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

July 2024

Insecurity Insight

Reported incidents and most commonly reported concerns in 2023			
822	**488**	**129**	**209**
Recorded incidents of explosive weapons use affecting health care	**Health facilities damaged/destroyed**	**Health transportation damaged/destroyed**	**Health workers killed**

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. The health care system is also indirectly affected by the cumulative and reverberating effects on civilian infrastructure of the use of explosive weapons. Access to health care requires unhindered road access to health facilities for wounded and sick people, for health workers to come to and leave their places of work, and for medical supplies to reach hospitals and pharmacies. Hospitals are also dependent on electricity, water, fuel and sewage systems, which, if damaged or destroyed, adversely affect the functioning of the health care system. The sustained use of explosive weapons will almost certainly have reverberating consequences for a health care system that will continue long after ceasefires are agreed, depriving communities of access to health care for long periods of time.

Despite the normative framework of international humanitarian law (IHL), which protects health care during conflict, and international human rights law, which enshrines people's right to the highest attainable standards of mental and physical health, health care during conflict is under attack.

The **Safeguarding Health in Conflict Coalition** (SHCC) identified over 2,500 incidents of violence against health care during conflict in 2023. There is an urgent need to strengthen the protection of civilians from the humanitarian consequences of the use of explosive weapons in populated areas, as recognised by the Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas (Political Declaration) of 2022.[1] By endorsing the Declaration, states both recognise the harms experienced by civilians from the use of explosive weapons in populated areas and commit to working to prevent and address these harms together with the United Nations (UN), the International Committee of the Red Cross (ICRC) and civil society both during and after conflict.

This document discusses the impact of explosive weapons use on the global health care system in 2023. It provides more details and updates to the statistics reported in the **Explosive Weapons Monitor's** 2023 annual report.

Overview of key trends in 2023

- In 2023 the Safeguarding Health in Conflict Coalition (**SHCC**) report documented a 25% increase in violence against or obstruction of health care in conflicts across 30 countries or regions, which was over 500 more incidents than the previous year. The escalation of two new conflicts in Sudan and the Gaza Strip in particular saw health care immediately come under attack, while attacks on health care also continued at an unrelenting pace in Myanmar and Ukraine. In these incidents, health facilities, including hospitals, primary health centres and ambulances, were damaged, destroyed, violently entered or looted, while health workers were killed, injured, kidnapped or arrested.

- These conflicts have also seen an increase in the use of explosive weapons in populated areas. The **Explosive Weapons Monitor** documented an increase in the recorded civilian casualties caused by explosive weapons that was primarily attributed to a relentless campaign of aerial attacks on Gaza, which is a very densely populated area.

- Explosive weapons refer to a broad category of weapons that use high explosives to create a zone of blast and fragmentation in the area around the point of detonation. The many types of explosive weapons range from small weapons, such as improvised explosive devices (IEDs) or hand grenades that are directly placed in the location they detonate, to larger air-delivered or ground-launched explosive weapons such as missiles, artillery shells and aircraft-delivered bombs.

- The use of explosive weapons in populated areas results in mass civilian casualties and injuries and causes direct, significant damage to and or the destruction of civilian infrastructure such as health facilities; schools; homes; and energy, food, water and sewage systems. Their use also has an indirect and cumulative impact on affected communities. Injuries caused by explosive weapons often require specialised medical and psychosocial care both immediately and in the longer term, while the wide-scale destruction of communities makes post-conflict reconstruction complex and costly.

- In 2023 the use of explosive weapons affecting health care increased compared to the previous year. A high number of incidents were documented in Myanmar, Ukraine and the occupied Palestinian territories (oPt), while an increase in incidents was also observed in the DRC, Sudan and Syria.

- Incidents with an impact on health care attributed to the use of explosive weapons by various state forces continued to increase in 2023, with nearly three-quarters of all reported incidents being attributed to state armed forces.

- The majority of documented incidents in which explosive weapons affected health care involved air-delivered weapons. This is a notable trend compared to 2022, when incidents impacting health care were more commonly attributed to ground-launched explosive weapons. State actors were 11 times more frequently identified as users of air-delivered explosive weapons than non-state actors.

- The use of drone-delivered explosives with an impact on health care also increased in 2023. The majority of this use was attributed to state forces.

- The use of explosive weapons in urban areas has devastating consequences for civilians and their communities, including the health care system. Some of these consequences are immediate and are directly caused by the blast waves from the explosions. However, the use of explosive weapons in populated areas also has a cumulative effect on conflict-affected communities that may remain long after the conflict has ended.
- The impact of the use of explosive weapons in populated areas affects the ability of the health care system to provide health care and people's ability to access such care. In 2023, 129 incidents of explosive weapons use were recorded in the vicinity of a health facility, impacting communities' ability to reach health facilities and medical teams' ability to reach people severely injured in the conflict.

Data used in the report

This report uses the incident data on violence against health care attributed to the use of explosive weapons from the SHCC 2023 report. Incident numbers given in footnotes are those used in the SHCC report. The incident data is compiled from open sources and partner-agency contributions of information on incidents of violence against and obstruction of health care in 2023, based on the WHO definition of attacks on health care and the definition of explosive weapons given by the **UN Office for Disarmament Affairs**. Access to sources differs among countries, and each source has its own strengths and weaknesses. The report's data is available on the Humanitarian Data Exchange (**HDX**). For the full description of the methodology used in the current report and incident verification, please see the section on **methodology** in the SHCC report.

Introduction

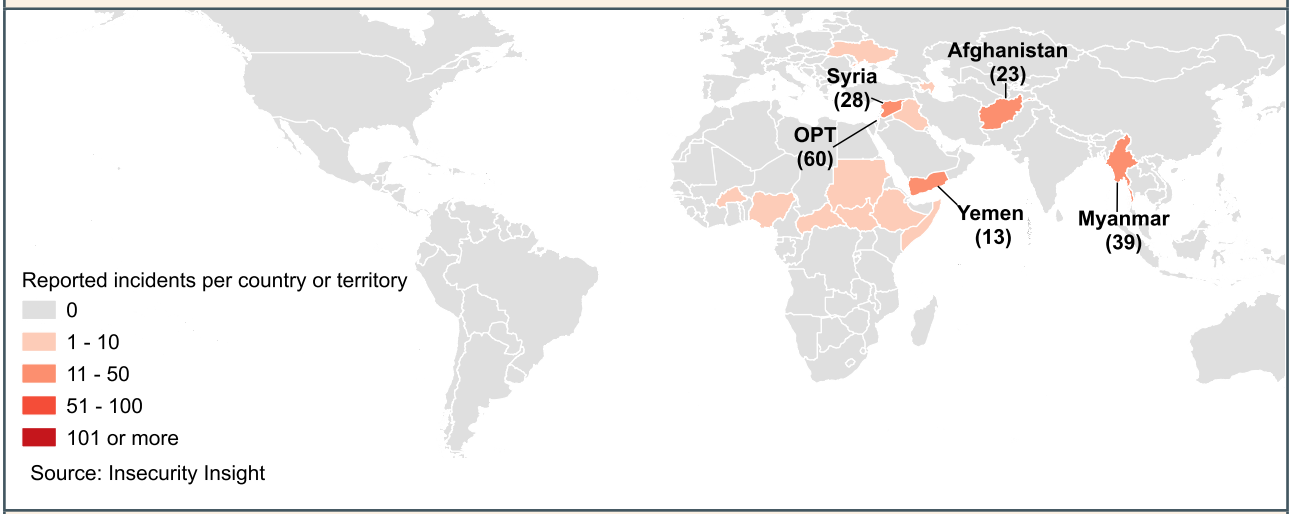
In 2023 the use of explosive weapons affecting health care increased compared to previous years. At least 822 incidents of explosive weapon use affecting health care infrastructure or health workers was documented across 20 countries. These incidents damaged or destroyed health care transportation and facilities, including hospitals, health clinics, pharmacies and field hospitals, and killed and injured health workers. Over 80% of reported incidents involving the use of explosive weapons occurred in Myanmar, the oPt and Ukraine, and were carried out by the Myanmar Armed Forces in Myanmar, the Russian Armed Forces in Ukraine and the Israel Defense Forces (IDF) in the oPt. On average, health care was affected by explosive weapons use twice per day, and these attacks occurred at a time when millions of people in these conflict-affected countries were already suffering the effects of war, including increased health needs from a rise in physical injuries, massive displacement, and the staggeringly widespread deprivation of food and other basic needs.

