NORWEGIAN REFUGEE COUNCIL

Speed, Scale and Disregard

How new technology and changing tactics are driving civilian harm



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Cover: Displaced Palestinians make their way back to their homes in northern Gaza.
Amjad al Fayoumi/NRC



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Foreword



By Jan Egeland

We often debate whether emerging technologies and artificial intelligence could one day pose an existential threat to humanity. Yet for civilians caught in ongoing wars, the threat is neither distant nor hypothetical. Drones and artificial intelligence (AI) in war zones are already causing immense suffering and loss of civilian lives.

The use of drones is expanding at an alarming rate. In some conflicts examined in this report, drones have become the leading cause of civilian deaths. Strikes are carried out without rigorous target verification and oversight, and against an ever-wider range of targets.

As I have seen first-hand from Ukraine to Gaza and from Sudan to DR Congo, the constant presence of drones makes everyday life a gamble with death. Going to the market, collecting fuel or waiting for a bus can expose people to attack. The incessant sound of drones overhead cause unbearable fear as families are unable to sleep and never certain when the next strike will come.

AI systems can generate potential targets faster than human scrutiny can accurately validate them, while reports have documented at least one case in which a drone equipped with onboard AI apparently selected a target without human oversight. The capacity to wage war is evolving faster than our ability to constrain its consequences.

Drones and AI, however, are part of a wider and deeply disturbing pattern of civilian harm. In many cases, civilians are deliberately targeted and essential civilian infrastructure is attacked. Siege tactics, too, have returned to the forefront of conflicts, depriving civilian populations of the essentials for survival.

The findings in this report document the immense harm inflicted on civilians and the infrastructure on which they depend. This suffering is not inevitable. Most of it is foreseeable and can and should be prevented. Parties to conflict that exploit new technology are as accountable under international humanitarian law as those who do not. They must protect civilians, distinguish between military objectives and civilian objects, and take all feasible precautions to avoid or minimise civilian harm.

This report is also addressed to us engaged in humanitarian work. We struggle to keep pace with the rapid transformation of warfare and the consequences for the people we serve. Too often our response remains focussed on delivering assistance after the damage has been done. Yet the principle of humanity demands more of us. Protection is as important as aid and we must do more to prevent civilian suffering caused by new and old ways of warfare.

We cannot accept a future in which technological advances make it easier to kill, with the protection of human life seemingly becoming an afterthought. The laws and restraints that govern warfare must keep pace with the technologies now transforming it.



Zainab, 35, fled with her four children from Nyala to West Darfur, Sudan seeking safety from relentless airstrikes and fighting. She found shelter and support from one of NRC's community access centres.

Photo: Karl Schembri/NRC

Executive summary

There are around 130 active armed conflicts today, more than double the number 15 years ago. About 831 million people, or 16 per cent of humanity, were exposed to conflict-related violence in 2025 and 117.8 million were displaced. The toll on civilians is enormous, from death and injury to displacement, destruction and damage. Much of the harm and the humanitarian needs and displacement arising from it is foreseeable. It can be anticipated and avoided, or at least minimised. The current trajectory is not inevitable but reversing it depends on states changing how they engage with the parties to conflict they arm, fund and support, as well as how their own armed forces operate.

Drawing on a review of six contexts where NRC provides humanitarian assistance to people affected by displacement – the Democratic Republic of the Congo, Gaza, the Islamic Republic of Iran, Lebanon, Sudan and Ukraine – this brief identifies recurring patterns of civilian harm and their drivers. They shed light on how parties to conflict are conducting their operations and whether civilians are being harmed as a result of operational error, persistent weaknesses in military operations or by deliberate conduct.

Patterns matter, because understanding them makes it possible to determine how to address them. International humanitarian law (IHL) is the legal baseline for assessing parties' conduct, but mitigating civilian harm is not limited to addressing violations of the law. Not all civilian harm is unlawful, and there are many measures that parties to conflict and third-party states can adopt to better protect civilians.

Two key trends carry the most severe consequences.

The first concerns the objects, infrastructure and services on which civilian life depends. In all six contexts these have been damaged at very large scale, and in several they are the target of sustained campaigns. Energy infrastructure sits at the epicentre. When power fails, so do water treatment, healthcare, cold chains, telecommunications and banking.

This can create immediately life-threatening situations for communities which then require humanitarian interventions until infrastructure can be restored. Attacks on financial and telecommunications systems tend to attract little attention, but they leave civilians unable to buy food, access cash – including through humanitarian programming – or report what is happening to them.

The second trend concerns emerging technology. More military strikes are being delivered faster, with less rigorous target vetting and oversight and against a widening range of targets. Drones are cheap and widely available. More than 100 states and dozens of armed groups possess them, and they are now the largest cause of civilian deaths in several contexts.

Their abundance and misuse in conflict-affected areas is reshaping daily life-and the dynamics of humanitarian operations far beyond frontlines. AI-assisted target generation, meanwhile, produces targets faster than human review can validate them, supplanting the procedural safeguards essential to IHL compliance.



Halina inside her house, which was destroyed by bombings, in Posad-Pokrovske, Southern Ukraine.

Photo: Myriam Renaud/NRC

Several drivers underlie these patterns. Even parties committed to IHL compliance have weaknesses and blind spots in their planning and operational decision making. Some are overly broad in characterising civilian objects as military objectives, including based on "war-sustaining" rationales. Large ordnance and explosive weapons are used extensively in populated areas, and sieges amplify every other driver and form of harm. Double-tap strikes kill and injure responders and deter rescue. Some parties to conflict strike infrastructure in escalatory responses to attacks on their own. In many cases, the civilian population itself is the object of the attack. Collectively, such tactics fuel humanitarian needs and forced displacement, impede people's prospects of returning to their homes and threaten humanitarian operations to save lives and assist civilians living close to frontlines.

The range of types of civilian harm and the factors driving them means there is no single solution for addressing it. A variety of approaches are necessary to influence how parties to conflict conduct their operations. Counteracting the current trajectory of civilian harm requires states to step up decisively and act together. They should use their leverage to make arms transfers, intelligence sharing and security cooperation conditional on demonstrated will and capability to mitigate civilian harm.

States should recognise that no military force can afford to be complacent in the face of the evolving challenges of modern warfare and work to develop good practice to mitigate civilian harm in their own military planning and operations. Given the scale of damage and destruction caused by current conflicts, they should also invest in creative mechanisms to repair and remediate damage to the infrastructure and services on which civilian life depends.

The onus is on parties to conflict to ensure civilians are respected and protected in line with IHL, but humanitarians and other stakeholders have vital roles to play in shaping efforts to mitigate patterns of civilian harm and counteract the current trajectory. This will depend in part on concerted interdisciplinary investment in civilian harm documentation and analysis across situations of armed conflict.



Zaccharie and his family fled their home in eastern DR Congo during 2024 clashes, seeking safety in Minova where they spent a year in a displacement camp. They returned home in February 2025 to find the village largely empty.

Photo: Beate Simarud/NRC

1 Introduction

There are about 130 active armed conflicts[1] today, more than double the number 15 years ago and involving more than 60 states and at least 120 non-state armed groups.[2] The number of non-international conflicts has roughly tripled[3] since 2000, and the number of inter-state conflicts doubled for two years in succession[4] from two in 2023 to eight in 2025. More than 20[5] conflicts have lasted for longer than two decades.

Conflict and violence triggered 32.3 million new or repeated[6] internal displacements across 48 countries and territories in 2025. About 831 million people,[7] or 16 per cent of the world's population, were exposed to conflict. Some 117.8 million people,[8] or one in 70 worldwide,[9] were living in displacement as a result of conflict and violence at the end of the year. At least 300 million people[10] were in need of humanitarian assistance in 2025, more than double the figure for 2018.

Without a negotiated end to the fighting, conflicts drag on year after year and the scale of civilian harm increases over time. They cause widespread destruction, fragmented societies, lasting trauma and, all too often, long-term dependency on humanitarian aid. Large areas of land have effectively become uninhabitable.

1 https://www.icrc.org/en/article/humanitarian-outlook-2026
2 More than 60 states and at least 120 non-state armed groups
3 https://blogs.icrc.org/law-and-policy/2024/05/02/defining-armed-conflict-some-clarity-in-the-fog-of-war/
4 https://www.uu.se/en/press/press-releases/2026/2026-06-09-ucdp-record-number-of-conflicts-between-states
5 https://www.icrc.org/sites/default/files/2025-12/LR_4909_002_ICRC_Humanitarian_Outlook_2026_A_World_Succumbing_to_War.pdf
6 https://api.internal-displacement.org/sites/default/files/2026-05/IDMC-GRID-2026-Global-Report-on-Internal-Displacement.pdf
7 https://acleddata.com/report/whats-driving-conflict-today-review-global-trends
8 https://www.unhcr.org/refugee-statistics
9 https://www.unhcr.org/global-trends
10 https://www.unocha.org/publications/report/world/global-humanitarian-overview-2025-united-nations-and-humanitarian-partners-launch-us47-billion-appeal-2025-support-190-million-people-worldwide-enarru

This creates enormous challenges for the restoration of essential services, prevents displaced people from returning safely and sustainably to their homes and impedes meaningful reconstruction.

The international humanitarian system must work to keep pace with the rapid evolution in the conduct of armed conflict. It has, for example, adopted innovative cash-based programming, but the financial systems and telecommunications infrastructure used to distribute and receive this type of assistance at scale are increasingly vulnerable to physical attacks, cyberattacks and shutdowns.

The global security landscape is changing rapidly in tandem. The rapid proliferation of armed conflict puts more civilian populations in more countries at risk of severe harm. As states position themselves to counter emerging threats, adapt to shifting alliances and increase defence spending,[11] they must make commensurate effort to ensure civilians are protected.

The types and scale of harm overwhelm existing mechanisms to promote restraint and respect for civilian life, and have led to widespread concern about the erosion of the norms that protect humanity in times of war. The use of emerging technologies in particular has significantly increased civilian harm over the past two years, fuelling humanitarian needs and displacement, deepening challenges for humanitarian action and increasing the risks aid workers face.

The rate at which new technology is being deployed far outpaces the development of diplomatic, legal and policy tools to ensure its use complies with international humanitarian law (IHL).

Death, injury, displacement, damage, and destruction resulting from armed conflict is exacting an enormous toll on civilians. However, the current trajectory is not inevitable. Much of the harm civilians experience in conflict is foreseeable. It can be anticipated and avoided, or at least minimised. There are clear steps that parties to conflict can take to limit civilian harm and its humanitarian consequences, particularly in the use of new technologies.

11 https://www.sipri.org/media/press-release/2026/global-military-spending-rise-continues-european-and-asian-expenditures-surge

Conflict and violence triggered 32.3 million new or repeated internal displacements across 48 countries and territories in 2025. About 831 million people, or 16 per cent of the world's population, were exposed to conflict.

States that are not parties to conflict could make better use of their leverage to reinforce IHL and other norms that respect civilian life and wellbeing, and humanitarians and other stakeholders have important roles to play in informing, shaping and complementing such efforts.

Purpose

The purpose of this brief is to examine the implications of modern warfare for the protection of civilians, including forced displacement and the disruption of life-saving humanitarian operations. It seeks to:

- Identify recurring patterns of civilian harm in contemporary armed conflict
- Analyse how the conduct of hostilities by parties to conflict contributes to these patterns
- Offer practical recommendations to counteract harmful trends and mitigate civilian harm in situations of armed conflict.

Methodology

With a focus on six contexts – the Democratic Republic of the Congo (DRC), Gaza, Iran, Lebanon, Sudan and Ukraine – findings are based on a desk review of published and unpublished situation and other reports and media coverage from the past three years. An AI tool was used to compile and organise the source material. Analysis then identified patterns of harm recurring across settings with a focus on those with the most widespread and severe consequences for civilians.

What this brief covers

The Brief focuses on the patterns with the most severe consequences for civilians. Two key trends emerged from the above analysis.

The first concerns the **objects, infrastructure and services on which civilian life depends**. These are being destroyed, damaged and disabled on a very large scale in every context reviewed. In some cases, they are the concerted target of sustained campaigns.

The second concerns **emerging technology** that is contributing to civilian death, injury, displacement and the destruction and damage of objects, infrastructure and services. More strikes are being delivered faster, with less rigorous target vetting and oversight and against a widening range of targets. This is driven in particular by the proliferation of drones and the use of artificial intelligence (AI) to identify targets.

The brief goes on to analyse the **key drivers** of these trends, looking principally at how parties to conflict are conducting military operations and whether adequate steps are being taken to avoid or minimise civilian harm.

Four sets of recommendations are offered to counteract the current trajectory of civilian harm in conflict. They encompass:

- Exercising leverage to change the conduct of parties to conflict
- Addressing persistent weaknesses and blind spots in the conduct of military operations
- Measures to repair and remediate large-scale damage to objects, infrastructure, and services on which civilian life depends
- Steps to improve documentation and analysis of civilian harm to inform both operational strategies and policy measures in support of civilian harm mitigation and response.

The examples this brief discusses are illustrative, not exhaustive. The brief includes references to specific incidents to illustrate particular dynamics. Their inclusion does not endorse the account presented. They do not represent a comprehensive assessment of civilian harm, nor do they encompass all causes or parties responsible for it in the settings examined.

NRC operates in each of the settings but does not conduct operations in all areas discussed. This brief is not a legal analysis of the specific cases of civilian harm and the conduct of parties to conflict, but it includes short summaries of the rules relevant to key issues.

What is civilian harm?

For the purposes of this brief, "civilian harm" refers to the harm civilians experience as a result of the means and methods of warfare employed during hostilities. This may include, for example, death, physical injury, mental harm, and displacement of civilians, and the destruction or damage of civilian objects.

Civilian harm is a subset of broader protection-of-civilians concerns, which include also sexual violence, the recruitment of children, loss of family links and legal identity documents and protection from abuses unrelated to the conduct of hostilities.

This brief addresses three types of civilian harm:

- **Immediate harm:** this occurs at the time of an attack or military operation. It includes death, injury, and other harm to civilians, as well as damage to or destruction of objects.
- **Cascading harm:** this occurs when destruction or damage to a particular object has knock-on effects because the functioning of one object or service depends on the functioning of another. It can cascade through a network to render a range of services and infrastructure inoperable with consequent civilian harm. Cascading harm can occur some time after an attack, and often far away from it.
- **Cumulative harm:** this takes two forms: (1) repeated attacks affecting a particular location where each successive attack produces greater harm, be it in the form of psychological impact, repeated displacement or the progressive degradation of essential services; and (2) successive attacks, including on various types of infrastructure and services, causing widespread death and injury, wider systems breakdown, and compounding consequences for civilians.

Three types can overlap and often coexist. They are not necessarily sequential stages, and a single strike can cause all three.

