



## Technical Briefing Note

### Use of Cluster Munitions in Syria

April 4, 2014

The Syrian government's extensive use of cluster munitions has caused numerous casualties, damaged infrastructure, and is resulting in a deadly legacy of explosive remnants of war that will pose dangers to civilians for years to come. Human Rights Watch has identified at least 224 locations in 10 of Syria's 14 governorates where cluster munitions have been used between July 2012 and March 2014. At least six types of cluster munitions and seven types of explosive submunitions have been used in the conflict to date.

Syria is not a party to the 2008 Convention on Cluster Munitions, but its cluster munition use has attracted widespread media coverage, public outcry, and condemnations from approximately 130 countries.

This Technical Briefing Note looks at the chronology, locations, and types of cluster munitions used in Syria.

### Methodology

Since 2012, Human Rights Watch has systematically researched, recorded, and documented the use of cluster munitions in Syria. It has reviewed evidence from a number of sources, including:

- More than 500 videos and images posted by local activists on social media websites such as YouTube and Facebook, assembled and categorized with the assistance of Elliot Higgins of the Brown Moses Blog;
- Witness accounts collected by Human Rights Watch researchers regarding casualties and humanitarian impact;
- Reports and blog posts by journalists, local NGOs, and other collaborators.<sup>1</sup>

For each video, or group of videos documenting the same attack, Human Rights Watch attempted to identify the type of cluster munition and explosive submunition used, and its method of

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<sup>1</sup> See for example, Syrian Network for Human Rights, "Victims of Cluster Munitions in Syria," 2 February 2014, [http://sn4hr.org/public\\_html/wp-content/pdf/english/cluster%20bombs%20english.pdf](http://sn4hr.org/public_html/wp-content/pdf/english/cluster%20bombs%20english.pdf).

delivery—by aircraft, including helicopters, or surface-to-surface rockets. This analysis provides an indication of the scale of cluster munition use, but the data is incomplete as not all remnants are likely to have been recorded on video and the actual number of cluster munitions used in Syria is most probably much higher.

## Chronology of cluster munition use since 2012

The first indications that Syrian government forces were using cluster munitions emerged in July 2012 with reports of air-dropped cluster bombs being used in Jabal Shahshabu, a mountainous area near Hama. Further cluster munition use by government forces increased especially during a wave of air strikes that began in October 2012. Evidence of the continued use of cluster munition persists to date, including the use of more recently manufactured and modern cluster munition types, such as submunitions with self-destruct mechanisms. The date and location of the earliest appearance of each submunition type and the type of cluster munition used to deliver them is detailed in the following timeline.