In the latter part of the year the reported use of explosive weapons increased drastically following an intensive bombardment campaign by Israeli forces in the oPt. At least 312 incidents involving explosive weapons use that affected health care across the Gaza Strip were documented in just three months. An increasing number of incidents were also reported in Myanmar, Syria and Sudan compared to previous years, following an escalation of violence in all three countries. New incidents were also reported in Israel following an attack by Hamas and other armed groups on the country on 7 October 2023; in Lebanon caused by the IDF; and in Azerbaijan, Haiti, India, and Kenya.

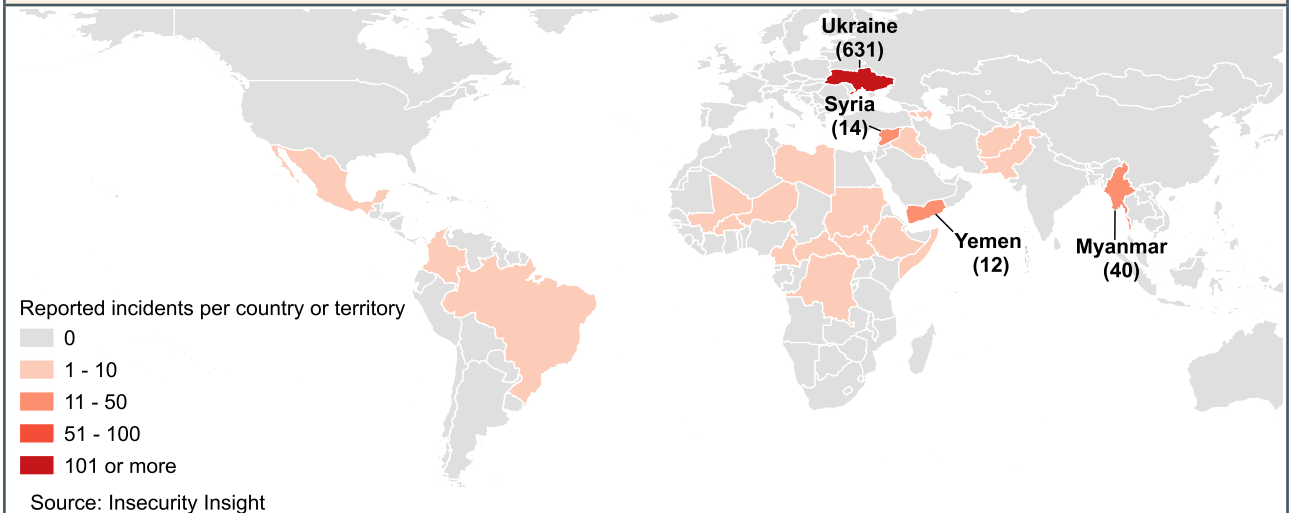
Download the data from this report on HDX

Map 1: Known locations of reported incidents involving explosive weapons use that affected health care, 2021-2023