Three types of civilian harm

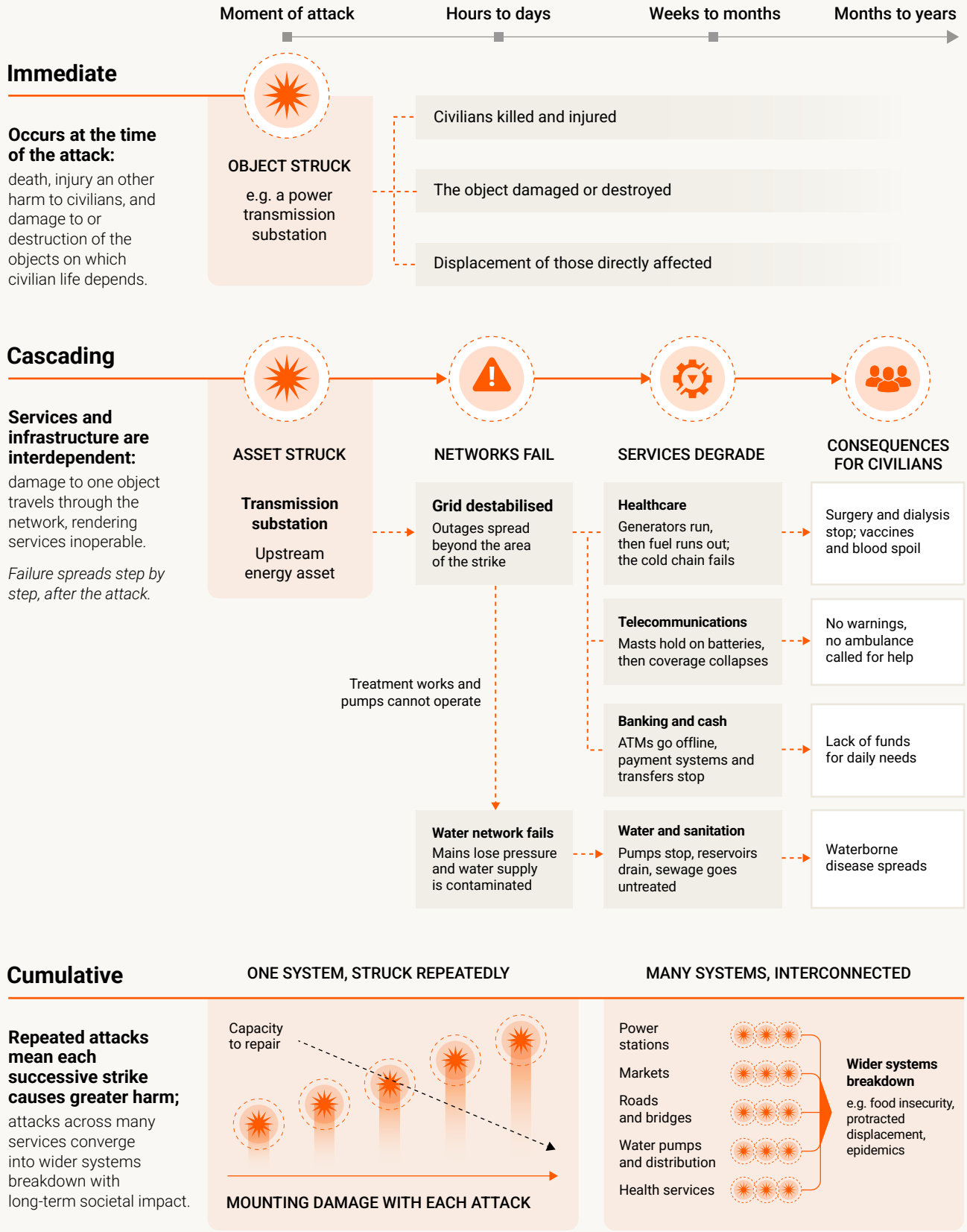


FIGURE 1 Three types of civilian harm: immediate, cascading and cumulative

How civilian harm happens and why patterns matter

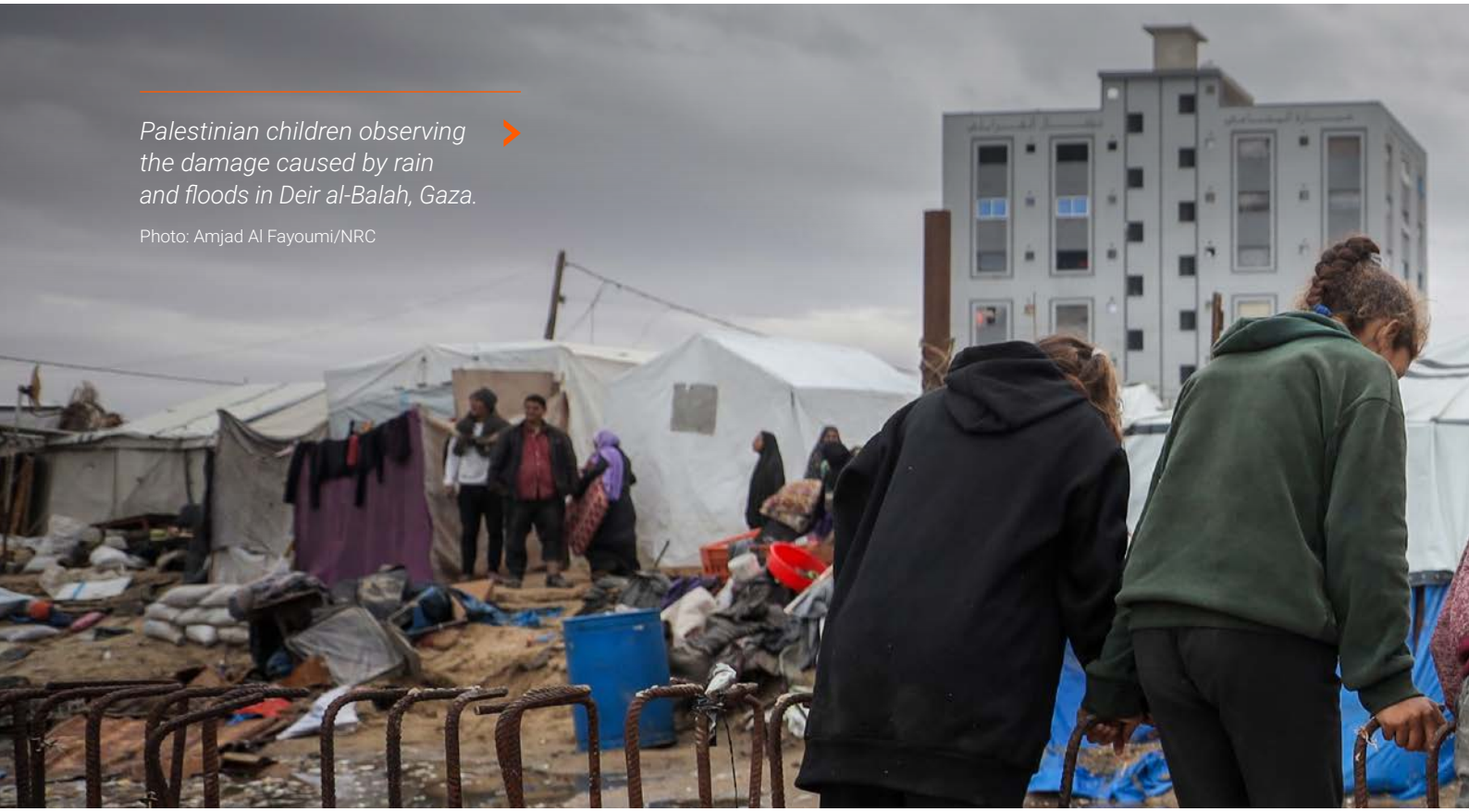
Military operations carry an inherent risk of causing civilian harm, particularly when they are conducted in densely populated urban settings with highly concentrated infrastructure and service networks. But civilian harm is not an inevitable consequence of conflict. IHL sets out how military operations must be conducted and includes a range of measures that parties to conflict must take to anticipate and minimise the effects of hostilities on civilians.

Addressing civilian harm does not, however, require legal determinations of IHL violations. Ascertaining whether violations have occurred requires information that is not often available to third parties while hostilities are ongoing. Nor does all civilian harm constitute a violation of IHL. Understanding patterns of harm and the dynamics behind them offers more practical insight to inform efforts to reduce the risk of civilian harm, while remaining guided by IHL.

Drivers of civilian harm caused by states and non-state actors vary widely across armed conflicts. Even for parties to conflict committed to fulfilling their IHL obligations, and the prevention and mitigation of such harm, accidents and operational errors may have unintended consequences. Incidental civilian harm which occurs as a result of an attack on a military objective may exceed what was anticipated in pre-strike estimates.

More seriously, widespread and recurring incidental harm that continues over time may indicate persistent weaknesses, recklessness and even negligence in how parties to conflict plan and conduct their operations. More seriously still, parties to conflict may deliberately inflict harm on civilians to break morale, punish or force political concessions.

Because the factors that contribute to civilian harm are so diverse, there is no single solution for avoiding or minimising it. Many parties will not be persuaded by normative arguments, meaning different approaches are needed to influence their behaviour and leverage tangible changes in how they conduct their operations. Analysis of patterns of harm and their various drivers offers the necessary insights and essential ingredients to tailor and target such efforts.



Palestinian children observing the damage caused by rain and floods in Deir al-Balah, Gaza.

Photo: Amjad Al Fayoumi/NRC

Why civilian harm and its drivers matter for humanitarian action

Immediate civilian harm generates acute and familiar needs: medical care, emergency shelter, food and water. Humanitarians have long had to make up for degraded infrastructure and services in their crisis responses. What is newly significant is the speed and scale of military operations and disregard for civilian life in contemporary warfare and, therefore, the scale of civilian death and injury that results and the breadth of services simultaneously degraded or destroyed.

When energy, water, health, telecommunications and financial systems are degraded together and repeatedly, the need for humanitarian assistance becomes system-wide and chronic. As people are exposed to recurring violence and their housing, services and livelihoods are destroyed, displacement becomes repeated and prolonged.

Not only is humanitarian aid stretched thin. International resources for humanitarian action do not necessarily flow to where human suffering is greatest[12] or address its causes. When harmful conduct is allowed to continue, it may become normalised, de-escalation and restraint become harder to negotiate, and grievances deepen in ways that make sustainable political settlements more difficult to reach.

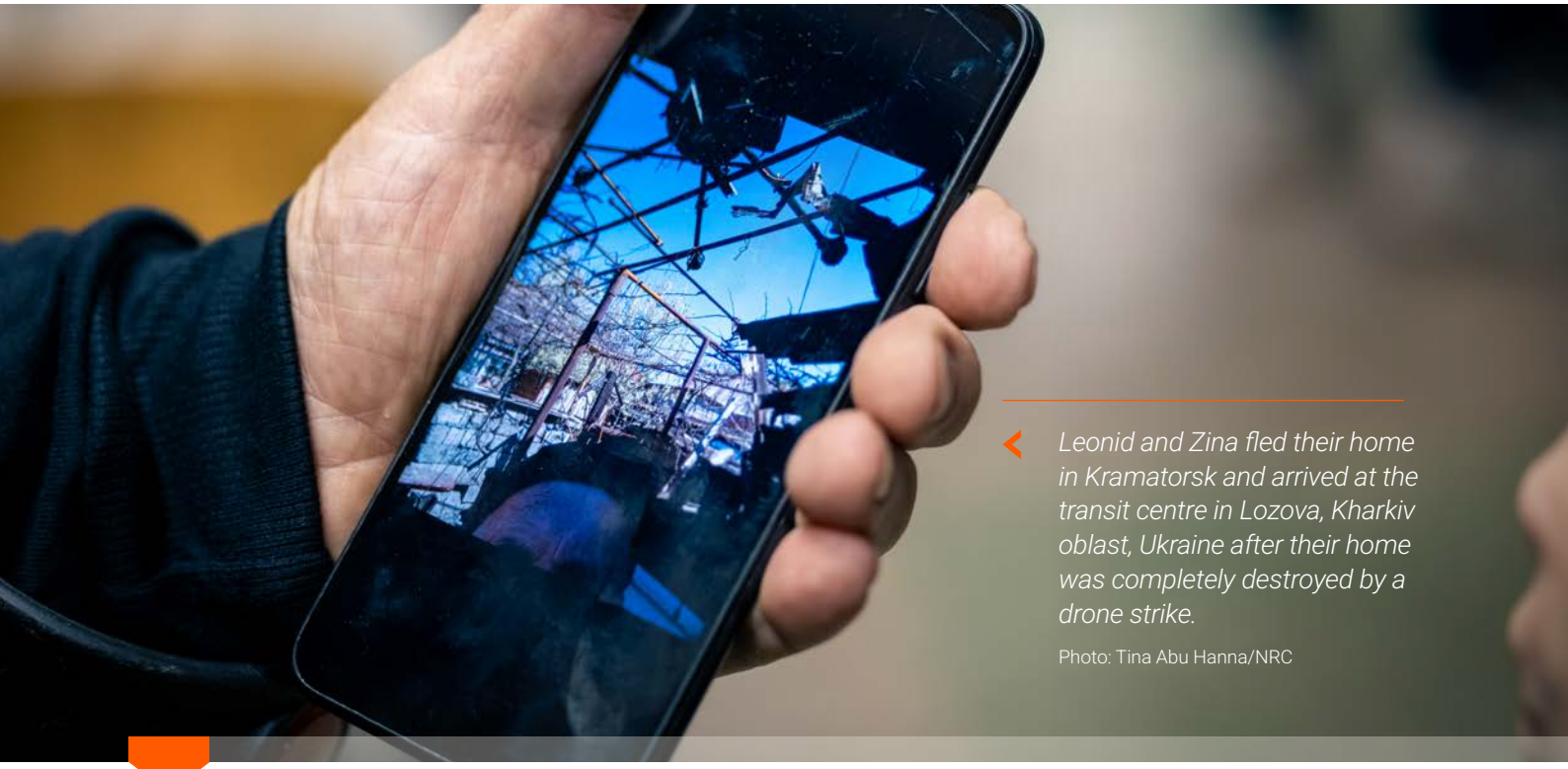
This is why the patterns of harm set out in this brief and their drivers are not only a concern for states and parties to conflict. They go to the purpose of humanitarian action itself. The international humanitarian system is organised primarily around delivering aid in *response* to human suffering, but the principle of humanity calls for suffering to be prevented as well as alleviated, for life and health to be protected, and for respect for the human being to be ensured.

Prevention in this sense means more than limiting further suffering once harm has occurred. It means helping to prevent harm from occurring, to give effect to the norms that protect civilians in situations of armed conflict. Saving lives and preserving human dignity means addressing the drivers of harm alongside the human suffering they cause.

12 https://www.nrc.no/feature/2026/the-worlds-most-neglected-displacement-crises-2025



Speed, Scale and Disregard: How new technology and changing tactics are driving civilian harm



Leonid and Zina fled their home in Kramatorsk and arrived at the transit centre in Lozova, Kharkiv oblast, Ukraine after their home was completely destroyed by a drone strike.

Photo: Tina Abu Hanna/NRC

2 | Key trends

1. Objects, infrastructure and services on which civilian life depends

Contemporary conflicts are damaging, destroying and disabling the objects, infrastructure and services on which civilian life depends at scale. Patterns of immediate, cascading and cumulative harm extend across energy, water, transport, food, healthcare, housing, telecommunications and financial services. Across the six contexts reviewed, civilian harm is not only the result of a single service interruption but a prolonged loss of a range of inter-dependent objects, infrastructure and services that sustain civilian life.

This harm is not inevitable, but a consequence of how military operations are conducted. Parties to conflict in several settings have targeted objects, infrastructure and services in sustained campaigns over a period of years. This undercuts civilians' coping capacity, fuels humanitarian needs and displacement, complicates humanitarian operations, increases the risks aid workers face and places great strain on collective efforts to save lives.

Patterns of immediate, cascading and cumulative harm extend across energy, water, transport, food, healthcare, housing, telecommunications and financial services.

This brief does not comprehensively address all types of objects targeted in military operations. It focuses on those whose destruction or damage has caused the most significant cascading and cumulative effects across a range of systems and services. The examples provided below are illustrative, not exhaustive.

