Patterns of Indirect Violence in Conventional War: Territorial Contestation and Civilian Casualties during the War in Ukraine

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Patterns of Indirect Violence in Conventional War: Territorial Contestation and Civilian Casualties during the War in Ukraine

RESEARCH NOTE

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Indirect violence involving methods such as artillery shelling and aerial bombardment remains an underexplored aspect of conflict, largely due to the rarity of disaggregated data. This article estimates the impact of such violence on civilians by analyzing how territorial contestation influenced civilian casualties from Russian shelling near the frontlines in Ukraine. Drawing on granular conflict data, we find that civilian casualties from indirect violence were significantly higher during local Russian offensives, consistent with a doctrine of clearing the way through intensive bombardment. In contrast, this effect was not observed during Russian retreats, nor during local stalemates, which were marked by greater military casualties only. These relationships hold when proxies for civilian evacuation are included. We conclude that the study of indirect violence should consider how changing battlefield dynamics expose civilians to harm, especially the relationship between casualties and territorial contestation.

La violencia indirecta, que implica métodos como el bombardeo con artillería y el bombardeo aéreo, sigue siendo un aspecto poco explorado del conflicto. Esto se debe, en gran parte, a la escasez de los datos desglosados Este artículo estima el impacto que ejerce esta violencia sobre los civiles. Para ello, analizamos cómo la contestación en materia territorial influyó en el número bajas civiles por los bombardeos rusos cerca de las líneas del frente en Ucrania. Concluimos, basándonos en datos granulares obtenidos de conflictos, que las víctimas civiles por violencia indirecta fueron significativamente mayores durante las ofensivas locales rusas, lo que es consistente con la doctrina que postula despejar el camino mediante bombardeos intensivos. Por el contrario, no se observó este efecto durante las retiradas rusas, ni durante los estancamientos a nivel local, los cuales se caracterizaron únicamente por un mayor número de bajas militares. Estas relaciones se mantienen cuando se incluyen sustitutos para la evacuación civil. Concluimos, por tanto, que el estudio de la violencia indirecta debería considerar cómo los cambios en la dinámica del campo de batalla exponen a los civiles al daño y, especialmente, debería tener en cuenta la relación entre las bajas y la contestación territorial.

La violence indirecte impliquant entre autres le pilonnage et les bombardements aériens reste un aspect sous-étudié du conflit, en grande partie à cause de la rareté des données ventilées. Cet article estime l'incidence de ce type de violence sur les civils en analysant l'effet de la contestation territoriale sur les pertes civiles dues au pilonnage russe près du front en Ukraine. Nous fondant sur des données granulaires relatives au conflit, nous remarquons que les pertes civiles issues de la violence directe étaient bien plus importantes lors des offensives russes locales, ce qui confirmerait une doctrine de nettoyage par bombardement intensif. Par opposition, cet effet n'a pu être observé lors des retraites russes ou impasses locales caractérisées par un plus grand nombre de pertes militaires uniquement. Ces relations se maintiennent lors de l'inclusion de substituts pour l'évacuation civile. Nous concluons que l'étude de la violence directe devrait s'intéresser à la mise en danger des civils par l'évolution des dynamiques sur le champ de bataille, notamment à la relation entre victimes et contestation territoriale.

Introduction

Artillery, missile, and aerial bombing are integral to modern warfare. These methods are employed in conventional conflicts to inflict casualties, to soften up defensive positions, destroy logistics, disrupt troop movements, and to undermine enemy morale (Horowitz and Reiter 2001; Norris 2011; Saunders and Souva 2020). In the work of Pape (1996, 10), indirect violence in the form of aerial bombing is a tool of coercion used to manipulate the costs and benefits of resis-

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tance for an opponent. Coercion can be divided into two subcategories, punishment and denial (Pape 1996, 12). The first involves raising the costs for the opposing party by threatening or inflicting harm on its civilian population,[1] whereas the latter refers to bombing to undermine the foe's capacity for resisting militarily. One example of punishment as a strategy is the use of nuclear weapons against Japan during World War 2, whereas an example of denial is the US bombing campaign during the Gulf War.[2] There is a large literature on punishment through strategic bombing dating back to the dawn of aerial warfare in the early 1900s, which deals with the concentration of force against cities and economic nodes to force an enemy into submission by raising costs for civilians (Clodfelter 2010, 402). However, this article explores a relatively under-studied topic, namely how civilians are affected by indirect violence for the purpose of denial near the frontlines, focusing on the warring parties' bombing of frontline targets through both aerial bombardment and short- to medium-range weapons such as artillery as part of the competition for territorial control. To this end, it asks: *How does territorial contestation affect civilian casualties from indirect violence?*

The use of weapons for indirect violence in war can have severe consequences for civilians, whether through collateral damage or the deliberate targeting of non-combatants and infrastructure critical to civilian welfare (Kocher et al. 2011). The lines between military and civilian targets have become increasingly blurred in modern warfare, not least because battles are often fought in or near densely populated areas, and because civilians and civilian infrastructure can play a supportive role for fighting forces (Strachan 2000; Konvitz 2022). Furthermore, the proliferation of long-distance weapons such as aircraft and missiles, and in recent times, drones, means that civilians' distance from the frontlines is no longer a guarantee against harm (Chávez and Swed 2021). Despite international efforts to regulate the use of explosive weapons against populated areas, artillery and aerial bombardment have been a key source of civilian suffering in recent and ongoing conflicts, including the Israel–Palestine conflict, the 2025 12-day war between Iran and Israel, the 2026 Iran war, and the civil wars in Iraq, Libya, South Sudan, Sudan, Syria, and Yemen (HRW 2022; United Nations 2025). While there is a small literature devoted to understanding how civilians are affected by such methods during civil wars (Balcells 2010), the recent eruption of interstate wars brings new urgency to the study of how indirect violence affects civilians during conventional warfare between states.

