

### Origins and development

The CAC is rooted in deep-seated socioeconomic inequality, rural marginalization, and weak state institutions. The civil war of the 1950s—*La Violencia*—between the country's dominant political parties laid the groundwork for the emergence of leftist guerrilla movements. The *Fuerzas Armadas Revolucionarias de Colombia - Ejército del pueblo* (FARC-EP) and the *Ejército de Liberación Nacional* (ELN) were both founded in 1964, followed by the *Ejército Popular de Liberación* (EPL) in 1967 and the *Movimiento 19 de Abril* (M-19) in 1970. Around the same time, paramilitary groups emerged as private security forces for landowners and extractive interests, later evolving into powerful armed actors often operating with implicit or explicit state support (CNMH 2013a; Comisión de la Verdad 2022d; Sanchez and Peñaranda 2007).

The conflict's trajectory was shaped by Cold War geopolitics, as the Colombian state adopted the US-influenced National Security Doctrine in the 1970s. This doctrine reframed leftist insurgency as a threat to national survival and extended the category of "internal enemy" to include civilian populations suspected of sympathizing with guerrilla groups (Palacios 2012; Posada 1991; Romero 2006). It also legitimized state support for paramilitary actors and underpinned a counterinsurgency logic that would later justify widespread repression (Gill 2004).

From the 1960s to the 1980s, the CAC remained relatively low in intensity, with guerrilla activity largely defensive, paramilitary groups fragmented, and violence concentrated in remote rural areas. This dynamic shifted in the late 1980s and early 1990s as both guerrillas and paramilitaries escalated operations, fueled by massive revenues from the drug trade. The FARC-EP adopted an offensive strategy aimed at seizing power, while paramilitary groups consolidated into the *Autodefensas Unidas de Colombia* (AUC), launching widespread campaigns of brutal violence (CNMH 2018c; Pécaut 2008; Romero 2003, 2006).

This escalation culminated in the most lethal phase of the conflict between 1996 and 2005, a period that accounts for nearly half of all homicides and enforced disappearances recorded in the CAC. Violence during these years became more systematic, widespread, and visible—marked by

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unprecedented levels of brutality and the public display of cruelty, often directed against unarmed civilians.

Violence declined sharply after 2002, under President Álvaro Uribe's Democratic Security policy, which expanded state presence in rural areas but was also marked by serious human rights violations (Ávila 2019), including forced displacement and extrajudicial killings known as *falsos positivos* (Comisión de la Verdad 2022b). The demobilization of the AUC (2003–2006), partly prompted by international pressure following its US terrorist designation, further reduced large-scale violence and public atrocities (Comisión de la Verdad 2022b; Gutiérrez-Sanín and Wood 2017). The 2013–2016 peace process with the FARC-EP also contributed to de-escalation. Nonetheless, as of January 2026, conflict persists: the ELN, FARC-EP dissidents, and emerging paramilitary successor groups continue to exert control over considerable rural areas and illicit economies (García Otero 2022; Human Rights Watch 2025) and harm civilians and communities.

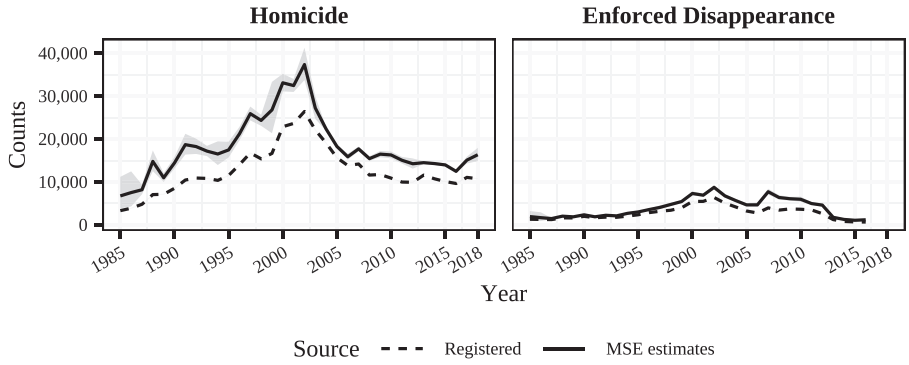
The CAC thus stands out not only for its exceptional duration but also for the systematic and persistent use of violence against civilians. A key factor in the conflict's longevity was the state's limited presence in peripheral rural areas. The absence of central governance allowed armed actors to consolidate territorial control and build parallel institutions. These spaces became sites of thriving war economies based on drug production, illegal mining, and fuel smuggling (Ávila 2019). The financial autonomy afforded by these economies reduced armed groups' dependence on political alliances or external support, enabling them to survive geopolitical shifts that dismantled similar insurgent movements elsewhere in Latin America.

## Patterns of civilian targeting

The CEV estimates that over 90% of conflict-related homicides and enforced disappearances involved noncombatants (Comisión de la Verdad 2022a). The CEV documented 16 categories of human rights violations, including homicides, sexual violence, enforced disappearances, forced recruitment, and displacement. Figure 1 shows the annual number of homicides and enforced disappearances during the CAC. The dashed lines represent documented cases, while the solid lines reflect corrected estimates using multiple systems estimation (MSE) (see the Accounting for underreporting section for details; crude rates are provided in Figure A2 of the Supplementary Materials). All parties to the conflict—the State, guerrillas, and paramilitary forces—engaged in systematic violence against civilians, but their patterns differed considerably (Comisión de la Verdad 2022b; Gutiérrez-Sanín and Wood 2017). Understanding these distinctions is crucial for interpreting both the scale and distribution of bereavement. Table 1 shows the distribution of human rights violations attributed to perpetrators during the 1985–2018 period, based on our completeness estimates.

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**FIGURE 1 Number of conflict-related homicides and enforced disappearances during the Colombian armed conflict**




NOTE: The dashed lines represent the number of victims documented by the JEP-CEV-HRDAG Joint Project (2025), and the solid lines, the estimates corrected using multiple systems estimation to address under-reporting, with 95% uncertainty intervals shown in gray.

**TABLE 1 Average estimates and distribution of life losses to conflict according to the type of violation and presumed perpetrator in the 1985–2018 period. Estimates based on Multiple systems estimation applied to the JEP-CEV-HRDAG Joint Project (2025) data**

| | Homicides | | Enforced disappearances[b] | | Total life losses to conflict | |
|---|---|---|---|---|---|---|
| Presumed perpetrator | Counts (thousands) | % | Counts (thousands) | % | Counts (thousands) | % |
| Guerrillas[a] | 232.9 | 38% | 49.1 | 39% | 282.0 | 38% |
| Paramilitaries | 253.2 | 41% | 58.8 | 46% | 312.0 | 42% |
| State forces | 33.2 | 5% | 6.6 | 5% | 39.8 | 5% |
| Other or multiple | 98.8 | 16% | 12.7 | 10% | 111.5 | 15% |
| Total | 618.1 | 100% | 127.2 | 100% | 745.3 | 100% |

[a] Guerrillas category includes FARC-EP, ELN, EPL, M19, and others.
[b] Enforced disappearances include only those that are ongoing (i.e., the victim is not linked to a record in the homicide database). Therefore, a case where a person was forcibly disappeared and then documented as having been killed is categorized as a homicide.

Guerrilla groups, particularly the FARC-EP, sought to undermine state authority mainly by targeting its representatives and institutions. Their strategy, often described as "emptying the state," included assassinations of local officials, violent takeovers of towns, and the destruction of civilian infrastructure. They also engaged in extortion, kidnapping, and forced recruitment, all of which contributed to considerable civilian harm (Arjona 2016). The ELN employed similar tactics but maintained a more overtly political orientation, including attacks on energy infrastructure and symbolic targets (Ávila 2019; Kalyvas 2006).

Paramilitary groups, in contrast, directed violence explicitly at the civilian population. Their strategies included scorched-earth campaigns,

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massacres, sexual violence, mass disappearances, and forced displacement. These actions aimed to instill fear, eliminate opposition, and assert territorial control, often with extraordinary brutality (Gutiérrez Sanín 2008; Gutiérrez-Sanín and Wood 2017; Hristov 2014). Unlike guerrilla tactics, which targeted state power, paramilitary violence often served the interests of local elites. Armed with relative autonomy and substantial economic resources, these groups established strongholds in rural areas, expropriated land, manipulated elections, and restructured local governance (Ávila 2019; CNMH 2018c; Posada 1991; Ronderos 2014).

