



Hovering Threats

The Challenges of Armed Drones in Humanitarian Contexts

January 2025

This report examines how conflict parties' increased use of armed drones affects the delivery of aid in conflict zones. It explores strategies to mitigate risks to aid workers, operations, and health care delivery by reviewing both the technical characteristics of armed drones and their munitions, as well as best practices when dealing with the armed drone threat in aid security risk management processes and procedures. The report concludes with actionable recommendations for aid agency security risk managers and advocates.

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Executive summary

Armed drones are an increasing threat to the safety of aid and health care workers, necessitating adaptations in security risk management practices. Insecurity Insight's monitoring indicates that between 2016 and 2024, at least 21 aid workers and 73 health workers, six of which worked for health NGOs, were reportedly killed in drone attacks. Aid operations or health care services in conflict zones have been directly impacted by drone-delivered explosive weapons in at least **426 documented incidents**. The rising use of unpiloted or remotely controlled aircraft (drones) to deploy explosive weapons is further limiting humanitarian access. This document discusses the impact of armed drone use on aid and health care operations, examining both the technical characteristics of these weapons and strategies to mitigate the risks associated with their use.

Armed actors' use of drones has been a factor in conflict dynamics since 2001.¹ Insecurity Insight recorded the first instances of drone-delivered explosives impacting health care services in 2016. Until 2022, the number of recorded incidents directly affecting aid and health care programmes remained below ten per year. By 2023, however, 84 incidents of drone use directly impacting aid operations or health services were recorded, and this figure surged to 308 incidents in 2024. Additionally, the geographic spread of drone-related incidents directly affecting aid or health services expanded from five countries or territories in 2022 to twelve in 2024. The share of drone-delivered explosives among all incidents where explosive weapons impacted aid or health care in conflict zones increased from 6% in 2023 to 12% in 2024.

Given that it is considerably cheaper to deliver explosive munitions with drones compared to piloted aircraft and that drone use carries minimal risk to operators, coupled with the increasing availability of modular components on both military and commercial markets, the frequency of drone use in conflict and with it the number of incidents where aid operations are affected is likely to rise in coming years – both in scale and in the number of affected countries and territories.

This report is based on a detailed analysis of reported incidents, indicating that aid and health workers are most frequently killed by armed drones while in vehicles, such as ambulances or aid agency cars. Drone-delivered explosives are also commonly reported to impact buildings that are vital to humanitarian programmes, including hospitals, infrastructure in IDP and refugee camps, food distribution points, and aid offices or warehouses. The report further notes that many of these incidents occur in the context of so-called anti-terrorist and counter-insurgency operations carried out by state security forces, underscoring the need for tailored and context-conscious security risk management strategies. These strategies must take into account both mobile and fixed assets to ensure the safety of staff and the secure delivery of critical programmes. In addition, there is a need to engage with stakeholders to address the fact that aid and health care operations are particularly at risk when their efforts are perceived as supporting what have been labelled “terrorist” or “resistance” groups.

The report provides technical insights into drones that are essential for developing security risk strategies tailored to aid operations. It recommends creating guidance for staff on how to respond in the presence of drones, and outlines operational measures that aid agencies can implement to avoid being mistaken for military targets. Additionally, the report emphasises the importance of humanitarian diplomacy and deconfliction efforts, proposing collective advocacy to raise awareness and address these challenges through coordinated, sector-wide strategies. Because the best security risk management approach is insufficient when conflict parties are not willing to protect aid and health services in conflict, the report also proposes to support appropriate legal accountability mechanisms for individuals directly affected by these incidents to work towards the better protection of these services when international humanitarian law is no longer respected.

Introduction to drones

What are armed drones?

Drones are unpiloted aircraft that can be remotely controlled or fly autonomously using software-controlled flight plans. Equipped with sensors, GPS, and sometimes cameras, drones are used for various purposes, such as aerial photography and surveillance, including military reconnaissance. They can also be used to deliver civilian objects such as parcels, medical supplies or building materials.

Armed drones are equipped with weapons, such as missiles or bombs, that can be controlled remotely and are delivered by air to attack selected targets. Armed drones are used in military operations to carry out air strikes that do not place friendly soldiers in immediate danger. They can be used for precision attacks on specific targets and are often employed in combat zones for both surveillance and offensive missions.

Drones come in different sizes and types, from small, hobbyist models to large, professional-grade drones for industrial use. Commercial models can be used to drop munitions such as grenades or mortar bombs on targets, and as such can be a form of improvised explosive device (IED). Drones designed for military use also come in various sizes and capabilities, from small, portable models used by ground troops to large, long-range drones that operate autonomously or by remote control.

Once the preserve of well-funded militaries, the use of drones has expanded exponentially in the past 20 years, and they are increasingly also affecting aid and health care operations. Insecurity Insight documented 296 incidents in 16 countries and territories in which drone-delivered explosives affected aid and health personnel and operations. These incidents killed and injured health and aid workers; damaged and destroyed aid infrastructure, including warehouses, IDP or refugee camps, and aid vehicles; and damaged or destroyed health facilities and ambulances. These incidents have negatively impacted aid and health operations, placing personnel and beneficiaries at risk and resulting in the suspension or withdrawal of programmes, which in turn restricts beneficiaries' ability to access aid.

For the purposes of this report, drones are divided into two broad categories: **surveillance drones** and **armed drones**. However, in Ukraine, Sudan, Myanmar and the occupied Palestinian territories (oPt), armed drones are frequently used for surveillance as part of their wider mission tasking, despite having a primary role as a strike munition or munitions carrier/bomber.

Confusing terminology

Western militaries sometimes refer to drones as unmanned aerial vehicles (UAVs), unmanned combat aerial vehicles (UCAVs) or improvised short-range combat unmanned aerial vehicles (ICUAVs). The latter are more colloquially referred to as one-way attack drones or suicide drones and are often factory-built by major arms manufacturers. Some media sources also refer to them as loitering munitions, but this can be confusing, because militaries consider loitering munitions to be a slightly different – and purpose built – type of drone.

Drones are operated by pilots who require training to identify and engage targets. Such training needs to include guidance on international humanitarian law (IHL) requirements and how to take the necessary precautions to prevent non-military targets (including aid and health care personnel and operations) from being attacked. It remains unclear to what extent this forms part of training for drone operators.

Air strikes and international humanitarian law

IHL rules govern the conduct of hostilities and regulate the use of any weapon, means, and method of warfare, including the use of armed drones. These rules include, notably, the strict application of the principles of distinction, proportionality, and precautions in an attack, and the prohibition of indiscriminate and disproportionate attacks.

IHL does not prohibit the use of explosive weapons in populated areas. However, the use of such weapons must comply with the rules governing the conduct of hostilities, notably the prohibition of indiscriminate and disproportionate attacks and the obligation to take all feasible precautions to protect civilians and civilian objects from harm.

Two linked characteristics of explosive weapons in particular are important when considering the feasibility of avoiding civilian harm:

- **Wide-area effects:** Certain types of explosive weapons have the capacity to injure and kill in a wide area around the place where an explosive device impacts.
- **Accuracy is needed to ensure that explosive devices hit military objects and minimise civilian harm.** This is defined as ensuring that the aim point (i.e. the intended target) is the impact point (where the explosive device hits and damage occurs). However, very few munitions are capable of hitting an aim point or target with complete accuracy.²

A drone can be used to deliver munitions that are known to have wide-area effects, in particular thermobaric, fragmentation and conventional high-explosive warheads. A strike's accuracy depends on the technology of both the drone and munition, and the way in which the munition is delivered. Avoiding civilian harm also depends on the intelligence that is used when distinguishing between civilian and military objects before aiming the munition. Accuracy can also be undermined by defensive electronic warfare countermeasures (e.g. GPS spoofing³).

What kind of weapons can armed drones carry?

Armed drones can carry different types of weapons. While all drone-delivered explosive munitions can affect aid operations when targeted at aid or health agencies or workers, a specific focus is usually on munitions with wide-area effects, because these make it difficult – if not impossible – to distinguish between civilian and military targets as IHL requires.

Armed drones can deliver warheads with varying degrees of wide-area effects and technological features to ensure accuracy. Wide-area effects refer to the potential for these weapons to cause harm over a large geographical area, often beyond the intended target. These effects arise from specific characteristics of the weapons, including the following:

1. **Large blast radius:** Some explosive weapons generate powerful blasts that extend over significant distances, destroying structures and causing injuries or fatalities well beyond the point of detonation either through the initial blast or through the spread of shrapnel and other debris by the initial explosion.
2. **Inaccuracy:** Certain weapons, such as artillery, mortars, or unguided rockets, lack precision. Even if aimed at a specific target, they may impact a wider area, increasing the risk to civilians and non-combatants. Some weapons, particularly rockets and heavy machine guns, are actually designed to be somewhat inaccurate in order to increase the “beaten zone” that is hit.⁴
3. **Multiple explosive submunitions:** Cluster munitions and other similar weapons disperse multiple smaller explosive devices across a broad area, often failing to distinguish between military objectives and civilians and civilian infrastructure.
4. **Secondary explosions:** In urban or industrial settings, explosive weapons may ignite secondary explosions or fires, increasing their destructive reach.
5. **Shoot downs and electronic warfare defences:** Attempts to shoot down drones will result in parts of the drones falling in an uncontrolled way, sometimes on civilian areas. These parts can include undetonated warheads, fuel tanks/ systems and rocket motors, as well as parts of spent air defence munitions and fragments of the drones themselves.

