

Cluster munitions in Kosovo

Analysis of use, contamination and casualties



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Cover: NATO image of the location of two strikes, each utilising 4 RBL755 cluster munitions (a total of 1,176 submunitions), against artillery positions. The lower strike can be seen to overlap with the village of Sojevo.

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Contents

Executive summary	2
1.0 Introduction	5
2.0 Targeting and military impact of cluster munitions	9
3.0 Other issues of cluster munition use	28
4.0 Civilian harm at the time of attacks	31
5.0 Post conflict contamination	36
6.0 Post-conflict civilian harm	46
7.0 ‘Individual risk’ by generic munition type	55
8.0 Lessons learned?	58
Annex A: Human Rights Watch (HRW) data on civilian casualties from cluster munitions in Kosovo	61
Endnotes	65

Executive summary

This report provides a detailed analysis of the use of cluster munitions in Kosovo, the unexploded ordnance (UXO) contamination that resulted and the civilian casualties that were caused. It draws upon three sources of primary data:

- NATO data provided to UNMIK on bombing missions in Operation Allied Force;
- An analysis of cluster munition clearance records contained in the Kosovo Information Management System for Mine Action (IMSMA);
- The UN database of landmine and ordnance casualties.

The report also provides a structured analysis of key secondary sources.

The report uses these data sets to examine the claims and counterclaims of humanitarian organisations and of user governments. It also looks at how key governments responded to lessons learned from cluster munition use and impact in Kosovo.

The analysis suggests that cluster munitions performed poorly in a role that had limited strategic significance for the outcome of the conflict. Furthermore, they probably resulted in more than 227 non-combatant deaths and injuries within Kosovo alone, drained directly more than \$30 million in post-conflict humanitarian funds, and were a focus of public dissatisfaction with the conduct of Operation Allied Force. Cluster munition contamination remains in the province more than seven years after the bombing.

Targeting:

More than 234,123 submunitions were dropped across Kosovo. Political and military officials presented the use of cluster munitions as being against a narrow set of targets only in very specific circumstances. NATO bombing records suggest that they were a weapon of convenience used against a wide range of static and mobile targets.

More than 8,345 submunitions were dumped without being aimed at any clear target.

Military impact:

The majority of cluster munitions were used against mobile fielded forces in Kosovo. Analysts have suggested that attacks on these targets had little impact at a strategic level.

Data on mobile target hits in Kosovo is disputed. However, an analysis of damage assessments in the bombing data released by NATO relating to cluster strikes on mobile targets in Kosovo finds only 75 out of 269 missions positively claiming some degree of damage to the target.

Little correlation can be seen between the pattern of cluster munition use throughout the conflict and the progress of mobile hits reported by NATO.

Casualties at the time of use:

Human Rights Watch has documented more than 75 deaths and injuries during the bombing campaign in Kosovo that were likely to have occurred in incidents involving cluster munitions. The total sample of possible casualties is 355.

The reasons for these incidents (as they are reported) included errors in targeting, inaccuracy of delivery and the wide-area effects of the munitions. Of these, errors in targeting are recognised as problems not specifically relating to the type of munition used.

Although a number of sources have reported that cluster munition use was suspended during the bombing campaign due to concerns about accuracy, NATO bombing records show cluster munition use continuing throughout.

Data released by NATO provides an indication of the expected inaccuracy and wide area affect of these weapons. Whilst the theoretical average area of a strike with CBU87 cluster munitions was 13,712 m² this rises to 133,405 m² when “additional errors associated with weapon delivery by aircraft” are taken into account. This larger figure is very similar to the average area of cluster strike clearance tasks (142,080 m²) in 217 clearance records analysed for this report.

Post-conflict contamination:

Political and military leaders asserted that in their propensity to suffer some degree of failure, and therefore to cause some level of post-conflict contamination, cluster munitions and unitary munitions were essentially the same. These assertions were false.

From an analysis of 217 clearance survey reports relating to tasks addressing cluster munitions contamination we find the following:

- An average of 34 unexploded submunitions cleared per task.
- Average area cleared per site: 142,080 m²
- Average area cleared per submunition: 4,179 m²
- Average time worked per submunition found was 18 hours.

A substantial proportion of cluster munition contamination was found below the ground rather than on the surface.

A range of estimates have been made for the failure rate of cluster munitions in Kosovo. Without better data it is not possible to draw definitive conclusions about failure rates.

Post-conflict casualties:

Cluster munitions have caused at least 152 post-conflict casualties to date. Most of these casualties occurred in the few months immediately after the bombing.

- 84% of unexploded ordnance casualties were caused by submunitions in the first 31 months after the conflict.
- There were an average of 2.4 casualties per incident.
- 32% of cluster munition casualties were killed and 68% injured – this compares with less than 8% killed for anti-personnel mines.
- Some 97% of cluster munition casualties were male.
- The average age of cluster munition casualties was 20 years old. Some 67% of casualties were 19 or younger.

The impact of cluster munitions in Kosovo was reduced by one of the largest humanitarian operations ever undertaken, including one of the best resourced mine action projects ever mounted. Despite this, areas of cluster munition contamination remain to be cleared in Kosovo more than seven years after the conflict.

Individual unexploded submunitions presented much the same level of risk to the post-conflict population as individual anti-personnel mines. Individual submunitions presented a 600% greater risk than individual items of general unexploded ordnance – strongly suggesting that quantity of contamination is not the only factor that makes cluster munitions a particular threat to civilian populations.

More NATO service personnel were killed by unexploded NATO submunitions after the conflict than were killed by Serb forces during the war. No evidence has been presented that suggests that the use of cluster munitions directly saved the lives of NATO troops or air-crews.

Lessons learned?

After Operation Allied Force the U.K. and the U.S.A. went on to use 500,000 submunitions *of the same types* in Afghanistan and Iraq.

Despite the U.S. establishing a policy target of less than 1% failure rate for future submunitions, it has continued to use known unreliable submunitions in large numbers and stockpiles hundreds of millions more.

The U.K. has failed to undertake any substantive analysis of the impact of its cluster munition use or the reliability of its cluster munitions in combat. These issues raise serious questions about how the responsibility for human security is shared across nation state boundaries.

The UK retains for use submunitions that it has officially stated have an “unacceptably high” failure rate and that it says should be banned.

COMMON ACRONYMS	
BLU97	Combined-effects submunitions
CBU87	U.S. manufactured cluster bomb containing 202 BLU97 submunitions
CBU99	U.S. manufactured cluster bomb containing 247 Mk-118 submunitions
FRY	Federal Republic of Yugoslavia
GICHD	Geneva International Centre for Humanitarian Demining
HALO Trust	A U.K.-based humanitarian landmine clearance organisation
MAG	Mines Advisory Group – a U.K.-based humanitarian landmine clearance organisation
Mk-118	Anti-armour submunition
NATO	North Atlantic Treaty Organisation
RBL755	U.K. manufactured cluster bomb containing 147 submunitions. We also use the term RBL755 to refer to the submunitions of this cluster bomb.
U.K.	United Kingdom
U.S.	United States of America
UNDP	United Nations Development Programme
UNMACC	United Nations Mine Action Coordination Centre
UNMIK	United Nations Mission In Kosovo
VJ	Army of the Federal Republic of Yugoslavia

1.0 Introduction

This report provides a detailed analysis of the use of cluster munitions in Kosovo, the unexploded ordnance (UXO) contamination that resulted and the civilian casualties that were caused. These issues have been examined in the past but this report draws on sources of data that have not previously been subject to substantial scrutiny.

The terms of reference for this project proposed research on the following subjects

- Nature of cluster strike targets and military impact of their use;
- Extent and nature of post-conflict contamination;
- History of humanitarian impact – from time of use through to present day.

The primary sources of data for this report are:

- NATO bombing records for the use of cluster munitions in Kosovo during Operation Allied Force.
- An analysis of 217 Clearance Survey Reports derived from the Information Management System for Mine Action (IMSMA) relating to the clearance of cluster munition strike sites.
- Casualty data compiled by Human Rights Watch and the United Nations relating to cluster munition and other casualties during and after the conflict.

These sources of quantitative data are used as tools for analysing the competing claims of user-Governments and humanitarian organisations regarding the military utility and likely civilian impact of cluster munitions.

It is important to situate this report in relation to the history of concern regarding the humanitarian impact of cluster munitions. During the conflict in Kosovo, humanitarian and human rights organisations predicted that serious problems would arise from the use of these weapons and appealed for their use to stop. Such appeals are part of a history of disquiet over these weapons that includes proposals put forward by some states in 1974 and 1976 that cluster munitions (or certain types of cluster munition) be prohibited.² Nearly eight years after the conflict in Kosovo such appeals have intensified still further.

Subsequent to the conflict in Kosovo the U.S. and the U.K. went on to use approximately 500,000 submunitions of the same types, albeit sometimes in different munition configurations, during operations in Afghanistan and Iraq.³ Neither country has ruled out using these same munitions in the future. With this in mind the report concludes by assessing how lessons are learned from experiences such as Kosovo regarding the appropriate means and methods of conflict.

1.1 Background

The 1998-1999 internal conflict between the Kosovo Liberation Army (KLA) and the armed forces of the Federal Republic of Yugoslavia (FRY) precipitated a NATO bombing campaign (Operation Allied Force) that began on 24th March 1999 and ended 78 days later on 10th June. During this bombing campaign substantial numbers of cluster munitions were used by NATO aircraft.

Immediately after the cessation of the bombing ground troops of the NATO Kosovo Force (KFOR) entered the province and aid organizations followed. The UN established a Mine Action Coordination Centre in Kosovo tasked with reducing the level of threat posed by unexploded ordnance and landmines. Since the 1999 invasion, Kosovo has been administered by the UN through the UN Mission in Kosovo (UNMIK) and has been under NATO protection.

1.1.1 Humanitarian concern about cluster munitions in Kosovo

During and immediately after the conflict, Human Rights Watch warned that the use of cluster munitions created legal and humanitarian problems. In particular they highlighted the known unreliability of the cluster munitions being used by the U.S. and U.K.⁴ In June 1999, Human Rights Watch produced *Ticking Time Bombs: NATO's use of cluster munitions in Yugoslavia* which further summarised their concerns about the likely impact of unexploded submunitions.⁵ In February 2000 they produced an analysis of civilian deaths during the NATO air-campaign that also highlighted particular problems associated with cluster munitions at the time of attacks.⁶

High profile voices were raised in opposition to cluster munition use. Former U.S. president Jimmy Carter wrote in the *New York Times*:

“As the American-led force has expanded targets to inhabited areas and resorted to the use of anti-personnel cluster bombs, the result has been damage to hospitals, offices and residences of a half-dozen ambassadors, and the killing of hundreds of innocent civilians and an untold number of conscripted troops.”⁷

These broad lines of argument, that cluster munitions had an indiscriminate effect when used near populated areas and that they left a landmine-like legacy for the civilian population, precipitated questions in political fora as well as NATO press conferences. Such arguments were strongly rejected by political and military leaders at the time. Subsequent sections of this report look systematically at the arguments used to reject these concerns.

After the conflict other reports from humanitarian organisations raised further problems relating to the effects of these weapons. In particular they questioned the military utility of the weapons in this context and highlighted physical, social and economic harm that cluster munition use had caused and was continuing to cause to the civilian population in Kosovo.⁸

Partly in response to the issues raised in Kosovo, States Parties to the UN Convention on Certain Conventional Weapons agreed Protocol V on Explosive Remnants of War in 2003. This protocol of international law places certain requirements on states to address the post-conflict problems of unexploded and abandoned ordnance. However, humanitarian organisations and a number of states consistently maintained that this law was insufficient to tackle the excessive problems caused by cluster munitions.

In examining the specific technical issues that are the focus of this report we will occasionally return to the themes raised by these analyses, and by Government rebuttals of the humanitarian case, to ask what light the available evidence casts on how this argument was conducted.

1.1.2 Established concerns over the types of cluster munitions used

Most of the submunition types used in Operation Allied Force were relatively old and all of the types used had already been identified as likely to cause humanitarian problems. The key features of these submunitions, including some of the established history of humanitarian problems associated with each type, can be summarised as follows:

Submunition type	Mechanism of injury	History of humanitarian problems
BLU97	<p>Anti-armour shaped charge</p> <p>“Scores” of 30g fragments capable of “injuring personnel at 150m”</p> <p>Zirconium incendiary ring that breaks up “causing burning particles to saturate the target area.”⁹</p>	<p>Previously used in the Gulf War (1990-1991). High failure rates were observed and acknowledged in military planning. The Gulf War Air Power Survey produced by the U.S. Air Force noted: “... the preferred F-16 munition was the CBU87 combined-effects munition. But CENTAF’s restrictions on the use of this munition in the middle of the war – a sensible decision in view of the heavy fighting that might have occurred during the ground war – limited its employment as well.”¹⁰ The restrictions referred to here were to reduce the risk to U.S. forces encountering unexploded munitions on the ground.</p> <p>Reports on post-conflict civilian casualties are limited due to lack of data. Cluster munitions (as a whole) are reported to have been responsible for “most” of the 191 casualties incurred during the post-conflict ordnance clearance operation.¹¹ Seven U.S. troops were killed in a single incident whilst stacking unexploded BLU97s.¹²</p>
M118 “Rockeye”	<p>Anti-armour shaped charge.</p> <p>Secondary fragmentation.</p>	<p>Used in Vietnam, Lao, Cambodia and the Gulf War (1990-1991).</p> <p>Rockeyes used in the Gulf War experienced “an extremely high failure rate”¹³ The resulting problems of unexploded ordnance contamination were identified at the time.</p>
RBL755 ¹⁴	<p>Anti-armour shaped charge</p> <p>“2,000 fragments” penetrate personnel and soft-skinned vehicles</p> <p>Zirconium sponge produces an incendiary effect.¹⁵</p>	<p>Used by the U.K. in the Falklands in 1982. High failure rates reported by Royal Air Force and considered by manufacturers to result from use at too low an altitude. Argentinean troops reported to have used shovels to clear unexploded munitions from runways before destroying them.¹⁶ Based only on figures from U.K. forces’ clearance records (i.e. with munitions cleared by Argentinean forces assumed to have functioned despite evidence to the contrary) the failure rate was already over 9%.¹⁷</p> <p>After the use of BL755 by Serb forces in bombing a “safe area” of Bihac in November 1994 unexploded submunitions were reported in the area and a statement from the then U.K. Secretary of Defence notes that “although some sub-munitions of the cluster bombs exploded, available evidence suggests that neither of the two weapon types operated as designed.”¹⁸</p> <p>The Croatian delegation to the Convention on Conventional Weapons in 1995, after they had been bombed with BL755 by Serbian forces, note in a statement that although “93-95%” of the bomblets detonate in impact, the rest “can be actuated at a later stage by the presence of a person.”¹⁹</p>

The purpose of this summary is to note that the appeals of humanitarian organisations against the use of cluster munitions were founded on historical evidence – and that this same evidence was available to governments before they undertook to use these weapons in Kosovo and on such a large scale.

As we note during this analysis, the states that undertook to use these weapons generally rejected this historical experience. They responded instead that:

- cluster munitions were *necessary* because they met a very specific need and were thereby facilitating the most rapid departure of Serb forces from Kosovo (a net benefit to the civilian population;)
- with respect to post-conflict contamination, cluster munitions are essentially *the same* as other forms of ordnance.



Tail fins of a Mk-118 'Rockeye' submunition partially buried in the ground without exploding. (photo from UNMACC)

2.0 Targeting and military impact of cluster munitions

Political and military officials presented the use of cluster munitions as being against a narrow set of targets only in very specific circumstances. However, NATO bombing records suggest that they were a weapon of convenience used against a wide range of static and mobile targets.

The majority of cluster munitions were used against mobile fielded forces in Kosovo. Analysts have suggested that attacks on these targets had little impact at a strategic level.

Data on mobile target hits in Kosovo is disputed. However, an analysis of damage assessments in the bombing data released by NATO relating to cluster strikes on mobile targets in Kosovo finds only 75 out of 269 missions positively claiming some degree of damage to the target.

Little correlation can be seen between the pattern of cluster munition use throughout the conflict and the progress of mobile hits reported by NATO.

Despite warnings from humanitarian organisations, air-dropped cluster munitions were used extensively in the NATO bombing campaign. The use of these munitions was usually explained or justified in terms of the particular value of the weapons against specific types of targets.

In this section we look in more detail at:

- The types and numbers of cluster munitions used;
- Official statements about targeting and use;
- Official data regarding targeting;
- Assessments and arguments regarding military effectiveness of cluster munitions.

2.1 Types and numbers of cluster munitions used

Different secondary sources have made different statements regarding the total number of cluster munitions and submunitions used in Kosovo specifically and Operation Allied Force more broadly (encompassing also strikes elsewhere in Yugoslavia and Albania).

Data provided directly by NATO to UNMIK presents the following breakdown of cluster munitions used within Kosovo:²⁰

CBU type	No. CBU dropped	Submunition type	No. submunitions dropped
CBU87	727	BLU97	146,854
CBU99	98	Mk 118	24,206
RBL755	429	RBL75521	63,063
Total CBU:	1,254	Total submunitions:	234,123

This total figure of 234,123 submunitions reflects a confirmed minimum. The following points also need to be considered:

- The total numbers of cluster munitions reported used by NATO user-states is higher than the numbers reported to UNMIK (even including those reportedly dropped in Albania, Montenegro and Serbia in the released data.)

- Ordnance clearance organisations found submunitions in areas of Kosovo that were not recorded as target locations of the munitions in the table above.
- Certain types of cluster munition, such as the AGM-154 Joint Standoff Weapon and TLAM-D Tomahawk missiles were reportedly used in the campaign²² but do not appear in the data made available by NATO. It is not clear if this is because data is classified for that type of munition or because they were not used within the province of Kosovo.

Substantially higher total numbers of submunitions have been cited in secondary sources. Drawing on different sources of data, the following table suggests numbers used in Operation Allied Force as a whole by different user-states:

User state	Cluster munition designation	Submunition type	No. used	Submunitions per container	Number of submunitions
U.S.A.	CBU87B	BLU97	1002 +	202	235,525 ²³
	TLAM-D cruise missile	BLU97	unknown	166	
	JSOW (AGM-154)	BLU97	unknown	154	
	CBU-99	Mk-118	139	247	34,333 ²⁴
U.K.	RBL755	RBL755	531	147	78,057 ²⁵
Netherlands	CBU87	BLU97	165	202	33,330 ²⁶
Former Yugoslavia	BL755, KB-1 and KB-2				unknown ²⁷

The ambiguities in this data should be borne in mind throughout this report. Most of the analysis that follows uses the NATO data provided to UNMIK without repeatedly presenting the qualification that this is the confirmed minimum, not the total quantity used.

