

# GLOBAL MAPPING AND ANALYSIS OF ANTI-VEHICLE MINE INCIDENTS IN 2016



**GICHD**



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# GLOBAL MAPPING AND ANALYSIS OF ANTI-VEHICLE MINE INCIDENTS IN 2016

## KEY FINDINGS



**181**  
incidents

related or  
suspected to  
be related to  
AVMs in



**22**  
states and  
territories

**423**  
casualties



On average



**2.3**  
casualties/  
incident

**228**  
were injured

**195**  
were killed



**46%**  
of casualties  
were civilians

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- In 2016, the GICHD and SIPRI recorded 181 incidents related, or suspected to be related, to anti-vehicle mines (AVMs)<sup>1</sup> in 22 states and territories, an increase of 2 per cent compared to 2015. These incidents caused 423 casualties,<sup>2</sup> including 228 injured and 195 killed, a decrease of 29 per cent in comparison to 2015.
- Afghanistan, Cambodia, Mali, Pakistan, and Ukraine were the five states with the most recorded AVM incidents in 2016. All states, besides Afghanistan, featured among the top five states with the most incidents in the previous year.
- Afghanistan, Mali, Pakistan, Syria and Ukraine were the states with the highest casualty rates in 2016. The 101 casualties recorded in Ukraine represent a 4 per cent increase since 2015 and account for 24 per cent of global casualties.
- In post-conflict situations, 87 per cent of casualties were civilians, while in conflict settings, this number drops to 40 per cent.



# ACKNOWLEDGEMENTS

The GICHD and SIPRI wish to extend sincere thanks to all partner organisations that responded to the survey and provided data, in particular:

- United Nations Development Programme
- United Nations Mine Action Service
- Ambassadors for Development without Borders, Iran
- APOPO
- “Dales Voz a Las Víctimas” platform
- Danish Demining Group
- iMMAP
- Landmine Monitor
- Mines Advisory Group
- Norwegian People’s Aid
- Organization for Security and Co-operation in Europe Project Co-ordinator in Ukraine
- Peace Sharing Association/Korean Campaign to Ban Landmines
- Sustainable Peace and Development Organization, Pakistan
- The HALO Trust
- Zamin Pak Persia International Company

The following mine action programmes also provided valuable responses and data:

- Albanian Mines and Munitions Coordination Office
- Azerbaijan National Agency for Mine Action
- Bosnia and Herzegovina Mine Action Center
- Cambodian Mine Action and Victim Assistance Authority
- Center for Humanitarian Demining and Expertise, Armenia
- Centre National d’Action Antimines au Sénégal
- Centro Peruano de Acción contra las Minas Antipersonal
- Comisión Nacional de Desminado Humanitario, Chile
- Comissão Nacional Intersectorial de Desminagem e Assistência Humanitária, Angola
- Croatian Mine Action Centre
- Dirección para la Acción Integral contra Minas Antipersonal, Colombia
- Direction de l’Action Humanitaire contre les Mines et Engins non explosés, Burundi
- Executive Secretariat for the Demining and Development of the North West Coast, Egypt
- Instituto Nacional de Desminagem, Mozambique
- Iraqi Kurdistan Mine Action Agency
- Israeli National Mine Action Authority
- Kosovo Mine Action Centre
- Lebanon Mine Action Center
- Mine Action Coordination Centre of Afghanistan
- Ministère de la Défense du Cameroun
- National Mine Action Center, Sri Lanka
- Palestine Mine Action Centre
- South Sudan National Mine Action Authority
- STC Delta, Georgia
- Tajikistan Mine Action Centre
- Thailand Mine Action Centre
- The National Committee for Demining and Rehabilitation, Jordan
- Yemen Executive Mine Action Center
- Zambia Mine Action Centre
- Zimbabwe Mine Action Centre

# BACKGROUND

## PURPOSE AND OBJECTIVES

The need for systematic data collection on AVM incidents was first recognised during joint research by the GICHD and SIPRI for a study on the humanitarian and developmental impact of anti-vehicle mines published in October 2014.<sup>3</sup> As a response, both organisations have been collecting global data on AVM incidents since 2015 with a view to improving evidence on and identifying trends in AVM impact. Data are available on interactive and regularly updated online maps.<sup>4</sup>

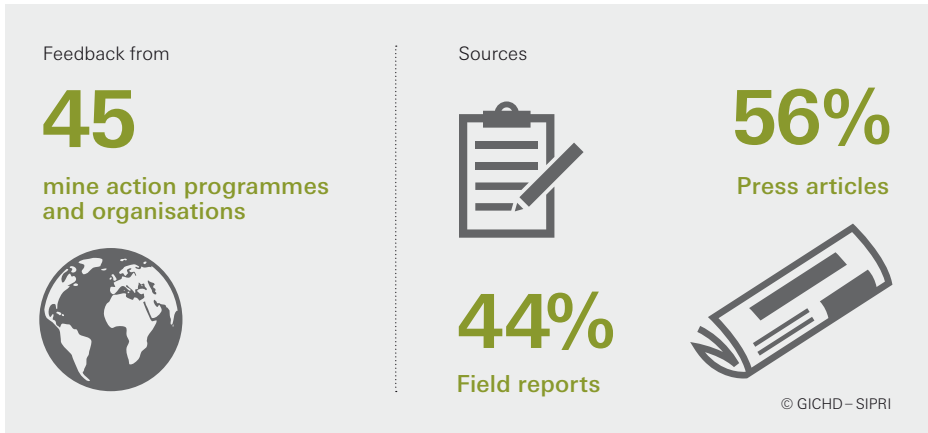


This report presents and analyses AVM incident data from 2016. It follows up on and compares findings with a first report of its kind: “Global Mapping and Analysis of Anti-Vehicle Mine Incidents in 2015”, released in April 2016.<sup>5</sup>

## RESEARCH METHODOLOGY

Data in this report stem from field reports from states, mainly national mine action authorities/centres, as well as mine action and other humanitarian organisations, and from media reviews in Arabic, English, French, Portuguese, Russian, Spanish and Urdu.

