



ACTION ON
ARMED VIOLENCE

AOAV

EXPLOSIVE VIOLENCE MONITOR 2021

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Israeli bombardment of Gaza, May 2021. Photo: Osama Eid.

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Introduction

Many victims of explosive weapons face lifelong disabilities and grave psychological trauma. The use of those weapons in urban areas also takes a devastating toll on essential infrastructure and services, with water, electricity and sanitation infrastructure often damaged or destroyed. Health-care services are severely disrupted when medical personnel are killed or injured, ambulances unable to reach the wounded, hospitals damaged and water and electricity cut off because supply lines have been destroyed.

António Guterres, UN Secretary-General

Protection of civilians in armed conflict, Report of the Secretary-General, 03 May 2021.¹

This report presents the findings of global explosive violence patterns in 2021. It constitutes the eleventh consecutive year of Action on Armed Violence's (AOAV) Explosive Violence Monitoring Project (EVMP), which records the casualties from explosive weapon use worldwide as reported in English-language media.

In 2021, AOA V recorded 19,473 deaths and injuries as a result of the use of explosive weapons around the world. Civilians continued to bear the burden of this harm: 11,102 of all those recorded killed or wounded by explosive weapons were civilians. This accounts for 57% of all global casualties.

As seen every year for the past decade, when explosive weapons were used in populated areas, the threat to civilians was seen to increase significantly. In 2021, 89% of all those reported harmed by explosive weapons in populated areas were civilians. Further, 93% of all civilian casualties from explosive weapons occurred in populated areas in 2021.

These findings reflect a persistent pattern of harm that AOA V has monitored for more than a decade. On average over the last eleven years, when explosive weapons were used in populated areas, nine in every ten of those killed or wounded were civilians.

For the second consecutive year, Afghanistan was the worst-impacted country in terms of civilian casualties of explosive weapons. This prominence is, in part,

reflected by the continued fall of casualties recorded in Syria, where civilian deaths and injuries from explosive violence decline by 33% between 2020 and 2021. Afghanistan also saw lower levels of civilian harm when compared to the previous year, but the reduction was smaller, falling by some 12%. Last year, Afghanistan saw the highest levels of civilian casualties between May and August, as US-led coalition forces withdrew from the country and a surge in Taliban offensives saw the latter gain rapid control of provincial capitals and, ultimately, the seat of power in Kabul by August 2021.

Gaza, the Palestinian enclave, was a country or territory that was to see the third highest level of civilian casualties from explosive weapons in 2021 globally, falling among the five worst-impacted countries/territories for the first time since 2014. This was a result of the intense bombardment of the Gaza strip by Israeli forces in May last year.

Yemen remains among the top five worst-impacted countries for civilian casualties of explosive weapon use, as it has done for seven consecutive years, since 2015.

While this data – global and national – quantifies the immediate harm to civilians caused by explosive weapons, this form of violence frequently has enduring, reverberating impacts that affect its victims and environment far beyond the initial devastation of a blast. AOA V and colleagues have sought to highlight some of the reverberating effects of explosive violence

harm, which see even greater numbers of civilian lives affected, with impacts lasting generations.

Explosive weapons:

Weapons that share common characteristics causing deaths, injuries, and damage by projecting explosive blast, heat and often fragmentation around a point of detonation. These weapons include a variety of munitions such as air-dropped bombs, mortars, improvised explosive devices (IEDs) and artillery shells.

Thousands more civilians are harmed by the impacts of explosive weapons than can possibly be hinted at by our casualty figures. AOA's data is not an attempt to capture every casualty of every incident around the world. No claims are made that this sample of data, taken from English-language media reporting, can represent the total impact of explosive weapons on civilians in 2021.

Since the monitor began in 2010, AOA has recorded the appalling suffering caused across the globe by both manufactured and improvised weapons. States and other users must politically commit to stop using explosive weapons with wide area effects in populated areas. The harm recorded in 2021 and reflected in this report further illustrates the stark urgency needed to reach this commitment.



A family approaches a US evacuation flight at Kabul's Hamid Karzai International Airport, Afghanistan, 22 August 2021. Photo: US Marine Corps, Sgt. Samuel Ruiz.

Key Findings

OVERVIEW

- In total, AOA V recorded **19,473** deaths and injuries by explosive weapons in **2,489** incidents in 2021, as reported by English language media. **Of these, 11,102 were civilians – 57%.**
- In total, **9,147** people were killed (of which **3,376** were civilians), and **10,326** were injured (**of which 7,726 were civilians**).
- When explosive weapons were used in populated areas, **89%** of those killed and injured were civilians. This compares to **10%** in other areas. AOA V recorded **10,295** civilians killed and injured in populated areas. This represented **93%** of globally reported civilian deaths and injuries.
- The civilian harm per incident rose markedly in 2021 compared to the year before, impacting women and children more acutely:
 - The number of reported child casualties rose by 11% (1,264 in 2020 to 1,407 in 2021). Last year saw the highest percentage of child casualties recorded since 2011, at 13% of the total civilian casualties. This is nearly double the average seen across the last eleven years of 7%;
 - Reported female civilian casualties of explosive violence rose by 7% – from 692 (2020) to 740 (2021), though often victims' genders go unrecorded. The proportion of civilian casualties reported to be women also saw a high of 7%, compared to the average of 3% from the last eleven years;
 - The average number of civilians harmed per incident rose from 3.8 in 2020 to 4.5 in 2021 – a rise of 18%.

- **Afghanistan, Syria, Gaza, Yemen** and **Iraq** saw the highest number of global civilian casualties in 2021 with **3,051, 2,016, 1,478, 867** and **600** civilian casualties respectively:
- **Afghanistan** and **Syria** saw a decrease in harm compared to 2020;
- **Gaza** saw an increase from nine civilian casualties in 2020, to 1,478 in 2021 – a **16,322%** rise;
- **Yemen** saw an increase from 683 in 2020, to 867 in 2021 – a **27%** rise;
- **Iraq** saw an increase from 232 in 2020, to 600 in 2021 – a **159%** rise;
- **Ethiopia** saw an increase from 34 in 2020, to 311 in 2021 – a **815%** rise.
- Overall, civilian deaths and injuries from explosive violence saw an increase of less than **1%** last year, compared to 2020 – the first increase in civilian casualties from explosive weapons globally since 2015.
- Manufactured explosive weapons accounted for 57% of civilian casualties (6,356); improvised explosive devices (IEDs) accounted for 43% of civilian casualties (4,726): this is the lowest number of civilians harmed by IEDs since our monitor began in 2010.
- Ground-launched manufactured explosive weapons were responsible for 31% of all civilian casualties; air-launched explosive weapons were responsible for 20% (2,231 civilians).
- Concerningly, last year the average number of civilians harmed per air-strike rose from 3.6 to 5.1, a **42%** rise – fuelled by air attacks in Gaza and Ethiopia.
- Incidents were recorded in **57 countries and territories** around the world; nine more locations than in 2020.

EXPLOSIVE VIOLENCE IN 2021



57%
CIVILIAN CASUALTIES

TOTAL REPORTED DEATHS & INJURIES: **19,473**
TOTAL CIVILIAN DEATHS & INJURIES: **11,102**

= 300 Civilian casualties = 300 Armed Actor casualties



1%

INCREASE IN TOTAL CIVILIAN
DEATHS & INJURIES



10%

DECREASE IN AVERAGE NUMBER
OF CIVILIAN DEATHS PER DAY

TARGETED AREAS

POPULATED AREAS



89% CIVILIAN DEATHS & INJURIES
IN POPULATED AREAS



1,430 ATTACKS IN POPULATED AREAS

NON-POPULATED AREAS



10% CIVILIAN DEATHS & INJURIES
IN NON-POPULATED AREAS



1,059 ATTACKS IN NON-POPULATED AREAS

URBAN RESIDENTIAL

TOTAL
DEATHS & INJURIES

2,563

CIVILIAN
DEATHS & INJURIES

93%

AVERAGE CIVILIAN
DEATHS & INJURIES
PER ATTACK

5

VILLAGE

1,858

81%

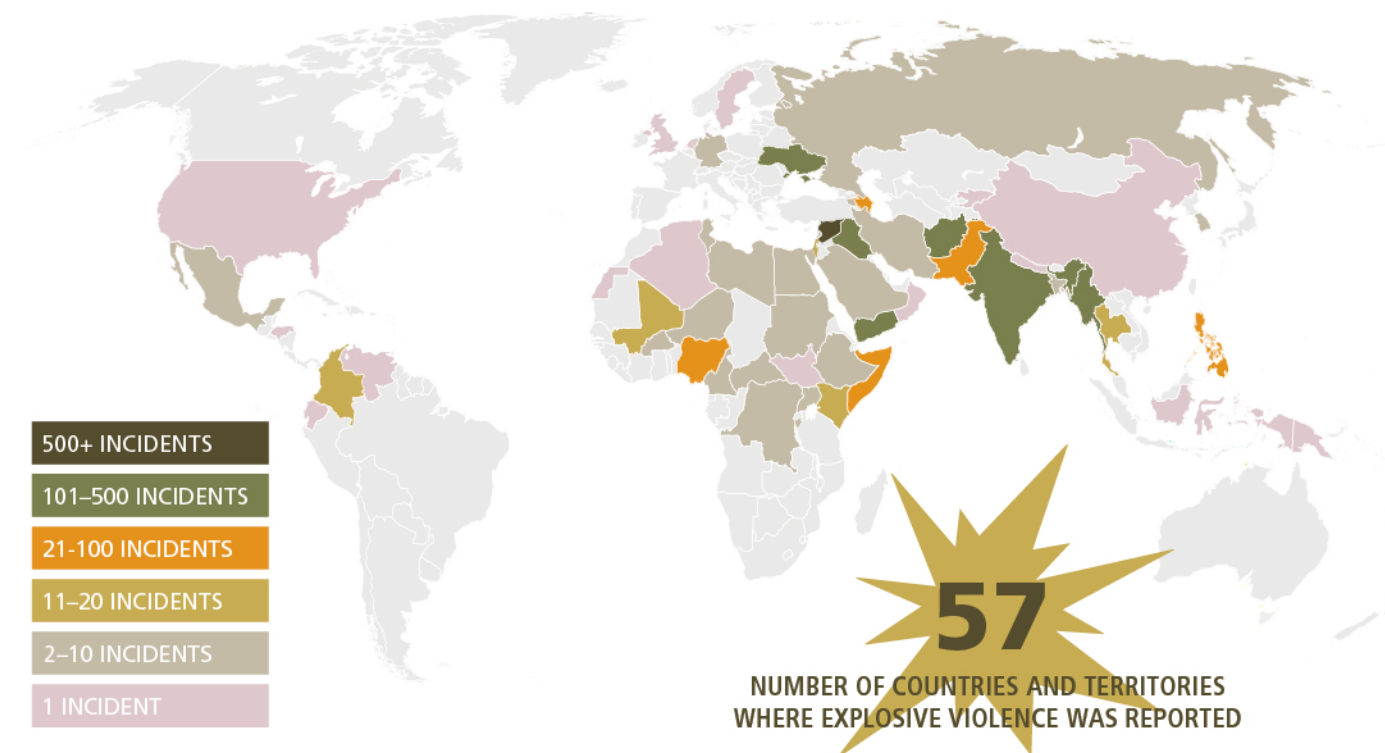
3

MARKETS

898

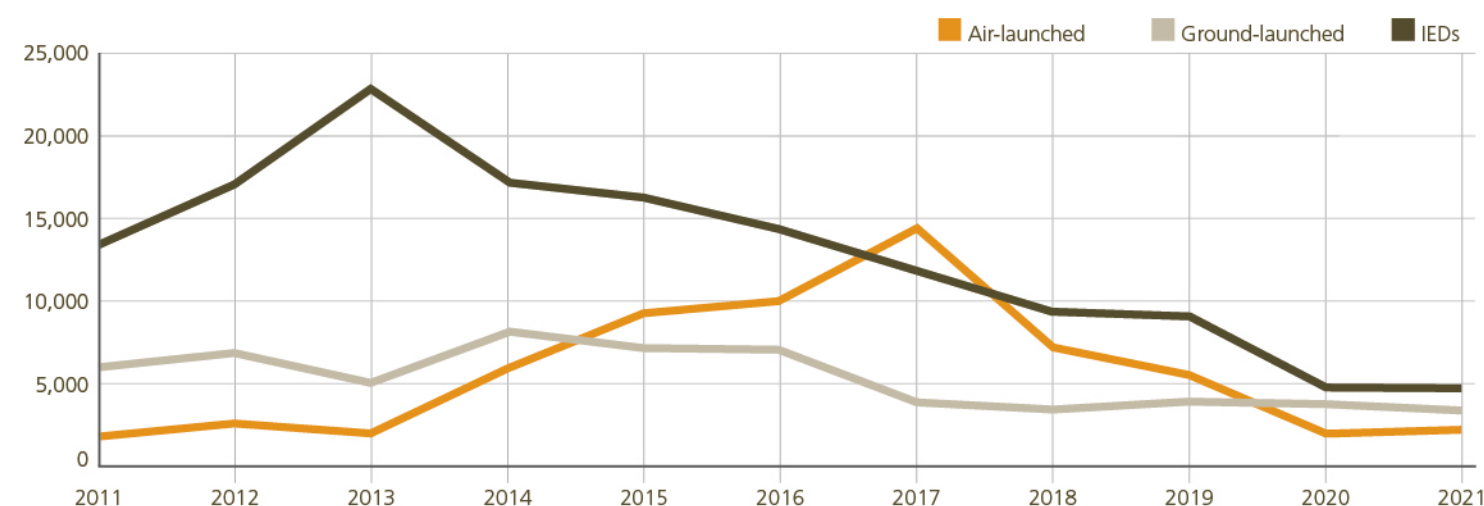
95%

19



DEADLY WEAPONS

CIVILIAN DEATHS & INJURIES BY AIR-LAUNCHED, GROUND-LAUNCHED AND IEDS, 2011 – 2021



CIVILIAN DEATHS & INJURIES BY WEAPON LAUNCH METHOD



DATA: AOAV, BASED ON ENGLISH-LANGUAGE MEDIA REPORTS

Key Terms

CIVILIAN/ARMED ACTOR OR SECURITY PERSONNEL:

Casualties were recorded as ‘armed actors’ only if they were reported as being part of the state military, were members of non-state armed groups, or were security personnel who AOA V considered likely to be armed. This includes police, security guards, intelligence officers, and paramilitary forces. All casualties not reported as belonging to these armed groups were recorded as civilians.

EXPLOSIVE VIOLENCE INCIDENT:

Refers to the use of explosive weapons that caused at least one casualty and took place in a 24-hour period.

POPULATED AREA:

Refers to areas likely to contain concentrations of civilians.²

WIDE-AREA EFFECTS:

Refers to the use of explosive weapons which, result in a large blast and fragmentation radius, lack accurate delivery systems, and/or, use multiple munitions.³

EXPLOSIVE WEAPONS TYPES:

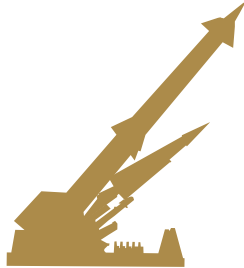
Weapons were classified by AOA V based on consistently-used language in media reporting. The categories used are deliberately broad in order to capture a range of different weapon types in light of considerable variance in the level of detail provided by news sources.

- **Multiple types:** Used to refer to incidents where a combination of different explosive weapon types were used and it was not possible to attribute casualties to each munition. These can involve any combination of air, ground-launched, or improvised explosive devices. The category most commonly includes attacks where ground-launched weapons such as rockets and artillery shells were fired together.
- **Mine:** Refers to incidents where the explosive weapon was described as a mine or landmine. These include both antipersonnel and anti-vehicle mines.⁴

AIR-LAUNCHED:



- **Air strike:** The broadest recording category in this grouping. It refers to incidents where explosive weapons were reported as delivered by drones, planes, helicopters, or other aircraft, and the type of munition fired was not specified in the news source.⁵ Where the munition used is specified in news sources it is recorded as one of the following more specific weapon categories below.
- **Air-dropped bomb:** References to areas being ‘bombed’ by military aircraft were recorded as air-dropped bomb incidents. This can include makeshift manually-deployed bombs, as well as cluster bombs.
- **Missile:** Recorded where explosive missiles delivered by air were reported in a news source, most commonly in drone attacks.⁶
- **Rocket:** Typically used to refer to unguided missiles, rockets were recorded wherever they are specified in a news source.⁷

GROUND-LAUNCHED:

- **Shelling (unspecified):** The broadest recording category in this grouping. It refers to reports of the use of explosive shells that do not specify how they were delivered (e.g. mortars, rockets, artillery, or tanks).
- **Artillery shell:** An explosive projectile fired from a gun, cannon, howitzer or recoilless gun/rifle. This refers to medium and large-calibre munitions primarily designed to fire indirectly. Artillery shells were recorded wherever specified in news sources.
- **Missile:** Recorded where reported in news sources, or where a ground-launched missile type was reported in the incident (e.g. SCUD, MANPAD). Ground-launched missiles can range from shoulder-mounted to ballistic missiles.
- **Rocket:** Recorded where reported in news sources, or where a known ground-launched rocket type was reported in the incident (e.g. Grad, Katyusha).
- **Mortar:** Recorded where reports specified that a mortar bomb was the munition used.⁸
- **Tank shell:** Explosive shells fired by tanks.
- **Grenade:** Recorded where reports indicate grenades deployed an explosive blast and/or fragmentation. Grenades specified as 'homemade' were recorded as IEDs.
- **RPG:** Rocket-propelled grenades. Grenades which are rifle-launched were recorded as grenades rather than RPGs.