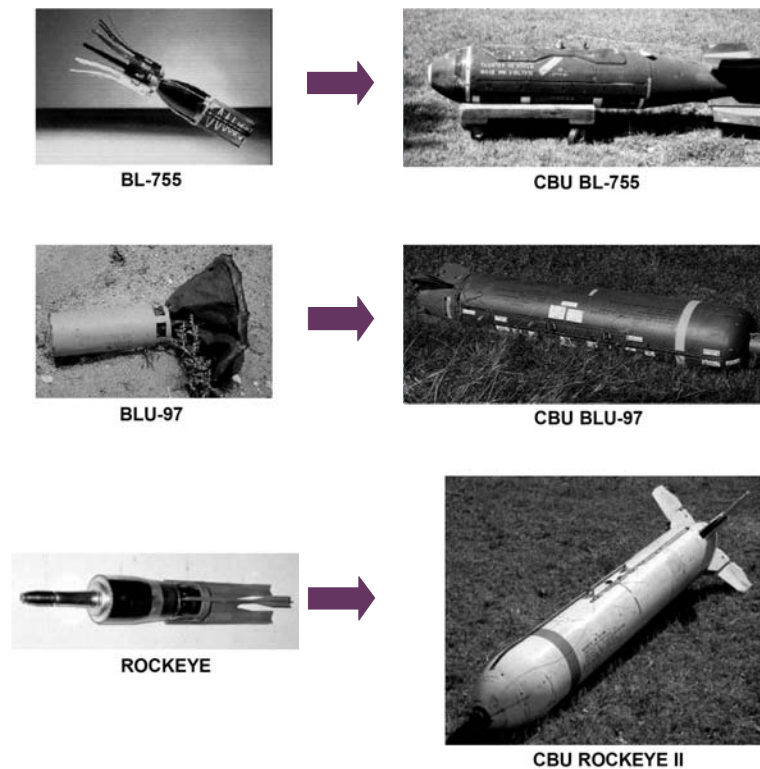


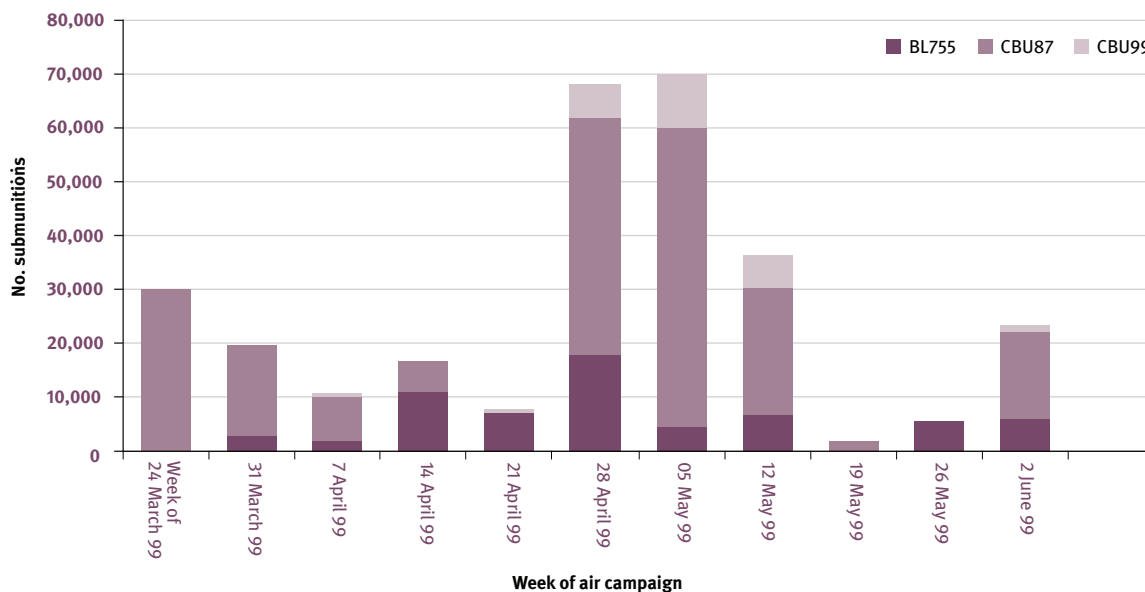
Illustration from UNMACC Factsheet 1 of submunitions and containers.

2.1.1 Timeline of cluster munition use during the bombing

Cluster munitions were used throughout the NATO bombing campaign. The use of cluster munitions peaked during the period 3 May to 13 May 1999. During this period of just eleven days some 157,000 submunitions were dropped in Operation Allied Force as a whole (amounting to over 54% of the total). Approximately 111,000 of these submunitions were dropped in Kosovo.

Number of submunitions used by munition type and week of bombing

(Across whole operation)



It was during the period of most intense cluster munition use, on 7th May, that bombs reportedly targeted at the airfield at Niç in Serbia caused substantial civilian casualties. It has been stated that this incident resulted in a cessation of cluster munition use by the U.S. (supposedly on the basis of a secret instruction from U.S. president Bill Clinton.²⁸) However, although U.S. use certainly fell sharply after this point, further CBU87 and CBU-99 strikes were recorded by NATO – particularly in what was to be the final full week of the operation.

A letter from the Dutch Ministry of Defence in October 2000 suggests that they did suspend use of cluster munitions during the campaign due to concern about unintended civilian harm but it is not clear at what point this was done:

“As long as the operational commander of the specific peace operation sticks to the mandate and the conditions, there is no direct Dutch interference with the operational exercise of the unit. But if there are weighty reasons the government can – in the mean time – impose additional conditions. As was the case during the Kosovo-war in which, due to the risks of unintended collateral damage, it was decided to suspend the use of cluster munitions by Dutch forces.”²⁹

2.2 Official statements and data on targeting

During the conflict, explanations given of the use of cluster munitions tended to highlight the particular utility of these weapons against specific types of targets or in specific circumstances. Rhetorically, these explanations tended to suggest that cluster munitions were used in rather a narrow, precise or specific way.

2.2.1 U.K. statements on targeting: use against tanks

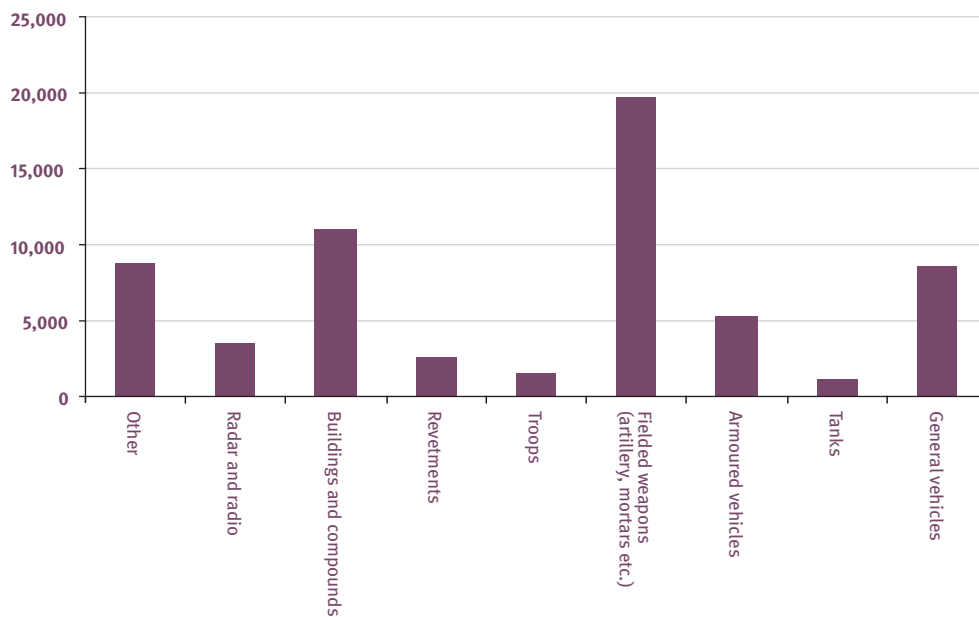
As a most extreme example, during the campaign the British Foreign Secretary argued that with respect to the RBL755:

There is a use of cluster bombs but in this context what the term refers to are anti-tank weapons. Each of the clusters in them is designed to penetrate heavy armour. If your target is a collection of a number of tanks, it makes sense to use a weapon that can disable many of the tanks and not just one of them.³⁰

This statement is misleading in two significant ways. The most commonly used submunitions by both the U.K. and U.S.A. were “combined effects munitions” – which is to say that they are designed with both an anti-armour and an anti-personnel function.³¹ The statement also suggests that *in practice* the munitions were being used primarily (or even solely) against tanks when this was not the case.

By dividing reported targets of RBL755 strikes into different categories we can see not only that armoured vehicles were not the primary objects of attack but also that these weapons were used on a wide range of targets. The following graph provides a categorisation of U.K. cluster munition targets based on data released by the U.K. Government:³²

Number of UK RBL-755 submunitions used against different categories of target



As can be seen here, weapons positions in the field were the single most common targets with armoured and general vehicles and buildings the next most common. The analysis below suggests that vehicles of all kinds made up only some 24% of RBL755 targets with 8% of the total targets identified as ‘armoured vehicles’ and only 2% of the total targets explicitly identified as ‘tanks’.

2.2.2 NATO statements on targeting

A somewhat wider explanation of the use of cluster munitions than that given by the U.K. Foreign Secretary was presented by NATO Major General Jertz:³³

“... on [area]³⁴ targets as we call it, we do use those bombs, however only when we can make sure that there is no collateral damage ... but [it] is also within the law and it is legal in the international community to use cluster bombs, but once again only against [area] targets and that is where we use them.”

General Jertz was asked to clarify the meaning of the term “area targets”:

“You could also call these cluster bombs ‘combined effects munitions’. They are being used when talking about ‘[area] targets’ such as airfields so we use cluster bombs on soft targets like aircraft and trucks when they are on the airfield and we detect them, and when we can make sure there is no collateral damage, and we also use those cluster munitions in areas where we know there are valid military targets which we cannot see because they are under the wood. Of course we know where they are but they cannot be attacked accurately by precise weapons so we use cluster bombs against those targets.”

Such a representation again suggests that cluster munitions were being used against a relatively restricted and specific set of targets: military vehicles within a military area; military targets that cannot be hit with precision guided munitions (which by implication would have been used otherwise); and all of these only in circumstances when it is “sure” that there will be no non-combatant casualties. Similarly, U.S. State Department Spokesman, James Rubin, stated “cluster bombs have been used for select military targets, including airfields and others.” Other formulations repeated the implication that these weapons were being used particularly where tree cover made it difficult to use more precise laser guided munitions.³⁵ Deputy NATO spokesperson Peter Daniel was very clear about the preference for laser guided munitions:

“[W]e take every precaution to avoid unintended damage when we use cluster munitions at all. In fact, as we have seen throughout the air operation, we prefer precision guided munitions any time we can use them. This is in keeping with our aim to avoid collateral damage as much as possible.”³⁶

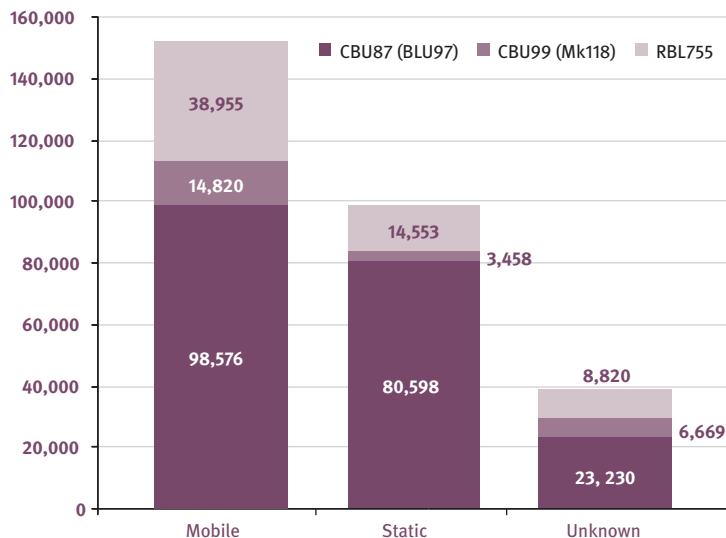
2.2.3 Official data regarding targeting

The spreadsheets provided by NATO to UNMIK provide substantial data about the targets that cluster munitions were directed against.

Cluster strike targets, as recorded in the data provided by NATO can be divided between the categories ‘static’, ‘mobile’ and ‘unknown / other’. The number of cluster munitions used against these different categories breaks down as follows:³⁷

Number of submunitions employed against mobile, static and unknown targets

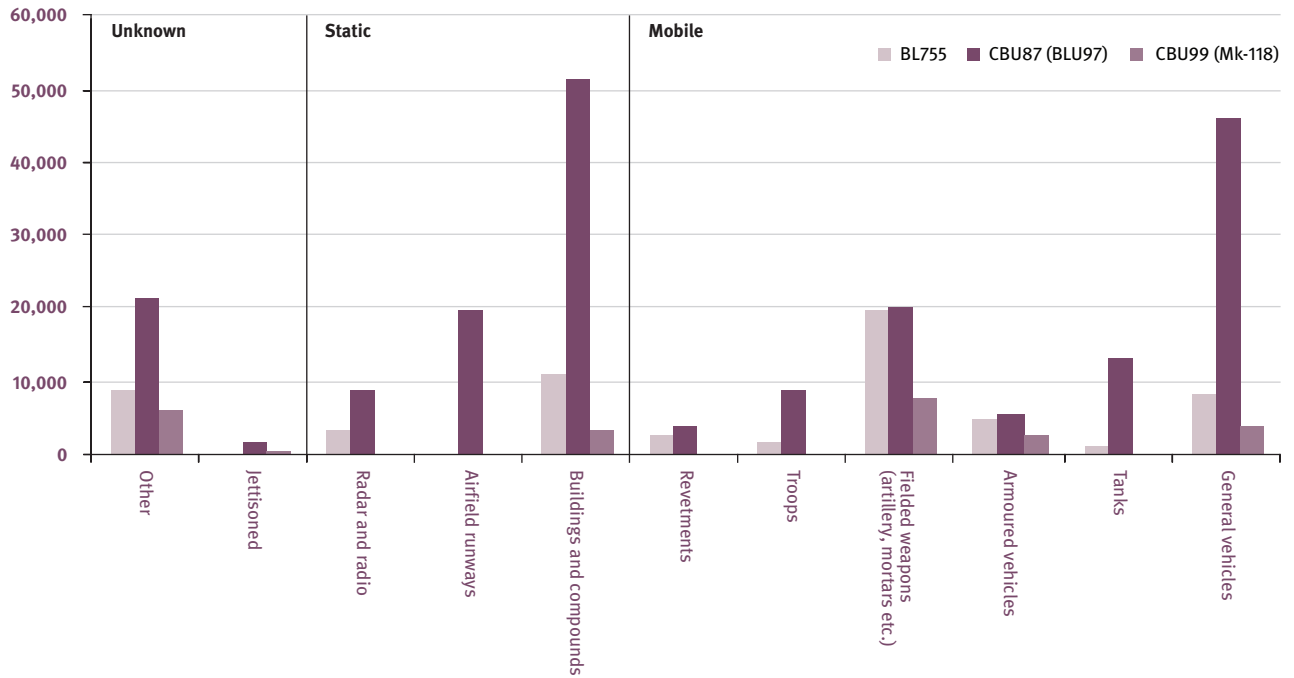
(Across whole operation)



A more detailed analysis allows us to split cluster munition use across further categories:³⁸

Number of submunitions employed against detailed categories of target

(Across whole operation)

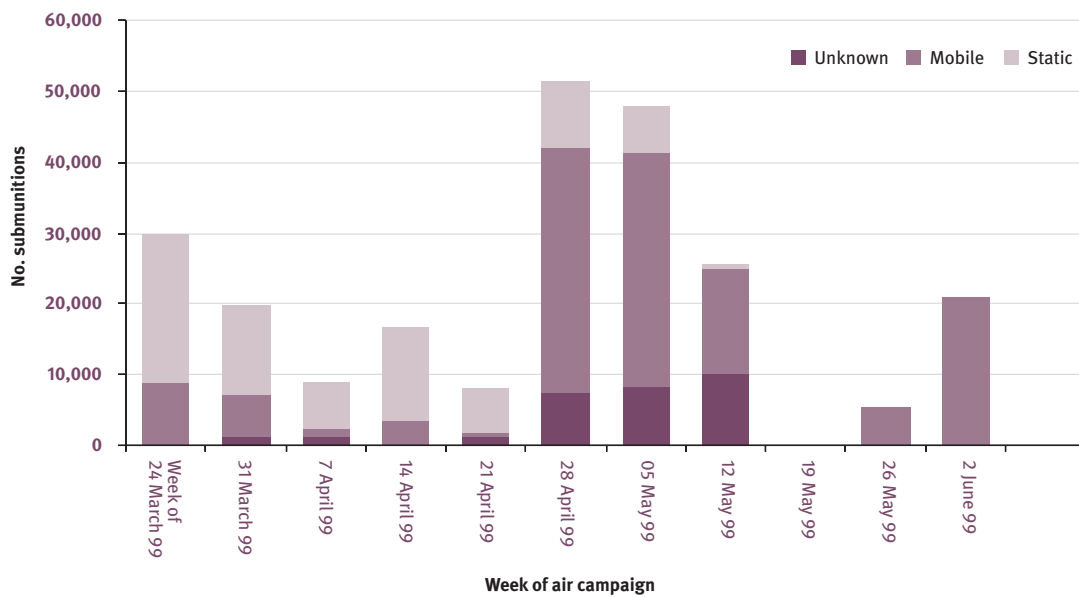


Such an analysis highlights that CBU87 in particular were also used extensively against static targets such as military compounds, railheads and buildings.