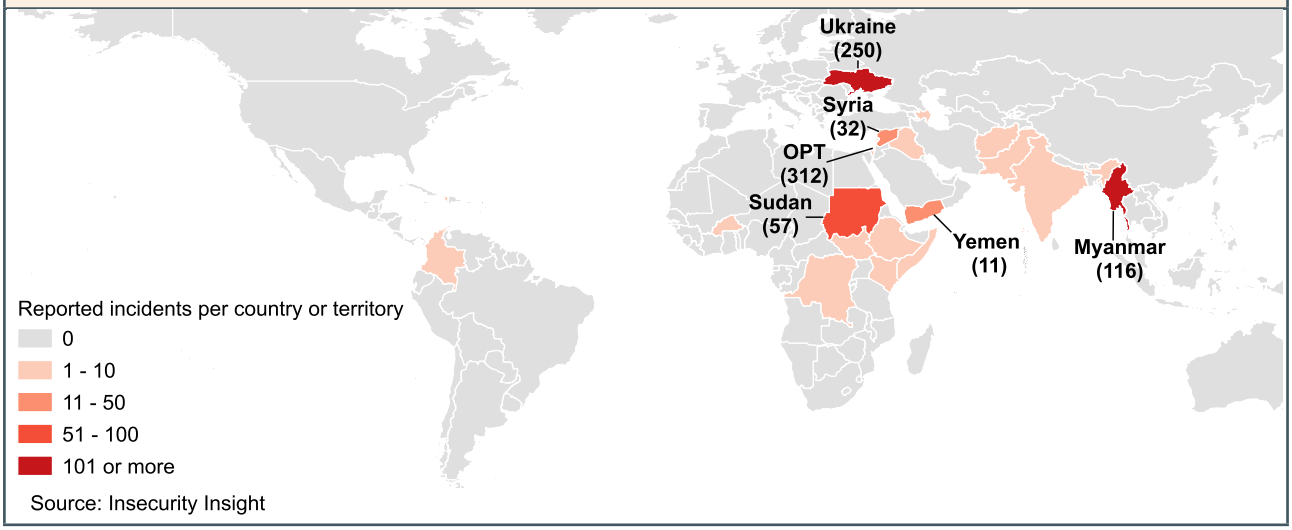
2021



2022



2023

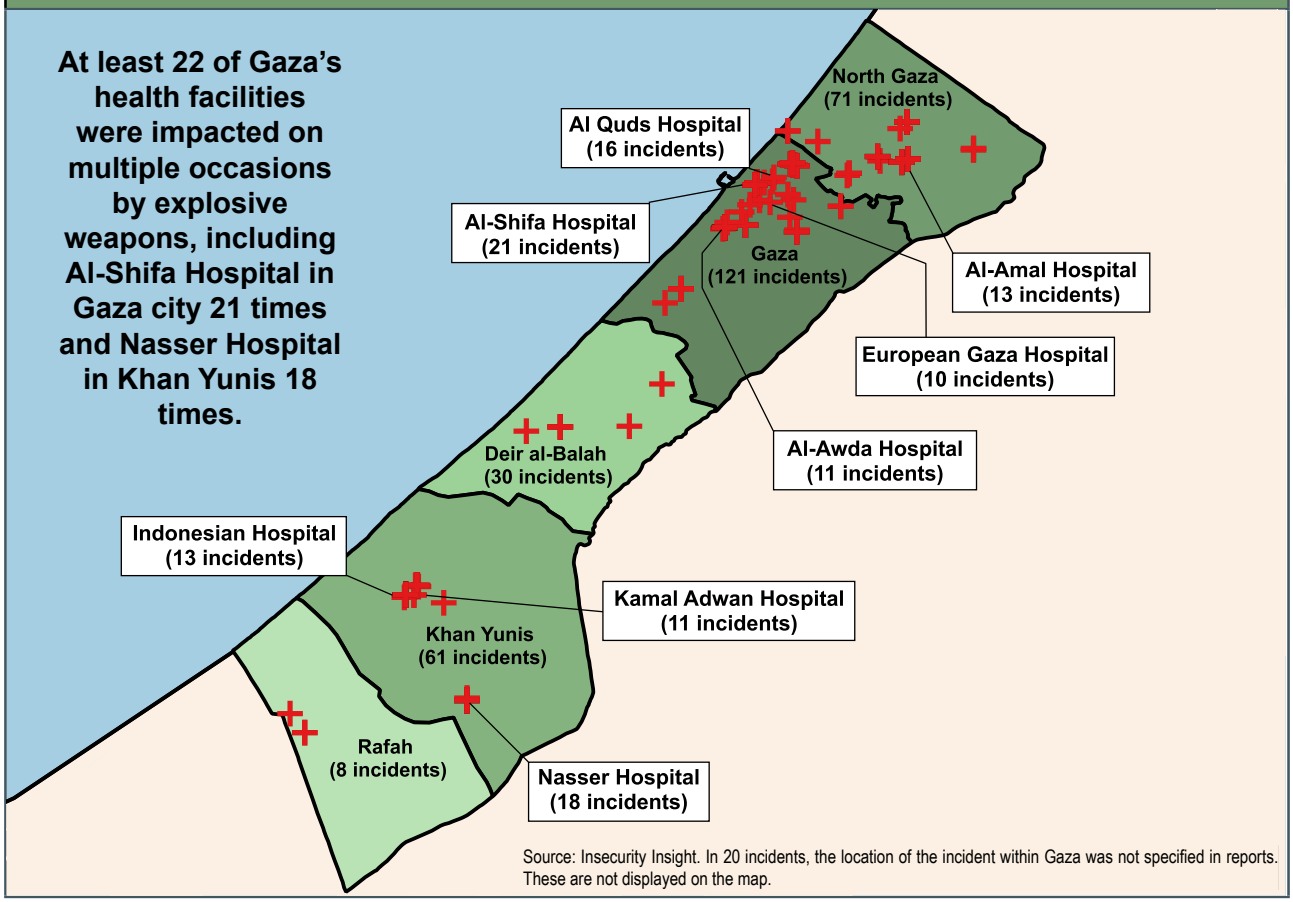


Health care facilities damaged by explosive weapons

In 2023 at least 144 named health care facilities reported damage or destruction from the use of explosive weapons in 488 incidents. Almost a third of health facilities reported more than one incident, highlighting the cumulative effects of explosive weapons use on the health care system over time during conflict. It raises questions of how it is possible that the international normative systems designed to protect health care during conflict fail repeatedly in so many conflicts. For example, in Somalia, the international non-governmental organisation (INGO)-supported Los Anod General Hospital was hit five times in February 2023 by mortar bombs and artillery shelling that damaged the solar power system and the hospital's oxygen plant, and paused the work of the paediatric ward and blood bank services.[2] An additional attack on 8 July wounded seven hospital staff and three caretakers and caused significant damage to the facility, resulting in the INGO deciding to withdraw its staff and support.[3] In another example, the Ye-U Traditional Medicine Hospital in Myanmar, which had been occupied by the Myanmar Armed Forces, was hit at least seven times by local resistance forces using drone-delivered explosive weapons, while the Barzilai Medical Center in southern Israel was struck on three separate occasions in the span of one week,[4] forcing it to relocate its gynaecology and high-risk pregnancy wards to an underground complex.[5]

Explosive weapons also damaged or destroyed at least 129 ambulances or health care vehicles.

Map 2: Known health facilities affected by violence in the Gaza Strip, October 07-December 31, 2023



Source: Insecurity Insight. In 20 incidents, the location of the incident within Gaza was not specified in reports. These are not displayed on the map.

Health workers killed by explosive weapons

Explosive weapons killed at least 209 health workers in 2023. Health worker casualties from the use of explosive weapons rose dramatically in 2023, primarily as a result of an intensive IDF aerial and ground offensive in Gaza that killed at least 121 Palestinian health workers between October and December 2023. An increase in health worker casualties caused by explosive weapons was also documented in Somalia, Ukraine and Sudan. Health workers were killed while on duty inside health facilities, while travelling in ambulances or other health care vehicles, and while attempting to reach civilians injured or killed by explosive weapons dropped on their communities. In the DRC, a nurse was killed after being caught in fighting with mortars and automatic weapons between the M23 rebel group, the Armed Forces of the DRC and the Collective of Movements for Change/Self-Defence Force of Congolese People.[6] In Israel, Myanmar, the oPT, Sudan and Ukraine at least 37 health workers were killed while off duty inside their places of residence after air strikes or artillery shelling hit their homes. Deaths such as these have devastating effects on the victims' colleagues and contribute to reducing the health care work force during periods of rising health needs resulting from the conflict. A total of 22 military medics were also reportedly killed.

Health workers working in national health structures were most frequently affected by violence from explosive weapons use during conflict. Some health workers who were killed in 2023 were part of the national or international staff working with national societies of the Red Cross, INGOs, the ICRC or UN agencies. Frequently, international aid agencies evacuated international staff during periods of intensive explosive weapons use. National staff often stayed in the affected areas to remain with their families and because of a strong sense of duty to remain and care for the injured and sick

Figure 1: Reported affiliations of health care workers killed by explosive weapons, 2023

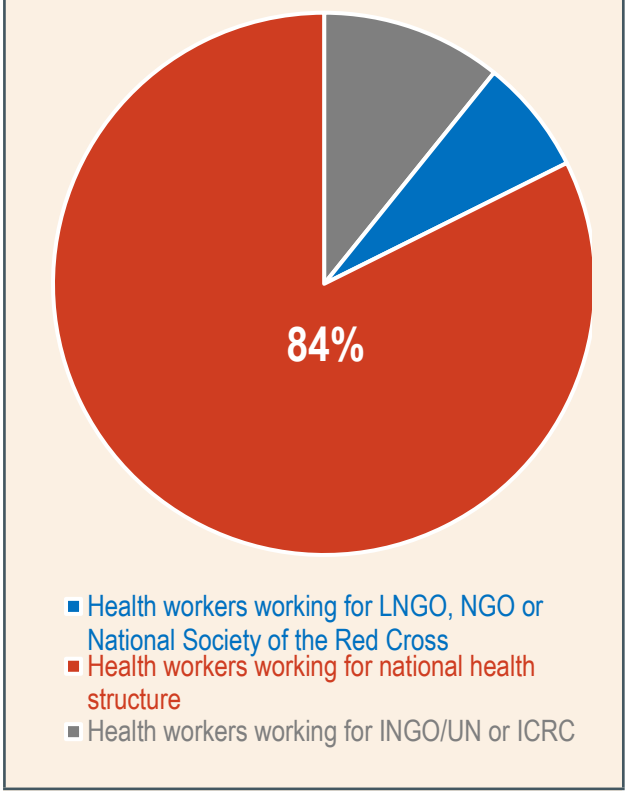
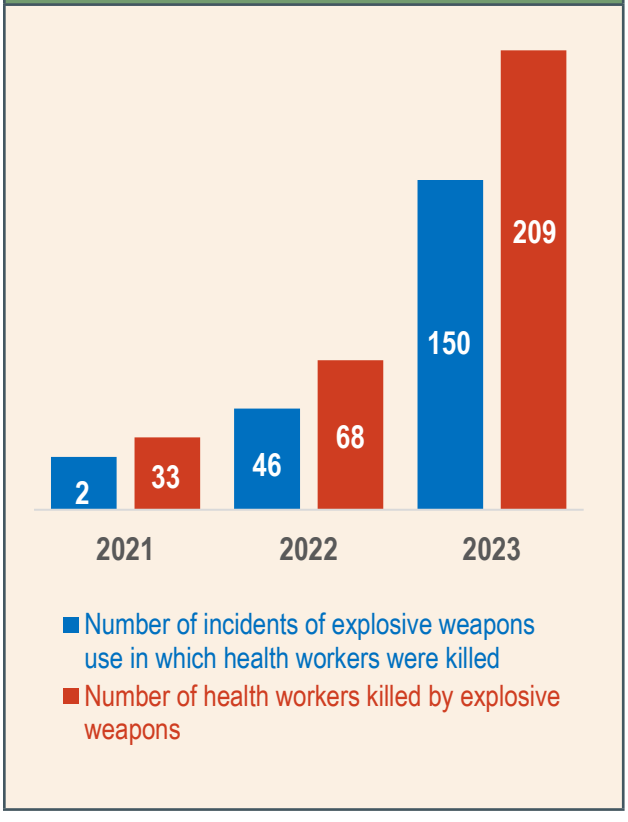