IMPROVISED EXPLOSIVE DEVICES (IEDS):

- **Non-specific IED:** The broadest recording category in this grouping. It refers to all IEDs which could not be categorised as either 'roadside bombs' or 'car bombs.'
- **Car bomb:** Incidents where the IED was clearly described as a 'car bomb,' or other vehicles like trucks were used. IEDs which were reported as being attached to vehicles, such as a sticky bomb attached to a politician's car or a remote control IED attached to a bicycle, were recorded as 'Non-specific IEDs.'
- **Roadside bomb:** IEDs which were either specifically reported as 'roadside bombs' or where an IED was reported to be used alongside a road and no further information was provided.

2021 Overview

AOAV recorded **19,473** casualties (people who were killed or injured) by explosive weapons in **2,489** incidents in 2021.

Of the casualties recorded in 2021, **57%** were civilians (**11,102** civilians killed and injured).

When explosive weapons were used in populated areas, **89%** of those killed and injured were civilians.

In 2021, AOA V recorded 11,102 civilian deaths and injuries from explosive weapons reported around the world. In total, 9,147 people were killed (of which 3,376 were civilians), and 10,326 were injured (of which 7,726 were civilians) by explosive weapons globally.

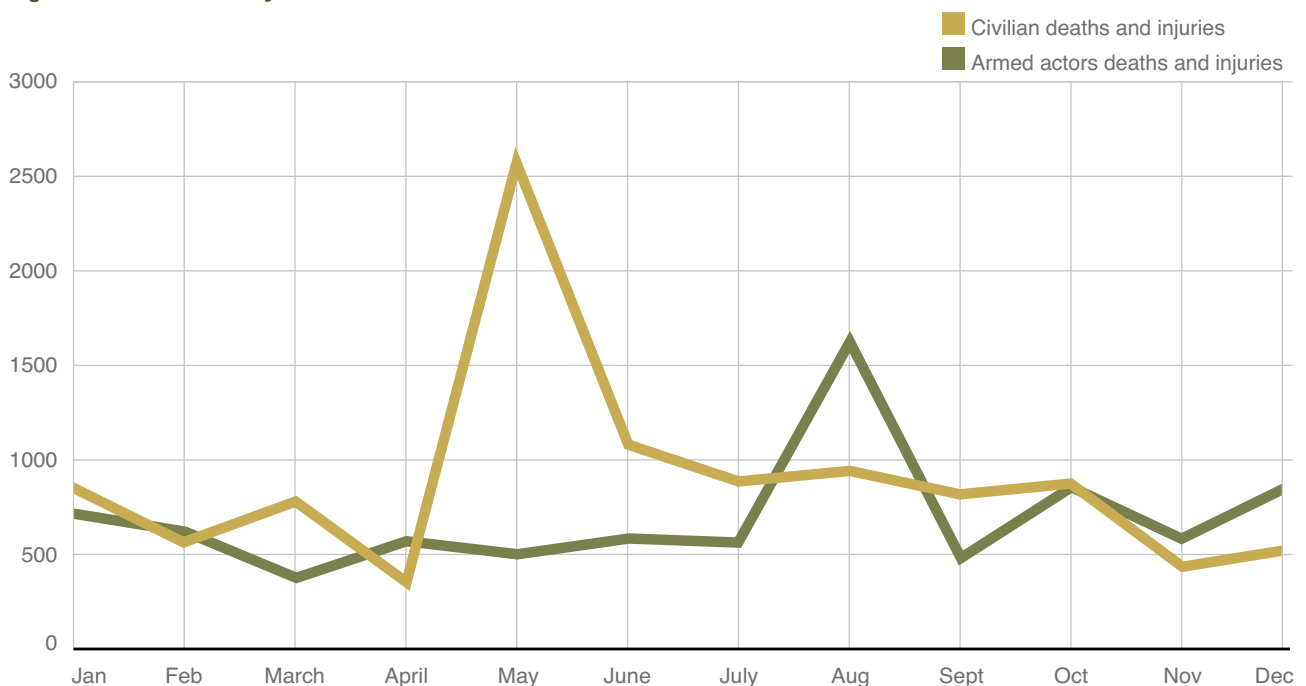
As seen every year since AOA V began recording in 2010, civilians continued to account for the majority of casualties from explosive weapon use, accounting for 57% of all recorded deaths and injuries.

When explosive weapons were used in populated areas, civilians continued to be at risk of far greater levels of harm; a pattern witnessed across more than a decade.⁹

In 2021, 57% of all recorded incidents took place in populated areas. In those attacks, 89% of those killed or injured were reported as civilians. This compares to 10% of deaths and injuries reported as civilians when explosive weapons were used in lesser populated areas.

That year saw AOA V record an increase of 4% in deaths and injuries from explosive violence recorded around the world compared to 2020. Civilian casualties saw a fractional increase of less than one percent in deaths and injuries from global explosive violence. Though minimal, this is the first increase in AOA V's civilian casualty figures since 2015. The number of incidents of explosive weapon use, however, fell by nearly 15%. As such, the level of civilian harm per incident was markedly higher last year, with the average number of civilians

Figure 1 Casualties by month in 2021



Worst explosive incidents of 2021 in terms of civilian harm

Incident	Location	Civilian casualties
Islamic State suicide bombing outside Kabul's international airport ¹⁰	Kabul, Afghanistan	334
Car bomb at a girls school in Kabul ¹¹	Kabul, Afghanistan	330
Airstrike at a market in Tigray ¹²	Tigray, Ethiopia	244
Prison riot involving explosive and other weapons in Guayaquil ¹³	Guayas, Colombia	197
Islamic State suicide bombing at Shia mosque in Kunduz ¹⁴	Kunduz, Afghanistan	150
Islamic State suicide bombing at mosque in Kandahar ¹⁵	Kandahar, Afghanistan	146
Twin suicide bombings at market in Baghdad ¹⁶	Baghdad, Iraq	142
Suicide car bomb attack, Logar ¹⁷	Logar, Afghanistan	134
Airstrikes on a residential building in Gaza ¹⁸	Gaza City, Gaza	121
Islamic state suicide bombing at market on eve of religious festival in Baghdad ¹⁹	Baghdad, Iraq	95

killed or injured in each incident of explosive weapon use increasing from 3.8 in 2020 to 4.5 in 2021, a rise of 18%.

As the severity of harm to civilians per incident of explosive weapon use increased, women and children suffered more acutely in 2021 than in previous years. The percentages of female and child casualties reported among total civilian casualties were both double that of the decade average, at 7% and 13% of civilian casualties respectively. On average since 2011, women have accounted for 3% of the civilian casualties of explosive weapon use, and children have accounted for 7%. Though it should be borne in mind that the gender and age of casualties has consistently been poorly reported in news sources.

The slight increase in the number of civilian casualties of explosive weapons from 2020 to 2021 stands in contrast to the significant decline in casualties recorded the previous year and the consistent decline in civilian casualties since 2015. In 2020, the number of civilians killed or injured by explosive weapons was 43% lower than that of the year before.

Though global numbers of civilian casualties from explosive violence increased by a small percentage in 2021, some countries experienced a surge in casualties of explosive weapons.

Civilian harm in Gaza saw its highest levels since 2014 and the number of civilians killed and injured in Ethiopia increased nearly tenfold. In Yemen, civilian casualties rose 27%, as fighting between government forces and Houthi rebels intensified in Marib. In Iraq, civilian casualties more than doubled, owing to an increase in high-casualty IED attacks by the Islamic State in Baghdad. Five of the ten worst explosive incidents in 2021 were in Afghanistan.

On average, AOVAV recorded 925 civilian casualties reported every month, compared to an average of 698 armed actors. This means that every day there were, on average, 30 civilians reported killed or injured by explosive weapons (compared to 23 armed actors).

In terms of fatalities specifically, on average every day nine civilians were reported to have been killed from explosive weapon use in 2021 around the world.

The number of casualties recorded in 2021 is likely to have been impacted by the continuing coronavirus pandemic, with journalistic access and movement restricted. This is particularly thought to be the case across Myanmar and in Ethiopia's Tigray region where much violence goes unreported, and casualty reports that do make it into English-language media often lack enough detail for incidents to be recorded.

Explosive Weapons in Populated Areas

In 2021, **89%** of casualties in populated areas were reported as civilians. This is compared to 10% in other areas.

The majority of explosive incidents – **57%** in 2021 – were perpetrated in populated areas.

Civilian deaths and injuries in populated areas represented **93%** of all reported civilian deaths and injuries from explosive weapons.

POPULATED AREAS

As *Figure 2* shows, in 2021 when explosive weapons were used in populated areas, 89% of the deaths and injuries were reported to be civilians. This compares to 10% in other areas. In total, 10,295 civilians were killed and injured in populated areas.

These findings are consistent with the pattern of harm AOA has persistently recorded since 2011. Since that time, in every year of AOA's Explosive Weapons Monitoring Project, the use of explosive weapons in populated areas has been shown to overwhelmingly harm civilians.

On average, when explosive weapons are used in populated areas, nine in every ten casualties (deaths and injuries) will be civilians. Previous years data can be found on AOA's website.

When explosive weapons are used in populated areas, areas likely to contain large numbers of civilians, it is far more likely that civilians will account for most of the casualties. The use of explosive weapons in populated areas is, however, carried out by both state and non-state actors alike, despite the likelihood of civilian casualties.

Despite the likely harm, the majority of explosive incidents – 57% (1,430) in 2021 – were perpetrated in such areas. This is compared to 1,059 incidents in lesser populated areas.

Although the number of incidents reported in populated areas was slightly higher in 2020 (1,611) compared to 2021 (1,430), the percentage of civilian casualties in populated areas increased in 2021, to 89% from 88% in 2020.

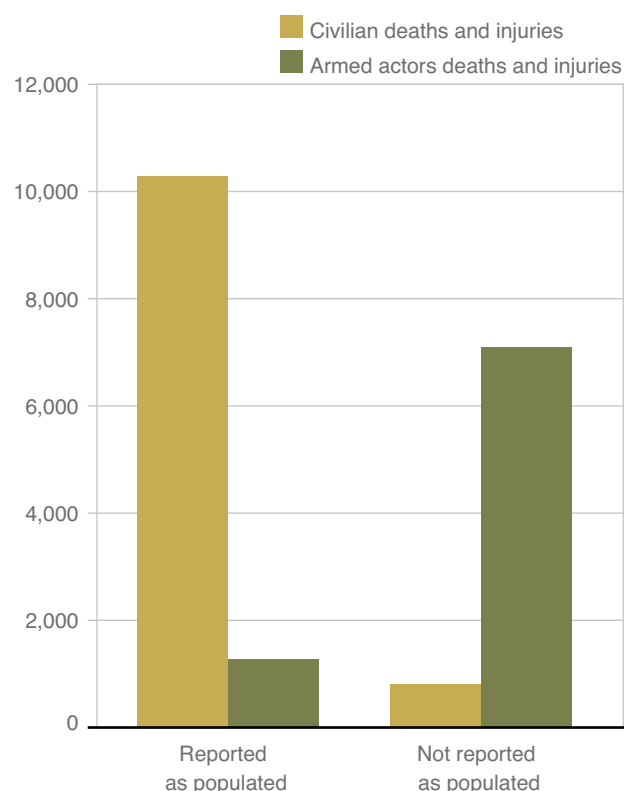
Civilian deaths and injuries in populated areas represented 93% of all reported civilian deaths and injuries from explosive weapons last year, demonstrating the disproportionate effect of explosives deployed in populated areas.

LOCATIONS

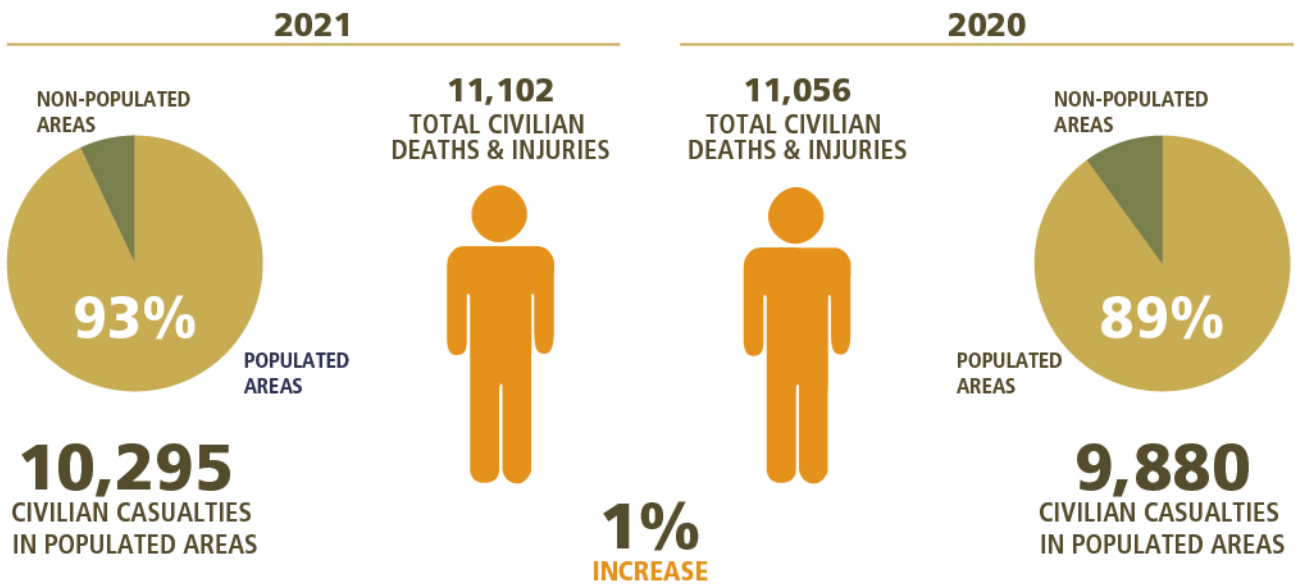
RESIDENTIAL

The highest number of civilians killed and injured were from incidents in residential areas or civilian houses. AOA recorded 449 such incidents in 2021.

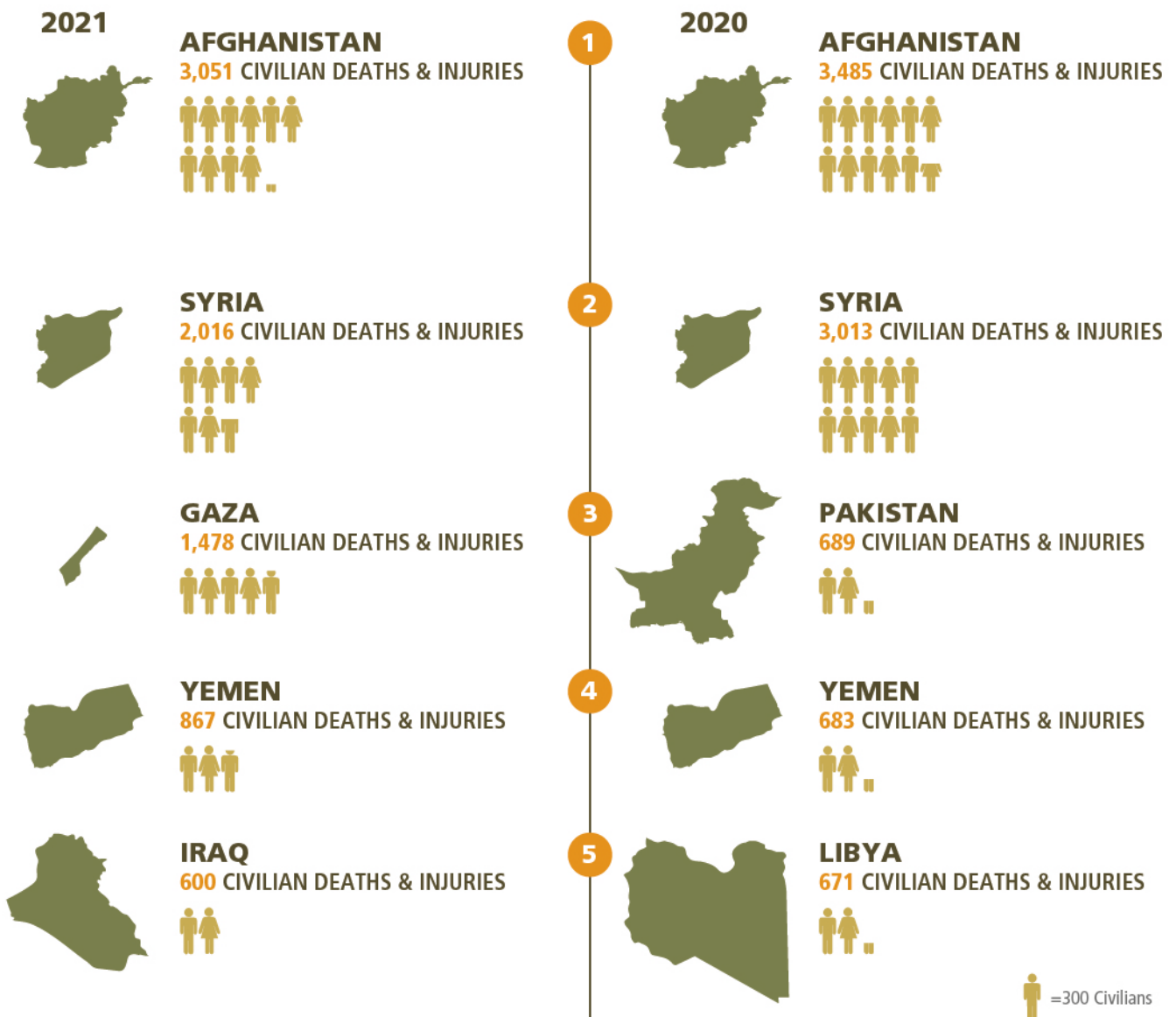
Figure 2 **Total casualties by populated area / non-populated area**



CIVILIANS KILLED AND INJURED: 2020 V 2021



THE MOST DANGEROUS PLACES TO BE A CIVILIAN





The Israeli bombing of civilian neighbourhoods in the Gaza Strip. 14 May 2021. Photo: Osama Eid. (CC BY-SA-3.0).