Using the broader categories of unknown, static and mobile we can plot the pattern of cluster munition use over time. As can be seen in the chart below, an emphasis on static targets during the first half of the bombing campaign gave way to an emphasis on mobile targets during the second half:

Number of submunitions used by target type and week of bombing

(Kosovo only)



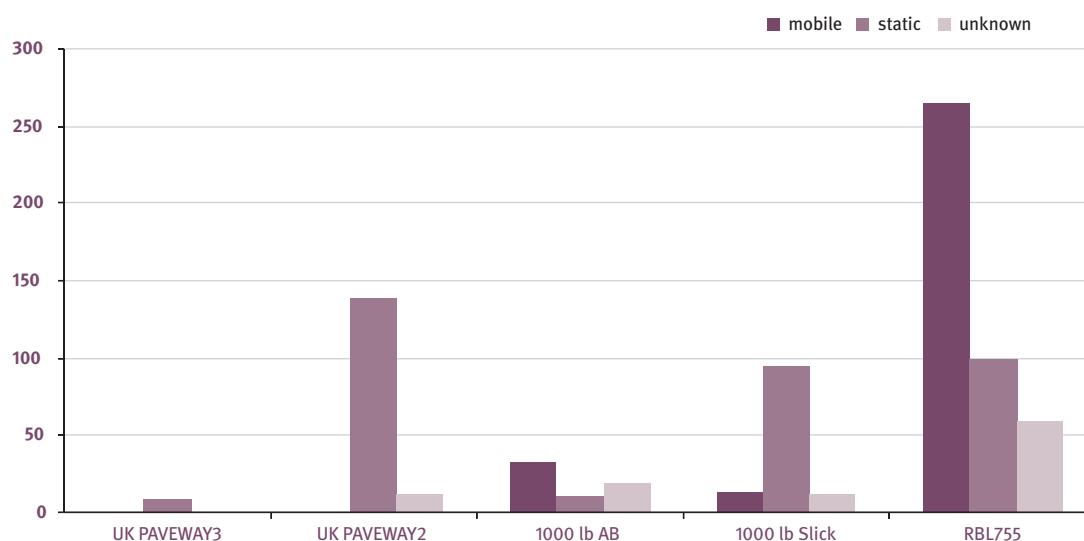
Data is also available from the NATO spreadsheets on targeting of other U.K. air-dropped munitions. Some 340 unitary munitions are recorded as being used against 174 targets by the U.K.³⁹ These weapons are as follows:

- UK PAVEWAY 2 Laser guided 1,000lb high explosive bomb
- UK PAVEWAY 3 Laser guided 2,000lb high explosive bomb designed to defeat hardened targets such as underground command posts.
- 1,000lb AB Unguided, 1,000lb air-burst bomb
- 1,000lb Slick Unguided 1,000lb bomb with stand-off tail

The mobile/static/unknown split can be compared as follows:

Number of munitions employed against mobile, static and unknown targets

(RBL755 recorded as whole clusters not submunitions)



When attacking mobile targets there was clearly a preference for using RBL755. However, only the Paveway 2 aircraft bombs were used by the U.K. against more static targets than RBL755 (in this data set). With the exception of targets such as bridges and protected bunkers, RBL755 seems to have been considered appropriate for use against a wide array of targets.

The same conclusion could be drawn regarding the use of cluster munitions as a whole. Whilst they seemed to have been a preferred weapon against mobile targets, they were also used in substantial quantities against static targets.

2.3 Military impact

The military value of this cluster munition use – i.e. to what extent did the specific performance of these weapons serve to achieve tactical or strategic goals – is very hard to determine. After the conflict both U.K. and U.S. officials asserted the value of these weapons but little or no analysis has been produced publicly to substantiate those assertions. Serious questions have been raised about the effectiveness of the NATO bombing at a tactical level, particularly in relation to the sorts of fielded forces cluster munitions were commonly presented as being used against. Others have noted that strategically the bombing must be recognised as only one of a number of components that secured Milošević’s decision to withdraw from Kosovo. This section tries to situate the use of cluster munitions within the broader set of strategic conditions that resulted in NATO’s victory. First, however, we note the positive public assertions about the effectiveness of these weapons.

2.3.1 Positive assertions of military utility

In January 2000, the U.S. Department of Defence published its *Kosovo/Operation Allied Force: After Action Report*.⁴⁰ This report was positive about the performance of cluster munitions but used much of the short paragraph relating to these weapons in the unclassified version to comment on the hazard presented by the unexploded submunitions:

“Our experience in Operation Allied Force also demonstrated the importance of Combined Effects Munitions (CEM). These munitions are soda-can-sized bomblet submunitions, designated BLU97 or cluster bombs, that are dispensed in large numbers (approximately 150-200 bomblets per weapon) to attack ‘soft’ area targets. These submunitions are dispensed by several different weapon airframes – the TLAM-D from long range, the JSOW from medium-standoff range, and the CBU87 tactical munitions dispenser for direct attack. CEM is an effective weapon against such targets as air defense radars, armor, artillery, and personnel. However, because the bomblets are dispensed over a relatively large area and a small percentage of them typically fail to detonate, there is an unexploded-ordnance hazard associated with this weapon. These submunitions are not mines, are acceptable under the laws of armed conflict, and are not timed to go off as anti-personnel devices. However, if the submunitions are disturbed or disassembled, they may explode, thus, the need for early and aggressive unexploded ordnance clearing efforts. Combined effects munitions remain an appropriate and militarily effective weapon when properly targeted and employed. However, the risk of collateral damage, as with any weapon, must be considered when employing these weapons.”

In June 2000, Geoff Hoon, the U.K. Secretary of State for Defence, giving evidence to the House of Commons Defence Committee, asserted regarding cluster munitions that:

“these are extremely effective weapons. They are the most effective weapons against armoured and certain kinds of soft skinned vehicles and, frankly, if we did not use the most effective weapons available to us we would be putting our armed forces at risk. I would face, rightly, criticism from this Committee if, in an exercise such as we are conducting now, I did not use a weapon that was available to us and our armed forces were put at risk in the process.”⁴¹

The key claims made about the positive utility of the weapons then were that they were the most effective weapons at destroying certain types of targets (certain facilities, armour, artillery and personnel) and that using the alternatives would have put troops at greater risk.

2.3.2 Strategic significance: factors that resulted in withdrawal of Serb forces from Kosovo in June 1999

NATO victory in Kosovo was based on Slobodan Milošević’s decision to accept terms for a withdrawal of Serb security forces and the introduction of a UN-lead military presence to the province.⁴² The U.K. House of Commons Select Committee on Defence and the U.K. Ministry of Defence drew broadly similar conclusions regarding the key factors likely to have precipitated this decision. The MoD report summarised them as follows:⁴³

- the continuing solidarity of the Alliance, and Milošević’s inability to divide the Allies, despite repeated attempts;
- the determination of the international community, including the states of the region and, crucially, Russia, to force him to accept a negotiated solution;
- ***the continued increase in tempo of the air operations, and the damage and disruption they had caused, and were likely to continue to cause if operations continued, to the command and control and operations of his security forces;***
- his indictment by the International Criminal Tribunal for the former Yugoslavia, and the indictment of four other key members of his regime, which would have added to the pressure on him and those around him;

- and the build-up of ground forces in the region, the confirmation at the NATO [Washington] Summit that all options remained under review, and the suggestions from the U.K. and other Allies that an opposed ground entry operation could not be ruled out.⁴⁴

Of these five factors, only one relates to the actual tactical functioning of the air campaign. This is not to downplay the necessary nature of this component but simply to note that the overall bombing campaign was only one of a number of factors that produced the eventual outcome.

2.3.3 Contribution of different elements of the bombing campaign

An analysis by Steven Hosmer in a monograph for the RAND Corporations' Project Air Force⁴⁵ recognises similar key factors but splits the functions of the bombing into two components:

- The attacks “on six types of largely ‘dual-use’ infrastructure targets: (1) command, control, and communication, (2) electric power, (3) industrial plant, (4) leadership, (5) lines of communication, and (6) petroleum, oil, and lubricant facilities – the bulk of which were located in Serbia, the area of transcending political importance to Milošević and his colleagues.” Hosmer notes that these attacks in particular had an effect on public morale (by creating hardship, fear and anxiety) that created a climate conducive to withdrawal from Kosovo.
- The attacks on military forces.

As we have noted, cluster munitions were used in both roles but the majority were used in attacks on mobile military targets.

Hosmer’s analysis suggests that the attacks on purely military targets (such as fielded forces) were of limited importance in the bombing’s contribution to achieving the withdrawal of Serb forces from Kosovo.

A reasonable criticism of such a line of analysis is that by working backwards from the outcome insufficient consideration is given to the uncertainty that prevails during the actual conflict (when the eventual outcome is of course unknown). Hosmer acknowledges this to some extent when he notes that air operations would have limited the potential combat effectiveness of the Third Army against a NATO invasion. However, his analysis is based on evidence that the bombing against fielded forces was not particularly effective even by its own terms:

Even though purely military targets were the primary focus of the NATO air campaign and accounted for the vast majority of weapons expended, the destruction and damage to military targets probably did not generate the major pressure for war termination. ... Except for the FRY air force, which lost a significant percentage of its frontline aircraft, the NATO attacks did not greatly diminish the FRY’s combat structure. Most of the purely military facilities that were struck were probably empty of personnel and equipment when hit, and only a portion of the FRY’s ground force structure was actually attacked.

Furthermore, those deployed force elements that NATO attempted to attack – the tanks, armored personnel carriers (APCs), and artillery/mortars of the Third Army and the Ministry of Internal Affairs Police Forces (MUP) in Kosovo – often escaped destruction because NATO aircraft found it difficult to locate, positively identify, and promptly strike such mobile targets. The actual results of the air attacks on the Serb armor and artillery deployed in Kosovo are in dispute. However, even if one assumed that all the equipment identified in the Kosovo Strike Assessment as having received a “successful hit” proved to be beyond repair, the amount of armor and artillery lost to NATO air attacks still would constitute only a small percentage of the FRY’s total armor and artillery inventories.

... The NATO air operations in Kosovo limited the potential combat effectiveness of the Third Army – particularly with respect to countering a future NATO ground invasion – by forcing VJ units to disperse and avoid large-scale operations. However, this dispersed and buttoned-up posture did not prevent VJ and MUP forces from carrying out – albeit with some difficulty – their immediate missions of (1) conducting ethnic cleansing, (2) rooting out and suppressing the KLA elements in Kosovo, (3) preventing the infiltration of KLA forces from Albania, and (4) strengthening Kosovo’s physical defenses against invasion.

Neither the limited losses in ground combat capability the FRY suffered as a result of the NATO bombing nor the purported “resurgence” of the KLA military threat to Serb forces in Kosovo appears to have importantly influenced Milošević’s decision to come to terms. The reporting that Milošević received from his military commander in Kosovo apparently continued to be upbeat throughout the war. Moreover, Serb officials, when discussing the decision to yield, mention neither the attrition of the FRY’s military forces nor the supposed deterioration of the military balance in Kosovo as major reasons for Belgrade’s capitulation.

His report goes on to recommend efforts are made to improve capabilities to attack hidden or dispersed forces.

Other analysts have noted similar shortcomings in the effectiveness of the bombing against fielded forces. Andrew Stigler in his 2003 article *A Clear Victory for Air Power* nonetheless states that “despite its sustained bombing campaign, NATO did little damage to the Serbs’ ability to control Kosovo.” Stigler also quotes in evidence a Washington Post article by Dana Priest reporting that “NATO commanders were surprised to see the robust [Serb] columns that eventually withdrew from Kosovo, and they concluded that the Yugoslav 3rd Army could have held out for weeks or even months.”⁴⁶

Underlying the analyses of both Hosmer and Stigler are the contested post-conflict claims about the number of mobile targets hit by NATO in Kosovo. We explore these arguments in the following section.

2.3.4 Contested claims about mobile target hits

As noted above, the effectiveness of the air attacks on Serb armour and artillery in Kosovo are disputed. Controversy arose in May 2000 when Newsweek magazine heralded a “Kosovo cover up.”⁴⁷ They ran a story that the actual numbers of armoured vehicles and other mobile targets destroyed by NATO, as determined by a Munitions Effects Assessment Team (MEAT) was much lower than had been represented in other official reports. The article also reported that the findings of the MEAT assessment were “suppressed” because of the implications of these findings. The story was picked up by other print and television media outlets as well as by NGOs⁴⁸ and received an honourable mention in the 2001 White House Correspondents Association awards.⁴⁹

A subsequent article in *Air Force Magazine* strongly challenged the interpretation of data put forward by *Newsweek*⁵⁰. This rebuttal cites a MEAT deputy team leader as noting that “our job was not to account for successful strikes, our job was to investigate what equipment was remaining from those strikes.” The article asserts that the term “remaining” is critical to understanding the data:

By the time MEAT investigators arrived, Serb forces had taken away whatever equipment was serviceable or salvageable, including tanks, armored personnel carriers, and artillery. What the team found in the “tank” category was 14 tanks plus 12 self-propelled artillery vehicles, which look like tanks and would have been reported as tanks in pilot mission reports. Those 26 “tanks” suffered catastrophic destruction and were abandoned by the Serbs.

What is clear is that the Serbs had plenty of time to remove and repair any equipment sustaining less drastic damage.

The assertion that the Serb forces had “plenty of time” to remove equipment from the battlefield is open to question. The *Air Force Magazine* article states:

[...] Serb mobile targets had been struck at different times during 78 days of air warfare. By early July 1999, when members of MEAT walked the ground and flew in helicopters looking for equipment, some strike sites were being visited for the first time in three months. The freshest of the sites was four weeks old.

However, a timeline for mobile target hits in Kosovo presented by General Shelton (and broadly supported by the timeline in the final Strike Assessment according to another article in Air Force Magazine⁵¹) places some 80% of hits in the last two weeks of the bombing campaign.⁵² Furthermore, with NATO troops entering Kosovo on the 12th June, almost immediately after the cessation of the bombing, Serb forces did not have freedom to move damaged equipment throughout the four weeks that then preceded the MEAT starting operations. This is not to deny that armour and equipment were removed – they certainly were – but it would be wrong to overstate the period of opportunity for such activities.

In the U.S. Department of Defense's after action report to Congress the methodology for determining mobile target hits as part of the Strike Assessment is outlined as follows:⁵³

To assess the number of mobile targets struck during operations in Kosovo, a team conducted a comprehensive day-by-day, mission-report-by-mission-report reconstruction of the operation to determine the actual number of mobile targets struck with high confidence. This assessment covered all 78 days of Operation Allied Force, focused exclusively on mobile targets, and covered only strikes in the area of Kosovo and the Presevo Valley [...]

[...] The team gathered data and other pertinent information related to the following essential elements of information

- Indications of destruction or damage of tanks, armored personnel carriers, artillery, mortars, and military vehicles
- Indications of the use of camouflage, concealment, and deception campaign by the Yugoslav military
- Indications that some NATO strikes missed specific targets (tanks, armoured personnel carriers, artillery, mortars, and military vehicles)
- Indications of evidence that Yugoslav military forces cleaned the battlefield
- Indications that the Kosovo Liberation Army destroyed or damaged tanks, armored personnel carriers, artillery, mortars, and military vehicles
- Indications that some NATO missions struck the same targets on multiple occasions.

Assessments of these indications were made using cockpit video from actual strikes, image intelligence, measurements and signatures intelligence, signals intelligence, human intelligence, interviews with forward air controllers and on-scene witnesses, and through on-site observations by the team [...]

[...] The assessment provides no data on what proportion of total mobile targets were hit or the level of damage inflicted on the targets that were struck. Instead, the number of target hits were collected.

Although not explained in the actual DoD report, the basic unit of evidence was the initial mission report which then had to be backed up by at least one additional source of evidence in order for a hit to be 'confirmed'.⁵⁴ The validity of this methodology has been variously challenged and defended.⁵⁵ The representation of methodology and data in the U.S. Department of Defense after action report to Congress does seem to be slightly misleading. Mission reports asserting hits which could not be supported by any additional source of data were described as follows:

[...] those mission reports that provided sufficient evidence of a hit based on the methodology to support a successful strike assessment. Thus, the targets in this category represent possible hits that cannot be confirmed.

[...] However, the on-site visits did not occur until more than a month after the conflict had ended, allowing time for the Serbs to remove damaged vehicles from the battlefield.

This formulation strongly suggests that 'on-site' evidence of a hit vehicle was one of the primary mechanisms (if not the only mechanism) for 'confirming' a hit when there were actually a range of other secondary data-sources being used to confirm hits. Such a formulation unnecessarily raises expectations regarding the confidence of numbers put forward as both confirmed and unconfirmed hits. Furthermore, we have already raised a degree of scepticism about the suggestion that Serb forces had a month in which they were free to remove equipment and armour despite NATO being in control of the province.

It is noticeable that both Hosmer (writing for RAND’s Project Air Force) and Stigler (now a professor in the National Security Decision Making Department of the United States Naval War College) accept grounds for scepticism over the strike assessment data put forward by NATO.

Some of the different assessments and assertions are summarised below:

Estimates of mobile targets hit or destroyed by NATO air-strikes				
	Tanks	Armoured personnel carriers	Military vehicles	Artillery pieces
Gen. Shelton (NATO) (June 1999) ⁵⁶	140	220	Not given	450
Gen. Clark (NATO) (September 1999) ⁵⁷	93	153	339	389
U.S. DoD Kosovo After Action Report: confirmed (not necessarily physically confirmed) / unconfirmed (January 2000)	93/181	153/317	339/800	389/857
Newsweek (May 2000) reporting purportedly from the Munitions Effectiveness Assessment Team – items physically confirmed as destroyed	14	18	Not given	20
Serb statement ⁵⁸	13	6	Not given	27

2.3.5 How effective were cluster munitions specifically against mobile targets in Kosovo?

We have noted already suggestions that the bombing of fielded forces was perhaps not a critical factor in securing the withdrawal of Serb forces from Kosovo. We have also noted the contested claims about the actual number of mobile targets hit. In this section we examine what assessment can be made of the effectiveness of cluster munitions in this regard.

It is important to note that given the methodology outlined for the Kosovo Strike Assessment, NATO or U.S. DoD should be in a position to present detailed data that allows comparison of the performance of cluster munitions with other types of munitions against mobile targets. Such an analysis, if it has been undertaken, has not been made publicly available.

Whilst the overall effectiveness of the bombing against fielded forces in Kosovo has been criticised, others have raised questions about the specific effectiveness of cluster munitions within that operation. Colin King, in a report for the ICRC⁵⁹, noted that:

“although submunition strikes undoubtedly hampered Serb operations, they did not appear to make a significant contribution to the air campaign. [...] The large defensive positions around Gjakova, for example, were subjected to extensive submunitions attack, yet there was little evidence of armoured vehicles or key equipment having been destroyed.”

“On June 7 1999, one of the most intense submunitions strikes of the conflict was mounted when U.S. B-52 bombers attacked Serb troops massing around Mount Pastrok. Initial NATO estimates indicated that as many as 400-600 soldiers may have been killed. However, subsequent reports by military analysts and U.S. airmen state that there was no evidence of such a large number of casualties and few signs of heavy equipment losses.”

Former U.K. General Sir Hugh Beach, in a February 2001 briefing paper for the International Security Information Service produced an estimation of the effectiveness of U.K. cluster bomb use.⁶⁰ His analysis considered the estimates

of Gen. Clark in September 1999 as being overly optimistic in the light of the limited firm corroboration that the MEAT assessment had been able to provide. He took a reduced version of Gen. Clark's figures (accepting only 50% of strikes that had not been corroborated by the Munitions Effectiveness Assessment Team) and then factored in that the U.K. had contributed only 4% of the total NATO munitions delivered.