Few conflicts of the twenty-first century have demonstrated the importance of artillery, missile, and aerial bombing to modern warfare more clearly than the War in Donbas (2014–2022) and the subsequent Russian invasion of Ukraine (2022–Present). The latter has developed into a war of attrition defined to a significant extent by urban and trench warfare, which has made artillery and aerial power, especially in the form of drones, crucial to either side's prospects for victory (Britzky et al. 2024; Gady and Kofman 2023).

These weapons have also had a significant impact on Ukrainian civilians (Polishchuk 2024; Taylor 2025). It should be noted that civilian casualties are not in themselves evidence of deliberate targeting due to inaccuracies associated with long-range weapons. At the same time, an independent commission appointed by the United Nations' General Assembly declared the civilian targeting to be "systematic" (United Nations 2025, 12/19). The same commission noted that "Attacks with explosive weapons in populated areas remain the leading cause of death and injury among the civilian population in Ukraine" (UNOCHA 2024). These civilian casualties have occurred both far into Ukraine's interior and near the frontlines.

In this article, we are concerned with violence affecting civilians near the frontlines, where we assume that violence primarily follows a logic of denial, where both sides seek to break the opponent's military capacity for the purpose of seizing new territory and to maintain control over already held territory. Keeping an agnostic attitude towards the question of whether civilian casualties were a product of the deliberate targeting of civilians, we investigate the conditions under which changes in territorial control put civilians at increased risk of dying from indirect violence. When wars are primarily fought within the territory of one country, the warring parties face different considerations with regard to the security of their populations. The defending state is likely to take measures to shield its citizens from harm, including in areas occupied by the attacking state. The attacking state typically does not face this issue to the same degree, though this might be different if there is a population of co-ethnics (Fjelde and Hultman 2014).

As a result, we focus only on casualties inflicted by Russian strikes, rather than comparing them with Ukrainian strikes. We theorize that offensive operations lead to civilian as well as military casualties from indirect violence because civilian support and infrastructure, such as homes and apartment blocks, are integral to the enemy's territorial defense, which, if unharmed, will increase the costs of offensive operations. Stalemates or retreats, by contrast, lead primarily to military casualties as indirect violence is aimed at explicitly military targets with the goal of breaking the stalemate, and to raise the costs for advancing enemy troops during retreats.

The causal relationship between territorial control and violence against civilians is central to research on the microdynamics of civil conflicts, but has received far less attention in the study of interstate war (Kalyvas 2006; Balcells 2011). We address this research gap through a quantitative study of civilian casualties from indirect violence during the war in Ukraine. This case is particularly suitable for analysis due to the near-unprecedented availability of highly granular conflict-event data. We examine the war in two phases. The first, from February 24 to November 11, 2022, was defined by fluid frontlines due to the initial Russian invasion and subsequent Ukrainian counter-offensives. The second phase, from November 12, 2022, to June 7, 2023, was characterized by a broader strategic stalemate and comparatively limited changes in territorial control.

Our analysis finds that a shift in a territory's status from Ukrainian control to contested was associated with both higher civilian and military casualties from Russian strikes. In contrast, local territorial stalemates and shifts from Russian control to contested areas were associated only with greater military casualties. This suggests that Russian attempts at seizing new territory were associated with intensive shelling, which affected both civilians and combatants to clear the way for offensive operations, whereas shelling affected military targets more selectively during local stalemates and Russian retreats. These relationships hold when controlling for proxies for the evacuation of civilians, such as the duration of contestation, and general and local stalemates.

[1]Though Pape (1996, 13) notes that punishment may also involve the killing of military personnel in large numbers to exploity the opponent's sensitivity to casualties.

[2]Though logically distinct, these categories may blend together in practice, such as during the German Blitz on the United Kingdom, where the Luftwaffe primarily targeted British industry, which was crucial for the war effort, but it also inflicted severe costs on the civilian population.

We conclude that future research on the impact of indirect violence on civilians should explore how macro-dynamic changes in how wars are fought shape micro-patterns of violence. While our research focuses on the impact of events near the frontline, we also argue that future research should investigate in what ways indirect violence through long-distance methods follows a distinct logic from violence at the front.

Indirect Violence in the Conflict Literature

Indirect violence can have devastating consequences for civilians in war, whether as collateral damage or through deliberate targeting (Pape 1996; Balcells 2011). Surprisingly little research explores how civilians are affected by indirect violence at the micro-level. While there are scattered examples of research into the micro-dynamics of indirect violence in the context of civil wars, there are even fewer studies into micro-patterns in conventional wars between states (Balcells 2011). There is, however, a large literature dedicated to the question of whether and how bombing can affect the outcome of wars. This scholarship grappled with the question of whether a foe could be beaten into submission by targeting its citizens and economic nodes; a question which gained extreme relevance during the Second World War and then during the Cold War, not least due to the introduction of nuclear weapons (Pimlott 1988; Haslam 2012). Variants of this literature, such as economic web theory, focused on the destruction of war-supporting industry, such as power plants and manufacturing plants, as well as dual-use infrastructure, such as rail and bridges, which is likely to lead to civilian casualties, though this may not be a goal in itself. After the end of the cold war, a new strand of research focused on aerial power's utility and limitations as a coercive tool (Pape 1996; Gentile 2001), especially in conflicts where one side enjoys aerial supremacy such as Operation Desert Storm (1990–1991), and the NATO interventions in the Kosovo War (1998–1999) and Libya (2011) (Hoffmann 2024). Subsequently, with the War on Terror in the 2000s, scholars devoted significant attention to the role aerial warfare, including drone strikes, could play in counterinsurgency (Johnston 2012; Gartzke and Walsh 2022). The renewed prospect for interstate conflict, and the growth of open-source data collection, bring new opportunities for scholars to move beyond the focus on strategic efficiency, to investigate how states' methods affect civilians.