These incidents resulted in 2,391 civilian deaths and injuries, a decline of 9% from 2020 when 2,630 civilian casualties were recorded from 502 incidents in such areas.

As in previous years, due to the frequency of bombardment in some areas many incidents in urban areas became categorised under “multiple (urban)”. An additional 114 incidents of explosive violence were recorded in this location, resulting in 1,706 civilian casualties.

Of the casualties recorded in urban residential areas, ground-launched explosives accounted for 44% of the civilian casualties caused there; IEDs accounted for 32%, and airstrikes for 20%.

VILLAGES

456 incidents were recorded from the use of explosive violence in villages, resulting in 1,501 civilian casualties. Many of these incidents (215) were perpetrated in Syria, which accounts for 45% (673) of the civilian casualties from explosive weapon use in villages, followed by Afghanistan, Myanmar and Yemen.

In villages, 53% of civilian casualties were caused by ground-launched explosives, 22% from IEDs, 16% from airstrikes, and 8% from landmines – the remaining

1% were caused in incidents using weapons with multiple or unclear launch methods.

MARKET BOMBINGS

Last year, AOA V recorded 898 casualties from incidents of explosive violence in markets, of whom 95% (852) were civilians. 77% of all civilian deaths and injuries from market bombings were recorded in just three countries: Iraq (254 civilian casualties), Ethiopia (244) and Syria (160). IEDs make up the majority of civilian casualties recorded from market bombings, accounting for 52% of civilian deaths and injuries, while air-launched weapons account for 30%.



The aftermath of a twin suicide bombing at a busy market in Baghdad, Iraq, 21 January 2021. At least 32 civilians were killed and 100 others injured in the attack. 21 January 2021. Photo: Ruwaym. (CC BY 3.0).

One [bomber] came, fell to the ground and started complaining ‘my stomach is hurting’ and he pressed the detonator in his hand. It exploded immediately...People were torn to pieces.

A stallholder at the market targeted by Islamic State suicide bombers in Baghdad told Reuters. The second bomber detonated his explosive vest as others came to help the victims, according to Iraq’s interior ministry. Some reports said that he posed as an injured person.²⁰

In 2021, 14% of those killed or injured by attacks which were explicitly coded as targeting armed actors were civilians.

It must be stressed that the use of explosive weapons that impact a wide area particularly endangers civilians, even if these weapons are directed at a military objective.

WOMEN

The number of reported female civilian casualties of explosive violence rose by 7% last year, from 692 in 2020 to 740 in 2021.

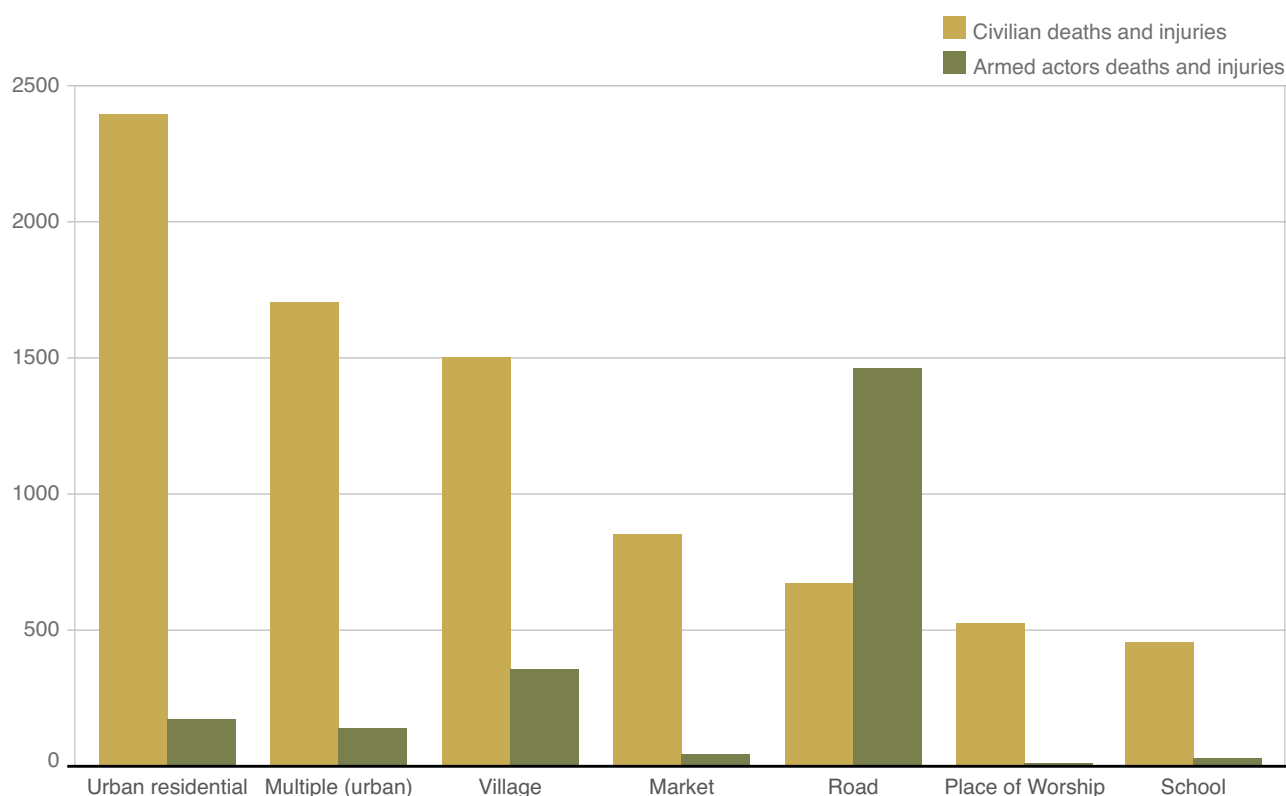
It is important to note that the majority of media sources did not include reporting of the gender of casualties in 2021. However, the proportion of women reported among civilian casualties in 2021 was significantly higher than average over the last decade. Since 2011, an average of 3% of civilian casualties were reportedly women.

TARGETING

As has consistently been the case throughout AOA’s records, simply targeting armed actors with explosive weapons did not prevent civilians from being killed or injured.

Women were reported among those killed and injured in 332 incidents in 2021, including incidents where no exact figure was given of the number of female

Figure 3 Locations with the most civilian deaths and injuries in 2021





Airstrike damage in Mosul, Iraq, December 2021. Photo: Lonni Friedman (CC BY-NC 2.0)

casualties. Overall, 740 women were reported killed or injured in 310 incidents in which a number of women casualties were recorded.

This figure does not include armed actors. Likewise, it does not include female suicide bombers. In 22 incidents women were reported amongst the casualties but no figure was given.

The majority of women who were killed or injured were victims of attacks in populated areas. It was found that 93% of female casualties recorded, occurred in populated areas.

CHILDREN

2021 marked the highest percentage of child casualties recorded since 2011, at 13% of the total civilian casualties.

The number of children reported killed or injured by explosive weapons last year rose by 11%, from 1,264 in 2020 to 1,407 in 2021.

The majority of media sources did not include reporting of the age of any casualties in 2021. Yet, the percentage of children reported among civilian casualties (13%) is

nearly double the average seen across the last eleven years, of 7%.

In 2021, AOA recorded 1,407 child deaths and injuries in 490 incidents. Of these, a gender was given for 183 individuals, of whom 108 were girls and 183 were boys. The rest were reported without specifying any gender. In a further 23 incidents, no figures were given for numbers of children killed or injured but children were reported to be amongst the victims.

Of the children killed or injured, at least 93% (1,305) were caused in incidents which occurred in populated areas.

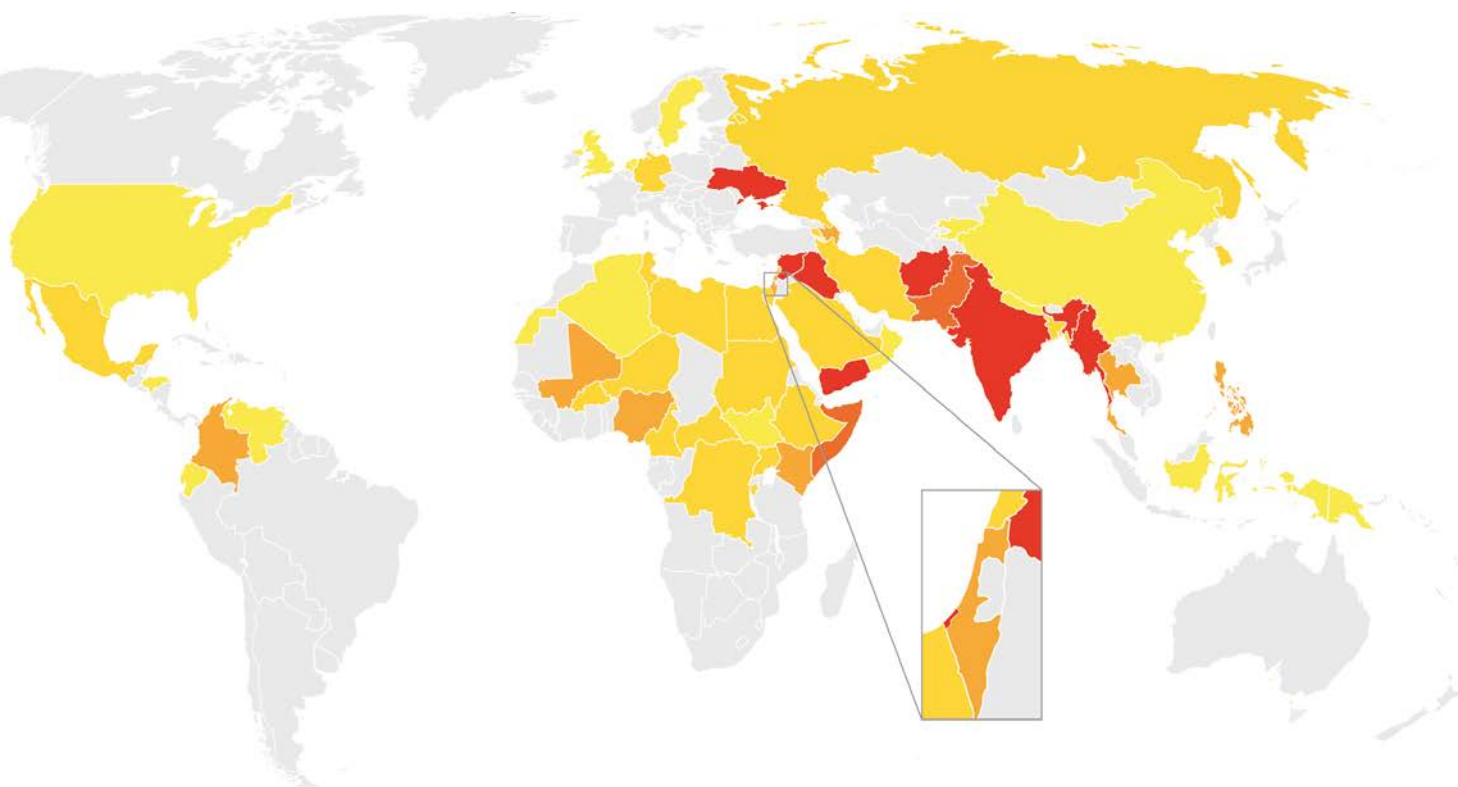
I rushed to the scene and found myself in the middle of bodies. All of them were girls. Their bodies piled on top of each other.

A witness told AFP after a car bomb and IEDs were detonated outside a secondary school in Dasht-e-Barchi, a predominantly Hazara neighborhood in Kabul. May, 2021.²¹

Casualty-causing Incidents of Explosive Violence Recorded by AOAV in 2021

AOAV recorded explosive violence in 57 countries and territories across the world.

Explosive violence was particularly intense in several contexts.



- **Countries and territories with between 101 and 1,000 incidents**
 Syria 709, Afghanistan 458, Iraq 266, Gaza 142, Yemen 133, India 123, Ukraine 110, Myanmar 103
- **Countries and territories with between 31 and 100 incidents**
 Pakistan, Somalia 89
- **Countries with between 11 and 30 incidents**
 Azerbaijan 29, Philippines 23, Nigeria 23, Mali 20, Thailand 18, Colombia 12, Israel 12, Kenya 11
- **Countries with between 2 and 10 incidents**
 Ethiopia 9, Iran 8, Libya 8, Burkina Faso 7, Tunisia 7, Cameroon 6, Saudi Arabia 5, Armenia 4, Burundi 4, Niger 4, Uganda 4, Bangladesh 3, Central African Republic 3, DRC 3, Egypt 3, Germany 2, Lebanon 2, Mexico 2, Russia 2, South Korea 2, Sudan 2
- **Countries and territories with 1 incident**
 Algeria, China, Ecuador, Honduras, Indonesia, Kyrgyzstan, Maldives, Nepal, Netherlands, Oman, Papua New Guinea, Paraguay, South Sudan, Sweden, UK, USA, Venezuela, Western Sahara

2021 Explosive Violence Hotspots

AOAV recorded at least one death or injury from an explosive weapon attack in 57 different countries and territories (see *map on page 16*).²²

Casualties from explosive weapons were reported in nine more countries and territories in 2021 than in 2020. There were 18 countries impacted by explosive violence last year that had not seen casualties the previous year.²³

As *Figure 4* shows, Afghanistan was the country with the most civilian deaths and injuries in 2021. This was followed by Syria, Gaza, Yemen and Iraq.

AFGHANISTAN

Despite a decline in the total number of civilian casualties from explosive weapons in Afghanistan – dropping from 3,485 civilian deaths and injuries in 2020 to 3,051 in 2021– Afghanistan remained the country most impacted by explosive violence, according to civilian

casualty totals. Of the civilian casualties last year, 1,005 were killed and 2,046 injured.

In Afghanistan, IEDs were responsible for the majority of civilian harm, accounting for 77% of civilian casualties in 2021. Last year marked the fifth consecutive year in which Afghanistan suffered the highest civilian casualties from IEDs globally (since 2017). There were 2,347 civilian deaths and injuries recorded in Afghanistan from IEDs, a 0.4% decline since 2020 (which itself had seen a 34% decrease in civilian casualties from IEDs since 2019).

There was a 37% decrease in civilian casualties from ground-launched explosive weapons, such as shelling and grenade incidents (from 751 civilian casualties in 2020 to 476 in 2021). The number of civilian casualties from air-launched weapons also decreased last year by some 47% – from 333 in 2020, to 178 in 2021.

The perpetrators of attacks in Afghanistan were frequently unknown, with both Islamic State and the Taliban deploying similar attacks across the country and rarely claiming responsibility. At least 320 civilian casualties were caused by explosive incidents carried out by the Taliban, 47% less than in 2020 (606). The number of civilian casualties reportedly caused by the Islamic State was nearly triple that of the previous year, with 713 civilian casualties recorded in 2021, compared to 266 in 2020.