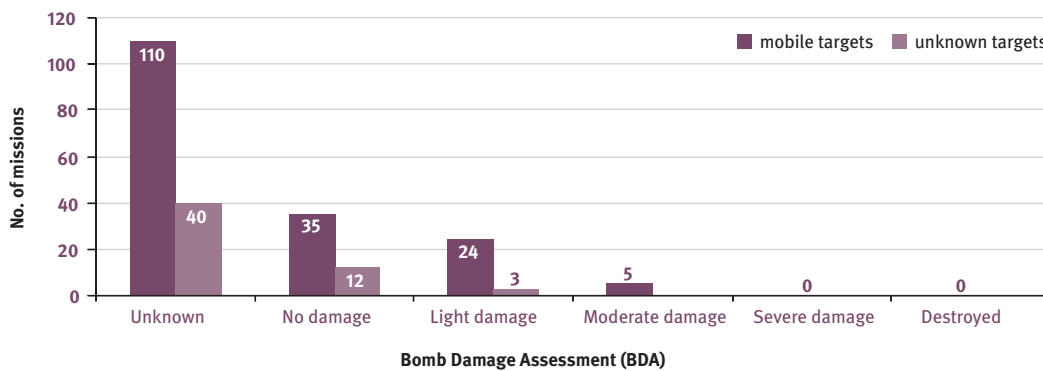
“[Our] analysis suggests that, in the British case, the delivery of some 530 cluster bombs in the course of the campaign may have resulted in the destruction of as few as 30 major items of military equipment [such as tanks, armoured personnel carriers, artillery]. This achievement can in no sense have influenced the outcome of the campaign.”

“... the Secretary of State [for Defence's] claim that cluster bombs are the “most effective” weapons” against armoured vehicles ... does not stand up to scrutiny ...”

The methodology used in this analysis has some serious shortcomings and General Sir Hugh Beach produced a revised version of the same paper which removed this projection of U.K. achievements.⁶¹

However, the data released by NATO to UNMIK does provide some further indications of the effectiveness of cluster munition use against mobile targets in Kosovo. An analysis of CBU99 and CBU87 use in Kosovo against mobile and unknown target categories reveals the following “bomb damage assessments”:⁶²

Bomb damage assessments (BDA) of 175 CBU99 & CBU87 missions against mobile and unknown target categories in Kosovo



Analysis is not possible on the same terms for RBL755 strikes. Data on RBL755 strikes includes only an assessment of hit or miss and does not assess the actual damage to the target. The following breakdown is produced for mobile targets in Kosovo:⁶³

Hit or miss assessment of 94 RBL755 missions against mobile and unknown target categories in Kosovo



Taken together these two charts suggest 75 missions against mobile targets either hitting (in the case of RBL755) or being positively assessed as causing some damage (in the case of CBU99 and CBU87). It should be noted that multiple vehicles could be hit in the strikes that constituted these missions.⁶⁴

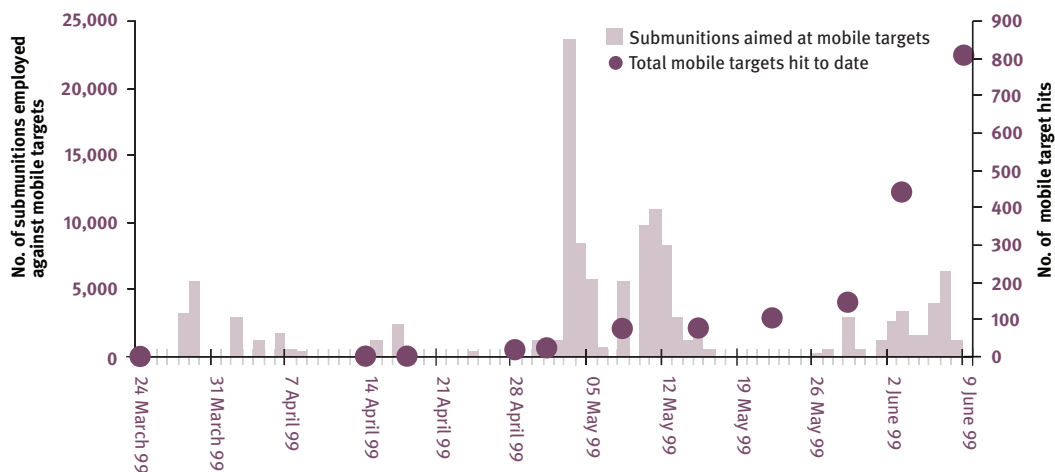
In a press conference on the Kosovo Strike Assessment⁶⁵ it was noted that this assessment worked from the basis of 1,955 mission reports “of mobile targets in Kosovo alone” in which pilots claimed a hit. With only 75 cluster strike missions in our analysis positively claiming a hit on mobile targets in Kosovo it would not appear that cluster munitions made up a substantial proportion of these reports in which pilots claimed a hit.

Set against this we have noted already that the cluster strike records made available to UNMIK are not thought to be comprehensive and it is not possible to determine how the ‘bomb damage assessment’ field in these records relates the documents from which the strike assessment was working.

The U.S. DoD after action report states that approximately 60% of “target-hit claims” made during Operation Allied Force could be confirmed by the assessment team (that is supported by at least one other source from either “cockpit video from actual strikes, image intelligence, measurements and signatures intelligence, signals intelligence, human intelligence, interviews with forward air controllers and on-scene witnesses, [or] through on-site observations by the team.”) If this bomb damage assessment data represents “target hit claims” this would suggest a still lower proportion of these missions resulted in ‘confirmed strikes’ by the methodology of the post-conflict strike assessment.

Further evidence can be brought out by comparison of the numbers of submunitions employed during the bombing with the accumulation of mobile target hits as estimated by General Shelton in June 1999⁶⁶:

Comparison of Shelton data (cumulative mobile targets hit in Kosovo) with number of submunitions employed against mobile targets in Kosovo over time



In the comparison as illustrated above there seems to be very limited correlation between the quantities of submunitions employed and the accumulation of hits.⁶⁷ The great majority of mobile target hits were claimed during the period 26 May to 9 June. The great majority of cluster munitions were dropped during their period 28 April to 9 May.

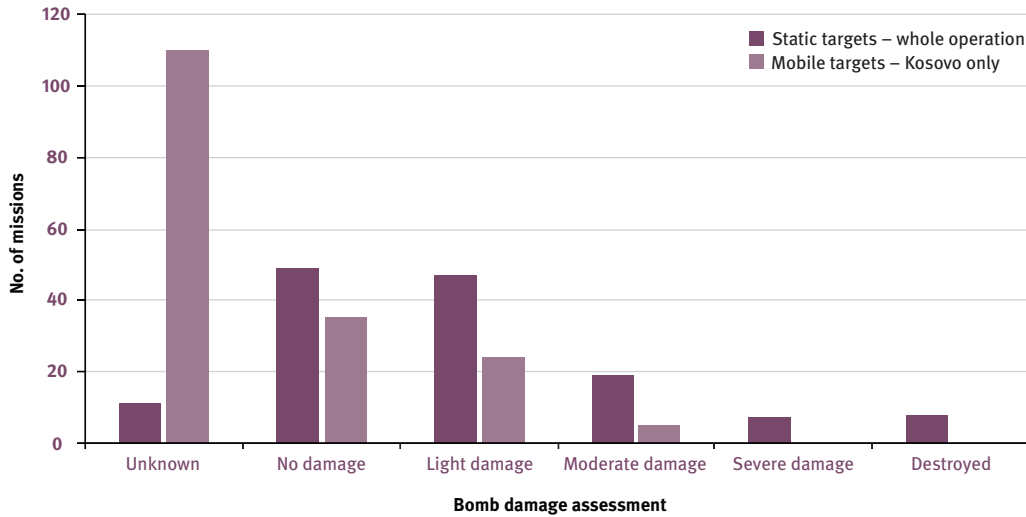
Without additional data it is not possible to undertake a detailed assessment of the performance of cluster munitions by comparison with other types of attack. However some such analysis is possible. NATO data on A10 ground attack aircraft strikes indicate that of 110 missions in Kosovo against mobile targets, 80 claimed hits. This 75% of A10 missions claiming hits compares with 28% of cluster strike missions claiming hits in the analysis above.

Taken together, these findings are strongly suggestive that cluster munitions were not particularly effective against mobile targets in Kosovo.

2.3.6 How effective were cluster munitions specifically against static targets?

As we noted earlier, a significant number of cluster munitions were used against facilities such as radar and radio installations, airfields, rail-heads and military compounds. Against these targets the U.S. bomb damage assessment presents a more positive picture.

Bomb damage assessments (BDA) of CBU99 & CBU87 missions against static targets across whole Operation Allied Force by comparison with mobile targets in Kosovo.



As noted previously, it is not possible to analyse RBL755 strikes on the same basis. The summary below does not include an assessment of the damage but only of the hit/miss status. Also, the data below covers only targets in Kosovo, not the whole operation.

Hit or miss assessment of RBL755 missions against static targets in Kosovo with strikes on mobile targets for comparison



Surprisingly, the RBL755 data suggests these weapons were more accurate against mobile targets than against static targets.

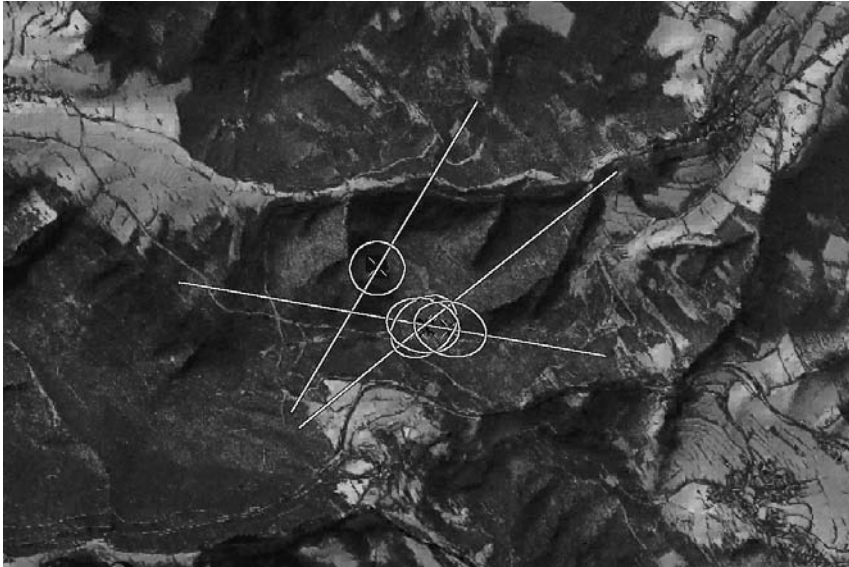


Figure 3: NATO image estimating locations of strikes with 36 CBU87 cluster munitions in total.

2.4 Conclusions regarding the targeting and military effectiveness of cluster munitions

2.4.1 Weapons of convenience

Cluster munitions seem to have been used more broadly than political or military spokespeople described during the conflict. The explanation that these weapons were necessary because of their exceptional effectiveness against specific types of targets does not seem to be borne out by the data. Rather, the utility of these weapons (at least for the U.K. – where comparative data is available) seems to have been in the wide range of targets against which they could plausibly be deployed. In addition, as official statements noted, the weapons were considered useful where vegetation cover obscured targets. This suggests that cluster munitions were more a weapon of convenience than a specific tool for a specific job.

2.4.2 Primary use was in a role of limited strategic value

The greatest focus of cluster munition use was against mobile targets within the province of Kosovo. The strategic contribution of strikes on mobile targets within Kosovo to the withdrawal of Serb forces from Kosovo has been strongly questioned by analysts of U.S. air power. Of the competing arguments about what resulted in a withdrawal of Serb forces from Kosovo the two most pointedly argued are:

- that the credible threat of ground troops was a necessary factor;⁶⁸
- that the coercive impact of bombing on dual-use targets was the primary factor.

Certain proponents of both of these positions seem prepared to concede that the NATO campaign against fielded forces in Kosovo had been of limited effectiveness.

It could be contended that the military utility of these specific weapons cannot reasonably be evaluated in direct relation to how the outcome of Serb withdrawal from Kosovo was achieved. However, NATO officials used this same frame of reference in justifying possible humanitarian harm from cluster munitions. In response to a question about fears that the unexploded cluster munitions were “small, attractive, bright coloured packages that children find intriguing” Major General Wald answered as follows:

“I hope that doesn’t happen, but I would certainly say that the sooner we have the Serb/MUP forces leave Kosovo, and we can have the Kosovar Albanians get back to a normal life, there are probably going to be a lot more children survive because of that than would get killed picking up some small object accidentally out in the trees.”⁶⁹

In Major General Wald’s formulation the contribution of cluster bombs to the speed of the overall war effort (i.e. getting Serb/MUP force to leave Kosovo) is the factor that outweighs the concern about civilian harm. Our analysis suggests that the use of these weapons did not substantially assist in achieving that end.

2.4.3 Evidence suggests limited effectiveness against mobile targets

The Strike Assessment data put forward by NATO to illustrate its effectiveness against mobile targets has been questioned. Even if the NATO data is broadly accepted there does not seem to be a strong correlation between hits on mobile targets and the use specifically of cluster munitions. Our analysis of bomb damage assessments from NATO strike data finds only 72 cluster strike missions positively reporting hits against mobile targets in Kosovo. Such reports would not necessarily have been recorded as ‘confirmed’ hits even by the methodology of the Strike Assessment.

2.4.4 Lack of military utility identified by external oversight bodies

Finally it is worth noting that the analysis presented here is broadly in line with the conclusions drawn by the U.K House of Commons Defence Select Committee in the wake of the conflict. Their conclusions are reproduced here with the original notes and emphasis: ⁷⁰

Cluster Bombs and Anti-Armour Weapons

The BL755 has been in-service with the RAF since 1972. Even in 1991, the MoD acknowledged that experience in the Gulf War had shown that the bomb was no longer credible against modern main battle tanks.⁷¹ Despite modifications since then to improve its capabilities, counter-measures⁷² have developed faster so that tanks are now four times as likely to survive BL 755 bombing than in 1991.⁷³ Its main limitations are that it works most effectively when deployed by low flying aircraft (which also have to fly directly over the target); it is not guided; and on average around 5% of its 147 bomblets fail to explode.⁷⁴ However, there is evidence that the actual failure rate in Operation Allied Force was higher-possibly between 8% and 12%.⁷⁵ That means that the RAF left between 4,000 and 10,000 unexploded bomblets on the ground in Kosovo during Operation Allied Force. A report in *Flight International*, purportedly based on MoD operational analysis, suggested that only 31% of cluster bombs hit their targets and a further 29% cannot be accounted for.⁷⁶

[...] The RAF need not have been so handicapped, however. The MoD's Brimstone programme is intended to provide a stand-off⁷⁷ anti-tank guided missile with its own autonomous target-seeking radar which will not require continuous guidance from its launching aircraft. The MoD now expects it to enter service in October 2001, but that will be 10 years later than planned when the programme was launched in 1982.⁷⁸ The project will have then taken more than twice as long as it should have done,⁷⁹ a delay largely caused by the MoD itself, as the missile's requirements were re-evaluated and refined, including a delay of more than 5 years while the implications of the post Cold-War 'Options for Change' defence review and the lessons of the Gulf War were addressed.⁸⁰ The MoD has reported that its operational analysis has showed that Brimstone would be 20 times as effective against main battle tanks deploying modern countermeasures as the cluster bomb currently in service⁸¹ – an advantage unavailable in the Kosovo conflict.⁸²

The Secretary of State put up a stout defence of the use of cluster bombs, telling us–

As far as cluster bombs are concerned, I regret that munitions are not always as effective as we would like ... We were aware that there was a small failure rate, in the order of 5% ... but a judgment has to be made. These are extremely effective weapons. They are the most effective weapons against armoured and certain kinds of soft skinned vehicles and, frankly, if we did not use the most effective weapons available to us we would be putting our armed forces at risk.⁸³

The Secretary of State's claim that cluster bombs are 'the most effective weapons' for an anti-armour ground attack task does not, we believe, apply to the circumstances of this campaign. At the very least, their reputation as an indiscriminate weapon risks international condemnation, undermining popular support for an action. The UK needs a more discriminatory anti-armour system in order to move to an early end to reliance upon recourse to these weapons in inappropriate circumstances.

As well as directly rejecting the Secretary of State's claims about the effectiveness of these munitions this analysis usefully identifies the failure of procurement processes as leading to the U.K. Air Force's "reliance" on these munitions.



On 3rd September 1999, Arton Baftiu (then still at school) and some of his friends went to collect wood near their home village. They found a BLU 97 cluster munition. At that time they didn't recognise the yellow canister and parachute for what it was. Arton threw it into a ditch and it exploded – cutting off his right hand.

KFOR cleared some additional munitions from this area but only after Arton's accident had alerted them to the problem.⁸⁴

3.0 Other issues of cluster munition use

3.1 Dumping munitions

During Operation Allied Force at least 8,345 submunitions were dumped or jettisoned without been aimed at any clear target.

According to the United Nations Mine Action Service (UNMAS), in a paper to the Convention on Conventional Weapons in 2002:

“An additional problem was encountered during the clearance of sites that were used to ‘dump’ cluster bombs, presumably if the pilots were unable to identify suitable targets. A number of remote mountain sites were chosen to unload upon. Most of these turned out to be summer grazing areas, and subsequently required clearance. Unfortunately, given the nature of the sites, the ability to access and then support the clearance task was extremely difficult. Communications, logistic support, medevac [medical evacuation] and quality assurance all became a major challenge to overcome.”⁸⁵

The practice of dumping munitions without a defined target is problematic in terms of international humanitarian law because the post-conflict impact of such actions may be foreseeable and excessive in relation to the military advantage expected.