Figure 2: Number of health care workers reportedly killed by explosive weapons (310) in 220 incidents, 2021-2023

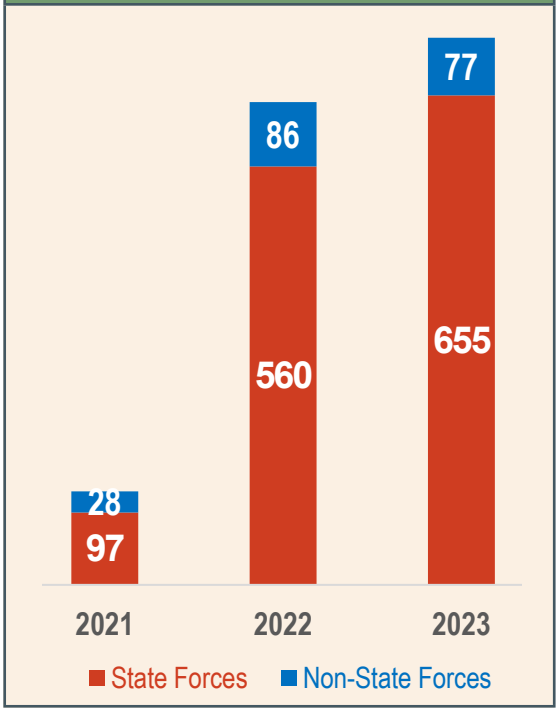


State forces' and non-state actors' use of explosive weapons impacting health care

The use of explosive weapons by state actors that affected health care continued to increase in 2023 compared to previous years, with more than three-quarters of incidents involving explosive weapons use that affected health care attributed to state actors – a 16% increase compared to 2022. The destruction to the health care system caused by explosive weapons use was particularly evident in Gaza. In just three months, at least 69 health care facilities and 31 ambulances were reportedly damaged or destroyed by air-delivered explosive weapons. By May 2024 **only 15 hospitals from a pre-war total of 36 were still operating** – but at a limited capacity. State forces also increasingly used drone-delivered explosive weapons.

Non-state armed actors were named in at least 77 incidents involving explosive weapons use affecting health care in 2023, a slight decrease from the previous year, when 86 incidents were attributed to named non-state armed actors, but an important rise compared to the 28 incidents recorded in 2021. Nearly a quarter of the 2023 incidents were attributed to the Rapid Support Forces (RSF) in Sudan, whose explosive weapons use damaged health facilities and killed and injured health workers following an escalation of violence in the country in April 2023. In Myanmar, there was an increase in explosive weapons use affecting health care perpetrated by various non-state armed groups, including the Arakan Army, the Karen National Defence Organisation and the Karen National Liberation Army. Incidents attributed to the People's Defence Forces in Myanmar decreased. No incidents were reported of explosive weapons use against health care facilities by the various Islamic State factions or by Jama'at Nasr al-Islam wal Muslimin.

Figure 3: Reported incidents of explosive weapons use by state forces and non-state actors that affected health care, 2021-2023



Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas (Political Declaration)

The Political Declaration, which so far has been endorsed by 86 states worldwide, reiterates states' obligations under applicable international law, particularly IHL, which aims to protect civilians and civilian objects during military operations. The Declaration obliges states to strengthen the protection of civilians and civilian objects both during and after armed conflict, and to address the humanitarian consequences that arise from armed conflict involving the use of explosive weapons in populated areas. It also encourages states to strengthen their cooperation and assistance and to actively promote the Declaration. Lastly, the Declaration also recognises the need to collect, share, and make publicly available disaggregated data on the direct and indirect effect on civilians and civilian objects with particular regard to the use of explosive weapons in populated areas. The Declaration stresses that the use of explosive weapons in populated areas has a devastating impact on both civilian lives and civilian infrastructure, including the disruption of the provision of basic needs and essential services such as health care, which will cause harm to civilians beyond a weapon's immediate impact area.

Table 1: Recorded use of explosive weapons affecting health care in 2023 attributed to state forces			
	2021	2022	2023
Azerbaijan Armed Forces in Azerbaijan			1
Burkinabé Armed Forces in Burkina Faso			2
Ethiopian Armed Forces in Ethiopia	5	3	1
Israel Defense Forces in the oPT and Lebanon	60		321
Myanmar Armed Forces in Myanmar	14	22	58
Russian Armed Forces in Ukraine	3	512	220
Sudan Armed Forces in Sudan			13
Syrian Armed Forces in Syria, mainly in north-west Syria	7	1	20
Turkish Armed Forces in Syria, mainly in north-east Syria	1	7	11
Ukrainian Armed Forces in the temporarily occupied parts of Ukraine		1	6
Yemen Armed Forces in Yemen			1

Table 2: Recorded use of explosive weapons affecting health care in 2023 attributed to non-state actors.			
	2021	2022	2023
Allied Democratic Forces in eastern DRC			1
Al-Qaeda in the Arabian Peninsula in Yemen			4
Al-Shabaab in Kenya		2	1
Arakan Army in Myanmar			1
Armed Forces of Somaliland and contested territory in Somalia		1	6
Hamas in Israel			4
Houthis in Yemen	3	1	4
Karen National Defence Organisation in Myanmar			1
Karen National Liberation Army in Myanmar			1
March 23 Movement in northeastern DRC			1
People's Defence Forces in Myanmar		24	1
Rapid Support Forces in Sudan			17

Reduction in the number of countries/territories in which the use of explosive weapons impacted health care in 2023 compared to 2022

Despite an overall increase in incidents involving explosive weapons use affecting health care in 2023, the number of countries or territories from which the use of explosive weapons with direct effects on health care were reported fell from 22 in 2022 to 20 in 2023. Underlying this small decrease are wider shifts in the countries where damage to health care systems was recorded. In 2022 the use of explosive weapons with effects on health care had been reported from Armenia, Brazil, Cameroon, the Central African Republic, Libya and Niger, but no incidents were recorded in these countries in 2023. In Mali, **despite an increase in violence against civilians in 2023**, no incidents involving explosive weapons use that affected health care were documented – a decrease from 2022, when five incidents were reported in Kayes, Mopti and Timbuktu regions.[7] In Ukraine, incidents involving explosive weapons use that affected health care more than halved in 2023 compared to 2022. This may primarily be due to a decrease in the use of ground-launched explosives in a period when the conflict's front lines remained in the eastern part of Ukraine, as well as the use of a sophisticated air-defence system that shielded populated areas from air-launched explosives to a considerable extent.