**Timeline of first documented appearance of cluster munition types in Syria**

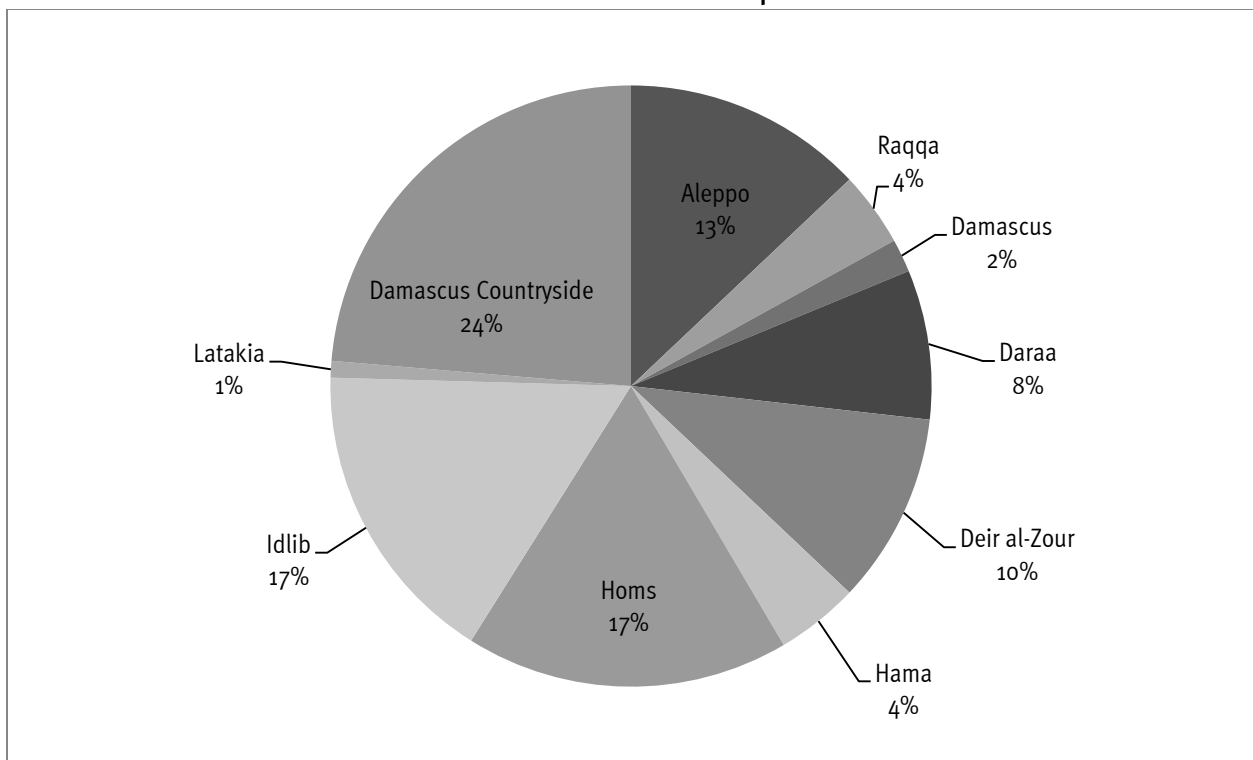
Date	Location	Cluster Munition	Submunition Type
July 2012	Jabal Shahshabu, Hama	RBK-250-275 AO-1SCh bomb	AO-1SCh fragmentation
August 2012	Talbiseh, Homs & Abu Kamal, Deir al-Zour	RBK-250 PTAB-2.5M bomb	PTAB-2.5M high explosive/anti-tank
December 2012	Jabal al-Zaweya, Idlib & Latamneh, Hama	SAKR 122mm rocket	M77-type DPICM
March 2013	Heish, Idlib	RBK-500 ShOAB-0.5 bomb	ShOAB-0.5 fragmentation
May 2013	Unclear	Not known	PTAB-2.5KO high explosive/anti-tank
June 2013	Harbnafeh, Hama	Not known	AO-2.5RT fragmentation
February 2014	Keferzita, Hama	9M55K 300mm rocket	9N235 fragmentation
February 2014	Namar, Daraa	9M27K-series 220mm rocket	Not determined

## Locations of cluster munition use

As of March 2014, cluster munition strikes have been identified at 224 locations in 10 of 14 of Syria's governorates. Another 34 strike locations have been documented but it is not possible to discern if they are unique strikes or different views of already documented strikes.

At least seven types of explosive submunitions have been identified.<sup>2</sup> These originate from at least three different types of air-dropped bombs and three different surface-to-surface rocket systems.<sup>3</sup> The geographic distribution of the 224 identified cluster munition strikes sorted by governorate is illustrated in the following chart.

Identified Cluster Munition Strikes per Governorate



<sup>2</sup> Additionally, ZAB incendiary submunitions delivered by RBK bombs have been used by government forces. However, this type is not accounted for in this briefing note since this type is not considered to be an explosive submunition since the ZAB submunitions ignite after release from its container instead of detonating on, before, or after impact. These weapons are not listed in this Technical Briefing Note as they are not covered by the Convention on Cluster Munitions. For further information on Syria's use of incendiary weapons, see: [http://www.hrw.org/sites/default/files/related\\_material/Arms\\_SyriaIncendiary\\_Nov13\\_Final\\_o.pdf](http://www.hrw.org/sites/default/files/related_material/Arms_SyriaIncendiary_Nov13_Final_o.pdf).