While paramilitary violence was formally distinct from the state, it often operated with state tolerance or complicity. The National Security Doctrine not only framed civilians as potential enemies but also justified outsourcing violence to irregular actors (Palacios 2012). Paramilitaries benefited from military training, logistical support, and legal frameworks that shielded them from accountability (CNMH 2013b; Comisión de la Verdad 2022d; Ronderos 2014).

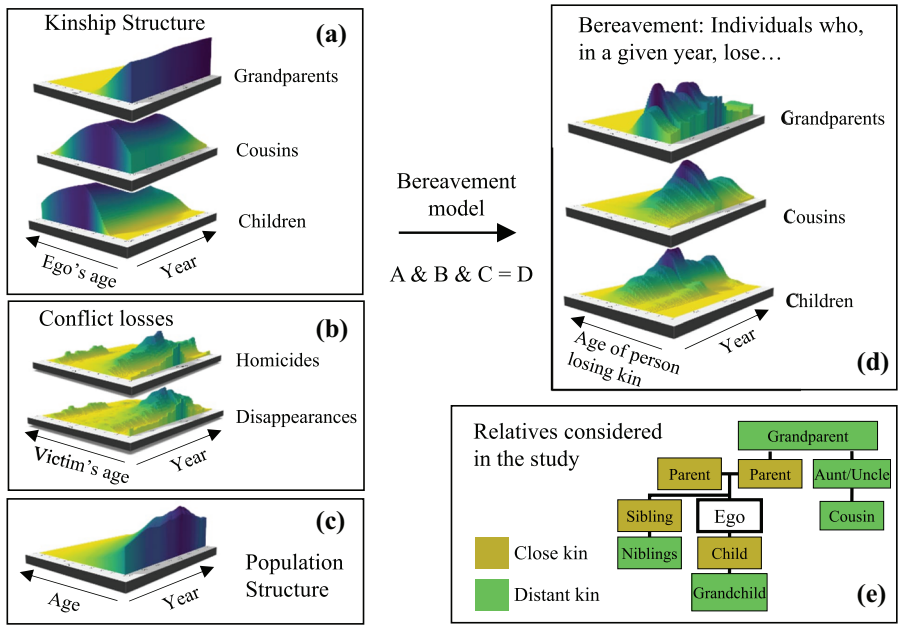
State forces—military, police, and intelligence agencies—also committed systematic human rights abuses throughout the conflict. These included homicides, massacres, enforced disappearances, and forced displacement, often carried out under the guise of counterinsurgency (CNMH 2013a; Comisión de la Verdad 2022a). One of the most notorious state-perpetrated practices was the "false positives" scandal: the extrajudicial execution of over 6400 civilians, who were falsely presented as guerrilla combatants to meet performance quotas under a military incentive system (Comisión de la Verdad 2022b). This practice institutionalized lethal violence against civilians as a mechanism of bureaucratic advancement.

## Bereavement as a demographic process

In this paper, we define bereavement as a lasting state that begins when an individual experiences the loss of a family member. Once someone enters this state, they are considered bereaved for the remainder of their life. Importantly, the death of additional relatives of the same type—for instance, losing a second parent after already having lost one—does not alter or intensify this bereaved state in our framework. This perspective allows us to apply demographic methods to estimate the number of individuals in a population who experience the death of biological kin. The formal demography of bereavement has its roots in the work of Goodman, Keyfitz, and Pullum (1974), who demonstrated that all populations possess intrinsic kinship structures, just as they possess intrinsic age-sex structures. These kinship structures—defined by the average number of siblings, parents, cousins, grandchildren, and other relatives—can be approximated using demographic models because they arise from the historical interplay of fertility and mortality rates across generations. For instance, the number of

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**FIGURE 2 Bereavement estimation**




NOTE: Panels a–d refer to both sexes across ages 0–100 and years 1950–2020. Panel a shows the average number of living relatives for an individual ("Ego") over age and time, with three kin types shown as illustrative examples. Panel b displays the annual number of conflict-related homicides and enforced disappearances by age, while panel c presents annual population counts by age. Panel d shows bereavement incidence, defined as the number of individuals in the population who experience the loss of at least one given kin type in a specific year, by age of the bereaved individual. Panel e shows the grouping of the kin types included in the analysis. Note that the values in the panels are indicative; results from this study are presented in the corresponding section.

cousins a person has depends on the reproductive behavior and survival of their aunts and uncles, whose own numbers reflect the demographic experiences of the parental and grandparental generations (Alburez-Gutierrez, Williams, and Caswell 2023). In this paper, we build on this tradition by proposing a method to quantify the number of people who experience the death or enforced disappearance due to armed conflict of biological family members.

Figure 2 outlines the logic of our kinship analysis. In short, we estimate bereavement at the population level (Panel d) by interacting average kinship structures (Panel a), the estimated number of homicides and enforced disappearances (Panel b), and the population size and distribution (Panel c). In the rest of this section, we introduce our kinship and bereavement models. Conflict and population data are introduced in the next section.

## Kinship analysis

We computed average kinship structures using time-variant, two-sex matrix kinship models implemented in the DemoKin R package (Williams,

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Alburez-Gutierrez, and DemoKin Team 2023). Next, we illustrate how kin counts are estimated in a two-sex time-variant framework. For details on estimating kin counts with time-variant rates see Caswell and Song (2021) and Caswell (2022) for two-sex models. The average number of living relatives of a given type for a randomly selected individual in the population—referred to as *Ego*—can be estimated using the following equation:

$$\bar{k}_{x+1,t+1} = \bar{U}_t \, \bar{k}_{x,t} + \bar{B}_{x,t}.$$

Here, $\bar{k}_{x,t}$ is a block-structured matrix containing the age distribution of a specific type of kin (male and female) for an average member of the population who is aged $x$ at time $t$. $\bar{U}_t$ is a block-structured matrix with male and female survival probabilities for time $t$ in the subdiagonal. The block-structured matrix $\bar{B}_{x,t}$ captures the "recruitment" of new male and female kin through the reproduction of existing kin. For example, older siblings of Ego result from the reproduction of Ego's mother, in which case $\bar{B}_{x,t}$ depends on a block-structured matrix of female and male fertility $\bar{F}_t$. In situations where new kin of a particular type cannot be acquired after Ego's birth—such as biological grandparents—recruitment does not occur, and $\bar{B}_{x,t} = 0$. For more details, see Caswell (2019), Caswell and Song (2021), and Caswell (2022).

Panel a of Figure 2 exemplifies how kin structure (i.e., average kin counts) varies over age and time for three selected kin types. In the analyses, we consider all kin included in Panel e. For convenience, in the Results section, we sometimes group these kin into the *close* and *distant* categories shown in the panel. In the text and figure labels, we use Boolean operators to describe combinations of these categories. For example, *Close AND distant kin* refers to individuals who experienced the loss of both close and distant kin, whereas *Close OR distant kin* includes those who lost either close kin, distant kin, or both.

## Bereavement model

Our bereavement model aims to estimate the absolute number of individuals who experience the death of one or more relatives of a specified type as a consequence of war. This includes losses resulting from both homicide and enforced disappearance, as detailed in the Data section. In this sense, our approach is similar in spirit but different in implementation from studies of bereavement from Covid-19 (Snyder et al. 2022) and from "deaths of despair" in the United States (Schlüter et al. 2024; Verdery et al. 2024). Our approach is also different from the bereavement rates proposed by Alburez-Gutierrez et al. (2024), which present bereavement events as a proportion of the population at risk. Here, we aim to highlight the number of people that ever experienced kin loss rather than the number of times that bereavement was experienced in a population.

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We are interested in estimating the number of individuals who lose at least one relative of type $k$ due to the CAC in a given year $t$. To do this, we first calculate the sex- and age-specific probabilities of experiencing the death or disappearance of a given kin type over the life course. We then estimate the number of bereaved individuals by multiplying these probabilities by the corresponding population counts for year $t$.

We start by estimating the probability that a focal individual—of gender $s$ and age $x$—does **not** lose any relatives of category $k$ in year $t$ as:

$$p^0_{kxst} = \prod_g \prod_y \left(1 - q_{ygt}\right)^{n_{kxsygt}} ,$$

where $q_{ygt}$ denotes the sex- and age-specific probability of death or disappearance for relatives of age $y$ and gender $g$, and $n_{kxsygt}$ is the average number of surviving relatives of type $k$ *aged* $y$, gender $g$, for a focal individual aged $x$, gender $s$, during year $t$. This is similar to the methodology proposed by Moody (2005), except that we operate in a formal kinship demographic framework.