In Afghanistan, incidents involving explosive weapons use also continued to decline after the Taliban returned to power in 2021. This reduction in their use was also accompanied by a change in the type of explosive weapons used that impacted health care, with directly emplaced weapons such as hand grenades and IEDs more frequently used. Since 2021, no air-delivered and ground-launched explosives that affected health care were documented. In 2023, two incidents involving explosive weapons were reported in Afghanistan compared to nine incidents in the previous year. In one incident a hand grenade was thrown at an NGO-run public health centre by unnamed perpetrators,[8] while in October 2023 a remotely controlled IED detonated under a container belonging to an NGO-run health care facility. As a result, the clinic sustained substantial damage and the NGO temporarily withdrew from the area.[9]

Air-delivered explosive weapons

The use of air-delivered explosive weapons increased overall throughout the year. Prior to the intensive air-delivered campaign impacting health care that started in Gaza in October 2023, the general use of air-delivered explosive weapons had already increased by 14% compared to 2022, with an increase in use of air-delivered explosives with an impact on health care reported from Burkina Faso, Myanmar and Sudan.

It was the first time that the use of air-delivered explosive weapons affecting health care was reported in Burkina Faso, Lebanon and Sudan since monitoring started in 2016.

Two-thirds of the attacks using air-delivered explosive weapons that impacted health infrastructure were reported from just seven countries/territories: Burkina Faso, Myanmar, the oPt, Sudan, Syria, Ukraine and Yemen. Air-delivered explosive weapons damaged or destroyed at least 173 health facilities in 171 incidents. This also included incidents of health centres being damaged inside refugee camps, administrative buildings and compounds. In the oPt, in at least 28 incidents air-delivered explosives hit residential homes, killing at least 22 health care workers and profoundly affecting the health care work force. In the majority

of these cases, many of the health workers' family members who were inside their homes at the time of the attack were also killed. In one incident, an INGO doctor who specialised in maternal and child health care and his brother, a dentist, were killed together with eight of their family members after two Israeli air strikes hit their home in a seven-storey apartment building. It took days for his body to be recovered from the rubble of the building.[10]

Figure 4: Reported incidents of air-delivered explosives affecting health care, 2022-2023

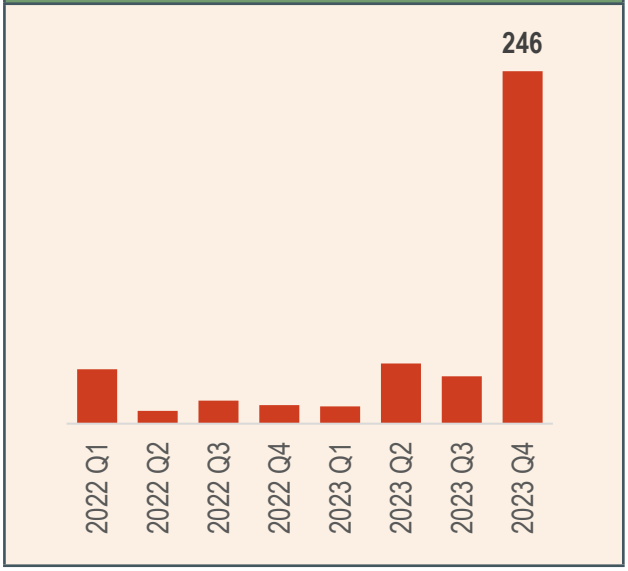


Figure 5: Reported incidents of air-delivered explosives that affected health care, 2022-2023

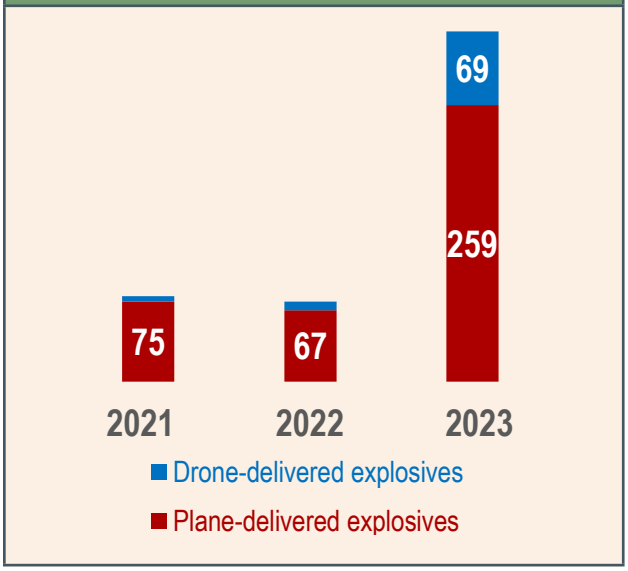


Image 1: The Dawtamagyi Hospital after the Myanmar military air strike on 24 March 2023

Drone-delivered explosive weapons

Since 2001 in Afghanistan and 2002 in Yemen, armed drones (also known as unmanned aerial vehicles or UAVs) have become a regular feature of military operations, with both state forces and non-state actors employing them to deliver explosive weapons, among other uses. The use of drone-delivered explosive weapons affecting health care also increased in 2023 and was reported in nine countries, compared to four in the previous year, highlighting the spread of the use of this method of delivering explosive weapons.

In 2023 state forces deployed armed drones 11 times more often to deliver explosive weapons that affected health care compared to non-state armed actors. For example, the Burkinabé Armed Forces used Turkish-made Bayraktar TB2 drones to carry out attacks on Islamist groups that also resulted in civilian harm. In one incident a drone strike hit an ambulance that was evacuating a pregnant woman, as well as a tanker truck, resulting in six civilian casualties,[11] while in a separate incident a drone strike hit a health care centre, killing four civilians, including children.[12]

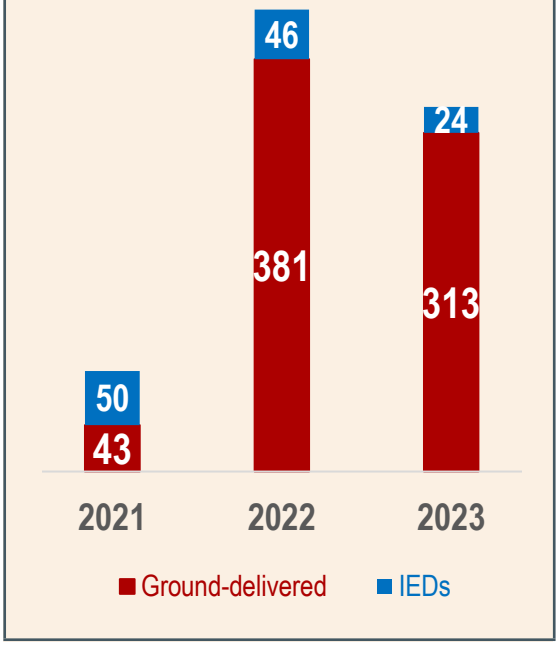
While high-technology military drones remain largely inaccessible to non-state armed actors, in recent years the commercialisation of drones has made it easier for these actors to obtain drones that can be adapted to deliver IEDs or other explosives. As a result, in 2023 there was a significant increase in their use (from one reported incident in 2022 to at least 24 incidents in 2023). In 2023 the use of drones to deliver explosive weapons that impacted health care was also more frequently reported from Myanmar,[13] Sudan (the RSF[14]) and Yemen (the Houthis[15]). In Myanmar, local resistance forces reportedly used drone-delivered explosives to carry out attacks on Myanmar military forces occupying hospitals and health care centres in at least 24 incidents. In October 2023 local resistance forces dropped 11 bombs from fixed-wing drones during a three-day period, striking a primary-level health centre and police station that had been occupied by the Myanmar Armed Forces. At the time of the attack, however, the health centre was not functioning.[16]