<sup>3</sup> For two of the types of air-delivered submunitions it is not possible to ascertain what type of delivery system was used since evidence of the canister that dispersed them is not available. Also, the type of submunition delivered by one surface-to-surface rocket system has not been identified.

## Types of cluster munitions used in Syria

For over 100 of the 224 documented strike locations it is possible to identify the cluster munition and submunition type used. In the other cases, remnants of cluster munitions were present, but it was not possible to identify the specific type used. Nonetheless, the most frequently-seen cluster munition remnant in these latter cases was the tail unit of the RBK-250 series bomb, a component common to the cluster bombs containing PTAB-2.5M and AO-1SCh submunitions.

Some of the identified submunitions have been used in multiple locations as summarized in the following table and in further detail in Appendix 1.

**Geographic Distribution of Unexploded Submunitions**

Submunition Type	Frequency, by Governorate
PTAB-2.5M	47 locations in 9 governorates
AO-1SCh	39 locations in 10 governorates
AO-2.5RT	5 locations in 3 governorates
ShOAB-0.5	4 locations in 3 governorates
9M27K rocket (submunition type unknown)	3 locations in 1 governorate
9N235	1 location in 1 governorate

The origins and ages of the cluster munitions and explosive submunitions used in Syria are diverse. It is not known how or when Syria acquired its stockpile of cluster munitions.

- A review of the markings on the RBK series bombs and the AO-1SCh, PTAB-2.5M, and ShOAB-0.5 submunitions contained inside them, as well as a comparison with the Soviet manuals for the weapons, show that they were manufactured in the 1970s and early 1980s at Soviet state munitions factories.
- The method of delivering AO-2.5RT and PTAB-2.5KO submunitions is not known since remnants of a delivery system have not been documented. Both are capable of being loaded into BKF cartridges, which are subsequently dispersed by KMG-U dispensers. Additionally, the AO-2.5RT submunition can be delivered by a 500-kilogram sized RBK series cluster bomb. Both systems were developed, produced and deployed by the Soviet Union in the 1980s.
- The 122mm SAKR cluster munition rockets containing DPICM submunitions bear the markings of the Egyptian state-owned Arab Organization for Industrialization and an Egyptian company called Sakr Factory for Development Industries. It is not known if the

122mm rockets are SAKR-18 or SAKR-36 variants, which contain 72 and 98 submunitions respectively.

- The 9M55K 330mm cluster munition rocket was designed and initially manufactured by the Soviet Union in the late 1980s and then manufactured and exported by the Russian Federal State Unitary Enterprise “SPLAV State Research And Production Association” from 1991 onward.
- The sections of the cargo-carrying payload portion of 9M27K 220mm rockets have also been documented in the remnants of attacks indicating yet another delivery system has been used. However, there is no evidence of the submunition type which the system is capable of delivering, including antipersonnel fragmentation submunitions.

## Responses to cluster munition use in Syria

The Syrian military initially denied possessing or using cluster munitions, but no longer appears to respond to reports of its use of the weapons.<sup>4</sup> Syria is not a party to the 2008 Convention on Cluster Munitions, but its cluster munition use has attracted widespread media coverage, public outcry, and condemnations from approximately 130 countries.<sup>5</sup>

It does not appear that cluster munitions have been used by opposition rebel groups, but there is some evidence of unexploded submunitions being used as improvised explosive devices (IEDs) by some rebel groups.<sup>6</sup>

## For more information, see:

This Technical Briefing Note does not detail casualties from cluster munition use in Syria as it is only a partial general survey based on limited access and sources, but Human Rights Watch has documented cluster munition casualties in numerous statements issued on the use of cluster munitions in Syria, including:

- “Syria: New Deadly Cluster Munition Attacks,” February 19, 2014.  
<http://www.hrw.org/news/2014/02/18/syria-new-deadly-cluster-munition-attacks>
- “Cluster Munitions: Nations Condemn Syrian Use,” September 13, 2013.  
<http://www.hrw.org/news/2013/09/13/cluster-munitions-nations-condemn-syrian-use>

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<sup>4</sup> According to the state-run Syrian Arab News Agency (SANA), “the General Command of the Army and the Armed Forces stressed on [15 October 2012] that the misleading media outlets have recently published untrue news claiming the Syrian Arab Army has been using cluster bombs against terrorists.” According to SANA, “the General Command said the Syrian Army does not possess such bombs.” “Syria denies using cluster bombs,” *CNN*, October, 16 2012, [www.edition.cnn.com/2012/10/15/world/meast/syria-civil-war/index.html](http://www.edition.cnn.com/2012/10/15/world/meast/syria-civil-war/index.html).

<sup>5</sup> See: Cluster Munition Coalition, Syria web page: <http://www.stopclustermunitions.org/syria/>.

<sup>6</sup> This video uploaded to YouTube on March 26 of arms captured by government forces from rebel groups shows submunitions prepared for use as IEDs: <http://youtu.be/UTwbnoRQodc>.

- “Cluster Munitions: Syria Use Persists,” September 4, 2013.  
<http://www.hrw.org/news/2013/09/04/cluster-munitions-syria-use-persists>
- “Syria: New Air, Missile Strikes Kill Civilians,” April 26, 2013.  
<http://www.hrw.org/news/2013/04/26/syria-new-air-missile-strikes-kill-civilians>
- “Syria: Aerial Attacks Strike Civilians,” April 10, 2013.  
<http://www.hrw.org/news/2013/04/10/syria-aerial-attacks-strike-civilians>
- “Syria: Mounting Casualties from Cluster Munitions,” March 16, 2013.  
<http://www.hrw.org/news/2013/03/16/syria-mounting-casualties-cluster-munitions>
- “Syria: Army Using New Type of Cluster Munition,” January 14, 2013.  
<http://www.hrw.org/news/2013/01/14/syria-army-using-new-type-cluster-munition>
- “Syria: Evidence Shows Cluster Bombs Killed Children,” November 27, 2012.  
<http://www.hrw.org/news/2012/11/27/syria-evidence-shows-cluster-bombs-killed-children-o>
- “Syria: Despite Denials, More Cluster Bomb Attacks,” October 23, 2012.  
<http://www.hrw.org/news/2012/10/23/syria-despite-denials-more-cluster-bomb-attacks>
- “Syria: New Evidence Military Dropped Cluster Bombs,” October 14, 2012.  
<http://www.hrw.org/news/2012/10/14/syria-new-evidence-military-dropped-cluster-bombs>
- “Syria: Evidence of Cluster Munitions Use by Syrian Forces,” July 12, 2012.  
<http://www.hrw.org/news/2012/07/12/syria-evidence-cluster-munitions-use-syrian-forces>

## Appendix 1: Locations of Identified Cluster Munition Strikes, by Submunition and Governorate

This listing shows the locations in each governorate where unexploded submunitions have been identified, sometime one more than one occasion.

