

ACTION ON
ARMED VIOLENCE

AOAV

EXPLOSIVE TRUTHS

Monitoring explosive violence
in 2016



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Cover illustration

A U.S. Army M109A6 Paladin conducts a fire mission at Qayyarah West, Iraq

Photo by: Pfc. Christopher Brecht

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Introduction

The 2016 report presents the findings of the sixth consecutive year of Action on Armed Violence's (AOAV) Explosive Violence Monitoring Project (EVMP). The EVMP tracks the impact of explosive weapon use world-wide as reported in the English-language media.

In 2016, AOA V recorded 45,624 deaths and injuries as a result of the use of explosive weapons around the world. And, as with previous years, civilians continue to bear the burden of explosive violence. Of those harmed, 70% were reported to be civilians – 32,088.

Whilst the total number of those impacted by explosive weapons continues to rise, for the first year since AOA V began the recording, there was a decrease in the number of civilian deaths and injuries compared to the previous year. Despite this, the number of civilian deaths and injuries recorded in 2016 remained 48% higher than that recorded in 2011, the year our EVMP began.

Iraq and Syria remained amongst the worst five impacted countries for the fifth year in a row. These two countries have consistently seen the highest numbers of civilian casualties from explosive violence. The civilian impact of explosive violence in these two countries has had a significant impact upon what has been termed the 'migrant crisis' – but should be more accurately called the 'refugee crisis' – in Europe. AOA V's report 'The Refugee Explosion' has looked into this reality in more detail.

Yemen, too, continues to suffer painfully high levels of civilian harm from explosive weapons. 2016 saw increased calls for cooperation in Yemen, where almost 19 million need humanitarian assistance.¹ Without a doubt the Saudi-led coalition's bombing campaigns on Yemen have had a major impact on this crisis – a causal factor that those nations arming Saudi Arabia (Britain included) need to acknowledge.

When explosive weapons are used in populated areas, they massively elevate the threat to civilians. In 2016, 92% of those reported harmed by explosive weapons in populated areas were civilians. Last year AOA V recorded an average of 32 civilian deaths from explosive weapons per day.

Such findings reflect a consistent pattern of harm that has endured throughout the years AOA V has been tracking explosive violence. AOA V's report, 'Patterns of Harm', which examined the trends seen across five years of explosive violence casualty recording, found that when explosive weapons had been used in populated areas on average 91% of the deaths and injuries caused were civilians.²

Even when explosive weapons were targeted at a military objective in 2016, their wide-area effect often meant that bystanders were all too often caught by the blast or hit by projected fragments – something that AOA V catalogued in our separate report in 2015: 'Wide Area Effects' (found on our website).

This data only shows the immediate impact of explosive violence but it should be remembered that the impacts of such weapons stretch far beyond these, including the destruction of homes, hidden psychological suffering, economic deprivation and reverberating impacts that are often poorly understood or addressed.

Explosive weapons impact far more people than can possibly be hinted at by our casualty figures. There are those whose lives are uprooted by the blast of an earthbound shell, a silent multitude whose numbers run into the millions. Countless flee across international borders, whilst even greater numbers are displaced internally.

AOA V'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 2016.

Since the monitor began in 2010, AOA V has recorded the appalling suffering caused across the globe by both manufactured and improvised weapons. This continued harm that has now manifested in the refugee crisis that impacts Europe and far beyond shows the urgent need for action to combat and reduce the harm these weapons continue to cause.

States and other users must politically commit to stop using explosive weapons with wide area effects in populated areas. The harm recorded in 2016 and reflected in this report illustrates the stark urgency needed to reach this commitment.

Current and recent armed conflicts – such as those in Syria, Ukraine, Afghanistan, Yemen, Iraq and Gaza – continue to expose the particularly devastating effects on civilians of heavy explosive weapons when used in populated areas... In addition to the high risk of incidental civilian death, injury and disability, heavy explosive weapons tend to cause extensive damage to critical civilian infrastructure, triggering debilitating "domino effects" on interconnected essential services such as health care, and water and electricity supply systems. This in turn provokes further civilian death and displacement. And these effects are exacerbated in protracted armed conflicts.

Christine Beerli, vice-president of the ICRC, 12 October 2016³



Jadah Camp, Salah al-Din. Credit: IOM November 19, 2016 (<https://creativecommons.org/licenses/by-nc-nd/2.0/>)

Key findings

OVERVIEW

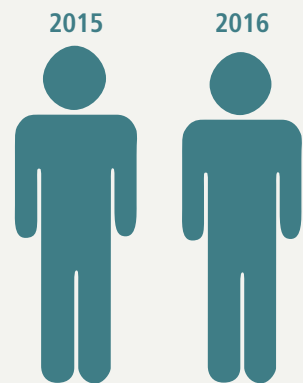
- AOA V recorded 45,624 deaths and injuries by explosive weapons in 2,300 incidents in 2016. Of these, **32,088 were civilians – 70%**.
- When explosive weapons were used in populated areas, **92% of those killed and injured were civilians**. This compares to 25% in other areas.
- Civilian deaths and injuries in populated areas, represented **89% of all reported civilian deaths and injuries**.
- AOA V recorded the **highest number of civilian deaths** since it began its monitor in 2011 – a **7% increase compared to the previous year**, and a **92% increase compared to 2011**.
- An **8% increase** in civilian harm from **air-launched attacks** compared to 2015 – with a reported 9,934 civilians worldwide killed and injured, accounting for **31% of all civilian deaths and injuries**.
- **Syria, Iraq, Yemen, Afghanistan, and Turkey** saw the highest number of civilian deaths and injuries in 2016.
- A further rise in death and injuries in **Syria** from explosive violence; over **15,000 deaths and injuries** in 2016, **51% more than in 2015**.
- **Turkey** saw a **113% rise** in civilian deaths and injuries in 2016 from explosive violence, compared to 2015. **Somalia** saw **an increase of 83%** of the same.
- **Six countries and territories** saw over **1,000 civilian deaths and injuries** in 2016.
- Incidents were recorded in **70 countries and territories** around the world – seven more countries than in 2015.
- AOA V recorded **256** suicide bombings in 2016, causing 12,673 deaths and injuries – of which **76% were civilians**.
- On average **38 civilians were killed and injured by each suicide bombing** – an increase of two since 2015.
- Civilian deaths and injuries from explosive violence saw a **decrease of 2% in 2016** from 2015 – this is owing to the drop in numbers of injuries reported. This is the first year since AOA V began its monitor in which recorded civilian casualties of explosive violence have decreased but could reflect the fact that, with the rising numbers of people killed, less wounded have been reported.

EXPLOSIVE VIOLENCE IN 2016



70%
CIVILIAN CASUALTIES

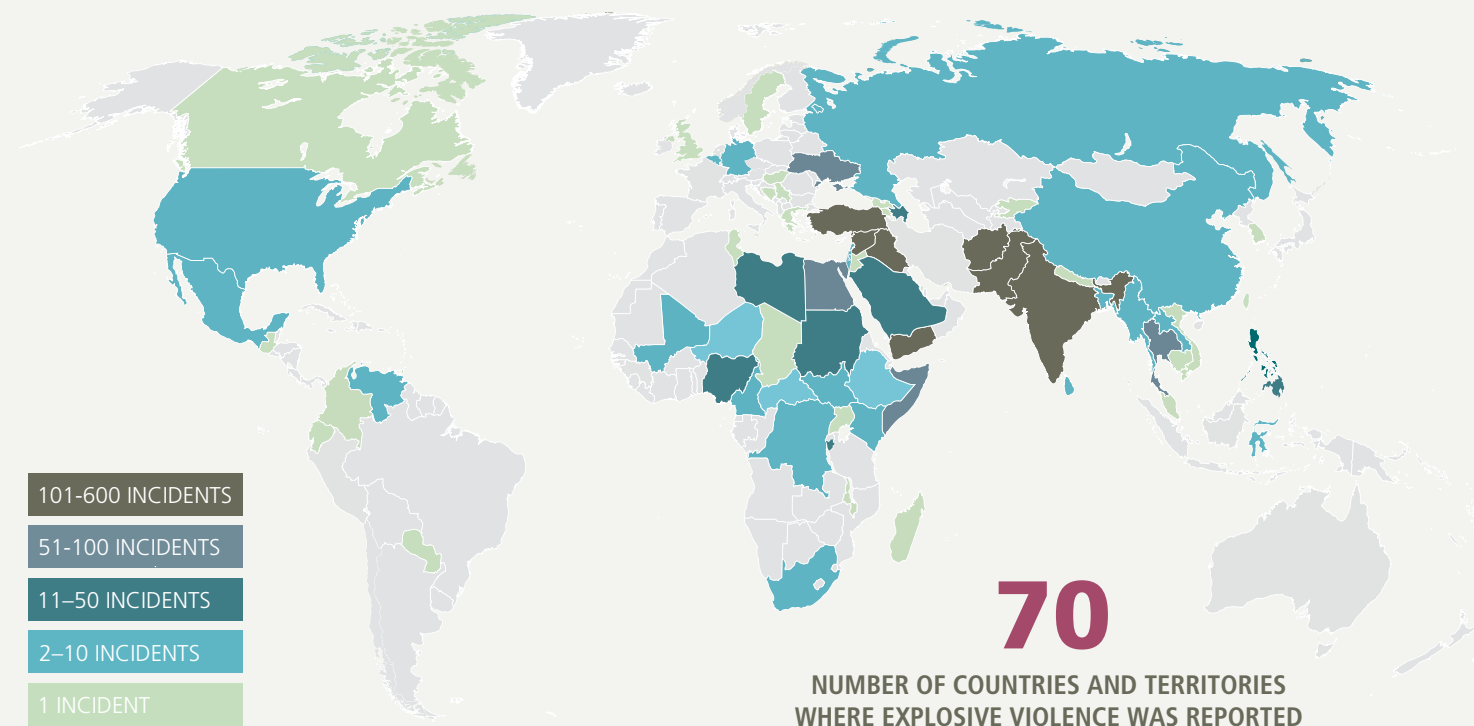
TOTAL REPORTED DEATHS & INJURIES: 45,624
TOTAL CIVILIAN DEATHS & INJURIES: 32,088



-2%
DECREASE IN TOTAL CIVILIAN
DEATHS & INJURIES



32
AVERAGE NUMBER OF CIVILIAN
DEATHS PER DAY



TARGETED AREAS

POPULATED AREAS

92% CIVILIAN DEATHS & INJURIES
IN POPULATED AREAS



1,241 ATTACKS IN POPULATED AREAS

NON-POPULATED AREAS

25% CIVILIAN DEATHS & INJURIES
IN NON-POPULATED AREAS



1,059 ATTACKS IN NON-POPULATED AREAS

DEADLY WEAPONS

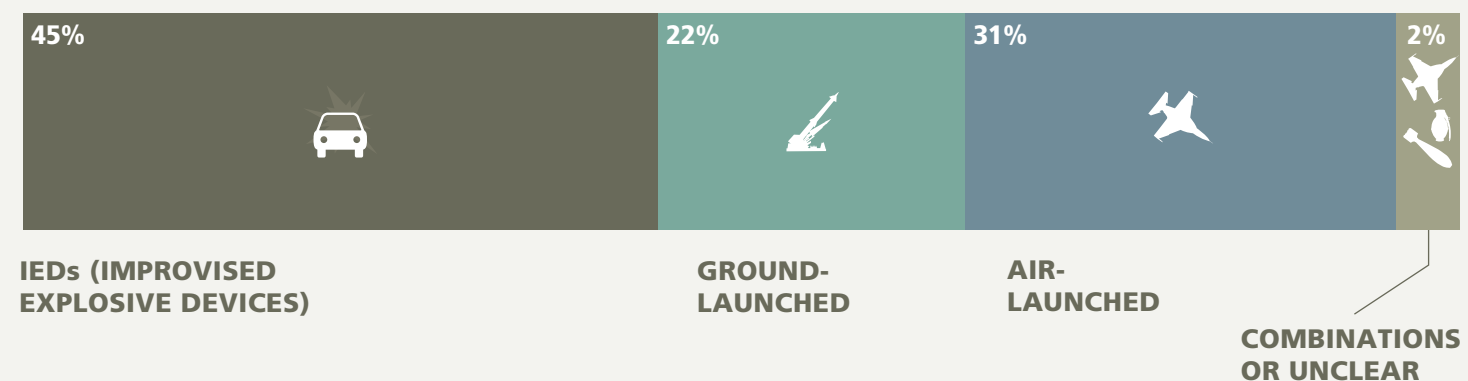
AVERAGE CIVILIAN DEATHS & INJURIES PER INCIDENT BY EXPLOSIVE WEAPON TYPE

27
CAR BOMBS

27
AIR-DROPPED BOMBS

13
ROCKET ARTILLERY

CIVILIAN DEATHS & INJURIES BY WEAPON LAUNCH METHOD



Targeted Area	TOTAL DEATHS & INJURIES	CIVILIAN DEATHS & INJURIES	AVERAGE CIVILIAN DEATHS & INJURIES PER ATTACK
URBAN RESIDENTIAL	5,865	99%	16
MARKETS	2,793	98%	35
PLACES OF WORSHIP	1,719	97%	43

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, members of non-state armed groups, or 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.⁴

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.

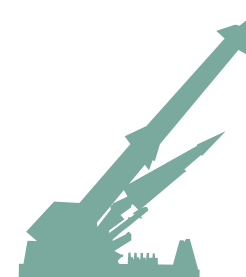
- **Multiple types:** Used to refer to incidents where a combination of different explosive weapon types were used and it was not possible to attribute casualties to each munition. These can involve any combination of air, ground-launched, or improvised explosive devices. The category most commonly includes 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.⁵

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.⁶ 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.⁷
- **Rocket:** Typically used to refer to unguided missiles, rockets were recorded wherever they are specified in a news source.⁸

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.⁹
- **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.

2016 Overview

AOAV recorded **45,624** people killed or injured by explosive weapons in **2,300** incidents in 2016.

Of the casualties recorded in 2016, **70%** were civilians (**32,088** civilians killed and injured).

This meant there was a **2% decrease** in civilian casualties from explosive violence in 2016 (down from 33,307 in 2015).

In 2016, for the first time, AOA V recorded a decrease in civilians killed and injured by explosive violence. In that year, AOA V saw 32,088 civilian deaths and injuries from explosive weapons reported around the world. This is a decrease of 2% from 2015.

Despite this AOA V recorded the highest number of civilian deaths seen across the six years. Whilst this is usually accompanied by a rise in injuries, this was not the case – reflecting the nature of the war reporting, where injuries often fail to make the headlines.

Worst incidents of 2016

Incident	Location	Civilians killed and injured
Air strike hits community hall in Sana'a where wake is being held ¹²	Sana'a, Yemen	735
Car bomb attack on commercial area in Baghdad ¹³	Baghdad, Iraq	524
Suicide bombing targets Christians at a park ¹⁴	Lahore, Pakistan	413
Suicide car bomb attack at rush hour near National Security Directorate ¹⁵	Kabul, Afghanistan	393
Airstrikes target rebel-held eastern Aleppo destroying residential areas ¹⁶	Aleppo, Syria	385
Suicide bomber detonates explosives at peaceful demonstration ¹⁷	Kabul, Afghanistan	311
Dawn airstrikes on ISIS-held villages using barrel bombs ¹⁸	Oqayrabad, Syria	303
Air strikes hit a busy market in ISIS-held area ¹⁹	Qaim, Iraq	300
Multiple suicide bombers detonate across Istanbul airport ²⁰	Istanbul, Turkey	280
A car bomb and suicide attackers detonate near Shia shrine ²¹	Sayyidah Zaynab	261

The decrease overall may also be accounted for by the decrease in IED attacks targeting civilians. Civilian deaths and injuries from IEDs fell by 12% in 2016 compared to the previous year. At the same time, armed actor and security personnel deaths and injuries from IEDs rose by 75%.

Over the last six years, AOA V has recorded 233,949 deaths and injuries, of which 76% (177,653) were civilians.