**FIGURE 1** SOURCES OF AVM INCIDENTS<sup>6</sup>



Out of a total of 181 recorded incidents in 2016, 79 are based on field reports from 45 mine action programmes and organisations, and 102 from media sources. A more detailed description of the methodology and challenges of this research is available in Annex 1.

# GLOBAL TRENDS 2016

The GICHD and SIPRI recorded 181 incidents in 2016 that were related or suspected to be related to AVMs in 22 states and territories.<sup>7</sup> This represents a minor increase compared to 2015, when 178 incidents were recorded in 25 states and territories.<sup>8</sup> The highest number of incidents were found in Ukraine, Mali, Afghanistan, Pakistan and Cambodia (see Table 1). New states in 2016 include Azerbaijan, Israel, Lebanon, Rwanda and South Korea.

As in 2015, Ukraine and Mali were the states with most incidents in 2016, totalling 35 per cent of all incidents globally. Ukraine alone accounted for 37 incidents – a significant increase compared to the 25 incidents the year before.





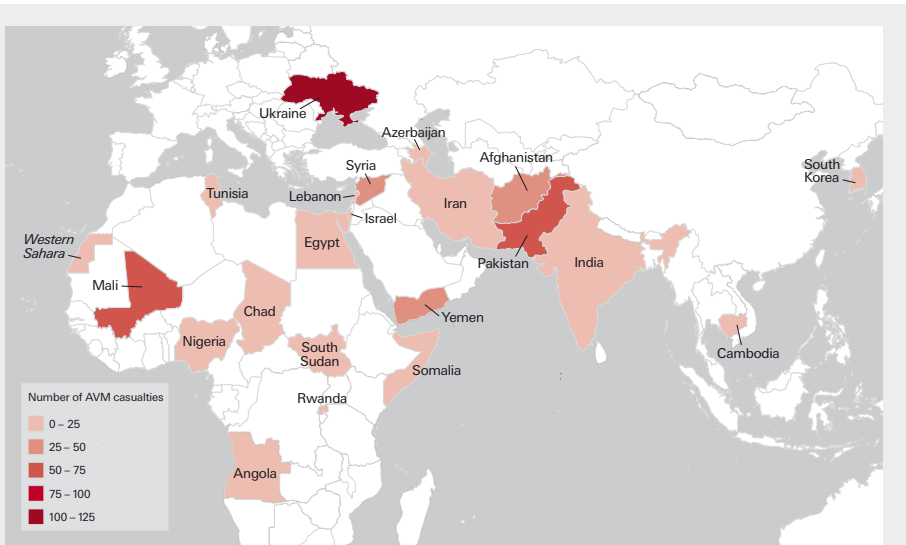
In total, 423 casualties were recorded including 195 dead and 228 injured. This is a decrease of 29 per cent compared to the previous year (598 casualties). The previous trend was an increase in casualties and it is too early to say whether 2016 represents a reversal of this trend or whether it was an outlier year. Corroborating last year's GICHD and SIPRI findings, the Landmine Monitor also registered a notable spike in AVM casualties in 2015 compared to previous years.<sup>9</sup>

The vast majority of incidents recorded by the GICHD and SIPRI in 2016 occurred in current conflict settings. 144 incidents (80 per cent) and 371 casualties (88 per cent) were found in conflict settings.<sup>10</sup> This is comparable to 2015, when 81 per cent of incidents and 91 per cent of casualties were found in conflict situations.

Data also testify to the sustained – and proportionally growing – humanitarian and developmental impact of AVMs in relation to other mines and explosive remnants of war (ERW) in states long after conflict has ended. For example, while Cambodia noted a 25 per cent drop in overall mines/ERW casualties from 2015 to 2016 (from 111 to 83),<sup>12</sup> the number of AVM casualties remained fairly stable: 17 in 2015 and 16 in 2016.

FIGURE 2

HEAT MAP OF ALL STATES AND TERRITORIES WITH RECORDED INCIDENTS IN 2016<sup>11</sup>



Absolute numbers are: Ukraine 101, Mali 55, Pakistan 52, Syria 38, Afghanistan 34, Yemen 32, Egypt 21, Cambodia 16, India 12, *Western Sahara* 12, Angola 10, Tunisia 10, Iran 9, Chad 7, Rwanda 5, South Sudan 3, Lebanon 2, Azerbaijan 1, Israel 1, Somalia 1, South Korea 1, Nigeria 0

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For the first time in four years, an AVM incident was recorded in South Korea in 2016 – a further incident occurred only a few weeks later in January 2017. This is a reminder of the legacy of contamination stemming from decades of military tensions.<sup>13</sup>

The Korean War from 1950 to 1953 ended with an Armistice Agreement.<sup>14</sup> Since then, AVMs have posed a threat to both security forces and civilians. The Demilitarized Zone (DMZ) and the Civilian Control Zone (CCZ)<sup>15</sup> still remain among the most mine-affected areas in the world due to extensive contamination by mines laid during the Korean War, during the 1960s, as well as in 1978 and 1988. The CCZ is still not safe for people to access,<sup>16</sup> as many of these areas have no signs to indicate where the mines are.<sup>17</sup>