### PTAB-2.5M

#### Aleppo

Al-Bab (2)  
Azaz  
Mar'a (2)  
Mar'anaz  
Meng (2)  
Sawran  
Sheikh Saeed  
Sukkari  
Tel Rifaat  
Hanano  
Marjeh

#### Raqqa

Al-Tabqah

#### Daraa

Bosra  
Naseeb

#### Deir al-Zour

Abu Kamal (2)  
Al-Mara'iyah (2)  
Al-Mayadin (2)  
As-Shaheel  
Deir al-Zour (2)  
Mohassan

#### Hama

Ltamenah

#### Homs

Abil  
Al-Farhanah, Talbiseh  
Al-Ghantoo  
Rastan (2)  
Az-Zafaraneah, Rastan  
(3)  
Eastern Bouwayda  
Al-Qusayr  
Talbiseh (2)

#### Idlib

Armanaz (2)  
Binnish  
Kafar Ruma  
Kafar Takharim  
Ketian  
Maarrat an-Numan (2)  
Ma'arrat Misrin  
Sarmin (2)  
Talmenes  
Ma'arrat Misrin

#### Latakia

Jabal al-Akrad

#### Damascus Countryside

Daraya (2)  
Douma (2)  
Eastern Ghouta (3)  
Hamouriah (4)  
Kafar Batna (2)  
Yelda  
Madyara

### AO-1SCh

#### Aleppo

Tariq al-Bab  
Urm Al-Kubra  
Hanano

#### Marjeh

#### Raqqa

Raqqa (2)

#### Tuwayzan

#### Damascus

Al-Asali

Al-Mathniah  
Al-Qadam

Hama  
Kafar An Baudah (2)

Kafar Takharim  
Maarrat an-Numan (3)  
Taftanaz  
Talmenes  
Ma'arrat Misrin

Daraa

Gharriyya al-Gharbiyeh  
Ma'rabat  
Naemeh

Homs

Abil  
Rastan (2)  
As-Salloumia  
Eastern Bouwayda  
Al-Qusayr  
Talbiseh

Damascus Countryside

Dayr al-Asafir (2)  
Douma  
Eastern Ghouta (2)  
Hamouriah  
Moadamiyah  
Madyara

Deir al-Zour

Abu Kamal  
Ad-Duweir  
Al-Mara'iyah (2)  
Deir al-Zour  
Mohassan  
Al-Mayadin

Idlib

Armanaz  
At-Tamanah, Maarrat  
an-Numan  
Isqaat

AO-2.5RT

Daraa

Tafas

Hama

Harbinafsah

Homs

Aqaribat  
Rastan  
Talbiseh

ShOAB-0.5

Aleppo

Kuweriss military  
airport

Homs

Dar al-Kebira

Abu ad-Dahur

Haysh

Idlib

9N235

Hama

Kafar Zitna

9M27K-series

Daraa



Naemeh  
Namar  
Taseel

## Unknown Submunition Type

### Aleppo

80th Army Brigade  
Base  
Aleppo Airport  
Al-Maysar  
As-Safeera (3)  
Bani Zeid  
Dara Aza  
Jirah Airbase  
Khan Al-Assal  
Madrasa al-Masha  
Tel Rifaat (2)

### Raqqa

At-Tabqah (2)  
Raqqqa (3)

### Damascus

Al-Asali

### Daraa

Abbasid  
Al-Gharya as-Sharqiyeh  
Busr al-Harir (2)  
Gharriyya al-Gharbiyeh  
(2)  
Jizzah  
Khirbet Ghazaleh  
Taiba

### Deir al-Zour

Abu Kamal  
Al-Mara'iyah (2)  
Deir al-Zour  
Deir al-Zour Airport (2)  
Kabbajb

### Hama

Kafar An Baudah (2)  
Kafar Zitna  
Kernaz  
Qal'at al-Madiq

### Homs

Abil (4)  
Az-Zafaraneah, ar-  
Rastan (3)  
Eastern Bouwayda (5)  
Hay ar-Rabia al-Arabii  
Houla  
Jobar (2)  
Az-Zara

### Idlib

Armanaz  
Binnish (2)  
Haysh  
Idlib

### Isqaat

Jisr as-Sugur  
Ma'arr Shamshah  
Martyr's Brigade  
Qrsaaa  
Salkeen  
Shelekh  
Taftanaz (2)