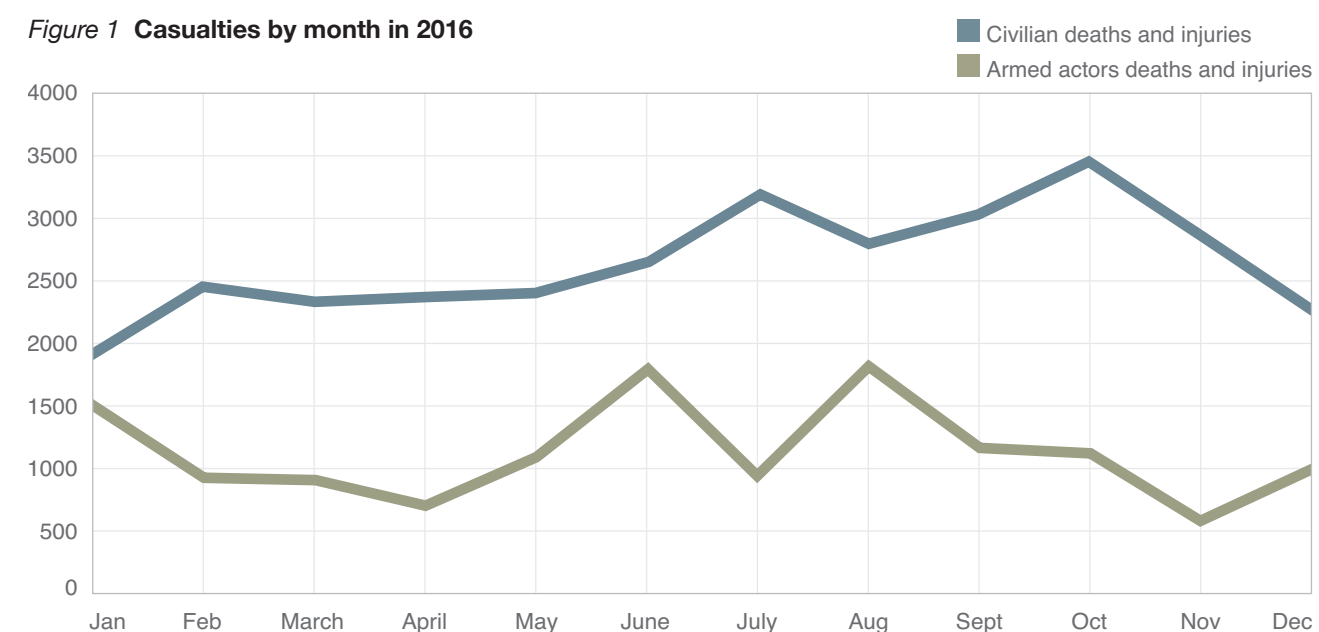
As in previous years, the majority of casualties from explosive weapon use were civilians. Civilians accounted for 70% of all recorded deaths and injuries in 2016.

Following a well-established pattern of harm, civilians were seen to be most at risk when explosive weapons were used in populated areas.¹⁰ In those attacks, 92% of those killed or injured were reported as civilians. This compares to 25% of victims being reported as civilians when explosive weapons were used in lesser populated areas.

In 2016, 54% of all recorded explosive incidents took place in populated areas.

As shown in *Figure 1*, the reported civilian casualties of explosive weapon use consistently and substantially outnumbered armed actors in 2016.¹¹

Figure 1 Casualties by month in 2016



On average, AOA V recorded 2,674 civilian casualties reported every month, compared to an average of 1,128 armed actors. This means that, every day, there were on average 88 civilians reported killed or injured by explosive weapons (compared to 37 armed actors).

32 civilians were reported killed on average every day from explosive weapon use in 2016.

A GLOBAL PROBLEM

AOAV recorded at least one death or injury from an explosive weapon attack in 70 different countries and territories (see map on page 6),²² seven more than in 2016.²³

Casualties from explosive weapons were reported in 20 countries and territories in 2016 that had not been impacted in 2015.²⁴

As *Figure 2* (overleaf) shows, Syria was the country with the most civilian deaths and injuries in 2016, followed by Iraq, Yemen, Afghanistan, Turkey.

Iraq

Iraq saw a 26% increase in the number of civilian casualties recorded by AOA V compared to 2015. High civilian casualties from explosive violence have been a continuous aspect of life in Iraq for over a decade.

Despite the increase in civilian harm recorded last year, given the worsening security situation since the emergence of the Islamic State in Iraq and Syria (ISIS) as a major force in Iraq in 2014, it is likely that this figure does not reflect the true levels of harm within Iraq. This would be due to a decline in English-language casualty reporting from inside Iraq, particularly within active zones of conflict.²⁵

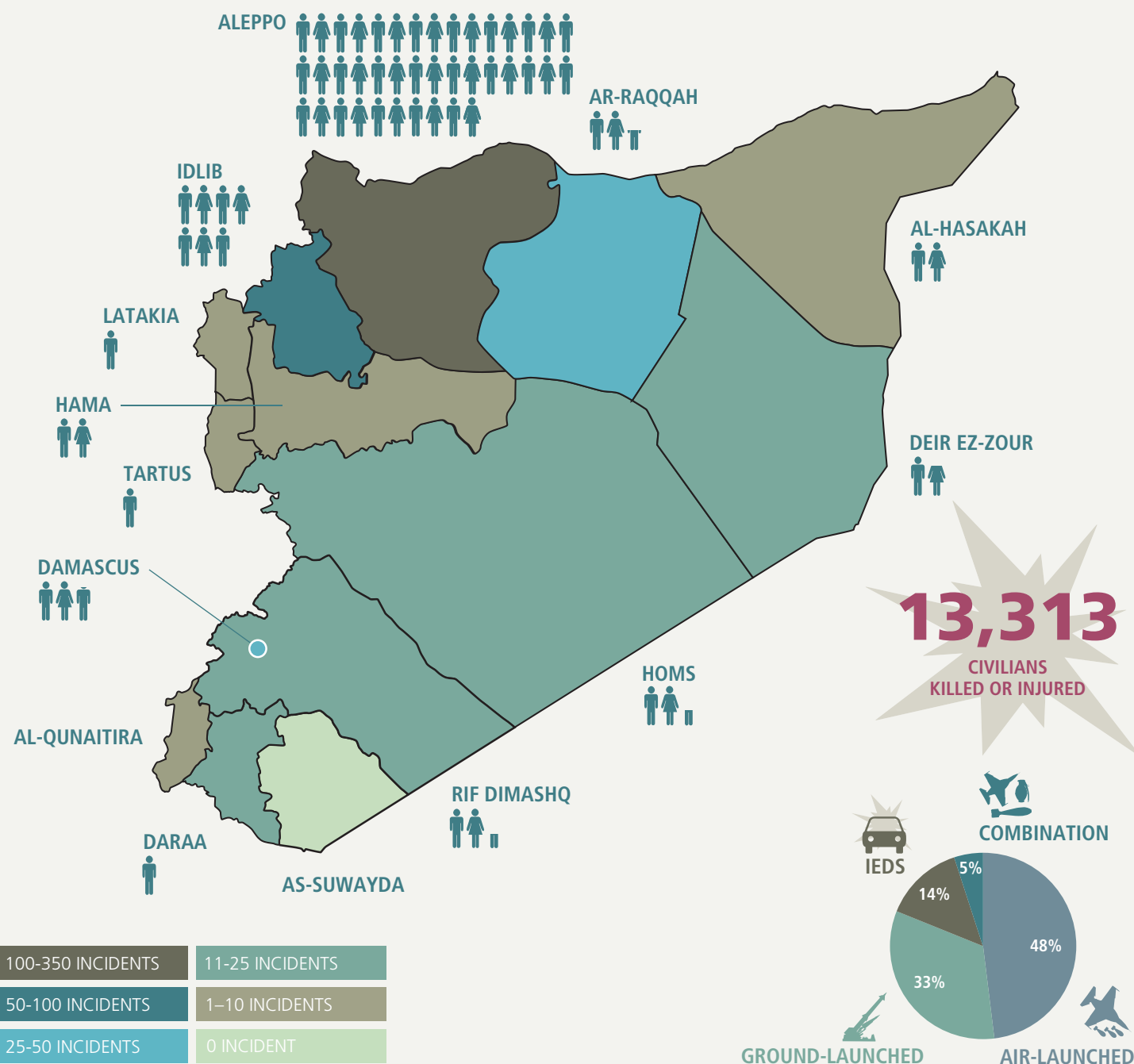
Yemen

Yemen saw a decrease of 57% in recorded civilian casualties from explosive violence in Yemen in 2016, compared to 2015. This is because, despite numerous violations, the ceasefire between April and August led to a significant decrease in violence. The breakdown during peace talks in August led to a resurgence of violence, though such violence did not reach the levels seen in 2015.

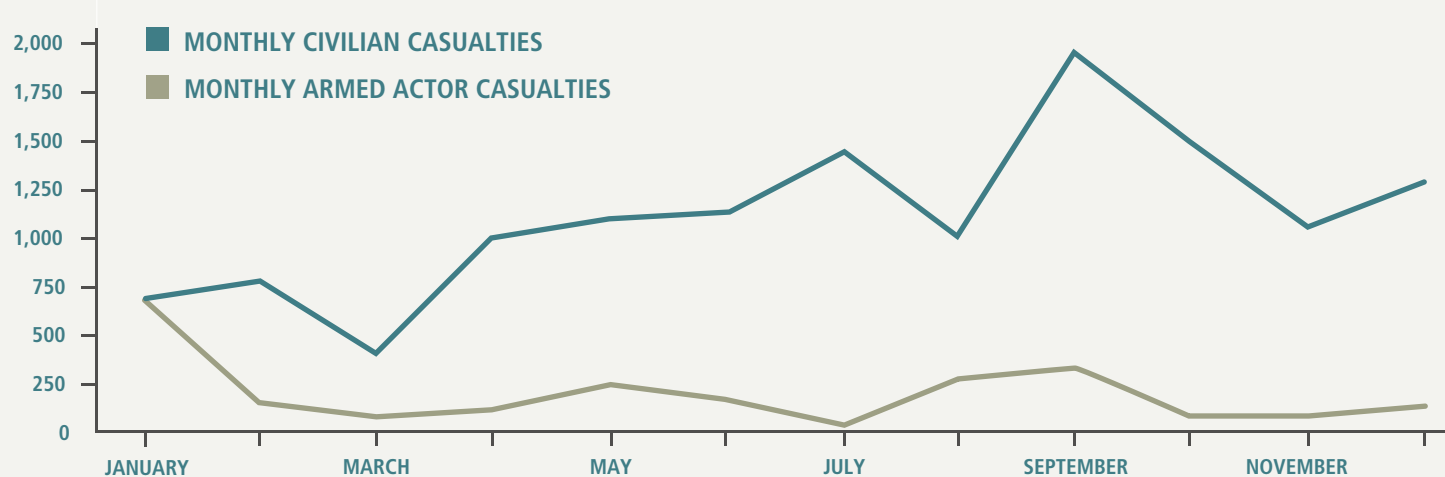
Despite the decrease in harm, Yemen remained amongst the top three countries worst impacted by explosive violence in the world. 82% of the civilian deaths and injuries in Yemen were caused by the Saudi-led coalition, a situation exacerbated by the continued sales of weapons to the Saudis.

The conflict has caused a wide-spread humanitarian crisis in Yemen, where all parties to the conflict are arbitrarily denying sustained humanitarian access,

THE HARDEST-HIT PROVINCES IN SYRIA IN 2016



MONTHLY CASUALTIES OF EXPLOSIVE VIOLENCE IN 2016



despite two-thirds of the population – 18.8 million people – in need of aid.²⁶

Nigeria

In 2015, Nigeria was in the top five worst impacted countries worldwide from explosive weapons, with 2,920 civilian deaths and injuries.

Last year, AOV recorded an 83% decrease in civilian casualties from explosive violence in Nigeria. This is partly because Nigeria and its surrounding countries (Chad, Cameroon, Benin, and Niger), have formed the Multinational Joint Task Force to combat Boko Haram. This force has made concerted efforts to rid the region of Boko Haram, a group that has historically been responsible for the majority of explosive harm – often suicide attacks – in Nigeria and other countries around the Lake Chad region.

HOTSPOTS: 2016's BIGGEST ESCALATIONS

Syria

Syria is entering its seventh year of civil war. The intensity of the explosive violence in conflict scenarios like Syria means that AOV's incident-based methodology is likely to be capturing just a fraction of the real harm unfolding there, particularly harm caused during the sieges of Aleppo during the end months of 2016.

In spite of this, AOV's records still show 13,313 civilian deaths and injuries as a result of explosive weapons use recorded in Syria in 2016. This constitutes a 52% increase from the previous year.

Over the last six years, AOV has recorded 51,875 deaths and injuries from 2,160 incidents of explosive violence in Syria. 86% of the deaths and injuries have been reported by reliable media sources as being those of civilians.

Figure 2 Most affected countries and territories in 2016

Position	Country/Territory	Civilian casualties	All casualties	Number of recorded incidents	Average civilian casualties per incident	Percentage of casualties who were civilians	Global ranking in 2016
1	Syria	13,313	15,640	553	24	85%	1
2	Iraq	6,359	9,785	401	16	65%	3
3	Yemen	2,713	4,095	151	18	66%	2
4	Afghanistan	2,199	4,095	198	11	54%	5
5	Turkey	1,825	2,675	110	17	68%	8
6	Pakistan	1,498	2,136	158	9	70%	6
7	Somalia	826	1,414	87	9	58%	13
8	Nigeria	491	900	29	17	55%	4
9	Cameroon	319	337	10	32	95%	11
10	Libya	309	782	38	8	40%	10
11	Belgium	261	264	2	131	99%	N/A
12	Philippines	261	358	48	5	73%	17
13	India	234	458	124	2	51%	16
14	Thailand	176	279	52	3	63%	19
15	Egypt	158	705	65	2	22%	9

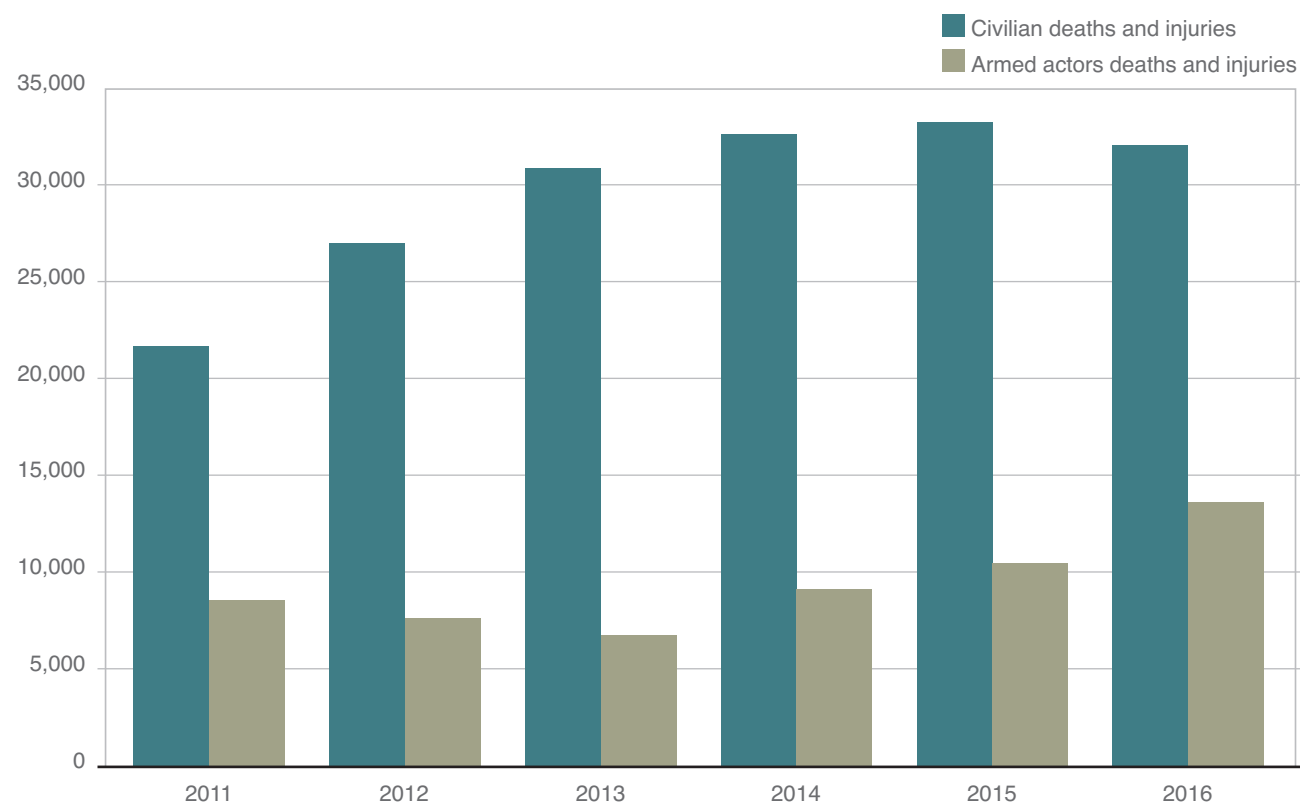
The violence in Syria has been characterised by the destruction of civilian areas – with 73% of recorded incidents perpetrated in populated areas, responsible for 89% of civilian deaths and injuries.

Last year, when explosive violence was used in populated areas in Syria, an average of 97% of the deaths and injuries were civilians. There were at least 22 incidents of explosive violence that directly killed and injured targeting hospitals; 15 on schools, and at least 173 on residential areas.

Whilst the types of explosive violence are diverse, what is also notable is that the majority of this violence has been perpetrated by state actors. At least 56% of the civilian deaths and injuries were caused by explosive violence perpetrated by states. The states perpetrating most of this violence, Syria and Russia, have been regularly accused of targeting civilian areas.