Ground-launched explosive weapons and IEDs

The use of ground-launched explosives impacting health care slightly decreased in 2023 compared to the previous year, when the majority of explosive weapons that reportedly impacted health infrastructure involved ground-launched explosives. Similarly to previous years, state forces continued to be frequently named as using ground-launched explosive weapons that impacted health care compared to non-state actors. However, in 2023 the RSF in Sudan and Hamas in Israel both used ground-launched explosives that damaged health infrastructure. In October 2023 a Syrian Armed Forces attack on Idlib governorate that primarily used ground-launched explosive weapons damaged health infrastructure and killed at least three health workers.

The reported use of IEDs and hand grenades that impacted health infrastructure continued to decrease in 2023 and was reported in only nine countries compared to the previous year, when the use of these types of explosive weapons was documented in 14 countries. In Pakistan, a health care facility was damaged after an IED planted by an unnamed perpetrator exploded,[17] while in Colombia a medical centre was damaged after a car bomb detonated in its vicinity.[18]

Figure 6: Reported incidents of ground-launched explosive weapons and IEDs that affected health care, 2021-2023



In Yemen and Kenya, non-state armed groups planted IEDs in roads used by ambulances and health care vehicles, resulting in damage to or the destruction of vehicles when these IEDs were detonated. In Yemen, IEDs planted by al-Qaeda in the Arabian Peninsula fighters in Abyan and Shabwah governorates damaged at least five Shabwani Defence Forces military ambulances,[19] while in Kenya, four health care officials were killed and two others injured when their vehicle hit an IED planted by al-Shabaab.[20]

Immediate and longer-term effects of explosive weapons use on the health care system

The use of explosive weapons in urban areas has devastating consequences for civilians and their communities, including the health care system. Some of these consequences are immediate and directly caused by the blast wave from the explosions. However, the use of explosive weapons in populated areas also has a cumulative effect on conflict-affected communities that may remain long after the conflict has ended. Most of the incidents discussed in this report occurred in urban areas, with almost two-thirds of incidents occurring in cities with a population over 100,000 people. When explosive weapons are used in populated areas they often have wide-area effects and cause death and destruction beyond their intended target, resulting in adverse effects on civilian personnel and infrastructure, including hospitals, pharmacies, medical warehouses and health care transport. They also damage or destroy electricity, water supply, and sanitation systems that are needed to maintain most civilian infrastructure, including health care and the production of vital supplies ranging from medication to equipment, all of which have severe consequences for the delivery and provision of essential services such as health care. The destruction of and damage to energy, food, water and sanitation systems also hampers the delivery of health care.

Intense bombardment campaigns on populated areas also destroy critical civilian infrastructure such as roads that are vital for bringing patients to health facilities, allowing health workers to move between their homes and workplaces, and ensuring that supplies can reach health facilities. In the Gaza Strip, the extensive bombardment campaign has **destroyed more than 70% of civilian infrastructure**, including main roads, making it almost impossible for medical vehicles to reach Palestinians in need. Insecurity Insight recorded at least **96 incidents** of explosive weapons use occurring in the vicinity of health facilities in Gaza. In nearly a third of these incidents, health facilities reported damage caused by shrapnel and blast waves, as well as disruptions to main access roads[21] and power outages.[22] Bombings in close vicinity to hospitals also put patients and health workers in danger and are highly traumatic for all who live through such incidents.

The use of explosive weapons in populated areas also hampers the delivery of health care. Unrelenting bombardments hinder and obstruct medical teams from reaching and assisting wounded civilians. In at least four incidents in Syria, the oPt and Ukraine, medical teams were hit by explosive weapons in likely double-tap strikes as they were responding to casualties caused by a previous bombing.[23] Health facilities are also likely to take preventive measures to decrease the threat from explosive weapons, such as closing or withdrawing services or making changes to their working conditions. In some cases, after a health facility is hit or due to the consistent threat of a health facility being hit by an explosive weapon, the facility is forced to close or withdraw its services. In Syria, after the Syrian Armed Forces fired over 1,150 artillery shells and missiles in Idlib and western Aleppo in October 2023, hospitals were forced to stop providing non-essential services and focused on providing emergency care to casualties of the attacks.[24] In Myanmar, after hospitals were bombed or seized by the Myanmar Armed Forces, **hidden hospitals** were set up in the jungle in order

to provide health care to resistance fighters and civilians, with the hospitals camouflaged so that they blended into their surroundings, while in one hospital the **operation theatre was put underground** in order to further protect it from any potential air strikes. In Kharkiv, Ukraine, entire hospitals or wards were **relocated** to basement bomb shelters. In Israel, as a result of the thousands of **rockets and mortars** fired from Gaza in October 2023, two medical centres in the south of the country that had treated most casualties during the first days of the conflict were forced to relocate some of their wards to more sheltered areas or underground complexes.

The use of explosive weapons against health care systems, workers and infrastructure also affects staff and patients in profound ways, with wide-ranging consequences for individuals and public health. After explosive weapons hit populated areas, health facilities are immediately overwhelmed with casualties caused by the blast waves. In such contexts health workers have to adapt quickly to more chaotic and overwhelming working conditions. They must deal with numerous patients with complex blast injuries that require trauma-specific skills that few health workers possess in non-conflict settings. Doctors need to quickly learn how to perform complex, life-saving operations on people with blast injuries, which at times have had to be **learnt via Skype from trauma surgeons** who were already experienced in treating such injuries in other conflict settings. In Khartoum, Sudan, doctors were forced to operate on patients using the light from mobile phone torches when their hospital was **left without electricity for 20 days** after the city's electricity supply infrastructure was struck by bombs. Injuries caused by explosive weapons often require multiple operations, post-operative care and rehabilitation; however, in such an environment this care is either limited or not available due to sustained attacks on civilian infrastructure and health facilities that seriously weaken the health care system.

Health care workers must also deal with high numbers of deaths following sustained attacks on the health care system. In Gaza, health workers were forced to bury casualties on hospital premises in mass graves due to the high number of casualties and the inability to evacuate corpses from hospitals due to constant shelling and sniper fire in their vicinity.

> **"Eight patients in the [intensive care unit] died before my very eyes .... It was the first time I had ever buried people on the hospital [premises]."**
> **A health worker in Gaza[25]**

Medical students and volunteers often assume important roles in overloaded health care systems when qualified medical staff are killed. Many of these students and volunteers work without pay and learn on the job. In one makeshift hospital in Myanmar the majority of a staff of 35 are under the age of 30.