Data released by NATO⁸⁶ suggests that at least 32 CBU87 cluster munitions and eight RBL755 cluster munitions (7,640 submunitions in total) were dropped without being aimed at a clear target. Notes relating to these strikes use the following phrases:

- “Dump target area”
- “No TGT specified”
- “Could not ID a TGT within the trees”
- “No target”
- “Couldn’t ID anything Mil or Non Mil in area”
- “No flex, ordnance jettisoned”

As is illustrated in the case study opposite, RBL755 submunitions have been found in locations not thought to have contained targets during the conflict.⁸⁷

CASE STUDY: DUMPED MUNITIONS IN BAJGORA



Bajgora is situated in a remote hilly area approximately 20 kilometres from Mitrovica. Local inhabitants reported that Serbian military positions had been located several kilometres below the village towards the bottom of the valley that Bajgora overlooks. However, cluster munition contamination has been found further above the village on a field used for grazing livestock. French and Belgian engineers cleared 68 RBL755 submunitions from the site.⁸⁸ At this same site, Arben Musa was injured when he stepped on an item that exploded, severing two toes on his right foot and amputating his right arm.⁸⁹

According to clearance operators and UN coordination staff the absence of any military targets nearby and the remoteness of the location suggest that this field above Bajgora was used as a dumpsite by pilots who did not drop their munitions on the targets intended during their sorties and instead released their payloads of cluster munitions in supposedly remote locations before returning to base.⁹⁰

Correspondence from the U.K. Royal Air Force suggests that dumping munitions was not the standard practice in the absence of a target. In a letter of 7 August 2006, the U.K. RAF noted the following:

“... of the cluster munition weapons sorties flown on RAF aircraft flying sorties during the conflict in Kosovo, 67% of those cluster munitions were not released i.e. the munitions were landed still on board the carrying aircraft. Therefore, on 2 out of 3 occasions that a cluster weapon was flown, it was not released.”⁹¹

Despite evidence to suggest RBL755 were occasionally dumped in Kosovo, the U.K. has subsequently stated in a working paper to the CCW that “the U.K. does not regard it appropriate to use cluster munitions when the coordinates or location of a target are not known.”⁹² It is not clear if this also relates to situations where possible targets are under cover of foliage – one of the specific justifications for cluster munition use in Kosovo.

3.1.1 Jettisoned weapons due to ‘technical problems’

During the conflict, NATO was discovered to be using a set of designated areas in the international waters of the Adriatic Sea as locations for pilots to jettison munitions that they did not feel safe to land with. Three Italian fishermen were injured after trawling up a submunition in their nets.⁹³ In a NATO press conference of 14 May 1999, Major General Walter Jertz explained the practice:

“In rare cases weaponry cannot be dropped because of a technical malfunction of the aircraft and the aircraft cannot land with these kind of weapons and then of course the pilots do have to drop these weapons in an area which they know ... and we make sure if we have to do it – and it is only in a few rare cases where we have had to do it – we make sure by overflying the area first to see there is nobody there and then these weapons are jettisoned there.”

In the wake of these incidents it was reported that the Italian Government had not been informed of the practice and teams had to be dispatched to the area to undertake clearance operations.

In addition to the 40 cluster munitions apparently dropped without specific targets (discussed above), data released by NATO indicates some 10 CBU87 cluster munitions were dumped in the Adriatic (containing some 2,020

submunitions) and at least 3 CBU99 (containing 741 submunitions in total) jettisoned elsewhere.⁹⁴ Although Major General Jertz pointed to technical malfunctions of the aircraft as necessitating such actions, the NATO data indicates wet runways and evasive manoeuvres were also responsible for such decisions; in the NATO data, only one out of five incidents of weapons being jettisoned notes a likely technical fault ('hung weapon').⁹⁵



Ferki Peci (pictured) and his brother Lan, joke about being rejected. They had applied for jobs with the Kosovo Police, but both were turned down. Two days later they survived a cluster munition accident. "We made an application for the other world but they are not accepting us either, it seems that nobody wants us," they laugh.

3 days after accident, KFOR and the Kosovo Protection Corps destroyed 3 more items in this area. Again it is accidents amongst the civilian population that are leading the remaining clearance teams to find the items of ordnance.⁹⁷

4.0 Civilian harm at the time of attacks

Data gathered by Human Rights Watch indicates 75 deaths and injuries during the bombing campaign in Kosovo that were likely to have been caused by cluster munitions. The total sample of possible casualties is 355.

The reasons for these incidents (as they are reported) included errors in targeting, inaccuracy of delivery and wide-area effects of the munitions. Of these, errors in targeting are recognised as problems not specifically relating to the type of munition used.

Although a number of sources have reported that cluster munition use was suspended during the bombing campaign due to concerns about accuracy, NATO bombing records show cluster munition use continuing throughout.

Data released by NATO provides an indication of the expected inaccuracy and wide area affect of these weapons. Whilst the theoretical average area of a strike with CBU87 cluster munitions was 13,712 m² this rises to 133,405 m² when “additional errors associated with weapon delivery by aircraft” are taken into account. This larger figure is very similar to the average area of cluster strike clearance tasks (142,080 m²) in 217 clearance records analysed for this report.

From the reports available, civilian harm from cluster munitions at the time of attacks can be attributed to errors in targeting, problems relating to accuracy and the wide area affected by this category of munitions. Gathering accurate data on civilian harm during attacks is very difficult. The different parties to the conflict have competing agendas which condition how they represent those incidents of civilian harm that do occur. Humanitarian agencies have only limited access to the affected areas. In this section we consider in turn some of the different causes of civilian harm at the time of attacks based on a catalogue of incidents compiled by Human Rights Watch.

In an analysis of the civilian impact of Operation Allied Force⁹⁸, Human Rights Watch recorded 90 individual incidents in which civilian harm could be reasonably corroborated. Out of these they identified seven confirmed and five likely incidents as involving cluster munitions. However, for the purposes of this report we re-categorised the Human Rights Watch incidents identifying all those incidents that allege cluster munition use and dividing these into three levels of confidence.

We then examine only the 13 incidents that occurred in the province of Kosovo (as opposed to elsewhere in Serbia.) It is important to note therefore that this analysis does not relate to the totality of cluster munition casualties at the time of attacks during Operation Allied Force as a whole.

The individual incidents and the relevant categorisations are contained in Annex A to this report.

This approach identifies a total of 13 incidents which can be divided into three confidence levels as follows:

	Based on HRW report of:	Number:
Confidence level 1	Submunitions found / cluster strike clearly described / photo-documentation provided / linked to an earlier confirmed incident / strong evidence even if use is contested.	5
Confidence level 2	Some evidence reported to be found / use explicitly contested despite some evidence	5
Confidence level 3	Report with little substantiation / explicitly noted that “no evidence” is available.	3

From the reports of casualties recorded by Human Rights Watch, these 13 incidents can be related to approximately 169 deaths and 186 injuries. It should be noted that in some cases cluster munitions are not reported or alleged to have been the only munitions used in the incident.

Approximate civilian casualties from incidents involving cluster munitions in Kosovo



This data can be further analysed to draw conclusions about the specific cause of the civilian casualties from individual incidents.

4.1 Errors in targeting

Of the total of approximately 355 deaths and injuries in these reports some 279 seemed to result primarily from errors in targeting. Such errors involved mistaking civilian convoys for military vehicles and mistaking groups of civilians for military personnel. Such incidents involved the civilian group being purposefully (if mistakenly) targeted and therefore subject to more sustained attack than might result from individual munitions going wide of the target, or where the area-affect overlaps a military target and civilian objects. Not surprisingly given the high levels of civilian harm resulting from such incidents, NATO’s role in these attacks was strongly contested at the time and in some cases still is.⁹⁹

It is hard clearly to assert that the use of cluster munitions made these incidents substantially worse than if only unitary munitions had been used.

4.2 Inaccuracy

Of the 13 incidents in Kosovo only two were explicitly related to cluster munitions landing away from their targets. These incidents were responsible for 12 deaths and injuries according to the reports compiled by Human Rights Watch.

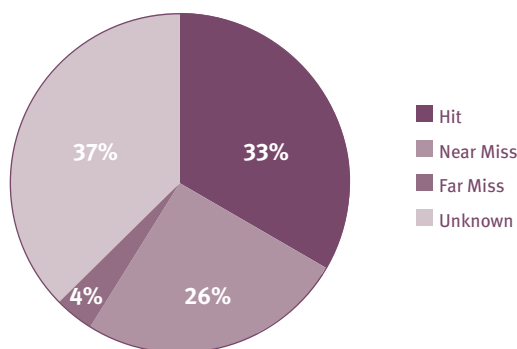
When a cluster munition went astray on 7th May 1999 and landed in the town of Niç in Serbia causing more than 40 deaths and injuries, serious concerns were raised about the accuracy of these munitions and NATO apologised for the casualties caused.

Such high-profile incidents aside, other military sources have noted problems with the accuracy of cluster munitions. One U.S. Air Force Major noted after the conflict:

“It does not matter how proficient the aircrew is if the platform cannot deliver the munition with the requisite accuracy ... An excellent example is the British GR-7 during Allied Force. The RAF pilots were some of the most professional and well-trained pilots available. However, at medium altitude the GR-7 was extremely inaccurate delivering the BL-755 cluster bomb unit. This was due to a lack of a computed delivery solution for the BL-755, requiring a modified manual delivery from medium altitude with the aid of an Electro-Optic targeting pod. First canister impacts were recorded as far as 1-2 km from target.”¹⁰⁰

Such an analysis is reinforced to some extent by assessments of whether such munitions hit or missed their intended targets. The U.K. RBL755 targeting data suggests only 36% of individual cluster strikes were initially considered as hits.¹⁰¹

UK RBL-755 cluster strikes initially reported as “hit” or “miss”



4.3 Wide area effect

The wide area effect (or ‘footprint’) of cluster munition strikes is closely linked to ‘inaccuracy’. If such a footprint is considered to have missed a point target (as seems to have been fairly common from the data above) then outlying munitions may land a substantial distance from the original aim-point.

In the Human Rights Watch data the two incidents suggesting inaccurate delivery of cluster munitions, along with another five in which civilian harm was reported, occurred in or near areas of identifiable civilian concentration – villages, towns or cities. These seven incidents altogether accounted for some 73 deaths and injuries.

It is very important to note that of the cluster strikes reported by NATO in Kosovo, the great majority were not in areas of civilian concentration. This is to be commended and no doubt served to limit the number of casualties incurred at the time of attacks.

4.3.1 Evidence regarding “area affects”

A further understanding of the area effects and inaccuracy of cluster munitions can be gained from examining data provided by NATO to mine clearance authorities in the immediate aftermath of the Kosovo bombing.¹⁰² As well as providing information on the probable locations of cluster munition strikes NATO data also provides suggested “inner” and “outer” “rectangles, circles or ellipses” relating to the possible spread of submunitions.

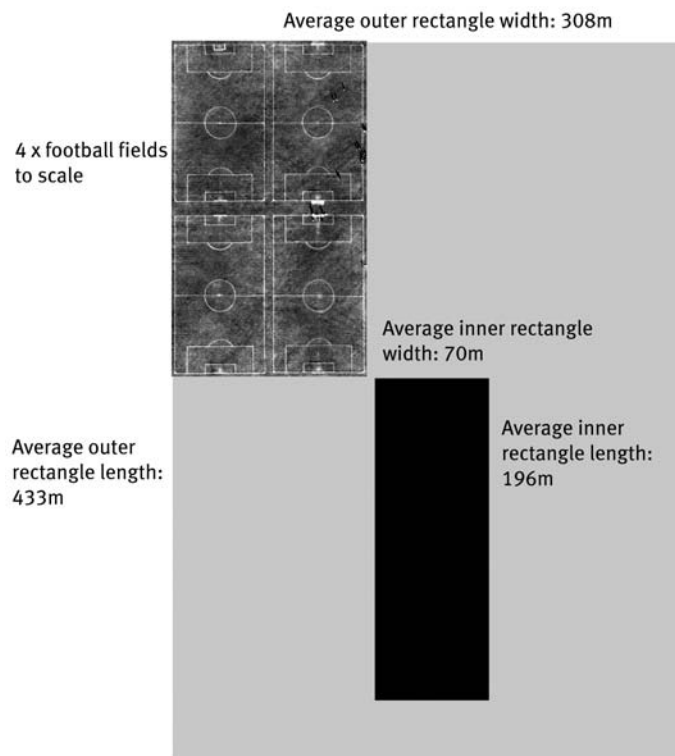
The inner rectangle conveys the “probable dimensions of bomblet dispersal area around the designated location.” The outer rectangle conveys the “probable dimensions of bomblet dispersal area around the designated location, including additional errors associated with weapon delivery by aircraft.”

Comparison of the difference between these values provides us with an indication of the acknowledged inaccuracy in the area-effect of these weapons.

For a set of 184 CBU87 strikes (involving a total of 572 CBU87 munitions – containing in turn 115,544 BLU 97 submunitions) the average predicted ‘inner rectangle’ was 13,712 m² (approximate equivalent to two football fields.) However, the average ‘outer rectangle’ was predicted at 133,405 m² (approximate equivalent to 18 football fields.)

The figures used by NATO to create such estimates of the outer rectangle may well err on the side of caution. The purpose of the estimate is an effort to ensure clearance personnel are not too narrow in their expectations of where submunitions made be found in relation to intended targets (so as to assist in the effective clearance of post-conflict contamination.) Also it must be reiterated that these strikes contain an average of 3.1 cluster munitions (containers) per area. Even the inner areas of strikes where only one cluster munition was used are greater than the spread patterns estimated for single munitions based on data derived from the Joint Munitions Effectiveness Manual¹⁰³ and little overlap is factored into those strikes involving multiple munitions.

However, the sheer scale of possible error or variance in the location of submunitions, as acknowledged in this official data, is striking.



Comparison of average inner and outer CBU87 strike contamination areas as expected by NATO

5.0 Post conflict contamination

Political and military leaders asserted that in their propensity to suffer some degree of failure, and therefore to cause some level of post-conflict contamination, cluster munitions and unitary munitions were essentially the same. These assertions were false.

From an analysis of 217 clearance survey reports relating to tasks addressing cluster munitions contamination we find the following:

- An average of 34 unexploded submunitions cleared per task.
- Average area cleared per site: 142,080 m²
- Average area cleared per submunition: 4,179 m²
- Average time worked per submunition found was 18 hours.

A substantial proportion of contamination was found below the ground rather than on the surface.

A range of estimates have been made for the failure rate of cluster munitions in Kosovo. Without better data it is not possible to draw definitive conclusions about failure rates.

Organisations that appealed against the use of cluster munitions during the bombing in Kosovo noted the history of high levels of unexploded ordnance contamination resulting from this type of weapon.¹⁰⁵ In this section we examine the arguments put forward in opposition to these predictions and then examine data regarding the actual patterns of contamination produced by the bombing. In the next chapter we analyse the casualties that resulted from this contamination.

5.1 Arguments that cluster munitions would not produce a particular problem of unexploded ordnance

Both during and after the conflict, political and military representatives of the U.K. and the U.S.A. argued that in their propensity to create contamination with unexploded ordnance, cluster munitions were much like any other weapons in the arsenal. In part this was to counter the suggestion that cluster munitions were akin to anti-personnel mines. More broadly it sought to suggest that cluster munitions, as a category of weapons, were not significantly different to other conventional weapons in the problems they may cause.

At a U.S. DoD News Briefing, in May 1999, Major General Chuck Wald stated:

Now these cluster bombs, you mentioned, I think, earlier to Mr Bacon, that there are some duds in there. Very few. But when they are, it's like any other unexploded ordnance. This is not a mine. There is no proximity on it where if you walk by or make the ground rumble or anything like that it's going to go off. So they're just like any other unexploded ordnance any place in the world. But they are not a mine. They have no timers on them whatsoever or anything like that. I think it's just like a 500-pound bomb, except there are several of them in a cluster. That's the way I'd characterize it.¹⁰⁶

In a letter of 26 July 1999, U.K. Prime Minister Tony Blair presented the issue in the same way:

The bomblets (submunitions) within cluster bombs are designed to detonate on impact, but, as with other, similar munitions, a small percentage may fail to do so. This does not make them illegal under any treaties or conventions.¹⁰⁷

A similar line of argument was employed by U.K. officials when senior military figures and civil servants were called to give evidence before the House of Commons Defence Select Committee in March 2000:

Q. 261: Is there thought to be any political sensitivity about the use of ... cluster bombs ...?

Air Commodore Morris: ... As far as cluster bombs were concerned, everybody was well aware of cluster bombs, the nature of them and the possibility of unexploded ordnances. The same applies, of course, to conventional weapons as well, 1,000lb bombs, you can have some that fail to detonate, so we are extremely aware of that and none more so than the air crew who are asked to release them and to make sure that they always use the minimum number of weapons and only on the appropriate occasions.

This answer again asserts that the likelihood of unexploded ordnance is basically the same whether we are talking about cluster munitions or other unitary weapons. These assertions are misleading for a number of reasons:

5.1.1 The number of explosive items deployed

The sheer number of submunitions deployed radically alters the probability of unexploded items being produced. A comparison can be made by considering data on the spreadsheet “UK weapons record” submitted by the U.K. MoD to UNMIK.¹⁰⁸ This specific sheet details some 340 unitary bombs and 496 cluster munitions being dropped during the air campaign. If we accept, simply for the purposes of this example, that the unitary munitions and the submunitions have the same failure rate of 5% then the following numbers of unexploded items might be expected:

Munition type	No. dropped ¹⁰⁹	Likely no. of unexploded items at a failure rate of 5%
Unitary bombs	340	17
BL755 cluster munitions	496 x 147 submunitions	3,646

It is very obvious even from this simplistic analysis that cluster munitions will create particular problems of unexploded ordnance contamination as a result of the number of individual explosive items deployed (regardless of issues relating to the ‘failure rate’ of the individual submunitions.)

5.1.2 Submunitions may have a greater propensity to cause casualties

The likelihood of members of the civilian population having accidents with cluster munitions, rather than larger unitary bombs, also seems to be greater. As John Flanagan, Programme Manager for the UN Mine Action Coordination Centre in Kosovo reported to the UN Convention on Certain Conventional Weapons:

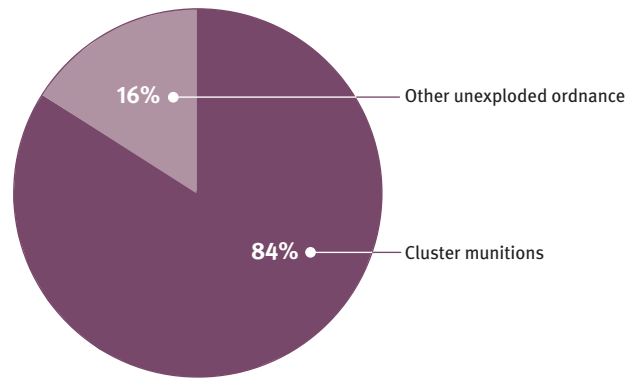
Experience from Kosovo showed that sub-munitions were likely to cause multiple casualties (including fatalities), and that a high proportion of victims were under the age of 18. This was because the shape and colour made them appear “toy-like”, and the destructive power and lethality of the weapons was completely misunderstood.