Explosive violence in Syria has been found to be the most significant factor driving Syrians to seek refuge across international borders.²⁷

Figure 3 Civilians killed and injured 2011-2016



Turkey

For the first year since AOVAV began the Explosive Violence Monitor, Turkey was recorded in the worst five impacted countries by explosive violence. Since the breakdown of the two-year ceasefire between the PKK and the Turkish government in 2015, Turkey has experienced significant rises in the levels of explosive violence, and the resulting civilian harm. Explosive violence had been largely absent from Turkey in previous years of recording, minus the rare large-scale IED attack.

Between 2014 and 2015, Turkey saw a 7,682% rise in civilian casualties from explosive violence. In 2016 the increase continued, with civilian casualty levels more than doubling. Almost all civilian deaths and injuries have been caused by IEDs. In 2016, 94% of civilian casualties from explosive weapons in Turkey were caused by IEDs.

Whilst there were 110 explosive violence incidents in Turkey in 2016, just six caused 54% of the total civilian deaths and injuries. All six attacks were car bombs, suicide bombs or both. All took place in populated areas. The worst incident was a triple suicide bomb

attack at Atatürk Airport, Istanbul, in June, leaving more than 40 dead and over 230 injured.²⁸ Whilst no one claimed responsibility for the attack, Turkish officials claimed the attackers were working on behalf of ISIS. These IED attacks have also taken their toll on Turkish police and security forces, with 757 armed actors and security personnel killed and injured by IEDs in Turkey last year.

Somalia

Somalia saw civilian deaths and injuries from explosive violence increase by 83% in 2016, compared to the levels recorded in the previous year – 451 civilian deaths and injuries were recorded in 2015 and 826 were recorded last year. This increase should concern, though, the levels of harm fortunately failed to reach those recorded in 2011, the first year recorded by AOVAV, when 1,326 civilian deaths and injuries from explosive violence were recorded. In 2011, AMISOM re-established control over Mogadishu and other important areas, inhibiting al-Shabaab’s political ascendancy in Somalia.

Last year, al Shabaab was responsible for at least 71% of the civilian deaths and injuries recorded from explosive attacks. Of the explosive violence claimed by al Shabaab in Somalia, 74% of their attacks used IEDs.

Al Shabaab primarily operate in the south and central regions of Somalia. Last year, just over 50% of the group’s attacks took place in the Somali capital, Mogadishu. It is possible that many of al Shabaab’s attacks go unreported.

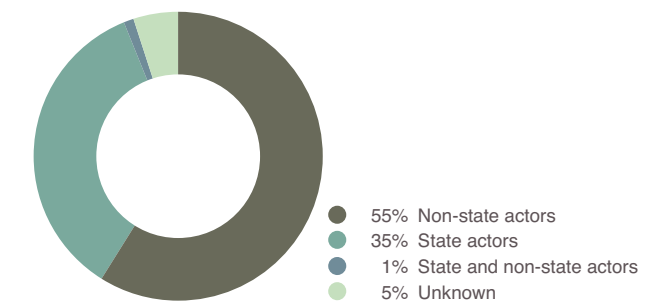
Whilst suicide attacks account for 25% of the total incidents recorded, such strikes have caused a disproportionate impact. 52% of the total civilian deaths and injuries from explosive violence in Somalia were from suicide bombers in 2016.

WHO IS BEHIND THE EXPLOSIVE VIOLENCE?

As in previous years, many of the explosive violence incidents recorded by AOVAV in 2016 went unclaimed and could not be attributed to a specific actor. In 11% of incidents it was unclear from reporting whether a state or non-state actor was responsible. This is a far-lower percentage than in 2015, when 40% of incidents were coded as unclear. The rise in state or

non-state attribution is likely to be due to the increase of aerial campaigns and as the majority of incidents occurred in Syria and Iraq.

Figure 4 Civilian casualties by reported user



State Actors

Incidents which could unambiguously be attributed to a state rather than a non-state group caused 18,838 deaths and injuries in 2016, of whom 60% (11,313) were reported to be civilians. This means over a third of the 32,088 total civilians killed or injured in 2016 were by states.

The most prolific state users of explosive weapons are listed in Figure 5.

This list, however, may be deceiving. It is likely that far more incidents should be attributed to Syria and Russia, but in many of the state perpetrated incidents in Syria the perpetrator name was unknown, so it was unclear whether they were perpetrated by Syria or Russia.

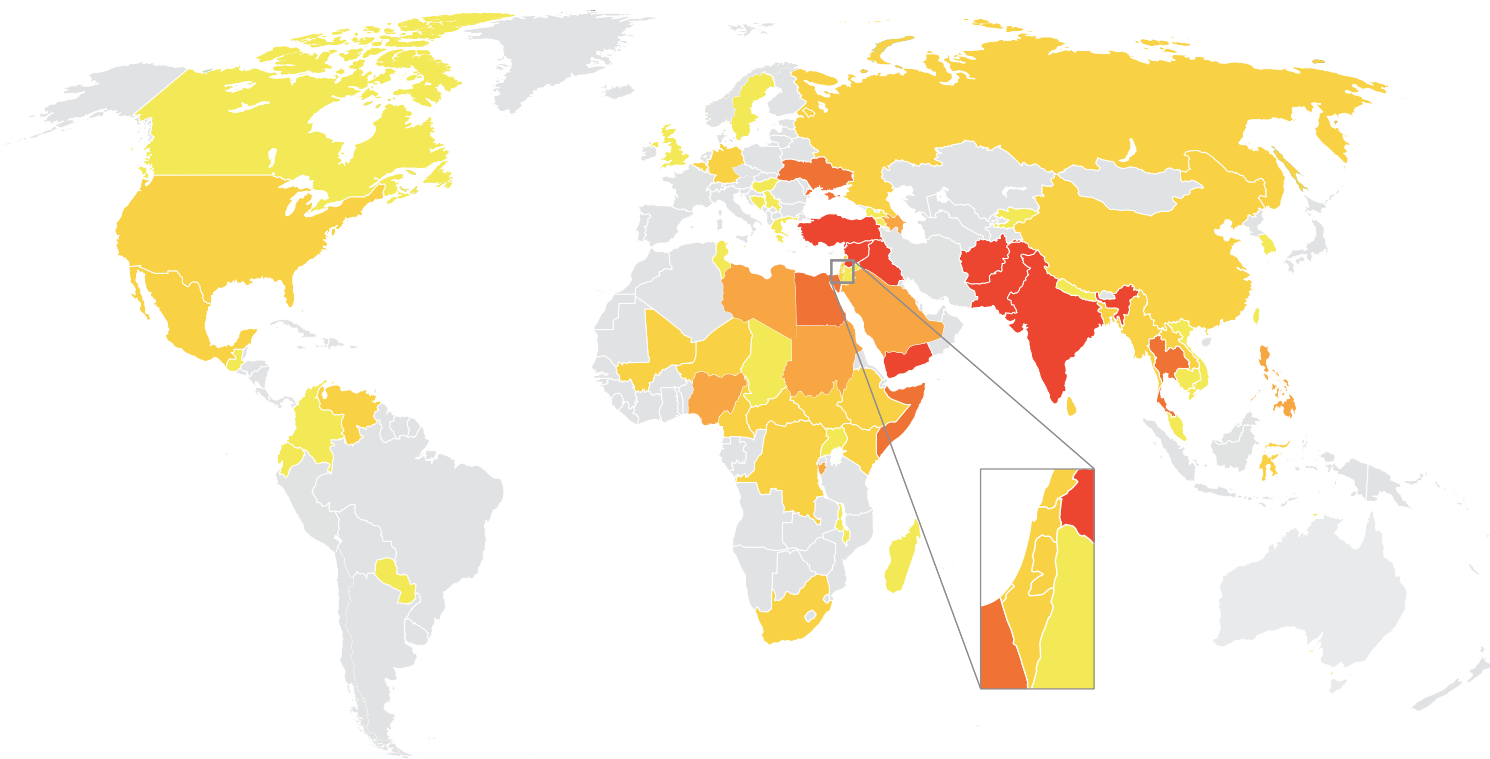
Of the 170 global incidents where the state perpetrator was unknown, 124 were in Syria, and 119 of these were from air-launched explosives.

The number of reported civilian deaths and injuries from explosive violence caused by state actors represents a 9% rise from the previous year. This is probably due at least in part to a greater percentage of attacks being attributed to states and a smaller percentage being coded as unclear.

State forces were recorded as being responsible for 35% of civilian deaths and injuries. This is a slight rise from 2015, when they were responsible for 31% of all civilian deaths and injuries.

Incidents of explosive violence recorded by AOVAV in 2016

AOAV recorded explosive violence in 70 countries and territories across the world. Explosive violence was particularly intense in several contexts.



- **Countries and territories with between 101 and 400 incidents**
Afghanistan 198, India 124, Iraq 401, Pakistan 158, Syria 553, Turkey 110, Yemen 151
- **Countries with between 51 and 100 incidents**
Egypt 65, Somalia 87, Thailand 52, Ukraine 53
- **Countries with between 11 and 50 incidents**
Azerbaijan 17, Burundi 17, Libya 38, Nigeria 29, Philippines 48, Saudi Arabia 50, Sudan 12
- **Countries with between 2 and 10 incidents**
Bangladesh 2, Belgium 2, Burma 5, Cameroon 10, China 2, DRC 3, Gaza 6, Germany 3, Indonesia 3, Israel 9, Kenya 10, Laos 2, Lebanon 10, USA 8, Mali 8, Malta 2, Mexico 2, Russia 5, Sri Lanka 2, South Africa 2, South Sudan 5, Venezuela 4, West Bank 3
- **Countries and territories with 1 incident**
Armenia 1, Bahrain 1, Bosnia and Herzegovina 1, Cambodia 1, Canada 1, Chad 1, Colombia 1, Ecuador 1, Georgia 1, Greece 1, Guatemala 1, Hungary 1, Japan 1, Jordan 1, Kyrgyzstan 1, Madagascar 1, Malawi 1, Malaysia 1, Nepal 1, Paraguay 1, Serbia 1, South Korea 1, Sweden 1, Taiwan 1, Trinidad and Tobago 1, Tunisia 1, Uganda 1, UK 1, Vietnam 1

Twenty-six different state forces used explosive weapons in 2016.²⁹ This is a slight decrease from in 2015, where twenty-nine states were recorded. However, many states operate under coalitions with many attacks recorded under the coalition name.

Three distinct state coalitions used explosive violence last year (AMISOM in Somalia, the Saudi-led coalition in Yemen and the US-led coalition against al-Qaeda and ISIS-linked elements in Iraq and Syria), and one incident attributed to the NATO taskforce in Afghanistan (previously NATO-ISAF, now known as Resolute Support).

Figure 5 Biggest state users of explosive weapons in 2016

States	
1	US-led coalition 17% of incidents
2	Syria 10%
3	Saudi-led coalition 10%
4	Turkey 5%
5	USA 5%

Non-State Actors

Collectively, non-state actors caused 24,726 casualties in 2016, of whom 77% were civilians (18,999). This is a considerable rise from previous years.³⁰ This means almost two thirds of all civilians harmed by explosive weapons are the victims of non-state actor violence.

The higher figure does not necessarily represent a greater proportion of violence being carried out by

non-state actors directly. Compared to previous years, a much lower number of incidents were not attributed to either a state or non-state actor. It is likely that a large percentage of those incidents for which an attribution was not clear in previous years were in fact the work of non-state actors but were not recorded as such.

AOAV recorded 60 different named non-state actors using explosive weapons.³¹ The most prolific non-state actors in 2016 are listed in *Figure 6*. This year, ISIS was the largest non-state user of explosive weapons in the world, followed by Syrian rebel groups.

Due to AOVAV's methodology, 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 are recorded. 558 incidents committed by non-state actors were not claimed by any group. Of these incidents, 19% took place in Iraq, 14% in Pakistan, and 10% in Afghanistan. Many attacks also went unclaimed in Egypt, Thailand, India, Turkey and Somalia.

Figure 6 Biggest non-state users of explosive weapons in 2016

Non-state	
1	ISIS 19% of incidents
2	Syrian rebels 11%
3	PKK 4%
4	Houthi rebels 3%
5	Al Shabaab 3%

Explosive weapons in populated areas

In 2016, **92%** of casualties in populated areas were reported as civilians. This is compared to **25%** in other areas.

On average **23** civilians were killed or injured in every incident of explosive weapon use in populated areas. In other areas the average number was **three**.

5,741 civilians were killed or injured in homes or in residential areas in 2016 – a rise of **14%** from 2015.

In 2016, AOVAV recorded **1,490** child deaths and injuries in **338** incidents.

POPULATED AREAS

As *Figure 7* shows, in 2016 when explosive weapons were used in populated areas, 92% of the deaths and injuries were reported to be civilians. This compares to 25% in other areas.

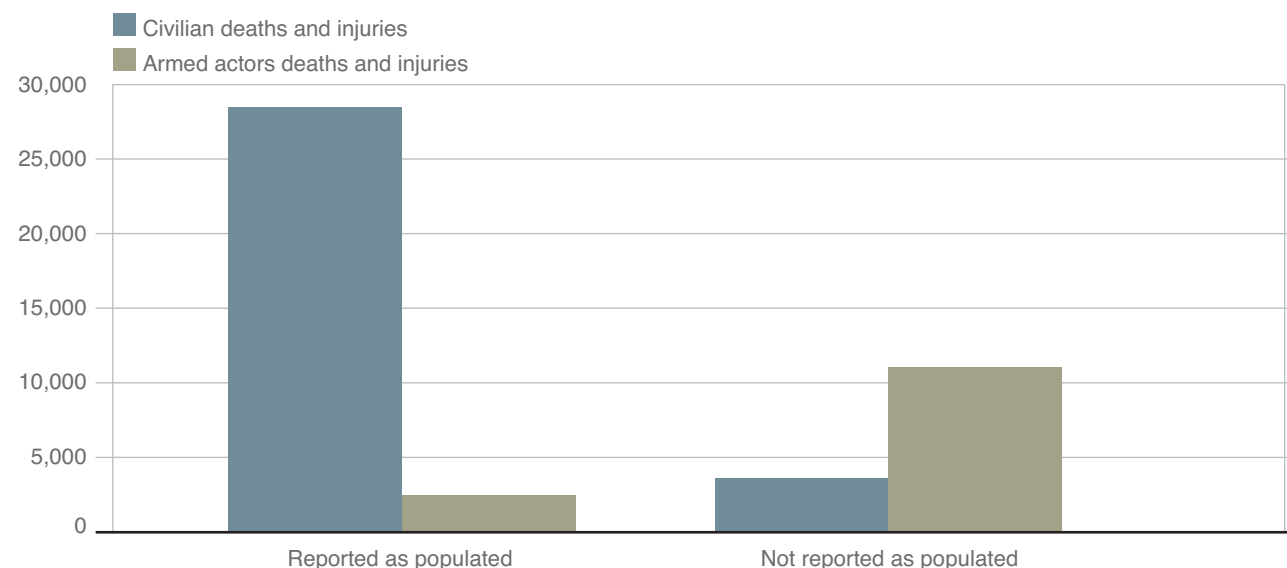
These percentages are consistent with the pattern of harm previously recorded by AOVAV. In every year of AOVAV's Explosive Weapons Monitoring Project, the use of explosive weapons in populated areas has proven particularly lethal to civilians. In 2011, 84% of deaths and injuries in populated areas were reported as civilians; in 2012, 2013, 2014, and 2015 the proportions were 91%, 93%, 92% and 92% respectively.

This is clearly a predictable pattern of harm. It is, therefore, preventable; and yet state and non-state actors alike repeatedly deployed explosive weapons in populated areas during 2016.