Drone-delivered munitions with wide-area effects

High-explosive and thermobaric warheads are munition types with known **wide-area effects**, because the blast wave they create when they explode extends over tens or even hundreds of metres rather than being accurately focused on a target (e.g. to penetrate armour). Armed drones can also carry anti-armour or multi-purpose warheads that are not designed as wide-area effect weapons, but can cause wide-area effects through secondary impacts.

- **Anti-armour warheads** are primarily designed to destroy or disable heavily armoured military vehicles. They use a shaped charge that generates a narrow jet of molten metal that can penetrate conventional armour, which then ignites any flammable materials such as ammunition or fuel inside the target vehicle, as well as ricocheting inside the target and causing kinetic and heat damage.
- **Multi-purpose warheads** are designed to penetrate light armour, vehicles, and buildings and to kill or injure people with a combination a shaped charge with blast and fragmentation capabilities.
- **High-explosive warheads** are intended to engage targets such as light armoured vehicles and personnel in the open and are designed as wide-area effect weapons. **High-explosive munitions** pass the shock wave from the blast through the targeted material at supersonic speed (compared to **low-explosive munitions**, which deflagrate (detonate) at a subsonic speed). High-explosive munitions are intended to project a blast and/or primary and secondary fragmentation from the point of impact (either from the casing of the munition itself or from materials such as stones, metal items, etc. in the area surrounding the point of detonation).

- **Thermobaric warheads** are intended to engage personnel and equipment rather than damage or destroy built infrastructure. They are also designed as wide-area effect weapons by using oxygen from the surrounding air to generate a much higher-temperature explosion. They generally consist of a container of fuel and two separate explosive charges. After the munition is dropped, the first charge shatters the container and disperses the fuel in a cloud that mixes with atmospheric oxygen. The cloud of fuel flows around objects and into structures. The second charge then detonates the cloud, creating a massive blast wave. This means that the blast wave produced lasts much longer than that of conventional high explosives. The anti-personnel effect of the blast wave is more severe in enclosed spaces, such as shelters, bunkers and caves. The use of thermobaric weapons against people sheltering in enclosed spaces increases harm to civilians.
- **Thermite warheads** are designed to destroy vehicles and artillery pieces through shower thermite, i.e. a mix of metal powder and metal oxide that when ignited undergoes an exothermic reduction-oxidation creating a burst of very high-temperature “rain” in a small area, usually from a height, against an identified target. The high temperatures means that they have also been used against personnel – especially those using woodland or scrub as cover.

Both large **high-explosive** and **thermobaric warheads** are wide-area effect weapons, but with a **difference**: thermobaric warheads are actually more effective when the fuel air mixture is **detonated in enclosed spaces** that channel and contain the blast wave, while high explosives create a stronger wide-area effect **in the open**. The explosive weight in the various high explosive warheads used in Ethiopia is very similar to the US Hellfire missile (8 kg). This has an estimated “kill radius” of 50 feet (15 metres) and a “wounding radius” of 65 feet (20 metres). As a result, recommendations for more effective civilian sheltering from the use of explosive weapons differ – moving to bunkers provides protection from high explosives, but increases the risk when thermobaric warheads are used against bunkers. Thermite warheads will burn through concrete and even steel, so even armoured vehicles provide little protection, and the molten metal can actually fuel the resulting chemical reaction or fire.

Many drone munitions designed as **anti-armour** and **multi-purpose warheads** are classified as **point-area effect** weapons intended to destroy or disable a specific target, usually a vehicle or fixed point such as a bunker. However, the risk that the initial blast triggers secondary explosions by detonating ammunition or fuel in or around the intended target remains. This also applies to thermite charges. In particular, when vehicles transporting containers of fuel are hit, even point-area effect munitions may turn into wide-area effect weapons through their interaction with the environment in which they are detonated, given the flammable nature of their loads and the kinetic impact allowing the release of flammable vapour into an oxygen-rich environment.

Key takeaways from drone characteristics for aid security

- **Aid workers are very unlikely to see or hear surveillance drones during normal humanitarian activities.** Pure surveillance drones and even the more sophisticated military attack drones invariably operate beyond visual range (BVR) from their targets. Their camera technology is of such high quality that they do not have to approach the area they are surveying and can remain at a considerable distance from it. As a consequence, they cannot normally be seen using normal sight.
- **The most advanced surveillance drone models can also be armed**, e.g. the Chinese Guizhou WZ-7 Soaring Dragon and Wing Loong II, the US MQ-1 Predator and MQ-9 Reaper, and the Israeli Hermes 900. Other advanced surveillance drones, such as the US RQ-4 Global Hawk and the Russian Orlan series, are only used for surveillance purposes.
- **All drones can be used for surveillance.** There is increasing video evidence demonstrating the practice that drone operators use the drones' onboard cameras to conduct reconnaissance before delivering the munition even when a target has been positively identified, e.g. until the drone's battery is low or other dangers threaten the success of the mission.
- **Most drones can be fitted with variety of sensors and equipment.** Almost all drones have some kind of live video feed to the operator. These video cameras can be augmented with image intensification (night vision) and/or infrared thermal imaging. Some more sophisticated drones have radar that is used to identify the target, and/or various types of radio receivers that can monitor, intercept, jam, and home in on radios, mobile phones, or other communications equipment. Others are fitted with radio and video rebroadcast equipment to relay signals from other drones further away from the controller to increase the overall range of a swarm of drones.
- **In conflict areas, all drones that can be spotted should be considered a potential danger.** "Loitering drones" – drones that appear to simply circle an area – can be "loitering munitions". Drones may also carry equipment that can jam or intercept radio communications, mobile phones, or other equipment.
- **Aid agencies should monitor when drone modules are known to be used with the reported capabilities of carrying munitions with wide-area effects when conflict parties claim to be attempting to respect the IHL principle of distinction.** These models include the Turkish-made Bayraktar TB2, Chinese-made CAIG Wing Loong II and Iranian-made Mohajer-6.
- **Aid operations need to develop strategies to avoid being directly targeted. According to technical specification and when used by trained pilots, drones should be able to hit the intended targets.** Aid agencies need strategies to ensure that targets are correctly identified and develop processes to address drone attacks that intentionally target aid personnel, facilities or vehicles.
- **Aid agencies should have policies in place for how to respond when they believe they have been intentionally targeted by drone attacks.**

Techniques for locating drones

Cameras/visual sightings

- can be used to identify drones and their payload. Potentially images can be used as forensic evidence, but this can place the person taking or carrying the images at risk.

Audio/microphones

- can detect drones in quieter environments at a range of up to 3,500 metres.

Radar

- does not distinguish birds from drones except if a highly skilled operator is using it. The use of radar requires a transmission licence and frequency checks to prevent interference from affecting the radar signal.

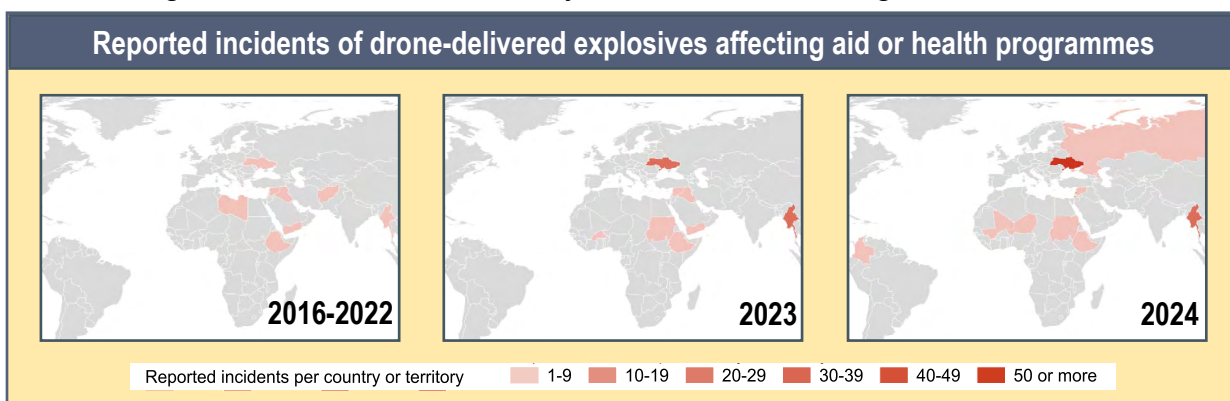
Radio frequency (RF) analysers

- do not require a licence to operate them, but sometimes require an import licence. They cannot detect autonomous drones using artificial intelligence (AI) or fibre optic cables, and are less effective in crowded RF areas. Typically, they are effective only at a short range and struggle to detect drones controlled using 4G or 5G networks.

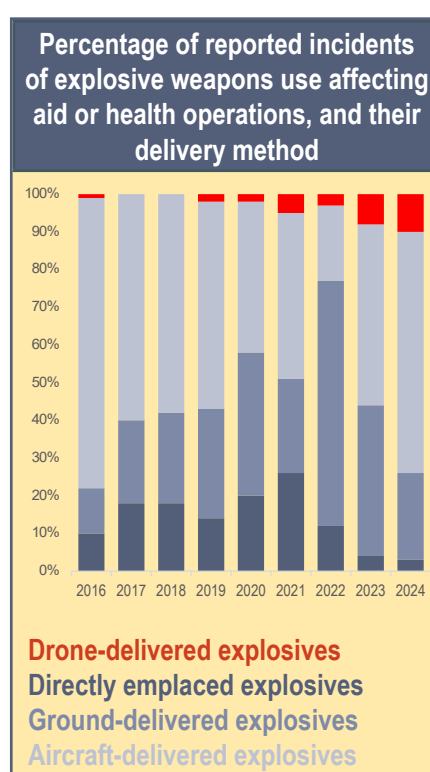
A rising concern: the use of armed drones in conflict and their impact on aid operations and health care

Insecurity Insight first identified the use of armed drones affecting aid or health care in Syria in 2016, when two drone attacks carried out by Syrian and Russian forces occurred in Idlib province. No further incidents of drone-delivered explosives affecting aid or health were documented until 2019, when cases were recorded in Afghanistan and Libya. Since 2023, coinciding with a broader rise in air-launched explosives impacting aid and health care programmes, reports of drone attacks affecting aid operations have surged. From 2016 to 2022, at least 34 such incidents were identified. In 2023, incidents increased more than fivefold from 2022, and in 2024 they more than tripled compared to 2023.