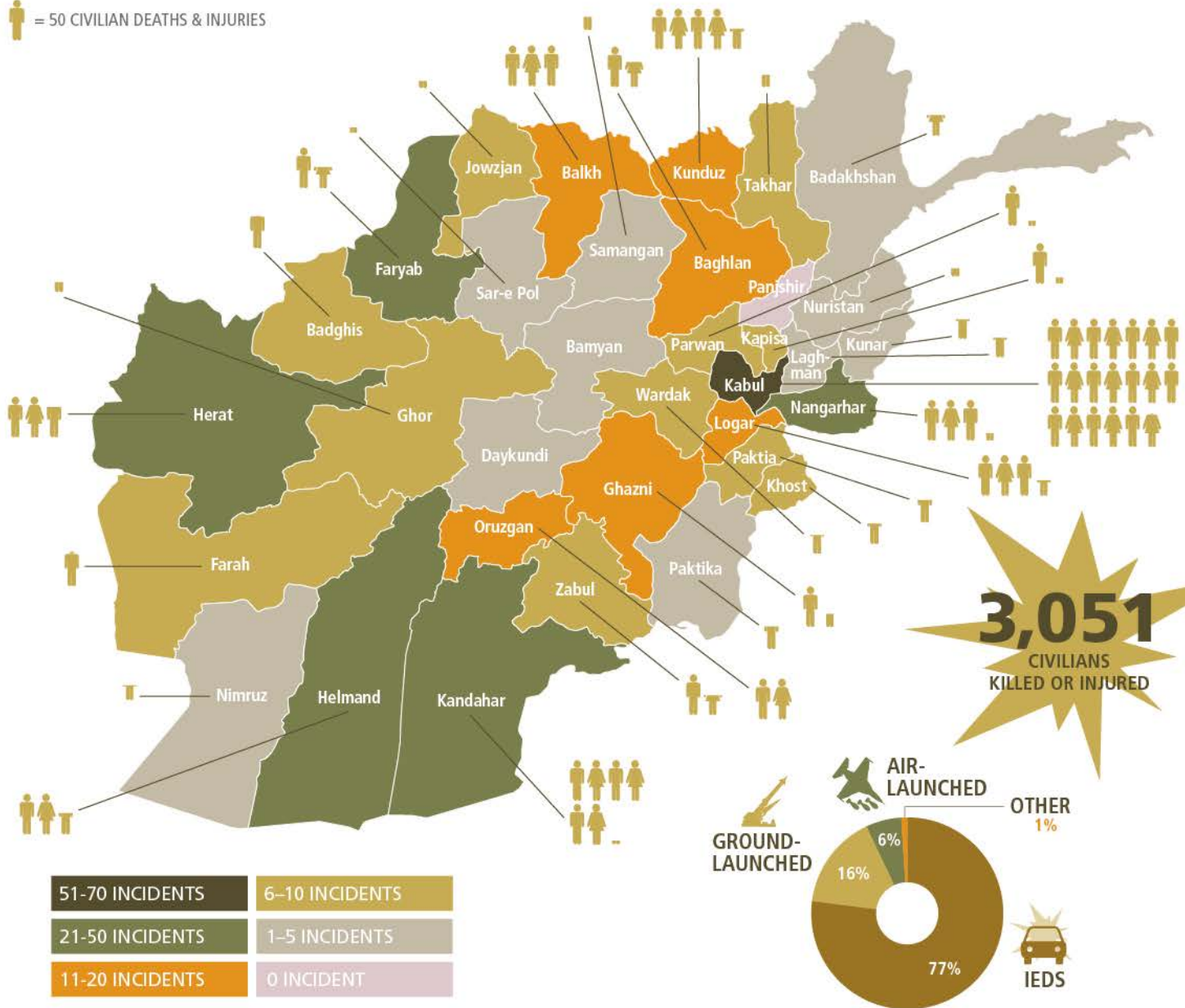
These changes are likely to have occurred due to the changing political situation in Afghanistan which saw the Taliban take control of the country in August 2021; resulting in an end to Taliban *explosive* violence and a rise in Islamic State attacks.

It was as if someone pulled the ground from under my feet. For a moment I thought my eardrums were blasted and I lost my sense of hearing...I saw bodies, body parts, elderly and injured men, women and children scattered in the blast site...[they] were lying in the road and in the sewage canal. The little water flowing into it had turned into blood...I don't think the mental wound and the shock I sustained from [the] blast will ever let me live a normal life.

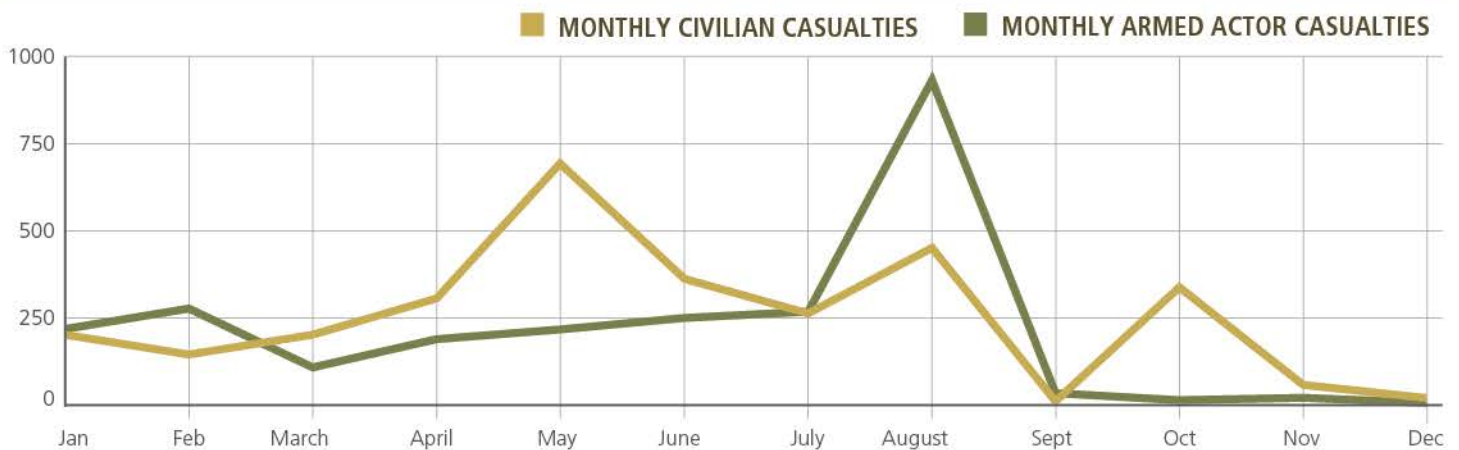
A witness told Reuters of scenes from the Islamic State suicide bombing at Kabul's Hamid Karzai International Airport, during the evacuation after the Taliban took Afghanistan's capital. August, 2021.²⁴

THE HARDEST-HIT PROVINCES IN AFGHANISTAN IN 2021

 = 50 CIVILIAN DEATHS & INJURIES



MONTHLY CASUALTIES OF EXPLOSIVE VIOLENCE IN 2021





Crowds waiting for evacuation flights at Kabul's Hamid Karzai International Airport, 20 August 2021. On 26 August 2021, at least 149 civilians were killed and 334 injured when Islamic State suicide bombers detonated explosives in the middle of crowds trying to get into the airport. Photo: U.S. Marine Corps. Staff Sgt. Victor Mancilla.

SYRIA

In 2021, as in 2020, levels of explosive violence in Syria continued to fall. It was the second-worst impacted country globally from explosive violence for the second year in a row. This is after five consecutive years (2015–2019) of Syria being the worst-impacted.

AOAV recorded a 33% decrease in civilian casualties last year (from 3,013 in 2020 to 2,016 in 2021). The number of incidents recorded also fell – from 844 in 2020 to 709 in 2021.

For the first time since 2014, ground-launched weapons, mostly shelling, accounted for the most harm of all the main weapon types, resulting in 1,176 civilian casualties, or 58% of the total civilian casualties from explosive weapons across the country. This is more than double the number of civilian casualties recorded in 2020 (584). IEDs were the second highest cause of civilian casualties, accounting for 26% (516 civilian casualties). Air-launched weapons, which, for the last six years (since 2015) have caused the highest proportion of

civilian deaths and injuries, accounted for 11% (214) of civilian casualties, 81% less than in 2020.

The worst-impacted regions remained Idlib and Aleppo. However, casualties in both regions fell, compared to 2020. AOAV recorded 714 civilian casualties from explosive weapons in Aleppo in 2021, compared to 1,287 in 2020 (a fall of 45%). In Idlib, AOAV recorded 671 civilian casualties in 2021, compared to 998 in 2020.

Frequently the perpetrators of attacks went unknown. Nevertheless, AOAV recorded at least 659 civilian casualties from the Syrian regime's use of explosive weapons, and 132 from Russian explosive violence. Turkey was also responsible for at least 118 civilian casualties.

GAZA

As a result of the outbreak of violence between Israel and Gaza involving the heavy use of explosive weapons in May 2021, civilian casualties in Gaza reached their highest levels since 2014.

AOAV recorded 142 incidents of explosive violence, which caused at least 1,498 casualties, the vast majority of whom were civilians (1,478). All but 16 civilian casualties occurred in populated areas. In total, some 233 civilians were killed and 1,245 injured. At least 394 of those killed and injured were reported to be children, whilst 277 were women. Twenty armed-actors were recorded among the total casualties, with 2 injured and 18 killed.

Israel was the reported perpetrator in all but one of the 1,478 civilian deaths and injuries. The remaining civilian casualty was recorded from an incident with an unknown perpetrator, as it was unclear if the weapon was a blocked rocket or an Israeli shell.

Airstrikes were the primary cause of civilian death and injury, accounting for 83% of all civilian casualties (1,230), across 124 recorded strikes. Other types of explosive weapons that caused civilian casualties were ground-launched weapons (52 civilian casualties) and multiple-types of explosive weapons (140).

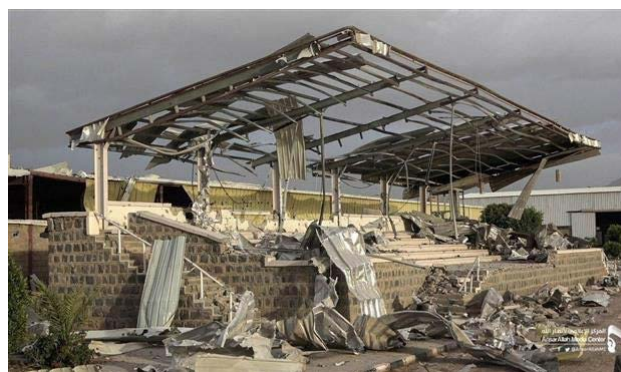
Due to the dense urban environment of the Gaza strip, where Israeli airstrikes were concentrated, 58% of all civilian casualties occurred in locations recorded as 'Multiple (urban)', across 25 incidents.²⁵ Another 77 of the 142 incidents of explosive weapon use took place in urban residential areas, where 336 civilians were killed and injured. Other locations where civilian casualties occurred included encampments (with 82 civilian deaths and injuries), places of worship (56 civilians) and villages (32).²⁶

The house was shaking as if it would fall on our heads...While hearing the sound of bombs getting much closer and several ambulances coming, we gave farewell looks to one another, and then we hugged.

Ibrahim al-Talaa, 17, recounts to Reuters how he and his family feared for their lives during the Israeli bombardment of the Gaza Strip in May 2021.²⁷

YEMEN

Yemen saw 867 civilian casualties from explosive violence last year, a 27% rise in civilian deaths and injuries compared to 2020, when 683 civilian casualties were recorded. 279 civilians were killed and 588 were injured. There were 133 incidents of explosive violence recorded last year in Yemen.



Aftermath of an airstrike by Saudi Arabia in Yemen. 2020. Photo: Felton Davis. (CC BY 2.0).

Civilians accounted for 36% of the total 2,439 casualties. Armed-actor casualties rose substantially last year, to 1,572 in 2021 from 419 in 2020; with many high casualty airstrikes conducted targeting Houthi rebels, particularly in Marib.

Ground-launched explosive weapons accounted for 66% (569) of civilian casualties. Further civilian casualties were caused by airstrikes (93 civilian casualties), mines (88), IEDs (56), and attacks using multiple types of explosive weapons (35). The remaining 26 casualties were caused by missiles with unclear launch methods.

The number of civilian casualties from airstrikes was notably lower last year, dropping 44% from 166 in 2020. Airstrikes, however, caused the highest number of total casualties in Yemen in 2021, killing and injuring 1,383 armed-actors. Casualties reached a peak in October, when 622 people became casualties of explosive violence during an intensification of the conflict between the Yemeni state and Houthi rebels in Marib. 422 of these casualties were armed-actors and 200 were civilians. With few independent journalists able to report from the impacted regions, this data should be treated cautiously as it is difficult to tell if casualty figures are inflated or if civilian casualty data is missing.

The highest numbers of recorded civilian casualties in Yemen took place in Saada (319) and Marib (223). Other provinces with high levels of civilian casualties were Taiz (90), Al-Hudaydah (88), and Aden (47).

Overall, reporting from Yemen has been consistently poor and is likely to have been inhibited by the coronavirus pandemic.

IRAQ

In 2021, there were 600 civilian casualties of explosive violence recorded in Iraq, two and a half times more than were recorded in 2020 (232), returning to a similar level as seen in 2019 (638). Of the 600 civilian casualties of explosive weapons, 142 were killed and 458 injured. Civilians accounted for over half, 53%, of the total 1,139 casualties. When explosive violence occurred in populated areas, 87% (512) of those killed or injured were civilians. There were 266 incidents of explosive weapon use recorded last year, compared to 204 in 2020.

IEDs caused the majority of civilian death and injury from explosive weapons, accounting for 85% (508) of civilian casualties. 388 civilians were injured by IEDs,

and 120 civilians were killed. Of these casualties, non-specific IEDs accounted for the vast majority of civilian IED harm – some 94%. IEDs also caused the majority of armed-actor casualties at 61% (327).

Of the remaining civilian casualties, air-launched weapons and ground-launched weapons both accounted for 7% of civilian casualties respectively. Landmines accounted for 1%.

42% of civilian casualties from explosive weapon use occurred at markets, as a result of two particularly devastating incidents in which Islamic State suicide bombers targeted busy markets in Baghdad.²⁸ Across these two incidents, at least 67 civilians were killed and 170 injured.

Non-state actors were the recorded perpetrator for 88% of civilian casualties in Iraq in 2021. ISIS were responsible for at least 53% (319) of civilian casualties last year. The perpetrator was unknown in the case of 40% (238) of civilian casualties. Turkey was responsible for 7% (42) of civilian casualties.



At least 32 civilians were killed and 100 others injured in a suicide bombing at a busy market in Baghdad. 21 January 2021. Photo: Ruwaym. (CC BY 3.0).

Figure 4 Most affected countries and territories in 2021

Ranking	Country/ Territory	Civilian casualties	Total casualties	Number of recorded incidents	Average civilian casualties per incident	Percentage of casualties who were civilians	Global ranking in 2021
1	Afghanistan	3051	5585	458	7	55%	1
2	Syria	2016	3516	709	3	57%	2
3	Gaza	1478	1498	142	10	99%	29
4	Yemen	867	2439	133	6	36%	4
5	Iraq	600	1139	266	2	53%	9
6	Somalia	537	911	89	6	59%	6
7	Pakistan	445	611	100	4	73%	3
8	Myanmar	353	694	103	3	51%	7
9	Ethiopia	311	314	9	34	99%	18
10	India	223	383	123	2	58%	188
11	Ecuador	197	197	1	197	100%	Not listed
12	Nigeria	160	437	23	7	37%	12
13	Israel	102	108	12	9	94%	30
14	Burundi	82	82	4	21	100%	27
15	Colombia	79	160	12	7	49%	43

A Global problem

The results of explosive violence continue to be felt across the globe, from Germany to Mali, from Colombia to the Maldives.

ETHIOPIA

Conflict in northern Ethiopia, between armed forces in the Tigray region and the Ethiopian state military, saw a severe escalation in 2021. The use of explosive weapons, particularly by government forces, killed and injured at least 311 civilians last year, across nine recorded incidents across the country. 288 of these civilian casualties occurred in Tigray and were the result of state airstrikes. 14 civilians were casualties of ground-launched weapons, specifically grenades and shelling; 8 of whom were killed and 7 injured.

The majority of civilian casualties from explosive violence occurred in one incident in June 2021, when a state airstrike on a market in Togoga, in the Tigray region, injured 180 civilians and killed at least 64

people.²⁹ All civilian casualties recorded in Ethiopia in 2021 took place in populated areas, including urban residential areas (47) and a hotel (7). The number of incidents and civilian casualties recorded in 2021 are the highest since AOA first recorded civilian casualties of explosive violence in Ethiopia in 2013.

We didn't see the plane, but we heard it...When the explosion happened, everyone ran out. After a time we came back and were trying to pick up the injured.

A woman told Reuters, from the hospital where her husband and young daughter were being treated for injuries. The woman said the market had been full of families, and she did not see any armed forces in the area. Tigray market, June 2021.³⁰

Given the sporadic reporting coming from the region and the lack of specific incident data, it is likely that this data is an underestimation of the levels of civilian harm occurring in the region.

MYANMAR

Myanmar continued to see high levels of civilian casualties from explosive violence, with 353 civilians killed or injured in 2021. The number of provinces in which casualties were recorded more than doubled, from five in 2020 to 13 in 2021. However, the number of civilians killed or injured fell by 3%, though armed-actor casualties increased significantly as the conflict intensified, from 12 in 2020 to 341 in 2021.

91% of all civilian casualties from explosive weapons took place in populated areas. The location type with the highest proportion of civilian casualties was villages (152), followed by public gatherings (103), with protestors a frequent target of state violence in 2021.

Ground launched weapons were the cause of 40% of all civilian deaths and injuries. Air-launched weapons caused at least 74 civilian casualties across nine incidents, and IEDs caused 32 civilian casualties across 17 incidents. Multiple types of explosive weapons, specifically mortars and grenades, were the recorded cause of 82 civilian deaths in one incident, which saw protestors targeted in Bago – it is likely further were injured but these casualties went unreported. Land-mines caused a further 23 civilian casualties across 32 incidents.