One of the key lessons learned from Kosovo was that submunitions needed to be singled out for particular attention as part of the awareness campaign. To simply include cluster bombs as part of a generic UXO threat was not sufficient, given the threat that they posed.¹¹⁰

The data on civilian casualties in the years after the conflict clearly indicates that cluster munitions were more problematic than other forms of unexploded ordnance:¹¹¹

Comparison of reported casualties from cluster munitions with other types of unexploded ordnance (not landmines)

June 1999 to end 2001



In section 7 later in this report we examine the ‘individual risk’ presented by submunitions (based on a combination of casualty data and data on the quantity of items presenting a threat.) This analysis shows that submunitions were very similar to anti-personnel mines in the risk they presented to the local population – with individual submunitions presenting an approximately 600% greater risk than other individual items of ordnance.

5.1.3 Failure rates are likely to be higher for submunitions than for unitary munitions

The failure rates of cluster munitions are likely to be higher than those of unitary munitions because the process of delivery involves more stages and at each of these stages failures can occur that result in unexploded ordnance. However, establishing reasonable estimates for failure rates is very difficult, an issue that we examine in more detail later in section 5.3.

5.2 Analysis of cluster munition clearance tasks

Landmine Action has undertaken an analysis of the ordnance clearance records relating to cluster munitions held in the Information Management System for Mine Action (IMSMA) in Kosovo. In this analysis we have compiled available data from 217 ‘clearance survey reports’ that recorded clearance of BLU97, RBL755 or MK-118 submunitions.

5.2.1 Limitations of this data

Landmine Action was only able to print the clearance survey reports from IMSMA for subsequent analysis. As a result the types of analysis possible are perhaps more limited than if the data was being interrogated directly through the IMSMA system.

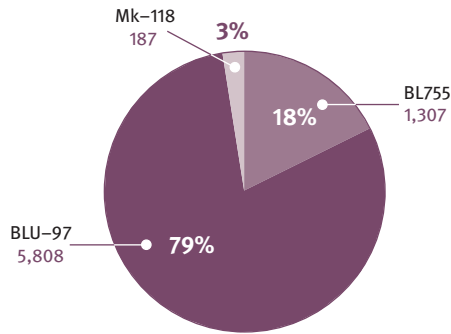
The 217 clearance survey reports examined do not represent the full total of clearance tasks undertaken in Kosovo that relate to cluster munitions. However, we are not able to provide a clear indication of what that total is.

Furthermore it is possible that other work was conducted on these same sites without being recorded on these completion reports (such as surface clearance by KFOR troops prior to the establishment of UN coordination).

5.2.2 Numbers and proportions of different submunitions found

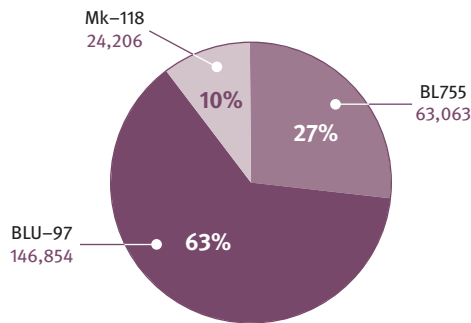
Within the 217 clearance survey reports, 7,308 submunitions were reported cleared. This figure was broken down as follows:

Proportions of submunitions found in 217 Kosovo clearance survey reports



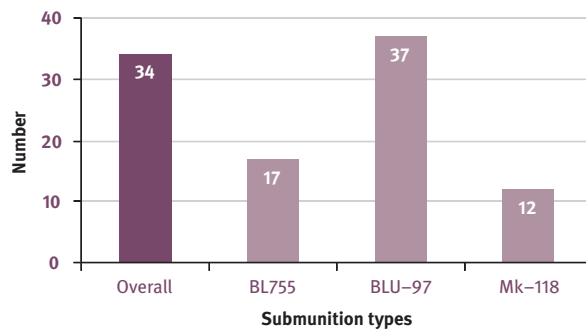
This can be compared with the proportions of different types dropped during the bombing:

Proportions of submunitions known to have been dropped in Kosovo



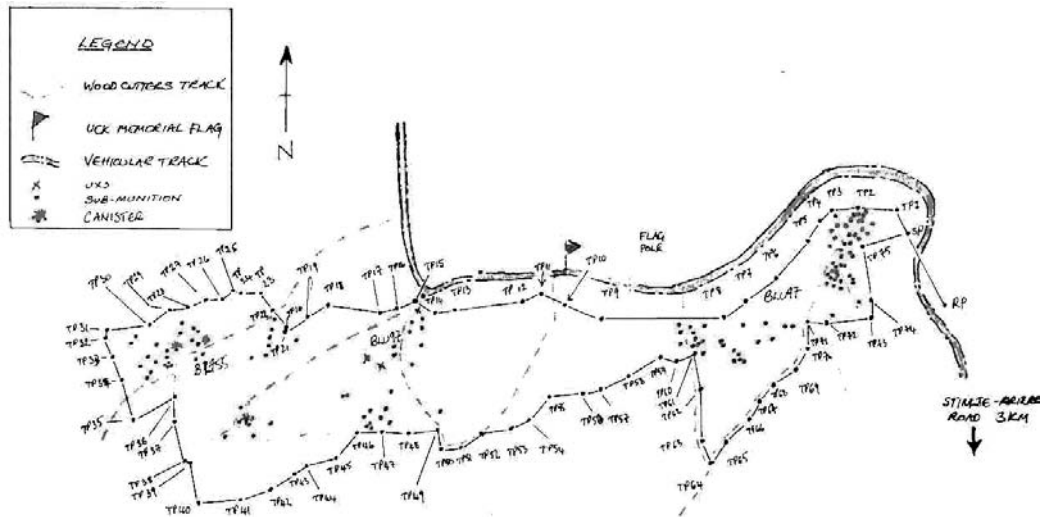
Further to this it is possible to provide average (mean) numbers of individual submunition types cleared from each clearance site where these types of submunitions are found:

Average number of submunitions of different types found per clearance site where such types were present



Of the different clearance survey reports, 40 contained mixed contamination, 124 contained BLU 97 only, 50 BL755 only and three Mk-118 only.

Beyond arguments about failure rates these figures provide a useful indication of the types of problems cluster munitions caused in the province. With an average of 34 unexploded submunitions being found and destroyed in each location where cluster munition clearance was undertaken an impression is given of the density of contamination that these weapons caused.



Sketch map showing the location of more than 120 BLU97 and BL755 submunitions (source: Handicap International)

5.2.3 Area cleared

176 clearance survey reports recorded the size of area cleared as greater than 1m². The total area cleared in these reports was 25,006,048 m² or 25 km² – this is the equivalent of some 3,300 football fields.

The average area cleared for each clearance survey site was 142,080 m² – broadly in line with the 133,405 m² estimated for the average suspect area in the NATO data (see section 4.3.1 previously)

With 5,983 submunitions found on those sites where the area cleared was recorded, the average area cleared per submunition found was 4,179 m² – that is over half a football field cleared for each submunition located.

5.2.4 Work hours recorded

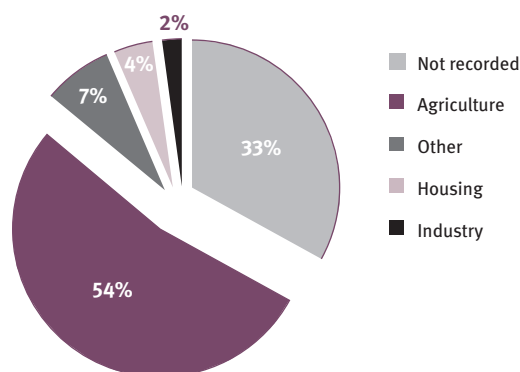
For the 146 clearance survey reports that included an indication of the hours worked per team per site the total was 78,557 hours worked.

With 4,366 submunitions found on these sites where the hours worked was recorded, the average time worked per submunition found was 18 hours.

5.2.5 Type of area contaminated

144 clearance survey reports indicated the type of land that was contaminated. Of these by far the greatest proportion recorded agricultural land as being contaminated.

Types of area recorded as being contaminated



5.3.6 Surface and subsurface clearance

It is not possible from the clearance survey reports to determine what proportion of submunitions were found on the surface and what were found subsurface. However, comparison can be made of the average number of submunitions found on sites where a clearance depth was recorded by comparison with those sites where clearance depth was recorded as zero or left blank.

The average number of submunitions found on tasks where clearance depth was recorded as greater than 5cm was 29.¹¹² The average number found where clearance depth was recorded as zero or left blank was 43.

Data provided by UNMACC to Landmine Action in 2001 reported 4,424 submunitions removed during tasks using surface clearance only and 1,690 removed during tasks that employed subsurface clearance.

The problem with both of these mechanisms of analysis is that surface-lying cluster munitions would also have been found on tasks employing subsurface clearance. Furthermore, the initial response to cluster munition contamination was structured with an emphasis on surface rather than subsurface clearance as these items were considered to pose the greatest risk to the location population.¹¹³

This resulted in numerous areas initially being considered cleared only for substantial further contamination to be discovered. The high levels of subsurface contamination are generally attributed to wet ground and ploughed fields providing a soft landing site for the submunitions – factors which may also have contributed to higher failure rates.¹¹⁴ Subsurface contamination is a particular problem because it can present a risk to people seeking to utilise land (such a ploughing fields) and is more time-consuming and expensive for ordnance disposal teams to address.

In 2002 Landmine Action published a case-study illustrating a situation of substantial subsurface contamination¹¹⁵:

Grebnik Hill lies in an area of higher ground between Pristina and the plains of western Kosovo [...] NATO bombed the Serb positions with BLU97 cluster submunitions. Evidence of five cluster bomb containers has been found during clearance of the ordnance that remains around the site [...]

During May and June 2000, teams from the HALO Trust cleared the ordnance lying on the surface. During this period, 22 individual BLU 97 submunitions were found and destroyed [...]

Having begun subsurface clearance of the site, the HALO Trust found a further 91 BLU 97s. An area which saw a particularly high incidence of surface-lying munitions remained to be cleared and the site supervisor expects to find significantly more sub-surface items before this task is completed.

With 202 individual munitions in each of five cluster bombs, this site appears to have had some 1,010 submunitions dropped on it. If this is correct, the 113 unexploded bomblets found so far suggest a failure rate already in excess of 11 per cent and technicians working on the site expect this to rise.

In the case study of Grebnik cherry orchard, some 22 individual BLU97 bomblets were found during surface clearance of the whole site, and a further 91 had already been found during subsurface clearance at a time when a significant part of the site still needed to be covered. In this example the proportion of subsurface UXO was greater than 80 per cent.

Weaknesses in information on cluster munition strike locations

A discussion paper prepared by John Flanagan, former Programme Manager of the UN Mine Action Programme in Kosovo, for the United Nations Mine Action Service (UNMAS) highlighted the shortcomings of the NATO data as a basis for clearance activities:¹¹⁶

There were a number of factors that hindered the clearance of sub-munitions in Kosovo. In some instances, incomplete and/or inaccurate reports were provided to the UN, and this was largely due to a lack of familiarity with the information required. Furthermore, delays in providing updated information over a period of 12 months led to conflicting reports, which affected the overall credibility of the information.

The inaccurate information meant that survey teams were often unable to locate the cluster bomb strike sites [...]

Because of these difficulties, additional information such as the direction of flight of the aircraft was requested, in an effort to narrow down the search area. [...] This, and other important information that was recorded by the coalition air forces should have been provided immediately following the cessation of hostilities so as to facilitate rapid removal of the sub-munition threat [...]

Such difficulties point to limitations in the extent to which Article 4 of Protocol V to the CCW¹¹⁷ will be capable of ensuring an adequate level of protection for the civilian population even when implemented by some of the best organised military forces internationally.

5.3 Failure rates

Concern over the post-conflict impact of cluster munitions is often presented in terms of the high failure rate of these munitions. As we have noted previously, even if the failure rates of submunitions and unitary munitions are the same, cluster munitions produce a far greater quantity of unexploded ordnance as a result of the number of explosive submunitions that they contain. Therefore we should be cautious about placing too much emphasis on failure rates as opposed to other factors. Whilst different estimates are often put forward for the failure rates of different types of cluster munitions in different contexts it is often difficult to determine the evidence that underpins such assertions.

5.3.1 Secondary source estimates of failure rates

Various sources have presented estimated failure rates of cluster munitions in Kosovo:

- Information provided by the U.S. Air Force to the UNMACC used 8% as a working estimate of the number of unexploded BLU 97 submunitions likely to result from a CBU87 strike.¹¹⁸
- A UNIDIR report on cluster munitions in Albania states that “the United Kingdom Explosive Ordnance Disposal (EOD) unit of the Multi-National Brigade (Centre) found that the failure rate of BLU97 was 7.1% and BL755 submunitions was assessed at 11.8%.”¹¹⁹ However, the original source for this material is a website – and the website managers are no longer able to identify where the information came from.¹²⁰
- ICRC have stated that: “According to NATO’s own estimate of a 10% failure rate, some 29,000 unexploded submunitions remained in the area, many in or near populated areas. Others, however, estimate failure rates at 3% to 26% per canister, with the average failure rate falling between 10% and 15%.”¹²¹

- John Flanagan, former Programme Manager for the United Nations Mine Action Coordination Centre in Kosovo has referred to “an overall failure rate of about 12% although some areas could be up to 30%.”¹²²

As both the ICRC and John Flanagan’s comments highlight, a particular difficulty in approaching failure rates is the wide variation between one location and another.

5.3.2 An overall estimate

It is very difficult to establish reasonable estimates of failure rates based on the data available from Kosovo. In particular the absence of data on ordnance disposal conducted prior to systematic management of clearance information by the UN Mine Action Coordination Centre means unknown quantities of ordnance were cleared but cannot be linked back to strike sites in the information management system.

Up to the end of 2001, the Landmine Monitor reported 15,940 cluster munitions had been cleared in Kosovo. This number is reported to be derived from the “UNMIK Mine Action Programme Annual Report 2001,” to which “Landmine Monitor has added in the 7,455 submunitions cleared by KFOR.”¹²³ No reference is given to the source of this KFOR figure despite it accounting for almost half of the submunitions cleared. By the end of 2005, the Landmine Monitor records the total number of submunitions cleared as having risen to 18,318.

We established at the beginning of this report a minimum of 234,123 submunitions dropped in Kosovo.

If we accept the Landmine Monitor figure for cluster munitions cleared and this recognised minimum figure for cluster munitions deployed we have an estimate of 7.8%.

There remain unknown numbers of submunitions that were cleared by local people, by Serb forces and by NATO troops without being effectively reported. Furthermore cluster munition have been cleared since the time covered by this data and an unknown number of submunitions remain to be cleared. Access to evidence on all of these factors would increase our estimate of the failure rate. However, because of uncertainty about the actual number of cluster munitions deployed in Kosovo (and the provenance of the clearance data) other additional evidence could have the opposite effect.

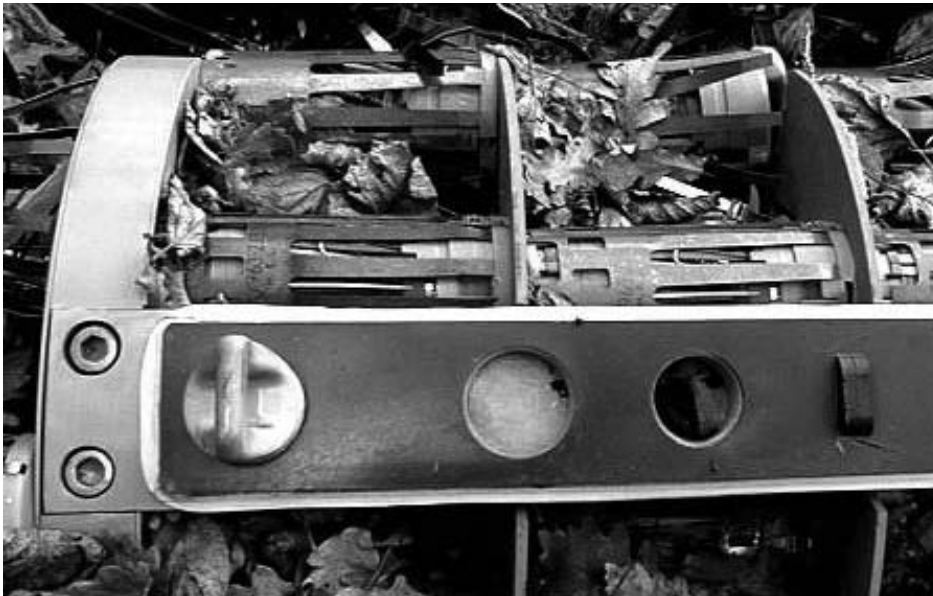
5.3.3 What difference does it make?

A reasonable response to such calculations is to ask what difference they make. On one level a case can be made for the significance of such figures. Better understanding of the performance of such munitions in actual operations would allow a better appreciation of the problems that their future use might cause. Some states (such as the U.K.) assert that they evaluate the likely future impact of unexploded ordnance on the civilian population when undertaking proportionality evaluations at the time of attacks. If this were being done with any degree of rigour, information on the actual failure rates of munitions would be a significant aide to such processes. Indeed without such information it is difficult to understand how such an evaluation can reasonably be made.

However, failure rates can serve only as a crude proxy for future civilian harm. Failure rates must be seen in the context of the number of submunitions used if they are to provide any indication of the probability of unexploded ordnance being created or the likely number of unexploded items that will be left behind after attacks. In turn, the relationship between numbers of unexploded items in an environment and actual civilian harm is not at all clear. This is brought out in our calculations of ‘individual risk’ for different categories of ordnance (see section 7). In that analysis we find unexploded submunitions caused 7.8 casualties per thousand items whereas other unexploded ordnance caused 1.3 casualties per thousand items. This 600% difference in magnitude is regardless of the quantities of contamination. Various factors could be proposed to explain such a difference (such as the size and shape of submunitions being attractive to children, or the possibility that large quantities of general unexploded ordnance were found in stockpiles where their threat to the population was limited) but they would all be factors extraneous to the failure rate of the submunitions.

Finally, analysis of failure rates should not obscure attention from the need to discuss what level of civilian harm from unexploded submunition contamination is considered acceptable. NATO has never presented any substantive post-conflict assessment that the cost of civilian lives, and the cost in humanitarian funds, was considered satisfactory, acceptable or appropriate in relation to the direct and concrete military advantage achieved through the use of these specific weapons.

What is more disturbing is the lack of interest amongst key user-states in developing a better understanding of these issues. We return to this in the final section of the report.