The incident in 2016 occurred when an AVM was triggered during road construction in the CCZ, killing a dump-truck driver, despite previous clearance work. The incident drew renewed attention to the importance of demining in South Korea.<sup>18</sup>

**FIGURE 3** THE DMZ AND CCZ BORDERLANDS

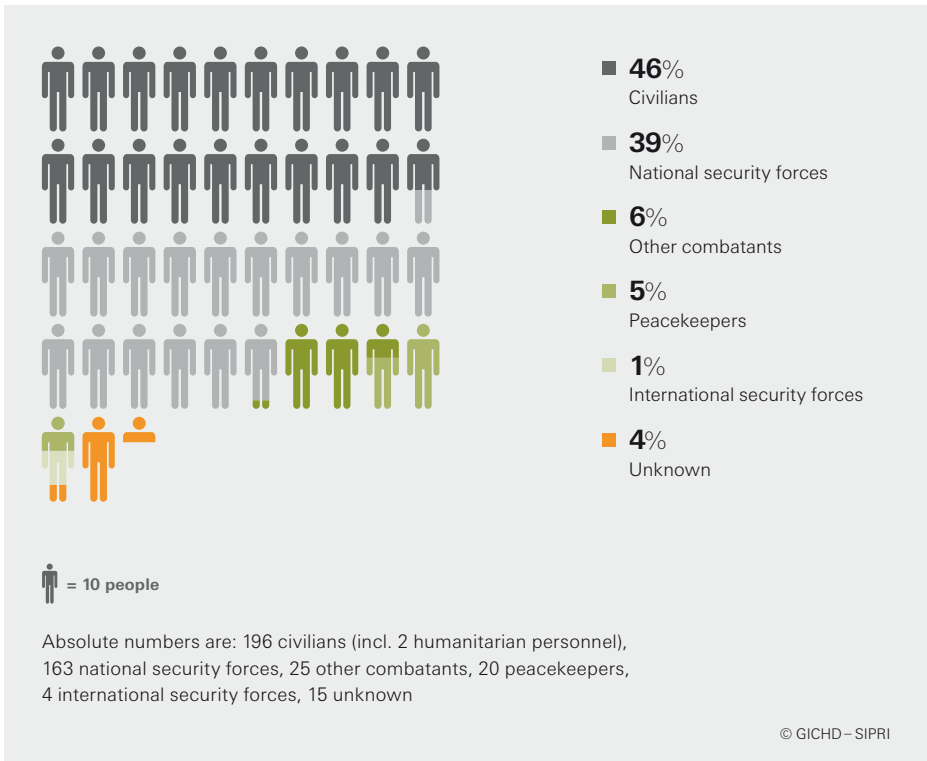


Figure adapted from Kwi-gon Kim and Dong-Gil Cho (2005), "Status and Ecological Resource Value of the Republic of Korea's De-militarized Zone", *Landscape and Ecological Engineering*, vol. 1, p. 4. Reproduced with permission from Springer

## CATEGORIES OF CASUALTIES

Categories of reported casualties (killed and injured) are represented in Figure 4. Civilians overall accounted for 46 per cent of total casualties (196 out of 423), while national security forces comprised 39 per cent (163 casualties).<sup>19</sup> As in the previous year, peacekeepers, international security forces, other combatants and unknown casualties accounted for a smaller fraction of the total.<sup>20</sup>

**FIGURE 4** CATEGORIES OF CASUALTIES<sup>21</sup>



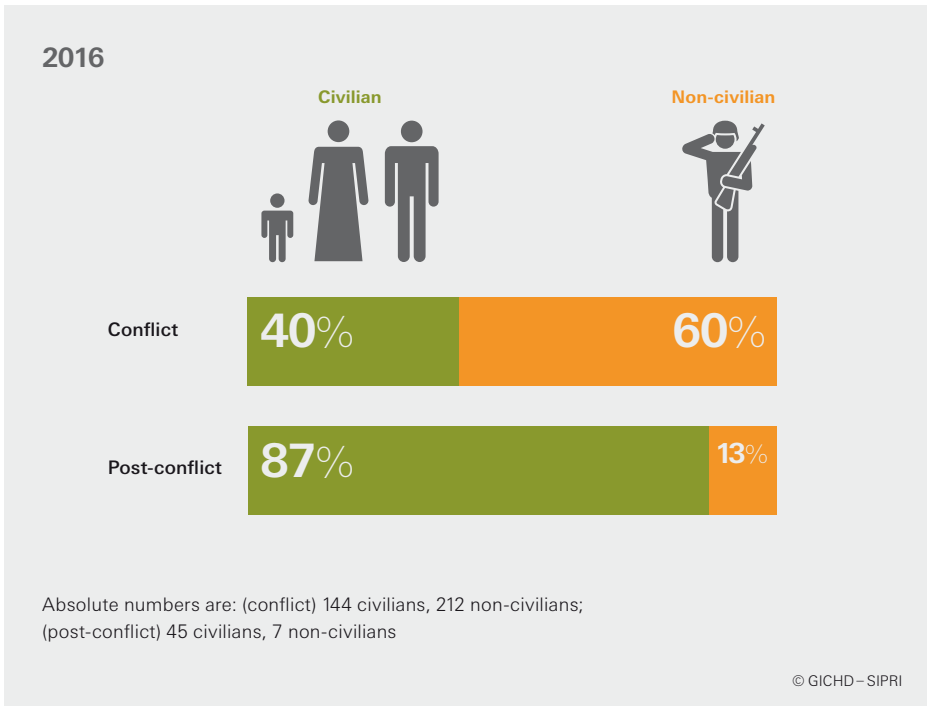
The percentage of overall civilian casualties decreased substantially from 60 per cent in 2015 to 46 per cent in 2016, while a notable proportionate increase was observed for casualties from national security forces from 28 per cent to 39 per cent in the same period.