In addition, the majority of health workers working in these environments are national staff with families, friends and colleagues living in conflict-affected areas. Some health workers are themselves displaced and are **living inside hospitals or in tents** close by. They may be required to treat their own families and friends, and are often also dealing with their own **personal losses**. Additionally, care workers may be torn between their duties to their patients and their families. Many work around the clock in order to cope with the daily influx of patients. During conflict, health workers work in extreme and stressful conditions. They are often exhausted and traumatised by what they witness and their inability to deliver care to the required high standards due to the circumstances imposed on them by the damaged

health care system. Few health workers receive the required mental health support. In some cases, they were reported to self-medicate with anti-anxiety drugs if they were available. Over the long term, especially as conflicts become more protracted, this affects health workers' ability to continue to provide health care and remain working, resulting in profound impacts on the future health care system.

We can cry the whole day, that's OK. But we have to stand up again. If we are not here, who will treat those patients?"
A health worker in Myanmar.[26]

Map 3: Between 07 October and 25 December 2023 Insecurity Insight recorded 14 incidents involving explosive weapons around the Indonesian Hospital in Northern Gaza, devasting the area around the hospital.

Image source: Planet Labs. Analysis and annotations by Insecurity Insight.

The use of explosive weapons in populated areas also changes communities' health care-seeking behaviours. In Syria, a **joint study** by the International Rescue Committee, Physicians for Human Rights, the Syrian American Medical Society, and Syria Relief & Development found that a high number of pregnant women in north-west Syria chose to undergo a caesarean section instead of a vaginal birth in order to reduce the time spent in a health care facility. They also avoided prenatal care visits. Patients with chronic conditions, such as kidney disease, diabetes and cancer, also struggle to access life-saving health care, because health facilities, including medical equipment, may be destroyed or damaged by explosive weapons.

After a Turkish drone strike hit a dialysis centre in Qamishli city in Syria and put it out of service in October 2023, dozens of **kidney patients were left without treatment**, resulting in the death of at least one of them. When the centre was able to resume service two months later, dialysis sessions were reduced due to the damage caused to the water station by the explosion. Additionally, patients may also have difficulties accessing health care when health facilities become overwhelmed with patients with blast injuries. In **El Fasher** in North Darfur state, Sudan, a maternity hospital was turned into a trauma centre dealing with civilian casualties. The hospital was the only one still functioning in the city after others needed to be evacuated or were severely damaged, resulting in the facility being overwhelmed with civilians with blast injuries, as well as sick patients and pregnant women, significantly increasing the number of patients in the hospital.

Conclusions

- Health care systems are particularly vulnerable to the impact of explosive weapons use in populated areas because they are often housed in large buildings in the middle of populated areas, and because they are dependent on numerous systems that support their operations (water and electricity supply systems, supplies of medication, etc.). Health care facilities provide critical services that are maintained throughout a conflict and function as important centres that provide hope for communities experiencing death and loss. Health care systems become more vulnerable from cumulative impacts the longer a conflict continues.

- It is very difficult to make any assumptions about armed actors' intent to destroy a health care system from evidence of the damage it sustains. Some technical factors related to specific weapons systems suggest that direct targeted attacks were carried out in some cases. Because of the wide-area effects of explosive weapons, the observed damage could be evidence of intent to target a particular health care facility or evidence of a failure to apply appropriate precautions in the attack.

- The extent to which the health care system is affected by an attack using explosive weapons also depends on the means and type of weapons being used that may vary according to the capabilities of the conflict party that carried out an attack, but conflict parties need to use such weapons systems in compliance with IHL.

Recommendations

For conflict parties:

- Conflict parties should refrain from using heavy explosive weapons in populated areas, and in particular in the vicinity of health care facilities and in ways that affect the civilian infrastructure required for the functioning of complex health care systems, due to the high risk of harm to civilians that results from the damaging or destruction of a health care system.
- Conflict parties should refrain from using air-dropped explosive weapons in populated areas due to the high risk of harm to health care infrastructure, health workers and patients.
- Conflict parties should refrain from using ground-launched explosive weapons in populated areas, and particularly in the vicinity of health care infrastructure, due to the high risk of harm to civilians in the wider populated area, health care infrastructure, health workers and patients.
- Conflict parties should avoid impeding the access of emergency medical transport and supply transport to health care facilities by the use of explosive weapons such as IEDs.
- Conflict parties should take into account both the immediate and long-term harm to civilians caused by the use of explosive weapons and must refrain from any act that would deprive a community of health care in the long term.
- Conflict parties should consider the expected civilian harm from the destruction of health care systems in all proportionality assessments that consider the expected civilian harm in relation to the military advantage of explosive weapons use during the targeting process.
- Conflict parties should include consideration of the impact of explosive weapons use on health care infrastructure in all battle damage assessments.
- Conflict parties should communicate the measures they take to ensure the protection of health care during conflict and their compliance with IHL to prevent disproportionate civilian harm resulting from the damaging or destruction of a health care system.

For states:

- All countries should endorse the 2022 Political Declaration and embed in their national policies and practices the recommendations of the UN Secretary-General and ICRC that parties to a conflict should avoid the use of explosive weapons with wide-area effects in populated areas.
- States that have endorsed the Political Declaration should actively promote its implementation and continue to review and revise their policies and practices to further strengthen the protection of civilians during conflict.
- States should comply with the requirements of the Arms Trade Treaty and avoid supplying or enabling users of explosives weapons who do not comply with IHL, because their use of explosive weapons can damage or destroy health care systems.

- Concerned countries should continue to publicly call for action to address the severe harm to individuals and communities caused by both the direct and indirect use of explosive weapons in populated areas.

For civil society organisations (CSOs) and the international humanitarian community:

- CSOs can monitor civilian harm following the use of explosive weapons that damages some part of a health care system.
- CSOs can highlight conflict parties' failure to protect health care and demand accountability and transparency in their targeting and proportionality decisions.
- The international medical community can support the training and development of medical guidance to address injuries from explosive weapons use.
- The humanitarian community can also play an important role in efforts to strengthen the protection of civilians and civilian infrastructure, including health care infrastructure, by implementing effective mitigation measures that reduce the vulnerability of health care systems.
- The international humanitarian community can increase its support for the mental health of health workers.
- The international humanitarian community can continue to support local health workers, including volunteers, by providing direct support and capacity-building training where possible.
- The international humanitarian community can support the supply of equipment needed to treat injuries from explosive weapons use.
- International NGOs can support the development of the security risk management capacity of local health care providers

For donors:

- Donors can find innovative ways to maintain their funding of health care systems affected by conflict. The discontinuation of funding in conflict-affected areas risks weakening health systems further.
- Donors can support mitigation measures to protect health care systems during conflict.
- Donors can support the training of local health care workers and provide whatever assistance they need to carry out their work.

Understanding vulnerability, means and intention to evaluate how explosive weapons use affects health care, in order to increase the protection of health care during conflict

The extent to which health care is affected by the use of explosive weapons during conflict is the result of the combination of three factors: the vulnerability of the health care system to the impacts of attacks, the means available to conflict parties to cause damage and destruction to the health care system, and the intention and internal accountability processes used by conflict parties to comply with the IHL requirement to protect health care systems during conflict. In each incident involving the use of explosive weapons that caused damage and destruction to the health care system, all three factors were present. Over time and in different locations the relative weight of these factors can be very different.