BOX 1 **What does the law say?**

- Parties to armed conflict must distinguish between civilians and combatants, and between civilian objects and military objectives. Civilian objects include residential and commercial buildings, healthcare facilities, schools, shops, markets, banks, agricultural land, livestock, telecommunications systems and power and water infrastructure.
- Civilian objects may become military objectives and lose protection if, by virtue of their nature, location, purpose or use they contribute to military action, and their total or partial destruction in the circumstances at the time offers a definite military advantage.
- In case of doubt as to whether an object that normally serves a civilian purpose (such as a dwelling or a marketplace) is being used to make an effective contribution to military action, it should be presumed not to be used in this way, and as such that it does not constitute a military objective.
- Attacks directed against civilians and civilian objects, and indiscriminate attacks – those which do not distinguish between military objectives and civilian objects – are prohibited.
- Disproportionate attacks are prohibited. These are attacks directed against military objectives expected to cause loss of civilian life, injury to civilians, damage to civilian objects or a combination of these that would be excessive in relation to the anticipated concrete and direct military advantage to be gained.
- The harm to be considered is that reasonably foreseeable when planning an attack. It covers harm that manifests itself immediately, and also that which occurs immediately but only manifests itself some time later. This might include an outbreak of disease that becomes apparent months after an attack or a civilian death or injury caused by unexploded ordnance long after it was deployed.
- Parties to armed conflict must take constant care to spare the civilian population, civilians and civilian objects. This obligation is broad:
  - It applies to all military operations, unlike the principle of proportionality, which only applies to attacks. There is a significantly broader range of activities that may cause civilian harm.
  - It does not specify the type of harm that must be avoided. "Sparing" civilians, the civilian population and civilian objects covers a wide range of harm that goes well beyond that considered in proportionality assessments.
  - The obligation is to take all feasible precautions. It requires that civilian harm is taken into account in all decision making in the conduct of military operations.
  - Parties must also take precautions in defence. These include removing civilians and civilian objects under their control from the vicinity of military objectives and not locating military objectives in or near densely populated areas.

For more on international humanitarian law, see The Basics of International Humanitarian Law and International Humanitarian Law: A Comprehensive Introduction.

The objects at the centre of the civilian harm patterns

Energy sits at the epicentre of objects, infrastructure and services that sustain civilian life. Its disruption affects all key services. Water treatment and distribution, telecommunications networks, healthcare and banking services, heating, cooling, cold chains for vaccines and insulin, irrigation and food processing all fail when power fails.

In the six contexts reviewed, the breakdown of energy systems is not merely the result of unintended and incidental harm occurring as a result of hostilities. In some, they have been the focus of sustained military campaigns with significant consequences.

Both major parties to the conflict in Sudan have attacked energy systems. A strike by the Rapid Support Forces (RSF) on the Merowe dam transformer station in January 2025 caused widespread power shortages[13] in a country where hydropower generates around 70 per cent of electricity.

The RSF also conducted drone strikes on Port Sudan, the country's principal humanitarian gateway for the east of the country, in May 2025. These damaged strategic fuel depots[14] and the city's converter station. Repeated drone strikes on the Atbara power station caused outages across River Nile and Red Sea states at the end of the year.

Cumulatively, these attacks affected areas hosting millions of displaced people[15] and put further strain on lifesaving infrastructure.

An intensive Sudanese Armed Forces (SAF) manned air attacks and drone campaign against RSF supply lines included repeated strikes on fuel convoys and a fuel trading hub on the border with Chad. Drones struck the fuel market and depot[16] at the Adikong gate, on the Sudanese side of the Adré crossing into West Darfur in March 2026. An SAF source claimed its strikes were directed at military hardware, but local responders described the victims as small-scale traders and the fuel market, a main source of livelihood for dozens of families. Beyond the immediate consequences, the strikes degraded an important commercial artery for Darfur and jeopardised a crossing on which humanitarian convoys depend.

Russia has attacked energy systems in Ukraine. Deliberate campaigns that began in October 2022 meant that 100 per cent of Ukraine's thermal power plants had been reportedly damaged by February 2026, triggering rolling nationwide blackouts.[17]

Seasonal campaigns against energy infrastructure have also continued. The UN Human Rights Monitoring Mission in Ukraine[18] (HRMMU) recorded at least 423 attacks on electricity generation, transmission, and distribution facilities between October 2025 and March 2026, alongside at least 74 attacks on heating infrastructure. HRMMU also documented at least 14 large-scale coordinated attacks[19] on the power grid in the 12 months to February 2025.

Hundreds of thousands of people experienced heating and hot water interruptions over the 2025-26 winter. Indoor temperatures fell far below safe levels, with particularly severe consequences for the elderly, people with disabilities and families with young children. A strike on Kyiv's district heating infrastructure in January 2026 left nearly 6,000 buildings without heat in sub-zero conditions and prompted around 600,000 people to leave the capital. Following Moscow's sustained campaign against Ukraine's power grid since 2022, both Ukraine and Russia have increasingly targeted each other's energy infrastructure,[20] such as energy production and energy storage facilities. This escalatory campaign has caused civilian casualties and other harm across both Ukraine and Russia, including domestic fuel shortages.

13 https://www.reuters.com/world/africa/blackouts-hit-wide-swathes-army-controlled-sudan-after-drone-attacks-2025-01-18/
14 https://www.info-res.org/reports/alleged-drone-strikes-in-port-sudan/
15 https://www.newarab.com/news/blackouts-hit-wide-parts-sudan-after-drone-attacks
16 https://sudantribune.com/article/311687
17 https://www.prismonitor.eu/insights/deep-dive/ukraine-energy-infrastructure-winterization-response-facility-status
18 https://ukraine.ohchr.org/en/Attacks-against-Ukraine-s-energy-infrastructure-and-update-on-the-human-rights-situation-in-Ukraine-1-December-2025-31-May-2026
19 https://ukraine.un.org/en/289667-civilian-harm-and-human-rights-abuses-persist-ukraine-war-enters-fourth-year
20 https://www.ohchr.org/en/documents/country-reports/ahrc62crp1-attacks-against-ukraines-energy-infrastructure-and-update

Energy sits at the epicentre of objects, infrastructure and services that sustain civilian life. Its disruption affects all key services.

BOX 2 **What does the law say?**

- A country's power grid is a civilian object. Elements of it may become military objectives if they support military installations, equipment or activities and their total or partial destruction in the circumstances ruling at the time offers a definite military advantage.
- The concrete and direct military advantage anticipated from attacks against such elements of a power grid must not be excessive compared with the expected death and injury of civilians and damage to civilian objects. This includes foreseeable immediate and cascading harm.

In Iran, US-Israeli strikes on fuel depots and refineries near Tehran, a power plant at Khorramshahr in Khuzestan province, the South Pars gas field and the Kharg Island oil export hub in March 2026 caused cumulative damage to the national power grid. A strike near Shohada Square in central Tehran on 16 March destroyed buildings of the Tehran Regional Electric Company, with engineers among those killed. Some sources reported Israel as describing the target as an intelligence command centre.[21]

These facilities were closely linked to essential resources and services on which civilians depend, including electricity, fuel, transport and heating. Their targeting affected civilian access to basic commodities well beyond the immediate strikes. The environmental consequences are also a humanitarian concern. Damage to oil and fuel facilities may release hazardous pollutants with longer-term health risks.

Water supplies tend to depend on an extensive network of infrastructure for treatment, storage and distribution, particularly in urban settings. A single strike on one element can compromise the supply of water to hundreds of thousands of people and create a public health crisis and other humanitarian impacts.

In Sudan, repeated drone strikes on water points, pumping facilities and related infrastructure in El Obeid in North Kordofan state have disrupted civilians' access to safe drinking water. Humanitarian organisations have warned[22] that attacks on water infrastructure and damage to the fuel and power infrastructure needed to operate it have worsened shortages and increased public health risks[23] in a city hosting large numbers of displaced people.

Nearly 60 per cent of Gaza's water and sanitation infrastructure was damaged or destroyed between October 2023 and January 2024, including wells, desalination facilities, pipelines and sewage works. Israeli military bulldozers subsequently destroyed solar panel arrays intended to power at least four of the strip's six wastewater treatment plants, according to Human Rights Watch.[24] All six plants had already ceased operating by mid-October 2023 for lack of electricity and fuel.

By August 2024, 84.6 per cent of the territory's water, sanitation and hygiene (WASH) infrastructure had been damaged or destroyed. A joint UN, EU and World Bank assessment[25] in April 2026 put the cost of direct damage to the sector at $1.7 billion. In several attacks on WASH facilities investigated by Human Rights Watch,[26] no apparent military objective was present and no evidence was found that these facilities were used by combatants or in direct support of military action.

The destruction of this infrastructure will create severe restrictions and risks for families seeking to return to their home areas and rebuild their lives.

21 https://newlinesmag.com/reportage/us-israeli-attacks-on-iran-show-a-pattern-of-double-tap-strikes/

22 https://www.doctorswithoutborders.org/latest/sudan-drone-attacks-are-worsening-water-and-fuel-crisis-el-obeid

23 https://www.rescue.org/press-release/sudan-imminent-rsf-offensive-pushing-north-kordofan-toward-humanitarian-catastrophe

24 https://www.hrw.org/report/2024/12/19/extermination-and-acts-genocide/israel-deliberately-depriving-palestinians-gaza

25 https://unsco.unmissions.org/sites/default/files/2026-04/full_report-_gaza_strip_rapid_damage_and_needs_assessment_rdna_2026_1.pdf

26 https://www.hrw.org/report/2024/12/19/extermination-and-acts-genocide/israel-deliberately-depriving-palestinians-gaza

Israeli strikes on water treatment and distribution systems and wastewater processing facilities in Lebanon, along with damage to the electricity grid needed for them to work, left communities south of the Litani River without reliable running water for weeks, forcing them to depend on stored rainwater or costly private trucking.[27] Regional water authorities' reports indicate damage resulting from a combination of direct strikes and incidental damage during the escalation that began on 2 March 2026, and put the cost of damage across southern Lebanon at more than $100 million as of May 2026. Ongoing insecurity and access constraints also hindered assessments and repairs. No military use of the facilities struck was documented in the sources reviewed.

In Iran, reservoirs and water treatment and pumping systems were struck in Fars and Khuzestan provinces. The destruction of the Qeshm Island desalination plant[28] left more than 8,000 people on two islands without safe drinking water and as many as 14 villages reliant on trucking. Some received mains water only about once every 40 days. Responsibility for the strikes on the Qeshm desalination plant is contested. There were several instances of water infrastructure being struck during the hostilities that started February 2026, including state media reporting strikes that damaged a 10,000-cubic-metre reservoir at Haftkel in Khuzestan. About 400 water-related sites had been struck across the country as a whole as of 31 May 2026, according to the UN.[29]

Production, processing, transportation, distribution and access to food similarly depend on a network of objects and infrastructure including farmland, agricultural equipment, seed, storage facilities, mills, factories and smaller-scale processing plants for production; logistics hubs for transport; and shops and markets for distribution. Damage to these objects and facilities has a significant impact on food security and community resilience during armed conflict and can lead to costly humanitarian interventions where food assistance is needed.

The most severe impact of conflict on food security was observed in Sudan. Famine was declared at the Zamzam camp in North Darfur in August 2024 – the Famine Review Committee's first such determination[30] worldwide in more than seven years – and it was extended to the Abu Shouk and Al Salam camps and the western Nuba mountains five months later. Famine was also declared in the besieged cities of Al Fasher and Kadugli in November 2025, when a further 20 localities were assessed as at risk.

Systematic RSF attacks on farming communities[31] in Darfur have been documented, including arson attacks on farmers' homes and stores, the looting of seed stock, damage to tractors, threshers, harvests, and livestock enclosures and the destruction of markets.

The looting and burning of Samil Industrial in Khartoum, Sudan's largest manufacturer of food used to treat malnutrition in children at the time, halted production in the early phases of the current hostilities in 2023, and the Sayga flour mill was damaged by shelling from both sides and then looted at around the same time. Compounding significant reductions in crop yields, the loss of such food processing centres occurred amidst a 46 per cent fall in national cereal production recorded by the Food and Agriculture Organization[32] in 2023.

In DRC, loitering munitions – which circle an area searching for a target before striking it – have been observed over marketplaces before detonating, extending lethal risk far from frontlines. The Allied Democratic Forces also conducted attacks[33] in March 2026 along National Route 4, the principal artery linking food-producing areas of Ituri province to markets, and local militia ambushed 12 trucks on National Route 27 in April.

Taken together, these actions disrupted farmers' ability to sell their produce, reduced supplies to markets and further limited civilian access to farmland already impeded by fighting and movement restrictions.

27 https://newlinesmag.com/spotlight/israeli-strikes-are-decimating-water-infrastructure-in-lebanon/
28 https://www.nytimes.com/2026/03/08/world/middleeast/desalination-plants-iran-bahrain.html?smid=nytcore-ios-share
29 https://www.unocha.org/publications/report/iran-islamic-republic/islamic-republic-iran-humanitarian-update-no-05-31-may-2026
30 https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Famine_Review_Committee_Report_Sudan_July2024.pdf
31 https://www.nrc.no/globalassets/pdf/reports/what-it-takes-to-eat-conflict-and-sudans-fragile-food-system/what-it-takes-to-eat_conflict-and-sudans-fragile-food-system.pdf
32 https://www.fao.org/newsroom/detail/sudan--cereal-production-down-by-over-40-percent--likely-exacerbating-hunger/en
33 https://digitallibrary.un.org/record/4119763?v=pdf&ln=en

Systematic RSF attacks on farming communities in Darfur have been documented, including arson attacks on farmers' homes and stores, and the destruction of markets.

Food production, processing, storage and distribution have all been affected in frontline areas of Ukraine, where harm has been concentrated along the contact line and close to large urban centres, such as Kyiv. HRMMU recorded[34] 43 attacks on food, retail and logistics companies between July and August 2026 alone, and the World Food Programme's Dnipro warehouse was struck by an Iskander precision-guided ballistic missile[35] in May 2026, destroying food for 130,000 people in the second strike on the facility. More than 84 incidents affected the agency's warehouses, vehicles, distribution points and partner assets from January 2025 to May 2026.

In Gaza, bakeries and food production facilities have been bombarded, farmland destroyed and wells and greenhouses put out of action. This combined with long-standing restrictions on the entry of food and fuel contributed to famine being declared in Gaza governorate[36] in August 2025. More than 100,000 children aged between six months and five years old were expected to suffer acute malnutrition for much of 2026, according to the Integrated Food Security Phase Classification[37] (IPC).

Lebanon's agriculture minister said[38] in April 2026 that Israeli attacks had damaged more than a fifth of the country's agricultural land, including olive groves, citrus and banana orchards, vineyards and greenhouses. Beyond the loss of crops, the destruction combined with the displacement of more than 76 per cent of farmers in southern Lebanon has disrupted agricultural livelihoods and production and created near-term challenges for food security as well as longer-term challenges for socioeconomic recovery.

It has also contributed to a broader deterioration in food security across Lebanon as a whole. IPC estimated[39] that 1.24 million people would face crisis levels of acute food insecurity or worse between April and August 2026, with some of the highest levels recorded in southern districts.

BOX 3 **What does the law say?**

- Objects necessary for food production, preparation, storage and distribution – such as agricultural land, livestock, crops, grain storage facilities, shops and markets – are civilian objects, as are water installations and infrastructure for its storage, purification and distribution.
- Parties to conflict must not direct attacks against such objects, nor loot them.
- Foreseeable incidental damage to these objects caused by attacks against military objectives must be taken into account in proportionality assessments. This includes foreseeable immediate and cascading damage.
- Constant care must be taken in the conduct of all military operations to spare such objects.
- Starvation of civilians as a method of warfare is prohibited.
- It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population – such as crops and foodstuffs, agricultural areas for their production, livestock, drinking water installations and supplies and irrigation works – for the specific purpose of denying them for their sustenance value to the civilian population.

34 https://ukraine.ohchr.org/en/Attacks-against-retail-food-and-logistics-companies-surge-amid-high-civilian-casualties-UN-human -rights-monitors-say
35 https://ukraine.un.org/en/316191-un-wfp-warehouse-dnipro-damaged-strike
36 https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1159696/
37 https://news.un.org/en/story/2025/12/1166638
38 https://www.newarab.com/news/israels-attacks-devastate-over-fifth-lebanon-farmland
39 https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1163301

Telecommunications are central to how civilians survive during conflict. They enable people to receive warnings and identify safe areas, family members to locate each other, survivors of violence to report abuses, banking and other services to be accessed and humanitarian cash transfers to be delivered. They are also the means by which documentation of civilian harm reaches the outside world.