This increase coincides with the spread of drone-delivered explosives; escalating conflict in Ukraine, the oPt, Lebanon, Myanmar and Sudan; and the growing availability of drones, making them accessible not only to state security forces, but also to non-state armed groups. In 2023, the use of drone-delivered explosives affecting aid or health operations was reported for the first time in Burkina Faso, Lebanon and Sudan. In 2024, incidents involving drone-delivered explosives that impacted aid or health care were reported from more countries and territories, including for the first time in Chechnya, Colombia, Mali, Niger and Russia.



The increasing impact of drone-delivered explosives on aid and health care has occurred in a context of the overall rising use of explosive devices in conflict. Since 2022, the use of explosive weapons affecting aid and health care has been rising. In 2023, 31% of all incidents affecting aid or health operations involved explosive weapons. This rose even further in 2024, with nearly half of all incidents documented by Insecurity Insight involving the use of explosive weapons (48%). During this period, for the first time explosive weapons were the most commonly recorded form of violence directly affecting aid or health operations. Within this wider trend, the use of drone-delivered explosives is also increasing. The share of drone-delivered explosives among all incidents involving explosive weapons use increased from 6% in 2023 to 12% in 2024. Because drones became more easily accessible to armed group, were available at lower cost, increased the safety of pilots and became more accurate, it is likely that their use in conflict will continue to increase still further.



The impact of explosive weapons on aid and health care operations

Patterns of harm to aid operations and staff

An analysis of the 426 incidents of armed drone use identified by Insecurity Insight that affected aid operations in 17 countries and territories identified the following patterns, which are discussed in more detail below.

Risk to the lives and well-being of staff:

- At least 21 aid workers and 73 health workers were reportedly killed by armed drones between 2016 and 2024.⁵
- 76% of aid worker casualties recorded to date occurred in 2024, highlighting a relatively new and escalating concern.
- 73% of health worker casualties recorded to date occurred in 2024.
- 77% of aid and health worker fatalities were reportedly caused by drone-delivered explosives while they were on duty.⁶
- Moving vehicles have frequently been identified as the location where staff are killed by drone-delivered explosives. 54% of staff were killed while in moving objects (vehicles), 22% in fixed aid objects (such as health facilities or aid offices or warehouses) and 23% in unknown locations.

Risk to aid operations and the delivery of health care in conflict zones:

- Insecurity Insight documented 300 incidents where armed drones affected the delivery of health care in conflict zones and 123 incidents where armed drones impacted aid programmes (excluding health care programmes run by aid agencies).
- The use of armed drones affected fixed objects (65% of incidents), particularly health facilities and IDP or refugee camp structures. Aid offices or warehouses were also reportedly affected, but to a lesser extent.
- Moving vehicles, ranging from ambulances to aid vehicles being used to transport aid workers to field sites or to deliver aid to affected communities, were affected in 16% of incidents involving drone-delivered explosives, with a direct impact on aid or health care programmes.

Staff casualties from drone attacks often occur while they are travelling in a vehicle.

The impact of drones on aid operations and health services is frequently reported to result from attacks on buildings that are important to the functioning of the aid organisation and affect its ability to provide services, even if these attacks do not kill or injure staff, aid recipients or patients.

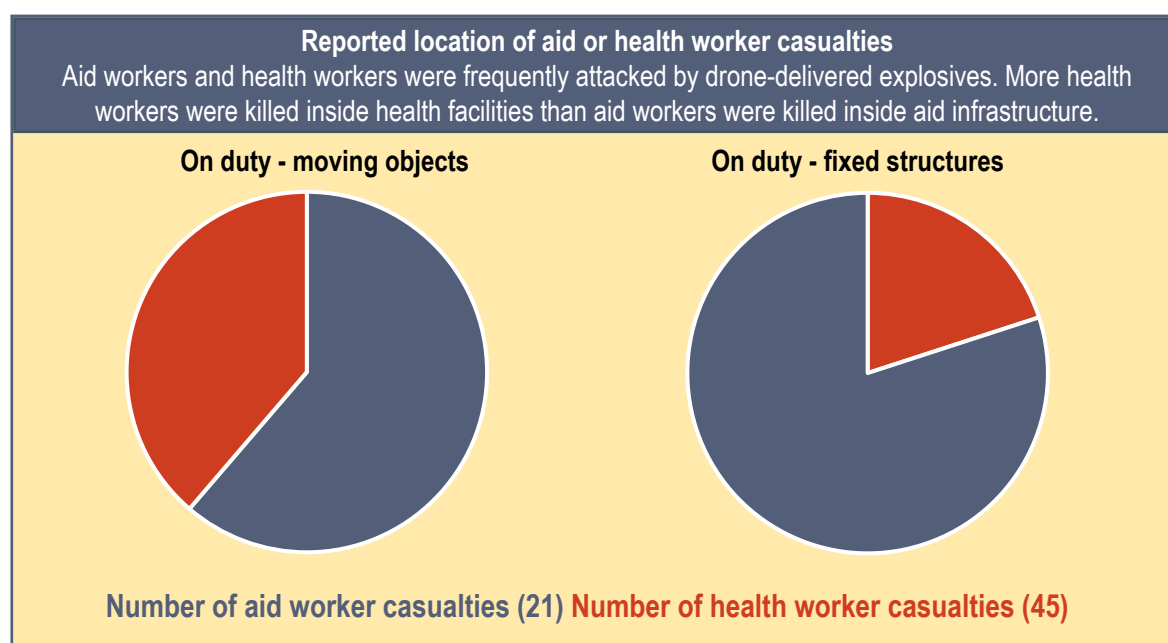
Risk to the lives and well-being of staff

- **Aid and health workers killed by drone-delivered explosives**

Since 2016, at least 94 aid and health care workers have been killed by drone-delivered explosives, with almost three-quarters of these fatalities occurring in 2024. The majority of aid and health worker casualties occurred while staff were on duty, either inside health facilities, while assisting beneficiaries or delivering humanitarian aid or health care, or while travelling in humanitarian convoys or ambulances.

Aid and health workers killed in vehicles

Half of aid and health worker casualties caused by drone-delivered explosives were killed while staff were travelling in mobile vehicles, such as ambulances or aid vehicles. The proportion of deaths in moving objects caused by drone-delivered explosives was higher among aid workers than health workers (76% compared to 48%, respectively).



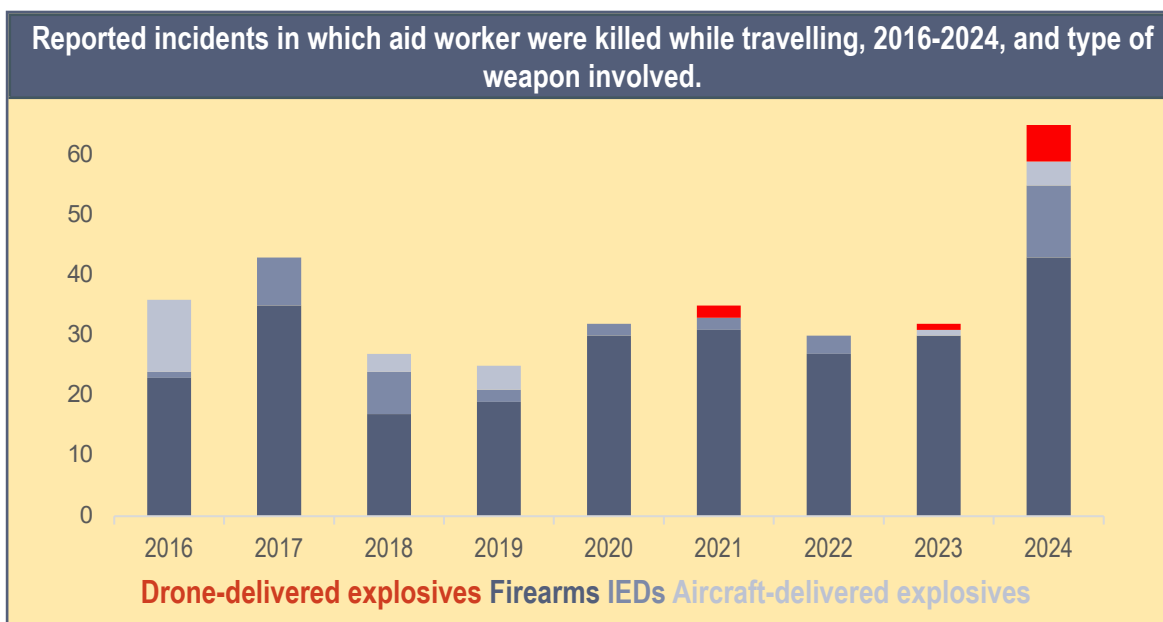
Aid worker killings on roads

Aid workers travel for a variety of reasons, including to transport aid supplies and undertake field assessments. Travelling by road has long been recognised as a risk that requires attention,⁷ and between 2016 and 2024, 25% of all recorded aid worker killings occurred on roads.⁸ While firearms continue to be the most frequently used weapon when aid workers are killed while travelling and roadside IEDs continue to be a risk, drone strikes were more frequently reported than attacks using explosives delivered by piloted aircraft.⁹

Attacks on aid workers when they are travelling towards a programme site or during field assessments often lead to the suspension of these programmes, which severely impacts communities dependent on this aid. Additionally, the threat of armed drones may also affect the ability of an aid agency to reach affected communities, and programmes may be downscaled or temporarily suspended following a risk assessment.