In conflict settings, civilians accounted for 62 per cent of casualties in 2015, where disaggregated data were available (Figure 5). This figure dropped to 40 per cent in 2016.

In post-conflict situations, civilians accounted for 87 per cent of casualties in 2016 compared to 73 per cent the year before. This high ratio of civilian casualties in post-conflict settings may be expected, since the presence of military personnel is typically lower than in ongoing conflicts.

**FIGURE 5**

**CASUALTY DEMOGRAPHICS IN CONFLICT VS POST-CONFLICT SETTINGS**



The impact of large incidents on data variance may also be noted. In 2015, one single incident in Mali killed four and injured 28 civilians when a civilian bus detonated a suspected AVM 45 km from Gao, near the village of N'Tillit. These 32 casualties alone represented no less than 5 per cent of total casualties in 2015. The largest incident recorded in 2016 occurred in the Donetsk region in Ukraine when a minibus hit a suspected AVM, resulting in 15 civilian casualties.

For two consecutive years, Ukraine has been the state with the most AVM-related incidents and highest number of casualties. In 2016, the GICHD and SIPRI recorded 37 incidents with 101 casualties, including 43 dead and 58 injured. Ukraine therefore accounted for 20 per cent of all recorded incidents and 24 per cent of all casualties globally. Compared to 2015, this represents a 48 per cent spike in incidents and a 4 per cent increase in the number of casualties.

While old mines dating from World War I and World War II continue to be discovered in Ukraine<sup>22</sup>, recorded AVM incidents in 2016 took place in Luhansk and Donetsk oblasts, where conflict between government and separatist forces erupted in 2014 (Figure 6).

AVM contamination affected non-civilians in particular: 69 per cent of the casualties, where disaggregation was possible, which is higher than the global average of 60 per cent in conflict contexts. This corroborates a trend observed in 2015 when 64 per cent of the casualties in Ukraine were non-civilians.

The mines not only caused casualties, but had detrimental socio-economic effects, preventing people from using agricultural land for crops and livestock, which are the main means of subsistence.<sup>23</sup> They were also an obstacle to the repair of infrastructure, such as water and gas supply, and limited the monitoring of the implementation of the Minsk Agreements<sup>24</sup> by the Special Monitoring Mission of the Organization for Security and Co-operation in Europe (OSCE).<sup>25</sup>

**FIGURE 6** MAP OF AVM INCIDENTS IN UKRAINE

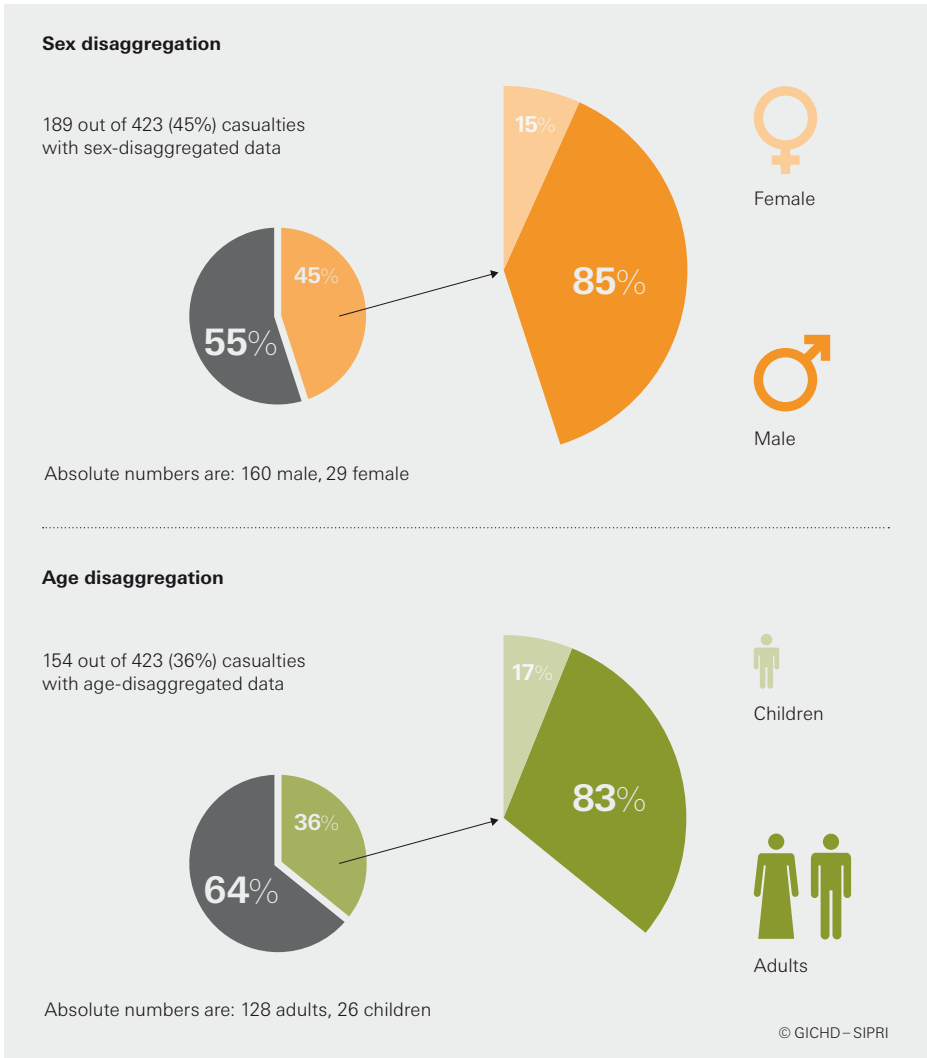


© Base map: International Crisis Group;  
AVM incidents: GICHD-SIPRI

## CASUALTIES BY SEX AND AGE

The 2016 data reconfirm the challenges observed in the 2015 report. Sex-disaggregated data were only available for 45 per cent (189 casualties) of total casualties in 83 incidents. Where disaggregated data were available, men were disproportionately affected