In the cases reviewed, physical attacks, cyberattacks, jamming, spoofing and administrative shutdowns have all led to the loss of telecommunications. Interference with GPS has disrupted navigation and location-based services, creating additional risks for civilians and humanitarians trying to move safely and reach affected areas. GPS interference has also prevented the provision of emergency services such as ambulances.

The Iranian government's 88-day telecommunications shutdown from February 2026 cut off more than 90 million people at the height of the US-Israeli attacks on the country. A national shutdown in Sudan in February 2024 cut service across the country for more than a month, and a near-total blackout continues across Darfur, Kordofan, and parts of Khartoum.

Sudan also banned internet voice calls nationwide in July 2025, which disrupted gender-based violence reporting and other vital crisis-response activities.

In the South Kivu highlands of eastern DRC, the armed forces (FARDC) and their allies have encircled the town of Minembwe[40] since mid-2025. All major land access routes have been closed, significantly hindering the movement of people and the delivery of essential goods, medical supplies and aid, aggravating an already severe humanitarian situation.

Loss of telecommunications followed the capture by FARDC-aligned forces of Point Zéro, the site of the only mobile phone mast serving the region, in January 2026. A community radio station near Minembwe was damaged in an apparent drone attack on 9 March, removing a remaining source of information for a population trapped and under siege.

40 https://www.criticalthreats.org/briefs/congo-war-security-review/june-26-2026

When cash cannot be accessed and electronic payment systems fail, civilians are unable to buy food, water or fuel or pay rent. They are unable to receive cash-based humanitarian assistance, pay for medical care, or move themselves out of danger.

After several months of isolation, the International Committee of the Red Cross negotiated a humanitarian pause[41] that allowed it to access Minembwe and evaluate the situation and humanitarian needs. By that time, the price of sugar had reportedly risen to $40 per kilogramme.

Parties to the conflict in DRC have also interfered with GPS-based systems. Jamming and spoofing have disrupted navigation across North Kivu and South Kivu and in Burundian airspace since at least mid-2024. Given the dangers posed to civil aviation, DRC's government referred the matter to the International Civil Aviation Organisation in July 2024.

The targeting of banking services has received little attention to date, but parties to conflict are conducting such attacks with increasing frequency and with significant consequences for civilians. When cash cannot be accessed and electronic payment systems fail, civilians are unable to buy food, water or fuel or pay rent. They are unable to receive cash-based humanitarian assistance, pay for medical care, or move themselves out of danger. Hospitals and public utilities also struggle to sustain their operations, potentially compromising the continuous functioning of public services.

In Lebanon, Israeli forces struck around 30 branches of a Hezbollah-affiliated financial institutions in March 2026, many located in residential buildings or crowded neighbourhoods. The institution provided loans and other financial services that tens of thousands of civilians relied on to cover essential expenses, including school fees, healthcare and basic household needs in a country already in banking collapse.

41 https://www.rfi.fr/fr/afrique/20260508-est-de-la-rdc-une-situation-humanitaire-tr%C3%A8s-pr%C3%A9occupante-dans-les-hauts-plateaux-du-sud-kivu-d%C3%A9crit-le-cicr



Hundreds of thousands of displaced people have sought refuge in remote Tawila, North Darfur, Sudan. They face a severe lack of basic services, struggling to access food and water.

Photo: NRC

Access to **banking services** depends heavily on telecommunications connectivity and has also been affected by physical attacks and cyberattacks. Cyber operations against major banks in Iran in June 2026 disrupted card payments and the functioning of cash machines. Iran's economy is almost entirely cashless and civilians rely on digital transactions for water, food, transport and other basic needs.

There have also been cases, including in DRC, in which the government was able to simply suspend banking services to areas of the country no longer under its control. Though the apparent reason was to cut off cash flows to armed groups, it was the civilian population that bore the brunt of the disruption.

The combined effect of disruptions to telecommunications and banking services has significant implications for humanitarian operations. In Iran, for example, cash transfers that form part of NRC's response to the war-affected population and Afghan refugees were suspended for several weeks. The international humanitarian system has built innovative programming around cash-based aid, but the infrastructure used to distribute and receive cash at scale is vulnerable to physical destruction, cyberattacks, jamming and shutdowns.

Without reliable telecommunications, civilians also lose a vital means of reporting their experiences to the outside world, which in turn may inhibit the documentation and analysis needed to inform efforts to influence how parties to conflict conduct their operations.

Cumulative harm in Sudan

The RSF and allied militias encircled Al Fasher, the capital of North Darfur with a population of around 1.5 million people, in May 2024. They sealed it off behind an earthen berm about 75 kilometres long in a siege that held for 18 months.

During that time, the RSF shelled the city with long-range artillery on a near-daily basis and attacked it with loitering munitions, quadcopters, and fixed-wing drones while jamming civilian communications. Munitions with wide-area effects fell repeatedly on the same predictable gathering points: markets, water points, communal kitchens and displacement shelters.

The SAF and its allies conducted airstrikes and tried to defend the city with artillery fire from within and around populated neighbourhoods. Explosive weapons caused more than 83 per cent of the 13,000-plus injuries recorded between April 2023 and May 2025, nearly one in five of them children.

Cumulative harm took two forms:

- Repeated attacks on the same type of object at a pace that exceeded capacity to restore services: each successive attack meant greater harm. According to Médecins Sans Frontières (MSF) and the UN, of the city's three main hospitals, the paediatric facility was put out of service in May 2024 when an SAF airstrike landed 50 metres away, killing two children in intensive care; South hospital was shelled repeatedly and then stormed and looted by the RSF in June 2024; the Saudi maternity hospital, the only facility left with surgical capacity, was struck repeatedly throughout 2024 before RSF drones hit it again in January 2025, killing about 70 patients and their companions. Eleven strikes on hospitals had been recorded across the city as of August 2024.
- Damage and disruption to a range of interconnected systems: farms were burned, seed stores looted and markets destroyed, and the Darfur telecommunications blackout cut mobile money services, forcing communal kitchens reliant on digital transfers to close. At the same time, attacks on water and sanitation systems led to their collapse, which fuelled cholera outbreaks while only one damaged hospital was delivering health services. IPC confirmed famine at Zamzam in August 2024 and in Al Fasher in November 2025.

The SAF withdrew in late October 2025, leaving around 200,000 civilians behind. After 18 months of starvation, deprivation, trauma and confinement, many were physically unable to flee when the RSF finally overran the city.

MSF has since reported the use of comparable tactics in El Obeid, where half a million people, including 100,000 displaced people, are encircled. RSF drone strikes that began in June 2026 have destroyed most of the city's fuel stations and hit the power station, water points, schools, a market and health facilities. Because the water system runs on fuel and electricity, residents queue at manually dug wells for poor-quality saline water amid a cholera outbreak. Food prices have risen by up to 300 per cent.

RSF drones strike water tankers, aid convoys and other vehicles on the roads in and out of the city, and the UN Office of the High Commissioner for Human Rights (OHCHR) has documented summary executions, abductions and sexual violence along routes taken by displaced people across the Kordofan region. SAF drones, meanwhile, strike markets in RSF-held North Kordofan.

The **natural environment** in the settings reviewed has been contaminated by pollution released as a result of military strikes, debris, rubble and munitions themselves, with short and long-term consequences for food security and public health. Orchards and other farmland, for example, have also been the object of direct attacks in the cases reviewed, causing immediate harm with clear implications for livelihoods and food security. Three recurring patterns were identified:

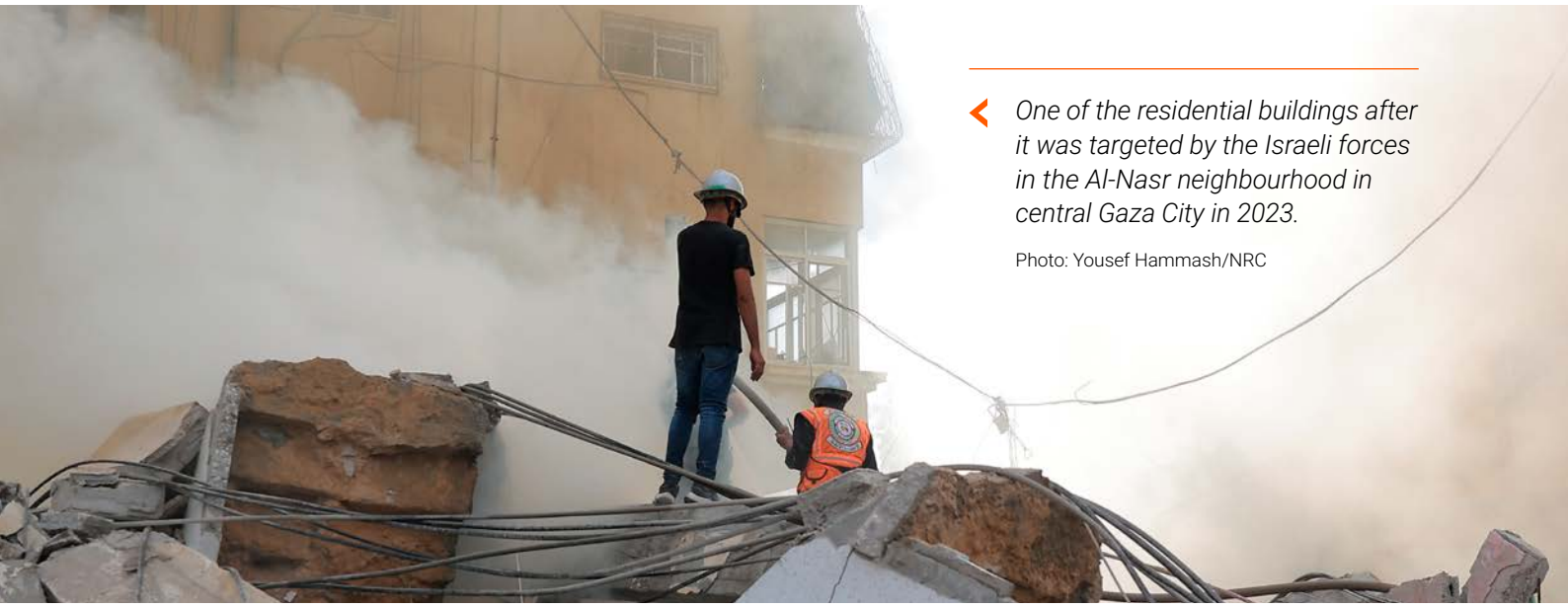
- **Toxic releases from strikes on industrial and energy sites:** Strikes on major oil facilities[42] near Tehran produced thick smoke, acidic rain and what witnesses described as a "river of fire". Residents were instructed to stay indoors and wear masks, but the incident still led to a sharp rise in respiratory problems and skin and eye injuries, particularly among infants and older people. It is also expected to have longer-term consequences, including chronic respiratory and cardiovascular conditions and heightened cancer risk.

  In Sudan, 401 incidents were recorded[43] across Khartoum's industrial zones in the first nine months of the conflict. Attributed to both the SAF and RSF, they involved direct attacks, fires, looting and occupation, and they released toxic coolant oils, pesticides and other pollutants that pose continuing contamination risks. Repeated fires at the Al Jili refinery recorded during fighting over the site produced a smoke plume that was tracked for more than 300 kilometres.

- **Explosive remnants, debris and rubble:** Gaza's debris, estimated at 68 million tonnes,[44] includes at least 800,000 tonnes of asbestos,[45] other contaminants and unexploded ordnance. Mixed in with debris are an estimated one in ten fired munitions that have failed to detonate. Removing the debris and unexploded ordnance is projected to require years if not decades. Civilians continue meanwhile to be exposed to toxic contaminants and children have been killed and injured collecting firewood and scrap metal.

- **Incendiary munitions:** Human Rights Watch verified[46] the detonation of at least two artillery-delivered white phosphorus munitions over a residential neighbourhood in Yohmor, south Lebanon in March 2026, causing fires that affected homes and a vehicle. It has also documented[47] similar incidents in Gaza. Beyond the immediate risk of serious skin burns and fires, the use of incendiary munitions contaminates agricultural land and – along with the destruction of agricultural objects – has contributed to lower crop yields and increased food insecurity.

42 https://www.bbc.com/news/articles/cqxd1nv3re2o
43 https://ceobs.org/the-environmental-costs-of-the-war-in-sudan/
44 https://www.un.org/unispal/document/report-gaza-strip-rapid-damage-20apr26/
45 https://news.un.org/en/story/2024/05/1149256
46 https://www.hrw.org/news/2026/03/09/lebanon-israel-unlawfully-using-white-phosphorus
47 https://www.hrw.org/news/2023/10/12/israel-white-phosphorus-used-gaza-lebanon



One of the residential buildings after it was targeted by the Israeli forces in the Al-Nasr neighbourhood in central Gaza City in 2023.

Photo: Yousef Hammash/NRC

BOX 4

What does the law say?

- Elements of the environment, such as fields and pastures, are usually civilian objects and protected as such under IHL rules regulating the conduct of hostilities. They must not be directly attacked unless a specific element becomes a military objective.
- Incidental damage to elements of the environment expected to be caused by an attack against a military objective constitutes damage to a civilian object and must be considered in advance in proportionality assessments and appropriate precautions determined.
- IHL also affords the environment additional special protections. Care must be taken to protect it against "widespread, long-term and severe damage", and the use of means and methods of warfare that are intended or that may be expected to cause such damage are prohibited.
- The general rules on the conduct of hostilities limit how all weapons may be used and prohibit the use of those that by their nature are indiscriminate.
- Treaties restrict the use of specific weapons. These include biological and chemical weapons, anti-personnel mines and cluster munitions. In addition to the immediate harm they cause, all of these weapons may also cause long-term contamination of land, rendering it unsuitable for farming and grazing. They may also contaminate water sources, making their water unfit for human consumption.



A group of women walk between rows of crops in their field in Mahd al-Nimr, White Nile State, Sudan.

Photo: Noory Taha/NRC

New and emerging technology

Drone use and proliferation

Drones are cheap and widely available. Also known as unmanned aerial vehicles (UAVs), their use has proliferated rapidly across all six contexts reviewed and they have become a leading cause of civilian death and injury in several.

Some conflict-affected areas, including densely-populated locations significantly removed from frontlines, are becoming infested with drones, dramatically altering daily life. They pose physical risks and cause psychological harm through persistent fear and anxiety. Their proliferation also enables a higher tempo of attacks.

Drone technology is developing rapidly. UAVs' range and reach is increasing, and first-person view (FPV) drones – which stream live video directly to goggles worn by their pilots – are becoming more common. These developments go hand-in-hand with other fast-paced technological innovation such as the use of artificial intelligence (AI) to identify targets.

Drone strikes killed more than 1,000 civilians in Sudan between January and May 2026, according to OHCHR,[48] accounting for more than 80 per cent of all conflict-related civilian deaths over that period and making UAVs the leading cause[49] of civilian deaths in the country.

In Gaza, Israeli forces have used small, remotely-operated quadcopters capable of close-range surveillance and fire. The Costs of War project recorded[50] 18 children killed or injured by bullets between August and September 2024, most involving single small-calibre rounds to the head, neck, chest or abdomen. Witnesses who brought the children to hospital attributed 90 per cent of the cases to quadcopters.

Israeli quadcopters have also been reported as broadcasting distressing sounds, including children screaming and dogs attacking children, to scare and psychologically exhaust civilians. Persistent drone activity and the wider soundscape of hostilities have contributed to fear, hypervigilance and severe sleep disruption.

In DRC, the International NGO Safety Organisation recorded at least 70 drone incidents[51] that led to at least 168 deaths and 93 injuries between January 2025 and March 2026. An armed UAV strike on 2 January 2026[52] hit the sub-base of the NGO War Child in Masisi centre, killing seven people and injuring 42, mostly women and children. On 11 March, a drone strike in densely populated Goma[53] killed a UNICEF worker and two other civilians, and on 8 May a drone struck the market in Mushaki,[54] killing more than 20 and wounding at least 50.