Examples of aid workers being killed by drone strikes while being in a vehicle

- August 2021: In Kabul province, **Afghanistan**, a local aid worker was killed by a US drone strike that struck the vehicle he was travelling in. According to the US military, the vehicle was targeted because it was making “suspicious stops that involved the collection and delivery of items”; however, the affected organisation stated that the aid worker was picking up laptops and delivering water canisters.¹⁰
- December 2021: In Tigray region, **Ethiopia**, a male UN aid worker was killed in an Ethiopian government drone strike while he was travelling in a car with his daughter.¹¹
- February 2024: In Kherson oblast, **Ukraine**, a team of six aid workers working with an INGO were struck by a Russian drone strike while carrying out a field assessment to evaluate areas needing humanitarian aid. The INGO had previously asked both civil and military administrations for permission to access these areas and its members were travelling in two clearly marked vehicles. They had successfully passed two military checkpoints when they were suddenly struck by drone-delivered explosives. Two staff members were killed, while the other four sustained injuries.¹²
- April 2024: In Deir al-Balah governorate, **Gaza**, six international aid workers and a Palestinian driver were killed in an Israeli air strike while they were leaving a warehouse after unloading humanitarian aid supplies, despite travelling in three clearly marked vehicles and after they had communicated the details of their movements to Israeli forces. One national staff member was also injured. As a result, the organisation suspended activities in the area for a few months.¹³
- May 2024: In Nuseirat Refugee Camp, **Gaza**, three local volunteers were killed inside the camp after their private vehicle was struck by an Israeli drone strike.¹⁴
- August 2024: In Kherson oblast, **Ukraine**, an INGO team was struck by Russian drones while attempting to fill a water tank in Kherson city with fresh drinking water. The truck driver and another INGO staff member were critically injured and later died from their injuries.¹⁵



Health worker killings on roads

Of all health worker killings between 2016 and 2024, 48% were reported to have occurred on a road. Paramedics, including ambulance drivers, were most frequently reported to have been killed by drone-delivered explosives on roads (25 paramedics in total). They were often struck while attempting to reach people injured in previous strikes and were providing emergency medical care close to front lines and as an emergency response when civilian objects were targeted. These incidents were documented in Burkina Faso, Chechnya, Ethiopia, Lebanon, Libya, the oPt, Russia and Ukraine. On some occasions, drones were used in what were likely double-tap operations. These are incidents where a second strike is carried out once health workers respond to victims of the first strike. Among the 73 health workers killed by drone-delivered explosives were seven military medics in Ukraine. These medics were also protected under IHL, which requires conflict parties to ensure that wounded personnel can be safely evacuated to receive medical care.

Examples of health workers being killed by armed drones in ambulances or vehicles

- May 2023: In Boulgou province, **Mali**, an ambulance was struck by a Burkinabé Armed Forces drone, killing three paramedics and a pregnant woman who was inside the ambulance. The drone strike was carried out at a JNIM¹⁶ checkpoint.¹⁷
- November 2023: In Amhara region, **Ethiopia**, an ambulance was struck by a drone strike while transporting medicine to a hospital. The driver, a laboratory technician and another health worker were killed in the strike, while the head of the hospital was injured. The ambulance was also destroyed in the attack. At that time, the Ethiopian Armed Forces were the only operators of armed drones in the country, making it likely that they were responsible for the attack.¹⁸
- January 2024: In Gaza city, **Gaza**, the head of the pathology department of a hospital was hit by an Israeli drone while fleeing his home. He was critically injured and died from his injuries after medics were unable to reach him.¹⁹
- August 2024: In Kursk oblast, **Russia**, a paramedic and ambulance driver were killed after a Ukrainian drone strike hit their ambulance. Another health worker was also injured in the strike.²⁰

The Effects on Health Care of the Use of Explosive Weapons in 2023

The years 2022 and 2023 saw an increase in the use of explosive weapons in populated areas (EWIPA), which has impacted access to health care for conflict-affected populations. Health care is directly affected when explosive weapons damage or destroy hospitals and health centres, damage or destroy ambulances, and kill or severely injure health workers. This [document](#) discusses the impact of explosive weapons use on the global health care system in 2023.



Aid and health workers killed in buildings

22% of aid and health worker fatal casualties were killed inside buildings, particularly health facilities. A greater proportion of health workers were killed in hospitals or other health-related buildings due to a drone-delivered attack on the buildings (26%) than aid workers were killed due to drone-delivered attacks on aid infrastructure (9%). At least 17 health workers were killed after the health facility they were working in was hit by drone-delivered explosives. These incidents were reported in Burkina Faso, Ethiopia, Iraq, Lebanon, Mali, Myanmar, oPt, Ukraine and Sudan.

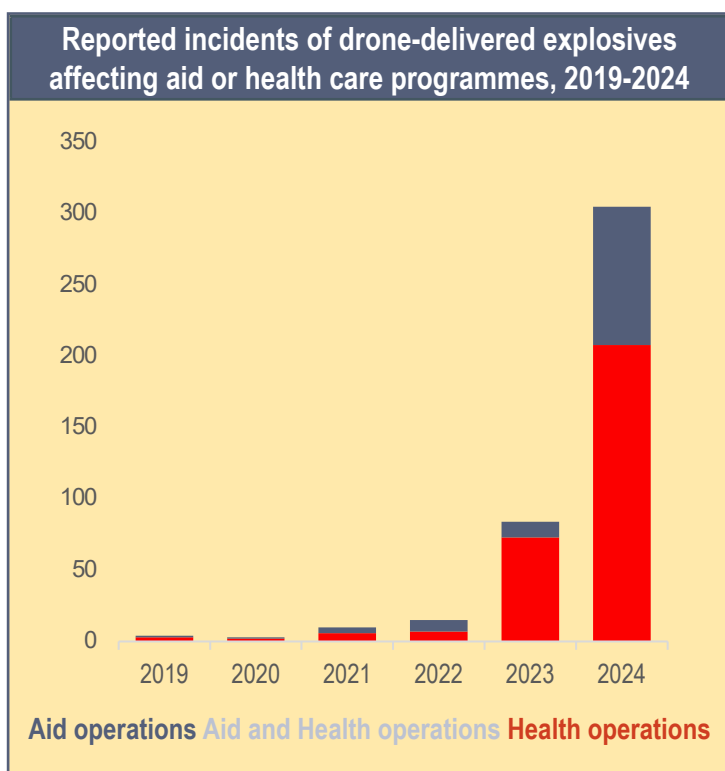
In 23% of incidents involving aid or health workers being killed by armed drones, the activity they were carrying out at the time was not known.

- May 2019: In Farah province, **Afghanistan**, a local NGO compound was struck by what was likely a drone strike that was aimed at resistance troops nearby. The compound was destroyed and two local NGO staff members were killed.²¹
- June 2023: In Khartoum city, **Sudan**, a Rapid Support Forces drone-delivered explosive weapon struck a hospital inside the headquarters of the Armoured Corps, killing medical personnel and patients who were inside the hospital at the time of the attack.²²
- March 2024: In Gao governorate, **Mali**, a communal health centre was struck by a Malian Armed Forces drone, killing the technical director of the health centre.²³

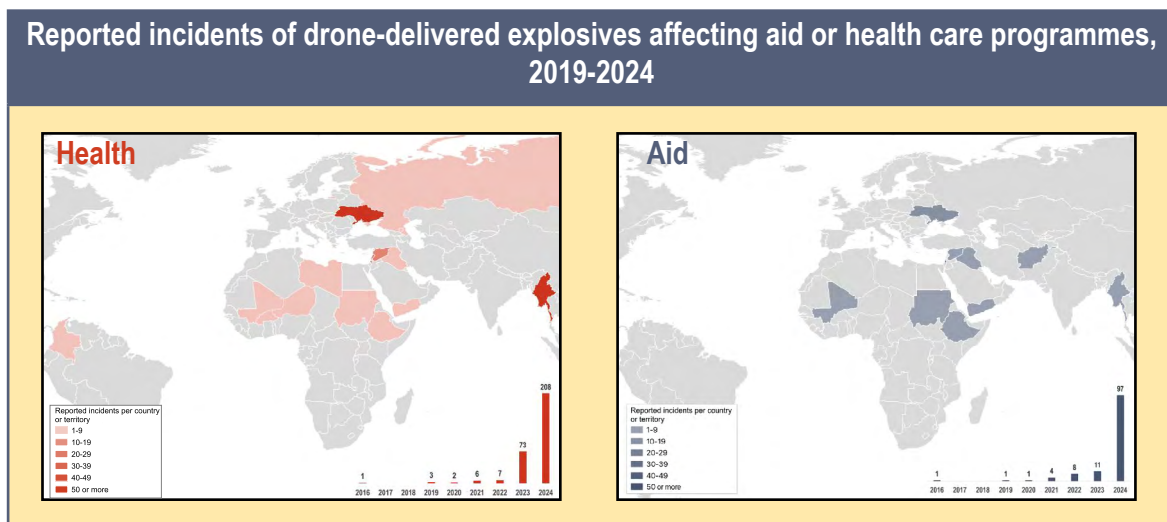
Risk to aid operations and the delivery of health care in conflict zones

- Aid operations and health care affected by the use of armed drones**

Aid or health care programmes and operations are frequently affected by the impact of drone-delivered explosives on buildings and other fixed objects. Of the total of 426 recorded incidents that affected aid or health care programmes, 65% involved reports of damage to or the destruction of a building or in the vicinity of a building. In 12 incidents staff were killed and in at least four incidents the drone-delivered explosives affected the provision of services after the building was either evacuated or operations were suspended. Health buildings in particular were frequently affected: 193 (45%) of all incidents involving drone-delivered explosives affected hospitals, health centres and pharmacies. IDP/refugee camp structures (85 incidents) and aid agency infrastructure (eight incidents) in the form of offices and warehouses were also impacted by drone-delivered explosives.