Sagaing state saw the most incidents of explosive weapon use, with 24 incidents recorded, and 31 civilian casualties. The region with the highest number of civilian casualties was Bago, with 98 civilian casualties, 5 of whom were injured and 93 killed. The violence in Myanmar has also been concentrated in Kachin (47 civilian casualties), Shan (41), Karen (30), and Mandalay (28).

Violence across the country has led to mass displacement, humanitarian crises, and persecution of the country's minority groups.³¹

UGANDA

Last year, Uganda saw the highest levels of explosive violence recorded since AOAV's monitor began in 2011. This was due to a surge in attacks by the Islamic State and affiliated groups. Across four incidents in 2021, there were a total of 51 casualties of explosive weapon use in Uganda: 47 of these casualties were civilians, eight of whom were killed and 39 injured. All casualties occurred in populated areas and IEDs were the cause of all civilian deaths and injuries.

All civilian casualties were caused in the space of one month, between October and November, across four incidents. At least three of these incidents were caused by Islamic State and local affiliate groups targeting locations with high concentrations of civilians. On 22 October, a civilian woman was killed and three others injured by an Islamic State IED attack at a popular roadside restaurant in the capital city, Kampala.³² Three days later, on 25 October, one civilian was killed and three injured in an Islamic State suicide bombing on a passenger bus near Kampala.³³

The highest casualty incident took place on 16 November, when at least three civilians were killed and 33 injured by twin suicide bombings in the centre of Kampala.³⁴ The attack was claimed by the Allied Democratic Forces (ADF), an Islamic State affiliate group. These three incidents were the first recorded explosive weapon attacks perpetrated by Islamic State groups in Uganda since AOAV began monitoring explosive violence in 2010.

We were sleeping when we started to hear the sound of an airplane... Soon after that, we heard an explosion... Now there are continuous sounds of heavy weapons..."

A woman sheltering at a temporary camp for displaced people in Hpalu, a village on the Myanmar-Thai border, told Myanmar Now. People at the camp were preparing to move overnight amid fears of further shelling. December, 2021.³⁵

WHO IS BEHIND THE EXPLOSIVE VIOLENCE?

A significant proportion of explosive violence incidents recorded by AOVAV in 2021 went unclaimed and could not be attributed to a specific actor. In 13% of all incidents, it was unclear from reporting whether a state or non-state actor was responsible.

State actors

Those 800 explosive incidents that were attributed to a state, rather than a non-state group, caused 8,568 deaths and injuries in 2021. Of these 47% (3,990) were civilians. This compares to 7,018 deaths and injuries in 2020, of which 48% (3,347) were civilians. The most prolific state users of explosive weapons are listed in *Figure 5*.

Figure 5 Biggest state users of explosive weapons in 2021

State		
1	Israel	21% of incidents
2	Syria	19%
3	Turkey	11%
4	Afghanistan	9%
5	Russia	8%

AOVAV recorded 165 incidents of explosive weapon use by the state of Israel, resulting in 1,503 civilian casualties, primarily located in Gaza. The second highest state perpetrator of explosive violence was Syria, with 152 recorded incidents of explosive weapon use, resulting in 659 civilian casualties.

Other states identified as key perpetrators of civilian harm from explosive violence included Ethiopia, Turkey, Afghanistan, Russia, Myanmar, and Saudi Arabia.

Twenty-four different state forces used explosive weapons in 2021. This is a marginally lower number than recorded in 2020, during which 27 state forces used explosive weapons.

In addition to these state military forces an additional three coalition forces carried out casualty-causing incidents of explosive violence: the Saudi-led coalition, the US-led coalition and AFRICOM. These coalitions

often comprise multiple states that carry out attacks under the coalition.

Non-State Actors

Collectively, non-state actors' use of explosive weapons caused 9,515 casualties in 2021, of whom 65% were civilians (6,187). This compares to 9,706 casualties in 2020, of whom 65% were civilians (6,272). This represents a slight decline in civilian deaths and injuries from non-state actor use of explosive weapons, as violence across key conflicts continues to fall.

AOVAV recorded 34 different non-state actors using explosive weapons in 2021.³⁶ The most prolific non-state actors in 2021 are listed in *Figure 6*. In 2021, Islamic State groups caused the highest numbers of civilian casualties from explosive weapon use among non-state groups; with 1,182 civilian casualties across 117 incidents in seven countries. Of these, most were caused in Afghanistan, with 713 civilian deaths and injuries, across 15 incidents. The Taliban were the perpetrator in 60 incidents, causing 320 civilian casualties. Houthi rebels were also among the key perpetrators of explosive violence, with 44 recorded incidents, causing 392 civilian casualties, while Al Shabaab caused 348 civilian casualties from explosive violence.

Due to AOVAV's methodology, those groups which do not routinely claim responsibility for their attacks or which operate in areas where attribution to a specific actor is difficult, may be responsible for more attacks than recorded. 876 incidents committed by non-state actors were not attributed to any group, out of a total of 1,366 incidents.

Figure 6 Biggest non-state users of explosive weapons in 2021

Non-state		
1	ISIS	7% of incidents
2	Ukrainian separatists	5%
3	Taliban	4%
4	Houthi rebels	3%
5	Al Shabaab	3%

AIR-LAUNCHED EXPLOSIVE WEAPONS



2,231

CIVILIANS KILLED
& INJURED IN 2021



5 IN 10 INCIDENTS OCCURRED IN
POPULATED AREAS



90% OF DEATHS & INJURIES IN
POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN
17 COUNTRIES AND TERRITORIES IN 2021

GROUND-LAUNCHED EXPLOSIVE WEAPONS



3,391

CIVILIANS KILLED
& INJURED IN 2021



7 IN 10 INCIDENTS OCCURRED IN
POPULATED AREAS

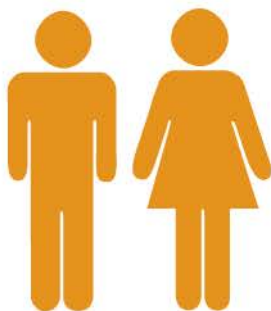


92% OF DEATHS & INJURIES IN
POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN
30 COUNTRIES AND TERRITORIES IN 2021

IMPROVISED EXPLOSIVE DEVICES (IEDS)



4,726

CIVILIANS KILLED
& INJURED IN 2021



5 IN 10 INCIDENTS OCCURRED IN
POPULATED AREAS



86% OF DEATHS & INJURIES IN
POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN
42 COUNTRIES AND TERRITORIES IN 2021

Explosive Weapon Types

AOAV records information on the explosive weapon used in any incident. The full list of the recording types used can be found on pages 7-8. These are kept deliberately broad in order to reflect the language commonly used in source reporting (i.e. 'shelling', which can cover several types of ground-launched weapons). More specific weapon types are used where such information is available in the source material.

The total number of civilian casualties recorded by AOA from each explosive weapon type is shown in *Figure 7*. There are different ways of evaluating the threat that various explosive weapons have had for civilians in 2021. These are explored over the following sections.

In order to better understand how these different explosive weapons have endangered civilians in 2021, AOA has split them into three different groups based on their launch method.

Air-launched weapons include any explosive munition dropped from an aircraft. If a bomb, missile or rocket is specified in the reporting of an incident (e.g. 'Hellfire' missile, FAB aircraft bomb) it is recorded under these narrower categories.³⁷ Other explosive attacks from the air are coded more generally as 'Air strike'.

Ground-launched weapons are manufactured conventional ordnance that range from small hand grenades to heavy artillery and multiple rocket launchers. They can be fired from a variety of platforms, but all are launched from surface level.

IEDs are improvised explosive devices. These cover any explosive weapon not manufactured through a commercial process, although they can include conventional ordnance. IEDs vary greatly in purpose, size and power, and in their mode of detonation.

The broadest recording type is 'Non-specific IED' which encompasses anything from a magnetic bomb attached to a car to a vest of explosives detonated in a market square.

In addition to these three categories, AOA records casualties from attacks where multiple launch methods are used to deploy explosive weapons. AOA also

records reported casualties of landmines. These are excluded from analysis in the following sections.³⁸

Figure 7 Civilian casualties by weapon type in 2021

Weapon type	Total Civilian casualties	Average civilian casualties per incident
Air-launched	2,231	5
Air Strike	2,100	5
Air-dropped bomb	69	3
Missile	20	2
Rocket	37	12
Rocket	5	1
Ground-launched	3,391	4
Artillery shell	380	4
Grenade	686	5
Missile	287	5
Mortar	552	6
Multiple explosive weapons	116	8
Rocket	390	4
RPG	44	3
Shelling	935	4
Tank shell	1	1
IED	4,726	5
Car bomb	1,267	13
Non-specific IED	2,715	4
Roadside bomb	744	3
Mine	357	2
Anti-personnel mine	2	1
Anti-vehicle mine	14	4
Landmine	341	2
Multiple types	310	15
Multiple explosive weapons	310	15
Unclear	87	9
Missile	87	9
Grand Total	11,102	4

Air-launched Explosive Weapons

Air-launched explosive weapons killed and injured **2,231** civilians in 2021 (**20%** of all civilian harm recorded).

When airstrikes were recorded in areas reported as being ‘populated’, **90%** of those killed and injured were civilians.

DEATHS AND INJURIES

In 2021, air-launched weaponry accounted for 20% of all civilian deaths and injuries recorded worldwide. The number of civilian casualties from airstrikes has risen by 16% since 2020, the first increase in civilian casualties from air-launched weapons since 2017. AOAV recorded 2,231 civilian casualties from airstrikes in 2021, compared to 1,922 civilian deaths and injuries from the previous year.

In total, there were 6,392 deaths and injuries, including both civilians and armed actors, from aerial explosive weapons in 2021. Civilians accounted for 35% of these casualties, a slightly lower share than last year, when they accounted for 39%.

Last year, the average number of civilians killed or injured per air-strike rose, from 3.6 to 5.1. Broken down, this is 434 airstrikes with 2,231 civilian casualties in 2021, and 529 incidents causing 1,922 civilian victims in 2020.

In 2021, 55% of reported air-launched explosive violence incidents were recorded in populated areas. This reflects a notable increase in the percentage of attacks carried out in populated areas; in 2020, 47% of airstrike incidents were recorded in populated areas.

When aerial explosive weapons were used in populated areas, 90% of those killed and injured were civilians. In areas that were not recorded as populated, that figure dropped to 3%.

COUNTRIES

Gaza was the country worst-impacted by airstrikes in 2021 (see *Figure 8*). The number of civilians killed and injured by airstrikes in Gaza accounted for 55% (1,230) of all civilians killed or injured worldwide by such weapons. Gaza has seen its highest levels of civilian casualties from air-launched weapons since 2014.

Ethiopia, Syria, and Afghanistan also saw high numbers of casualties from airstrikes, with 289, 214, and 178 civilian casualties from air-launched explosive violence respectively.

Nonetheless, Syria and Afghanistan also both saw significant declines in the number of civilians being killed or injured by airstrikes. In Syria, civilian casualties from this weapon type have fallen by 81% since 2020, and in Afghanistan, by 47%.

This is the first year since AOAV’s monitor began in 2011 that casualty-causing airstrikes have been recorded in Ethiopia. Of the 289 casualties from air-launched weapons recorded this year in the country, all were civilians. Seventy-eight people were killed and 211 injured.

I heard the sound of the jet, then a bomb landed in the middle of the crowd...I don't know why.

Said Negassie Berhe, 34, who was being treated at Ayder hospital for a serious wound to his left arm from the airstrike on a busy market in Tigray, Ethiopia. July, 2021.³⁹

PERPETRATORS

The number of air-launched explosive incidents continued to fall in 2021, from 529 in 2020 to 434 this year. The proportional level of decline was smaller than in 2020, which saw a 59% decrease in incidents from 2019, compared to 18% from 2020 to 2021.

Israel and Ethiopia were key perpetrators of airstrikes in 2021. All 289 civilian casualties from airstrikes in Ethiopia were caused by the Ethiopian state. The Israeli



The explosion of an airstrike by Saudi Arabia in Yemen. 2020. Photo: Felton Davis. (CC BY 2.0).

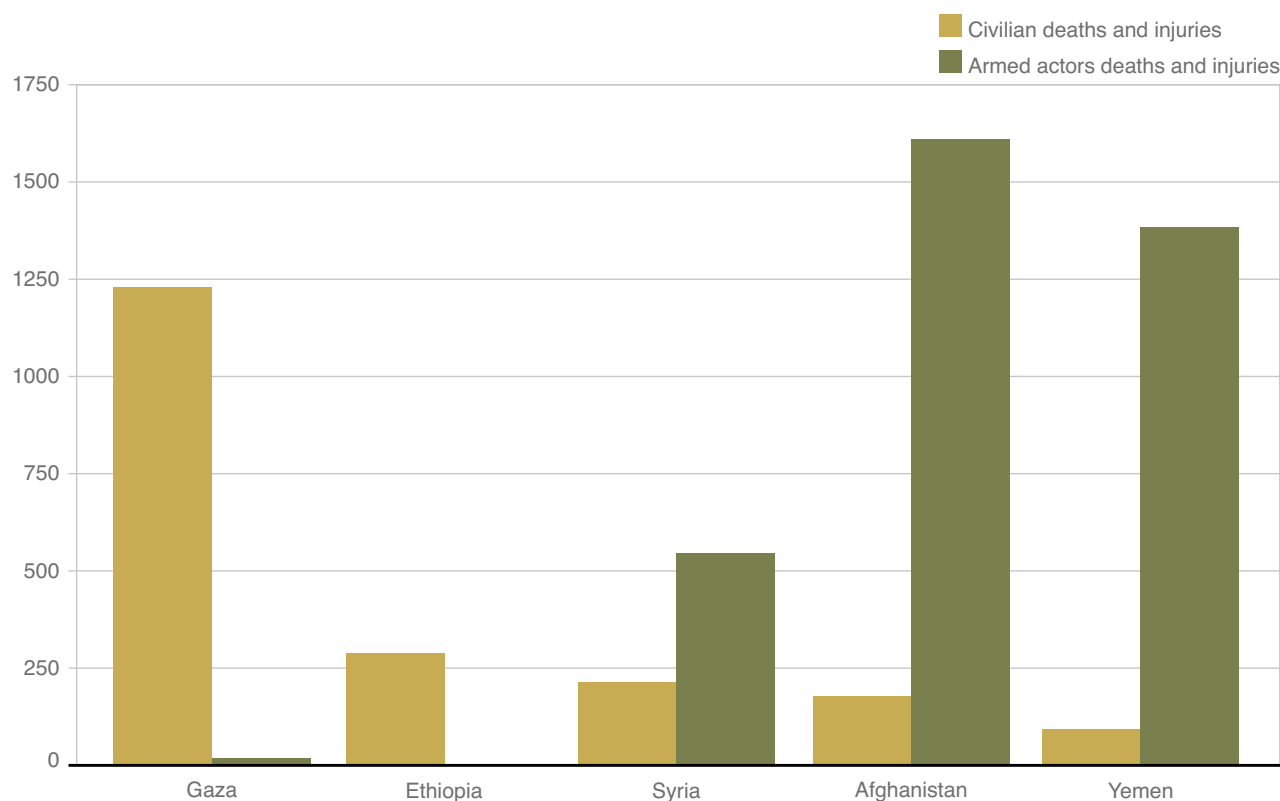
state was the recorded perpetrator in all 1,230 civilian casualties from airstrikes in Gaza, as well as 205 casualties in Syria, 19 of whom were civilians.

The Afghan government was identified as the perpetrator behind the death and injury of at least 133 civilians from airstrikes, out of a total 1,442 casualties (including armed-actors).

While difficulties remain in identifying the perpetrators of airstrikes in Syria, civilian casualties from Russian airstrikes declined, from 572 in 2020 to 119 in 2021, though they were still among the top four perpetrators of civilian casualties from air-launched weapons.

Other perpetrators seeing high levels of civilian casualties from their airstrikes include Turkey (72 civilian casualties from airstrikes), Myanmar (74), and Nigeria (58).

Figure 8 Top five countries worst-affected by air-launched weapons in 2021



Ground-launched Explosive Weapons

Ground-launched explosive weapons reportedly killed and injured **4,404** people in 2021.

77% of casualties from ground-launched explosives last year were civilians.

70% of all ground-launched incidents recorded were reported as taking place in populated areas.

heavy artillery and multiple rocket launchers. They can be fired from a variety of platforms, but all are launched from surface level.

In total, these weapons were reported to have caused 4,404 casualties in 2021; 3,391 of whom were civilians (77% of total deaths and injuries from this weapon type). This is a slightly lower level to that seen in the last few years, with 3,769 civilian casualties recorded in 2020 and 3,893 in 2019.

Civilian casualties from ground-launched weapons accounted for 31% of total civilian casualties from all explosive weapon types in 2021.

Ground-launched explosive attacks saw the most incidents in populated areas. Of all explosive weapon types, ground-launched weapons accounted for 32% of all recorded incidents, and 39% of those in populated areas.