Next, we calculate the cumulative probability that an individual from cohort $c$ does **not** lose any kin of type $k$ due to conflict over their life course, up to age $a$ in the year $t$. This is given by $p^{0A}_{kast} = \prod_{x=0}^{a} p^0_{kcxst}$ . We then estimate the gender- and age-specific probability of having lost at least one relative of type $k$ until age $a$ in year $t$ as the complement of the probability that all such relatives have survived: $p^{>0A}_{kast} = 1 - p^{0A}_{kast}$.

By combining these cumulative probabilities with population exposures—excluding immigrants—by gender $s$ and age $a$ in year $t$, we estimate the number of individuals who experienced the loss of at least one relative of type $k$ as:

$$f^A_{kast} = p^{>0A}_{kast} \times pop_{ast} \times (1 - mig_{ast}) ,$$

where $p^{>0A}_{kast}$ is the cumulative probability that an individual of age $a$ and gender $s$ experienced at least one loss of kin type $k$ during its life course until age $a$ and year $t$; $pop_{ast}$ is the corresponding population exposure; and $mig_{ast}$ is the proportion of the population in that group who are immigrants. This formulation assumes that immigrants residing in Colombia in the year $t$ were not exposed to the risk of losing relatives to the conflict.

Colombia has substantial regional heterogeneity in demographic dynamics, kinship structures, and violence intensity. Figure A1 in the Supplementary Materials shows the subnational distribution of the violence burden—conflict-related homicides and enforced disappearances (panel a)—and average surviving kinship availability in 2018 (panel b) at *departamento*-level. Unfortunately, the absence of long-term subnational data precluded estimating bereavement while fully accounting for regional heterogeneity in kinship structures and violence. To assess potential bias

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from this limitation, we conducted a subnational sensitivity analysis (Supplementary Materials) using *departamento*-level estimates of conflict-related bereavement that incorporate observed annual sex- and age-specific fertility, mortality, and population structures for 1985–2018. Because data prior to 1985 are unavailable, kinship models assume constant demographic dynamics before that year. This yields downward-biased estimates—by fixing pre-1985 fertility and mortality and omitting the fertility decline that began in the 1960s, which artificially reduces family size, kinship availability, and bereavement—yet it provides a useful benchmark for sensitivity to regional heterogeneity.

## Data

### Demographic data

Data for the kinship analysis come from the UN *World Population Prospects* 2024 (United Nations 2024), WPP, covering the period 1950–2018. These data include country-level female age-specific fertility rates and sex- and age-specific survival probabilities and population for Colombia.

For the estimation of mortality rates before 1950, we relied on sex-specific aggregate life tables from the Latin American Mortality Database, LAMBdA (Palloni, Pinto-Aguirre, and Beltrán-Sánchez 2014), for Colombia in 1905, 1908, 1912, 1915, 1918, 1923, 1928, 1933, 1938, and 1944. Estimates for Colombia available in this dataset indicate that, during the first three decades of the 20th century, life expectancy increased moderately—rising from 29 to 36 years for males and from 32 to 39 years for females between 1905 and 1938, a gain of approximately 7 years. Thereafter, life expectancy began to rise more rapidly. By 1950, female life expectancy at birth had reached almost 51 years, and male life expectancy had reached 46 years (WPP 2024)—representing gains of 10–12 years over a 12-year period. To obtain more detailed mortality data before 1950, we disaggregated the mortality rates from LAMBdA into single-years of age (from age 0 to 100+) using the Penalized Composite-Link Model (Rizzi, Gampe, and Eilers 2015) within the R package DemoTools (Riffe et al. 2023). Then we combined these values with single-year sex-specific mortality rates for Colombia in 1950 from WPP and applied cubic splines interpolation in order to estimate annual mortality rates by single year of age from 1905 to 1949.

Fertility rates were relatively constant before 1950 in Colombia as the fertility transition started in the 1960s (Flórez-Nieto 2000; Guzman et al. 1996). We compared the age structure of fertility rates in 1950 (from WPP) with ASFR for previous years (from 1941 to 1949). We calculated the latter using birth statistics by mother's age (retrieved from historical statistical yearbooks) as well as the age-distribution of women during those years. Annual estimates of the female population by age before 1950 were obtained

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by interpolation, using adjusted figures for 1938 (i.e., population estimates in 1938 based on the results of the Census of that year, corrected for omission) and the female population estimates in 1950 from WPP. These comparisons revealed that the pattern was relatively constant during those years. We then assumed constant ASFRs in Colombia between 1900 and 1950.

To account for the lack of male fertility data—essential for kinship modeling but unavailable from official sources—we adjusted the age pattern of female childbearing. We did this by shifting female age-specific fertility rates by 4.12 years to the right, while keeping the absolute values unchanged. This shift reflects the average age difference between mothers and fathers in Colombia, as documented by Schoumaker (2019).

Since we expect that most bereavement events related to the CAC occur to people who live and have family ties in the country, we subtract the number of immigrants from the population exposures. An approximation of the number of immigrants was obtained from the 2018 population Census based on the place of birth (DANE 2020). The assumption that immigrants are not at risk of experiencing the loss of a family member due to the armed conflict is strong. However, our analyses showed that excluding the immigrant population has a small effect on our estimates.

To understand how subnational heterogeneity in violence and kinship structures affect our estimates, we conducted a sensitivity analysis (presented in the Supplementary Materials) using annual sex- and age-specific population counts, and fertility and mortality rates for each *departamento* between 1985 and 2018, retrieved from DANE (2025).

Finally, to compute the bereavement burden over time—the share of the Colombian population that has lost a family member to conflict—we rely on the WPP medium-variant population projections through 2100. For these estimates, we assume that no further conflict deaths or enforced disappearances occur after 2018. While this assumption is clearly unrealistic, given evidence of conflict-related losses post-2018 (García Otero 2022; Human Rights Watch 2025), it serves as a conservative baseline for assessing the time required for demographic metabolism to reduce the bereavement burden through cohort replacement. Importantly, our demographic definition of bereavement captures the prevalence of kin loss—not the intensity of grief, which may evolve in response to public interventions and operates independently of demographic turnover. As noted in the introduction, we assume that a bereavement event persists throughout the individual's life course. To test alternative scenarios, we also calculate bereavement burdens assuming shorter "bereavement memory" periods of 20 and 40 years, whereby individuals are no longer classified as bereaved after the specified period unless they experience a new loss. The results, presented in the Supplementary Materials, show that bereavement is long-lived but shorter bereavement-memory periods attenuate its duration in predictable ways.

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## Conflict homicides and enforced disappearances

We retrieve individual-level information on homicides and enforced disappearances related to the CAC between 1985 and 2018, compiled by the JEP-CEV-HRDAG Joint Project (2025). These data were compiled using records from more than 30 governmental institutions, civil society, and victims' collectives. The JEP-CEV-HRDAG Joint Project deduplicated all of the input databases and probabilistically imputed missing fields using multiple imputation (MI) prior to publishing the data (Amado et al. 2025). The MI process generated 100 replicate data files of homicides and enforced disappearances. Each replicate data file includes information about the date and location where the human rights violation occurred, the presumed perpetrator, as well as information about the sex and age of the victim. It also includes indicators of which source(s) documented each victim. For this analysis, we use the second version of the data, which is appropriate for new studies of the armed conflict (see Gargiulo et al. (2025) for more information). The homicides data are available for the period 1985–2018 and contain information about 540,580 documented victims. The disappearances data are available for the period 1985–2016 and contain information about 169,305 documented victims. We filter the datasets to include only instances of violence thought to have occurred in the context of the CAC. Additionally, we further filter the disappearances dataset to only include instances of ongoing enforced disappearances, that is, enforced disappearances that do not link to any record in the full homicides database. Due to missing fields in the original records, which were filled in using MI, the number of records of conflict-related homicides and enforced disappearances varies by replicate data file. We randomly selected 10 replicate datasets from the 100 imputed conflict databases for use in this analysis.[3] Each replicate data file contains approximately 427.9 thousand [427.8–428.0] victims of conflict-related homicides and approximately 89.3 thousand [89.2–89.3] victims of ongoing conflict-related enforced disappearances

## Accounting for underreporting

We used MSE (also called capture-recapture in some fields) to estimate the total number of conflict victims—including those not documented in any source—disaggregated by violation type, year of violation, victim's sex and age, and presumed perpetrator. MSE models use information about documentation patterns (i.e., which source or combination of sources documented victims) to make inferences about the number of victims not documented by any source. Due to the large number of lists documenting victims and following Amado et al. (2025), we apply Bayesian Nonparametric Latent-Class Capture-Recapture (LCMCR) methods (Manrique-Vallier

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2016), implemented in the *LCMCR* (Manrique-Vallier, 2023) and *verdata* (Gargiulo et al. 2024) R packages.