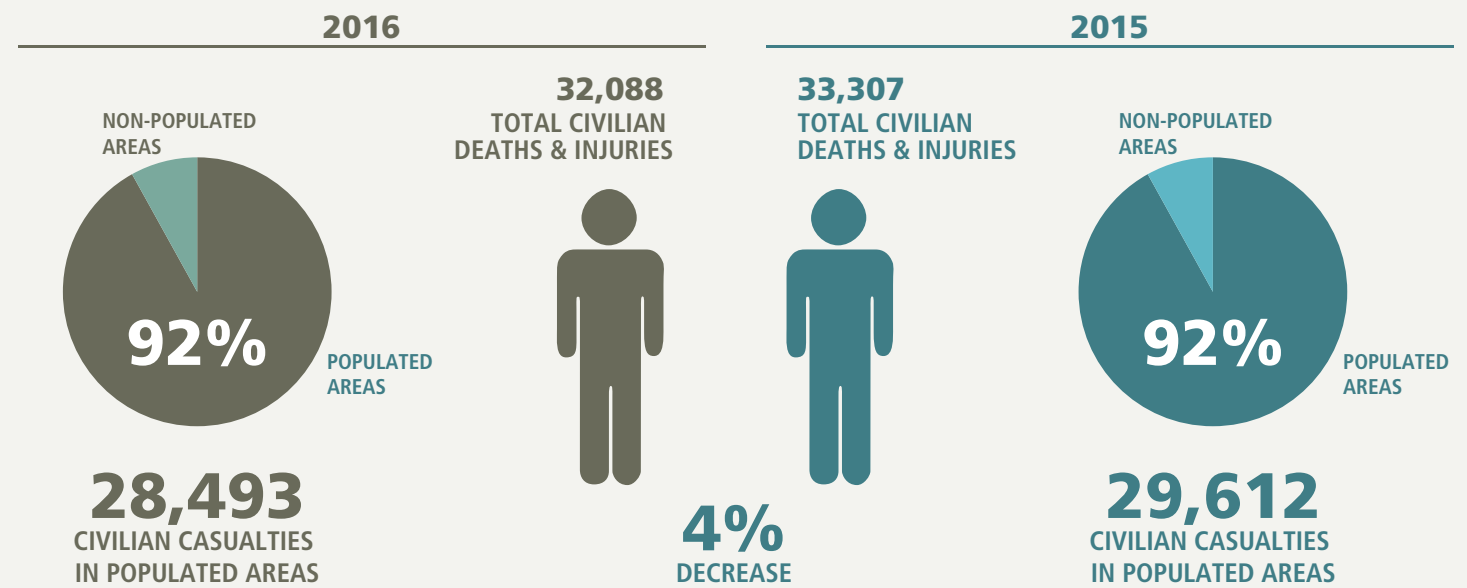
54% of the total incidents that AOVAV recorded in 2016 were in areas reported to be populated (1,241 incidents). Civilian deaths and injuries in populated areas, represented 89% of all reported civilian deaths and injuries, demonstrating the disproportionate effect of explosives deployed in populated areas.

AOVAV recorded an average of 23 civilian casualties per incident of explosive weapon use in populated areas, compared to just 3 in other areas.

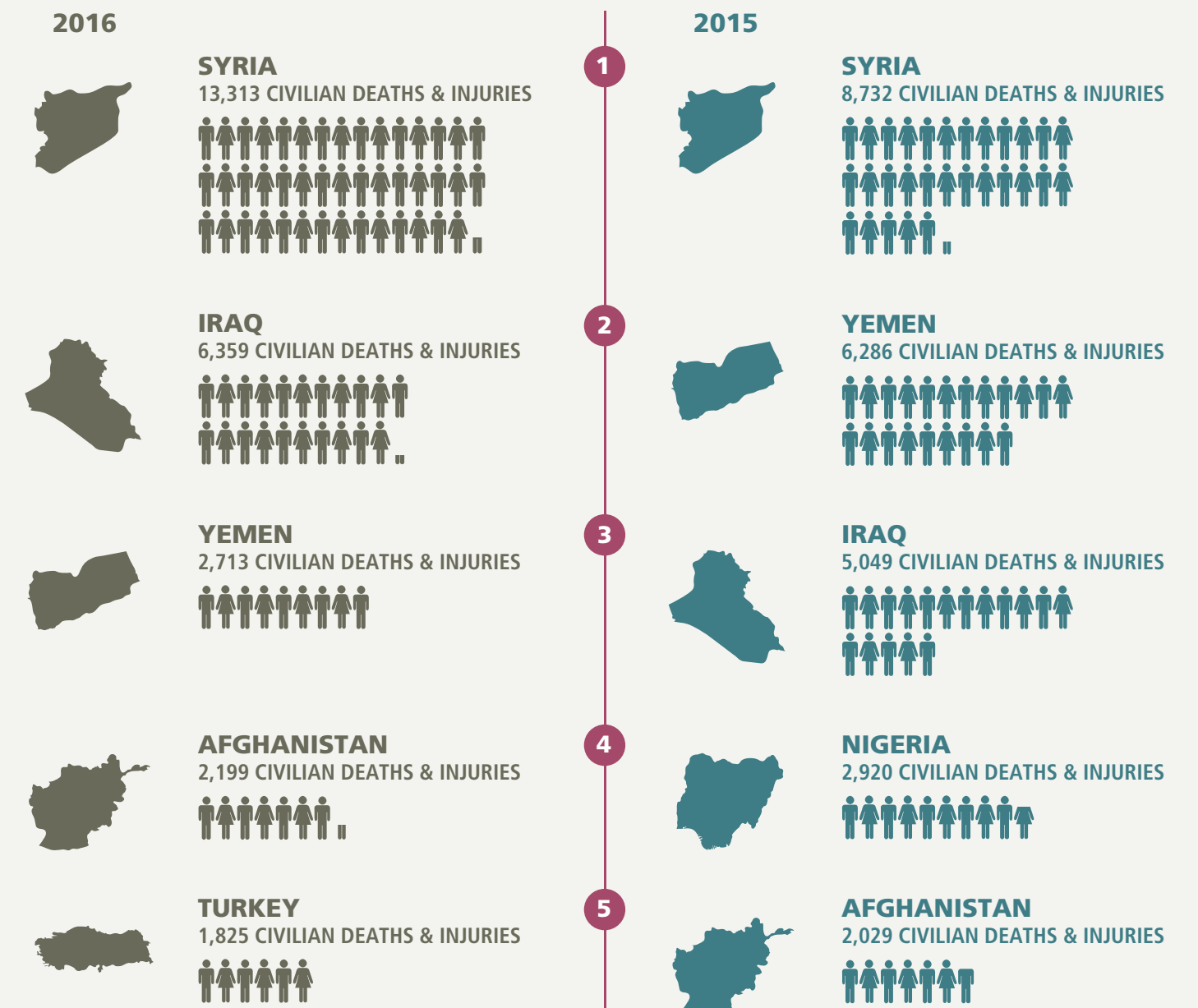
Figure 7 Total casualties by populated area / non-populated area



CIVILIANS KILLED & INJURED: 2015 v 2016

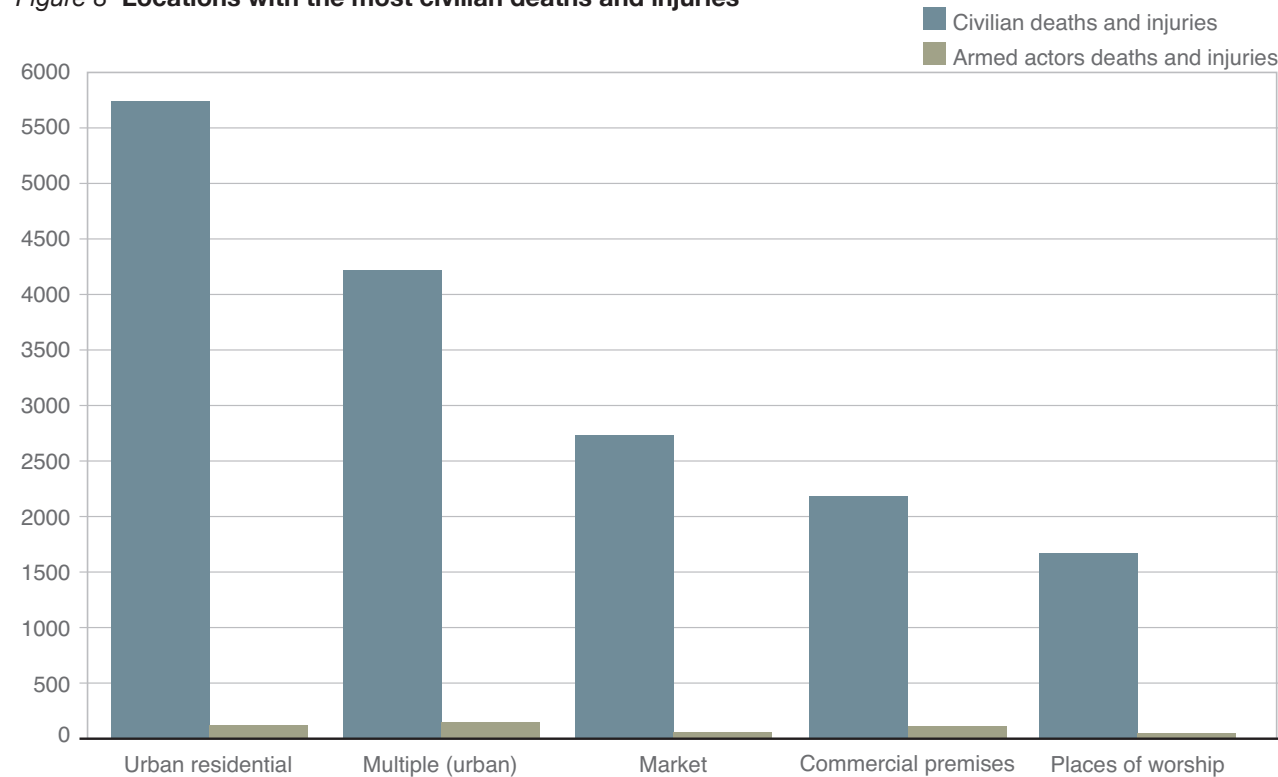


THE MOST DANGEROUS PLACES TO BE A CIVILIAN



LOCATIONS

Figure 8 Locations with the most civilian deaths and injuries



HOMES

The highest number of civilians killed and injured was from incidents in residential areas or civilian houses. AOVAV recorded 368 such incidents in 2016, a rise of 27% from the previous year.³²

These incidents resulted in 5,741 civilian deaths and injuries – a rise of 14% from 2015.³³

In 2015, the majority of incidents recorded in residential areas were high-casualty attacks in Syria and Yemen. 47% of all incidents recorded in residential areas took place in Syria last year (173 incidents).

Syria saw attacks on residential areas with multiple different kinds of weapons. In Syria, air-launched incidents accounted for 41% of the recorded civilian deaths and injuries in residential areas, with ground-launched explosives accounting for the remaining 58%.

Aleppo was by far the most impacted by the use of explosive weapons on residential areas – 83% of all civilian deaths and injuries in residential areas of Syria from explosive weapons occurred in that beleaguered city.

MARKET BOMBINGS

As was the case in 2015, attacks on markets were, perhaps predictably, among the most dangerous for civilians in 2016.

Last year, AOVAV recorded 78 incidents in markets, about 3% of all incidents recorded. This was a similar number to previous years. These incidents resulted in 2,733 civilian deaths and injuries – about 9% of all recorded deaths and injuries worldwide, an average of 35 per strike.

Whilst all areas that showed particularly high rates of civilian harm from explosive weapons also saw a relatively small number of armed actors killed or injured, attacks on markets are notable for the sheer numbers of civilians harmed.

AOVAV only recorded 60 armed actors killed or injured as a result of market incidents, meaning that for every armed actor recorded as killed or injured there were around 46 civilians. At least 29 of the armed actor deaths recorded were suicide bombers carrying out attacks.

98% of those killed or injured in market incidents were civilians.

81% of all civilian deaths and injuries from market bombings were recorded in three countries: Iraq, Syria and Yemen.

The majority occurred in Iraq where 1,340 civilians were killed and injured in market bombings. In Syria, all incidents recorded in marketplaces were air-launched.

In Yemen, 454 civilians were killed and injured in just 7 incidents targeting markets. Whilst all the attacks had a high casualty rate, one in particular, a Saudi-led coalition airstrike on March 15th 2016, caused 166 civilian deaths and injuries at a market in Hajja – at least 22 children were reported among those killed.³⁴ In 2016, market bombings caused an average of approximately 35 civilian deaths and injuries per incident.

TARGETING

As in previous years, simply targeting armed actors with explosive weapons did not prevent civilians from being killed or injured. In 2016, 22% of those killed or injured by attacks which were explicitly coded as targeting armed actors were civilians. In populated areas this rose to 65%, whilst in non-populated areas it fell to 7%.

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



Outskirts of Mosul. Credit: Mstyslav Chernov [CC BY-SA 4.0 (<http://creativecommons.org/licenses/by-sa/4.0>)] via Wikimedia Commons

I saw the building completely razed to the ground. One child was wedged between the rubble... her blood was dripping. Her father was at work and arrived half an hour later and fell into tears. When they pulled the child out, he collapsed on the ground. He didn't let the civil defense take her. He kept saying she's asleep, she's just asleep. But he couldn't wake her up. It was heartbreaking.

Karam al-Masri, local photojournalist, witnessed the aerial attack on a five-storey residential building in al-Sha'ar neighbourhood, Aleppo, September 27th 2016³⁵

WOMEN AND CHILDREN

The majority of media sources did not include reporting of the age or gender of any victims in 2016.

Women were reported among those killed and injured in 251 incidents, including 50 incidents where no figure was given. Overall, 502 women were reported killed or injured. This figure does not include armed actors. Likewise, it does not include, for example, female suicide bombers in Nigeria.

The majority of women who were killed or injured were the victims of attacks in populated areas. When women were specifically reported as killed or injured, it was found that 87% were in incidents in areas recorded as populated.

In 2016, AOVAV recorded 1,490 child deaths and injuries in 338 incidents. Of these, a gender was given for 159 individuals, of whom 78 were girls and 81 were boys.

The rest were reported without specifying gender. In 61 incidents, no figures were given for numbers of children killed or injured but children were reported to be amongst the victims. Of the incidents which were reported as killing or injuring children, 85% took place in populated areas.

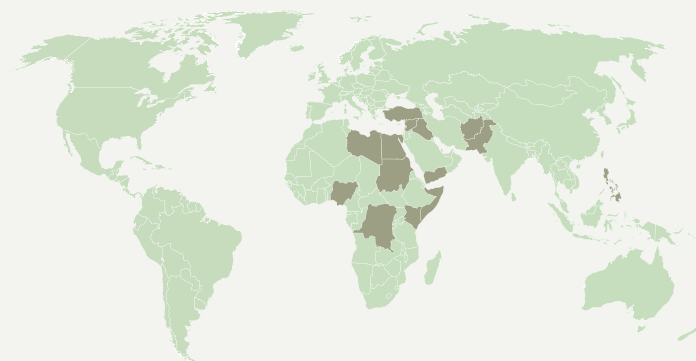
AIR-LAUNCHED EXPLOSIVE WEAPONS



5 IN 10 INCIDENTS OCCURRED IN POPULATED AREAS



95% OF DEATHS & INJURIES IN POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN **15 COUNTRIES AND TERRITORIES** IN 2016

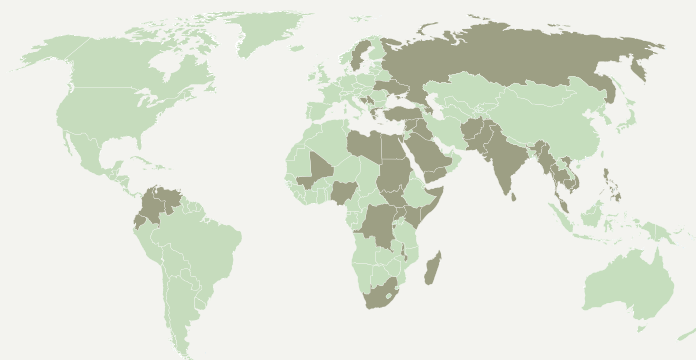
GROUND-LAUNCHED EXPLOSIVE WEAPONS



6 IN 10 INCIDENTS OCCURRED IN POPULATED AREAS



96% OF DEATHS & INJURIES IN POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN **42 COUNTRIES AND TERRITORIES** IN 2016

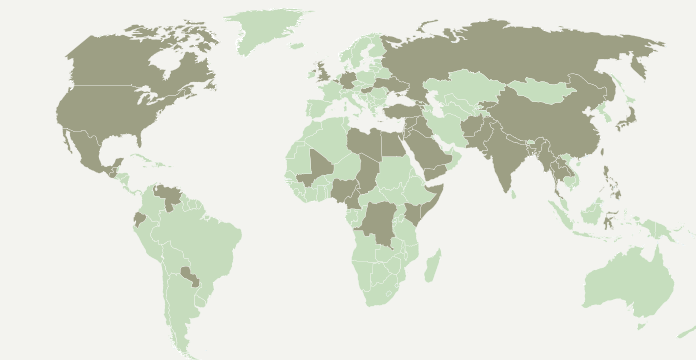
IMPROVISED EXPLOSIVE DEVICES (IEDs)



5 IN 10 INCIDENTS OCCURRED IN POPULATED AREAS



88% OF DEATHS & INJURIES IN POPULATED AREAS WERE CIVILIANS



INCIDENTS WERE RECORDED IN **48 COUNTRIES AND TERRITORIES** IN 2016

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 9*. There are different ways of evaluating the threat that various explosive weapons have had for civilians in 2016. These are explored over the following sections.

In order to better understand how these different explosive weapons have endangered civilians in 2016, AOA has split them into three different groups based on their launch method.

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.

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 more narrow categories.³⁶ 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.