**FIGURE 7** CASUALTIES BY SEX AND AGE



by AVMs: in 2016, 85 per cent of casualties were men in comparison to 93 per cent in 2015. Traditionally high male representation among security forces, peacekeepers and other combatants may explain this finding. The proportion of men, however, only marginally decreases when considering only civilian casualties.

Age-disaggregated data were only accessible for 36 per cent (154 casualties) of total casualties in 69 incidents. In these instances, 83 per cent were adults, while children<sup>26</sup> represented 17 per cent. These figures are in the same range as last year.<sup>27</sup>

## CATEGORIES OF VEHICLES

Figure 8 illustrates that a civilian vehicle (agricultural, commercial and other civilian) triggered the AVM in 49 per cent (84 incidents) of recorded incidents involving a vehicle (173 incidents), while 57 per cent of incidents occurred with civilian vehicles in 2015. This proportional decrease reflects the trend observed for civilian casualties. Still, like in 2015, civilian vehicles continue to be the most impacted in 2016, with a continued high number of farming-related incidents. They are followed by vehicles belonging to national security forces (24 per cent) and peacekeeping vehicles (8 per cent), for which the share has only varied slightly over the last two years.

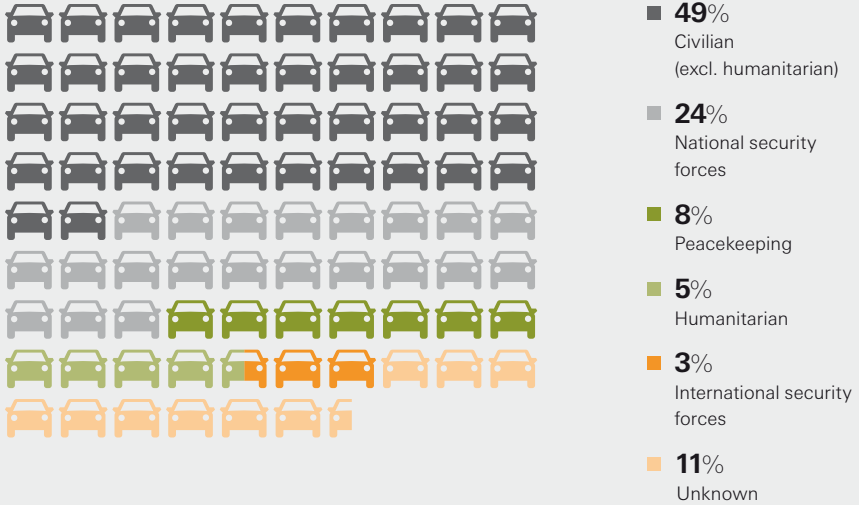
A major spike was, however, recorded for humanitarian vehicles in both absolute and relative terms: from one incident in 2015 (less than 1 per cent of all vehicle-related incidents) to nine incidents in 2016 (5 per cent). A major part of this spike can be attributed to the significant number of demining incidents in Iran (see Box 3).



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Approximately 4 per cent (eight incidents) of recorded incidents did not involve a vehicle. In these cases, AVMs were detonated when someone tried to remove the AVM from the ground. In two incidents, one in Somalia and one in Angola, children were killed or injured after finding AVMs on the ground. As in 2015, livestock also triggered AVMs.

**FIGURE 8** CATEGORIES OF VEHICLES



= 2 vehicles

Absolute numbers are: 84 civilian, 42 national security forces, 14 peacekeeping, 9 humanitarian, 5 international security forces, 19 unknown

**Breakdown of the civilian vehicle sub-categories (84 incidents in total)**



Absolute numbers are: 33 agricultural, 8 commercial, 43 other civilian



## CASUALTIES PER INCIDENT

Since AVMs are designed to destroy vehicles, they have a large explosive charge that often causes several casualties. The average casualties per incident reached 2.3 in 2016 which is a decrease compared to 2015 (3.4 casualties per incident). This reduction is mainly due to the lower number of casualties whereas the number of incidents remained stable.

The ratio of casualties per incident varied depending on the context as well as between states or territories (see Table 1). The type of vehicle, the number of passengers as well as the victim's activity at the time of the incident impact the likely number of casualties.

Previous high average casualty rates in Syria, Pakistan and Ukraine were again recorded in 2016. However, among the seven states/territories with most incidents in both years (i.e. Ukraine, Mali, Syria, Cambodia, Pakistan, Afghanistan and Western Sahara), the average numbers decreased for six of them – with only Cambodia noting an increase. In five instances (out of these six), the proportion of civilians amongst the casualties also dropped.