MSE models make four main assumptions. First, they assume that the population of interest is closed. Second, they assume that individuals are perfectly identified across sources. Third, they assume that all sources are independent of each other. Fourth, they assume that all individuals have the same probability of being documented. Amado et al. (2025) and Gargiulo (2025) provide detailed discussions of these assumptions in the context of this dataset. We consider assumptions 1 and 2 satisfied for the purposes of this analysis. The population of homicide victims is closed and while the population of ongoing enforced disappearances is technically open, regrettably very few cases have been solved and the cases that have been resolved often take years. For this reason, we believe that these data approximately reflect the population of ongoing enforced disappearances at the time of analysis. While linkage across sources may not be perfect, the fit metrics presented in Amado et al. (2025) gives us confidence that the record linkage is adequate. Furthermore, Johndrow et al. (2018) show that errors in record linkage can still yield reliable MSE estimates. Assumption 3 can be relaxed by only fitting MSE models when three or more lists documenting victims are available. Finally, Assumption 4 can be managed by using stratification (Sekar and Deming 1949) and through the use of latent classes, which are part of the LCMCR model specification. We always consider stratifications using temporal and spatial information to adjust for differences in the number of lists documenting victims in time and space (see Gargiulo [2025] for further discussion).

Due to data sparsity, it was not possible to calculate estimates by all desired covariates simultaneously. Instead, we used a multistep approach to calculate estimates at the desired granularity. First, we estimated the total number of victims of homicides and enforced disappearances by region and year. Separate LCMCR models were fit for each stratum. Then, we calculated separate estimates stratified by region, year, and presumed perpetrator for each violation. At this level of granularity some strata were not estimable due to the presence of fewer than three active lists. In these instances, the number of documented victims was used as the estimate. Then, for each region-year-violation, we transformed the counts into proportions of responsibility for each presumed perpetrator. We applied these proportions to the region-year-violation totals to get the estimates by presumed perpetrator. Finally, to disaggregate the estimates by the age and sex of the victims, we calculated the observed age-sex distributions by region-year-violation in each replicate file and applied them uniformly by presumed perpetrator to the corresponding estimates. We then aggregate these estimates to the national level. These operations yield 1000 samples from the posterior distribution of the probable number of victims disaggregated by year, presumed perpetrator, sex, and 5-year age group for each of the 10 replicates analyzed.

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We then further disaggregate the adjusted counts into single-year ages using the Penalized Composite-Link Model (PCLM), implemented in the *ungroup* R package (Pascariu et al. 2019). This step allows us to recover a smooth age distribution of victims while maintaining consistency with the aggregated MSE outputs.

Using data on population exposures, we then compute annual, sex- and age-specific probabilities of homicide or enforced disappearances. These probabilities are then combined with population exposures and average kinship structures—as described earlier and illustrated in Figure 1—to estimate the bereaved population over time, disaggregated by sex, age, kinship relation, violation type, and presumed perpetrator.

Finally, we pool the results across the 1000 calculations per replicate to produce point estimates and 95% uncertainty intervals for all bereavement indicators using the laws of total expectation and total variance (Gelman et al. 2013) with the *verdata* package for R. MSE results are typically distributed approximately log-normally, so the results are first log-transformed prior to pooling. See Appendix A1 of Gargiulo (2025) for a detailed explanation of this pooling operation.

This integrated pipeline brings together MI, MSE, age disaggregation, kinship modeling, and population projections. By linking these steps, we can estimate the cumulative demographic imprint of conflict-related homicides and enforced disappearance in Colombia, while propagating uncertainty from the original data to the final estimates of bereavement across generations. Note that the resulting uncertainty does not account for any variability from the kinship analysis, since we estimate average kinship structures using deterministic demographic models.

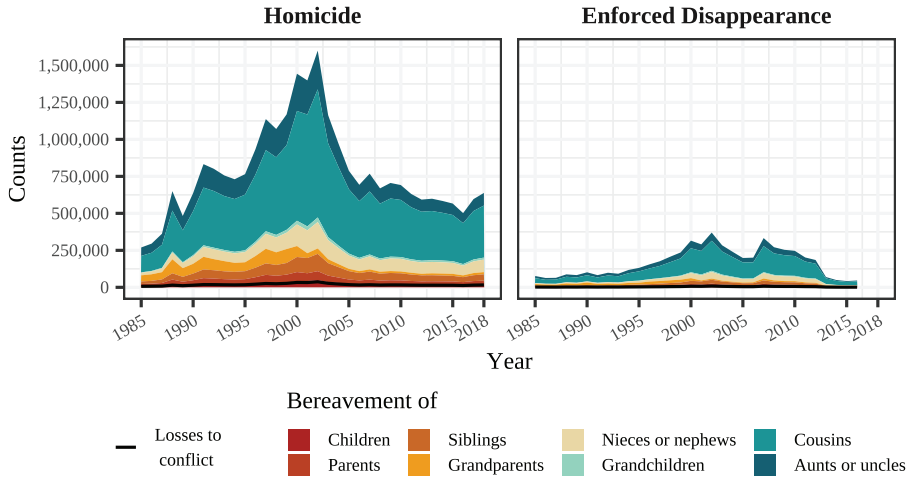
## Results

This section presents estimates of the demographic burden of conflict-related bereavement in Colombia between 1985 and 2018. We begin by quantifying the total number of conflict-related homicides and enforced disappearances, and then estimate the number of individuals who experienced kin loss—disaggregated by relationship type. We conclude by examining the demographic profile of the bereaved population and projecting how this burden evolves over time. Together, these findings reveal the extensive and long-lasting demographic imprint of violence on kinship networks and social life.

Based on the MSE analysis, we estimate that about 745.3 thousand individuals were lost to conflict violence during the period studied, including 618 thousand [603.4–633.0] homicides (83%) and 127.2 thousand [123.4–130.1] enforced disappearances (17%). These figures include roughly 190.2 thousand [175.5–205.1] deaths and 37.9 thousand [34.2–41.2] disappearances that were not captured in official records, highlighting

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**FIGURE 3 Annual number of estimated conflict deaths and enforced disappearances (black line) and yearly number of kin losses by kin type (colored areas)**




an estimated underreporting of about 31% for homicides and 30% for enforced disappearances.

Figure 3 illustrates the contrast between the annual number of estimated conflict homicides and enforced disappearances (black line at the bottom of the plots) and the corresponding number of individuals who experienced bereavement, disaggregated by kin type (colored areas). The gap between these curves underscores the multiplicative nature of kin loss: each violent death or disappearance reverberates through families, resulting in several individuals entering a state of bereavement. This effect is particularly pronounced during periods of intense violence, such as the late 1990s and early 2000s, when both mortality and bereavement peaked sharply. This surge was driven by all presumed perpetrators, but primarily fueled by the sharp escalation of paramilitary violence. As shown in Figure A3 in the Supplementary Materials, the number of individuals bereaved by paramilitary actions more than tripled between 1990 and 2000, almost reaching one million bereaved individuals per year by the early 2000s. Bereavement linked to guerrilla violence also rose, though more gradually, while losses attributed to state forces roughly doubled.