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.³⁷

Figure 9 **Civilian casualties by weapon type in 2016**

Weapon type	Civilian casualties	Average civilian casualties per incident
Air-launched	9,934	15
Air Strike	8,504	14
Air-dropped bomb	1,022	21
Missile	19	6
Multiple explosive weapons	332	83
Rocket	14	7
Shelling	43	43
Ground-launched	6,997	10
Artillery shell	69	3
Grenade	830	6
Missile	107	6
Mortar	888	8
Multiple explosive weapons	6	1
Rocket	1,072	13
RPG	70	5
Shelling	3,955	15
IED	14,301	16
Car bomb	5,815	27
Landmine	8	8
Multiple explosive weapons	809	74
Non-specific IED	7,158	16
Roadside bomb	511	2
Mine	28	1
Anti-personnel mine	0	0
Anti-vehicle mine	10	5
Landmine	18	1
Multiple explosive weapons	733	31
Unclear	95	16
Missile	4	2
Rocket	91	3

Improvised explosive devices (IEDs)

IEDs were responsible for **14,301** civilian deaths and injuries (46% of the total recorded in 2016).

74% of those killed and injured by IEDs were civilians.

There was a **12% decrease** in the number of civilian deaths and injuries caused by IEDs compared to 2015 (14,301 down from 16,199).

Compared to 2011, the first year of recording, 2016 saw a **96% increase** in deaths and injuries from suicide bombings.

DEATHS AND INJURIES

In 2016, AOVAV recorded 19,246 deaths and injuries as a result of improvised explosive devices, of which 14,301 were civilians (74%). This is a slight decrease compared to previous years, where a higher percentage of deaths and injuries were civilians.

There was an increase of 1% in recorded deaths and injuries from IEDs compared to 2015. Though this is only slight it breaks the trend of decreasing overall deaths and injuries that had been occurring over previous years. However, despite this drop in harm to people, there was a continued decrease in the number of actual IED incidents recorded compared to previous years.³⁸

The rise in total deaths and injuries from IEDs was a consequence of the rise in armed actor deaths and injuries from IED attacks. There was an increase of 75% since 2015 – with more police and soldiers being targeted in such incidents. This was particularly the

case in Yemen, where 86% of deaths and injuries from IED attacks were those of armed actors. Similarly, in Libya, 80% were armed actors.

For the second year running, IED deaths and injuries did not constitute a majority of all deaths and injuries from explosive violence recorded worldwide.

Nonetheless, they still accounted for the largest number of civilian deaths and injuries of any weapon type (14,301 compared with 6,997 caused by ground-launched weaponry and 9,934 caused by air-launched weaponry).

As with other kinds of weapon, IEDs caused particularly high levels of civilian harm when used in populated areas, which was the case in 54% of all recorded attacks – totalling some 492 incidents. In these incidents, 88% of reported deaths and injuries were civilians, contrasting with 29% in other areas. On average, an IED incident in a populated area killed or injured 26 civilians.

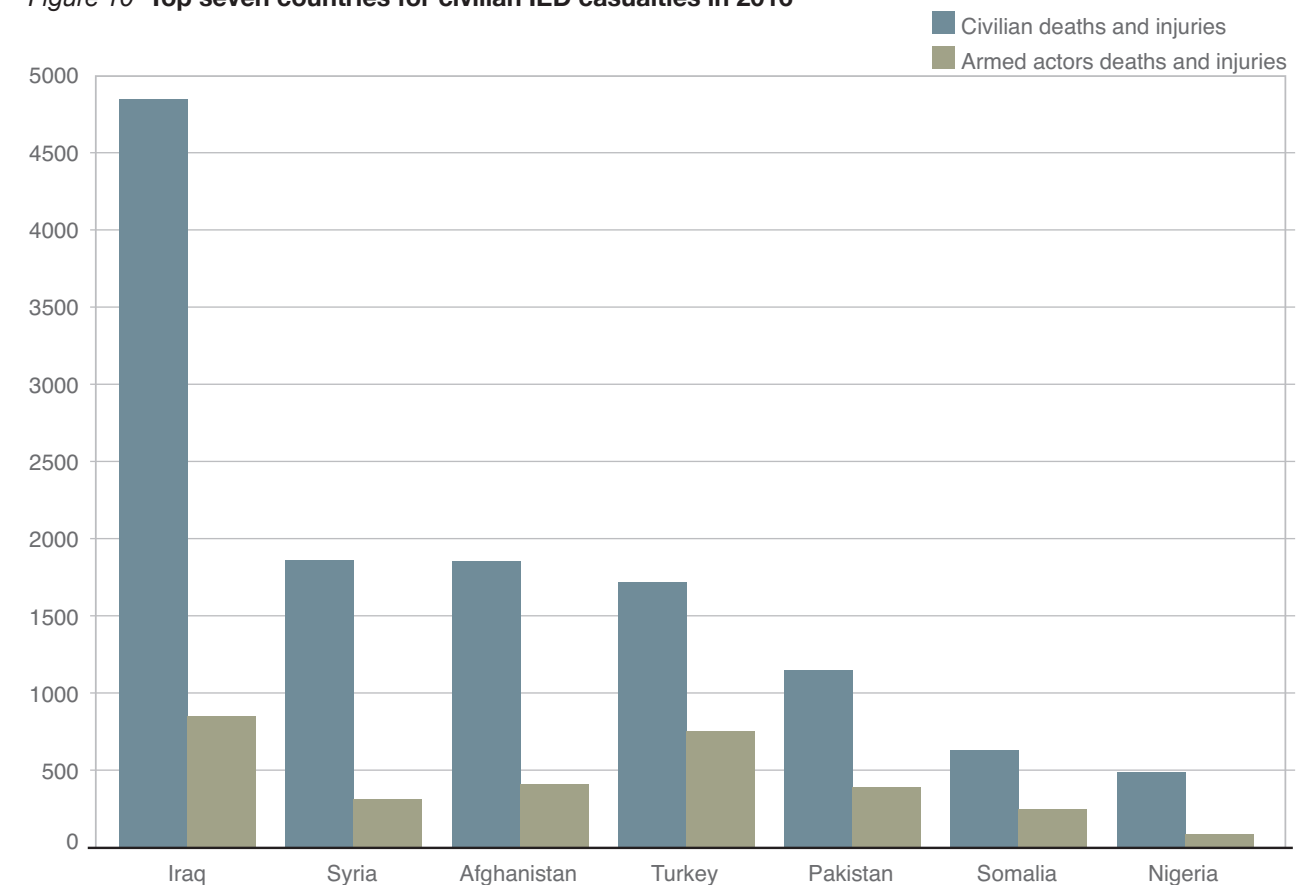
COUNTRIES

In 2016, IEDs resulted in at least one casualty in 48 different countries and territories, one more than the previous year. This is the highest number ever recorded by AOVAV. *Figure 10* shows the seven countries which saw the most civilian casualties from IEDs in 2016.

In 2016, five countries saw more than 1,000 civilian deaths and injuries from IED attacks.

Iraq continued to be the country most badly affected by IED incidents, including both suicide and non-suicide IED attacks. Whilst the number of recorded deaths and injuries from IEDs fell significantly in 2015, 2016 saw this number begin to increase again. 68% of those civilian deaths and injuries recorded were in Baghdad Province and the south-western region of neighbouring Diyala Province (immediately adjacent to Baghdad). There was also a greater amount of IED incidents recorded elsewhere across the country including in the provinces of Anbar, Salahuddin and Nineveh. Though civilian deaths and injuries in Diyala halved.

Figure 10 Top seven countries for civilian IED casualties in 2016



Afghanistan and Pakistan continued to experience high levels of deaths and injuries as a result of IED attacks.

Syria, Somalia and Turkey all saw precipitous rises in IED-inflicted deaths and injuries. Whilst Boko Haram impacted countries such as Nigeria, Cameroon and Chad have seen significant decreases in IED incidents, as well as Yemen. In the case of Yemen, this has been accompanied by a significant increase in armed actor deaths and injuries from IED attacks. IEDs killed and injured 867 armed actors in Yemen in 2016 – accounting for 86% of all IED deaths and injuries in Yemen last year.

USERS

IEDs were almost exclusively used by non-state actors in 2016. AOVAV recorded IED usage by 34 non-state entities. In the one incident that a state actor was recorded as using an IED, was when the Dallas police force in Texas used a 'robot-bomb', comprised of

Remotec, Model F-5 and C4 explosive with a detonator cord. The bomb was used to kill a 25-year-old veteran sniper, who had murdered five police officers.³⁹

Of the 350 incidents for which responsibility was assigned, 50% were attributed to ISIS groups.⁴⁰ The largest numbers of civilian deaths and injuries were caused by ISIS (45%), the Taliban (6%) and Jamaatul Ahrar (5%).

It was hell with many bodies torn and mangled with metal parts from smashed and charred cars.

Abdullah al-Sheikh, a young mechanic who witnessed the car bomb explosion on October 13th 2016 at a checkpoint on the Turkish-Syrian border.⁴¹

Figure 11 Locations where the most civilian harm resulted from IED attacks

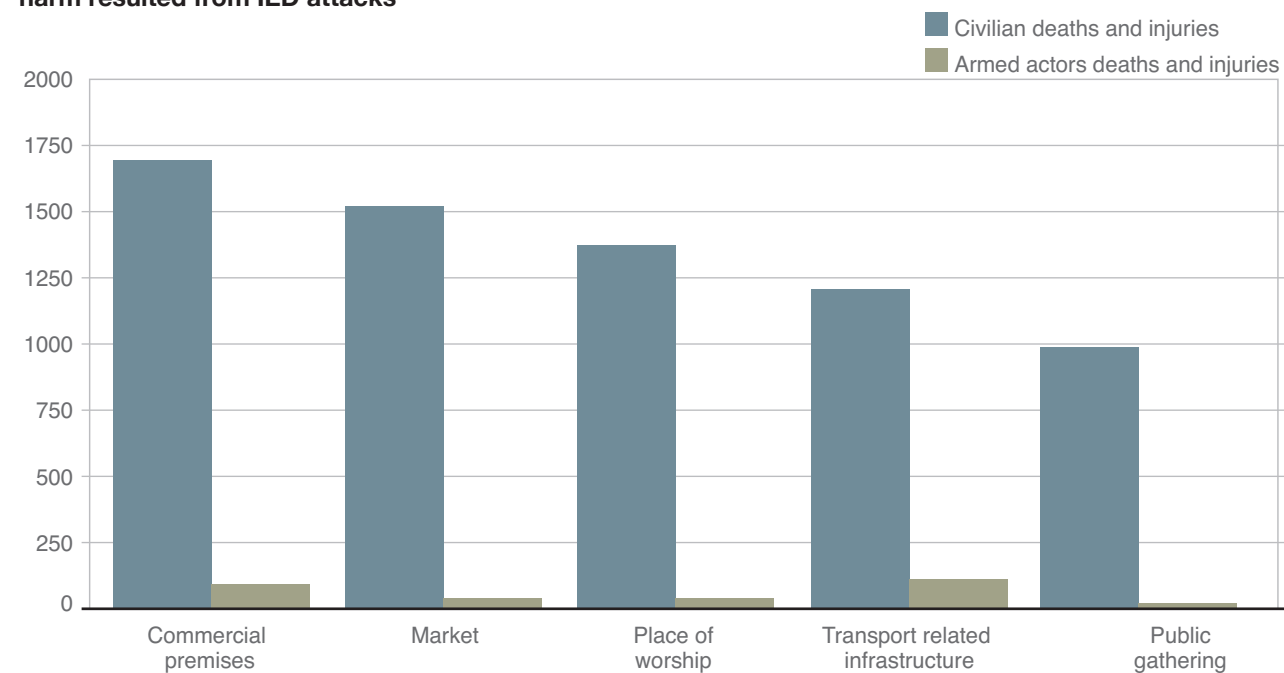


Figure 11 shows the locations where the most civilian harm resulted from IED attacks. IED attacks in commercial premises caused the highest number of civilian deaths and injuries in 2016. AOVAV recorded 54 incidents of this kind resulting in 1,696 deaths and injuries. Other particularly badly affected areas included markets, places of worship and public events such as funerals, parades or gatherings of pilgrims. This is to be expected as these areas often have a particularly dense concentration of civilians.

DELIVERY METHOD AND DETONATION MECHANISM

AOAV's recording distinguishes between car bombs,⁴² roadside bombs and more general non-specific IEDs. The majority of incidents (49%) reported were recorded as non-specific IEDs. Car bombs accounted for a further 24% and roadside bombs for 26%. As is to be expected given their greater payload capacity, car bombs were the most fatal kind of IED for civilians, killing and injuring on average 27 civilians per incident.

For the majority of IED incidents no detonation mechanism was reported. Often the detonation mechanism is not clear after a bomb has exploded, and even if

there is a local capacity to investigate a lack of follow-up or security concerns means this information never makes it to publication. Nonetheless, AOVAV recorded detonation mechanisms for 47% of reported incidents.

Suicide bombings

Suicide bombings, including car bombs operated by suicide bombers, are a form of command-operated IEDs. In total AOVAV recorded 256 suicide bombings in 2016, killing and injuring a reported 12,673 people. This means that, once again, suicide bombs constitute the most injurious specific type of explosive weapon being used today.

The amount killed and injured by suicide bombings has seen a consistent increase in the last six years, since AOVAV began its explosive violence monitor. Compared to 2011, the first year of recording, 2016 saw a 96% increase in deaths and injuries from suicide bombings.

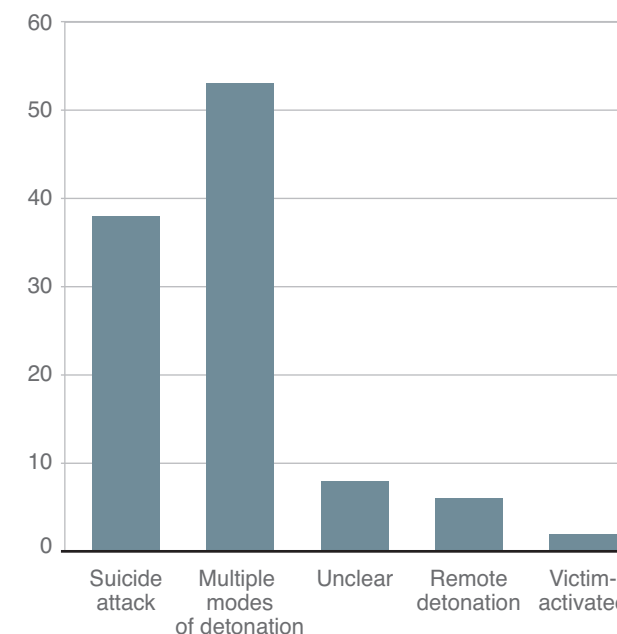
In 2016, 9,680 of those killed and injured were civilians (76%), representing a slight rise of 5% from 2015,⁴³ or a 90% rise since 2011.⁴⁴ On average, 38 civilians were killed and injured by each suicide bombing – two more than in 2015, when the average was 36.

This was accompanied by a doubling of the numbers of armed actors killed and injured from suicide bombings, reflecting the overall increase of such casualties from IED incidents.

Suicide bombings represented only 28% of all IED incidents recorded, but they accounted for 66% of all deaths and injuries from IED attacks.

54% (138 incidents) of the suicide bombings reported were recorded as non-specific IEDs, which in the case of suicide bombings largely refers to suicide vests. 43% (111 incidents) were recorded as car bombs. Both car bombs and non-specific IED attacks caused an average of 36 civilian deaths and injuries per incident.

Figure 12 Average civilian deaths and injuries by IED detonation method



AOAV recorded suicide attacks in 21 countries. Whilst this is the same number recorded by AOVAV the previous year, some of countries saw suicide attacks for the first time since 2010.⁴⁵ The countries worst affected by suicide bombing were Iraq (3,279 civilian deaths and injuries), Syria (1,613), Afghanistan (1,324), Turkey (849) and Pakistan (844). 30% of all incidents recorded were in Iraq.

Nigeria fell from the position it held from the previous year, as the worst-affected country by suicide bombings. This is representative of the efforts made by Nigeria to counter Boko Haram. Whilst the group did carry out successful IED attacks and other violence across the in Nigeria and other areas in the region of Lake Chad, these have been significantly reduced compared to last year.

After a fall to second-worst impacted in 2015, Iraq returned to being the country worst-impacted by suicide attacks last year. Iraq saw a 50% rise in civilian deaths and injuries from suicide attacks in 2016 compared to the previous year. Over half of all suicide attacks took place in just one city – Baghdad. It appeared that an increase of such attacks were ISIS's response to their loss of ground in other areas. ISIS appears, too, to be using suicide attacks more strategically, using local fighters to strike at military targets. This constitutes a break from the past when suicide attacks in Iraq often used foreign fighters to kill civilians.