Iranian Shahed 136 loitering munitions were used against Israel and Gulf states[55] in strikes that harmed civilians and civilian infrastructure.

A wide variety of drones are now in use, serving different purposes and posing different types of threats to civilians. They include:

- Strategic/long-range UAV, programmed route: Shahed 136 used in Ukraine and Iranian strikes on Israel and Gulf states; one-way attack drones used in DRC; long-range platforms used by SAF and RSF in Sudan
- Medium-armed UAV, human-piloted: Bayraktar TB2, Akinci, CH-95/CH-4, Mohajer-6/Ababil, used in DRC, Gaza, Lebanon and Sudan
- Short-range FPV drones: real-time video and human confirmation; tactical quadcopters used to target individuals in Gaza; used across frontlines by all parties to conflict in Ukraine and by various parties in DRC.

48 https://www.ohchr.org/en/statements-and-speeches/2026/06/deputy-high-commissioner-dabo-sudan-cannot-be-forgotten
49 https://www.ohchr.org/en/press-releases/2026/05/turk-issues-high-alert-widening-sudan-conflict-amid-increased-use-drones
50 https://costsofwar.watson.brown.edu/paper/Quadcopter
51 https://docs.un.org/en/S/2026/481
52 https://www.sosmediasburundi.org/en/2026/01/04/north-kivu-at-least-7-civilians-killed-and-more-than-40-wounded-in-a-drone-strike-in-masisi-centre/
53 https://www.criticalthreats.org/briefs/congo-war-security-review/march-11-2026
54 https://www.sosmediasburundi.org/en/2026/05/14/drc-drones-strike-a-market-in-mushaki-afc-m23-denounces-a-massacre-of-civilians/
55 https://english.elpais.com/international/2026-03-04/the-shahed-136-drone-irans-advantage-in-warfare.html

The combined use of different drone types is becoming increasingly common. The UN reported[56] in July 2026 that the RSF had deployed a combination of surveillance drones, loitering munitions, drones capable of air-dropping munitions and large armed fixed-wing drones in an environment in Sudan in which civilian communications had been progressively degraded by network destruction and the use of electronic warfare equipment, including jamming systems.

Drones' precision and persistent surveillance capabilities present an opportunity to minimise civilian harm when used appropriately. Israeli drones have been used to track and strike vehicles and other targets in Lebanon, including on roads and in or near populated areas. If a target can be monitored and tracked over time, the question is not only whether the strike is precise but whether such tracking is used to select a time and location for the attack that minimises the risk to nearby civilians and civilian objects.

Some conflict-affected areas, including densely-populated locations significantly removed from frontlines, are becoming infested with drones, dramatically altering daily life.

This suggests that civilian harm from drone operations may result not only from a lack of technological precision, but from how precision and surveillance capabilities are used in practice.

A drone infestation: life in Ukraine's frontline communities

FPV drones have become the leading cause of civilian casualties in frontline areas of Ukraine, rendering some areas uninhabitable. The rapid evolution in the technology has led to drone density extended from about 25 kilometres from the line of contact on both sides at the beginning of 2026, to 40 kilometres in the summer/fall of 2026. It is expected that within a few months many can start reaching up to 100 kilometres.

Ordinary civilian movement within that zone has become life-threatening as both Russia and Ukraine continue to scale up the use of FPV drones. Journeys to a market, a fuel station or a bus stop carry the risk of attack. NRC Ukraine staff describe partners trying to evacuate civilians with dozens of drones overhead, and FPVs operating around the clock as "long-range snipers" targeting civilians. Delivering assistance to people living in these areas have also become increasingly complicated.

The scale of harm has risen sharply. HRMMU recorded a 120 per cent increase in short-range drone casualties in 2025, when 577 civilians were killed and 3,288 injured, compared with 226 killed and 1,528 injured in 2024. In Kherson – where Russian forces on the left bank of the Dnipro use thousands of FPV drones to conduct attacks on the Ukrainian-controlled right bank – the pattern of civilian targeting is clear and widespread.

Armed Conflict Location & Event Data (ACLED) recorded more than ten incidents of drones hunting ambulances responding to strikes or in transit to impact sites in 2024 alone. The UN Commission of Inquiry on Ukraine found that systematic drone attacks on civilian populations in Kherson, combined with repeated Russian calls for people to flee, drove the forcible transfer of the civilian population.

Drone saturation does not only kill. It also isolates and displaces. The expanding zone of infestation has cut off humanitarian access to frontline areas and forced thousands of civilians to flee at the same time as obstructing evacuations. For those who remain in frontline communities, and for the humanitarian workers trying to reach them, drones have fundamentally altered daily life and disrupted the aid deliveries civilians need.

56 https://www.ohchr.org/sites/default/files/documents/hrbodies/hrcouncil/sessions-regular/session62/a-hrc-62-crp-4.pdf

Proliferation in manufacturing and use: Drones are now nearly universally available. Only a handful of advanced militaries had such capabilities two decades ago, but today more than 100 states[57] and dozens of non-state armed groups[58] possess drones, ranging from[59] cheap commercial and improvised weapons to large military-grade systems.

Their diminishing cost[60] has been key to their spread. Small FPV systems cost a few hundred dollars and can be assembled from off-the-shelf components and consumer electronics, 3D-printed and mass produced. Ukrainian domestic production alone reached about four million drone systems in 2025.

The proliferation of drone technology puts lethal precision-strike capability within reach of actors operating outside traditional chains of command that could never have acquired it before, and largely beyond the effective reach of existing arms control frameworks.

Impacts on humanitarian access and operations: The saturation of frontline areas with drones presents new and increasing risks to civilians and humanitarian operations in some settings. In others, increasingly ubiquitous drone technology facilitates the enforcement of sieges, persistent surveillance and use of lethal force along lines of control and evacuation routes.

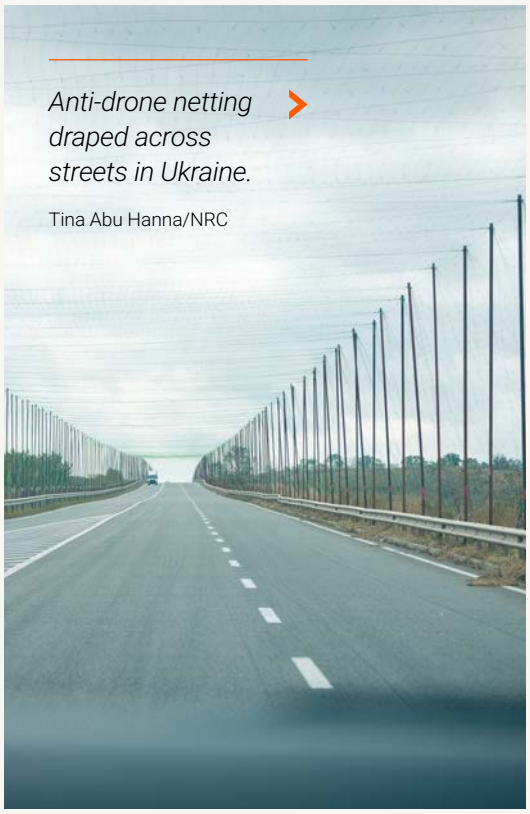
In Sudan, drone strikes on fuel stations and vehicles along exit routes have trapped populations in besieged cities or cities experiencing siege-like conditions. Drone attacks that affected healthcare facilities[61] nearly quadrupled globally in 2024 and rose again in 2025 to 410 incidents across 12 countries.[62]

The expanding use of FPV drones, particularly in contexts such as Ukraine, is profoundly shaping humanitarian access and operations to reduce civilian exposure to violence, with increased risks to aid workers, delayed evacuations and responders unable to enter areas within reach of drones.

As noted above, NRC partner staff risk their lives every day trying to evacuate civilians from frontline communities. Two partners have been directly targeted by FPV drones while trying to evacuate people over the last six months alone. The constantly increasing range of FPV drones keeps expanding what is considered frontline and the so-called "kill zone", making evacuations more challenging and resulting in previously safe places being increasingly exposed to the risk of attacks.

BOX 5 **What does the law say?**

- It is not prohibited to use drones in military operations, but as for all weapons systems, parties to conflict must comply with IHL rules that regulate the conduct of hostilities when doing so.
- Parties to conflict must ensure that all those involved in the use of drones take appropriate measures to ensure that this is in accordance with IHL, including by providing operators with appropriate guidance, training and oversight.



Anti-drone netting draped across streets in Ukraine.

Tina Abu Hanna/NRC

57 https://dronecenter.bard.edu/files/2019/10/CSD-Drone-Databook-Web.pdf
58 https://www.newamerica.org/insights/world-drones/
59 https://www.cnas.org/publications/reports/drone-proliferation-dataset
60 https://www.cnas.org/publications/reports/drone-proliferation-dataset
61 https://safeguarding-health.com/ignoring-red-lines-shcc-2022-report/
62 https://www.insecurityinsight.org/wp-content/uploads/2026/04/2025-SHCC-Annual-Report.pdf

Artificial intelligence: accelerating attacks outstrip human oversight

AI integration risks overwhelming procedural safeguards: The most significant concern about the integration of AI into military operations is its use in targeting processes. The pace and scale at which AI systems identify targets strains the capacity of analysts and operators undertaking human review to validate and approve them in a way that meets IHL requirements. There are documented[63] cases of AI-assisted targeting and reduced human oversight contributing to civilian harm.

Reporting on the use of AI ranges from anonymous sources in Gaza to on-the-record corporate disclosures in Lebanon and official government statements from the US about its Iran operations. These paint only a partial picture, leaving significant uncertainties about the extent and nature of AI uses in military planning and operations.

Israel's AI-based Lavender system reportedly generated a list of about 37,000 people[64] flagged as targets in Gaza, with human review compressed to as little as 20 seconds for each name and incidental damage thresholds pre-authorised. A second system – Where's Daddy? – reportedly tracked individuals for strikes[65] to be conducted when they returned to their family homes. Another, the Gospel, is reported to have generated[66] as many as 100 targets a day, including alleged "power targets" intended to exert pressure on the civilian population.

Israel struck around 15,000 targets in Gaza[67] in the first 35 days after 7 October 2023, compared with 5,263 over 51 days[68] in its 2014 campaign in the territory.

According to the Israeli defence firm Elbit Systems, its Tzayad battle-management system logged about 850,000 "real-time intel targets"[69] – roughly 1,000 a day – between October 2023 and the end of 2025 across all theatres of Israeli operations, principally Gaza and Lebanon. Coordination of external fire support was reportedly compressed from the standard 40 to 50 minutes to less than 10 minutes.

The US reportedly used Palantir's Maven Smart System,[70] a decision-support platform that fuses geospatial, signals, and communications intelligence into a single "click-to-action" interface, to identify targets in Iran. Anthropic's large language model Claude was integrated into Maven from late 2024 to generate and rank target lists by category – radar stations, missile batteries, communications nodes and senior commanders – and to produce new target lists within minutes of post-strike damage assessments.

The US reported in April 2026 that the system had enabled more than 13,000 targets to be struck[71] in 38 days, including more than 2,000 command and control, 1,500 air defence and 1,450 industrial base sites. Around 1,000 were hit in the first 24 hours. The US and Israel reportedly declared[72] that they had hit more targets in the first 100 hours of their Iran operations than the US-led coalition had in the first six months of its campaign against the Islamic State (IS) group.

After the deadliest single incident of the US-Israeli operations in Iran – the destruction of the Shajareh Tayyebeh primary school[73] in Minab on 28 February 2026, in which more than 150 children, parents, and teachers were killed – US Central Command's preliminary assessment[74] found that the school had been added to an AI-generated target list based on outdated intelligence and without adequate human supervision. Subsequent reports indicated that commanders overrode warnings[75] that the underlying intelligence required re-vetting.

63 https://www.ohchr.org/en/press-releases/2024/04/gaza-un-experts-deplore-use-purported-ai-commit-domicide-gaza-call
64 https://www.972mag.com/lavender-ai-israeli-army-gaza/
65 https://www.972mag.com/lavender-ai-israeli-army-gaza/
66 https://www.972mag.com/mass-assassination-factory-israel-calculated-bombing-gaza/
67 https://breakingdefense.com/2023/12/55-days-of-war-the-israel-gaza-conflict-by-the-numbers/
68 https://www.ynetnews.com/articles/0,7340,L-4564678,00.html
69 https://www.theguardian.com/world/2026/jul/06/israel-command-system-identified-850000-targets-gaza-lebanon-war-supplier-elbit-systems
70 https://www.washingtonpost.com/technology/2026/03/04/anthropic-ai-iran-campaign/
71 https://breakingdefense.com/2026/05/insatiable-appetite-for-ai-maven-usage-surged-for-strikes-on-iran-pentagon-ai-chief-says/
72 https://airwars.org/record-pace-of-strikes-in-iran-bombing-campaign-analysis/
73 https://www.nytimes.com/2026/03/05/world/middleeast/iran-school-us-strikes-naval-base.html?smid=nytcore-ios-share
74 https://www.cnn.com/2026/07/07/politics/us-commanders-intelligence-iran-school
75 https://www.cnn.com/2026/07/07/politics/us-commanders-intelligence-iran-school

Human oversight and automation bias: Much remains uncertain about current and future uses of AI in military operations, but the available evidence points to a number of clear risks to civilians.

The first is accelerated target generation: the use of AI to produce, rank or recommend targets for human decision makers. There is not yet any evidence of AI mistakes or hallucination directly resulting in civilian harm, but the sheer volume and pace of target proposals generated by AI risks overwhelming human review and other processes on which IHL compliance depends.

Verifying that a person or object is a military objective, weighing expected incidental harm against anticipated military advantage and considering feasible alternatives in means, timing, and method of attack, all require human judgement. What IHL specifically requires of human involvement in AI-assisted targeting is contested. Many states agree[76] that decision making and accountability cannot be delegated to AI, but there is less consensus on the scope of any prohibitions and the regulatory measures required in law and policy for AI-assisted targeting.

76 https://www.exteriores.gob.es/en/REAIM2026/Documents/REAIM 2026 Pathways to Action.pdf

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The concept of "meaningful human control"[77] central to UN and multilateral discussions has no universally accepted definition. Nor have states generally disclosed enough[78] about their AI-assisted targeting processes for any standard to be assessed externally.

A second set of risks concerns bias.[79] These include automation bias, which leads analysts to trust AI more than human judgement, overreliance on algorithmic outputs and cognitive offloading that shifts mental tasks and judgement to an external tool.

77 https://documents.un.org/doc/undoc/gen/n24/154/32/pdf/n2415432.pdf
78 https://www.hrw.org/report/2025/04/28/a-hazard-to-human-rights/autonomous-weapons-systems-and-digital-decision-making
79 https://hcss.nl/wp-content/uploads/2025/09/GC-REAIM-Strategic-Guidance-Report-Responsible-By-Design-HCSS-2025.pdf



A Palestinian man in his damaged home in western Khan Younis, Gaza. He returned home after the Israeli military left the area, despite the house being burnt and severely damaged.

Photo: Amjad Al Fayoumi/NRC

Taken together, they may lead operators to stop independently scrutinising AI-generated outputs. If AI systems are encoded with weaknesses and blind spots in their target generation – overly expansive definitions of military objectives, for example, or inadequate forecasting of potential civilian harm – the risk to civilians will be further amplified by the scale and pace of AI-assisted targeting.

A third risk concerns accountability.[80] When AI systems are embedded in targeting workflows it may become difficult to establish retrospectively what they recommended, what a human decided and on what basis. This is particularly so when militaries themselves report being unable to determine with any certainty whether AI was used in a given strike.

Without auditable records of AI involvement in targeting decisions, post-strike reviews, civilian harm assessments and any subsequent accountability process are all weakened.