Bereavement multipliers quantify the number of relatives affected per loss. Table 2 reveals a substantial variation in these values by kin type. On average, each conflict-related death or disappearance was associated with 2.8 grieving siblings, 1.7 grieving parents, and over 17 grieving cousins. Each loss also left approximately 5 individuals grieving the death or disappearance of a close family member, and between 29 and 38 individuals when including both close and extended kin. Close kinship includes par-

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**TABLE 2 Average bereavement multipliers by kin and conflict loss type**

| | Relatives | Homicides | Enforced disappearances |
|---|---|---|---|
| Kin | Children | 0.9 | 1 |
| | Parents | 1.7 | 1.7 |
| | Siblings | 2.8 | 2.8 |
| | Grandparents | 2.3 | 2.5 |
| | Nieces or nephews | 3.4 | 3.9 |
| | Grandchildren | 0.3 | 0.4 |
| | Cousins | 17.7 | 20.7 |
| | Aunts or uncles | 6.7 | 6.7 |
| Kin grouping | Close | 5.3 | 5.5 |
| | Distant | 26.3 | 33.2 |
| | Close or distant | 29.3 | 38.1 |

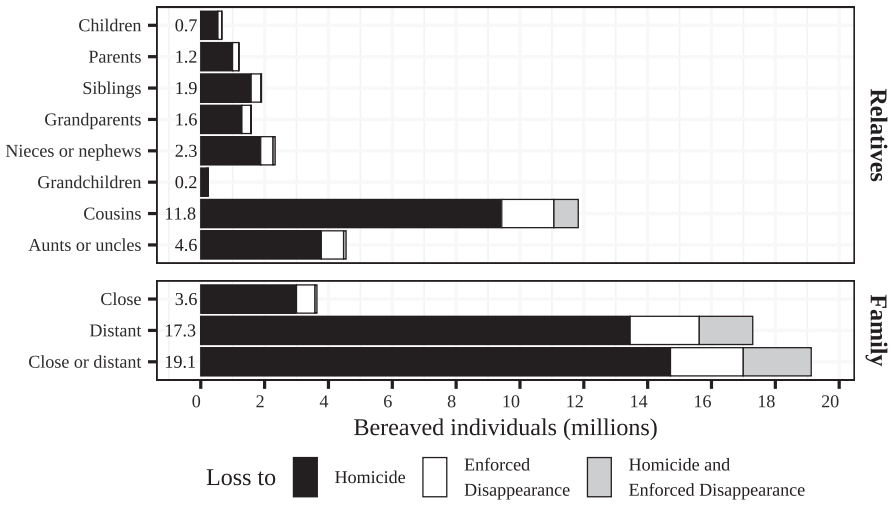
NOTE: Close family includes siblings, parents and children. Distant family includes cousins, nieces, nephews, aunts, uncles, grandchildren, grandparents. Note that the categories "Close" and "Distant" are mutually exclusive and "Close or distant" means close, distant, or both.

ents, siblings, and children, while the distant category encompasses cousins, aunts, uncles, nieces, nephews, grandparents, and grandchildren. These categories are not mutually exclusive: individuals with close family losses are also counted within the distant family group. Note that "Close or Distant" refers to cases in which individuals experienced the loss of either a close relative, a distant relative, or both. These multipliers are broadly similar for homicides and enforced disappearances, with small differences reflecting variation in the victims' age and sex profiles. The especially high figures for distant kin—such as cousins, aunts, and uncles—underscore how kinship networks serve as amplifiers of demographic harm. In this sense, kinship structures not only shape the spread of grief—they also extend the reach of violence, turning each death into a tool for destabilizing entire families and communities. This mechanism is central to understanding how bereavement itself can become a strategy of terror.

To further examine the scale of bereavement, we now turn to cumulative counts of affected individuals. Figure 4 presents a snapshot of the average total number of bereaved persons in 2018, disaggregated by kinship category and type of human rights violation. This allows us to quantify how deeply the Colombian population had been impacted by conflict-related family loss by the end of the study period. Additionally, Tables A1 and A3 and Figure A4 in the Supplementary Materials present average estimates and 95% confidence intervals of bereaved persons in 2018, along with their population proportions for that year, disaggregated by presumed perpetrator, type of violation, and kinship relation.

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**FIGURE 4 Average estimates of bereaved individuals in 2018 (in millions), disaggregated by the category of relative loss, the family grouping in which the loss occurred (close, distant, or both), and the type of violation that caused the loss**




NOTE: "Homicide and Enforced Disappearance" means that individuals experienced both the homicide and the enforced disappearance of (different) family members. "Close or distant" means close, distant, or both. The numbers to the left of each bar indicate the total number of bereaved individuals in each kin category, regardless of the type of Human Rights violation.

By 2018, an estimated 11.83 million [11.71–11.95] people had lost at least one cousin due to conflict, of whom nearly 9.43 million [9.31–9.55] were bereaved by homicide, 1.63 million [1.60–1.67] by enforced disappearance, and over 761 thousand [745–777] by both homicide and enforced disappearance. Losses of other kin were also widespread: millions experienced the death or disappearance of a parent, sibling, or child. Importantly, kin categories are not mutually exclusive. Many individuals suffered multiple types of bereavement—for example, someone may have lost a sibling to disappearance and a child to homicide. This overlap illustrates how the burden of grief often accumulates within families and over the life course.

To better understand the scope of kin loss, the bottom panel in Figure 4 groups bereaved individuals according to whether they lost members of their close, distant families, or both. By 2018, 3.64 million [3.59–3.69] people—about 7.4% [7.3–7.5] of the Colombian population—had lost at least one close family member, and 19.12 million [18.96–19.29]—roughly 40% [38.7–39.3] of the population—had lost a relative in the broader distant family network.

Among the bereaved, many experienced multiple forms of loss. More than 59.8 thousand [58.4–61.2] individuals suffered close family bereavement due to both homicide and enforced disappearance, while 1.67 million [1.64–1,71] experienced this dual burden within their distant fami-

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lies. These overlapping experiences compound psychological trauma and often complicate processes of mourning, justice, and healing—particularly in cases involving unsolved disappearances.

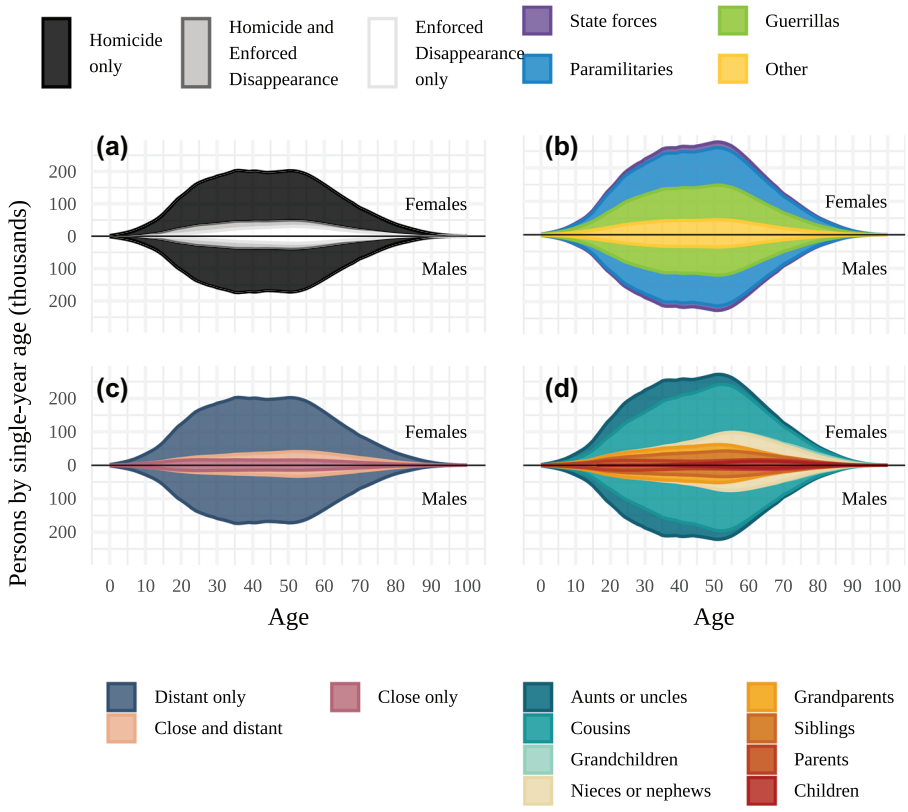
Because these main estimates assume nationwide homogeneity in kinship structures and violence, we conducted a sensitivity analysis (Supplementary Materials) to assess the impact of regional variation. As noted in the Bereavement Model section, this approach is downward-biased: fixing pre-1985 fertility and mortality omits the fertility transition beginning in the 1960s, artificially yielding smaller families, reduced kinship availability, and lower bereavement. Accordingly, these estimates are not main results; they are provided solely to compare the limited national and subnational specifications, and should be read as heavily downward-biased. Figure A1 (Supplementary Materials) presents the subnational distribution of the violence burden (panel a) and surviving kinship availability in 2018 (panel b). Figure A5 (Supplementary Materials) presents subnational bereavement estimates in 2018. Table A3 (Supplementary Materials) compares national and aggregated subnational estimates, showing that the latter are generally higher. With the exception of children, grandparents, and grandchildren, all kin categories exhibit greater bereavement under the subnational approach. On average, discrepancies across kin types amount to 2.6%, with the largest differences for more distant relatives—cousins, aunts/uncles, and nieces/nephews—ranging from 2.8% to 7.5%.