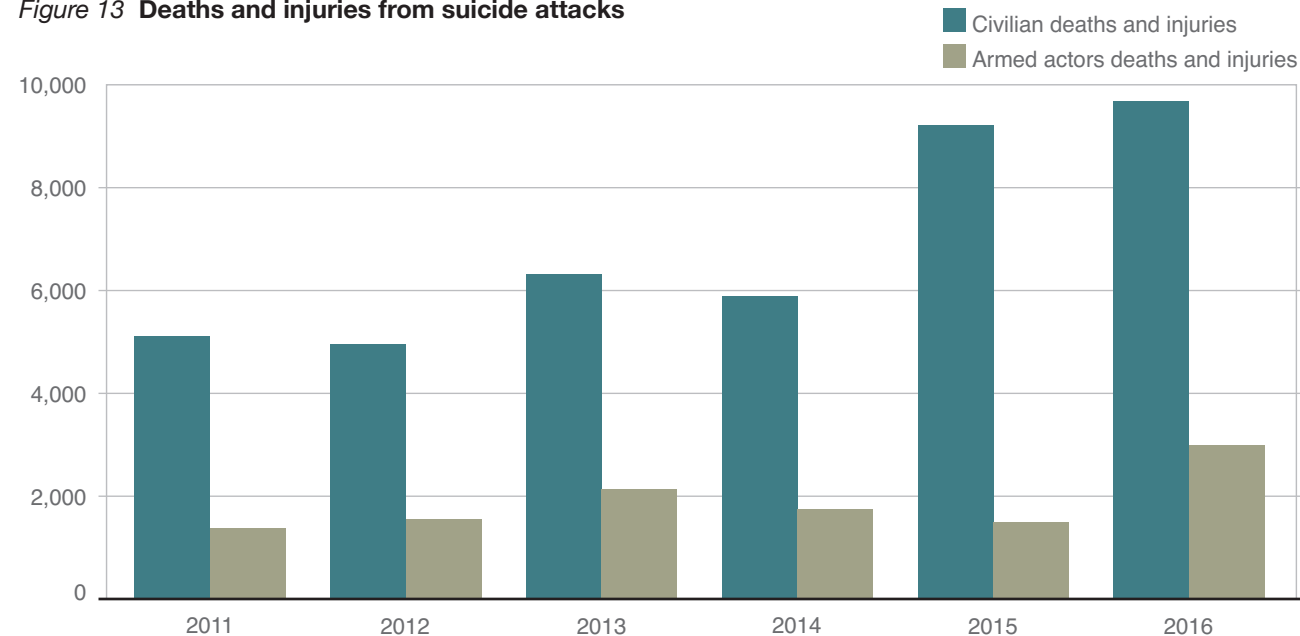
As with elsewhere, when suicide bombings were used in populated areas they inflicted much higher levels of civilian harm. 70% of all recorded suicide incidents took place in populated areas. In these attacks around 90% of those killed and injured were civilians. This compares to 23% in other areas.

Suicide attacks in populated areas caused an average of 51 civilian deaths and injuries per incident. This means suicide bombings are the most injurious of all explosive weapon types. Frustratingly, they are one weapon type that is significantly lacking from debate held within the disarmament community at large.

Victim-activated IEDs

Victim-activated devices are most commonly detonated when a person or animal stands on them, or when they are driven over.⁴⁶ IEDs detonated in this fashion are considered as de facto antipersonnel mines under the Mine Ban Treaty and are therefore prohibited under international humanitarian law.⁴⁷ Their random trigger mechanism means that they cannot distinguish between armed actors and civilians, and as such are inherently indiscriminate.

Figure 13 Deaths and injuries from suicide attacks



AOAV recorded 74 incidents involving victim-activated IEDs in 2016. 49% took place on roads.

In 2016, victim-activated IEDs resulted in the lowest average civilian deaths and injuries per incident, with an average of 2 civilians being killed or injured in each attack. This is consistent with AOA's findings from previous years.

This reality is important for policy makers – as it is clear that seeking to address the complex problem of IED proliferation purely through the mechanisms of the Mine Ban Treaty would fail to acknowledge the multi-faceted nature of general IED production, use and consequence.



Syrian refugee camp on the border at Suruc, Turkey. Credit: Voice of America News (<http://www.youtube.com/watch?v=V-QFVCnd7Po>) [Public domain], via Wikimedia Commons

Command-operated IEDs

Command operated IEDs (or CIEDs) are detonated generally by radio signals or command wire. AOA divides these IEDs between those detonated by remote-control or command, 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 from incidental harm.

AOAV recorded an 821 deaths and injuries from 88 events using such IEDs – 60% of the casualties were civilians. This means average of 6 civilian deaths and injuries per remote-detonated IED attack in 2016. Even where they are used to target armed actors, civilians were often killed or injured by these IEDs in 2016, either because of their large inherent blast effects, deliberate attempts to target civilians, or the deployment of these weapons in populated areas without sufficient control.

In 2016, 57% of remote-detonation incidents recorded took place on roads. Remotely-detonated IEDs are particularly harmful to civilians when used in populated areas. In those attacks, 86% of those harmed were civilians, compared to 29% in non-populated areas.

Air-launched explosive weapons

Air-launched explosive weapons killed and injured **9,934** civilians in 2016 (**31%** of all recorded).

Civilian deaths and injuries from aerial explosive weapons in 2016 **rose by 7%** from 2015 levels.

15 countries and territories saw deaths and injuries in 2016.

Over half, **64%** (**6,382** civilians) were in Syria, and another **23%** (**2,249** civilians) were in Yemen.

DEATHS AND INJURIES

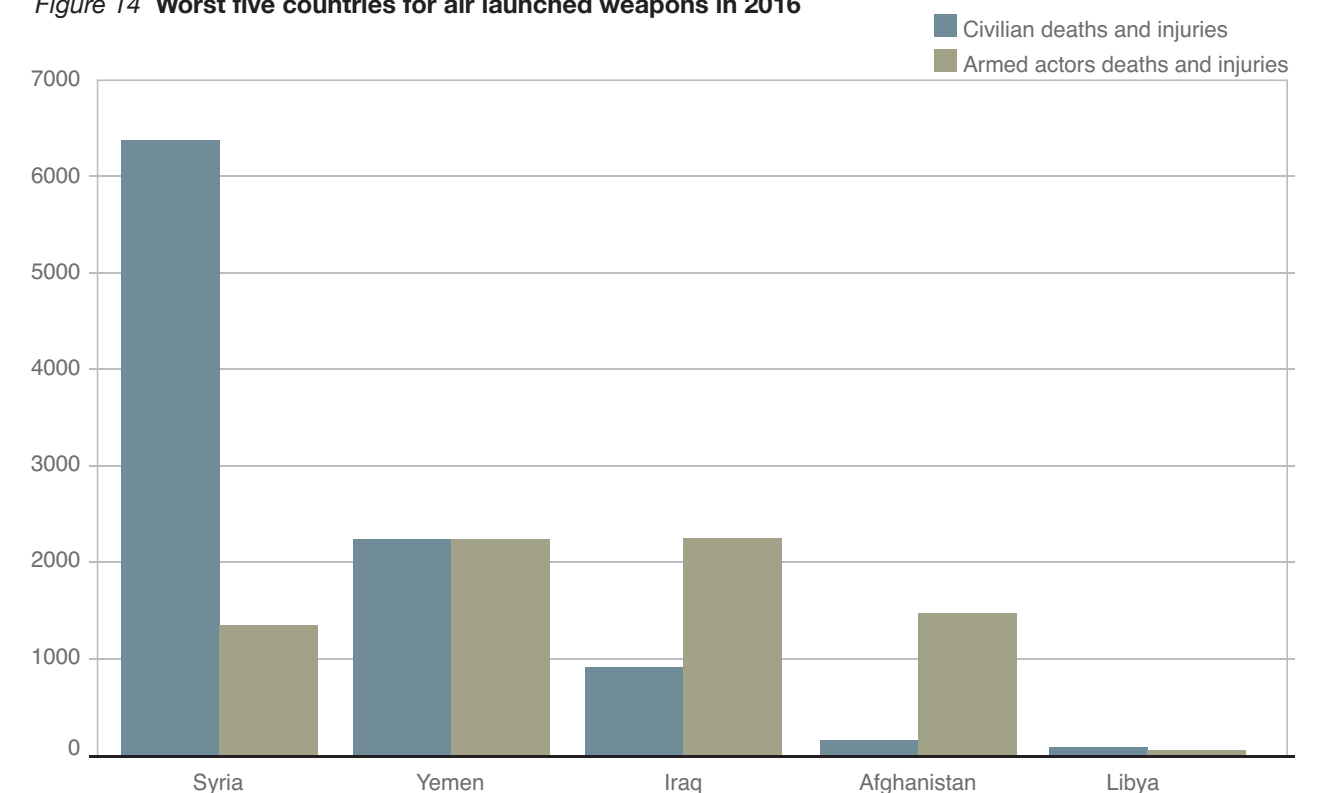
Air-launched explosive weapons include a wide variety of ordnance, from bombs dropped out of planes or helicopters to missiles fired by unmanned drones.

Consistent with broader trends, AOA recorded 679 incidents of air-launched weapon use in 2016 – a 36% rise from the year before. This increase can probably be attributed to the increased campaigns across Syria, where air-launched incidents increased by 77%.

There was a correlated, though lesser, increase in civilian deaths and injuries: 7% compared to 2015. A total of 9,934 civilian deaths and injuries were recorded in incidents involving air-launched weapons. Air-launched weaponry accounted for 31% of all civilian deaths and injuries recorded worldwide.

In total, AOA recorded 16,490 total deaths and injuries from aerial explosive weapons in 2016. Civilians accounted for 60% of these casualties, a similar share to previous years.⁴⁸

Figure 14 Worst five countries for air launched weapons in 2016



When aerial explosive weapons were used in areas reported as being 'populated', 95% of those killed and injured were civilians – a rise from 2015, when the figure was 91%.

In areas which were not recorded as populated, that figure dropped to 13%. In 2016, 46% of incidents involving air-launched weaponry were recorded in populated areas. This is similar to the figures in 2012 (45%), 2013 (47%) and 2015 (43%).

In 2014, the figure was considerably higher (63%), which can probably be accounted for by the intensity of Operation Protective Edge in Gaza.

It was not a normal missile, the damage was huge. Three of the bodies were found 50 meters away from the house.

Saeed Yousef, a resident of Fadiliya, Iraq, following a US-led coalition air-strike that killed his brother and seven other relatives, on October 22nd 2016⁴⁹

COUNTRIES

The majority of civilian casualties from air-launched explosive weapons in 2016 were recorded in Syria (see Figure 13). Yemen and Iraq also saw significant casualty numbers, although in Iraq – similarly to Afghanistan – most deaths and injuries recorded were of armed actors. This is in part due to a continuation of the US-led coalition campaign against ISIS and al-Qaeda affiliates in Iraq and Syria. Since September 2015, Russian jets have also been launching missions within Syria and appear to have contributed significantly to the civilian casualty toll. The civilians killed and injured by air-launched weapons in Syria account for 64% of all civilians killed or injured worldwide by such weapons.

Yemen, the second most badly affected country, had low numbers of incidents involving air-launched weaponry prior to 2015. Since the Saudi-led coalition of largely Arab states began Operation Decisive Storm in March 2015, however, casualty figures from air-

launched weaponry in Yemen remain very high. This intervention has been widely criticised for its indiscriminate targeting of civilian areas and the use of internationally-banned cluster bombs. Whilst there was a decrease in the number of civilian deaths and injuries in 2016, compared to the previous year, this may be partially due to reporting fatigue, and the huge numbers of people fleeing the conflict.^{50, 51}

USERS

Despite the increase in air-launched weapons across Syria, the state perpetrator of such explosive violence in Syria is not always clear. Russian and Syrian planes launch raids against similar targets, and Russian involvement is often denied. It is frequently cited in the media that the attack was perpetrated by Syria or Russia; this sees the attack recorded by us as from an unknown perpetrator. It is clear that both, however, have caused significant levels of civilian harm.

AOAV recorded a decrease of 54% in civilian casualties caused by Syrian air-launched explosives but poor reporting does not mean the harm from Syrian airstrikes has decreased. Furthermore, where air-launched incidents were attributed to Syria, over 99% of the deaths and injuries have been those of civilians. On the other hand, Russia are quicker to claim their attacks on armed actors, with 720 armed actor deaths and injuries attributed to Russian air-strikes. Despite this, 50% of all recorded deaths and injuries from Russian air-launched explosives 50% have been civilians.

Due to the lack of attribution in Syria the US-led coalition was the most prolific user of air-launched weaponry in 2016, accounting for 21% (145 incidents) of all incidents recorded. Individual member states of the coalition are not typically specified in reporting.

The Saudi-led coalition, despite a decrease in the reported number of incidents came second, accounting for 12% (83 incidents) of all incidents recorded. The Syrian government came third, accounting for 8% (55 incidents) of all recorded incidents.

AOAV recorded incidents of non-state actors using air-launched weaponry in 2016 in Libya, and as part of the failed government coup in Turkey.

Ground-launched explosive weapons

Ground-launched explosive weapons were responsible for **6,997** civilian deaths and injuries in 2016 (22% of the total recorded).

79% of those killed and injured were civilians. In populated areas this figure rose to **96%** – compared to **46%** elsewhere.

Non-state actors were recorded as responsible for **55%** of incidents and state actors for **22%**.

DEATHS AND INJURIES

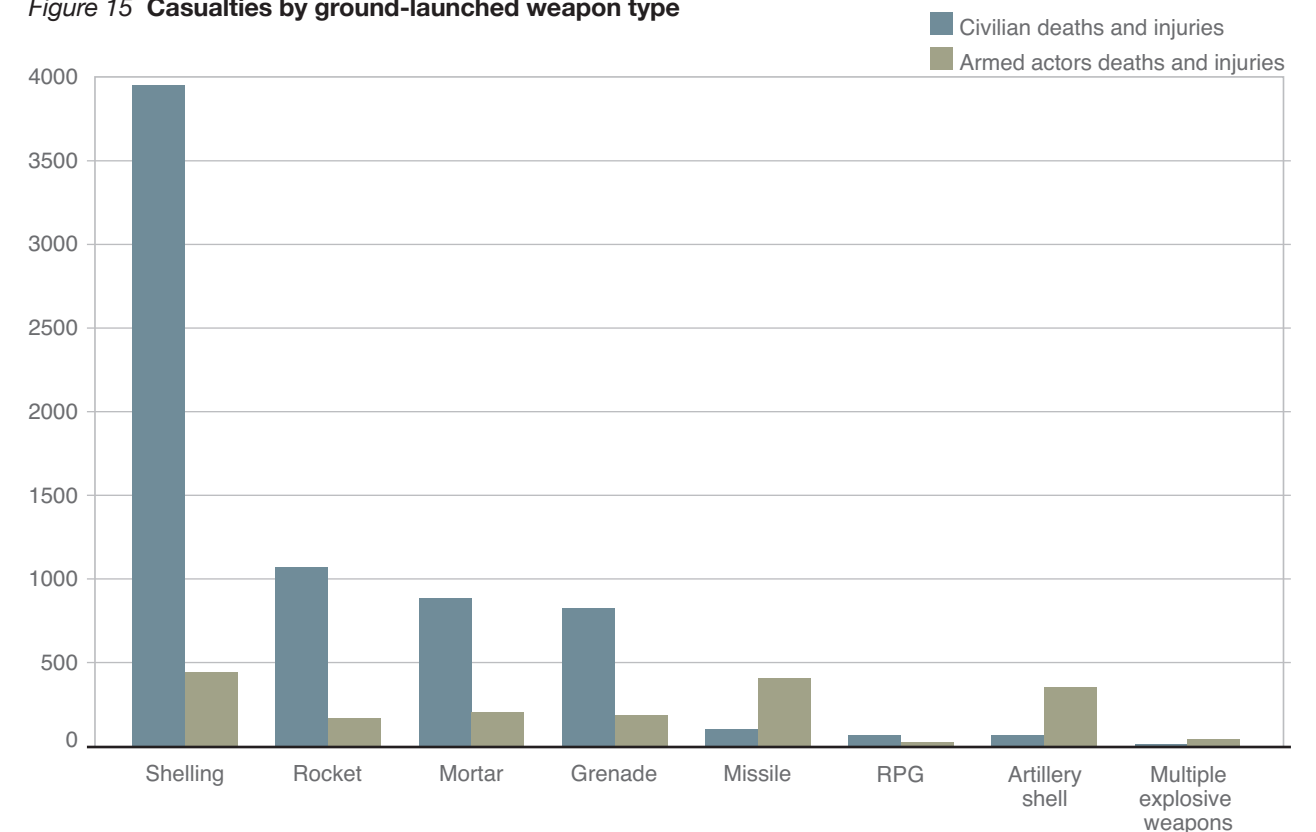
Ground-launched weapons are manufactured conventional ordnance that range from small hand grenades to heavy artillery and multiple rocket launchers. They can be fired from a variety of platforms, but all are launched from surface level.