Vulnerability of the health care system

Health care systems are highly vulnerable to the impact of explosive weapons use. Health facilities are often situated in the centre of populated areas and depend on infrastructure such as water, electricity and fuel supplies to function efficiently. Most often, health facilities are large buildings – some might even consist of several buildings – and therefore present large areas of infrastructure at risk of damage from the wide-area effects of explosive weapons. Good health care depends on qualified staff, whose ability to work is diminished by insecurity caused by a conflict. Supplies of medication are frequently limited and the necessary cold chains are difficult to maintain. Medical equipment often becomes unreliable for use in the absence of electricity and internet connection. In most contexts health facilities are reliant on access by roads so that patients can access health care, medication and energy can be supplied, and health workers are able to leave their place of work for periods of rest and return for shifts to care for patients. This dependency on complex infrastructure makes the health system highly vulnerable to disruption from the effects of explosive weapons. Vulnerabilities can be mitigated, however. In some countries, such as Ukraine, highly effective air-defence systems have provided some protection against some forms of explosive weapons use, and adaptive practices have made the health system relatively resilient. However, in most other contexts, except Israel, automated air-defence systems are not available. Mitigation measures frequently include moving hospitals underground.

The potent power of explosive weapons to cause damage and destruction

Several types of explosive weapons have a very high destructive force. As a weapon system, explosive weapons usually cause more damage and destruction to the health care system than, for example, firearms. Technical characteristics affecting accuracy, precision, and blast-and-fragmentation radius vary, and different types of explosive weapons systems provide conflict parties with varying degrees of means to damage or destroy a health care system. The specific characteristics of each system need to be taken into account when assessing the obligation of combatants to prevent a disproportional impact on the health care infrastructure. The use of explosive weapons with a large explosive yield, such as bombs or missiles, or explosives that lack precision or accuracy, such as artillery shells and mortars, should all be avoided in populated areas, and in particular in the vicinity of hospitals. Changes in costs and the increasing availability of explosive weapons also influence the ways in which conflict parties acquire such weapons systems and how frequently they can be deployed.

The methods used to deliver explosive weapons also affect their potential to cause damage to health infrastructure. The lower costs of using drones rather than aircraft to deliver explosive weapons increase the ability of a wide range of actors to use explosive weapons in ways that may affect health care systems. The increasing ability to remotely air-deliver explosives using targeted missiles or by dropping them from drones has decreased the risks for those using these weapons and has brought down the costs of using explosive weapons in relation to the risk of loss of life among those using these weapons. The Russian Armed Forces' use of glide bombs to attack Ukrainian border towns has allowed explosive weapons to circumvent air-defence shields.

All these factors contribute to strengthening the ways to potentially cause damage to health care systems. In the past few years, at the same time that the costs of delivering explosive weapons have reduced, the risk of health care systems being damaged has risen. The destructive force of explosive weapons can be addressed through strong internal processes for compliance with IHL and controls in international transfers of weapons systems to conflict parties not complying with the need to ensure the protection of health care systems during conflict.

Intent and accountability mechanisms

The intent to cause or avoid damage to a health care facility when deploying explosive weapons during conflict is the third important factor in understanding the causes of damage to and the destruction of a health care system from the use of explosives during conflict. In order to prevent attacks on medical services, health facilities, transportation and workers are often clearly marked with distinctive emblems so that they are visible to conflict parties. The extent to which marked health care personnel and infrastructure are affected by the use of explosive weapons raises important and unanswered questions regarding the intent and targeting decisions of conflict parties and limits the capacity to carry out proportionality assessments. In some circumstances there is evidence suggesting a deliberate targeting of a health facility. The indiscriminate and wide-area effect of explosive weapons make it very difficult to conclude with certainty that the affected health care infrastructure was the intended target. However, given the lack of accuracy and indiscriminate nature of the wide-area effects of explosions, the use of explosive weapons in the vicinity of health care infrastructure clearly has foreseeable impacts. Conflict parties need robust internal accountability structures to ensure the application of proportionality during conflict. The absence of transparency around targeting decisions and the criteria used in proportionality decisions is a concerning lack of accountability and a major additional factor that makes health infrastructure – and thus access to health care – vulnerable to attack.

The protection of health care personnel and infrastructure during conflict can only be improved when all the factors affecting vulnerability, means and intent are addressed.

This report was produced by Insecurity Insight using data collected for the Safeguarding Health in Conflict Coalition (SHCC). Much of the data used in the report also appears in the Explosive Weapon Monitor's 2023 annual report.

The International NGO Safety Organisation provided key data from its Conflict & Humanitarian Data Centre, and data was included for 7 countries: Afghanistan, Burkina Faso, the Democratic Republic of the Congo (DRC), Haiti, Somalia, Syria, and Ukraine.

This document covers humanitarian aid activities implemented with the financial assistance of the European Union (EU). Insecurity Insight has been generously supported through the EU-funded project Promoting Actions to Strengthen the Protection of Civilians and Prevent Humanitarian Consequences from the Use of Explosive Weapons in Populated Areas.

The data collection process that made this report possible was co-funded and supported by the UK Foreign, Commonwealth and Development Office (FCDO) via the Researching the Impact of Attacks on Healthcare project at the Humanitarian and Conflict Response Institute of the University of Manchester and the Tides Foundation, which supported data collection on violence against health care. The report was further made possible by support from the Norwegian government to develop and provide data on the reverberating effects of explosive weapons to the Explosive Weapons Monitor.

Please note that this report does not represent the official views of any of the funders. The views expressed in it should not be taken, in any way, to reflect the official opinions of the EU, the UK government, the European Commission, the FCDO or the Norwegian government, which are not responsible for any use that may be made of the information contained in the report.

1 Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas, Final Rev, circulated by Ireland on 25 May 2022: https://www.dfa.ie/media/dfa/ourrolepolicies/peaceandsecurity/ewipa/EWIPA-Political-Declaration-Final-Rev-25052022.pdf.
2 Incident numbers 37930; 37744; 44597; 37817; 37105.
3 Incident number 40157.
4 Incident numbers 44761; 44760; 40978
5 Incident number 44759.
6 Incident number 41051.
7 Incident numbers 36996; 35241; 36166; 36107; 34032.
8 Incident number 44938.
9 Incident number 44935.
10 Incident number 44071.
11Incident number 44848.
12 Incident number 44847.
13 In 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.
14 The RSF 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.
15 The Houthis are likely obtaining their drones and ballistic missiles from Iran.
16 Incident number 41786.
17 Incident number 36925.
18 Incident number 41654.
19 Incident numbers 41643; 42561; 41652; 39851; 39657; 39656.
20 Incident number 43180.
21Incident number 41074.
22 Incident number 41428.
23 Incident numbers 42939; 40022; 40036; 37503.
24 Incident number 41390.
25 Testimony from a medical student working in hospitals in Gaza, taken from https://www.aljazeera.com/features/2024/5/23/medics-in-gaza-risking-their-lives-to-save-people-hurt-by-israels-war.
26 Testimony from a health workers working in hospitals in Myanmar, taken from https://www.bbc.com/news/articles/c511p9dgm43o.

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.

This document is funded and supported by the European Union, the Foreign, Commonwealth and Development Office (FCDO) of the UK government through the RIAH project at the Humanitarian and Conflict Response Institute at the University of Manchester, and by the Tides Foundation. The opinions expressed in it do not reflect in any way the position of the EU, the UK government or the Tides Foundation who are not responsible for the content expressed in this document.

Insecurity Insight. 2024. The Effects on Health Care of the Use of Explosive Weapons in 2023, July 2024. Switzerland: Insecurity Insight. https://bit.ly/2023HealthExplosives