Figure 5 visualizes the demographic imprint of bereavement in 2018 through four population pyramids, each capturing a distinct dimension of loss. Panel a classifies individuals according to whether their relatives were lost to homicide, enforced disappearance, or both. Panel b depicts people who lost at least one relative to a given presumed perpetrator, distinguishing losses inflicted by guerrilla groups, paramilitary forces, the State, and other groups (e.g., criminal bands or instances where multiple armed actors were involved). Panel c presents the age and sex distribution of those who experienced kin loss within the close and distant families, or both. Finally, Panel d categorizes individuals by the type of relative lost—such as children, siblings, or cousins. Note that Panels a and c use mutually exclusive categories, ensuring that each person is counted only once. In contrast, Panels b and d allow for multiple counts per individual in cases of compound bereavement. For example, a person who lost both a child and a cousin would appear twice in Panel d; similarly, someone who lost one relative to guerrilla-perpetrated homicide and another to enforced disappearance by paramilitaries would be counted twice in Panel b.

This multidimensional representation of grief reveals important demographic patterns. Middle-aged adults carry the heaviest and most varied burden of loss, likely reflecting their position at the center of kinship networks, with living relatives across multiple generations. Across all panels, a consistent gender disparity emerges: approximately 20% more women than

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**FIGURE 5 Age and gender distribution of persons in Colombia in 2018 who have ever been bereaved by conflict**



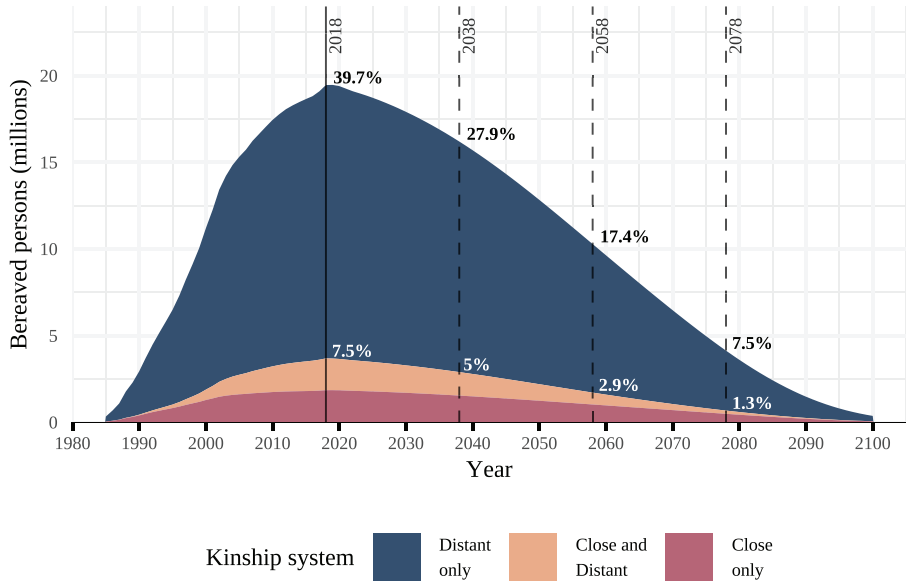

NOTE: Panel a depicts the number of bereaved persons according to the human rights violations accounting for the kin loss. "Homicide and Enforced Disappearance" means loss due to both causes. Panel b presents the number of bereaved persons according to the perpetrator of the violence against their relatives. Panel c presents the number of bereaved persons according to the type of family wherein the kin was lost (close, distant, or both). Panel d disentangles the broad categories in panel c, distinguishing the type of kin lost. "Close and distant" means loss of both types of kin. Note that whereas Panels a and c use mutually exclusive categories, Panels b and d allow for multiple counts per individual in cases of compounded bereavement (e.g., individuals losing both a child and a parent).

men are bereaved. This considerable imbalance reflects the conflict's highly gendered mortality profile, in which men—particularly young and middle-aged men—were disproportionately targeted for homicide and enforced disappearance. As a result, women are overrepresented among survivors and are more likely to bear the emotional, social, and economic consequences of kin loss. These demographic contours underscore the differential and cumulative nature of bereavement, reinforcing its role as both a personal tragedy and a population-level phenomenon shaped by the dynamics of violence.

We now examine the long-term demographic trajectory of conflict-related bereavement in Colombia. Figure 6 presents the evolution of the

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**FIGURE 6 Evolution of conflict-related bereavement from 1985 to 2100**



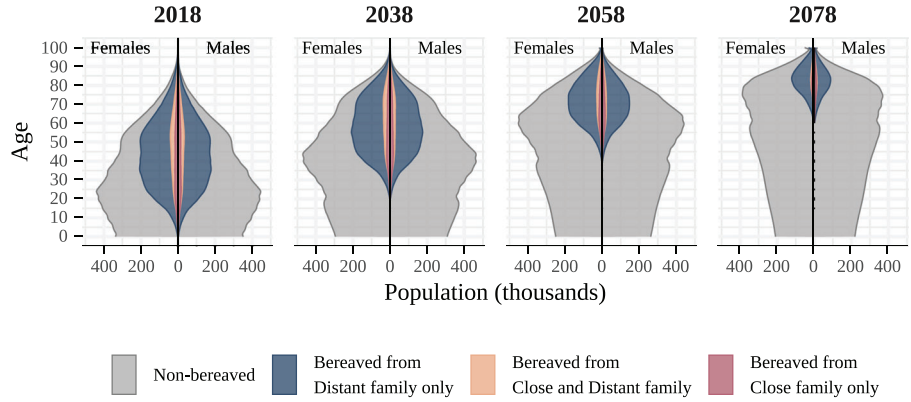

NOTE: The red segment represents individuals who have lost at least one member within the close family, the salmon segment denotes those who experienced lost members of both close and distant families, and the blue segment, only in the distant family. The figure also shows the proportion of bereaved individuals relative to the total population for 2018 and for the projected years 2038, 2058, and 2078, assuming no further conflict-related losses occur after 2018.

bereaved population from 1985 to 2100, under a counterfactual scenario in which no new conflict-related deaths or disappearances occur after 2018. It shows both the absolute number of bereaved individuals and the bereavement burden, defined as the share of the total population that has lost at least one close or distant family member to conflict over their lifetime. The blue segments represent individuals who have lost at least one member of their distant family, the red segments correspond to those who experienced losses within the close family, and the salmon segments those who experienced losses in both close and distant families. Estimates are shown for the last observation year (2018) and for 20, 40, and 60 years beyond the observation period, corresponding to 2038, 2058, and 2078.

The results reveal a gradual but persistent decline in the bereavement burden. In 2018, approximately 40% of the Colombian population had experienced the loss of at least one family member due to conflict. By 2038, this share declines to 28%, and by 2078 it reaches 7.5%. This reduction is driven by two mechanisms: natural mortality, which reduces the number of bereaved individuals over time, and demographic metabolism, whereby younger cohorts born after the conflict gradually replace older, bereaved generations. However, the decline is slow. Even under an overly optimistic scenario in which no new violence occurs after the observation period,

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**FIGURE 7 Population pyramids of individuals classified by conflict-related bereavement status for the last observation period, 2018, and the projected scenarios in 2038, 2058, and 2078**




NOTE: Blue segments represent individuals who have experienced the loss of at least one distant family member; red segments indicate losses within the close family; salmon segments correspond to losses in both close and distant families. Gray segments represent individuals who have not experienced any conflict-related kin loss.

conflict-related bereavement remains visible in the population structure until at least the 2080s. These projections illustrate how violence extends its reach far beyond its immediate victims, reverberating through kinship networks and leaving demographic scars that persist for more than half a century after the violence itself has ended.

As noted in the Introduction section, we adopt a demographic definition of bereavement, in which the loss of a family member to conflict-related homicide or enforced disappearance is considered a lifelong state. To assess the sensitivity of this assumption, we also examine scenarios in which bereavement persists for only 20 or 40 years (Figure A6, Supplementary Materials). Although these scenarios shorten the duration of exposure, the estimated prevalence in 2018 remains strikingly high, affecting between 32% and 40% of the population.