Current civilian harm trends are not being driven by AI systems that autonomously select and attack targets – yet this may be about to change. A Russian Molniya drone reportedly flying without a link[81] to a human operator and running an autonomous AI targeting system onboard struck a petrol station in Zaporizhzhia on 6 July 2026, killing three civilians.

The findings of the Ukrainian forensic investigators who recovered the airframe are as yet unconfirmed, but they suggest an operator had programmed the route to the site but that the drone selected the target itself. Russia has not acknowledged the use of drones capable of autonomous guidance, target selection and attack, but given the trajectory of military AI and its integration into weapons systems, such developments represent a serious concern.

BOX 6

What does the law say?

- Relying on AI in military operations is not prohibited, but parties to conflict must comply with the general rules that regulate the conduct of hostilities when doing so.
- IHL requirements of distinction, proportionality and precautions in attack pre-suppose context-specific human judgement. Humans must determine the lawfulness of the attacks they plan, decide upon and/or execute, and they must be accountable for such determinations. They cannot be delegated to machine processes.
- AI-assisted targeting must preserve, not displace, the human judgement these obligations require. This includes the capacity to verify targets based on current information, assess foreseeable civilian harm and cancel or suspend an attack when circumstances require it. Targeting systems that operate at a pace and/or scale that forecloses that capacity are incompatible with IHL requirements.
- States developing AI-enabled decision support systems must include measures to ensure compliance with IHL throughout their lifecycle, from design and development to testing, deployment and oversight.

80 https://www.icrc.org/sites/default/files/2025-04/ICRC_Report_Submission_to_UNSG_on_AI_in_military_domain.pdf
81 https://www.nytimes.com/2026/08/24/world/europe/russia-drones-autonomous-ai-kill-ukraine-war.html?smid=nytcore-ios-share



Awadia has spent a life of displacement throughout Sudan. Now she is displaced again in White Nile province after fleeing the violence in the capital Khartoum.

Photo: Ahmed Omer/NRC



65-year-old Valentyna fled her home in the Sumy region of Ukraine, after a glide bomb struck her house. She had no time to take anything with her — not even her documents.

Photo: Ed Prior/NRC

3 What is driving the patterns of harm?

Understanding the drivers of the patterns of civilian harm is essential to identifying specific problems that can be addressed and the strategies for doing so to change the conduct of parties to conflict. The patterns and trends across the settings reviewed point to seven key drivers that need to be addressed if the current trajectory of civilian harm is to be reversed.

1. Systemic weaknesses and blind spots in military operations

Parties to conflict committed to compliance with their IHL obligations may still lack adequately robust measures to anticipate and mitigate potential civilian harm, leading to repetition of patterns of harm.

They may, for example, fail to collect, analyse and use adequate pre-strike intelligence on civilian objects, infrastructure and services in the area of operations. This can lead to the misidentification of targets, as appears to have been the case in the US strike on the Shajareh Tayyebeh elementary school in Iran in February 2026.

Without understanding of the infrastructure networks that underpin essential services, parties to conflict may fail to take into account the consequences of damage for the civilians who rely on those services in their proportionality assessments. This knowledge gap – or lack of preparation and analysis – may also lead to failure to develop options to avoid or at least mitigate civilian harm in carrying out attacks.

It may also lead parties to use weapons ill-suited for the setting and circumstances where military targets are being pursued. Even when strikes hit military objectives precisely, the use of heavy ordnance and explosive weapons in densely populated urban areas can have severe secondary impacts on roads and other transport infrastructure, and water, sewage, electricity and telecommunications lines. The resulting service failures affect people well beyond the strike location.

If, in addition, attacks are not followed by post-strike assessments of their impact on civilians and civilian objects, parties to conflict will not have the information necessary to better limit civilian harm in subsequent attacks. Anticipating civilian harm, and taking proactive steps to mitigate it, requires systematic and sustained effort in military planning and operations.

2. Overbroad characterisation of objects as military objectives

If an object with normally civilian functions is used for military purposes, a party to conflict may consider it a military objective. However, such determination may be inaccurate or based on an extremely broad interpretation of what constitutes a military objective. Even when a civilian object does become a military objective, parties must still take into account the foreseeable harm that damage to it would cause civilians in their proportionality assessments and take appropriate precautions to limit the effects of an attack on civilians.

Commanders authorising strikes must act in good faith based on the information available to them at the time, but it is unusual for conflict parties to put forward a case-by-case rationale for characterising an object as a military objective. This means it tends not to be possible to assess the evidence used to inform their determinations or the legal criteria applied.

In the contexts reviewed, however, the rate of attacks on objects essential to civilian life suggests overly broad interpretations of what constitutes a military objective, inappropriate proportionality assessments and a lack of precautionary measures that together contribute to repeated and large-scale civilian harm.

Israel's destruction of key bridges across the Litani River[82] in southern Lebanon in March and April 2026 severely restricted civilian movement, isolating as many as 150,000 people[83] and disrupting their access to healthcare, food, essential services and humanitarian supplies. At least 10 bridges were hit, including, on 16 April, the Qasmieh bridge, the last main operational crossing connecting areas south of the Litani with the rest of the country. Israel said the strikes were carried out to prevent the movement of Hezbollah fighters.

Even if the bridges served military functions and the attacks offered military advantage, cutting off tens of thousands of people from healthcare, food and aid raises questions about whether the expected civilian harm was proportionate to the military gain anticipated, and about the precautions that could have limited that harm. These might have included the choice of which crossings to strike, the sequencing of strikes on a network of bridges serving a single population and the provision of alternative means of access.

Israel similarly said[84] during its operations in Iran that it was targeting rail bridges and sections of road used to transport weapons and military equipment, and on 2 April 2026 the US launched a double-tap strike on the B1 bridge in Karaj, Alborz province. It took place on a public holiday when civilians were picnicking near the site,[85] destroying the bridge, killing eight people and injuring 95.

Even if the bridge had been serving a military function, the timing, the choice of munition and the second strike create uncertainty about whether feasible precautions were taken and whether the expected civilian harm was proportionate to the military advantage sought.

Some states have expanded their definition of military targets to encompass all "war-sustaining" objects, including those that contribute economically to a party's war effort – oil exports, other revenue-generating industry and financial institutions, for example.

Russia has not explicitly stated a "war-sustaining" rationale, but its defence ministry consistently describes its strikes in Ukraine as directed at "military-industrial complex facilities"[86] and at fuel, energy and transport infrastructure "used in the interests of" or "used by" the Ukrainian armed forces. It also treats port infrastructure as military cargo logistics hubs.

82 https://www.hrw.org/news/2026/04/16/lebanon-israeli-bridge-attack-a-potential-war-crime
83 https://www.aljazeera.com/news/2026/4/6/israel-destroys-southern-lebanon-towns-hits-safe-areas-around-beirut
84 https://www.timesofisrael.com/liveblog_entry/idf-says-it-bombed-rail-bridges-roads-used-by-iran-to-transport-weapons-and-military-equipment/
85 https://www.bbc.co.uk/news/articles/cp86mrj40e2o
86 https://tass.com/defense/2158997

Israel described strikes on Iranian petrochemical and gas facilities as attacks on ballistic-missile production[87] and separately stated that it would strike Iran's national infrastructure to inflict economic damage on the government.[88] Bank branches were struck on the basis of financing links. On the other side, Iran's parliamentary speaker also described regional energy and oil infrastructure as legitimate targets.[89]

Additional Protocol I[90] to the Geneva Conventions defines military objectives as objects "which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralisation, in the circumstances ruling at the time, offers a definite military advantage".

The US adopts a broader approach that covers objects that make an effective contribution to the enemy's "warfighting or war-sustaining effort".[91] A "war-sustaining" rationale that places almost all of a state's productive economy on the list of potential targets clearly has huge implications for civilian harm. The prevailing view[92] is that "effective contribution to military action" requires a reasonably proximate connection to military operations rather than a general contribution to the economy or the political capacity of a state to continue fighting.

Even where that broader characterisation is asserted, an attack must still offer a definite military advantage in the circumstances prevailing at the time – a requirement that the diffuse and delayed effects of economic damage will often fail to meet.

BOX 7 What does the law say?

- IHL distinguishes only between civilian objects or military objectives. There is no third category of "dual-use objects", nor can an object be simultaneously a civilian object and a military objective.
- Once a civilian object becomes a military objective by virtue of its nature, location, purpose or use, it ceases to be a civilian object. When planning attacks against such objects, however, the civilian function they continue to serve must be taken into account.
- The expected loss of civilian function and its foreseeable cascading effects on the civilian population must be assessed as part of proportionality calculations before an attack is launched. Commanders must also take all feasible precautions in their choice of means and methods to avoid or minimise harm arising from the loss of that function.
- Neither obligation is discharged by the classification of an object as a military objective.
- In case of doubt as to whether an object normally dedicated to civilian purposes is being used to make an effective contribution to military action, it must be presumed to retain civilian status and may not be attacked.
- Foreseeable civilian deaths and injury and damage to civilian objects expected to occur as a result of the impairment of continuing civilian function must be included in proportionality assessments. This is a form of cascading / reverberating harm.

87 https://www.timesofisrael.com/liveblog_entry/idf-confirms-bombing-iranian-petrochemical-facilities-says-sites-used-to-make-ballistic-missile-materials/
88 https://www.timesofisrael.com/israel-shifts-to-hitting-irans-economy-as-it-enters-completion-phase-of-war/
89 https://www.aljazeera.com/news/2026/3/22/iran-says-will-hit-regions-energy-sites-if-us-israel-target-power-plants
90 https://treaties.un.org/doc/Publication/UNTS/Volume 1125/volume-1125-I-17512-English.pdf
91 https://ogc.osd.mil/Portals/99/Law of War 2023/DOD-LAW-OF-WAR-MANUAL-JUNE-2015-UPDATED-JULY 2023.pdf
92 https://www.justsecurity.org/148907/civilian-infrastructure-becomes-lawful-target/

3. Heavy ordnance and other explosive weapons used in populated areas

The use of heavy explosive weapons is not a new tactic, but it has become an increasingly significant driver of civilian harm and has contributed to a surge in humanitarian needs and displacement.

Blast and fragmentation from explosive weapons cause grievous injuries. Those who survive often do so with amputations, penetrating injuries and burns that require a lifetime of care and rehabilitation. This harm is clearly aggravated when healthcare facilities have been damaged or destroyed.

Such weapons are frequently deployed in densely populated urban areas, in the vicinity of critical infrastructure, in strikes on residential compounds and during sieges. The rate of damage to the infrastructure and services on which civilian life depends across each of the contexts reviewed indicates an absence or ineffectiveness of precautionary measures that could reduce civilian harm.

Attacks take place with no advance warning, or those issued are vague or overly broad. Large or unguided munitions have been used in densely populated areas when smaller or precision-guided alternatives may have been available and capable of achieving the desired military outcomes.

Israel dropped around 1,000 bombs a day[93] on Gaza in the opening weeks of the conflict in October 2023. By comparison, the US-led coalition against the IS group – also criticised for large-scale civilian harm[94] – reportedly used around 40,000 air-released munitions[95] in the whole of 2017, or just over 100 a day. The volume of strikes in Gaza approached the levels of Mosul and Raqqa coalition operations combined, in a far smaller area.

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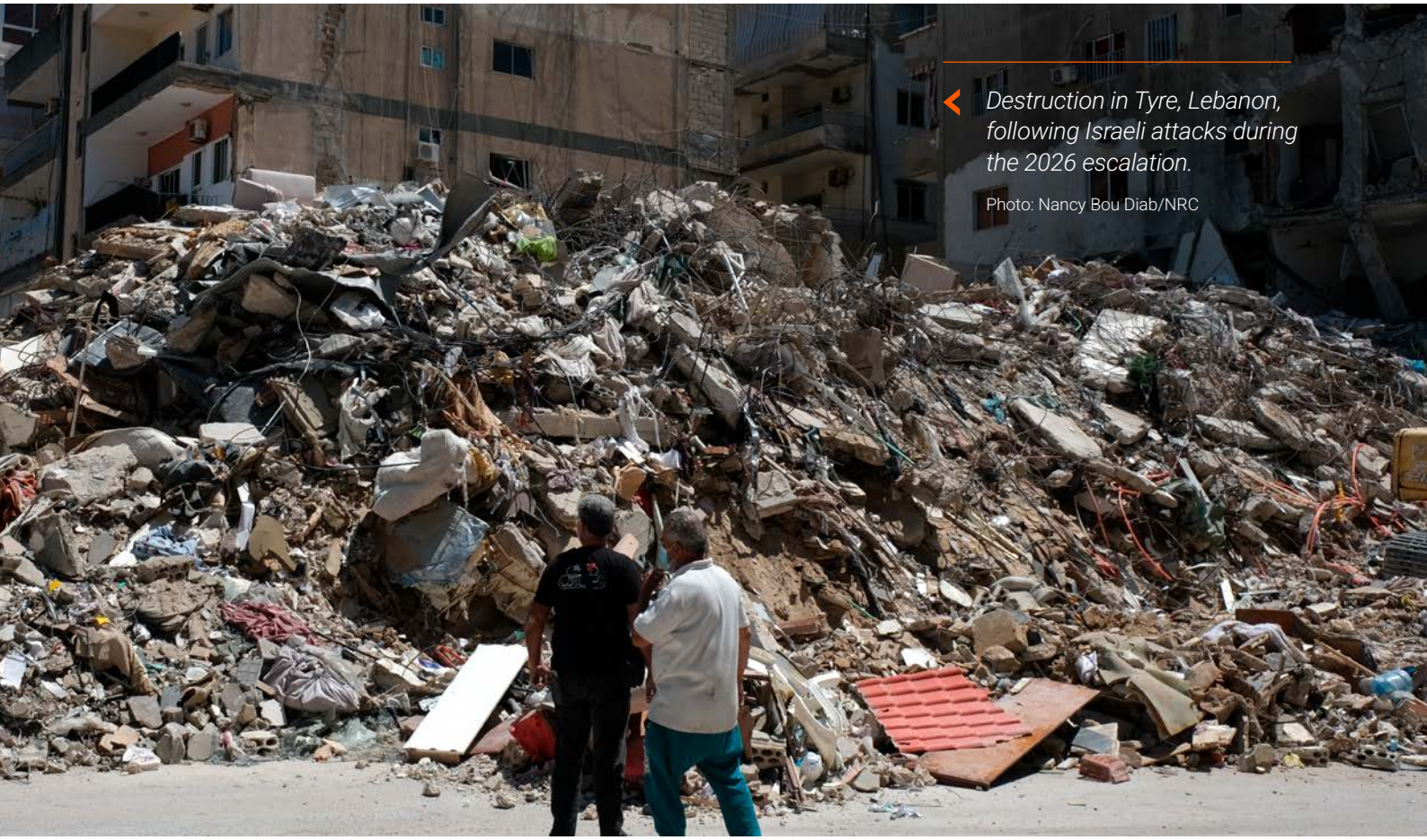
Between 40 and 45 per cent of air-to-ground munitions[96] used during the opening months of Israel's campaign in Gaza were unguided, a point noted in analysis at the time as highlighting the possibility that less precise weapons may have been chosen over precision-guided alternatives[97] for lower-priority targets to reduce cost. Strikes included US-supplied 2,000-pound bombs despite the risk that their blast and fragmentation radii may have rendered their use inherently indiscriminate in densely populated urban areas.

Explosive weapons account for virtually all verified civilian casualties in Ukraine. In July 2026,[98] the month with the highest civilian death toll since May 2022, weapons with wide-area effects accounted for 72 per cent of the total, while deaths attributed to short-range drones reached their highest monthly total of the war.

Aerial bombardment casualties rose by 143 per cent between June and July 2026, and glide bombs became the second leading cause of civilian harm. Cluster munitions have also been used in populated areas. Ukraine recorded the world's highest annual figure for civilian casualties[99] caused by such weapons for the third consecutive year in 2024.