In total, these weapons reportedly killed and injured 8,849 people in 2016. 6,997 of these were civilians (22% of all recorded civilian deaths and injuries). These figures are similar to that recorded the previous year.

In 2016, civilians made up 79% of all those killed or injured by ground-launched weapons. In populated areas the figure rose to 96%, consistent with trends seen with other weapon types.

As in previous years, ground-launched attacks had the highest percentage reported in populated areas compared to other weapon types: 63% of all ground-launched incidents recorded were reported as taking place in populated areas, compared to 45% of air-launched incidents and 54% of IED incidents.

Figure 15 Casualties by ground-launched weapon type



Despite, this they still caused the least civilian deaths and injuries out of the three in populated areas – ground launched weapons caused 5,636 civilian casualties in populated areas, accounting for 20% of all civilian casualties in populated areas, compared to 32% from air-launched and 46% from IEDs.

COUNTRIES

AOAV recorded casualties from ground-launched explosive weapons in 42 countries and territories in 2016 – three less than last year. More than half (56%) of these deaths and injuries were in Syria. Iraq and Yemen were also badly affected.

USERS

Similar to previous years, ground-launched explosive weapons were predominantly used by non-state actors in 2016. Non-state actors were recorded as responsible for 55% of incidents and state actors for 22% – the remainder being unattributed or caused by both non-state and state use of ground-launched explosives.

SPECIFIC TYPES

Figure 14 illustrates the range of ground-launched weapon types that AOAV tracks and their respective impact on civilians in 2016.



Damage in Aleppo.
Credit: Vatican Insider [CC BY-SA 4.0 (<http://creativecommons.org/licenses/by-sa/4.0/>)], via Wikimedia Commons

Non-specific shelling accounted for almost half (50%) of all deaths and injuries caused by ground-launched weapons – a significant rise from the previous year.⁵² 78% of all non-specific shelling caused deaths and injuries occurred in Syria. It is likely that the levels of violence and lack of journalistic access has impacted on the nature of reporting, meaning details such as the type of shelling are often missed.

Grenades, mortars and rockets also caused a significant amount of civilian harm, responsible for 12%, 13% and 15% of civilians death and injuries from ground-launched violence respectively.

Compared to 2015, mortars accounted for significantly less of the total reported deaths and injuries. In 2015, 2,198 deaths and injuries were caused by mortars, accounting for 25% of the total deaths and injuries from ground-launched explosives. In 2015, more than half (57%) of all mortar incidents reported took place in Syria and Iraq.

Due to the increase in violence in both countries in 2016, it is likely that deaths and injuries caused by mortar attacks have actually increased but were recorded as non-specific shelling.

Conclusion

More deaths and injuries from incidents of explosive violence were recorded in 2016 than in any of the five previous years that AOAV has been monitoring explosive weapon use. Whilst there was a reduction in civilian deaths and injuries for the first year since the monitor began, this was accounted for by a decrease in the amount injuries recorded in high-casualty conflicts and a greater amount of IED attacks focused on non-civilian targets.

The civilian deaths and injuries from explosive violence recorded in 2016 remain 48% higher than that the amount recorded in 2011, when AOAV first began recording – civilian deaths are 92% higher.

Over six years, AOAV has now recorded 233,949 deaths and injuries as a result of explosive violence. Over three-quarters of all of these were civilians (177,653 deaths and injuries or 76% of the total). Year on year, civilians have consistently borne the burden of reported explosive violence.

Civilians are at the most risk from explosive weapons when these weapons are used in populated areas. This was true again in 2016, when civilians made up 92% of casualties in populated areas, compared to 25% in other areas.

Suicide bombings are the most lethal explosive weapon type and their use is on the rise. It is clear from this body of data that while the threat to civilians from explosive weapons remains so high, the most effective measure that could be taken to dramatically improve civilian protection is to change how they are used.

This distinct and predictable pattern of harm is now recognised by more than 77 states around the world who have spoken out against the use of explosive weapons in populated areas.⁵³ Last May, the United Nations released a report by the Secretary-General on the protection of civilians in armed conflict, stressing the need for a greater effort globally to protect civilians from the use of explosive weapons in populated areas.⁵⁴

In October 2016, the First Committee of the United Nations General Assembly met to discuss disarmament, global challenges and threats to peace. During the

conventional weapons debate many countries' delegations expressed concerns over the use of weapons in populated areas. Many statements critiqued the use of explosive weapons in populated areas, and the civilian and humanitarian harm they cause.⁵⁵

Austria highlighted the need for an international political declaration to prevent civilian harm from the use of explosive weapons in populated areas, and reminded the delegation on the UN's Secretary-General's encouragement for all states to engage in the development of such a declaration.⁵⁶

In addition, there was the UN resolution 'Countering the threat posed by improvised explosive devices' (A/RES/71/72) passed in December 2016, that encouraged States and non-governmental organizations to continue to build upon existing awareness and risk education campaigns regarding the urgent threat of IEDs. In addition, it urged States in a position to do so, to contribute funding to the diverse areas of work needed to effectively address the issue of such weapons, including research, clearance, ammunition stockpile management, preventing violent extremism as and when conducive to terrorism, awareness raising, capacity-building, information management and victim assistance, through existing trust funds and arrangements. These recommendations need to be acted upon.

AOAV is a member of the International Network on Explosive Weapons (INEW). We urge 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.

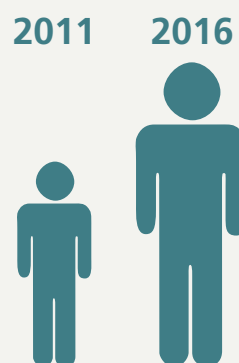
EXPLOSIVE VIOLENCE FROM 2011 TO 2016

233,949

Total reported deaths and injuries

177,653

Total civilian deaths and injuries



48% increase in total civilian deaths and injuries



76% civilian casualties

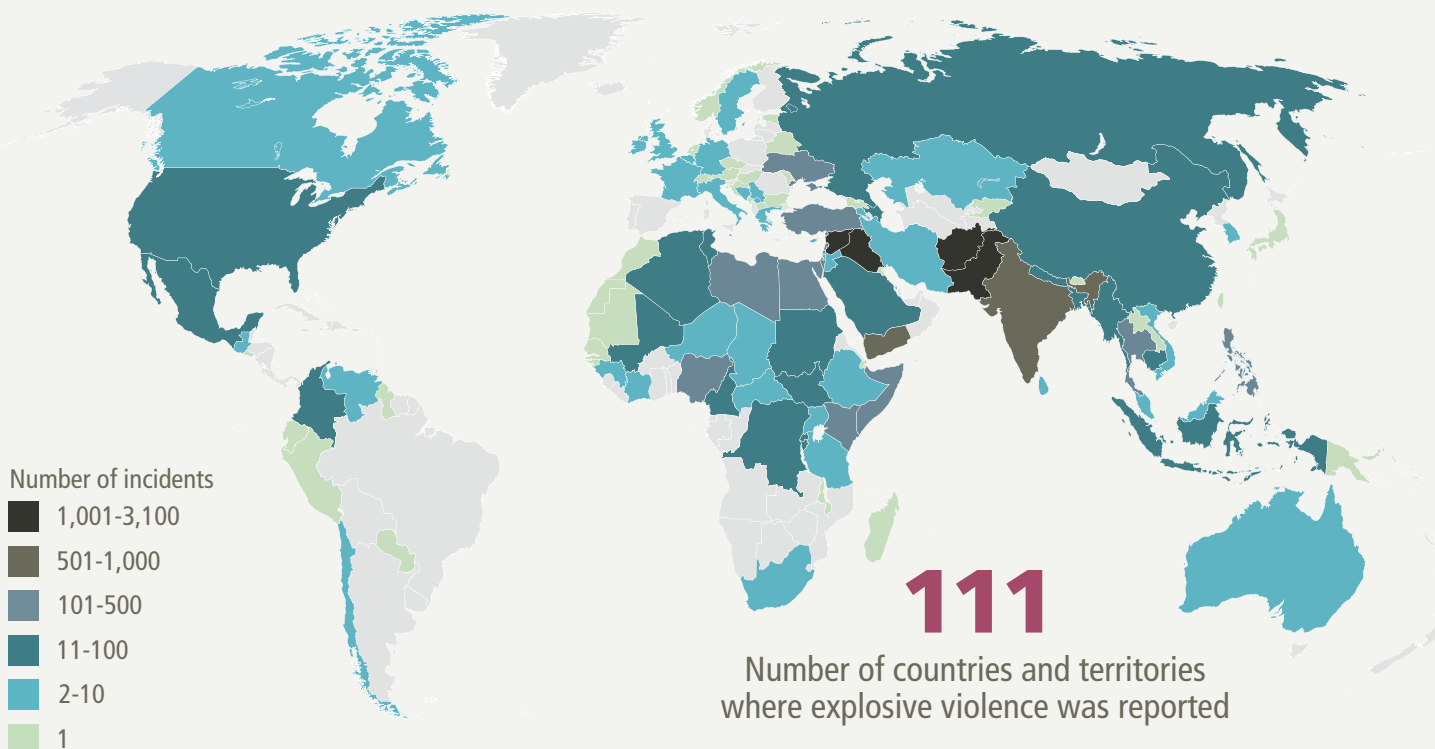
Total deaths and injuries per year

2011	2012	2013	2014	2015	2016
30,301	34,689	37,693	41,847	43,795	45,624

Civilian deaths and injuries per year

2011	2012	2013	2014	2015	2016
21,689	27,014	30,893	32,662	33,307	32,088

Incidents of explosive violence recorded by AOV from 2011 to 2016



Populated areas



91% civilian deaths and injuries

159,230

Total civilian deaths and injuries in populated areas

Number of attacks in populated areas per year



Less populated areas

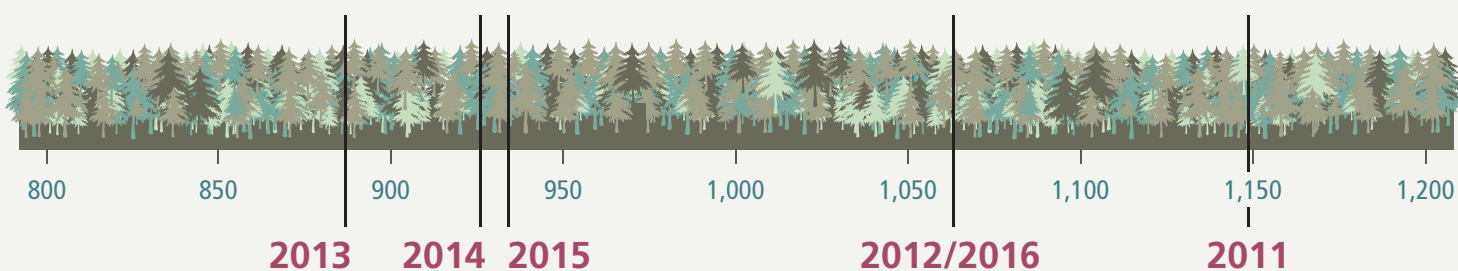


31% civilian deaths and injuries

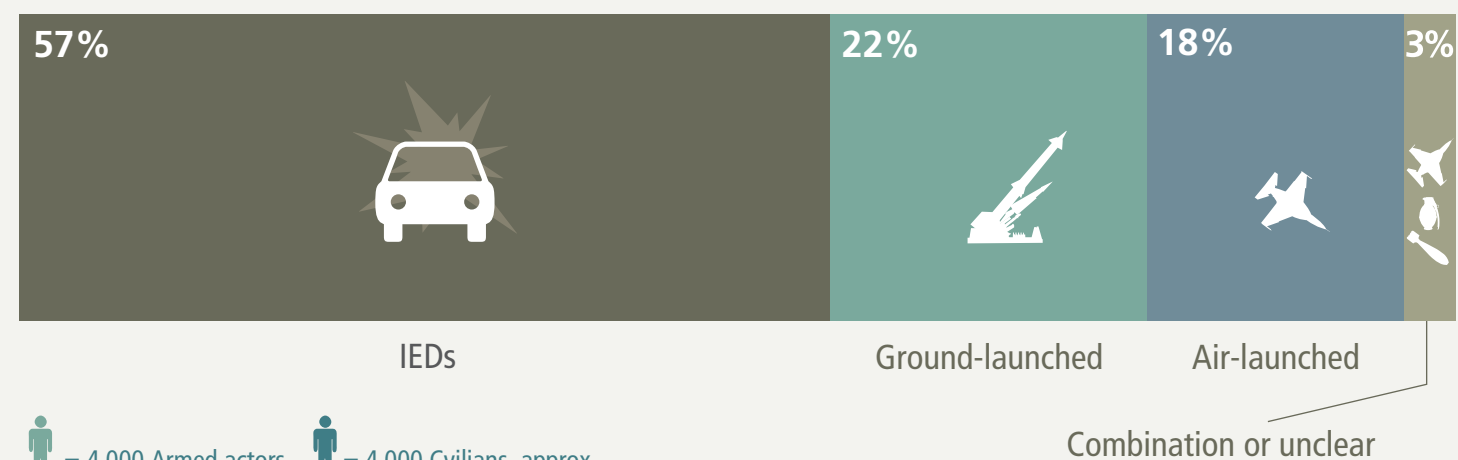
18,423

Total civilian deaths and injuries in less populated areas

Number of attacks in less populated areas per year



Total civilian deaths and injuries by weapon launch method



Recommendations

- States and other actors should stop using explosive weapons with wide area effects in populated areas.
- Previous AOA V reports have shown the impact that strong, progressive rules of engagement can have in limiting the impact of explosive weapons on civilians.⁵⁷ 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.
- States, international organisations and civil society should work together to further a process to develop an international political commitment to reduce the impact on civilians of the use of explosive weapons in populated areas, in line with the recommendations of the United Nations Secretary General.
- States and international organisations should publicly condemn any use of explosive weapons in populated areas.
- 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. This includes measures to address the security of stockpiled ammunition and munitions, coordinated efforts towards the control of source materials, and more systematic data collection.
- The issue of suicide bombings, while contentious, is relatively absent from the wider disarmament debate. This needs to be addressed and urgently. How to stop the rising use of this form of explosive weapon, and addressing the reverberating harm such weapons bring, needs to be a matter of urgent discussion by States, international organisations and civil society.
- 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.
- 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.
- The recommendations in the December 2016 UNGA resolution on ‘Countering the threat posed by improvised explosive devices’ (A/RES/71/72) have to be put into action and soon. The global threat of IEDs needs to be addressed far more by States, international organisations and civil society, and in a way that does not impinge on human rights or humanitarian principles.
- States should help track, collect, analyse, investigate and report systematically on violations of international humanitarian law to enhance compliance and accountability.
- More research is needed to better understand the reverberating effects of explosive weapons, including the impact of these weapons on vital infrastructure and services, public health, economic livelihoods, and environmental contamination.
- AOA V has demonstrated over six years the importance of systematic and continuous monitoring of explosive violence and its impacts in populated areas. This monitoring must continue in order to assess whether recommendations are put into effect.

The house had collapsed. We spent three hours digging with our hands and using our own tools to pull out my father. There are no armed groups nearby. No soldiers. There’s a mosque, houses, shops, schools, clinics. This is a residential neighborhood.

Zakaria Arab, a local resident of the Marjeh neighbourhood, witnessed a bomb strike his father’s house on October 17th 2016⁵⁸

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.⁵⁹

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.

AOAV 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 2016.

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.

RECORDING GUIDELINES

Civilian/armed actor or security personnel:

All casualties are assumed to be civilians unless otherwise stated.⁶⁰ 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.



Refugees at Jadah Camp, Salah al-Din. Credit: IOM November 19, 2016 (<https://creativecommons.org/licenses/by-nc-nd/2.0/>)

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."*⁶¹

User status:

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

- 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.

There was a loud bang, we thought it was lightning but right at that second the windows of the shop came down. It was extremely scary.

Cevher, a shopkeeper in Istanbul, whose shop windows were blown out by a car bomb, June 7th 2016.⁶²

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. This limitation was discussed earlier with specific reference to the conflict in Ukraine.

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 AOA. There is no systematic base-line for determining what constitutes an injury, and AOA 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 AOA always tries to determine the casualties specifically caused by explosive weapons, in these incidents new 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.⁶³

AOA 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. AOA recorded 53 incidents of accidental detonation resulting in 360 deaths and injuries, 126 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. In 2016, AOA recorded 14 incidents involving unexploded ordnance causing 44 civilian deaths and injuries.

The actual number of casualties from ERW is far higher.⁶⁴ Poorly secured or stockpiled explosive weapons can also cause unintended harm to civilians. AOA recorded two stockpile explosions in 2016.

Media reports used by AOA 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 193 incidents out of 2,300 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.