RBL755 submunitions inside a crashed container. At least 11 NATO missions reported cluster munitions failing to release their submunitions before striking the ground. (Photo from UNMACC)



Avdullah Halili witnessed a 14 year old boy, Driton Limani, being killed by a cluster bomb. It was the Summer of 2000 and a group of friends were taking a shortcut through the forest to fields where they were supposed to be planting crops. Avdullah told him not to touch the cluster munition but he picked it up anyway. He died before reaching the hospital.¹²⁴

5.4 Yugoslav cluster munition stockpiles

Contamination from stockpiled cluster munitions was amongst large quantities of other ordnance after NATO planes had bombed a VJ ammunition compound at Goles (not far from Pristina airport). Over a period of four and a half months in 2000, the clearance organisation BACTEC destroyed over 6,500 items of UXO at this location (despite KFOR units already having worked on the site.) These items included aircraft bombs, high explosive projectiles, air-to-air missiles, rockets and mines as well as British manufactured (but apparently VJ stockpiled) BL755 cluster munitions.⁹⁶



BL755 cluster munitions at a VJ ammunition compound, Goles. Considered by ordnance disposal operators to be part of the stockpile rather than part of the attack. Photographs © Kevin Bryant.

6.0 Post-conflict civilian harm

Cluster munitions have caused at least 152 post-conflict casualties to date. Most of these casualties occurred in the few months immediately after the bombing.

- There were an average of 2.4 casualties per incident.
- 32% of cluster munition casualties were killed and 68% injured – this compares with less than 8% killed for anti-personnel mines.
- Some 97% of cluster munition casualties were male.
- The average age of cluster munition casualties was 20 yrs old. Some 67% of casualties were 19 or younger.

The impact of cluster munitions in Kosovo was reduced by one of the largest humanitarian operations ever undertaken, including one of the best resourced mine action projects ever mounted. Despite this areas of cluster munition contamination remain to be cleared in Kosovo more than 7 years after the conflict.

More NATO troops were killed by unexploded NATO submunitions after the conflict than were killed by Serb forces during the war.

6.1 Casualty data

Data provided by the UNMACC to Landmine Action in 2001 provides detailed information on cluster munition casualties from incidents dated between 16 June 1999 and April 2001. The spreadsheet contains records of 142 casualties resulting from cluster munitions¹²⁵ and records of 328 casualties caused in other explosive incidents.

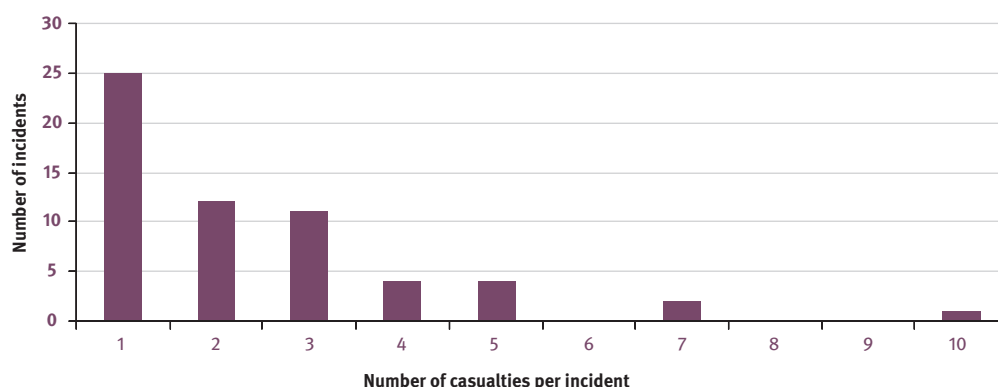
However, for the period from April 2001 to the present data does not seem to be available in as clear and detailed a format. Available records indicate at least 10 further casualties from April 2001 to May 2006.

The incidence of casualties from explosive incidents declined rapidly and from the latter part of 2000 it remained at a fairly low level. Analysis of the detailed dataset therefore captures the great majority of the total casualties.

6.1.1 Incidents

The total of 142 recorded cluster munition casualties for the period June 1999 to April 2001 were incurred in 59 individually identified incidents. This produces an average of 2.4 people involved in each event. The spread of casualties across events can be represented as follows:

Frequency of incidents involving different numbers of casualties



One of the incidents that caused seven reported casualties was described by the International Committee of the Red Cross (ICRC) as follows:¹²⁶

[On] 11 March 2000, between two villages south of Kosovska Mitrovi/Mitrovice, [a group of] eight children aged between 10 and 16 years went to a nearby hilltop to visit the site where a KLA soldier had been killed. The hilltop was allegedly used by the Yugoslav army and Serbian police during the conflict and had been targeted with a cluster bomb strike. The area was not marked as dangerous, despite previous reports of cluster bomblets in the area.

The children found two unexploded BLU97s, and two of the elder children started to play with them. One of these, a 16-year-old, claimed to have hit a bomblet on the ground a number of times without it having exploded, despite being reportedly warned by the others not to do so. He then threw it to one of the other friends whereupon it exploded in mid-air, killing one 12-year-old boy and seriously injuring his ten-year-old brother. The six other children were also injured, though not seriously.”

6.1.2 Mortality

32% of cluster munition casualties were killed and 68% injured – this compares with less than 8% killed for anti-personnel mines. Injuries amongst those that survived cluster munition incidents included loss of feet, loss of legs, loss of hands or fingers, loss of arms, loss of sight and loss of hearing and other injuries.

In addition to permanent disabilities (such as loss of limbs, sight or hearing) a VVAF survey of mine and UXO incident survivors (in general) found some “75.7% of interviewees [said] they suffer from one or more outstanding health problems. Among the most common are pain, remaining shrapnel, and difficulty moving an arm or leg.”¹²⁷

6.1.3 Gender

Some 97% of these cluster munition casualties were male. Similarly, 93% of anti-personnel mine casualties were male over the same period.

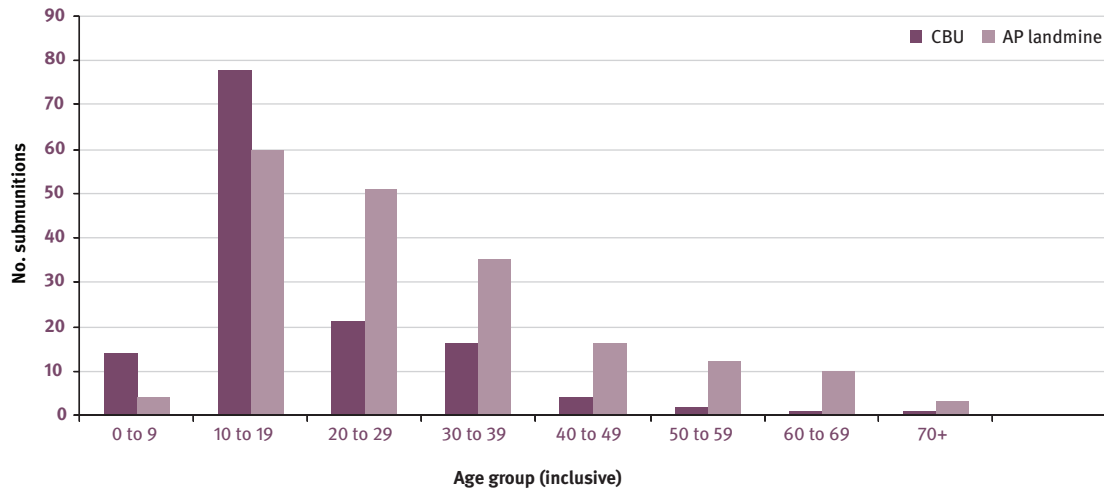
The general tendency of ordnance casualties to be predominantly male has been discussed elsewhere.¹²⁸ Landmine Action’s 2001 report on unexploded ordnance and post-conflict communities discussed specific issues regarding men’s accidents with unexploded ordnance in Kosovo.

6.1.4 Age

The average age of cluster munition casualties was 20 yrs old. However, some 67% of casualties were 19 or younger. According to the VVAF socio-economic survey of mine and UXO survivors when incident survivors are predominantly young “their rehabilitation and reintegration must be looked upon as a long-term issue.”¹²⁹

The age distribution of cluster munition casualties by comparison with anti-personnel mine casualties recorded in the same data set is represented in the following chart:

Distribution of cluster munition casualties in Kosovo (June 99 to April 01) by age group



With the overwhelming majority being male and a substantial majority being adolescents this pattern is in line with data from other environments regarding the demographics of ordnance casualties.¹³⁰ Such analyses have highlighted deliberate risk taking as being a significant element in such patterns (warning against an assumption that such incidents result wholly from ignorance.)

The following incidents, reported by the ICRC, highlight children’s interaction with ordnance.¹³¹

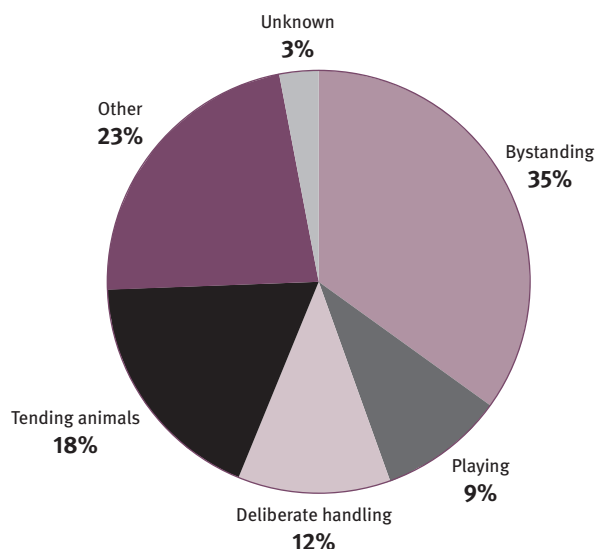
On 24 September 1999, in Vitina/Viti municipality, two 12-year-old boys were injured by a cluster bomblet while playing with it. One underwent an above-knee amputation and lost the toes of his left foot, the other had fragmentation injuries to his chest and back. The same month, in a village nearby, four children were killed and two other individuals – one a 21 year old adult, the other a child – were injured by a BLU97 that the children had been hitting with a stick.

6.1.5 Activity at the time of accident

The patterns of activity recorded at the time of accidents can also be interpreted in relation to this demographic data:¹³²

Activities at the time of cluster munition accidents in Kosovo

(June 99 to April 01)



The category of “bystanding” relates to people being killed and injured in accidents triggered by the actions of others (or possibly of animals). As such they often indicate multiple casualties being caused in a single incident.

Of 48 casualties reported as bystanders, 40 were injured rather than killed. The proportion of people killed rises to 42% if records relating to bystanders are discounted – suggesting a high mortality rate for people in direct contact with these munitions at the time of detonation.

The activities of ‘playing’ and ‘deliberate handling’ have some scope for overlap. As has been noted elsewhere deliberate contact and risk-taking with unexploded ordnance by adolescent boys (usually in small groups) is a common cause of accidents. Tending animals tends also to be an economic activity associated with adolescent boys (and may be an activity that brings them into contact with unexploded items that are then played with or deliberately handled.)

Fear for the safety of children can also result in adults engaging in risk behaviour with unexploded cluster munitions. An example from October 1999, recorded by Mines Advisory Group (MAG), highlights elements of this:¹³³

“A group of children had found an unexploded bomblet close to [Musa] village and after returning home talked excitedly about the unusual, bright yellow, cylindrical object. Worried villagers told them to stay well away.”

“Despite warnings, a villager spotted the children standing next to the bomblet the following day, debating whether or not to pick it up. The villager, a man named Gani, told them to leave it alone and to leave the area immediately. He decided to move it out of the way to prevent the children from tampering with the device. It exploded as he picked it up, killing him instantly and injuring one of the children, Albin. The boy lost a hand and suffered serious fragmentation injuries.”

6.1.6 Cluster munition casualties amongst NATO troops

On Tuesday, June 22, 1999 two British Gurkha officers and two Kosovars were killed when collecting together NATO-dropped BLU97 cluster munitions prior to destroying them. The incident was closely reminiscent of an accident in the Gulf War when seven U.S. troops were killed whilst stacking together BLU97 munitions. Whilst rightly paying tribute to the troops involved, U.K. Prime Minister Tony Blair's comments in the immediate aftermath of the incident did not acknowledge the role of NATO cluster munitions:

Tony Blair: They were performing very dangerous work. This was an ammunition dump that was in a school, it may well have been booby trapped by the Serb forces. And it shows I am afraid the dangers that our forces are running the entire time in Kosovo – and also I think it emphasises their courage and their bravery and the pride I think we can feel in them.

Interviewer: It also I think has implications for the danger of civilians making an early return to Kosovo.

Tony Blair: Kosovo is still a dangerous place. We have got the Serb forces out, the NATO forces are in. But we are having to work very hard to remove the mines... this was an ammunition dump in a school. It was left there by the Serbs and could well have been booby trapped – we simply don't know at the present time [...]

Interviewer: Will this have, I suppose it must, have some effect on the way the forces do their duty in policing the areas and controlling the return of Kosovo refugees to their homeland?

Tony Blair: We always knew there were going to be these types of difficulties. We've had Serb forces and paramilitaries in there, they have been carrying out the most appalling acts – this was an ammunition dump *in a school*... and it may well have been booby-trapped ... so there is no doubt about the dangers our forces are running, and this just underlines their courage – they are tremendously brave people in carrying out this work. Its essential for us to do this work in order for the refugees to return but my goodness what a debt we owe them.

Interviewer: So the likelihood is there could be more incidents of this kind as the days pass?

Tony Blair: All the way through we have known the risks.¹³⁴

After the reassuring comments during the conflict about the low likely failure rates and about how the threat from unexploded cluster munitions is much the same as from any other type of ordnance, it is not surprising that this high-profile incident, so soon after the end of the bombing, should have been represented as something quite different from what it was. Through speculation about “booby-traps” and a tone of shock at this “ammunition dump – *in a school*”, Tony Blair suggested that these casualties were the result of the “appalling acts” of Serb forces and paramilitaries.

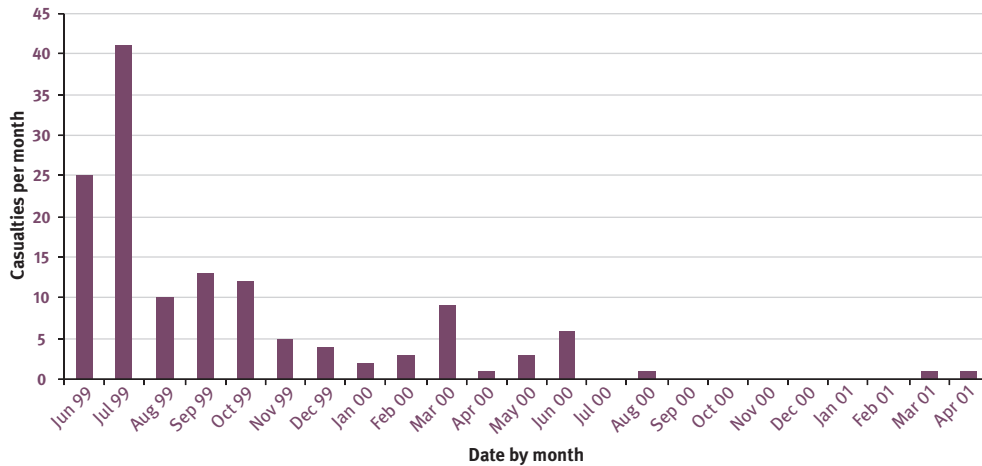
An alternative view would be that the deaths resulted from very large numbers of unexploded munitions being left in a civilian area as a result of NATO's cluster munition policy. The high level of contamination resulted in local people taking action to address the threat, and the U.K. troops responded in an effort to mitigate the risk the local population were already taking – appreciating the plight of the local population, they were trying to help.

General Sir Michael Jackson, the British commander of the international peacekeeping force, noted in response to this incident that “however much one talks about mines, unexploded ordnance and booby traps it appears we all have to learn the hard way.”

6.1.7 When casualties occurred

Casualties from cluster munitions were predominantly incurred during the very first months after the bombing campaign. Some 50% of all cluster munition casualties recorded between June 1999 and May 2006 occurred within the first two and a half months after the conflict.

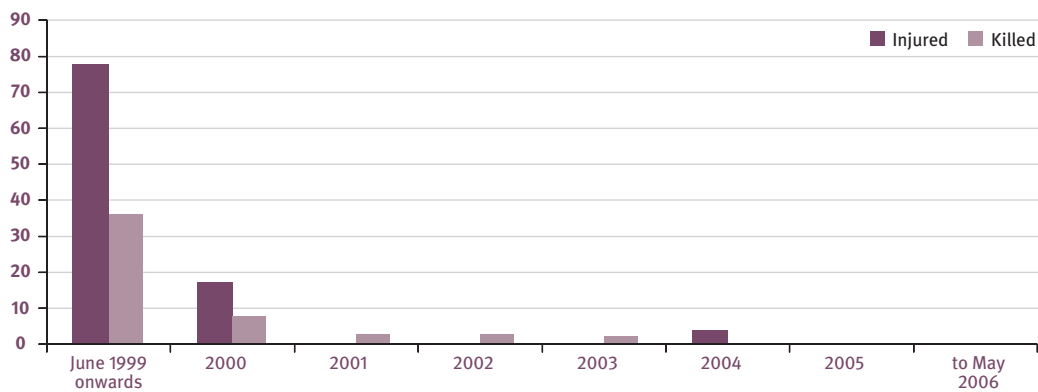
Casualties by month from 16 June 1999 to April 2001



Anti-personnel mine casualties in Kosovo follow a very similar pattern over the same period with a fairly rapid tail-off towards mid-winter 1999-2000 followed by a noticeable, though limited, resurgence in the spring of 2000.

Data after April 2001 is not available in a detailed form. Data available in country from the UN EOD Management Section indicates only 10 cluster munition casualties subsequent to incidents recorded in detail above.