Figure 7 further examines the demographic composition of the bereaved population over time, using population pyramids for the same years highlighted in Figure 6: 2018, 2038, 2058, and 2078. Individuals are grouped into four categories: those bereaved through any distant family loss (blue), those with close family losses only (red), those with losses in both close and distant families (salmon), and those with no conflict-related kin losses (gray). Over time, there is a clear aging of the bereaved population, as the majority of conflict-affected cohorts move into older age brackets. By 2078, bereavement is overwhelmingly concentrated among older adults. This pattern reflects not only the historical timing of the conflict but also the gradual replacement of bereaved cohorts by younger generations born

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after the violence. As a result, survivors become the long-term carriers of demographic memory.

In parallel, we observe a growing overrepresentation of women among the bereaved. This trend is explained by two demographic factors: the predominance of male victims during the conflict, particularly among young and middle-aged men, and women's higher life expectancy, which increases their likelihood of surviving into older age. While these demographic processes account for the pattern, its long-term implications are shaped by women's social roles in post-conflict societies—as caregivers, survivors, and custodians of memory. These roles suggest that the emotional, psychological, and community burdens of bereavement are likely to fall disproportionately on older women, who may become central actors in intergenerational remembrance and reconciliation. In this way, the enduring impact of conflict becomes embedded not only in historical narratives but in the age and gender structure of the population itself.

## Discussion

In this paper, we set out to study family bereavement from conflict in Colombia from a demographic perspective. Measuring the scale of bereavement—that is, the number and demographic composition of the individuals who have ever lost kin because of the war—is a critical step toward providing a comprehensive account of the demographic consequences of political conflict. In this section, we discuss the implications of our findings for the affected population and reflect on what our findings imply for our theorized instrumentalization of kinship as a form of terror. We start by considering our research objectives.

Our first objective was to characterize the population of individuals in Colombia bereaved as a result of the armed conflict. Leveraging the multiplicative structure of kinship, we showed that both historical and contemporary conflict-related homicides and enforced disappearances have generated a substantial population of bereaved individuals. The size of the bereaved population could be even larger than revealed by our estimates, as some families may have emigrated due to the experience of violence in Colombia. Silva and Massey (2015) observe that increasing levels of violence during the period 1986–2002 were "instrumental in promoting international migration from Colombia" (p. 75). Cárdenas Santa María and Mejía Mantilla (2006), indicate that, after the economic crisis of the late 1990s, the intensification of the armed conflict became the second most important driver of emigration between the second half of that decade and the first years of the following one. The most recent estimate available (for 2012) indicates that 4.7 million of Colombians, close to 10% of the resident population, live abroad (OIM 2022). However, the share of emigrants due to violence is not known with precision. By 2012, ACNUR estimated that around 395,900

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persons had left the country due to the armed conflict, and were refugees or seeking asylum abroad (OIM 2013).

Our estimated bereaved population is demographically heterogeneous. For example, women were approximately 20% more likely to be bereaved than men, primarily due to the disproportionate mortality of young males during the conflict. Variation also exists in the type of kin lost and the identity of the presumed perpetrator. The composition of the bereaved is shaped by two intersecting forces. Conflict dynamics determine the "inflow" of bereaved individuals and their distribution by age, gender, kinship tie, and perpetrator, while demographic change drives their aging and eventual attrition. These processes are evident during the empirical period covered by conflict data (1985–2018) and become even more pronounced in our demographic projections. Assuming no further conflict-related deaths after 2018 and applying UN demographic projections (United Nations 2024), we find that bereaved individuals remain a substantial demographic group for decades, though they gradually "age out" of the population. Older adults, in particular, will increasingly serve as repositories of intergenerational memory and trauma. Even under optimistic scenarios of more limited bereavement persistence (see sensitivity analyses and Figure A6 in the Supplementary Materials), the population-level burden remains intense and enduring.

The existence (and persistence over time) of a very large community of bereaved individuals has implications for population health. Existing evidence indicates that unexpected bereavement is linked to adverse physical and mental health outcomes (Bonanno 2004; Kristensen et al. 2012; Morina et al. 2011). In the context of the CAC, several studies have documented high rates of mental health conditions such as post-traumatic stress disorder and prolonged grief disorder among those who lost relatives to violence (Bell et al. 2012; Cuartas Ricaurte et al. 2019; Heeke et al. 2017). These outcomes are often exacerbated by conflict-specific factors—including feelings of guilt, injustice, and the absence of social support (Bedoya-Olaya et al. 2023). The notion of psychosocial trauma emphasizes that suffering is produced and sustained not only by the violent event but also by structures of domination—public silence, impunity, stigmatization—that deflect or block mourning (Martín-Baró 1989). Lykes (2002) similarly argues that trauma cannot be reduced to intrapsychic pathology, as it reverberates across communities and generations, threatening collective resilience and cultural continuity. Research and the CEV's work have also shown that women and ethnic minorities bear a disproportionate burden of these effects (CNMH 2018b; Comisión de la Verdad 2022c; Martínez et al. 2017), and that the psychological toll is especially severe in cases of enforced disappearance (CEV - Grupo de Procesamiento de Lenguaje Natural 2022; CNMH 2018a; Heeke, Stammel, and Knaevelsrud 2015).

Our second objective was to situate these findings within existing evidence to argue that bereavement should be understood as a mechanism of

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terror. While our research design is not appropriate to establish intentionality, the quantitative patterns we observe align closely with the qualitative findings of the CEV. Given the sheer scale of kin loss documented—close to 20 million of Colombians bereaved as a result of the conflict—it is implausible that armed groups were unaware of the broader familial consequences of their actions. The CEV documented in detail how violence was not merely episodic but systematic and strategic. Guerrilla, paramilitary, and state actors employed tactics such as enforced disappearances, massacres, and targeted assassinations not only to eliminate individuals, but to disrupt families and dismantle social networks. Such tactics functioned as instruments of psychological warfare, fostering a "culture of fear" (Lykes 2002) and a "normal abnormality" (Martín-Baró 1989), designed to silence dissent, erode community cohesion, and consolidate territorial control (CNMH 2013a; Comisión de la Verdad 2022a). Survivor testimonies and archival evidence further revealed that the infliction of familial suffering was frequently intentional (Richani 2002). As such, the CEV concluded—and our analysis supports—that family bereavement was often not a secondary consequence, but a deliberate strategy of domination (Comisión de la Verdad 2022a, 2022b, 2022e).

This study offers two main conceptual contributions. First, it advances the idea of bereavement as a mechanism of terror. Second it demonstrates how kinship structures can be weaponized to amplify suffering. While kinship demography has traditionally focused on the positive functions of kin availability—particularly as a source of informal support (Alburez-Gutierrez et al. 2022)—we build on emerging work showing that kinship can also act as a "bereavement multiplier" in contexts of mass mortality (Verdery et al. 2020). Extending this logic, we argue that armed actors can strategically exploit the multiplicative properties of kinship to magnify the social and emotional impact of violence. This aligns with broader conceptualizations of conflict-related violence as a deliberate attempt to tear apart the social fabric (Card 2003). In doing so, our contribution adds a new dimension to the study of kinship as a structure that not only mediates support and care, but also reproduces vulnerability and inequality under conditions of systemic violence.

Previous research has highlighted that kinship dynamics not only amplify grief but also serve as repositories of memory across generations (Alburez-Gutierrez 2022). This has significant implications for social cohesion, community healing, and historical memory in Colombia, where the population of bereaved individuals is exceptionally large. In response to conflict, survivors have developed powerful forms of collective coping and resistance, which must be recognized and supported as integral to any post-conflict reconstruction effort (Comisión de la Verdad 2022e). Cultural and symbolic practices have enabled survivors, and women in particular, to reclaim grief as a space of resistance and healing (Comisión

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de la Verdad 2022c; Jelin 2003). Lykes (1994) similarly documents how Mayan survivors in Guatemala used art and participatory projects to transform grief into collective healing, showing that cultural practices can sustain resilience and resist silencing. Recent survivor-led initiatives illustrate how grief can be institutionalized as collective expertise and care. In Rio de Janeiro, the UFRJ–RAAVE program engages more than one hundred bereaved mothers as extension fellows/researchers to co-produce psychosocial accompaniment and a policy proposal for families affected by state violence—foregrounding victims' agency as knowledge-holders rather than research objects (Ribeiro 2025). These grassroots memory practices should intersect with institutional mechanisms of historical clarification, particularly the work of Truth Commissions. While top-down recognition is essential to processes of justice and reconciliation (Hayner 2011), reckoning with atrocity also involves navigating the complex relationship between accountability and forgiveness (Minow 1998). Ending structural violence is a necessary but insufficient condition for the consolidation of peace if collective and individual memories of terror continue to undermine the capacity to internalize and reproduce the democratic values and practices upon which stable democratic institutions depend (Sanford 2000). By integrating quantitative data with the CEV's qualitative findings, our analysis makes visible the demographic scale of harms that have often been conveyed primarily through narrative and symbolic forms.