Technological advancements in weapons for indirect violence have made physical distance from troops an unreliable safeguard for civilians. Armed actors can now target cities and infrastructure without maintaining a local presence, thereby exposing non-combatants to harm even far from the frontlines (Patterson 2007). This has enabled the deliberate collective punishment of enemy populations with the firebombing of Tokyo (1944–1945) as an example (Downes 2008; Grosscup 2013). Moreover, modern conflicts are often fought in urban areas due to the symbolic importance of cities and their strategic role as communication and logistical hubs. However, urban warfare tends to be slow and costly, and efforts to avoid civilian casualties in densely populated urban environments can lead to heavy casualties for attacking forces (Vautravers 2010; Konvitz 2022; Skoglund et al. 2022). As a result, belligerents may turn to artillery and airstrikes to dislodge defenders, despite the negative impact this can have on civilians (Rusek and Ingrao 2004).

Most conflicts are unlikely to be resolved decisively through indirect violence alone, especially when defenders demonstrate resolve and internal cohesion (Pape 1996; Lake 2009; Saunders and Souva 2020; Petersson 2024). Moreover, bombings can backfire by causing rally-around-the-flag effects (Belkin et al. 2002; Horowitz and Reiter 2001; Stanton 2016; Pechenkina et al. 2019), inviting domestic and international criticism (Stanton 2016; Pechenkina et al. 2019). Over-reliance on indirect violence may also signal a lack of resolve and an unwillingness to incur costs (Post 2019). Historical cases such as the Vietnam War (1955–1975) and the War in Afghanistan (2001–2021) illustrate that determined defenders can prevail against technologically superior adversaries with overwhelming firepower, if those adversaries lack the political will to sustain losses (Arreguín-Toft 2001). Similarly, in the Ukrainian case, the existential nature of the conflict means that Russia's advantage in firepower has not been sufficient to quell Ukrainian resistance, leading to a deadlocked war of attrition.

While the debate on whether wars can be won through civilian victimization remains unsettled, inflicting civilian casualties may be effective for the purpose of territorial conquest at the micro-level, because it undermines a defender's logistics and ability to utilize civilian infrastructure (Azam and Hoeffler 2002; Lyall 2009; Straus 2015). Restraints against targeting civilians are likely to erode when armed actors suffer significant battlefield losses (Wood 2014) or when conflicts become drawn out (Downes 2006). The more drawn-out, desperate, or "total" a war becomes, the more likely that moral and operational constraints on violence will break down. On the other hand, the willingness to inflict civilian casualties may also be a feature of a state's military doctrine, as some militaries, especially those of authoritarian states, have more lenient attitudes towards civilian casualties (Allen 2007).

Indirect Violence during the Ukraine War

The Ukraine War began on February 24, 2022, when Russia escalated its involvement from supporting separatists in Donbas to launching a full-scale invasion. Although Russia initially seized large swaths of territory during the first month of the invasion, it failed to take Kyiv or to break Ukraine's capacity for resistance. Between March and November 2022, Ukraine recaptured significant areas through counter-offensives in Kyiv, Kherson, and Kharkiv oblasts (Biddle 2023). Artillery played a crucial role from the outset, proving vital in halting Russian advances and enabling Ukraine's counter-offensives (Gady and Kofman 2023, 11). Following Ukraine's counter-offensives in 2022, the war entered a second phase. The conflict became a war of attrition, characterized by trench warfare and only incremental territorial gains (Gady and Kofman 2023, 17). Both sides became heavily reliant on artillery, and increasingly on drones, to prevent enemy advances and support their own (Porter 2023).

By the fall of 2022, as it became clear that Ukraine would not fall easily, Russian forces increasingly targeted economic and logistical targets, such as hospitals (Sauter and Gates 2026), rail infrastructure, bridges, and the petroleum industry in an effort to undermine Ukrainian mobility and supplies (Williams 2023). According to one estimate, more than 5000 missile and drone strikes were launched against Ukrainian cities in the first year of the war (Sankaran 2024). However, the most severe impact on civilians from indirect violence has arguably occurred near the frontlines, where entire cities have been devastated. The most infamous example is Mariupol, which was under siege from February 24 to May 20, 2022, leaving the city in ruins (HRW 2024).