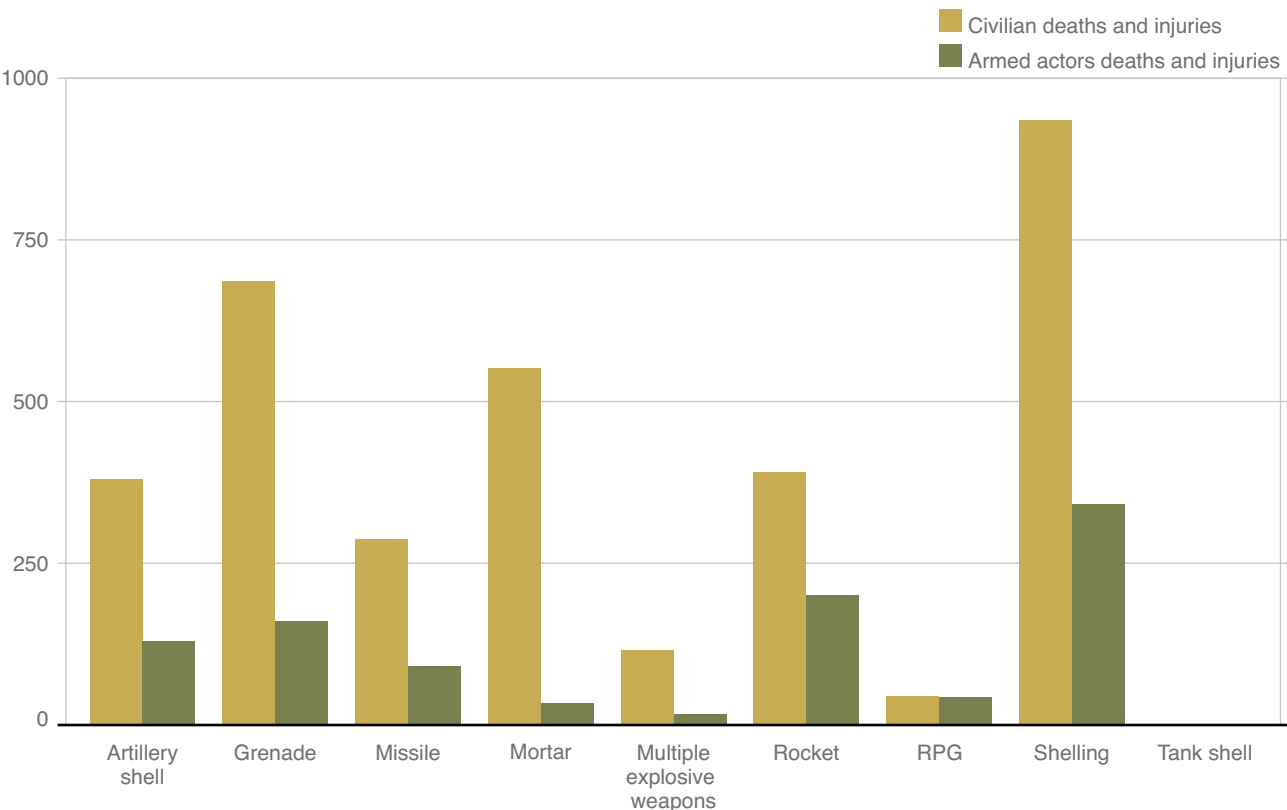
DEATHS AND INJURIES

Ground-launched weapons are manufactured conventional ordnance that range from small hand grenades to

COUNTRIES

Casualties from ground-launched explosive weapons were reported in 30 countries and territories in 2021.

Figure 9 Casualties by ground-launched weapon type in 2021





Damage from conflict in Martuni, Nagorno-Karabakh. Photo: Ministry of Defence of the Russian Federation. (CC-BY-4.0).

Syria saw the highest number of incidents of ground-launched weapon use (334) as well as the highest number of civilian casualties (1,176).

Other countries with some of the highest levels of incidents of casualty-causing ground-launched explosive weapon use include: Ukraine (92 incidents), Afghanistan (75), Yemen (65), Myanmar (43), India (40), Pakistan (36), and Iraq (27).

Yemen and Afghanistan saw the next highest numbers of civilian casualties from ground-launched weapons, with 569 and 476 civilian deaths and injuries respectively.

PERPETRATORS

45% (353) of incidents of ground-launched weapon use were attributed to State actors. Non-State actors were the recorded perpetrator group in 34% of incidents, decreasing from 41% in 2020. The perpetrator status in the remaining 21% of incidents was unknown.

168 incidents were recorded without it being known whether it was caused by a state or non-state actor. In 2020, this was the case for 224 incidents (24%).

SPECIFIC TYPES

Figure 9 illustrates the range of ground-launched weapon types that AOV tracks, and their respective impact on civilians in 2021.

Non-specific shelling accounted for the largest amount (28%) of civilian deaths and injuries from ground-launched weaponry.

Grenades, mortars and rockets also caused a significant amount of civilian harm, responsible for 686 (20%), 552 (16%) and 390 (12%) civilian casualties respectively, compared to 473 (13%), 566 (15%) and 527 (14%) in 2020.

Notably, the number of civilian casualties from grenades increased by 45% from 2020 to 2021.

Improvised Explosive Devices (IEDs)

In 2021, AOAV recorded **7,260** deaths and injuries from IEDs.

IEDs accounted for **43%** of all civilian casualties recorded last year.

IEDs resulted in at least one casualty in **42** different countries and territories.

DEATHS AND INJURIES

In 2021, AOAV recorded 7,260 deaths and injuries from IEDs. Civilians continued to see the majority of harm from such devices, accounting for 65% (4,726) of casualties from IEDs. This is the lowest number of civilians harmed by IEDs since AOAV began recording the casualties of explosive violence in 2010.

The number of civilian casualties from IEDs last year declined by merely 1% compared to 2020, when 4,778 civilian casualties were recorded from this weapon type.

Of civilian casualties from all explosive launch method types, IEDs accounted for 43%.

As is to be expected, IEDs caused particularly high levels of civilian harm when used in populated areas. IEDs were used in populated areas in 54% of all recorded attacks – totalling some 553 incidents. In these incidents, 86% of reported deaths and injuries were civilians, contrasting with 18% in other areas.

COUNTRIES

In 2021, IEDs resulted in at least one casualty in 42 different countries and territories. This represents an increase of six additional countries compared to 2020, in which 36 countries were recorded to have at least one casualty-causing incident of IED use.

Figure 10 shows the seven countries that saw the most civilian casualties from IEDs in 2021.

Figure 10 Top seven countries for civilian casualties of IEDs in 2021

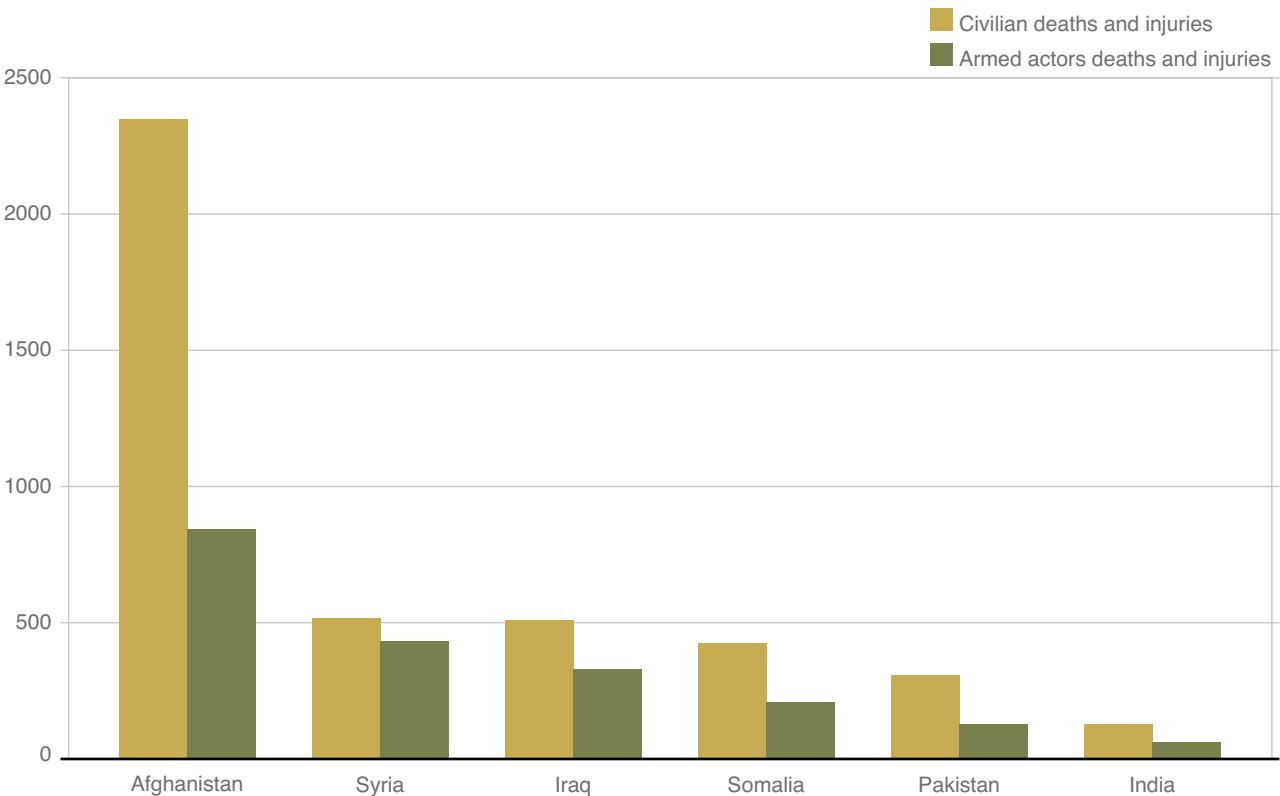
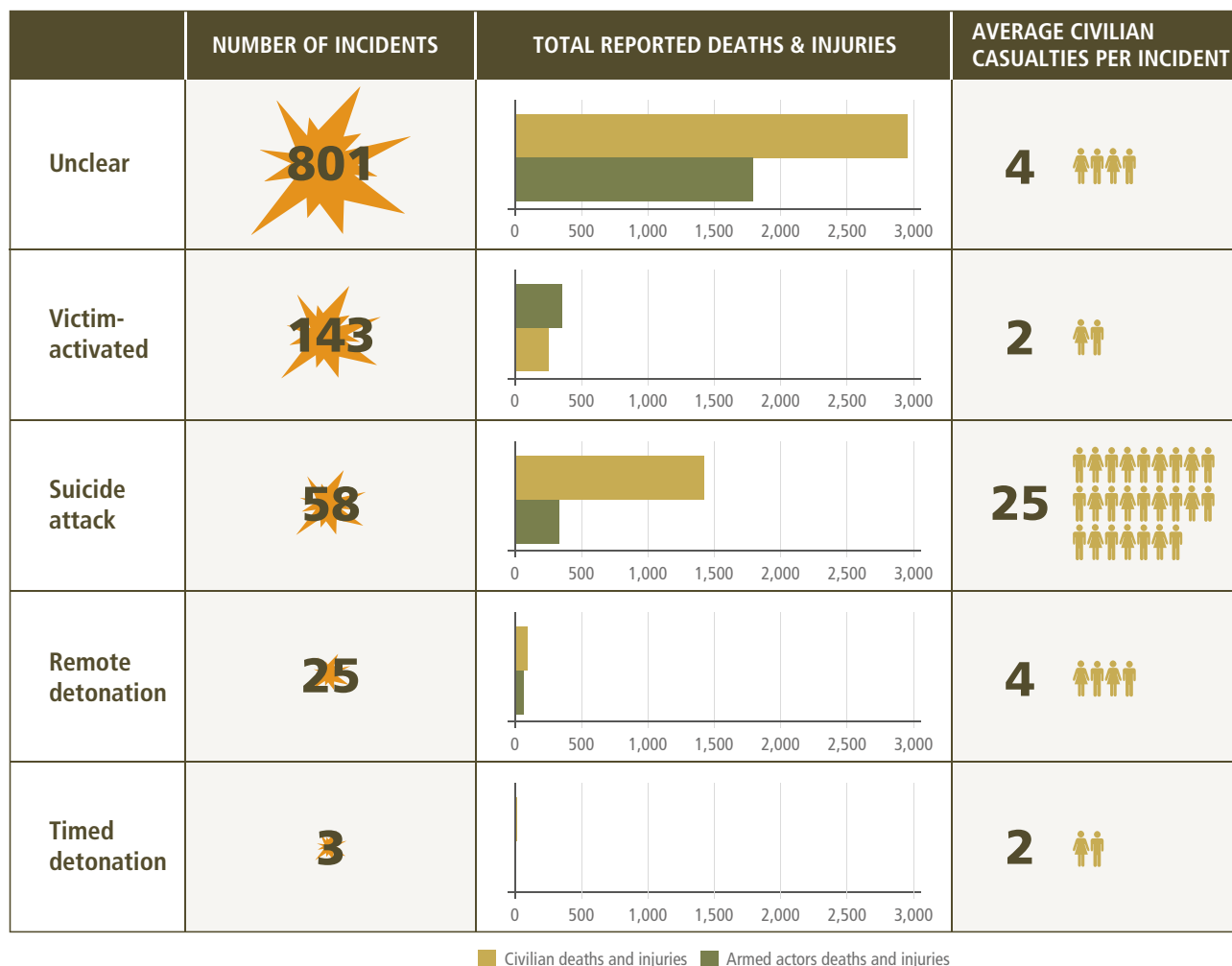


Figure 11 Average civilian deaths and injuries by IED detonation method



In 2021, six countries saw more than 100 civilian deaths and injuries from IED attacks: Afghanistan, Syria, Iraq, Somalia, Pakistan and India. These countries reflect those most impacted from IEDs globally in recent years, though civilian casualties from IEDs in India have more than doubled, from 58 in 2020 to 126 in 2021. Still, the numbers of civilian casualties in the other worst-impacted countries have all fallen.

For the fifth consecutive year, Afghanistan was the country worst-impacted by IEDs, with the most civilian casualties from this weapon type (2,347), and nearly five-times as many civilian casualties as the second worst-impacted country, Syria. The number of incidents of IED use in Afghanistan fell by 38%, from 473 in 2020 to 294 in 2021. Despite this, the number of civilian casualties remained at the same level (2,356 in 2020 and 2,347 in 2021).

Such a fall in incidents but maintenance in civilian casualties is likely to be linked to a number of particularly high casualty incidents of IED use in Afghanistan. In 2021, there were five incidents with over 100 civilian casualties, compared to 2 in 2020. Also, two of these incidents in 2021 saw over 300 civilian casualties, while in 2020 the highest casualty incident recorded 165 civilians killed and injured.

Of the 294 IED attacks recorded in Afghanistan, 16 (5%) were suicide attacks, resulting in 927 civilian casualties; 39% of all civilian casualties from IEDs in Afghanistan. This demonstrates the lethality of such incidents in Afghanistan.

On average, each suicide attack in Afghanistan saw 58 civilian casualties, compared to an average of 5 civilian casualties in non-suicide IED incidents.



Woman amongst the rubble of homes destroyed by the Israeli bombardment of the Gaza Strip, May 2021.

USERS

IEDs were exclusively used by non-state actors in 2021. AOA V recorded IED usage by 19 non-state entities.

Of the 1,030 incidents for which responsibility was assigned, 10% were attributed to Islamic State groups, which also accounted for 25% (1,161) of civilian deaths and injuries from IED incidents where the perpetrator was identified.

Al-Shabaab was the recorded perpetrator in 284 civilian deaths and injuries from IEDs (6%) and the Taliban were responsible for a total of 147 civilian casualties from IEDs (3%).