The use of armed drones that impacted health care and aid services has been recorded since 2016. The first case of aid and health operations being directly affected was recorded in Syria after a Russian armed drone struck an IDP camp and, in a separate incident, a drone-delivered explosive struck a gynaecology centre. Since 2016, health services have frequently reported being impacted by drone-delivered explosives, 300 incidents (70% of all recorded incidents) of drone use affecting health programmes²⁴ in 16 countries and territories.



Aid programmes in ten countries and territories reported being impacted by drone-delivered explosives in 123 incidents (29% of the total). Since 2024, an increase in attacks on aid programmes, particularly on protection programmes, has been documented. This increase is primarily due to intensive Israeli military attacks on Palestinian refugee camps across Gaza and the West Bank.

Health-care-related buildings

Drone strikes causing damage to or the destruction of health-care-related buildings or their vicinity in ways that impacted access to health care were reported in 15 countries and territories. The most frequently reported incidents occurred in:

- **Myanmar** (51), attributed to the Myanmar Armed Forces and ethnic armed groups or local resistance forces;
- The **oPt** (58), attributed to the Israel Defence Forces; and
- **Ukraine** (47), attributed to the Russian and Ukrainian armed forces.

Health facilities were not only damaged or destroyed after they were directly struck by drone-delivered explosives, but also as a result of these explosives striking in their immediate vicinity, with shrapnel and blast waves from the explosions damaging the structure of the health facilities. For example, in one incident in July 2024 in Dnipropetrovsk oblast (Ukraine), debris from a Russian drone strike damaged three medical facilities, including the intensive care unit of a children's hospital after a piece of debris hit the unit.²⁵ Attacks on or near key civilian infrastructure, such as health facilities, affect health programmes' ability to effectively provide health care to local communities. The use of drones, including surveillance drones, over and in the vicinity of hospitals intimidate and increase fear among local communities, making community members less likely to access these facilities. Additionally, the use of explosive weapons in the vicinity of health facilities also makes access to the facility more difficult and dangerous.

IDP and refugee camp infrastructure

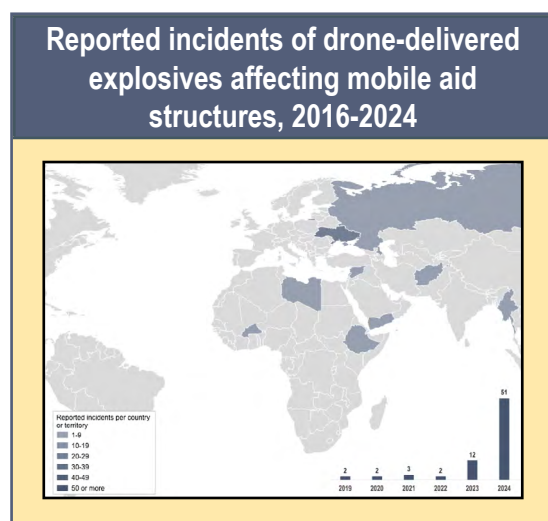
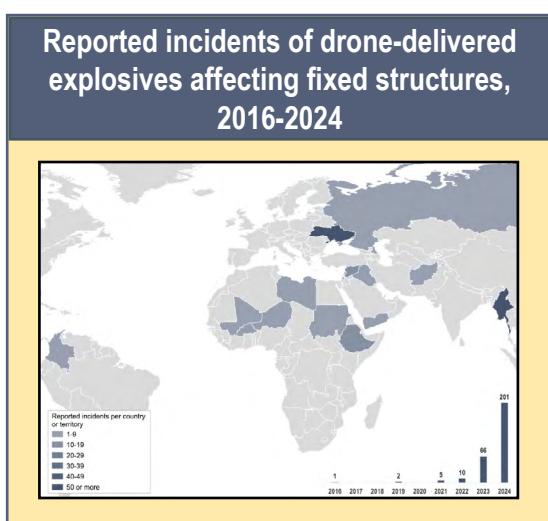
IDP and refugee camps in Ethiopia, Iraq, Mali, Myanmar and the oPt were affected at least 85 times by drone-delivered explosives, all of which were attributed to state forces. Armed drone attacks on locations where displaced people were being cared for have been observed since 2022. The first instances were recorded in Ethiopia, attributed to the Ethiopian National Defence Forces, and Iraq, attributed to the Turkish Armed Forces and the Iranian Islamic Revolutionary Guard Corps (also known as the Iranian Revolutionary Guards). In 2024, as a result of an increase in Israeli military operations inside Palestinian IDP and refugee camps, particularly in the West Bank, reported drone use inside these camps increased significantly. New reports of the use of drone-delivered explosives inside refugee camps also appeared in Mali and Myanmar. Drone strikes in crowded areas such as IDP or refugee camps often cause mass casualty events, severely injuring or killing many members of affected communities.

Aid agency infrastructure

Seven incidents in which drone-delivered explosives were used directly affected aid offices, warehouses or distribution points. These incidents were primarily reported in Afghanistan, the oPt, Ukraine and Yemen.

Moving objects

Of the 426 recorded incidents of the use of armed drones affecting aid and health care operations, 66 incidents (15%) affected moving objects such as vehicles and convoys, ambulances, and private vehicles used for health care or aid purposes. Staff were killed in 21 (or nearly a third) of these 66 incidents, while in around 60% of the incidents the ability to carry out the intended purpose was hindered by the use of drone-delivered explosives.



Emergency health care using ambulances

In the majority of the 66 incidents where a drone-delivered explosive affected a mobile structure, armed drone use affected ambulances (or evacuation vehicles) used by health care NGOs to assist injured people (48 incidents, or 72%). In 38 of these ambulance-related incidents (79%), no staff or patients were killed, but their attempts to assist or evacuate wounded were affected. These ambulances operated close to the front lines of the conflicts, providing emergency medical care to both civilians and combatants injured during fighting.

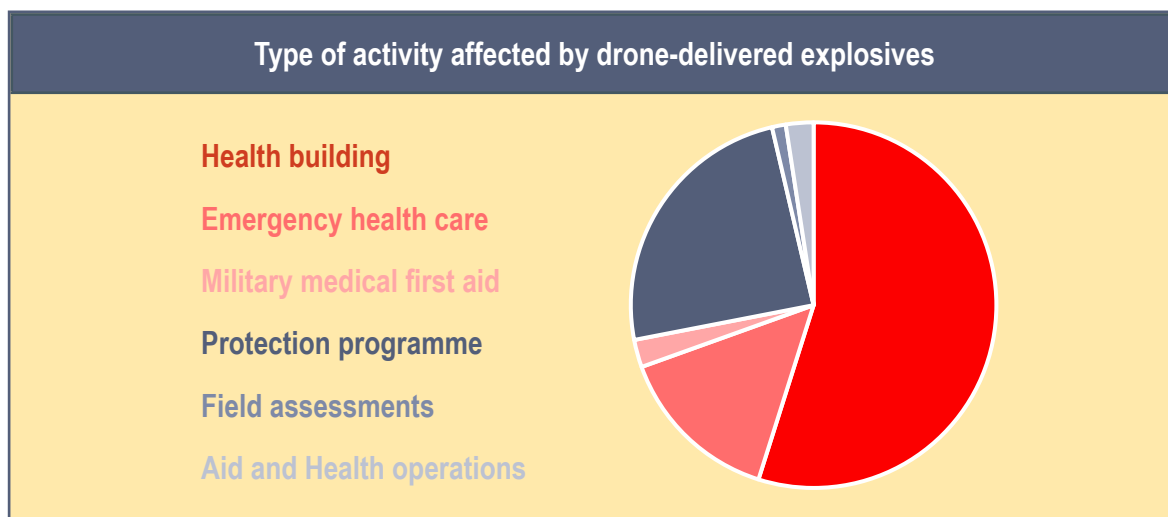
The high proportion of incidents in which ambulances were damaged without killing staff underlines an often-overlooked problem of violence against health care. There is not enough information to determine to what extent ambulances were directly targeted, mistakenly hit or affected by the wide-area effect of the weapons used. However, ambulances are usually clearly marked and first responders wore vests that clearly identified them as medics. In some incidents, ambulances were struck by drone-delivered explosives in possible double-tap strikes while responding to previous bombings. Vehicles being used by health NGOs were also struck at least twice while attempting to evacuate wounded individuals.

Field assessments

Aid vehicles were also struck while carrying out field assessments. In most of these incidents, aid vehicles were clearly marked, and the affected organisations had obtained clearance from the conflict parties involved to enter the area.

Aid delivery vehicles

Aid programmes, including the distribution of aid, particularly food aid, were also severely impacted by the use of armed drones. In at least six incidents in Afghanistan, Ethiopia, Syria, the oPt and Ukraine, aid vehicles were struck by drone-delivered explosives while delivering aid-related supplies such as laptops, food supplies, or water canisters, or carrying out aid-related activities, such as convoys carrying aid workers and civilians. In five incidents nobody was killed, but the aid operation was affected. Attacks on vehicles delivering humanitarian aid to affected communities may lead to the delivery of aid to communities that are most in need being delayed. In at least five incidents, drone-delivered explosives struck food or water distribution points in Ethiopia, the oPt and Ukraine.