Sources on Russian artillery tactics are rather sparse and largely take the form of assessments by Western military an-

alysts. A recurring claim in these assessments is that Russian military doctrine was shaped by lessons from the siege of Grozny (1999–2000) during the Second Chechen War (1999–2009), where outgunned defenders used the urban environment to slow Russian advances (Grinberg 2023). The purported lesson drawn from this was that offensives into urban environments should be preceded by heavy shelling to dislodge defenders and demolish structures that could be used defensively to avoid advancing troops from being bogged down (Arbatov 2000; Fisher 2022). Retired US Army Gen. David Petraeus observed that "When they confront a particularly determined and skilful urban defence, they pound it with artillery, rockets, missiles, and bombs until it is totally destroyed and 'depopulated'," (Schogol 2022). Artillery is also used to blunt assaults, where one report claims that a "common tactic is for the Russians to withdraw from a position that is being assaulted and then saturate it with fire once Ukrainian troops attempt to occupy it" (Watling and Reynolds 2023). The lack of primary sources on Russian artillery tactics means that it is difficult to determine to what extent civilian casualties are seen as operationally acceptable. Yet, the micro-level study of conflict patterns may reveal under which conditions civilians are most affected by violence.

The Ukraine War is a high-information environment marked by an unprecedented volume of publicly available conflict data due both to extensive media coverage and crowdsourced efforts at information gathering (Price and Ball 2014; Dietrich and Eck 2020; Dawkins 2021). The war shows a glimpse into the future, where conflicts will increasingly be documented through crowdsourced data-collection efforts, automated feeds, and increasingly remote sensing (Zhukov and Ayers 2023; Naghizadeh 2024). This means that highly granular data is available in the Ukrainian context, which makes the investigation of micro-patterns of violence possible.

A Theory of Indirect Violence against Civilians in Conventional Wars

We argue that in conventional wars where the warring parties have the capacity for large-scale bombing and shelling, civilian casualties will be influenced by territorial contestation. Building on (Pape 1996) insight that indirect violence may follow a logic of denial, we focus on how efforts to destroy the enemy's military capacity at the *local*, rather than national level, affect civilians near the frontline where the brunt of military force will be concentrated.

Strikes in the interior of the defending country may have the goal of undermining the broader infrastructure that supports the opponent's military, with civilian casualties being collateral damage due to the inaccuracy of the weapons used or the co-location of military and civilian targets (Clodfelter 2010; Biddle 2023). Alternatively, such long-distance weapons may be deliberately used against civilians to raise the costs of resistance (Schwartz and Straus 2018).

Near the frontlines, distinguishing these logics is more complicated, both due to the co-location of civilian and military targets and the supportive role civilians and civilian infrastructure may have. We posit, however, that the distribution of indirect violence affecting civilians varies across *both* space and time, depending on changes to military-strategic circumstances. The distribution of civilian and military targets is unlikely to be uniform across contested territory, and this spatial variation creates an opportunity for quantitatively assessing whether civilian casualties are incidental or associated with a strategic logic that leads to casualties, whether deliberate or as collateral damage.

If the status of a territory changes from being under complete control to being contested, the attacking forces' shelling will inflict both military and civilian casualties to "clear the way" for its troops through saturation bombing. Territorial control here refers to whether an armed actor maintains a physical presence in a defined area to the exclusion of its rivals. During offensives against opponent-held territory, military commanders may be more inclined to see civilians and civilian infrastructure as strategically legitimate targets or as acceptable collateral damage for at least four reasons (Downes and Cochran 2010, 31; Valentino 2014, 93). First, by seeing civilians and civilian infrastructure as integral to the enemy's logistical support structure. Second, by seeing civilians as inherently hostile, and therefore as a potential obstacle to seizing and holding territory (Straus 2015; Steele 2018). Third, by perceiving civilians to be important to either the operational capacity or the morale of defending forces. Finally, civilian structures provide cover for the defender and dislodging defending troops makes offensive operations more costly and time-consuming.

Armed actors might, therefore, see civilian casualties or the destruction of civilian infrastructure as an acceptable collateral to undermine the opponent's local capacity for defense (Fowler 2025). For the Ukraine War, this translates to the following hypothesis:

H1: Russian local offensives are associated with both increased civilian and military casualties from shelling in contested territory.

During retreats or local stalemates, by contrast, we expect forces to conserve their resources by focusing their artillery fire on military targets, either to break stalemates or to raise the costs of seizing territory for the enemy. Both stalemates and retreats bring about significant uncertainties about the military-logistical timeframe. Compared to offensives, forces in stalemate are not in control of the timeframe of battle, which leads to uncertainties about whether there will be sufficient munitions to fulfil their objectives. As a result, long-range attacks are directed towards softening up entrenched military positions to break deadlocks, because expending limited munitions on non-military targets is unlikely to yield significant military-strategic benefits. In the course of a retreat, shelling similarly becomes concentrated at advancing opposition forces rather than civilians because the goal is to delay and raise the costs of enemy troop advancements. This generates the following hypotheses:

H2: Russian retreats are associated only with increased military casualties in contested territory.

H3: Local Stalemates are associated with intensified military casualties, but not civilian casualties.

While these micro-patterns might hold at some stages of the war, we also know from previous research that macro-level changes to conflict dynamics can influence the micro-dynamics of violence over time (Costalli et al. 2020), owing to changes in the tactics of the attacker (Cranny-Evans 2023). Wars can be defined by either maneuver or attrition warfare (Betts 1983). The former typically involves flexible and rapidly changing frontlines as rival actors seek to outmaneuver each other, whereas the latter often involves more slowly moving frontlines. While artillery plays a crucial role in both, it is possible that its impact is more severe during maneuver warfare, due to the possibility that civilians do not evacuate in time. Thus, we hypothesize that