Syria accounted for the most significant decrease of civilian casualties, dropping from 93 per cent in 2015 to 45 per cent in 2016. A reverse trend was noted in Afghanistan where the proportion of civilians among casualties spiked from 35 per cent to 100 per cent in one year; while the overall number of AVM casualties remained the same (34), the number of incidents increased by 73 per cent between 2015 and 2016 with a recent prevalence in the south east regions. Possible factors for this trend



© Photo credit: GICHD/2015

include internally displaced persons moving by road, due to recent fighting, without knowledge of contamination or main roads being blocked by improvised explosive devices (IEDs), resulting in the local population trying to use alternative roads that are littered with AVMs.<sup>28</sup>

**TABLE 1** CASUALTIES PER INCIDENT AND LETHALITY RATIO IN 2016

Country/ Territory	Recorded incidents	Number of casualties	Average No casualties/ incident	Percent of casualties that were civilians	Percent of casualties that were killed
Ukraine	37	101	2.73	31%	43%
Mali	26	55	2.12	4%	29%
Afghanistan	19	34	1.79	100%	38%
Pakistan	18	52	2.89	40%	35%
Cambodia	16	16	1.00	100%	25%
Syria	12	38	3.17	45%	100%
Iran	11	9	0.82	100%	22%
<i>Western Sahara</i>	10	12	1.20	75%	25%

The 2016 data further indicate that the type of vehicle involved in an incident can cause different impacts on casualties. Understood as the ratio of killed to overall victims, the lethality rate of incidents with civilian vehicles (excluding humanitarian) reached 52 per cent overall, whereas the same rate of incidents involving non-civilian vehicles amounted to 29 per cent.

This difference stems from the assumption that non-civilian vehicles (i.e. national security forces, international security forces, peacekeepers, other combatants) are more likely to be better armoured and to protect passengers from the effects of explosions than civilian vehicles. Incidents without a vehicle reached a lethality ratio of 67 per cent.

Iran illustrates how AVMs continue to pose a legacy threat. The 2016 data capture the long-standing impact of contamination mainly from the conflict with Iraq in 1980-1988. Remaining contamination is concentrated in the five western regions bordering Iraq, an area rich in oil fields; available estimations ranged from 250 km<sup>2</sup> to 280 km<sup>2</sup> in 2014.<sup>29</sup>

FIGURE 9 MAP OF AVM INCIDENTS IN IRAN



Despite clearance efforts, AVM-related incidents still occur. The GICHD and SIPRI recorded 11 AVM incidents in these regions in 2016 – a significant increase compared to the previous year when three incidents were recorded. Over two years, two of them occurred during construction work and one when an oil company's tractor set off an AVM in Musian County, Ilam province.

In 7 out of the 11 recorded incidents in 2016, AVMs were set off during clearance work. This high number stands out and supports a broader trend of reported demining incidents in Iran. According to the Landmine Monitor, one deminer was killed and 17 injured in 2014, whereas 28 and 71 deminer casualties were recorded in 2013 and 2012 respectively.<sup>30</sup> While several factors testify to the challenging environment of AVM clearance in that country, such as the prevalence of non-metallic devices or possibly restricted access to technological advances in demining assets,<sup>31</sup> further research is required to understand the high number in 2016, from a larger quality management and occupational safety perspective.

**FIGURE 10** CATEGORIES OF VEHICLES IN IRAN



Absolute numbers are: 7 humanitarian, 3 civilian (agricultural), 1 civilian (commercial)

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A locally developed demining tool that is installed in front of a bulldozer in Iran

# CONCLUSION

In 2016, the GICHD and SIPRI recorded 181 incidents related or suspected to be related to AVMs in 22 countries and territories. This represents a 2 per cent increase of incidents compared to 2015. These incidents caused 423 casualties, among which 228 were injured and 195 killed – a 29 per cent reduction compared to the previous year. The proportion of civilians among casualties dropped from 60 per cent to 46 per cent over the two years.

The vast majority of the casualties in 2016 were suffered in conflict settings. This finding bolsters the previous year's observation: 80 per cent of incidents in 2016 (81 per cent in 2015) and 88 per cent of casualties (91 per cent in 2015) occurred in those situations. Notwithstanding, the 2016 findings also testify to the sustained humanitarian and developmental impact of AVMs in post-conflict situations long after the conflict has ended.

This report also highlights that in certain states and territories, like Cambodia, the number of casualties due to AVM incidents has proportionally grown compared to the impact of other mines and ERW.

For the second year in a row, the joint research by the GICHD and SIPRI sheds light on an often-neglected humanitarian and developmental issue. AVM incident data remain incomplete and their longer-term consistency and reliability continue to be a challenge, particularly in conflict settings. As a consequence, actual figures on AVM incidents and AVM-related casualties are expected to be higher than in the findings of this report. Long-term and regular data collection is needed in order to identify trends, support further analysis on the humanitarian and developmental impact of AVMs and contribute to informed and evidence-based political discussions.

## ANNEX 1: RESEARCH METHODOLOGY

### Research methodology

This research draws on data from states, typically national mine action authorities/centres, as well as from mine action and other humanitarian organisations. These reports were complemented by media reviews conducted in Arabic, English, French, Portuguese, Russian, Spanish and Urdu. Press articles were included, either because an incident was specially identified as AVM-related, or because an incident corresponded to a set of criteria that strongly indicated an AVM-related incident. These included incidents such as those on roads outside of a city involving a vehicle, but excluding remotely-detonated bombs, and causing multiple casualties. In cases where the criteria strongly suggested an AVM-related incident, the incident is referred to as a suspected AVM incident. In some instances, mine action authorities and organisations were able to assess the relevance and accuracy of retrieved press articles.