We identify six main limitations. First, due to data constraints on historical regional demographic patterns, we could not capture subnational variation in bereavement, despite the pronounced territorial specificity of violence in Colombia. Our sensitivity analysis (Supplementary Materials) suggests this omission could lead to an underestimation of up to 7%, though the bias is smaller for most kin considered. More importantly, longer historical series of fertility and mortality at the subnational level would allow future work to explicitly account for heterogeneity in kinship structures and violence. Future work using decomposition techniques could then disentangle how regional heterogeneity in violence, kinship availability, and population structure interact to shape bereavement outcomes. Second, we assume independence between the probabilities of experiencing single or multiple kin losses due to homicide and enforced disappearance. Yet, the risk of losing kin is probably not uniformly distributed across families. Previous work has shown that ignoring the clustering of mortality within families can lead to a slight over-estimation of bereavement (Alburez-Gutierrez et al. 2024). Third, the absence of detailed historical data on the prevalence of unions by age and sex prevented us from quantifying bereavement among intimate partners (widowhood), a form of loss with distinct emotional and economic consequences. Fourth, our uncertainty estimates are conservative as they include uncertainty propagation from the MSE and MI processes, but not from the kinship structure, as a kinship model accounting

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for time-variant stochasticity is currently unavailable. Fifth, our counterfactual scenario, projecting conditions in the absence of conflict-related deaths, assumes equal mortality and migration probabilities among bereaved and non-bereaved populations, ignoring the fact that bereavement itself can increase vulnerability. Finally, our estimates are conservative for at least two reasons: because they exclude conflict-related deaths prior to 1985, thereby omitting a considerable number of cases (Comisión de la Verdad 2022d); and because they only account for losses directly attributable to conflict-related violence, even though indirect mortality effects may also be substantial. Addressing these limitations constitutes an important avenue for future research.

We identify a number of policy implications. First, our demographic characterization of bereavement due to enforced disappearance aligns with the mandate of Colombia's *Unidad de Búsqueda de Personas dadas por Desaparecidas* (UBPD), a pioneering humanitarian body established under the peace accords. We provide the first demographic profile of the relatives of the disappeared—disaggregated by age, gender, and kinship tie—which can directly support the UBPD's efforts in targeted outreach, humanitarian assistance, and psychosocial care. Second, our estimates offer an empirical foundation for broader discussions on the societal impact of enforced disappearance. For instance, the UBPD could use these figures to establish baseline indicators for assessing the long-term effects of their interventions. Third, the detailed characterization of the bereaved population can inform the design and implementation of psychosocial interventions tailored to the distinct needs of different demographic groups. Evidence from Colombia shows that mental health outcomes after conflict-related loss are shaped not only by the nature of the loss but also by individual and structural factors such as age, gender, ethnicity, and social support (Bedoya-Olaya et al. 2023; Cuartas Ricaurte et al. 2019; Heeke et al. 2017; Martínez et al. 2017). Our findings quantify the magnitude of this challenge: millions of Colombians are aging with the enduring scars of traumatic family loss. Detailed knowledge of the demographic composition of the bereaved population—particularly age and gender—is essential for developing social policies tailored to distinct needs. For instance, younger individuals who have recently lost parents require different interventions than older adults who lost siblings decades earlier. This matters as evidence from non-conflict settings shows that losing relatives at a young age can have measurable detrimental effects at older ages (Patterson, Verdery, and Daw 2020). Gender also plays a critical role. Our findings demonstrate that women are more likely to be bereaved than men. This gender imbalance can amplify pressures on women to provide emotional, economic, and caregiving support to family members, potentially exacerbating their vulnerability as survivors of war, particularly in contexts characterized by structural gender inequalities (Comisión de la

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Verdad 2022c, 2022e). Timely psychosocial interventions are crucial to address the needs of all individuals bereaved by war.

## Conclusion

Focusing on 1985–2018 within a conflict that remains unresolved, this study documents the scale, structure, and persistence of conflict-related bereavement in Colombia by combining kinship demographic modeling with the Truth Commission's qualitative record. By 2018, an estimated 7.5% of Colombians had lost a close relative and nearly 40% had lost at least one family member to conflict-related homicide or enforced disappearance. Sensitivity analyses (subnational heterogeneity; alternative bereavement memory) support the robustness of these findings, and projections indicate that the demographic imprint of bereavement will endure into the late 21st century even if no further violence occurs.

Methodologically, we shift attention from counts of bereavement events to the prevalence of ever-bereaved persons, a person-based measure that makes the population burden legible for planning and evaluation—how many people need services, which kin categories are most affected, and how this burden will evolve.

The evidence points to bereavement as central to the conflict's social logic: a mechanism of repression that extends violence through kinship networks and fragments communities. Mitigating its consequences requires more than individual clinical care: community-anchored mental-health services; accompaniment and recognition for surviving families—including the relatives of the disappeared—in truth-seeking and reparations; memorialization and collective rituals that repair social ties; and institutional guarantees of non-repetition. Situating quantitative estimates within lived experience underscores the need to address war-induced bereavement as a population-health and institutional priority.

### Data availability statement

The data that support the findings of this study as well as the scripts in R to reproduce the analyses are available in OSF at https://osf.io/u2nb5/, DOI number 10.17605/OSF.IO/U2NB5. These data were derived from the following resources available in the public domain:

- Individual-level information on homicides and enforced disappearances related to the Colombian armed conflict between 1985 and 2018, were compiled by the joint project between the CEV, the Special Jurisdiction for Peace (JEP), and the Human Rights Data Analysis Group (HRDAG). The data are publicly available at: (JEP-CEV-HRDAG Joint Project 2025).

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- Annual sex- and age-specific rates of fertility, mortality, and migration were retrieved from the UN World Population Prospects 2024, publicly available at: (United Nations 2024).
- Annual sex- and age-specific rates of fertility, mortality, and migration were retrieved from the Colombian Departamento Administrativo Nacional de Estadística–DANE demographic change estimates, publicly available at: (DANE 2025).
- Life tables for Colombia before 1950 are published by the Latin American Mortality Database, LAMBdA, at: (Palloni, Pinto-Aguirre, and Beltrán-Sánchez 2014).
- An approximation of the number of immigrants was obtained from the 2018 population Census based on the place of birth, publicly available by the DANE, at: (DANE 2020).

## Conflict of interest statement

The authors declare that they have no competing interests.

## Ethics approval statement

This research project does not require ethics approval as it uses only anonymized data that are freely available online.

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## Author contributions

E.A. and D.A.-G. conceived the study and designed the research. All authors contributed to the analysis. C.T. and M.G. were responsible for data collection and curation. E.A. and D.A.-G. led the writing of the manuscript, with critical comments and revisions provided by C.T. and M.G. Visualizations were produced by E.A. and D.A.-G.

## Notes

1 This term refers to persons deprived of their liberty against their will, where the perpetrator refuses to acknowledge the detention or disclose the person's whereabouts. International humanitarian law distinguishes between two types of violence-related disappearances based on State involvement: if the State is involved or acquiescent, the disappearance is classified as enforced; if not, it is considered involuntary (Ruiz Reyes et al. 2024). For simplicity, we refer to all conflict-related disappearances where the victim was deprived of their liberty followed by the denial of the detention or failure to disclose the person's whereabouts as enforced irrespective of the presumed perpetrator.

2 Considering the Colombian context, in this work, we use the term *guerrillas* to refer to left-wing armed organizations, including the *Fuerzas Armadas Revolucionarias de Colombia - Ejército del pueblo* (FARC-EP), the *Ejército de Liberación Nacional* (ELN), the *Ejército Popular de Liberación* (EPL), the *Movimiento 19 de Abril* (M-19), and others. We use the term *paramilitaries* when referring to right-wing organized armed groups including the *Autodefensas Unidas de Colombia* (AUC).

3 The replicates selected for this analysis are: R11, R16, R18, R19, R49, R52, R65, R74, R82, R88.

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