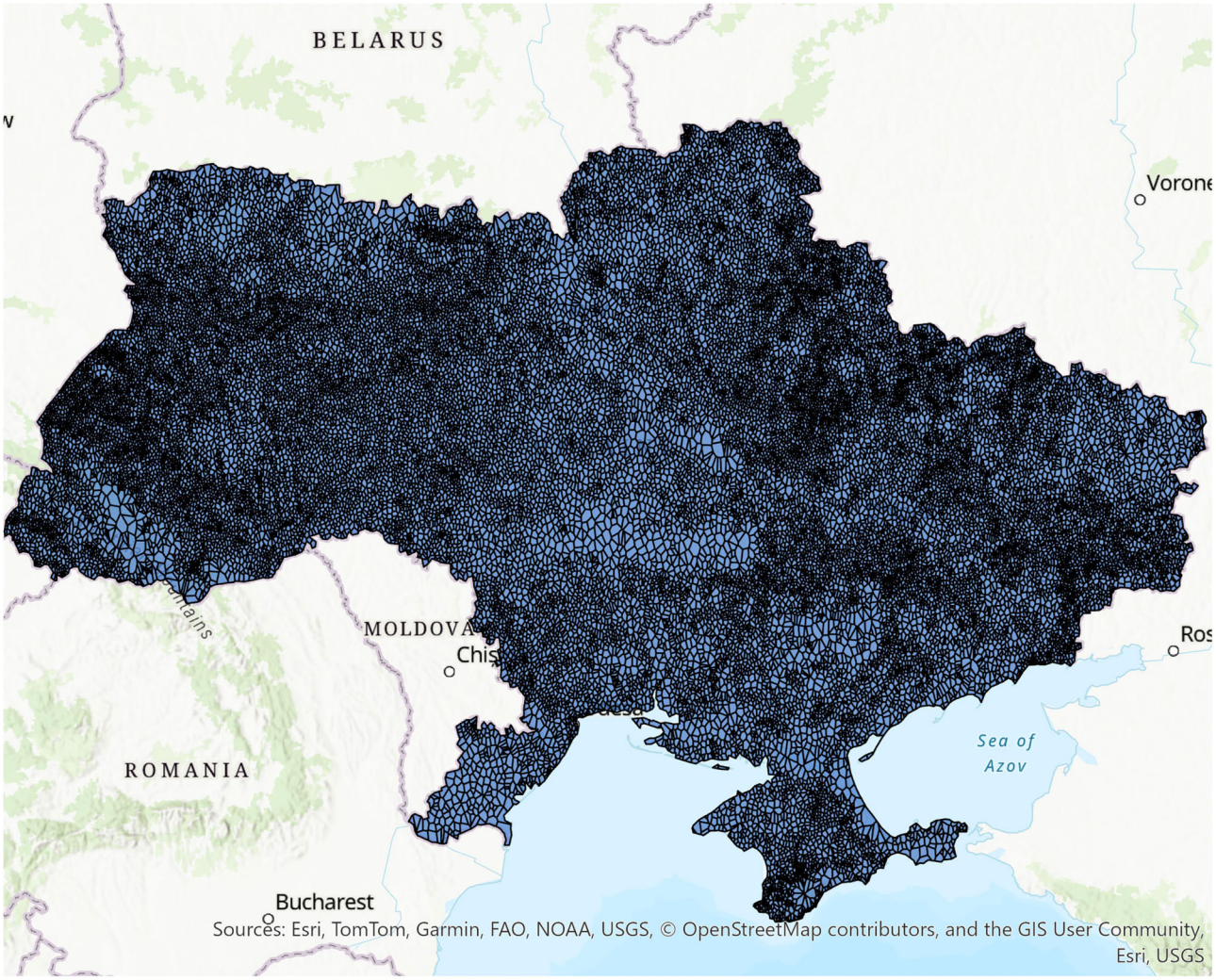

Figure 1. VIINA's spatial unit, "populated spaces".

H4: General stalemates are negatively correlated with civilian casualties from indirect violence because civilians can evacuate in time.

Our theoretical argument relies on a key assumption that violence near the frontlines primarily revolves around territorial contestation. While there might be instances of deliberate targeting of civilians near the frontlines, we assume that the primary goal behind military action at the frontlines is to overcome the opponent's *local* military capacity. While this does not preclude the possibility that a warring party may simultaneously seek to raise the costs to the opponent's civilian population to thereby apply political pressure towards its government, for the sake of this article, we assume that is not the primary goal.

Timeline and Research Method

To test these hypotheses, we conduct a quantitative study of the War in Ukraine during two phases. The first phase is between February 24 and November 11, 2022, which was a period of maneuver warfare and rapidly changing frontlines with the initial Russian invasion and Ukrainian counter-offensives in Kyiv, Kharkiv, and Kherson oblasts (Khurshudyan et al. 2022).[3] The second phase is one of general stalemate, lasting from November 12, 2022, to June 7, 2023, preceding a Ukrainian counteroffensive on June 8, 2023. By looking at these two phases, we seek to uncover whether the patterns of indirect violence in relation to territorial contestation were the same, or changed, as the broader dynamics of the war changed. However, our temporal unit of analysis is weeks (7 days), counting from February 24, which does not neatly overlap with these two phases of war. In our empirical models, the second phase will begin from the week starting on November 11. We recognize that a defending state will be more sensitive towards civilian casualties than an invader since it considers civilians in its own territories to be its citizens, though an invading force might share similar qualms if part of the population is its co-ethnics (Fjelde and Hultman 2014). Empirically, therefore, we limit our analysis to victimization by Russian—and not Ukrainian—artillery fire.