Civilian casualties from explosive weapons in Sudan have risen every year since the outbreak of war,[100] from 2,627 in 2023 to 4,478 in 2024 and 5,440 in 2025. An attack on the market in Tura, North Darfur, in March 2025 killed at least 100 people. A strike on the Sabreen market in Omdurman in February 2025 killed more than 60 and wounded at least 250.

93 https://explosiveweaponsmonitor.org/fragments/vol/1/issue/2/article/unprecedented-harm-to-civilians-in-gaza/
94 https://www.amnesty.org/en/latest/news/2018/06/syria-raqqa-in-ruins-and-civilians-devastated-after-us-led-war-of-annihilation/
95 https://airwars.org/coalition-air-released-munitions-in-iraq-and-syria-2014-2020/
96 https://www.cnn.com/2023/12/13/politics/intelligence-assessment-dumb-bombs-israel-gaza
97 https://www.economist.com/interactive/middle-east-and-africa/2023/12/16/why-is-israel-using-so-many-dumb-bombs-in-gaza
98 https://ukraine.ohchr.org/sites/default/files/2026-08/Ukraine - protection of civilians in armed conflict %28July%29_ENG.pdf
99 https://news.un.org/en/story/2025/09/1165844
100 https://aoav.org.uk/2026/counting-the-dead-explosive-weapons-devastating-impact-on-civilians-in-sudan/



Destruction in Tyre, Lebanon, following Israeli attacks during the 2026 escalation.

Photo: Nancy Bou Diab/NRC

In Al Fasher, explosive weapons accounted for at least 83 per cent[101] of the more than 13,000 conflict-related injuries recorded between April 2023 and May 2025. Nearly one in five of those injured were children.

During the latest escalation of hostilities in Lebanon, Israel carried out its most intense wave of strikes to date[102] on 8 April 2026, launching more than 100 strikes across the country within 10 minutes, including in densely populated areas of Beirut. At least 300 people were killed and more than 1,000 injured, according to Lebanon's health ministry. Strikes in central Beirut were carried out without prior warning.[103]

The scale and concentration of the strikes,[104] combined with the use of large explosive weapons in populated areas, illustrate the significant risks posed to civilians.

The use of heavy ordnance and explosive weapons with wide-area effects makes a significant contribution to cumulative civilian harm. Because attack-by-attack proportionality assessments before carrying out strikes and post-strike reviews tend not to capture such harm, they tend to be absent from militaries' operational planning and consideration of precautionary measures.

BOX 8 **What does the law say?**

- Parties to conflict must take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimising, incidental loss of civilian life, injury to civilians and damage to civilian objects.

101 https://www.amnesty.org.uk/knowledge-hub/all-resources/city-under-siege-children-under-fire-rapid-support-forces-crimes-against-humanity-in-north-darfur/
102 https://www.hrw.org/news/2026/04/10/lebanon-israeli-strikes-kill-hundreds-damage-vital-bridge
103 https://www.independent.co.uk/news/world/middle-east/beirut-lebanon-iran-israel-pakistan-b2953781.html
104 https://aoav.org.uk/2026/patterns-of-civilian-harm-displacement-and-institutional-targeting-by-israel-of-lebanon-october-2023-to-june-2026-a-data-driven-assessment-of-the-wars-human-impact/

4. Siege operations amplify the effects of harmful conduct

There has been a resurgence in the use of siege tactics in recent years, including in Gaza, Sudan and Ukraine. Sieges also add to the harm caused by explosive weapons. Damaged infrastructure cannot be repaired or resupplied and the wounded cannot be evacuated.

Unable to move or flee, civilians have little option but to seek shelter among damaged or destroyed objects, often concentrated in ever smaller areas with increased exposure to continued strikes. Facilities that would normally be repaired quickly remain inoperable without a supply of spare parts, fuel, generators, water-treatment chemicals, construction materials and skilled technicians.

Sustained bombardment increases the amount of toxic debris and unexploded ordnance contaminating a besieged area, which poses an immediate risk to civilians and impedes humanitarian action, making already dire conditions worse, particularly in areas that had previously been dependent on aid.

Drones are becoming more prominent in how sieges are enforced. In Al Fasher, according to the UN Fact-Finding Mission, the RSF used[105] loitering munitions, quadcopters, fixed-wing missile-capable airframes and electronic-warfare drones in combination to locate and strike the last functioning hospitals, a community kitchen, mosques and civilian hiding places while simultaneously jamming civilian communications.

BOX 9 What does the law say?

- Sieges are not prohibited under IHL or other areas of public international law.
- They are typically defined as combining two elements: encirclement and bombardment.
- Bombardment must comply with IHL rules that regulate the conduct of hostilities.
- The context in which attacks are conducted plays a significant role in proportionality assessments. The encirclement dimension of sieges affects the weight to be given to injuries to civilians and damage to civilian objects. Injuries are likely to be harder to treat in areas under siege because medical facilities may be limited and supplies stretched; damage to homes may have a more severe impact on civilians if alterative shelter is limited. The cumulative effects of attacks during sieges must also be taken into account. If previous attacks have damaged water treatment facilities, for example, any further damage will be more significant than if they had been intact.
- The use of explosive weapons with wide-area effects should be avoided in areas under siege given the significant likelihood of indiscriminate effects.
- Besieged forces must take precautions to spare civilians from the effects of attacks. To the maximum extent feasible, they must endeavour to remove civilians and civilian objects from the vicinity of military objectives, and avoid locating military objectives in or near densely populated areas. They must not deliberately place civilians in proximity to military objectives to render the latter immune from attack, or to favour or impede military operations.
- Starvation of civilians as a method of warfare is prohibited. Besieging and besieged forces must allow and facilitate the rapid and unimpeded passage of humanitarian relief operations for civilians in besieged areas. Both sides are entitled to adopt measures of control such as searches of relief consignments.
- Civilians must be allowed to leave. Hostilities cannot be conducted on the assumption that anyone who choses not to leave a besieged area is a fighter, and the rules regulating humanitarian relief operations continue to apply for the benefit of civilians who have remained.

105 https://www.ohchr.org/sites/default/files/documents/hrbodies/hrcouncil/sessions-regular/session62/a-hrc-62-crp-4.pdf

5. Double-tap strikes erode protections for medical personnel and prevent life-saving rescue

These are sequenced attacks in which a second strike is directed at the same location shortly after an initial strike. Humanitarian organisations have reported sequenced attacks in which a second and sometimes multiple subsequent strikes are directed at the same location. Their timing means that those killed and injured are often the medical personnel and other first responders who come to assist those harmed in the initial strike.

Double-tap strikes have been recorded in several of the settings reviewed and have been most extensively documented in Ukraine.[106] Reports from Lebanon[107] suggest the tactic is deployed deliberately to prevent life-saving care from reaching injured combatants, whereas in other cases healthcare workers and civilians may be killed as a result of follow-up strikes on a target.

At least five double-tap strikes were reported, according to NRC staff, during the first weeks of the escalation in conflict between Israel and Hezbollah that began on 2 March 2026, and 135 healthcare workers and first responders have since been killed, according to Lebanon's health ministry. [108]The practice has affected the ability of medical and rescue teams to respond immediately, with hospital staff reporting delays of up to nine hours because of fears of follow-up strikes. In one incident in April 2026, a Lebanese Red Cross paramedic[109] was killed and another injured while responding to an earlier airstrike in the south of the country, despite the ambulance team being clearly marked and the mission having provided notification in advance.

Sequenced strikes timed to catch first responders have been reported as a consistent pattern of Russian operations in Ukraine, including with some use of cluster munitions. HRMMU verified[110] 22 medical worker casualties, nine humanitarian worker casualties, and 24 emergency service worker casualties between December 2024 and May 2025, some of them attributed to double-tap strikes. ACLED recorded[111] more than ten incidents of drones hunting ambulances responding to strikes or in transit to or from impact sites in 2024, a pattern particularly evident in Ukrainian-controlled Kherson.

106 https://truth-hounds.org/en/cases/cruelty-cascade/
107 https://thenational.shorthandstories.com/lebanon-israel-war-crimes-medics/
108 https://www.moph.gov.lb/userfiles/images/Prevention/PHEOC/Cumulative Emergency Report/2-9-2026.pdf
109 https://www.ifrc.org/article/ifrc-strongly-condemns-killing-lebanese-red-cross-paramedic-hasan-badawi-while-ambulance
110 https://www.ohchr.org/en/documents/country-reports/42nd-periodic-report-human-rights-situation-ukraine-1-december-2024-31
111 https://acleddata.com/report/bombing-submission-russian-targeting-civilians-and-infrastructure-ukraine



Palestinians outside in the Namsawi neighbourhood, western Khan Younis, Gaza.

Photo: Amjad Al Fayoumi/NRC

Follow-up strikes that harm medical personnel and other first responders warrant heightened scrutiny because the circumstances in which they occur tend to be those where attacking forces should be best able to ensure distinction, proportionality and precautions in their follow-up strikes. If the interval between strikes is long enough for responders to reach the scene, it suggests there is also enough time for the attacker to gather information, observe the site and reassess whether and how to conduct follow-up strikes in a way that accounts for the presence of such personnel.

A pattern of double-tap strikes that harm first responders and medical personnel raises serious doubts about whether attacking parties are complying with their obligation to take all feasible precautions. Such sequenced strikes tend not to involve dynamic targeting or troops-in-contact situations in which compressed timelines and an imminent threat to one's own forces increase the risk of misidentification.

It is foreseeable that medical personnel will respond to an initial strike, and a range of precautionary measures should ordinarily be feasible. Persistent drone and other surveillance coverage in many settings means the presence of ambulances, medical personnel and other first responders should be readily observable in real time, and a video record should exist to substantiate claims post-strike.

BOX 10 **What does the law say?**

- All wounded and sick must be respected and protected. They must not be the object of attacks and are entitled to receive, to the fullest extent practicable and with the least possible delay, the medical care and attention required by their condition.
- Humanitarian and medical personnel exclusively assigned to the search for, collection, transport, diagnosis or treatment – including first-aid treatment – of the wounded and sick must be respected and protected. They must not be the object of attack.
- Before launching attacks, parties to conflict must do everything feasible to verify that the objectives to be attacked are not civilians or persons entitled to special protection, such as the wounded and sick and medical personnel.



6. Escalatory counterattacks against infrastructure and services

A dynamic in which parties to conflict engage in tit-for-tat attacks on each other's essential services and critical infrastructure, or threaten to do so, is increasingly apparent in some settings. In addition to the risk inherent in such attacks, parties to other conflicts may seek to use such conduct to justify their own attacks on civilian objects, infrastructure and services.

Attacks and public statements in the Iran conflict reflect this dynamic. In March 2026, for example, Washington threatened to strike Iran's power plants.[112] Tehran responded by threatening US-linked energy facilities[113] in the region, along with other critical infrastructure and oil facilities. Iran subsequently attacked Qatar's liquefied natural gas facility and Gulf desalination plants – infrastructure on which the region depends for virtually all of its drinking water. After US strikes in July 2026 which Iran said[114] had left 10,000 people without water after a desalination plant was hit, Kuwait reported Iranian strikes on two power and water desalination plants.[115]

The Russia–Ukraine conflict illustrates a similar dynamic. Following the sustained Russian campaign against Ukraine's power grid since 2022, both sides have increasingly targeted energy infrastructure,[116] resulting in civilian casualties and other harm, including fuel shortages, which have led to price rises and long queues at filling stations.

BOX 11 What does the law say?

- Compliance with IHL does not depend on reciprocity. Failure by one party to a conflict to comply with IHL does not entitle its opponent to also violate the law.

In some cases, the attacks or military conduct appears to have targeted the civilian population itself, whether to break morale, force movement, provoke an adversary, punish a community or extract political concessions.

7. Deliberate intent to inflict suffering on civilians

In some cases, the attacks or military conduct appears to have targeted the civilian population itself, whether to break morale, force movement, provoke an adversary, punish a community or extract political concessions. Parties to conflict will rarely if ever state such aims, but the patterns of attacks can indicate as much. Detailed fact finding and analysis are needed to comprehensively assess the intent and motivation that drive the conduct of parties to conflict.

A UN fact-finding mission in Sudan concluded that the RSF and allied groups had used starvation as a method of warfare. Its legal analysis[117] states that evidence supports findings of war crimes, crimes against humanity and genocide by starvation. Restrictions on humanitarian assistance in Gaza have also been characterised as starvation as a method of warfare, and form part of International Criminal Court (ICC) charges.[118]

The intensity of Moscow's attacks on Ukraine's power grid in winter months, the distance of sites struck from frontlines and the scale of coordinated barrages underlie ICC arrest warrants[119] for Russia's defence minister and its chief of the general staff.

112 https://time.com/article/2026/03/22/trump-iran-strait-of-hormuz-power-plant/
113 https://time.com/article/2026/03/22/trump-iran-strait-of-hormuz-power-plant/
114 https://www.bernama.com/tv/news.php?id=2582664
115 https://www.aljazeera.com/news/2026/4/5/kuwait-says-power-water-facilities-hit-by-iran-as-gulf-attacks-continue
116 https://www.ohchr.org/en/documents/country-reports/ahrc62crp1-attacks-against-ukraines-energy-infrastructure-and-update
117 https://www.ohchr.org/en/documents/thematic-reports/ahrc6177-sudan-hallmarks-genocide-el-fasher-report-independent
118 https://www.icc-cpi.int/news/situation-state-palestine-icc-pre-trial-chamber-i-rejects-state-israels-challenges
119 https://www.icc-cpi.int/news/situation-ukraine-icc-judges-issue-arrest-warrants-against-sergei-kuzhugetovich-shoigu-and



Families who fled the horrors of Al Fasher reached Tawila, Sudan, where they live out in the open, without shelter, food, or water.

Photo: NRC

4 | Recommendations

Civilian harm at the scale set out in this brief is not inevitable, but concerted diplomatic, policy, and operational efforts are needed to address the drivers of harm and counteract the rising trend. Civil society organisations should collaboratively approach reducing civilian harm risk as a shared objective across sectors, including humanitarian, human rights, peacebuilding, security sector reform, public health, civilian harm analysts, and other actors. Each brings its own unique expertise, operational programmes, policy tools and diplomatic channels, at local, national and international levels.

This section outlines recommendations for diplomatic, policy, and operational actions to reduce civilian harm.

1. Leverage existing relationships

Parties to conflict causing the civilian harm described in this Brief are not self-sufficient. They depend on others for anything ranging from weapons, munitions, components and intelligence to military bases, overflight permissions, diplomatic and security alliances, market access, technical and financial cooperation and international legitimacy.

These dependencies are points of influence for third-party states who have an obligation to ensure respect for IHL. In most of the contexts reviewed, however, the parties to conflict receive support that is rarely contingent on demonstrated effort and capability to anticipate and avoid or at least mitigate civilian harm. Where influence is exercised it tends to be episodic, retrospective and detached from demonstrable adherence to specific standards, making it largely ineffective.

States may find it difficult to achieve influence by acting alone, but by acting in concert[120] based on a shared commitment to preserve humanity in war they have the potential to bring about necessary change. Leverage only works, however, when the approach matches the dependencies of the party whose harmful conduct is being addressed.

The actions below do not depend on determinations of violations of the law, but are grounded in concrete steps to better anticipate and avoid or at least mitigate civilian harm.

- **Condition support on demonstrated practices to mitigate civilian harm.** States engaged in arms transfers, intelligence sharing or coalition partnerships should make their support explicitly conditional on the receiving party's demonstrated capability to anticipate, avoid and mitigate civilian harm. The ICRC provides a useful resource for this in its Practical Guide on Arms Trade Decisions.[121]

  To do so, they should assess the party's operational procedures and capabilities as part of their normal bilateral security cooperation, analyse the types of civilian harm that need to be considered, make the corresponding improvements that need to be demonstrated before support can proceed or resume explicit, and offer technical support and training for this purpose. This applies equally to non-state receiving parties, such as private military companies.