The impact of armed drones on humanitarian access to those in need and beneficiary access to critical assistance

Concerns for staff and programme safety often force aid agencies to suspend or close programmes in high-risk areas, weakening critical programmes in ways that contribute to a deteriorating humanitarian situation. The use of explosive weapons in urban areas causes civilian casualties, and attacks on emergency health services will prevent emergency care from being provided, increasing the number of fatalities. Moreover, weakened health care systems frequently contribute to higher rates of communicable diseases due to reduced vaccination, as well as other preventable deaths. Fear of accessing health care, fewer medical specialists, and a lack of equipment and medication reduce the care for treatable diseases and increase overall mortality, including from poorer nutrition and infections that are resistant to antibiotics, and increase mental health needs.

In addition, the perceived risks of aid programmes being targeted in conflict-affected areas influence community members' behaviour, because they may access these programmes less often out of fear that the programmes may be attacked, which contributes to the cumulative negative effects of armed drone use.

Examples of programme suspensions following drone strikes

- January 2024: In Gaza governorate, **Gaza**, a crowd waiting for the arrival of a food truck came under fire from an Israeli tank and its accompanying quadcopters, which killed over a 100 people.²⁶
- May 2024: In Rafah governorate, **Gaza**, an NGO-supported hospital was forced to suspend all its operations following an Israeli drone strike that killed two staff members and injured another.²⁷
- August 2024: In Kharkiv oblast, **Ukraine**, a Russian Armed Forces drone strike struck a vehicle parked next to a food distribution point, injuring a 64-year-old person and resulting in the suspension of the food distribution.²⁸

Patterns and trends driving the effects of armed drones on aid and health care

Armed drones are increasingly used by various conflict actors, including both state and non-state actors. The reasons are wide ranging and include a combination of cost (drone strikes are cheaper than aircraft-delivered strikes), reduced risks to staff (pilots can manage them remotely), availability (various models can be bought on commercial markets) and capabilities (they allow users to combine surveillance with targeted attacks). State forces frequently use drone-delivered explosives to target “terrorists”, insurgents or other opposition forces.

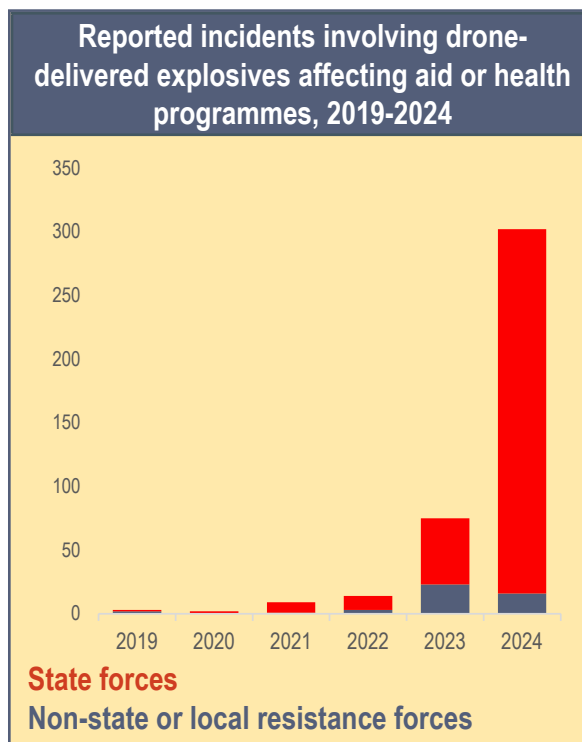
Examples of the use of armed drones in recent conflicts

- **Iraq and Syria, 2016:** Improvised armed drones capable of either carrying an IED or dropping a munition such as a grenade or mortar bomb were widely used by the so-called Islamic State group during their advance across northern Iraq and Syria in 2016.

- **Nagorno-Karabakh, 2020:** The Azerbaijani forces' use of drones was an important factor in their defeat of Armenian forces.
- **Ethiopia, Tigray conflict, 2020-2022:** The expansion of the use of drones by Ethiopian government forces possibly accelerated the defeat of the Tigray People's Liberation Front in the 2020-2022 civil war.
- **Ukraine since 2022:** The use of armed drones in the Ukraine war has been a significant element in the conflict, especially in terms of reconnaissance, precision strikes and psychological impact on the battlefield. Both Russia and Ukraine have deployed various types of drones with different capabilities, and the war has highlighted how effective drones can be in modern warfare.
- **Myanmar:** Myanmar resistance forces have used Chinese-made DJI drones that can be commercially bought online, while the Myanmar Armed Forces have reportedly deployed Chinese-made drones such as the CH-3A.
- **Sudan:** The Rapid Support Forces began using drones in mid-June 2023. It is unclear where these drones were acquired; however, it is likely that they are using quadcopter drones similar to those used in Ethiopia and Yemen, which had been supplied by the United Arab Emirates. The Sudan Armed Forces are reportedly deploying Iranian-made drones.
- **Sahel:** The use of armed drones by state actors in the Sahel is increasing in counter-terrorism operations, particularly after the withdrawal of French troops from the region.

State and non-state actors' use of armed drones affecting aid and health operations²⁹

Based on the 426 identified incidents of drone-delivered explosives that affected aid operations or health care in conflict-affected areas, state forces deployed armed drones approximately eight times more often than non-state armed actors to deliver explosive weapons that impacted health or aid programmes. A total of 360 of the attacks using drone-delivered explosives that impacted aid operations and health care were attributed to state forces, compared to 45 attributed to non-state armed groups or opposition forces. Incidents attributed to the Russian Armed Forces and the Israel Defence Forces up two-thirds (69%) of these incidents.



Context and circumstances

Each incident requires detailed examination of the context and circumstances of the use of armed drones to deliver explosives. Aid operations and health care may be impacted due to errors in target identification or because of an indiscriminate method of munition delivery, especially since these explosives may have wide-area effects and are often deployed in urban settings.

A general context analysis highlights that many of the reported incidents occurred in the context of military and security operations against “terrorists”, insurgents or local resistance groups, and in conflicts where humanitarian protection is openly called into question. Essential humanitarian services, such as health care, IDP or refugee camp infrastructure, and food aid, are particularly frequently affected by the use of drone-delivered explosives. These services are often needed because of the violence that results from a conflict. Health care needs rise dramatically during conflict as increasing numbers of people sustain violence-related injuries. Conflict triggers displacement, and food needs rise as food supply systems are destroyed. The providers of these services are frequently interpreted as siding with affected populations.

Social media in particular highlights the extent to which such service providers are often accused of supporting “terrorists” or insurgents and how public sentiment questions medical ethics in conflict. In such discussions, health facilities are frequently accused of harbouring combatants, and ambulances and paramedics providing emergency care in combat zones are seen as enabling/supporting insurrections. Perceptions of this kind clash with humanitarian principles and medical ethics. Health care in conflict is subject to medical ethics that require such care to be based on medical need alone and not affiliation or any potential wrongdoing. Similarly, displaced communities may be accused of harbouring insurgents among them.

The high proportion of attacks on health care in contexts related to counter-terrorism illustrates the weakening of the intended protective framework of IHL by counter-terrorism regulations and practices. While providing medical care without discrimination to all wounded and sick is a mandatory duty protected by IHL, the provision of medical care to wounded persons suspected of affiliation with armed opposition groups labelled as terrorists is rejected as a legal and political taboo. In the worst-case scenario, the presence of wounded fighters in an ambulance or a medical facility is sufficient to trigger targeted killing or other types of military attacks on them and on the medical personnel and facility involved in their medical treatment. Even though they are wounded, individuals labelled as terrorists arguably risk not being considered as “out of combat” and are therefore being wrongfully deprived of their protected status under IHL, and attacked or killed as a result. In addition, drones provide intelligence focusing on the localisation of suspected fighters and their movement rather than on their medical status. This requires specific legal risk assessment, documentation, advocacy, and engagement regarding the rules and practices of military and security forces engaged in counter-insurgency and counter-terrorism operations in situations of armed conflict.

Accusations that health care providers support terrorists: examples from social media sentiment analysis

Burkina Faso, 2024: On 17 July 2024, in Djibo town, Burkina Faso, an MSF office was targeted by repeated gunfire during an attack. The medical centre supported by MSF was vandalised and two water distribution sites were destroyed. Armed groups stole equipment during both attacks. However, six days after the 17 July attack, a video surfaced on X showing what the post described as “terrorists” using an ultrasound machine that was allegedly taken from the MSF office in Djibo during the attack. According to France24, the video showed members of JNIM using the machine, while MSF referred to an “unknown armed group” in its public statement on the subject.

The post referring to terrorists reached an estimated 26,200 social media users and generated 254 engagement actions that included instances of misinformation, disinformation and hate speech. Several comments directly exaggerated or misinterpreted the situation, accusing MSF of working with terrorists or intentionally supplying them:

- «Doctors Without Borders are terrorist accomplices.»
- «They buy weapons to give to criminal terrorist groups.»
- «They use taxpayers’ money to buy equipment that ends up with terrorists.»

These comments falsely suggested that MSF was directly involved in aiding terrorists by providing them with equipment or funding. Some comments contained violent threats and racist or xenophobic sentiments:

- «There’s not much difference between you and the terrorists, you’re just a bunch of stateless people.»
- «You’re the source of fake news. You yourself are a terrorist.»

The language used, such as “terrorists”, is extremely emotionally charged and inflammatory, aiming to dehumanise aid workers and potentially incite violence against **them**.