For data on indirect violence against civilian and military targets in Ukraine, we rely primarily on data from the Violent Incident Information from News Articles (VIINA) project, version 2.0 (see figure 1) (Zhukov 2023; Zhukov and Ayers 2023). VIINA draws on both Ukrainian- and Russian-

[3]With the cutoff date marking the recapture of the city of Kherson.

language news sources to produce what is likely the most detailed conflict-event dataset on the Ukraine war. It relies on a deep learning model to classify events, to determine territorial control by the warring parties at the micro-level, and to record the date and location of war-related violent incidents. We also follow VIINA in using populated spaces in Ukraine ($N = 33141$) as our spatial unit of analysis. VIINA relies on VIINA event reports, map layers from Deeptiman, and crowdsourced maps from Wikipedia to assess territorial control. Where sources disagree, territorial control is inferred by what the majority out of these three sources report. VIINA has several advantages over alternatives such as the Armed Conflict Location & Event Data (ACLED) and the Uppsala Conflict Data Program's (UCDP) Georeferenced Events Data. First, the automated web scraping procedure is designed specifically for this conflict and is fine-tuned to capture local events. Second, it draws from both Ukrainian and Russian news sources, in their original languages. Third, the geocoding is highly precise, sometimes down to the street-level, and while it does involve coding by centroids, it is more geospatially precise which makes it possible to relate conflict events to levels of control at a more disaggregated unit of analysis.

Our unit of analysis is place-week. Since our outcomes of interest—presence of artillery or aerial attacks—are binary, we will use logistic regression models to conduct the empirical analysis.

Dependent Variables

Our outcome of interest is civilian casualties from Russian use of indirect violence. The variable is constructed using VIINA to capture any artillery or airstrike bombing that resulted in civilian casualties. VIINA distinguishes civilian casualties caused by indirect fire from casualties caused by other forms of violence, such as direct fire, by specifically recording whether civilian casualties were caused by artillery or aerial shelling.

Strikes that did not result in civilian casualties are coded as having military targets.[4] Table 1 compares the number of strikes according to VIINA, ACLED, and UCDP's GED (Geocoded Events Dataset)[5]. Data from VIINA is much more comprehensive and detailed than either ACLED or UCDP. Being fully automated and specifically designed for the Ukrainian context, VIINA captures more indirect attacks against civilians than ACLED, and also better captures the spatial distribution of events in major cities such as Kharkiv and Kherson (Zhukov and Ayers 2023). As an example, VIINA reports 2 strikes against civilian targets in Dnipro rayon (GeoName = 709930), on March 25, 2022. ACLED, however, reports no strikes that day in Dnipro. What all three sources have in common is the possibility of reporting bias toward urban and populated areas. In addition, some targets are more prone to dense indirect attacks, resulting in few observations with very high numbers of strikes.[6] These two factors combined, the count of events is heavily skewed to the right. To address this potential issue, the dependent variables will mainly be operationalized as binary variables. In the robustness checks, we will use the logged count of each event as an alternative measure of the dependent variables.

Table 1. Number of artillery or aerial attacks reported by VIINA, ACLED, and UCDP.

	VIINA	ACLED	UCDP
Strikes (all)	32,601	46,238	124,749
Strikes (civilian casualties)	5,211	2,964	1,429

Table 2. The status variable.

Shift	Label	Control $_t$	Control $_{t-1}$
0	Russian control	Russia	Any
1	Russian retreat	Contested	Russia
2	Russian offensive	Contested	Ukraine
3	Stalemate	Contested	Contested
4	Ukrainian control	Ukraine	Any

Explanatory Variable

Our explanatory variable is changes to territorial control. VIINA records whether a place is under Ukrainian control, under Russian control, or contested. Using this information, we track changes to territorial control by constructing a *Shift* categorical variable. A place is in Russian control (*Shift = 0*) if a place-week is under Russian control in week *t*; a place is undergoing a Russian retreat (*Shift = 1*) if a place-week becomes contested after being under Russian control in the previous week; a place is undergoing a Russian offensive (*Shift = 2*) if a place-week enters contestation after being under Ukrainian control in the previous week; a place is in stalemate (*Shift = 3*) if a place-week is contested for two consecutive weeks; a place is in Ukrainian control (*Shift = 4*) if a place-week is under Ukrainian control in week *t*. Table 2 presents an overview of the *Status* variable in terms of territorial control in week *t* and *t–1*.

Control Variables

The models include a battery of control variables, the details of which are available in the Online Appendix.

Empirical Analysis

The empirical data reveals evidence in support of all the hypotheses except the fourth. Civilian casualties are higher during Russian offensives against Ukrainian-controlled territory. By contrast, local stalemates and Russian retreats increase military casualties only. Interestingly, macro-developments, such as the shift from maneuver warfare to general stalemate, did not have an effect as the impact of Russian local offensives are associated with increased civilian casualties in both contexts. Figure 2 illustrates the difference in the spatial distribution of strikes between these two periods, with a notable reduction in strikes in places such as Kyiv and Mykolaiv oblasts, reflecting Russian withdrawals from these areas.

Models 1–4 (table 3) are logistic regressions estimating the likelihood of civilian casualties (Models 1 and 3) and military (Models 2 and 4) targets. In all models, the base category for the *Shift* variable is Russian control. Models 1 and 2 analyze strikes during the first phase of the war (between February 24 and November 11, 2022), which includes both Russia's ini-

[4] We do not restrict our definition to shelling resulting in military loss, because VIINA's source materials (news reports) are likely to be biased against loss of military assets or personnel.