Aftermath of Baghdad bombings July 4th 2016. Credit: Tashnim News <http://www.tashnimnews.com/ar> [CC BY-SA 4.0 (<http://creativecommons.org/licenses/by-sa/4.0/>)], via Wikimedia Commons



Children from Kawar Gosk camp in Erbil, Iraq, where many have fled to escape the violence in Syria.
By Anmarrfaat, via Wikimedia Commons

Notes

¹ UN News Centre, 'In Yemen, UN aid chief rallies support for relief efforts to prevent famine', February 27 2017, http://www.un.org/apps/news/story.asp?NewsID=56253#.WMC_Tal9rIU (accessed 03 Mar. 2017).

² Chris Hitchcock, 'Patterns of Harm: Five years of explosive violence 2011-2015', (AOAV 2016) <https://aoav.org.uk/wp-content/uploads/2016/08/Patterns-of-Harm.pdf> (accessed 15 Mar. 2017).

³ UNGA, 'General debate on all disarmament and international security agenda items: Statement by Ms. Christine Beerli, Vice President, ICRC', UNGA 71st Session, First Committee, October 2016, http://reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com16/statements/12Oct_ICRC.pdf (accessed 07 Apr. 17).

⁴ 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, October 10 1980, posted by U.S. Department of State, www.state.gov/documents/organization/190579.pdf (accessed 03 Jan. 2017). AOA's guidelines for recording an area as populated are included in the Methodology.

⁵ 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 in ambiguous language and it is not clear in many incidents whether these incidents involve manufactured or improvised explosive weapons.

⁶ 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.

⁷ Missiles are defined as "an armament store designed to be released from an aircraft or discharged from a gun or launcher towards a selected point usually to cause damage at that point." International Ammunition Technical Guideline, "Glossary of terms, definitions and abbreviations," United Nations Office for Disarmament Affairs, IATG 01.40:2015(E) 2nd Edition (2015-02-01) <https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/convarms/Ammunition/IATG/docs/IATG01.40.pdf> (accessed 03 Jan. 2017).

⁸ Rockets, both air and ground-launched, are defined as "munitions consisting of a rocket motor and a payload, which may be an explosive warhead or other device. The term often includes both guided and unguided missiles, although it traditionally referred to unguided missiles." International Ammunition Technical Guideline, "Glossary of terms, definitions and abbreviations," United Nations Office for Disarmament Affairs, IATG 01.40:2015(E) 2nd Edition (2015-02-01) <https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/convarms/Ammunition/IATG/docs/IATG01.40.pdf> (accessed 03 Jan. 2017).

⁹ Mortars are generally indirect-fire weapons which fire projectiles over a high-trajectory and do not depend on a line-of-sight. Erich G. Berman, Pierre Gobinet and Jonah Leff, "Mortars," Small Arms Survey, Research Notes - Number 2, February 2011, www.smallarmssurvey.org/fileadmin/docs/H-Research_Notes/SAS-Research-Note-2.pdf (accessed 03 Jan. 2017).

¹⁰ 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 page 35.

¹¹ In 2011 AOA recorded an average of 16 civilian deaths per day; an average of 22 in 2012, 25 in 2013 and 29 in 2014, 30 in 2015.

¹² Fox News, 'Airstrike in Yemen deepens war, puts pressure on US', *Associated Press*, October 11 2016, <http://www.foxnews.com/world/2016/10/11/airstrike-in-yemen-deepens-war-puts-pressure-on-us.html> (accessed 27 Mar. 17)

¹³ Al Arabiya, 'Death toll in Baghdad bombing rises to 324', *Reuters*, August 01 2016, <http://english.alarabiya.net/en/News/middle-east/2016/08/01/Death-toll-in-Baghdad-bombing-rises-to-324.html> (accessed 27 Mar. 17).

¹⁴ Sophia Saifi, Holly Yan, and Daniyal Hassan, 'Pakistan bombing: Suspects, arms seized after attack on Christians kills 74', *CNN*, March 30 2016, <http://edition.cnn.com/2016/03/28/asia/pakistan-bombing-lahore/index.html> (accessed 27 Mar. 17).

¹⁵ BBC, 'Afghanistan violence: Deadly bomb and gun attack hits Kabul', April 19 2016, <http://www.bbc.co.uk/news/world-asia-36079445> (accessed 27 Mar. 17).

¹⁶ Tim Hume, Joe Sterling and Chandrika Narayan, 'Syria airstrikes kill 85 people in Aleppo amid diplomatic row', *CNN*, September 26 2016, <http://edition.cnn.com/2016/09/25/middleeast/syria-aleppo-offensive/> (accessed 27 Mar. 17)

¹⁷ The Guardian, 'Afghanistan holds day of mourning after bomb kills at least 80', *Associated Press*, July 24 2016, <https://www.theguardian.com/world/2016/jul/24/afghanistan-holds-day-of-mourning-after-bomb-kills-at-least-80> (accessed 27 Mar. 17).

¹⁸ Reuters, 'Syrian Observatory reports suspected gas attack in Islamic State area near Palmyra', *Reuters*, December 12 2016, <http://uk.reuters.com/article/uk-mideast-crisis-syria-chemical-weapons-idUKKBN1411A9> (accessed 27 Mar. 17).

¹⁹ Reuters, 'Dozens killed in west Iraq air strike, MPs and medics say', *Reuters*, December 07 2016, <http://www.reuters.com/article/us-mideast-crisis-iraq-town-idUSKBN13W2HZ> (accessed 27 Mar. 17).

²⁰ Chiara Palazzo and Jessica Winch, 'Istanbul Atatürk airport attack: 41 dead and 239 injured in 'hideous' suicide bombings in Turkey', *The Telegraph*, June 29 2016, <http://www.telegraph.co.uk/news/2016/06/29/istanbul-ataturk-airport-attack-36-dead-and-150-injured-in-hideous/> (accessed 27 Mar. 17).

²¹ Yousuf Basil and Tim Hume, 'In Syria, dozens killed as bombers strike in Homs and Damascus, regime says', *CNN*, February 22 2016, <http://edition.cnn.com/2016/02/21/middleeast/syria-civil-war/> (accessed 27 Mar. 17).

²² In alphabetical order the 70 countries are: Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Belgium, Bosnia and Herzegovina, Burma, Burundi, Cambodia, Cameroon, Canada, Chad, China, Colombia, DRC, Ecuador, Egypt, Gaza, Georgia, Germany, Greece, Guatemala, Hungary, India, Indonesia, Iraq, Israel, Japan, Jordan, Kenya, Kyrgyzstan, Laos, Lebanon, Libya, Madagascar, Malawi, Malaysia, Mali, Malta, Mexico, Nepal, Nigeria, Pakistan, Paraguay, Philippines, Russia, Saudi Arabia, Serbia, Somalia, South Africa, South Korea, South Sudan, Sri Lanka, Sudan, Sweden, Syria, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, UK, Ukraine, USA, Venezuela, Vietnam, West Bank, Yemen.

²³ These only include casualties from an explosive weapon at its time of use. AOAV also recorded impacts of unexploded ordnance (UXO) and abandoned ordnance (AXO), and from unattended or mismanaged stockpiles. These casualties are excluded from the primary analysis in this report, but are documented on pages 35-36.

²⁴ In alphabetical order these were: Belgium, Bosnia and Herzegovina, Democratic Republic of the Congo, Ecuador, Georgia, Germany, Greece, Hungary, Japan, Kyrgyzstan, Laos, Madagascar, Malawi, Malta, Nepal, Paraguay, Taiwan, Trinidad and Tobago, Uganda, Vietnam.

²⁵ Iraq Body Count, which aims to keep comprehensive figures, recorded 5,878 civilian deaths alone from explosives in 2016. See <https://www.iraqbodycount.org/database/>

²⁶ United Nations Security Council, 'Amid Humanitarian Funding Gap, 20 Million People across Africa, Yemen at Risk of Starvation, Emergency Relief Chief Warns Security Council', March 10 2017, <https://www.un.org/press/en/2017/sc12748.doc.htm> (accessed 15 Mar. 17).

²⁷ Robert Perkins, "Syria's Shockwaves," AOAV, December 2013; Escaping the Bombing: The use of explosive weapons in populated areas and forced displacement: perspectives from Syrian refugees (Handicap International 2016)

<https://www.handicapinternational.org.uk/sites/uk/files/documents/files/2016-09-report-qasef-escaping-the-bombing-syria-handicap-international-web-final.pdf> (accessed 05 Mar. 17).

²⁸ *The Telegraph*, 'Istanbul Atatürk airport attack: 41 dead and 239 injured in 'hideous' suicide bombings in Turkey', June 29 2016, <http://www.telegraph.co.uk/news/2016/06/29/istanbul-ataturk-airport-attack-36-dead-and-150-injured-in-hideous/> (accessed 15 Mar. 17).

²⁹ In alphabetical order these states were: Afghanistan, Armenia, Azerbaijan, Burundi, the DRC, Egypt, India, Iran, Iraq, Israel, Kenya, Libya, Myanmar, Nigeria, Pakistan, the Philippines, Russia, Saudi Arabia, South Sudan, Sudan, Syria, Turkey, the UAE, Ukraine, the USA and Yemen.

³⁰ In 2015, there were 15,864 casualties from incidents perpetrated by non-state actors. Of these casualties, 83% were civilian (13,192).

³¹ Non-state actors named as causing casualties with explosive weapons, in alphabetical order, were: Abu Sayyaf Group (Philippines), al-Shabaab (Kenya and Somalia), al-Qaeda in the Arabian Peninsula (AQAP, Yemen), the Bangsamoro Islamic Freedom Fighters (the Philippines), Barisan Revolusi Nasional (Thailand), Freedom Falcons of Kurdistan (Turkey), Garo National Liberation Army (India), Hasm Movement (Egypt), Hizb-ul-Mujahideen (Pakistan), Houthis (Saudi Arabia and Yemen), ISIS

(including various local affiliates; Iraq, Syria, Yemen, Libya, Bangladesh, Egypt, Pakistan, Malaysia, Tunisia, Germany, Canada, Russia, Afghanistan, Turkey, Jordan, Belgium, Saudi Arabia, Indonesia, Philippines, Nigeria, Chad, Cameroon), Jamaatul Ahrar (Pakistan), Lashkar-e-Jhangvi (Pakistan), Various Libyan militias (Libya), the Naxals (India), the New People's Army (Philippines), the NSCN-K (India), the Pakistani Taliban (Pakistan), Rashtriya Swayamsevak Sangh (India), the People's Liberation Army (India), the Peshmerga (Iraq), the PKK (Turkey), various Syrian rebel groups (Syria and Turkey), the Taliban (Afghanistan), Ta-ang National Liberation Army (Burma), Ukrainian separatists (Ukraine), and ULFA (India). There were also various other actors identified only as gangs, rebels or separatists and those that staged the Turkish coup.

³² AOAV recorded 290 incidents in urban residential areas in 2015, down from 389 in 2014.

³³ In 2015 AOAV recorded 5,024 civilian deaths and injuries as a result of incidents in urban residential areas.

³⁴ Associated Press, "Saudi Arabia to scale back Yemen attacks as airstrike death toll rises", *The Guardian*, March 17 2016, <https://www.theguardian.com/world/2016/mar/17/saudi-arabia-scale-back-yemen-attacks-sanaa-airstrikes-toll-houthi-market-rises> (accessed 24 Mar. 17).

³⁵ *Human Rights Watch*, "Russia/Syria: War Crimes in Month of Bombing Aleppo", December 01 2016, <https://www.hrw.org/news/2016/12/01/russia/syria-war-crimes-month-bombing-aleppo> (accessed 06 Apr. 17).

³⁶ 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.

³⁷ 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 in ambiguous language and 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 and Cluster Munition Coalition, *The Landmine Monitor 2016*, November 2016, <http://www.the-monitor.org/media/2386748/Landmine-Monitor-2016-web.pdf> (accessed 12 Jan. 17).

³⁸ In 2015, 932 IED incidents were recorded, whilst in 2014, 1,131 were recorded.

³⁹ International Business Times, 'Dallas Shooting: Police Department Defends Use Of Bomb Robot To Kill Suspect Micah Johnson', July 10 2016, <http://www.ibtimes.com/dallas-shooting-police-department-defends-use-bomb-robot-kill-suspect-micah-johnson-2390354> (accessed 26 Jan. 2017).

⁴⁰ Unlike AOAV's report on 2015, this year Boko Haram have been included in the ISIS groups as they have been affiliated with ISIS for over a year.

⁴¹ *Reuters*, "Car bomb near Syria-Turkey border crossing kills at least 20: witnesses", October 14 2016, <http://www.reuters.com/article/us-mideast-syria-blast-idUSKCN12D2ZA> (accessed 06 Apr. 17).

⁴² 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.

⁴³ In 2015 AOAV recorded 9,205 civilian deaths and injuries as a result of suicide bombings.

⁴⁴ In 2011 AOAV recorded 5,107 civilian deaths and injuries as a result of suicide bombings.

⁴⁵ These countries were, in alphabetical order: Afghanistan, Belgium, Cameroon, Egypt, Germany, Indonesia, Iraq, Japan, Jordan, Kyrgyzstan, Lebanon, Libya, Nigeria, Pakistan, Russia, Saudi Arabia, Somalia, Syria, Turkey, USA, and Yemen.

⁴⁶ 18 percent of IED attacks with a reported mode of detonation in 2016 were triggered by victim-activation

⁴⁷ Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their destruction, September 18 1997, www.un.org/Depts/mine/UNDocs/ban_trty.htm (accessed 09 Feb. 2017).

⁴⁸ 2015 civilians made up 62% of casualties from air-launched explosive weapons.

⁴⁹ John Davidson, 'Iraqi villagers mourn air strike victims as Mosul toll mounts', November 21 2016, *Reuters*, <http://www.reuters.com/article/us-mideast-crisis-iraq-victims-idUSKBN13G18E> (accessed 06 Apr. 17).

⁵⁰ UNHCR, Yemen: Regional Refugee and Migrant Response Plan, <http://data.unhcr.org/yemen/regional.php> (accessed 12 Jan. 17).

⁵¹ DTM, 'DTM Yemen – TFPM 11th Report – October 2016', December 03 16, <http://www.globaldtm.info/dtm-yemen-tfpm-11th-report-october-2016/> (accessed 12 Jan. 17).

⁵² In 2015, 1801 were killed and injured by non-specific shelling, accounting for 21% of all deaths and injuries from ground-launched weapons.

⁵³ INEW, 'Acknowledging the harm', <http://www.inew.org/acknowledgements> (accessed 27 Mar. 17).

⁵⁴ United Nations, Report of the Secretary-General on the protection of civilians in armed conflict, S/2016/447 Security Council Distr.: General, 13 May 2016.

⁵⁵ Reaching Critical Will, 'First Committee Monitor', No.4, October 24 2016, <http://reachingcriticalwill.org/images/documents/Disarmament-fora/1com/FCM16/FCM-2016-No4.pdf> (accessed 27 Mar. 17).

⁵⁶ INEW also released a briefing paper on the key elements needed within this declaration which can be seen at: https://aoav.org.uk/wp-content/uploads/2016/10/INEW-paper-on-a-declaration_26.9.16.pdf (accessed 27 Mar. 17).

⁵⁷ Robert Perkins, "Air Power in Afghanistan, How NATO changed the rules, 2008-2015," Action on Armed Violence (AOAV), December 2015, <https://aoav.org.uk/wp-content/uploads/2015/03/AOAV-Air-Power-in-Afghanistan.pdf> (accessed 27 Mar. 17); Robert Perkins, "Under Fire, Israel's artillery policies scrutinised," Action on Armed Violence (AOAV), December 2015, <https://aoav.org.uk/wp-content/uploads/2015/03/AOAV-Under-Fire-Israels-artillery-policies-scrutinised.pdf> (accessed 27 Mar. 17).

⁵⁸ *Human Rights Watch*, "Russia/Syria: War Crimes in Month of Bombing Aleppo", December 01 2016, <https://www.hrw.org/news/2016/12/01/russia/syria-war-crimes-month-bombing-aleppo> (accessed 06 Apr. 17).

⁵⁹ For more information see www.insecurityinsight.org (accessed 27 Mar. 17).

⁶⁰ 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 3% of all incidents recorded by AOAV in 2016.

⁶¹ Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III), to the UN Convention on Certain Conventional Weapons, Geneva, October 10 1980, www.icrc.org/ihl.nsf/FULL/515 (accessed 18 Mar. 17).

⁶² Humeyra Pamuk and Osman Orsal, "Car bomb targeting police kills 11, wounds 36 in Istanbul", *Reuters*, June 7 2016, <http://uk.reuters.com/article/us-turkey-blast-idUKKCN0YT0FB> (accessed 06 Apr. 17).

⁶³ AOAV recorded 55 such incidents in 2016.

⁶⁴ International Campaign to Ban Landmines, 'Landmine Monitor 2016', November 2016, <http://www.the-monitor.org/media/2386748/Landmine-Monitor-2016-web.pdf> (accessed 27 Mar. 17).

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