Public narratives that equate humanitarian support with aiding terrorists create justifications for attacks, including drone-delivered strikes, on humanitarian operations. In several instances, militaries have also publicly justified such strikes with reference to anti-terrorist and anti-insurgent operations. While detailed assessment of the decision-making processes involved in authorising such strikes is never available, the perceptions that particular humanitarian responses are taking sides in a conflict and reported drone-delivered attacks on humanitarian operations often occur in parallel.

Example of drone-delivered strikes on health facilities or IDP camps justified with reference to the presence of injured conflict parties

- August 2021: In Ninevah governorate, **Iraq**, the Turkish Armed Force carried out three drone strikes on a makeshift clinic where a wounded Kurdistan Workers’ Party (PKK) official had been admitted for treatment. The strikes killed four health workers and four PKK fighters, but despite this, Turkish forces claimed that the facility was housing PKK members and was not a health clinic.³⁰

- July 2024: In Kidal region, **Mali**, a camp was struck by a Malian Armed Forces drone strike. The Malian Armed Forces were collaborating with the Burkinabé Air Force likely as part of a military operation linked to attacking rebel positions in and near the town. The incident occurred shortly after a nearby town had been taken over by al-Qaeda-linked fighters and Tuareg rebels.³¹
- August 2024: In Kidal region, **Mali**, the same camp was struck a second time by a Malian Armed Forces drone strike that killed 21 people, including 11 children.³²

Local partners and volunteers at risk

Critical programmes, such as health care, food aid, and care for displaced people, require a humanitarian presence among affected communities. Health care requires direct contact with patients, while food aid has to be delivered and shelter provided for displaced people. Most of these front line services are carried out by local employees who speak local languages and by local partner organisations or volunteers from these communities, increasing the perception that aid providers may be affiliated with insurgents or resistance groups.

Measures aid agencies can take to mitigate the risks posed by the use of armed drones

The following mitigation measures may not be appropriate for all environments. Each will need to be considered in relation to the specific context.

Elements to support context and acceptance analysis and risk assessment

Basic insights

- The use of armed drones in conflict is likely to rise overall due to the lower costs and lower risks to pilots compared with manned/piloted aircraft.
- An analysis of available data up to December 2024 suggests that the risks that aid agencies and aid operations will be affected by armed drones is higher in conflicts where terrorists, insurgents or resistance groups are targeted by state armed forces, and in state-on-state conflicts such as in Ukraine.
- Health services and aid operations supporting communities are often targeted.
- Aid programmes tend to be targeted by armed drones when they provide assistance to populations perceived to be close to or support groups that state actors label “terrorists” or “fascists” because they pursue a different political agenda, are insurgents or form part of resistance groups.
- Health care services delivered to populations linked to actors labelled as “terrorists” or “fascists” are also frequently targeted. Health care responses provided to injured opposition fighters are very frequently targeted.
- Aid agencies or aid programmes accused of supporting “terrorism” and aid agencies or programmes subject to disinformation and hate speech on social media may be at higher risk of being targeted.
- Local partners and local staff who live among or are part of communities perceived to support, harbour or aid such opposition groups are at high risk of being targeted.

Planning and implementation

- Avoid the use of drones for humanitarian operations in conflict areas. While drones may offer valuable operational support, it is best to avoid using them in conflict areas to avoid misinterpretation of the purpose and objectives of aid operations among armed actors and civilian populations.
- Ensure the presence of liaison officers who can, as much as possible, carry out transparent and bilateral dialogue with parties to support deconfliction and allow better understanding of why and where humanitarian operations are being carried out.
- Rely on the UN Office for the Coordination of Humanitarian Affairs and other coordination mechanisms, such as the Clusters, to exchange information on risks and potential sightings of drones in the area.

General preparedness

- Ensure that staff travelling or working in high-risk areas are properly trained in hostile environment awareness training (HEAT) or similar training, first aid skills, and the use of various means of communication.
- Ensure that teams carry well-stocked first aid kits and know how to use them.
- Ensure that vehicle maintenance and staff health are not issues before travelling into higher risk areas. This prevents delays in an emergency.
- If and when possible, consider tracking vehicle or team movements using GPS trackers to ensure real-time coordination in case of an emergency, unless there is a real-time threat from electronic warfare/surveillance, as in the cases reported in 2024 in Israel/the oPt, Lebanon, Syria and Ukraine.
- Ensure that dedicated contingency plans are developed and trained for among teams operating in unsafe areas, including mobile teams and teams working in fixed locations.
- If and when relevant, consider building or reinforcing safe areas that may shelter the team and beneficiaries of the programme during an attack.
- Monitor contexts and consider flexible strategies and awareness training if the use of thermobaric weapons becomes prevalent.
- Minimise staff time spent in areas where drones have been seen or are active, and adequately alert and prepare the population about the time of the services/activities being offered, so that they also do not spend unnecessary time exposed to unnecessary risks.
- Try to avoid creating routines that can be identified and exploited by potential attackers – e.g. using the same route at the same time on a particular day, always visiting a particular location on a particular day/at a particular time, etc.

Operational measures to avoid being mistaken for a military target

Ensuring staff safety during movements

- Avoid travel at times of low visibility when humanitarian actors might be mistaken for combatants – dusk, night-time, or during snow/dust storms or fog.
- Understand the threat perception of your organisation's vehicles – this will determine whether or not to use logos or how to “appear” to a drone. The aim is to reduce the possibility of a vehicle being identified as a possible target by making it blend in with other traffic.
- Do not use vehicles that resemble combatants' vehicles or might be associated with combatants.

- Avoid using camouflage or other visual resources that may be locally associated with conflict parties.
- Use civilian vehicles that blend in with others.
- Carry out a context-specific risk assessment and identify the benefits and risks of using powerful communication systems that require, for example, a visible external antenna, or providing staff with personal protective equipment. Such systems increase protection, but can in some contexts increase the potential for a vehicle or personnel to be targeted by a drone.
- Adjust convoy formation to contexts. In contexts where conflict parties are willing and able to respect the humanitarian mission, being clearly visible as a humanitarian convoy will enhance protection. In other contexts, misidentification can lead to targeted attacks. In contexts where humanitarian actors are deliberately targeted, seek deconfliction support and ensure that vehicles in a convoy are irregularly spaced in terms of both time and distance.
- When the contexts where the situation assessments suggest that a humanitarian convoy may be mistaken for military activity (or there are fears of deliberate attacks), separate vehicles in a convoy by increasing the distance between them to several kilometres to reduce the likelihood of being mistaken for military movement during visual or radar surveillance. Understand and take into account the tools/equipment used by conflict parties to identify targets. The need to maintain communication between vehicles in a convoy will give it a far larger electronic signature than otherwise, potentially making it more suspicious to some more technically capable electronic warfare operators.
- Adapt communication practices to the context in which your organisation is operating. Many conflict parties monitor the use of mobile phones, satellite phones, and radios, and use them for intelligence gathering, target identification, and instructing drones to attack a particular vehicle/location. Even encrypted messages/communications can give clues about locations used, timings and the size of an organisation.
- Consider the benefits and risks of using different communication systems. Local SIM cards can ensure that the digital signature does not stand out. The use of satellite phones and foreign SIM cards will give your operation a recognisable signature.
- Armoured vehicles can provide some protection against collateral damage, but are generally ineffective when they are directly targeted by first person view (FPV) drones. They are generally less manoeuvrable and may also increase the risk of being mistaken for a military vehicle.
- Plan safe routes and in particular try to avoid “choke points” such as bridges, sharp bends, tunnels or cuttings where vehicles are forced to slow down and thus become easier targets.

Ensuring staff, partner and beneficiary safety at project sites

- Design programmes in ways that reduce crowd sizes at points of aid delivery or meetings with partners to reduce the appearance of a point of interest.
- Space out the timing of aid deliveries to keeps crowds small.
- Do not establish patterns of certain services being available on a particular day or at a particular time, because this risks provoking an attack or leading to crowds building up through word of mouth reports.
- Keep activities outside if possible unless aid gatherings are at risk of being deliberately targeted.
- Ensure that staff and beneficiaries are informed through the use of clear and contextualised visual signs where they should move to in case of an attack.
- Ensure that the risk management procedures of humanitarian activities account for the presence of groups with specific needs, such as people with reduced mobility, children, or people who only speak a local language and may not understand quickly shared instructions.
- Ensure that risks related to humanitarian services and activities are assessed and monitored in terms of both the safety and security of the humanitarian team, as well as partners and beneficiaries.
- Consider access roads that people use to reach humanitarian support. Consider the safety of roads for patients or beneficiaries, the availability of transport, how long people will have to travel, and the communication means available to them when they are seeking access to humanitarian services.
- Whenever feasible, aid agencies should provide partners with the same degree of security-related capacity-building that they provide to their own staff, in order to equalise the capacity to manage risks and security, encourage good practices, and reduce risks caused by lack of information and experience in aid agency security risk management.

Using humanitarian diplomacy and deconfliction to avoid being targeted

- If possible, clarify the reasons for your presence and activities with conflict parties/groups or coordinate/deconflict your activities with local military/political leaders. Be aware that their security concerns and willingness to engage with and support humanitarian operations may change when the wider conflict situation does. Their support will reduce significantly if an area is perceived as being at greater threat from the conflict party they perceive as their opponents.
- Use the capacities and trust placed in large humanitarian organisations to establish contacts and facilitate dialogue for negotiations. In international relations, for example, countries or international organisations may offer their «good offices» to help de-escalate tensions or resolve conflicts peacefully.
- Stay in contact with partners and front line operators and seek to negotiate protection on their behalf by working through the humanitarian system.