Incidents with an unknown number of casualties were categorised as incidents that resulted in casualties, but without specifying any absolute number. For incidents referring to a minimum number of casualties (“at least [number] casualties”), this minimum number was retained in this research. Furthermore, unless clearly attributed in the source, the vehicle category for incidents involving other combatants was defined as “unknown”.

This report provides an estimate of recorded AVM incidents and casualties in 2016, but due to the various methodological challenges below, actual figures are expected to be higher.

### Data collection challenges

Data reported by states and organisations remain insufficient for a number of reasons. In some instances, states with suspected AVM incidents do not release any information at all. In other cases, data remain incomplete due to the inability of the national mine action authority or organisations to access certain areas of the territory. This is at least a challenge in current conflict areas where data collection and verification are particularly difficult. The nature of these weapons, and the fact that AVM incidents often take place in rural areas, also make their reporting challenging, specifically regarding the exact location of incidents.

Reports from states and organisations generally provide much more accurate and disaggregated information than media reports. Since the disaggregation of data is, to a large extent, dependent on reports from states and organisations, data collection becomes sensitive to the inactivity or closure of programmes due to a lack of funding or to security concerns. This may, therefore, impact the ability to access detailed data from

certain areas and analyse differences across years. The GICHD and SIPRI are continuously engaging with new actors in country, specifically in conflict areas, in order to ensure the most complete and long-term data availability.

Disaggregation of collected data on the type of device also proved to be a challenging task. It is often difficult to identify an AVM after detonation, in particular if specific circumstances, resources and the security situation do not allow a proper investigation to take place. In 2016:

- 53 incidents (29 per cent) were categorised as confirmed AVM incidents with an identified or likely mine type;
- 43 incidents (24 per cent) were categorised as confirmed AVM incidents with an unknown device type;
- 85 incidents (47 per cent) were categorised as suspected AVM incidents.

An increased ratio of suspected AVM incidents compared to 2015, when 30 per cent of incidents were suspected to be related to AVMs, can be noted due, in part, to higher reliance on press articles in 2016.

Collecting disaggregated data on the sex and age of casualties remains a challenge. In 2016, it was only possible to disaggregate by sex in 45 per cent and by age in 36 per cent of casualties. Sex-disaggregated data were available in 66 per cent of the field reports while only 30 per cent of the press articles provided this information.

Finally, IEDs may function as AVMs.<sup>32</sup> AVMs can also be used as energetic charges of IEDs. This report is focused on industrial AVMs used in a conventional manner. Vehicle-activated IEDs are therefore excluded from these data.

## ANNEX 2: NOTES AND REFERENCES

- 1 In this report, AVMs are defined as landmines designed to detonate by the presence, proximity or contact of a vehicle. It covers a wide range of vehicles that operate on land including tanks. AVMs are also commonly known as anti-tank mines as well as mines other than anti-personnel mines.
- 2 Casualties refer to individuals who were physically injured and/or killed.
- 3 SIPRI and GICHD (2014), *The Humanitarian and Developmental Impact of Anti-Vehicle Mines*.
- 4 The GICHD-SIPRI interactive maps are available at <<http://www.gichd.org/avm>> (accessed: 22 February 2017).
- 5 SIPRI and GICHD (2016), *Global Mapping and Analysis of Anti-Vehicle Mine Incidents in 2015*.
- 6 Figures in this report are subject to rounding up/down.
- 7 The definition of territory rests on the United Nations definition of Non-Self-Governing Territories.
- 8 SIPRI and GICHD (2016), *Global Mapping and Analysis of Anti-Vehicle Mine Incidents in 2015*, p. 8.
- 9 The Landmine Monitor publishes data on anti-vehicle mine casualties every year. It recorded 468 casualties in 18 states and other areas in 2015, 218 casualties in 17 states and other areas in 2014 and 212 casualties in 13 states and other areas in 2013. See International Campaign to Ban Landmines (2016), *Landmine Monitor 2016*, p. 51; International Campaign to Ban Landmines (2015), *Landmine Monitor 2015*, p. 28; International Campaign to Ban Landmines (2014), *Landmine Monitor 2014*, p. 36. Note: Due to the GICHD and SIPRI undertaking a more focused and disaggregated data collection on AVM incidents, comparison with Landmine Monitor data might only be possible to a limited extent.
- 10 In this report, the definition of conflict setting is based on the Uppsala Conflict Data Program (UCDP). The UCDP defines conflict as “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in a calendar year” (see for instance Wallensteen Peter and Sollenberg Margareta (2001), “Armed Conflict 1989–2000”, *Journal of Peace Research* 38(5), pp. 629–644). Due to the absence of UCDP data for 2016 at the time of writing the present report, the GICHD and SIPRI defined a conflict setting in 2016 based on whether there were more than 25 battle-related deaths in 2015 according to the UCDP. Using this proxy definition for 2016, 15 states/territories were considered to be in a conflict setting (Afghanistan, Azerbaijan, Chad, Egypt, India, Lebanon, Mali, Nigeria, Pakistan, Somalia, South Sudan, Syria, Ukraine, Western Sahara, Yemen) and seven to be in a post-conflict phase (Angola, Cambodia, Iran, Israel, Rwanda, South Korea, Tunisia). Although Western Sahara was missing in the UCDP dataset that covers countries only, it was included in the list of states/territories in a conflict setting in this report. The UCDP data are available at <<http://ucdp.uu.se/downloads/>> (accessed: 28 February 2017). For more details on definitions, see UCDP/PRIO (2016), *Armed Conflict Dataset Codebook*, Version 4-2016, at <<http://ucdp.uu.se/downloads/ucdpprio/ucdp-prio-acd-4-2016.pdf>> (accessed: 28 February 2017).
- 11 All maps in this report are for illustrative purposes and do not imply the expression of any opinion on the part of the GICHD/SIPRI concerning the legal status of any state or territory, or concerning the delimitation of frontiers or boundaries. In addition, some incidents might appear as one in country maps due to their geographical proximity and the scale of the maps.
- 12 The number of anti-personnel mine casualties also increased from 13 in 2015 to 26 in 2016. See Landmine Monitor (2017), *Cambodia Country Profile. Casualties and Victim Assistance*,