### Latakia






Rabiyah


### Damascus Countryside

Ain Terma  
Al-Bahariyah  
Babbila  
Daraya (2)  
Dayr al-Asafir (2)  
Douma (2)  
Erbeen (5)  
Hamouriah (3)  
Harasta (2)  
Harran al-'Awamid  
Jesreen  
Jobar  
Moadamiyah  
Maliha (3)  
Mesraba (2)  
Yabroud

## Appendix 2: Types of Explosive Submunitions and Cluster Munitions in Syria

Submunition Type	Submunition Image	Cluster Munition Remnant Image	Notes
AO-1SCh delivered by RBK-250-275 bomb			<ul style="list-style-type: none"> <li>• Antipersonnel fragmentation</li> <li>• 150 submunitions per bomb</li> <li>• Fuze: AMA, AMB</li> <li>• 51 grams explosive weight</li> </ul>
	© 2012 Private	© 2013 Human Rights Watch	
PTAB-2.5M delivered by RBK250-bomb			<ul style="list-style-type: none"> <li>• High explosive/anti-tank</li> <li>• 30 submunitions per bomb</li> <li>• Fuze: AVM-524M</li> <li>• 454 grams explosive weight</li> </ul>
	© 2012 Private	© 2013 Human Rights Watch	
DPICM delivered by 122mm SAKR rocket			<ul style="list-style-type: none"> <li>• Dual purpose: high-explosive anti-tank and fragmentation</li> <li>• 72 or 98 submunition per rocket, depending on type</li> <li>• Submunition thought to be a copy of the US M77 DPICM</li> </ul>
	© 2013 Nicole Tung	© 2013 Nicole Tung	

Submunition Type	Submunition Image	Cluster Munition Remnant Image	Notes
AO-2.5RT		None Available	<ul style="list-style-type: none"> <li>• Antipersonnel fragmentation</li> <li>• 108 submunitions per bomb, paired in 54 assemblies or up to 96 per KMG-U dispenser</li> <li>• Fuze: Impact</li> <li>• 525 grams explosive weight</li> </ul>
	© 2012 Private		
ShOAB-2.5 presumably delivered by RBK-500 ShOAB-2.5 bomb		None Available	<ul style="list-style-type: none"> <li>• Antipersonnel fragmentation</li> <li>• 565 submunitions per bomb</li> </ul>
	© 2012 Private		
PTAB-2.5Ko		None Available	<ul style="list-style-type: none"> <li>• Dual purpose: high-explosive anti-tank and fragmentation</li> <li>• Up to 96 per KMG-U dispenser</li> <li>• Fuze: Impact and 7-10 second self-destruct</li> </ul>
	© 2012 Private		
9N235 delivered by 9M55K 300mm rocket			<ul style="list-style-type: none"> <li>• Antipersonnel fragmentation</li> <li>• 72 submunitions per rocket</li> <li>• Fuze: Impact and 120 second self-destruct</li> <li>• 272 grams explosive weight</li> </ul>
	© 2014 Private	© 2014 Brown Moses Blog	

Submunition Type	Submunition Image	Cluster Munition Remnant Image	Notes
Undocumented submunitions 9M27K-series 220mm rocket	None Available		<ul style="list-style-type: none"> <li>To date, only remnants of 220mm rockets have been documented. The type of submunition delivered by it is not known.</li> </ul>
		© 2014 Private	

Sources for Appendix 2:

Armament Research Services (ARES), “The Hoplite,”  
<http://www.armamentresearch.com/hoplite/>.

“Collective Awareness to UXO,” <http://www.cat-uxo.com/#/submunitions/4572070374>.

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US Department of Defense, “Afghanistan Ordnance Identification Guide,”  
<http://www.jmu.edu/cisr/pages/research/afghanistan-oig/afghan-oig.shtml>.

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<http://www.jmu.edu/cisr/pages/research/iraq-oig/iraq-oig.shtml>.