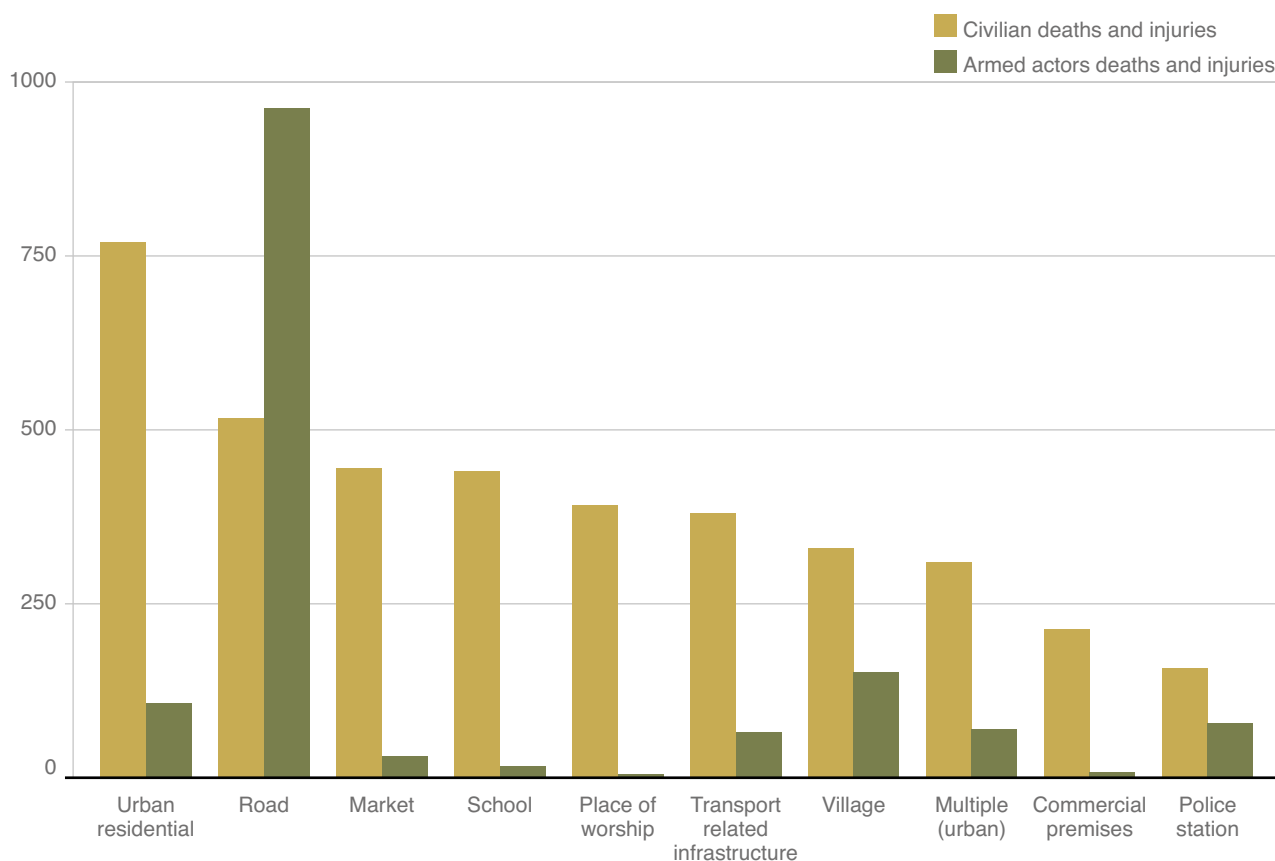
Figure 12 shows the locations where the most civilian harm occurred as a result of IED attacks. IED attacks in urban residential areas caused the highest number of civilian deaths and injuries last year. AOA V recorded 153 incidents of this kind resulting in 876 deaths and injuries, of which 88% (769) were civilians.

Other particularly badly affected areas included roads, markets, schools, and places of worship. While roads often see both civilians and armed actors fall casualty to bombs placed along them, markets, schools, and places of worship are frequently targeted due the likelihood of containing dense concentrations of civilians. Markets, schools, and places of worship saw over 90% civilian casualties in total when IEDs were detonated in these locations.

DELIVERY METHOD AND DETONATION SYSTEM

AOA V's recording distinguishes between car bombs,⁴⁰ roadside bombs and more general non-specific IEDs. The majority of incidents (66%) reported were recorded as non-specific IEDs. Roadside bombs accounted for a further 25% and car bombs for 10%. As is typically the case given their greater payload capacity, car bombs were the most injurious IED type for civilians, killing and injuring on average 13 civilians per incident. Whilst non-specific IEDs saw an average of four civilian casualties per incident and roadside bombs saw three.

Figure 12 Locations where the most civilian harm resulted from IED attacks in 2021



For the majority of IED incidents no detonation mechanism was reported. Nonetheless, AOA recorded detonation mechanisms for 22% (229) of reported incidents.

VICTIM-ACTIVATED IEDS

Victim-activated devices are most commonly detonated when a person or animal stands on them, or when they are driven over.⁴¹ IEDs detonated in this fashion are typically considered as de facto antipersonnel mines⁴² under the Mine Ban Treaty and are therefore prohibited under international humanitarian law.⁴³ Their random trigger mechanism means that they cannot distinguish between armed actors and civilians, and as such are inherently indiscriminate.

AOAV recorded 143 incidents involving victim-activated IEDs in 2021. This was 8% of the total number of victims from IEDs (5% of civilian casualties from IEDs) and 14% of the total number of IED incidents. In 2021, victim-activated IEDs resulted in an average of two civilian casualties in each attack.

Civilian casualties from victim-activated IEDs account for 2% of total civilian casualties from explosive violence worldwide.

COMMAND-OPERATED IEDS

These are detonated generally by radio signals or command wire. AOA divides these IEDs between those detonated by remote-control and those that involved the suicide of the perpetrator.

Command-operated IEDs should technically provide the greatest level of control for a user. However, this is not necessarily an assurance of higher protection standards for civilians, and can be used to instead maximise the number of civilian casualties per incident. In remote-detonated IED incidents civilians accounted for 61% of the total casualties. AOA recorded an average of 4 civilian deaths and injuries per remote-detonated IED attack in 2021. Even when targeting armed actors, the blast impacts may frequently result in civilian deaths and injuries, particularly when in a populated area.

In 2021, 92 of the 94 civilian casualties recorded from remotely detonated IEDs were in populated areas.

SUICIDE BOMBINGS

Suicide bombings, including car bombs operated by suicide bombers, are a form of command-operated IEDs. In total, AOAV recorded 58 suicide bombings last year, down from 78 suicide bombings in 2020.

In 2021, these attacks killed and injured at least 1,751 people, including 1,422 civilians (81% of the total).

On average, 25 civilians were killed and injured by each suicide bombing. In 2020, an average of 17 civilians were killed and injured in each suicide bombing.

Although suicide bombings represented only 6% of all IED incidents recorded, they accounted for 30% of all civilian deaths and injuries from IED attacks.

36 of the 58 suicide bombings reported were recorded as non-specific IEDs, which, in the case of suicide bombings, largely refers to suicide vests. 22 of the 58 incidents were recorded as car bombs. Non-specific suicide IED attacks caused an average of 33 deaths and injuries per incident, including 27 civilians, whilst suicide car bombs caused an average of 26, including 20 civilians.

Last year, 10 suicide attacks targeted armed bases, the highest incident count of any other recorded location for suicide IED attacks. This was followed by urban residential areas (7 incidents) and police stations (6). However, it was attacks on areas like transport-related infrastructure, places of worship and urban residential areas that resulted in the highest levels of civilian harm; with these locations seeing 338, 316 and 160 civilian casualties from suicide attacks respectively.

AOAV recorded suicide attacks in 16 countries. The countries worst-affected by suicide bombings last year were Afghanistan (927 civilian deaths and injuries), Somalia (258), Iraq (95), and Uganda (40).

Last year, civilian casualties from suicide attacks in Afghanistan rose, despite two previous consecutive years of decreasing numbers of civilian casualties from suicide attacks. Afghanistan continued to be the country worst-impacted by suicide attacks: 65% of all civilian casualties globally from suicide attacks occurred in Afghanistan.

Where the perpetrator group behind a suicide attack was identified, Al Shabaab was responsible for 13 suicide attacks, resulting in 259 deaths and injuries, including those of 200 civilians. The Taliban was responsible for four suicide attacks, also resulting in at least 151 casualties, including 99 civilians, whilst Islamic State groups claimed responsibility for 868 casualties from 11 suicide attacks, 90% (781) of whom were civilians. This is significantly higher than the causality numbers from Islamic State suicide attacks in 2020, which claimed the lives of 192 people across seven incidents, 93% (179) of whom were civilians. This is due to a rise in claimed and high casualty attacks in Afghanistan.

As with other explosive weapon types, when suicide bombings were used in populated areas they inflicted much higher levels of civilian harm. 78% (45) of recorded incidents took place in populated areas. In these attacks, 89% of those killed and injured were civilians. This compares to 4% in other areas.

In total, over 99% – 1,416 of 1,422 – of the civilian casualties from suicide attacks occurred in populated areas. Suicide attacks in populated areas caused an average of 31 civilian deaths and injuries per incident.

Conclusion



US forces during evacuation airlifts from Kabul's Hamid Karzai International Airport, Afghanistan, 20 August 2021.
Photo: Lance Cpl. Nicholas Guevara.

It remained the case in 2021 that civilians suffer acutely and disproportionately from the use of explosive weapons, a truth that echoes AOA's findings from over a decade of data on explosive weapon use. More civilians were harmed per incident last year than the year before, and this suffering is magnified when explosive weapons are used in populated areas.

2021 was AOA's eleventh year collecting casualty data from the use of explosive weapons and such data has consistently shown that when explosive weapons, especially those with wide area effects, are used in populated areas this will almost inevitably cause civilian deaths and injuries.

Explosive violence in populated areas is caused by both state and non-state actors alike.

The vast majority of civilian casualties from the use of explosive weapons have been caused when these weapons are used in populated areas. Last year, 93% of all civilian casualties from explosive violence worldwide occurred in populated areas. As over a decade of data shows, these casualties are predictable and far more needs to be done to protect civilians from the use of explosive weapons in towns and cities.

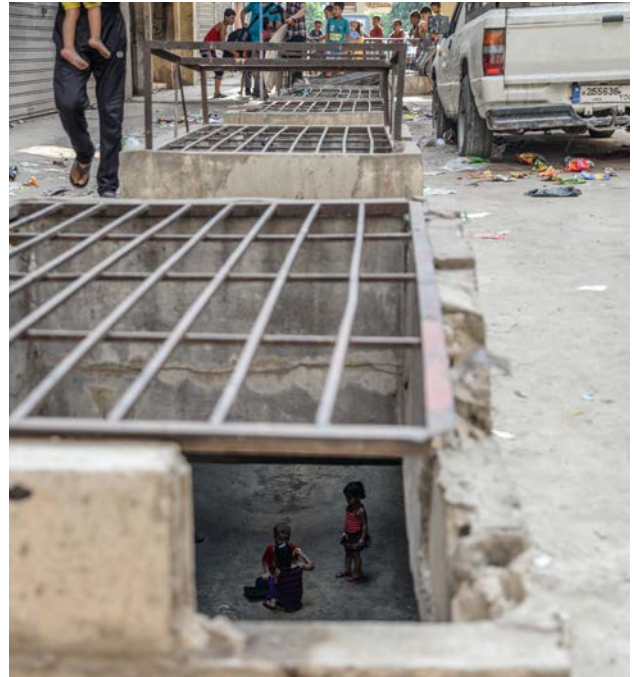
The use of explosive violence in these areas not only leads to civilian deaths and injuries but has further reverberating impacts, which prevent an untold number of civilians from accessing necessities and essential services. Research by AOA and colleagues from the International Network on Explosive Weapons (INEW) on the reverberating effects from the use of explosive weapons has sought to highlight some of this long-

term damage that continues to devastate the lives of civilians, long after the echoes of the blast have faded.

Unfortunately, far more casualties are likely to have been caused by explosive weapons last year than AOA's methodology can capture, particularly as the world continued to struggle through a pandemic, resulting in limitations around the reporting of explosive violence by English language media sources.

In this report, AOA sought to use the available data to highlight the suffering caused by explosive weapons. While we seek to examine trends and patterns, it is essential to remember that each casualty reflects a life-lost or forever changed.

We urge the international community to take note of the scale of the figures we have included in this report and seek to implement a strong political declaration to protect civilians from this foreseeable harm.



Refugees living in an abandoned factory near Saida, Lebanon. February 2021. Photo: Anthony Gale (CA BY-SA 2.0).

As a member of the International Network on Explosive Weapons (INEW), AOA and its colleagues urges states and all users of explosive weapons to:

- Acknowledge that use of explosive weapons in populated areas tends to cause severe harm to individuals and communities and furthers suffering by damaging vital infrastructure;
- Strive to avoid such harm and suffering in any situation, review and strengthen national policies and practices on use of explosive weapons and gather and make available relevant data;
- Work for full realisation of the rights of victims and survivors;
- Develop stronger international standards, including certain prohibitions and restrictions on the use of explosive weapons in populated areas.

In developing these standards, states and other actors should make a commitment that explosive weapons with wide area effects will not be used in populated areas.

Recommendations

- States and other actors should stop using explosive weapons with wide area effects in populated areas.
- States should review their policies and practices on the use of explosive weapons in populated areas, particularly those which may be expected to impact a wide area, to prevent civilian harm
- States, international organisations and civil society should work together to develop and implement the international political declaration to address the harm caused to civilians by the use of explosive weapons in populated areas, in line with the recommendations of the United Nations Secretary General.
- States should be transparent about civilian casualties and casualty recording methods, and should routinely investigate and report on every casualty caused by their use of explosive weapons.
- States, international organisations, and non-governmental organisations should gather and make available data on the impacts of explosive weapons. Data on the casualties of explosive violence should be disaggregated so that stakeholders can accurately assess the impact of explosive weapons. More should also be done to protect and support people and organisations who gather such data, including providing access to journalists on the ground.
- States should be cognisant of the fact that even where civilians have not been immediately killed or injured as a result of explosive violence, the reverberating effects of attacks may have an impact on infrastructure and civilians' daily lives and survival.
- States and users of explosive weapons should work towards the full realisation of the rights of victims, including those killed and injured, their families, and affected communities. They should strive to ensure the timely and adequate provision of needed services for the recovery, rehabilitation, and inclusion of victims of explosive violence, without discrimination.
- Recognising the large number of civilian casualties caused by IEDs, all parties should work on measures which address the high level of humanitarian harm caused by these weapons.
- AOAV's data has demonstrated the importance of systematic and continuous monitoring of explosive violence and its impacts in populated areas. This monitoring must continue in order to assess the harm and whether recommendations are put into effect.

Methodology

AOAV uses a methodology adapted from an incident-based methodology used by Landmine Action and Medact in 2009 which, in turn, was based on the Robin Coupland and Nathan Taback model.⁴⁴

Data on explosive violence incidents is gathered from English-language media reports on the following factors: the date, time, and location of the incident; the number and circumstances of people killed and injured; the weapon type; the reported user and target; the detonation method and whether displacement or damage to the location was reported. AOA does not attempt to comprehensively capture all incidents of explosive violence around the world but to serve as a useful indicator of the scale and pattern of harm.

No claims are made that this data captures every incident or casualty of explosive violence in 2021.

SELECTING INCIDENTS

An RSS reader is used to scan Google News for key terms which relate to explosive weapon use: air strike* artillery* bomb* bombing* cluster bomb* cluster munitions* explosion* explosive* grenade* IED* mine* missile* mortar* rocket* shell*.

At least one casualty from an explosive weapon must be reported in order for an incident to be recorded. Incidents with no clear date or which merely give a location as a country are excluded, as are incidents which occur over a period of more than 24 hours (e.g. 150 people killed by shelling over the last week).

Casualty numbers must be clearly stated; reports which only describe 'several' or 'numerous' cannot be recorded. When there are multiple sources for the same incident, those which provide the most detail or most recent casualty information are selected.

SOURCES

AOAV uses a wide range of English-language news sources, many of which are translated by the publisher. The most commonly-used sources are AP, AFP and Reuters. We also use the most credible data cited from organisations such as Airwars, which are frequently cited in the news reporting.

RECORDING GUIDELINES

Civilian/armed actor or security personnel:

All casualties are assumed to be civilians unless otherwise stated.⁴⁵ Casualties are recorded as 'armed actors' if they are reported as being members of the military, members of non-state armed groups, or security personnel who are likely to be armed, for example; police, security guards, intelligence officers, and paramilitary forces.

Intended target:

The target for an attack is only recorded if one of the three conditions below are met:

- The target is declared by the user.
- It is clearly reported in the source.
- The specific contextual conditions of use clearly indicate a target (e.g. if an IED is attached to the car of a police officer or soldier, 'State armed' is recorded as the target).

Populated area:

Incidents are designated as occurring in populated areas likely to contain concentrations of civilians if: a) It is stated in the source (e.g. a busy street, a crowded market); b) If an incident occurs in or near a pre-defined location which is likely to contain concentrations of civilians e.g. commercial premises, entertainment venues, hospitals, hotels, encampments (containing IDPs, refugees, nomads), markets, places of worship, public gatherings, public buildings, public transport, schools, town centres, urban residential neighbourhoods, villages/ compounds.

This definition of a populated area is based on Protocol III of the 1980 Convention on Certain Conventional Weapons (CCW) which defines concentrations of civilians as: *"any concentrations of civilians, be it permanent or temporary, such as in inhabited parts of cities, or inhabited towns or villages, or as in camps or columns of refugees or evacuees, or groups of nomads."*⁴⁶

User status:

Responsibility for the use of explosive weapons is assigned where any of the following conditions are met:



Airstrike damage in Mosul, Iraq, December 2021. Photo: Lonni Friedman (CC BY-NC 2.0).

- The group or actor responsible has claimed responsibility.
- The user of the explosive weapon is clearly stated in the report.
- If the user of the explosive weapon has employed technology clearly associated only with that user in the context in question.

If none of these conditions are met then the user is recorded as unknown. Users are recorded as ‘state and non-state’ when both users are identified but it is not possible to establish which one was responsible for the particular incident.

LIMITATIONS

This methodology is subject to a number of limitations and biases, many relating to the nature of the source material on which it is dependent and the lack of a mechanism to follow up reports with in-depth investigation. It is recognised that there are very different levels of reporting across regions and countries so that under-reporting is likely in some contexts. In addition, only English-language media reports are

used, which does not provide a comprehensive picture of definitive explosive weapon use around the world.

The methodology is designed to capture distinct incidents of explosive violence with a clear date and location. In some contexts of explosive violence, particularly during intense armed conflict, casualties cannot be assigned to specific incidents but a total number is reported as the result of a period of days. These casualties cannot be included in the dataset.