- **Incorporate patterns of civilian harm into arms transfer decisions.** A recipient's documented operational practices that cause civilian harm should be a factor in arms transfer risk assessments, licensing and end-use monitoring consistent with the UN Arms Trade Treaty. For states not party to the treaty or already bound by national or regional regulations that contain similar commitments, comparable measures should be taken.

  The UN's political declaration on the use of explosive weapons in populated areas (EWIPA) can also be used to press recipients to establish and retain decision records for such use, adopt and publish EWIPA use policies, and engage in the military-to-military exchange the declaration envisages.

- **Treat siege operations as grounds for heightened requirements.** If a party imposes siege conditions, supporting states should press for and make continued support contingent on it refraining from using explosive weapons with wide-area effects and enabling humanitarian access. They should also call on parties to conflict to provide contemporaneous public justification for any strikes undertaken against objects, infrastructure and services in a besieged area.

- **Treat attacks on medical, rescue and humanitarian workers as redline compliance violations.** This should happen within dialogues and association, trade and cooperation agreements. Supporting states should also require contemporaneous justification for such attacks. In the case of double-tap strikes, for example, what was observed in the interval between strikes, on what basis the follow-up strike was conducted and what precautions were taken. A pattern of such strikes should prompt a formal review that may lead to further cooperation being suspended or conditions imposed.

- **Extend arms control and end-use mechanisms to drones and dual-use components.** States should adopt measures to bring commercially sourced dual-use drone components under multilateral monitoring. An example is UN Security Council tasking the Yemen panel of experts in November 2025 to report on transfers of dual-use components and precursors. A recipient's documented pattern of civilian harm resulting from drone operations should factor into export risk assessments and end-use monitoring.

  Because many processes sit outside state-to-state channels, drone and component manufacturers should be engaged directly on voluntary standards, including "know your end user" practice and traceability. Companies can face being made responsible if they fail to prevent or address harmful conduct, especially if their products are used in hostilities.

120 https://eur-lex.europa.eu/EN/legal-content/summary/eu-guidelines-on-the-promotion-of-compliance-with-international-humanitarian-law.html

121 https://www.icrc.org/en/publication/0916-arms-transfer-decisions-applying-international-humanitarian-law-criteria

2. Strengthen civilian harm mitigation and response in military planning and operations

Even standardised military procedures designed to meet IHL obligations can have weaknesses and blind spots. Much of the harm described in this brief would have been foreseeable to a party holding accurate information about the civilians and objects present in its operating environment and applying that information in its planning and decision making.

The fact that persistent weaknesses and blind spots are amplified and aggravated when standard procedures are overtaken by AI-assisted target generation is of particular concern.

States that seek to counteract rising permissiveness in warfare must continuously improve their own military policy, capabilities and procedures to anticipate and mitigate civilian harm. Their efforts to shape the conduct of others will be significantly strengthened by their own demonstrable good practice and will be undercut in its absence.

Developing the necessary information and military capabilities to put IHL into practice and anticipate and mitigate civilian harm in military planning and operations requires concerted and continuous effort. Significant good practice has emerged in recent years which could be developed and disseminated further. One coherent example is the 2022 US civilian harm mitigation and response (CHMR) policy framework. The current administration has suspended implementation, but the framework still serves as a model and reference for other states.[122]

The use of AI in military planning and operations will become a particular challenge in the future. Few states have published doctrine, policy, procedure or lessons learned on AI-assisted decision making, leaving a considerable gap in shared knowledge and good practice despite growing use of such technologies.

122 In response to documented patterns of civilian harm resulting from US and US-led operations, the Department of Defense developed and adopted a civilian harm mitigation and response action plan (CHMR-AP) in 2022 and a DoD policy in 2023. Implementation was suspended and defunded by the current administration, but other states have referenced it in developing their own policies, capabilities, and procedures. They include Iraq, the Netherlands, Nigeria, Somalia and the UK as well as NATO. A CHMR international contact group also continues to convene to discuss good practice in light of contemporary security challenges.

The recommendations below concern the systematic adoption of good practice to improve civilian harm mitigation and response and identify practices that should be actively avoided and discouraged. They also cover measures third states can take to demonstrate good practice in their own military policy and operations.

- **Invest in, model and promote military good practice.** States should treat CHMR as a capability to be built, resourced and shared while demonstrating their forces' own good practice. This also helps militaries meet their IHL obligations, and encompasses:
  - Analysis of the civilian environment as part of intelligence processes
  - Assessments of civilian harm risk and development of harm mitigation measures in operational planning
  - Well-informed proportionality assessments and precautionary measures in targeting processes
  - Post-attack assessments to better minimise or avoid civilian harm in ongoing and future operations
  - Appropriate acknowledgment and response to civilian harm when it occurs
  - Institutional capacity to learn and adapt

  Civil society experts should be consulted throughout the process of establishing good practice. States should publish doctrine, policy and lessons learned. They should also foster dialogue through their regular engagements with bilateral security partners and in the forums of regional organisations such as NATO and the African Union, and in multilateral platforms such as the Munich Security Conference.

  An exchange of lessons would enhance shared knowledge on understanding the civilian environment, anticipating and avoiding foreseeable cascading and cumulative harm, and the use of post-strike assessments.

- Modelling good practice establishes a benchmark against which state and non-state parties to conflict can be encouraged to adopt

- improvements and gives a practical example to shape conditions for arms transfers and other support. Good practice along these lines also serves as a baseline requirement for the development AI-assisted procedures.

- **Mobilise a core group of states to counteract the rising trends of damage to and destruction of objects, infrastructure, and services.** This could take the form of a statement of principles on the protection of the objects, infrastructure and services on which civilian life depends tailored to counteract the overly broad characterisation of military objectives. It would also create a basis for the development of guidance on military good practice to minimise cascading and cumulative civilian harm in planning and operations.

  Such guidance could then inform military-to-military exchange of lessons; be more broadly promoted, endorsed and referenced in military doctrine; and serve as a basis for model policy. As analysis of cascading and cumulative effects improves, it could inform UN Secretariat reporting, for example with harm-triggered informal white notes circulated to member states and dedicated attention in country-specific reports.

- An initiative along these lines could build on the work of the Global Initiative to Galvanise Political Commitment to International Humanitarian Law, whose workstream on protecting civilian infrastructure has produced an outcome document setting out practical measures to protect civilian infrastructure and the essential services civilians rely on.

- **Establish necessary safeguards for AI-assisted targeting.** Commitments to "meaningful human control" made by states through international initiatives and processes such as those relating to the Convention on Certain Conventional Weapons[123] (CCW), Responsible AI in the Military Domain[124] (REAIM) and the Political Declaration on Responsible Military Use of AI[125] must be put into practice through specific and measurable requirements.

  This will benefit from improving the underlying procedures to mitigate and respond to civilian

123 https://indico.un.org/category/771/
124 https://hcss.nl/gcreaim/
125 https://www.state.gov/bureau-of-arms-control-deterrence-and-stability/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy



Ali and his family live on the fourth floor of a bombed-out apartment building in Khan Younis, Gaza. They have improvised stairs so that they can reach their home through the rubble.

Photo: Amjad Al Fayoumi/NRC

harm while ensuring they keep pace with the increased volume and tempo of AI target generation. These might include minimum review standards per target and mandatory vetting of the intelligence used to create no-strike lists, and civilian harm assessment capacity proportionate to targeting tempo.

As a matter of principle and policy, there should be no use or expansion of AI-assisted targeting without a proportionate expansion of civilian harm mitigation capacity. Demonstrable capacity should be assessed before the procurement and use of AI systems. States should confirm that AI target-generation tools are subject to testing and legal review as new means or methods of warfare before their deployment.

States should also engage humanitarian and human rights organisations and civil society subject matter experts in the formulation of definitions, standards, testing and transparent review processes pertinent to civilian harm mitigation.

- **Establish an independent international mechanism to monitor the use of autonomous and AI-enabled weapons systems.** The rapid development and proliferation of such technologies and the clear risks their use poses to civilians need to be monitored, investigated and reported on publicly with an explicit focus on their implications for civilian harm and humanitarian operations within the mandate.

  Current international efforts are fragmented. Initiatives such as the CCW group of government experts on lethal autonomous weapons systems, the REAIM process and the recent informal exchanges convened under UN General Assembly resolution 80/58 are advancing normative dialogue among states along different tracks and with varying degrees of support and participation.

  States should move to unite these dispersed efforts by establishing an overarching, permanent, UN-led process on AI in the military domain — a process whose mandate must explicitly encompass civilian harm and humanitarian implications. Within it, or as a complementary measure, they should support the establishment of an expert panel under the secretary general's authority with a mandate to document the use of AI in conflicts, assess its compliance with IHL obligations and report findings to the Security Council and the Human Rights Council.

  Humanitarian and other civil society organisations should have formal submission, observer rights and status in any such mechanism.

- **Develop and fund protective technologies, including protective AI.** Militaries operate with unprecedented volumes of data on adversary forces and comparatively little on the civilian environment. This systematic blind spot risks being built into automated targeting. States should invest in AI-enabled capabilities that improve their understanding of operational environments and enable civilian harm mitigation and IHL compliance.

  These may include dynamic no-strike lists, vetting of open-source information, modelling of cascading and cumulative harm, improved proportionality analysis and the development of harm mitigation options during operational planning. This could be supported by a range of civilian-focused data, such as population movements, protected sites, patterns of life and critical infrastructure and essential services. This information, most of which is publicly available, could also be used to improve civil-military coordination approaches.

  In parallel, and in close consultation with civil society, states should fund passive protective measures for civilians and humanitarian operations, such as a machine-readable protective marker that automated and AI-assisted systems are trained to recognise.

  States and humanitarian organisations should explore partnerships with AI and related technology companies, research bodies and watchdogs for this purpose, and humanitarian organisations should consider a coordinated approach as purchasers of AI and related technologies. Existing mechanisms such as civil-military coordination bodies will also need to adapt to these changes in the operating environment.

3. Repair and remediate damage and destruction

The scale of damage and destruction that has occurred and may occur demands innovative means of repair and remediation, including for the psychological impacts of years of conflict. Formal reparations mechanisms depend on determinations of legal wrongdoing, and their establishment is often contested.

Recognising the scale of destruction and the protracted nature of current conflicts, states should develop other means to repair and restore infrastructure and services while hostilities continue, including through mediation efforts and the use of neutral parties' technical skills. They should also start to explore means of larger-scale remediation schemes that encourage and facilitate no-fault contributions by parties to conflict to pay for war damages.

Options to expedite repair and promote remediation could include:

- **Restoration-first arrangements:** These could include safe passage and deconfliction for utility crews, the entry of spare parts and supplies and localised pauses at specified sites negotiated at operational level. Suspensions of hostilities to facilitate infrastructure repair could draw lessons from the "windows of silence" facilitated by the Organization for Security and Co-operation in Europe and which enabled the repair of water, power and gas supplies along the Russia-Ukraine contact line.

  The International Atomic Energy Agency (IAEA) also brokered six local ceasefires in 2025-26 to enable the repair of off-site power infrastructure serving the Zaporizhzhia nuclear plant. These involved a defined geographical scope and timeframe, demining of the repair area, cooperation between the technicians from both sides working on the line, and IAEA teams monitoring from both banks of the Dnipro. A contextually tailored approach to restoration of critical infrastructure and services could have the most immediate effect on cumulative harm to infrastructure serving large populations.
- **Sector-specific protective arrangements during hostilities:** Reciprocal commitments not to strike specified categories of infrastructure, such as power plants, water treatment and desalination facilities, telecommunications towers, hospitals, health centres and schools, could be pursued as de-escalatory measures.
- **Damage registers with a mandate to verify:** Existing registers record claims of damage without adjudicating legality. Their coverage should be extended beyond property loss to verification of essential services and infrastructure. This would produce usable data during hostilities while creating an evidence base for later claims.
- **Pooled financing for the restoration of essential services:** A mechanism to facilitate contributions from parties to conflict and third states, expressly without prejudice to legal responsibility, would allow the restoration of infrastructure and essential services more quickly than reparations.

4. Improve documentation and analysis

The above recommendations will depend on robust data and analysis to guide their implementation. Civil society has played an important role in recent years in analysing how military operations cause civilian harm and to inform good practice for its mitigation. This has been the result, in part, of increasingly rigorous documentation and tracking by a small but growing field of expert organisations.

Shared definitions and methods increasingly shape the recording of civilian casualties,[126] but other documentation is still fragmented and not standardised across settings, meaning it captures entire categories and drivers of harm inconsistently. These include casualties caused by drones and double-tap strikes that affect first responders. Some categories, such as banking, telecommunications and the environment, are barely covered at all.

Similarly, even when the damage or destruction of objects and its impact on civilians is documented, definitions and methods differ between organisations and sectors, meaning that findings cannot be aggregated within and across settings or compared over time.

126 See for example Standards for Casualty Recording developed through a collaborative process led by Every Casualty Worldwide (ECW).

Mechanisms that would ordinarily monitor downstream effects, such as public health surveillance, disease reporting, mortality registration, water quality monitoring and agricultural data are also often degraded during conflict. At the same time, many variables responsible for human suffering affect the same population simultaneously, making it difficult to isolate cause and effect.

The formulation and use of shared terminology and standards needs to be expanded beyond specialist casualty recording organisations. This will enhance the compatibility of datasets and strength of analysis generated through collaborative efforts, including by humanitarian, human rights and peacebuilding organisations and academics.

The UN and civil society, including humanitarians, should work in partnership with other stakeholders to develop interdisciplinary initiatives to improve the documentation of civilian harm and analytical capacity. This should include:

- **Documenting cascading and cumulative harm:** The documentation of civilian harm necessarily starts with the immediate impact of specific events, but it should not stop there. The further development of standardised definitions and methodologies should extend to cascading and cumulative civilian harm. These efforts should be consistent with and build on emerging standards for the reporting of civilian casualties and existing humanitarian standards, definitions and methods.
- **Extending documentation to consistently under-covered sectors.** These include telecommunications shutdowns and jamming and the disruption of financial and banking systems, all of which are documented less systematically than casualties and building damage. Emerging methods to more comprehensively assess environmental contamination could also be further developed and better integrated into expanded standards and methods for civilian harm analysis.
- **Collecting stated rationales for the characterisation of civilian objects as military objectives:** Parties to conflict rarely explain why they characterised a particular object as a military objective, but they do sometimes make public statements that characterise classes of objects and make claims of military use that are often not independently verified. Systematically collecting these statements as part of an enhanced and expanded effort to document civilian harm would support analysis of operational practices and inform engagement with parties to conflict on civilian harm mitigation.
- **Standardising and disaggregating the tracking of harm caused by drones and of sequenced strikes that affect responders:** Standardised terminology across all harms, including the use of drones that kills, injures or terrorises civilians, would support disaggregated tracking within existing mechanisms. WHO, OHCHR and civil society monitors of civilian casualties should add an agreed category for incidents of double-tap strikes that harm medical personnel, rescue workers, humanitarians and other first responders to their existing datasets.
- **Developing a variety of flexible methods:** Methods and approaches to documentation and analysis will vary depending on their intended use. Those that support community-based strategies or operational dialogue with parties to conflict, for example, do not need to meet the same evidence threshold as submissions to accountability processes. The information and analysis needed to support operational programming may be different to that required for international policy development. Terminology should be consistently applied, but a variety of methods should be available to meet a diversity of operational and other needs. This could include looking for data available to humanitarian organisations that could be better used.
- **Building capacity to measure and assess cumulative harm.** The documentation of individual incidents does not capture cumulative harm. Measuring and assessing cumulative harm should include baseline mapping of essential services — health, water, energy, food, telecommunications — in areas at risk of conflict. Drawing on national public services data and augmented by development and humanitarian datasets, this would enable the tracking of key indicators against pre-conflict levels.

  Cumulative harm assessment also requires the systematic aggregation of harm across incident types using consistent methodologies to capture cascading effects at defined intervals over time.

Speed, Scale and Disregard

How new technology and changing tactics are driving civilian harm

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