[5] Since UCDP does not distinguish types of attacks, we record the number of deaths from all violent events and deaths from one-sided violence against civilians that happened in Ukraine during the study period.

[6] An area in Kyiv (GeoName = 703448), for example, experienced 112 and 140 incidents in the weeks of February 25 and March 11, 2022, respectively. On average, each spatial unit experienced 0.016 incidents in a given week.

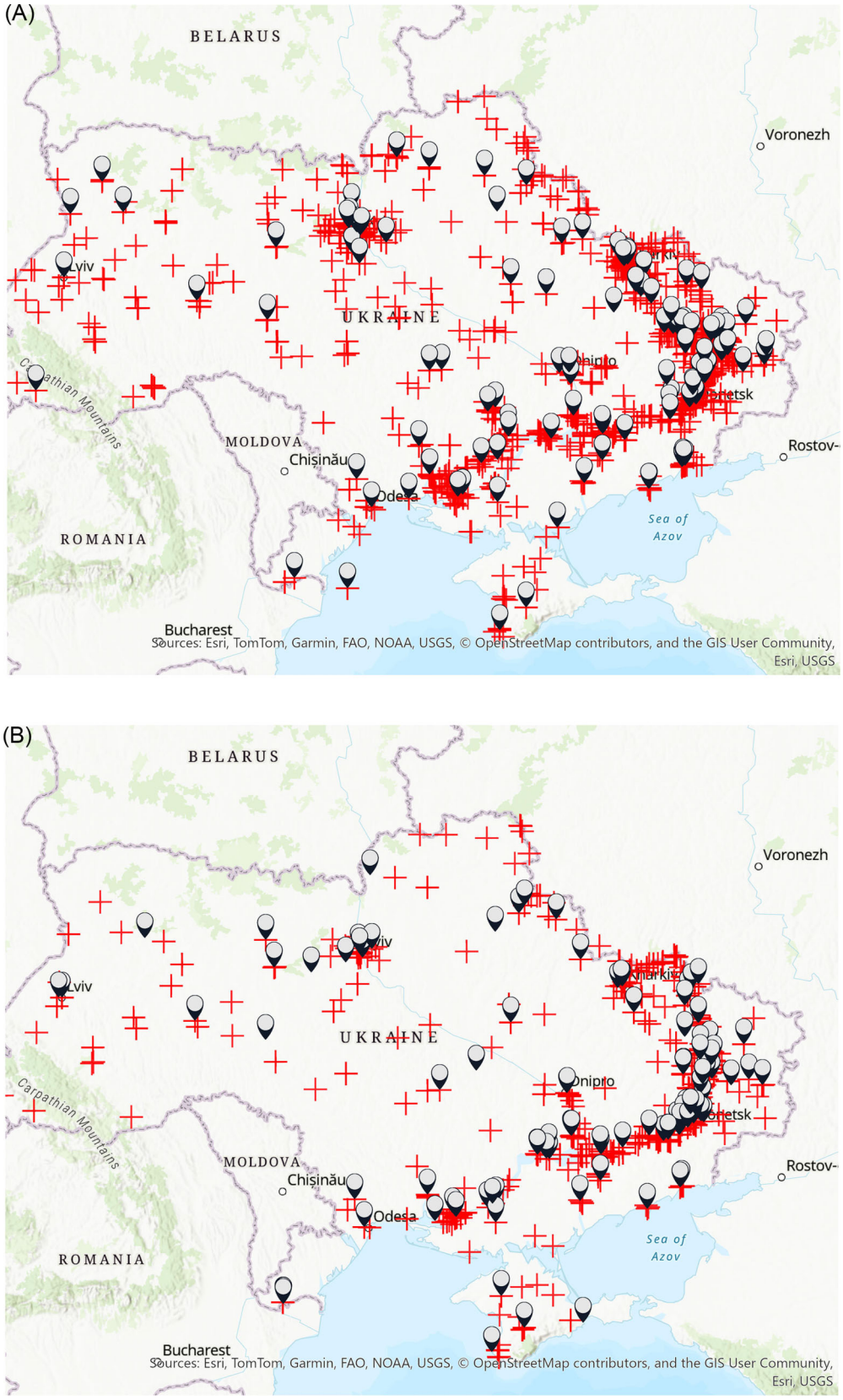

Figure 2. Strikes in phase 1 and 2 of the study period (a) Phase 1 (Feb 24–Nov 11, 2022). (b) Phase 2 (Nov 12–Jun 7, 2022).

tial offensive and Ukraine's first counteroffensive (figure 2a). Over this turbulent period, both civilian and military casualties from indirect violence were more likely during Russian offensives, adding support to H1. Confirming H2, Rus-

Table 3. Main models.

Casualties=	Model 1 Civilian	Model 2 Military	Model 3 Civilian	Model 4 Military
Shift				
Russian retreat	0.177	1.992***	0.744	2.469***
	(0.809)	(0.171)	(1.117)	(0.372)
Russian offensive	1.355**	1.027***	2.133*	2.005***
	(0.469)	(0.169)	(0.965)	(0.442)
Stalemate	1.039	1.109***	0.398	2.767***
	(0.590)	(0.208)	(1.104)	(0.311)
Ukraine control	0.198	-0.200	-0.034	-0.170
	(0.357)	(0.120)	(0.758)	(0.201)
Weeks in contestation	-0.019	0.105	0.186	-0.308**
	(0.259)	(0.096)	(0.249)	(0.101)
Russian first language	0.777	0.575**	0.115	0.925**
	(0.509)	(0.185)	(1.084)	(0.296)
Battle intensity	0.008	0.035**	0.003***	0.027***
	(0.007)	(0.012)	(0.001)	(0.007)
L*n* (population)	0.471***	0.359***	0.348***	0.323***
	(0.075)	(0.031)	(0.105)	(0.038)
L*n* (urban)	0.090	0.214***	0.127	0.213***
	(0.056)	(0.035)	(0.090)	(0.044)
N	1,226,180	1,226,180	994,200	994,200