page updated as of 27 January 2017, at <<http://the-monitor.org/en-gb/reports/2016/cambodia/casualties-and-victim-assistance.aspx#ftnref3>> (accessed: 15 March 2017); e-Mail from Monoketya Nguon, Deputy Director Socio-Economic Planning and Database Management, Cambodian Mine Action and Victim Assistance Authority, 9 March 2017.

- 13 For a recent article on the impact of landmines in the Korean DMZ, see for instance Kim Eleana J. (2016), "Toward an Anthropology of Landmines: Rogue Infrastructure and Military Waste in the Korean DMZ", *Cultural Anthropology*, vol. 31, issue 2, pp. 162–187.
- 14 See United Nations Peacemaker, *Agreement Concerning a Military Armistice in Korea*, at <<http://peacemaker.un.org/koreadprk-militaryarmistice53>> (accessed: 15 March 2017).
- 15 DMZ is the place formed by the Armistice Agreement that establishes that both Koreas should retreat 2 km from the border. The area is not a place for residence or business and civilians are prohibited from entering. CCZ is the area which extends 4 -10 km south of the border line, whose initial purpose was to restrict civilian access. Over the years, some villages have now been built and residents have settled there.
- 16 Mines Advisory Group, Norwegian People's Aid and The HALO Trust (2016), *Clearing the Mines 2016. A report by Mine Action Review for the Fifteenth Meeting of States Parties to the Anti-Personnel Mine Ban Convention*, p. 302.
- 17 Park Kyung-nam (2015), "Area around the DMZ still strewn with 600,000 dangerous landmines", *The Hankyoreh*, 21 July 2015, at <[http://english.hani.co.kr/arti/english\\_edition/e\\_national/701145.html](http://english.hani.co.kr/arti/english_edition/e_national/701145.html)> (accessed: 15 March 2017).
- 18 Yonhap News Agency, [*Anti-Vehicle Mine Exploded in the Construction Site in Cheorwon. A Worker Died*], 30 November 2016, Translation from Korean, at <<http://www.yonhapnews.co.kr/bulletin/2016/11/30/0200000000AKR20161130158052062.HTML?input=1195m>> (accessed: 15 March 2017).
- 19 The term 'national security forces' refers to national military, police and border guard personnel.
- 20 The term 'international security forces' refers to international armed forces who are present in a conflict outside the mandate of a peacekeeping mission.
- 21 Due to rounding up/down, percentages of this breakdown figure may exceed 100 per cent.
- 22 Landmine Monitor (2016), *Ukraine Country Profile. Mine Action*, page updated as of 14 November 2016, at <<http://www.the-monitor.org/en-gb/reports/2016/ukraine/mine-action.aspx>> (accessed: 15 March 2017).
- 23 Ibid.
- 24 Representatives of Ukraine, the Russian Federation, the Donetsk People's Republic and the Lugansk People's Republic signed the Minsk Agreements aimed to stop the conflict in the Donbass region. It was signed on 5 September 2014 and followed, in February 2015, by a package of measures for the implementation of the Minsk Agreements (known as Minsk II). See for instance Organization for Security and Co-operation in Europe, "OSCE Chairperson-in-Office gives full backing to Minsk package", 12 February 2015, at <<http://www.osce.org/cio/140196>> (accessed: 20 March 2017).
- 25 See for instance Organization for Security and Co-operation in Europe, "Latest from the OSCE Special Monitoring Mission to Ukraine (SMM), based on information received as of 19:30, 17 March 2017", 18 March 2017, at <<http://www.osce.org/special-monitoring-mission-to-ukraine/306076>> (accessed: 20 March 2017).

- 26 In this report, the definition of children is based on article 1 of the Convention on the Rights of the Child whereby children are considered to be persons below the age of eighteen years. See Convention on the Rights of the Child, 1577 UNTS 27531.
- 27 SIPRI and GICHD (2016), *Global Mapping and Analysis of Anti-Vehicle Mine Incidents in 2015*, p.11.
- 28 E-Mail from Abdul Qudos Ziaee, Operations R&D Manager, UNMAS Afghanistan, 22 January 2017.
- 29 Landmine Monitor (2015), *Iran Country Profile. Mine Action, page updated as of 29 November 2015*, at <<http://the-monitor.org/en-gb/reports/2015/iran/mine-action.aspx>> (accessed: 15 March 2017).
- 30 Ibid.
- 31 Islamic Republic News Agency (IRNA), [*Clearance of mine-affected areas will be completed this year/Iran is ready to export its mine action services*], 28 March 2012, Translation from Persian, at <<http://www.irna.ir/fa/News/128025/>> (accessed: 22 March 2017).
- 32 There is no universally accepted definition of an IED. However, NATO for instance defines an IED as “a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic or incendiary chemicals and designed to destroy, incapacitate, harass or distract. It may incorporate military stores, but is normally devised from non-military components”. See NATO (2010), *Glossary of Terms and Definitions*, NATO document AAP-6(2010), p. 2-I-2.



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