Providing guidance and training for personal safety and security when encountering armed drones

DO'S	DON'TS
<ul style="list-style-type: none"> • If at home or in an office where a drone is present, keep away from windows. If it safe to do so, close curtains or shutters. • If the space is regularly used, cover windows with blast film (or even duct tape) to reduce the risk from flying glass. 	<ul style="list-style-type: none"> • Don't look outside to observe or video the drone. • Don't overtly take photographs or video of drones, because this may antagonise armed actors. • Don't stay in or use upper floors in a building that might be targeted.
<ul style="list-style-type: none"> • Seek cover – where possible, try to place two solid walls between you and the exterior . • Try to ensure that there are at least two exits from any place of shelter. • Sleeping mats with metal cores will provide an individual with limited protection from drones fitted with thermal cameras, if such mats are available. 	<ul style="list-style-type: none"> • Yoga mats do not provide cover to individuals during drone attacks, as has been claimed in Ukraine.³³
<ul style="list-style-type: none"> • If you are outside when a drone is present, seek cover. • Look for a solid structure such as a building, bridge or underpass if one is available. • Look for a cellar or any other building that can provide the “two wall rule” cover. • At the very least lie flat, ideally under something that will screen you from the drone camera and if possible in a dip/fold in the ground (because explosions spread upwards in a “V” shape). • Be aware that more advanced drones can detect heat signatures. 	<ul style="list-style-type: none"> • Don't try to outrun a drone. Drones travel faster than humans. Doing so may highlight yourself as something suspicious or a potential target. • Movement attracts drone visual sensors, so ideally move slowly and smoothly, rather than with panicky or jerky movements.
<ul style="list-style-type: none"> • Vehicle dashcams or discreet body cameras may be less visible ways of recording images, but are still not safe to use in all environments. 	<ul style="list-style-type: none"> • Don't attempt to destroy, neutralise or take control of the drone.

Collective action to protect the humanitarian space from the use of armed drones

- Collective action for the protection of the humanitarian space refers to efforts undertaken by groups of individuals and organisations where the security risk efforts of an individual organisation are insufficient to ensure safe humanitarian access.
- Collective action relies on cooperation, shared resources and a collective commitment to humanitarian principles.
- Collective action to seek protection of the humanitarian space can take the form of communications targeted at the UN level and governments, in negotiations with conflict parties, or communications aimed at the general public.
- Depending on the context, collective action can take the form of public advocacy statements, confidential conversations, and providing technical information in support of particular diplomatic positions.
- Collective action can involve the sharing of information and advice among aid agencies, and the provision of support by international aid agencies to national partner NGOs and volunteers organising front line aid.
- At the diplomatic level, collective action can communicate the impact of armed drones on humanitarian operations for consideration under the existing mechanisms of the Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas (EWIPA) and the Arms Trade Treaty (ATT).³⁴
- Reckless action by an aid agency can jeopardise humanitarian access for the aid agency itself – and for the entire aid community. All decisions related to collective action to protect the humanitarian space must take into account the possible consequences beyond any immediate needs and actions.

NGO collaboration to protect the humanitarian space from the use of armed drones

- NGO cooperation can provide safe and secure information-sharing mechanisms to report and inform others of suspicious drone activity.
- Agencies should monitor and report incidents/near misses to security risk managers and other relevant coordination groups.
- Conflict parties, authorities, and local leaders should be informed that aid agencies monitor and report threats and incidents for the purpose of internal risk management, and not to hold a conflict party accountable for particular actions. Authorities and conflict parties may also be informed that aid agencies do not investigate actions, but do review incidents to ensure better planning and risk management.
- Organisations must have clear protocols for information-sharing procedures in particular if critical incidents occur.

INGO and LNGO collaboration for the protection of the humanitarian space from the use of armed drones

- National partners have the right, as citizens of the country, to take independent decisions on recording incident details. At the same time, when international non-government organisations (INGOs) and national non-government organisations (LNGOs) are operating in partnership, the stakes and procedures related to recording and publicising incident-related information should be discussed, and larger, more experienced aid agencies have the ethical responsibility to train and share knowledge with local, smaller organisations.
- Just like international aid agencies, local partners are bound by medical ethics and humanitarian principles when providing care and aid based on beneficiary needs. At the same time, larger international aid agencies have an ethical responsibility to support smaller local partners and help them to understand and incorporate such ethical responsibilities into their own practice, thus reducing the knowledge gap and the inequitable access to capacity-building.

Post-incident care and action

- Never blame the individual or the organisation that came under armed drone attack for the way they dealt with or responded to the attack. Shaming actions may shut down communication, reduce trust and weaken collective action.
- Whenever aid agencies are targeted, the key fault lies with the conflict parties that carried out the attacks and did not respect their IHL obligations.
- Constructive approaches to post-incident management can support better practices in the future.
- Identify the underlying structural and procedural challenges that may put smaller NGOs at greater risk, because they may be operating with unequal resources and access to information in comparison to larger agencies.
- Seek to identify a variety of different mechanisms to enhance the collective protection of the humanitarian space.
- Legal accountability for drone attacks remains rare. Collective action can promote accountability to hold those in breach of IHL responsible for their actions.
- Support staff or family members of staff who have been killed if they choose to take legal advice. If in-country legal advice is not safe, consider advising them to approach **Legal Action Worldwide**.
- Ensure that survivors receive appropriate care and families of aid workers who have been killed receive support. Consider seeking support from **Protect Aid Workers - Support for Aid Workers at Risk**.

Annex 1

Table 1: Incidents involving drone-delivered explosives affecting aid or health programmes attributed to named state forces

	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total incidents
Armed Forces of the Russian Federation	1						1	26	79	107
Armed Forces of Türkiye					1	2	4	8	3	18
Armed Forces of Ukraine									4	4
Burkinabé Armed Forces								2		2
Eritrean Defence Forces						1				1
Ethiopian National Defence Forces						2	5	1	7	15
Islamic Revolutionary Guard Corps (Iran)							1			1
Israel Defence Forces						1		10	150	163
Mali Armed Forces									3	3
Myanmar Armed Forces								3	16	19
Syrian Armed Forces	1									1
US military						1				1

Table 2: Incidents involving drone-delivered explosives affecting aid or health programmes attributed to named non-state or local resistance forces

	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total incidents
Fuerzas Armadas Revolucionarias de Colombia									1	1
Karen National Liberation Army (Myanmar)								1		1
Libyan National Army				1						1
People's Defence Force (Myanmar)									2	2
Rapid Support Forces (Sudan)								2	6	8
Shia al-Houthi (Yemen)						1		3		4

Additional resources

<https://visitukraine.today/blog/990/list-of-things-to-put-in-an-emergency-suitcase-and-basic-rules-that-will-save-lives-during-missile-strikes>

Endnotes

1 See <https://geospatialworld.net/prime/business-and-industry-trends/history-of-drones-in-conflict-zones-2/>

2 Commercially produced munitions (from most countries, including Russia, China and NATO members) are tested and marketed on the basis of “precision to circular area probability” (CEP – see https://en.wikipedia.org/wiki/Circular_error_probable). Very few munitions, except for sniper rifle rounds and a few really advanced missiles, will be expected to (or marketed as being able to) hit an aim point target 100% of the time.

3 Techniques for manipulating the global positioning system (GPS) data and misleading a GPS receiver about an objects actual location.

4 See https://www.moore.army.mil/Infantry/DoctrineSupplement/ATP3-21.8/appendix_f/CombatTechniquesofFire/CharacteristicsofFire/index.html.

5 These figures include six health care workers working with aid agencies, which have been counted in figures for health care worker casualties.

6 For 23% of cases the information on the local context was not included in the report recording the death.

7 See [Aid Worker Security Report 2014.pdf](#).

8 These figures only include aid workers killed by conflict actors and do not include aid workers killed in road traffic accidents.

9 This data can be accessed [here](#). All numbered incidents referred to in the footnotes that follow come from this source.

10 Incident number 29147.

11 Incident number 30586.

12 Incident number 61107.

13 Incident number 46089.

14 Incident number 53319.

15 Incident number 81775.

16 Jama'at Nusrat al-Islam wal-Muslimin.

17 Incident number 44848.

18 Incident number 42805.

19 Incident number 43686.

20 Incident number 71152.

21 Incident number 24193.

22 Incident number 39623.

23 Incident number 46127.

24 This figure also includes 27 incidents that affected both health care and aid programmes.

25 Incidents number 56204; 56205; 56206.

26 Incident number 45899; quadcopters are a type of drone.

27 Incident number 47157.

28 Incident number 81742.

29 See Annex 1 for detailed information on named actors who have deployed drone-delivered explosives that affected health or aid operations.

30 Incident number 29292.

31 Incident number 75703.

32 Incident number 75736.

33 See <https://foreignpolicy.com/2024/09/11/suicide-drones-killing-civilians-syria-ukraine-gaza/>.

34 Armed drones, which are often categorised as “combat aircraft” or “unmanned aerial vehicles (UAVs)” that are used for military purposes, may fall under the ATT if they meet certain criteria related to their design and use in combat. However, unarmed drones used for surveillance or civilian purposes may not be covered explicitly unless their transfer is determined to have significant risks, such as being diverted for unauthorised uses or contributing to human rights abuses. In practice, the treaty obliges signatories to consider the potential consequences of any arms transfers for peace and security and human rights, which could, by extension, apply to drones if they are likely to be used for violent purposes or to support conflict.

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As an **H2H** (humanitarian-to-humanitarian) association, Insecurity Insight supports the work of aid agencies; the providers of health-care, education, and protection services; and other civil society organisations by providing publicly available information that humanitarian organisations can use to design evidence-based policies. We collect and analyse data about violence against civilians and damage and destruction of vital civilian infrastructure in order to strengthen civilian protection and the delivery of aid in armed conflict.

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