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Cluster-robust standard errors in parentheses. Spatial lags are not reported.

sian retreat, by contrast, only affected strikes against military targets. In terms of marginal effects, Model 1 predicts that an area undergoing a Russian offensive is 3.87 times more likely to experience a civilian casualty compared to an area that is under Russian control. Model 2 predicts that an area in which Russian troops are advancing is 2.79 times more likely to have a military casualty compared to the baseline. By contrast, places going through a Russian retreat are 7.25 times more likely to have military casualties, but there is no effect on civilian casualties compared to the base category. These statistical patterns lend support to H1 and H2, which posit that Russian offensives intensify both civilian and military casualties, but that a Russian retreat only affects military casualties.

Model 2 also provides empirical support towards H3, which predicts that local stalemates would intensify only military casualties. In terms of predicted probabilities, an area under localized stalemate is 3.01 times more likely to experience military casualties targets than areas under consecutive Russian control. This result in Model 2 is in stark contrast to that of Model 1, which shows the relatively limited impact of local stalemates on civilian targeting. According to Model 1, local stalemates do not significantly increase the probability of civilian casualties compared to areas under consecutive Russian control. Together, Models 1 and 2 provide empirical evidence in favor of our third hypothesis.

Moving on from localized stalemates, Models 3 and 4 explore the effects of a theatre-wide impasse by analyzing the second phase (from November 12, 2022, to June 7, 2023) of the war, where the two sides entered an overall stalemate at the macro-level (figure 2b). Although theatre-wide can result in overall increases in indirect attacks, our empirical analysis reveals that not all areas or targets experience the same increase in indirect fire. Mirroring patterns during maneuver warfare, areas not under complete Russian or Ukrainian control are more susceptible to military casualties from strikes. According to Model 4, an area is 16.07 times more likely to face military casualties if in stalemate, 11.66 times more likely if Russia is retreating, and 7.36 times more likely if going through a Russian offensive. Similarly, the theatre-wide stalemate intensified civilian casualties in some contexts but not in others. According to Model 3, a place undergoing a Russian offensive is 8.45 times more likely to suffer civilian casualties, compared to the base category (Russian control). Other areas, however, are not significantly more susceptible to indirect victimization. These results are contrary to H4, as macro-developments appear to affect the effect size rather than significance. Across all models, population size consistently has a significant, positive impact on the likelihood of artillery and bombing, reflecting the tendency for indirect attacks to target heavily populated areas.

Robustness Checks

As robustness checks, we conduct three additional empirical tests (see Online Appendix), all of which lend further support to our hypotheses. Even with different model specifications, the data provide consistent support for the three hypotheses.

Discussion

The evidence suggests that civilians are especially vulnerable when territory previously under the firm control of a defending state becomes contested, indicating that the lines between military and civilian targets become blurred in such contexts. While it cannot be inferred whether casualties were due to deliberate targeting or collateral damage, it is clear that civilians are more at risk during local Russian offensives. Local stalemates and retreats only lead to intensified shelling of military targets, as the priority becomes to break the stalemate and disrupt enemy advancements. Such variance suggests that the shelling of civilians in or near contested territory is linked to the military-strategic logic of undermining the enemy's local capacity for resistance, such that there is a military rationale for inflicting civilian casualties, unethical as it might be.

As there is a dearth of micro-level studies of indirect violence in interstate wars, it is difficult to determine to what extent the results found in this study reflect general patterns in interstate war or are products of Russian military doctrine. Moreover, the willingness to rely on saturation bombing in offensive operations may be influenced by one's own casualties, the vulnerability of one's strategic position, or feelings of revenge and dehumanization of a local population. Understanding how these different factors might influence strike patterns and whether our empirical findings are reflective of a generalizable theory of indirect violence, should be a priority for future research on the topic. It should also be noted that the capacity of the actors involved is likely to affect the generalizability of these results, as it cannot be readily assumed that the same patterns will hold when the warring parties lack the capacity for high-intensity bombing.

Conclusion

The patterns of indirect violence in conventional wars, and its impact on civilians, remain an understudied topic in conflict scholarship. In this article, we examine the relationship between territorial contestation and civilian casualties from indirect violence during the Ukraine war. In the frontlines, we find that civilian casualties from indirect violence were higher during Russian local offensives, reflecting a doctrine of intense shelling to clear the way to reduce the costs of offensive operations. Conversely, only military targets were systematically affected during local stalemates, and during

Russian retreats. A key policy implication is that, when enemy offensives are imminent, the timely evacuation of civilians could save lives. While this article focuses on indirect violence driven by the military-strategic priorities of armies near the frontlines, future research should explore how these micro-dynamics also relate to macro-level changes driving strategic bombing of civilians deep in the interior—a tactic designed to exact political costs rather than diminish the enemy's operational capacity for resistance.

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Supplementary Material

Supplementary material is available at *International Studies Quarterly* online.

Data Availability

The data underlying this article are available on the ISQ Dataverse, at https://dataverse.harvard.edu/dataverse/isq.

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