As the methodology relies on reports which are filed shortly after an incident took place, there is no mechanism for assessing whether people reported as wounded in the immediate aftermath of an incident subsequently died from their injuries. This is another factor that should be assessed when considering the likelihood that the actual numbers of fatalities of explosive violence are higher than the numbers recorded by AOV. There is no systematic base-line for determining what constitutes an injury, and AOV is therefore subject to the assessment of the news source.

On a number of occasions firearms were also reported as having been used alongside explosive weapons. While AOAV always tries to determine the casualties specifically caused by explosive weapons, in these incidents news sources are not always able to clarify which casualties were caused by which weapon type, particularly in incidents that involved large numbers of casualties. It is therefore possible that some casualties in these incidents may not have been caused by explosive weapons.⁴⁷

AOAV is focused on capturing the harm caused by explosive weapons at the time of use. Accidental detonations are recorded but not included in the overall figures. Last year, AOAV recorded 97 incidents of accidental detonation resulting in 1,155 deaths and injuries, 950 of whom were civilians.

Explosive weapons that fail to explode as intended can linger in the form of explosive remnants of war (ERW) for years, if not decades, to come. Last year, AOAV recorded incidents involving unexploded ordnance causing 584 civilian deaths and injuries. The actual number of casualties from ERW is far higher.⁴⁸

Poorly secured or stockpiled explosive weapons can also cause unintended harm to civilians. AOAV recorded five stockpile explosions in 2021.

Media reports used by AOAV are a valuable resource for better understanding the scale and pattern of explosive violence use. However, these reports are less helpful for capturing other types of harm known to be characteristic of explosive weapons in populated areas.

Damage to infrastructure, the risk of ERW, long-term health effects, and displacement are all aspects of the pattern of harm caused by explosive weapons which are not fully represented in the data set. However, reporting on these effects is often limited, with news sources focusing on the immediate aftermath of an incident. For instance, only 266 incidents out of 2,489 reported damage to a location.

Effects which are the result of cumulative levels of explosive violence, for instance communities displaced by heavy shelling or continued insecurity, cannot be fully represented by this research.

Notes

- 1 *UN Secretary General*, 'Protection of civilians in armed conflict, Report of the Secretary-General', UN Security Council, S/2021/423, 03 May 2021. https://www.security-councilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s_2021_423.pdf (accessed 13 Jan. 22).
- 2 The definition of a populated area used by AOA is based on Protocol III of the 1980 Convention on Certain Conventional Weapons (CCW) which defines concentrations of civilians as: "any concentrations of civilians, be it permanent or temporary, such as in inhabited parts of cities, or inhabited towns or villages, or as in camps or columns of refugees or evacuees, or group of nomads." The full definition is available at: "Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III)," ICRC, Geneva, 10 October 1980. AOA's guidelines for recording an area as populated are included in the Methodology.
- 3 Iain Overton et al, 'Wide-Area Impact: Investigating the wide-area effect of explosive weapons', (AOAV 2015) <https://aoav.org.uk/wp-content/uploads/2016/03/Wide-Area-Impact-explosive-weapons-in-populated-areas.pdf> (accessed 13 Jan. 22).
- 4 The category of 'mines' includes both antipersonnel landmines and antivehicle mines. In many incidents, news sources often report what were likely to have been actually victim-activated IEDs as 'mines' or used ambiguous language; as such, it is not clear in many incidents whether these incidents involve manufactured or improvised explosive weapons.
- 5 Attacks described as air-strikes can combine the firing of explosive missiles, the dropping of aerial bombs, and/or strafing using automatic weapons. There is often a lack of detail in media and official statements as to which specific weapons were used. On this basis, incidents reported as air-strikes were recorded as the use of an explosive weapon unless it is clear that only non-explosive weapons were used.
- 6 Missiles are defined as "Ammunition which consists of propellant type motors fitted with a payload and equipped with guidance devices." International Ammunition Technical Guideline, "Glossary of terms and definitions," United Nations Office for Disarmament Affairs, IATG 01.10:2021(E) 3rd Edition (March 2021) https://unoda-safeguard.s3.amazonaws.com/iatg/en/V3_IATG_compiled-compressed.pdf (accessed 13 Jan. 2022).
- 7 Rockets, both air and ground-launched, are defined as "ammunition consisting of a rocket motor and a payload, without an on-board guidance system. NOTE The term often includes both guided and unguided missiles, although it traditionally referred to unguided missiles." International Ammunition Technical Guideline, "Glossary of terms and definitions," United Nations Office for Disarmament Affairs, IATG 01.10:2021(E) 3rd Edition (March 2021) https://unoda-safeguard.s3.amazonaws.com/iatg/en/V3_IATG_compiled-compressed.pdf (accessed 13 Jan. 2022).
- 8 "Guided mortar systems provide increased firing accuracy and reduced ammunition consumption over their conventional counterparts. Mortars are normally smooth-bore, muzzle-loading, indirect-fire support weapons, and are typically used against personnel, light armoured vehicles, and structures. Although they can engage targets that may not be within their line of sight, they are limited in range and accuracy when compared to many other artillery systems." N. R. Jenzen-Jones, Small Arms Survey, Guided Mortar Systems (Research Note 51), April 2015. <https://www.smallarmssurvey.org/sites/default/files/resources/SAS-Research-Note-51.pdf> (accessed 13 Jan. 22).
- 9 A populated area is one that is likely to contain concentrations of civilians. It is based on Protocol III of the 1980 Convention on Certain Conventional Weapons (CCW). The full definition and guidelines for recording an area as being populated is detailed on pages 32-33.
- 10 Al Jazeera, 'Kabul airport bombing: What we know', 27 Aug 2021, <https://www.aljazeera.com/news/2021/8/26/what-we-know-so-far-about-the-explosions-at-kabul-airport> (accessed 13 Jan. 2022).
- 11 Faizi, F., F. Abed, and N. Rahim, 'Afghan War Casualty Report: May 2021', *New York Times*, 3 Jun 2021, <https://www.nytimes.com/2021/05/06/world/asia/afghan-war-casualty-report-may-2021.html> (accessed 13 Jan. 22).
- 12 Burke, J. 'Scores killed in Ethiopian airstrike on Tigray market', *Guardian*, 24 Jun 2021, <https://www.theguardian.com/world/2021/jun/24/ethiopian-airstrike-tigray-market> (accessed 13 Jan. 22).
- 13 *Al Jazeera*, 'At least 24 killed in Ecuador prison gang riot: Police', 29 Sep 2021, <https://www.aljazeera.com/news/2021/9/29/at-least-24-killed-in-ecuador-prison-gang-clash-police> (accessed 13 Jan. 22).
- 14 *BBC*, 'Afghanistan: Deadly attack hits Kunduz mosque during Friday prayers', 09 Oct 2021, <https://www.bbc.co.uk/news/world-asia-58842793> (accessed 13 Jan. 22).
- 15 *ANI*, 'Kandahar mosque bombing death toll rises to 63', 16 Oct 2021, <https://www.khaleejtimes.com/world/rest-of-asia/kandahar-mosque-bombing-death-toll-rises-to-63> (accessed 13 Jan. 22).
- 16 Arraf, J. 'Suicide Bombings in Crowded Baghdad Market Kill at Least 32', *New York Times*, 21 Jan 2021, <https://www.nytimes.com/2021/01/21/world/middleeast/baghdad-market-bombing.html> (accessed 13 Jan. 22).
- 17 Faizi, F., F. Abed, and N. Rahim, 'Afghan War Casualty Report: May 2021', *New York Times*, 3 Jun 2021, <https://www.nytimes.com/2021/05/06/world/asia/afghan-war-casualty-report-may-2021.html> (accessed 13 Jan. 22).
- 18 *Palestinian Centre for Human Rights*, 'On Seventh Day of Israeli Offensive on Gaza, Residential Area Destroyed over People's Heads; Airstrikes Cause Earthquake-like Destruction', 16 May 2021, <https://www.pchrgaza.org/en/on-seventh-day-of-israeli-offensive-on-gaza-residential-area-destroyed-over-peoples-heads-airstrikes-cause-earthquake-like-destruction/> (accessed 13 Jan. 22).
- 19 *Al Jazeera*, 'Baghdad bombing: 35 killed in attack on packed Iraq market', 19 Jul 2021, <https://www.aljazeera.com/news/2021/7/19/iraq-roadside-bomb-kills-10-in-baghdad> (accessed 13 Jan. 22).
- 20 *BBC* 'Iraq attack: Twin suicide bombings in central Baghdad kill 32' 21 Jan 2021 <https://www.bbc.co.uk/news/world-middle-east-55746676> (accessed 13 Jan. 22).
- 21 *BBC* 'Kabul attack: Families bury schoolchildren of blast that killed dozens' 9 May 2021 <https://www.bbc.co.uk/news/world-asia-57046527> (accessed 13 Jan. 22).
- 22 In alphabetical order the 57 countries are: Afghanistan, Algeria, Armenia, Azerbaijan, Bangladesh, Burkina Faso, Burundi, Cameroon, Central African Republic, China, Colombia, DRC, Ecuador, Egypt, Ethiopia, Gaza, Germany, Honduras India, Indonesia, Iran, Iraq, Israel, Kenya, Kyrgyzstan, Lebanon, Libya, Maldives, Mali, Mexico, Myanmar, Nepal, Netherlands, Niger, Nigeria, Oman, Pakistan, Papua New Guinea, Paraguay, Philippines, Russia, South Korea, South Sudan, Somalia, Sudan, Syria, Thailand, Tunisia, Uganda, UK, Ukraine, USA, Venezuela, Western Sahara, Yemen.

- 23 In alphabetical order these were: Central African Republic, China, DRC, Ecuador, Germany, Honduras, Kyrgyzstan, Maldives, Nepal, Netherlands, Oman, Papua New Guinea, Paraguay, South Korea, South Sudan, Sweden, Venezuela, Western Sahara.
- 24 BBC 'Kabul airport attack: "Today I saw doomsday" 27 Aug 2021 <https://www.bbc.co.uk/news/world-asia-58340809> (accessed 13 Jan. 22).
- 25 AOA's methodology defines the location type of 'Multiple (urban)' as: Used for explosive violence incidents taking place at the same time in a number of different locations in an area known to be populated and where deaths or injuries cannot be ascribed to a specific, narrower location.
- 26 Reporting by the *Palestinian Centre for Human Rights* was the primary news source for this data. <https://pchr.org/en/> (accessed 13 Jan. 22).
- 27 Sulaiman K. R. 'Gaza attacks: Fear finality and farewells as bombs rained down' *Al Jazeera* 22 May 2021 <https://www.aljazeera.com/news/2021/5/22/gaza-attacks-fear-finality-and-farewells-as-bombs-rained-down> (accessed 13 Jan. 22).
- 28 BBC, 'Iraq attack: Twin suicide bombings in central Baghdad kill 32', 21 Jan 2022, <https://www.bbc.co.uk/news/world-middle-east-55746676> (accessed 13 Jan. 2022); BBC, 'Iraq Attack: Bombing at Baghdad market kills Eid shoppers', 19 July 2022, <https://www.bbc.co.uk/news/world-middle-east-57895957> (accessed 13 Jan. 22).
- 29 *Associated Press*, "Horrible: 64 dead in Ethiopian airstrike on Tigray", 24 June 2022, <https://apnews.com/article/africa-ethiopia-ca9b378c5fce53d10c33e4e14b8d03d5> (accessed 13 Jan. 22).
- 30 Burke, J. "Scores killed in Ethiopian airstrike on Tigray market", *The Guardian*, 24 Jun 2021, <https://www.theguardian.com/world/2021/jun/24/ethiopian-airstrike-tigray-market> (accessed 13 Jan. 22).
- 31 *Human Rights Watch*, 'Myanmar: Junta Blocks Lifesaving Aid', 13 Dec. 2021, <https://www.hrw.org/news/2021/12/13/myanmar-junta-blocks-lifesaving-aid> (accessed 13 Jan. 22).
- 32 BBC, 'Uganda: One killed in bomb attack at Kampala bar', 25 Oct. 2021, <https://www.bbc.co.uk/news/world-africa-59028210> (accessed 13 Jan. 22).
- 33 Olukya, G. 'Bus blast in Uganda carried out by suicide bomber: Police', *Anadolu Agency*, 26 Oct. 2021, <https://www.aa.com.tr/en/africa/bus-blast-in-uganda-carried-out-by-suicide-bomber-police/2403586> (accessed 13 Jan. 22).
- 34 *Al Jazeera*, 'Uganda's capital Kampala hit by deadly suicide bombings', 16 Nov. 22, <https://www.aljazeera.com/news/2021/11/16/ganda> (accessed 13 Jan. 22).
- 35 *Myanmar Now* 'Junta carries out airstrikes on KNU-controlled Lay Kay Kaw' 24 Dec 2021 <https://myanmar-now.org/en/news/junta-carries-out-airstrikes-on-knu-controlled-lay-kay-kaw> (accessed 18 Feb. 22).
- 36 Abu Bakr al-Siddiq (Syria), Afrin Liberation Front (Syria), Al Shabaab (Somalia, Kenya), Baloch Liberation Army (Pakistan), Boko Haram (Nigeria, Cameroon), Carlos Patino Front (Colombia), Chinland Defense Force (CDF) (Myanmar), CPI (naxals) (India), FARC (Colombia), Hamas (Israel), Hlaing Tharyar Dalan Eradication Team (Myanmar), Houthi rebels (Yemen, Saudi Arabia), Hynniewtre National Liberation Council (India), ISIS (Afghanistan, DRC, Egypt, Iraq, Nigeria, Syria, Uganda), Janatantrik Tarai Mukti Morcha (Nepal), KA/KNDF (Myanmar), Kachin Independence Army (Myanmar), Kalay PDF (Myanmar), Mabij Military Council (Syria), National Defence Forces (Syria), NPA (Philippines), Pakistan Taliban (Pakistan), PDF (Myanmar), People's Revolution Army (Myanmar), Peshmerga (Syria), PKK (Syria, Iraq), Russian-backed forces (Ukraine), SDF (Syria), Syrian rebels (Syria), Taliban (Afghanistan), TPLF (Ethiopia), Turkish-backed factions (Syria), Ukrainian separatists (Ukraine), Yaw Defense Force (YDF) (Myanmar). There were also various other actors identified only as individuals, mercenaries, or rebels.
- 37 Barrel bombs, which are improvised makeshift weapons that comprise fuel, explosive content and often metal fragments, are included under the air-dropped bomb recording type. It is often unclear in media reporting whether descriptions of 'barrel' bombs in fact designate improvised weapons or conventional aircraft bombs with similar wide-area effects.
- 38 The category of 'mines' includes both antipersonnel landmines and antivehicle mines. In many incidents, news sources often report what were likely actually victim-activated IEDs as 'mines' or used ambiguous language; it is not clear in many incidents whether these incidents involve manufactured or improvised explosive weapons. For detailed information on the incidents of antipersonnel and other types of mine use around the world see International Campaign to Ban Landmines, 'Landmine Monitor 2021', November 2021, <http://www.the-monitor.org/media/3318354/Landmine-Monitor-2021-Web.pdf> (accessed 13 Jan. 22).
- 39 Marks S. Dahir A. L. 'Dozens Killed in Market Airstrike in Ethiopia' officials say *The New York Times* 23 June 2021 <https://www.nytimes.com/2021/06/23/world/africa/ethiopia-tigray-attack.html> (accessed 13 Jan. 22).
- 40 Car bomb' is taken as shorthand for vehicle-borne IEDs or VBIEDs, including explosives concealed in or built into vehicles of all kinds. Thus some car bombs may in fact be bike bombs or truck bombs.
- 41 62 percent of IED attacks with a reported mode of detonation in 2021 were triggered by victim-activation.
- 42 Though some IEDs may be designed to only be triggered by a vehicle. For instances of this please see: CAR, 'Dispatch from the Field: Mines and IEDs Employed by Houthi Forces on Yemen's West Coast', September 2018. *Anti-vehicle mines are not covered by the Mine Ban Treaty.*
- 43 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their destruction, 18 September 1997, https://treaties.un.org/doc/Treaties/1997/09/19970918%2007-53%20AM/Ch_XX-VI_05p.pdf (accessed 13 Jan. 22).
- 44 For more information see www.insecurityinsight.org (accessed 13 Jan. 22).
- 45 In a minority of cases in reported incidents there is a possibility that armed actors were among those killed and injured by explosive weapons, but the exact details of the number of armed actors killed or injured was not recorded. Incidents which meet this profile are coded as 'yes' in a column titled 'Could armed actors be included among the dead and injured?' Incidents coded in this manner represented just 4% of all incidents recorded by AOA in 2021.
- 46 Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III), to the UN Convention on Certain Conventional Weapons, Geneva, 10 October 1980, www.icrc.org/ihl.nsf/FULL/515 (accessed 13 Jan. 22).
- 47 AOA recorded 67 such incidents in 2021.
- 48 International Campaign to Ban Landmines, 'Landmine Monitor 2021', November 2021, <http://www.the-monitor.org/media/3318354/Landmine-Monitor-2021-Web.pdf> (accessed 13 Jan. 22).

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