Cluster munition casualties June 1999 to May 2006



6.2 Factors promoting the rapid decline in casualties

The rapid reduction in cluster munition casualties after high levels in the first few months is very significant. The ability of Kosova society to develop resilience to the threat of cluster munitions can be linked to a range of factors probably including:

- Direct learning of the local population regarding the risks posed by these items.
- Implementation of one of the largest post-conflict landmine and ordnance eradication programmes ever mounted by the international community. According to UNDP and GICHD: “The speed and size of the deployment of a wide range of mine action resources to the province of Kosovo are unprecedented in the history of humanitarian demining.... Massive amounts of mine action capacity flowed into the region. Initially, this came in the form of military engineer and EOD units but was soon followed by a wide array of commercial and NGO mine action organisations. The ratio of clearance resources to contamination is probably greater in Kosovo than in any other mine-affected region in the world.”¹³⁵
- Onset of winter reducing certain land-use demands at a critical time.
- Implementation of one of the largest overall aid operations ever mounted. Valerie Warmington noted in 2001 that: “compared to the situation faced by people living in other mine/UXO-contaminated countries, Kosovars were generally in a good position to heed the mine awareness advice given to them. This was directly related to the exceptionally high levels of assistance provided to them during the period of time during which they were most vulnerable to mine/UXO accidents.”¹³⁶

The NATO bombing was undertaken by wealthy nations that are prepared to make substantial contributions to humanitarian assistance in general and ‘mine action’ specifically. For example, between 1992 and 2005, the U.S. has been the largest single state donor to mine action internationally, the U.K. is ranked 4th, the Netherlands is ranked 6th.¹³⁷

Direct humanitarian responses to cluster munitions under the umbrella of ‘mine action’ included survey, clearance, risk education, survivor assistance and coordination. The wide variety of funding sources and funding mechanisms, including contributions in-kind, hamper efforts to produce a precise figure for ‘mine action’ funding in Kosovo. Analysis of data compiled in the 2000 to 2006 Landmine Monitor reports produces a figure of approximately \$92 million for the period mid-1999 to end of 2005.¹³⁸

There is no ready way of determining how much of this total was required to address problems of cluster munition contamination as opposed to anti-personnel mines or other UXO. In terms of numbers of items destroyed between 1999 and 2005 submunitions, anti-personnel mines and other unexploded ordnance are all at much the same level. However, stockpiles of mines or ordnance can easily skew such figures – we have already noted one location where over 6,500 items of ordnance were found.¹³⁹ Alternatively, looking at area clearance presents a false comparison (in terms of resource needs) between large areas of surface battle area clearance and subsurface minefield clearance.

Crudely calculated from the relative numbers of anti-personnel mines, submunitions and other unexploded ordnance cleared, and considering coordination, risk education as divided equally between the three, \$30 million would almost certainly under-estimate the value of mine action funds addressing cluster munition contamination.

6.2.1 Cluster munition contamination remaining in Kosovo

Despite this disbursement of some \$92 million for mine action between 1999 and the end of 2005 there remain outstanding landmine and cluster munition clearance needs in the province. The extent of these needs and the best mechanism for addressing them is a matter of ongoing dispute. The HALO Trust, in a report at the end of 2006 entitled *Failing the Kosovars: The Hidden Impact and Threat from ERW*,¹⁴⁰ identified some seven cluster munition strike tasks amongst a further 58 primarily minefield clearance tasks remaining to be tackled.

The seven outstanding cluster munition tasks identified by HALO Trust are described as follows¹⁴¹:

Location	Description
Junik village DA-2567 (or 256) GR: 34T DN 40113 01999	An area of open field and wooded hill hit by a BLU97 strike. Local people report the area received surface clearance in 2000 and subsurface clearance in 2001, but 2 BLU97s have turned up subsequently. Local people say they would like to cut wood in the area but they are afraid to do so without further clearance (particularly the wooded area outside of the original clearance.)
Dulje Pass village DA-2764 GR: 34T DM 91344 96313	This area, where there was a large VJ position, was subject to two weeks of NATO bombings including cluster munition use. Local people and the forestry commission are unwilling to enter the area. A local man died near here in 2001, reportedly handling a submunition. This clearance task would be an extension one already undertaken in which 45 BLU97s and BL755s were destroyed.
Makovac village DA-3943 GR: 34T EN 17510 2780	Location of a cluster strike by NATO forces. A total of five BL-755s had been found and destroyed by 2005. In May 2006, a BL755 was found by a local man who reported it to the police. No subsurface clearance has been conducted. The local people still fear the land and would use it for wood cutting and grazing their cattle.
Kodralija village DA-2557 GR: 34T DN 47394 08916	The HALO Trust has conducted extensive clearance of this area which had two cluster strikes recorded on IMSMA. The first clearance was conducted from April to October 2001 and subsequent clearance took place from June to November 2004. A total of 21 BLU97s were cleared from this site. A further BLU97 was found in 2005 outside the cleared area. The discovery of this additional munition indicates more clearance is required of this site. This requirement is given weight by the fact that the specific area where the munition was found remains uncultivated whereas the other areas of this fertile river basin are all ploughed. A further block of approximately 10,000m ² of Battle Area Clearance is required.
Zulfaj village DA-2723 GR: 34T DM 49197 83825	This task is on the Albanian border. An area of approximately 200m x 200m is thought to have sustained two cluster munitions strikes. One cluster failed to dispense its load and deflagrated in the area but an agency found and destroyed 1 BLU97 in 1999. The area was cleared (written off) by Ops Memo in June 2001. The dangerous area is complicated by a mine threat that was marked off in 2003 but has not had further work done on it.
Vulljak village DA-4032 GR: 34T DN 65600 09200	According to IMSMA, KFOR conducted Battle Area Clearance of this area in 2000. In September 2004 two further BLU97s were found close to the village. There is a possibility that the area contains other sub-surface munitions.
Gerbnik village DA-4062 GR: 34T DN 67492 14842	IMSMA records this as a cluster munition strike area and in 2000 KFOR conducted limited Battle Area Clearance of one spot task. Their post-clearance report noted that many BLU97s were expected to remain in the area. Uncontrolled explosions are reported to have been heard from the area. The local community is extremely unhappy with the situation.

6.3 Economic impact of cluster munition contamination

As is noted in relation to some of the outstanding cluster munition clearance tasks listed above, fear of this contamination can result in people not using land. Such land denial means that people lose economic resources such as firewood or agricultural land. In 2002 Landmine Action published detailed case-studies of social and economic impacts resulting from cluster munitions contamination in western Kosovo.¹⁴² These case studies highlighted issues such as the abandonment of traditional transhumance pastoral practices due to contamination of high summer pastures; transfer of arable land to pasture in order to maintain herds or to reduce perceived risks (resulting in reduced crop production); extensive contamination making agricultural subsistence doubtful; and hampered infrastructure renovation being perceived as a barrier to the return of displaced populations.

Whilst noting such issues here, this report does not include additional research on the economic impacts of cluster munition contamination.



Pozhare, Kosovo, 14 April 2000: "Of course, I remember it very clearly. It was about 4pm. Everyone was here at the house, building a wall. My brother Kreshnik and my cousin Mustaf came home from school and they went to put the cattle out to graze. They walked down to the stream and I heard an explosion. I ran down the road because I didn't know where the explosion had come from. I called out but there was no answer. Towards the stream I saw some debris from the explosion. The neighbours had come to help. I was very scared. They had been blown to pieces and I could hardly tell it was them. My cousin was in pieces and my brother was cut in half. The same day we called KFOR and they came and blocked the village off. They left my cousin and my brother until the next morning when they came with their equipment to clear the area."¹⁴³

KFOR destroyed 1 BLU97 after this report. The HALO Trust cleared a further 33 BLU97 cluster munitions from this area during two separate clearance operations.

7.0 'Individual risk' by generic munition type

In the risk they presented to the post-conflict population individual unexploded submunitions presented much the same level of risk as individual anti-personnel mines. Individual submunitions presented a 600% greater risk than other individual items of unexploded ordnance. This strongly suggests that quantity of contamination is not the only problem that makes cluster munitions a particular threat to civilian populations.

The Geneva International Centre for Humanitarian Demining (GICHD), in their 2002 report *Explosive Remnants of War: A Threat Analysis* proposed an analytical model for assessing and even predicting risk from landmines and ordnance amongst a population exposed to this threat. The most simple form of this model is as follows:¹⁴⁴

The equation to calculate the Individual Risk to members of a post-conflict community per generic munition type is:

$$K = C / N$$

Where:

K = Individual Risk,

C = Casualties per generic munition type,

N = Number of UXO by generic type.

Calculated in this way, we are able to compare the relative risks from different types of munitions.

The GICHD report presented a detailed case-study analysing individual risk from cluster munitions in Kosovo (as an Annex) but also a simple case study as follows (with original supporting references):

The United Nations Mine Action Coordination Centre in Kosovo (UNMACC) estimates that there were 50,000 anti-personnel mine and 30,000 blind cluster bomblets¹⁴⁵ (submunitions) throughout the province.¹⁴⁶ If these estimates are used with no modifiers the following Individual Risk casualty figures can be derived:

$$\text{IR (casualties per anti-personnel mine)} = 0.0008$$

$$\text{IR (casualties per bomblet)} = 0.001$$

These figures would therefore imply that, for Kosovo, the risk to an individual is 25 per cent higher from cluster bomblets (submunitions) than from anti-personnel mines. It would not however, be fair to extrapolate this finding to other post conflict environment without supporting data.

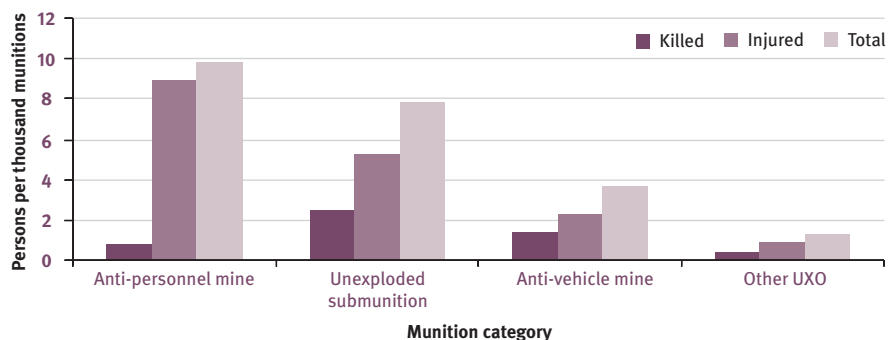
The phrasing of the conclusion to this case study might slightly obscure the meaning. A more accurate conclusion would be that, for Kosovo, each cluster bomblet (submunition) presented a 25% greater risk than each anti-personnel mine.

Rather than relying on such broad estimates (and more in line with the further developed case-study at Annex 3 of the GICHD report) we can populate the same model of analysis with clearance data from Kosovo between 1999 and 2006 (using clearance data as a proxy for the overall quantity of contamination in the province.) In table form such an analysis can be presented as follows (expressing Individual Risk in person casualties per thousand munitions present in the environment):

Analysis by munition type				
	Anti-personnel mines	Unexploded submunitions	Anti-vehicle mines	Other UXO
Number cleared (June 1999 – end 2005) ¹⁴⁷	21,256	18,318	5,619	20,238
Casualties ¹⁴⁸				
Killed	18	45	8	8
Injured	190	97	13	19
Total	208	142	21	21
Individual Risk (people killed per 1,000 munitions)	0.8	2.5	1.4	0.4
Individual Risk (people injured per 1,000 munitions)	8.9	5.3	2.3	0.9
Individual Risk (total casualties per 1,000 munitions)	9.8	7.8	3.7	1.3

Probably the most significant issue here is that these two munition categories are significantly closer to each other than they are to either anti-vehicle mines or to other UXO in terms of their individual risk in this context. The risk of death presented by individual unexploded submunitions in this context was significantly greater than that presented by anti-personnel mines, anti-vehicle mines or other forms of UXO. By comparison with individual items of unexploded ordnance, individual unexploded submunitions were found to present a 600% greater risk of death or injury.

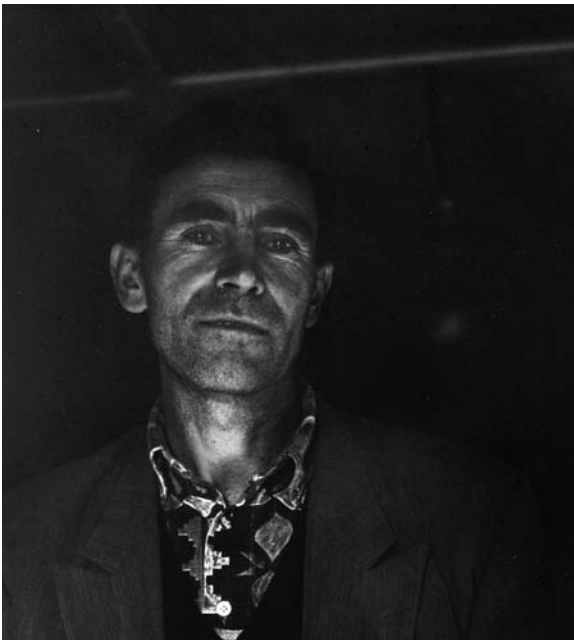
Persons killed and injured per thousand munitions presenting a threat



As we have noted elsewhere in this report, a number of explanations could be put forward for the relatively higher threat presented by unexploded submunitions compared with other items of unexploded ordnance. Suggested explanations could include:

- the size, shape and colour of submunitions being particularly attractive to children;
- the relatively low level of local knowledge about these particular items of ordnance;
- that submunition have particularly sensitive fuses compared to most other items of UXO;
- the possibility that large numbers of general UXO were cleared from stockpiles where they were not presenting a risk to the population.

All of these factors could have played a part in creating the pattern of risk identified here – though without further analysis they remain points of speculation. However, what can be strongly taken from this data is that beyond the quantities of contamination, other factors in Kosovo resulted in unexploded submunitions presenting a far higher risk than other types of unexploded ordnance. This has important implications for whether or not limiting cluster munition failure rates is capable of providing a sufficient basis for humanitarian protection.



“The village population were not here during the bombing. We had been driven away by Serb attacks and after that NATO bombed the Serb troops here.”

“I did not see when the cluster bombs were dropped, because we were hiding in the forest at that time – I only saw them afterwards, where they stood on the surface about one meter away from each other and in a straight line.”¹⁴⁹

8.0 Lessons learned?

The U.K. and the U.S.A. went on to use 500,000 submunitions of the same types in Afghanistan and Iraq.

Despite the U.S. establishing a policy target of less than 1% failure rate for future submunitions, it has continued to use known unreliable submunitions in large numbers and stockpiles hundreds of millions more.

The U.K. has failed to undertake any substantive analysis of the impact of its cluster munition use or the reliability of its cluster munitions. The UK retains for use submunitions that it has officially stated have an “unacceptably high” failure rate and should be banned.

In January 2001 the U.S. Secretary of Defence issued a memorandum on submunition reliability stating:

“Submunition weapons employment in Southwest Asia and Kosovo, and major theatre war modelling, have revealed a significant unexploded ordnance (UXO) concern... It is the policy of the DoD to reduce overall UXO through a process of improvement in submunition system reliability – the desire is to field future submunitions with a 99% or higher functioning rate.”¹⁵⁰

Subsequent to the conflict in Kosovo and to this U.S. policy announcement, the U.S. and the U.K. went on to use approximately 500,000 submunitions of the same types, albeit sometimes in different munition configurations, during operations in Afghanistan and Iraq.¹⁵¹

As of 2005, some 20 million BLU97 submunitions were assessed as still remaining in U.S. Air Force stocks. Hundreds of millions more submunitions of other types are held across the U.S. military as a whole.¹⁵²

Likewise, the U.K. has described the failure rate of the RBL755 as “unacceptable” in an official working paper to the U.N. Convention on Conventional Weapons.¹⁵³ In November 2006, the U.K. also stated that it “recognises the need for a ban on dumb cluster munitions” – which it defines in terms that would include the RBL755.¹⁵⁴ Yet despite this, the RBL755 remains available for use. The U.K. Government in December 2006 stated only that it will phase out “dumb cluster munitions” (including RBL755) by the “middle of the next decade.”¹⁵⁵ In the interim period, with the Government appearing publicly to recognise that these weapons present a disproportionate risk, U.K. armed forces might be exposed to civil or even criminal liability if further use of these weapons caused subsequent civilian casualties.

By contrast to the U.S., the U.K. Government refuses to make available information on the quantities of cluster munitions that it stockpiles on the basis that this “would not be in the national interest.”¹⁵⁶

The willingness of states to recognise problems but not then to act on them in a timely manner can be used to support calls for new international law to address such issues. The alternative seems to be that states will continue to expose non-combatants to risks that they recognise to be undesirable (and perhaps even unacceptable) but which they are not prepared to pay or act to alleviate. In such a situation it seems that the financial anxieties and procurement difficulties of military institutions serve as a barrier to ensuring that the risk of armed violence to civilians is managed in accordance with the public conscience.

An examination of the U.K. Government’s failure to analyse the humanitarian impact of cluster munitions in Kosovo or elsewhere raises further serious questions about how the responsibility for human security is shared across nation state boundaries.

Discussing the U.K.'s RBL755 shortly after Operation Allied Force, the U.K. Secretary of Defence predicted much lower failure rates may be found in operations than had been achieved in tests:

[T]he RAF dropped some 500 RBL-755 cluster weapons during Operation Allied Force, each containing 147 bomblets. Research trials of the equivalent weapon (BL-755) when used at low level indicate that approximately 5 per cent of the bomblets are likely to fail to detonate. However, when used at medium level as during Operation Allied Force, the failure rate is expected to be lower given that the impact angles and velocities are greater, and could be as low as 1 per cent.¹⁵⁷

Two weeks later the U.K. Prime Minister Tony Blair was arguing an opposite position:

...but I should explain that the height at which the weapons were dropped had no bearing on the percentage of bomblets that failed to explode on impact, nor on the size of the area affected, as the weapons are programmed to release their bomblets at a much lower height than the initial drop, and do so only when they have reached this height.¹⁵⁸

Despite the authoritative and technical nature of these pronouncements it seems certain that neither the Secretary of Defence nor the Prime Minister were basing their assertions on actual data.

The statements noted above were made in July 1999 in the immediate aftermath of the conflict. Such statements do not acknowledge the absence of U.K. Government data on the phenomena being discussed even though, at that time, an absence of data would be perfectly reasonable. What is more, the opportunity existed at that time to start gathering evidence that would inform our understanding of this problem (a problem that was of apparent concern to U.K. parliamentarians) at no substantial additional cost.

Although U.K. ordnance disposal teams worked in Kosovo immediately after the bombing, the U.K. Government has not made available statistics regarding the numbers of RBL755 submunitions that they cleared. Indeed it seems from a letter from the Army to Landmine Action that the U.K. has made no efforts to assess such information so as to better understand the reliability of their munitions.¹⁵⁹

Up to July 2006 the U.K. has stated that no efforts have been made to evaluate the reliability of RBL755 cluster munitions during actual operations:

Some analysis of the accuracy and performance of BL755 cluster bombs used during operations has been undertaken; however, the reliability of individual weapons was not specifically addressed as part of this analysis.¹⁶⁰

Internal MoD briefing materials regarding the use of cluster munitions in Iraq suggest that lessons had been learned from Kosovo about the reliability of the RBL755.¹⁶¹

Previous lessons:

- The speed of provision of information to assist rapid clearance of UXO was criticised in Kosovo. New procedures have been put in place since then.
- The comparative ineffectiveness of BL755 against modern armour was demonstrated in Kosovo; the number of roles it's used for have been reduced.

Key Facts and Figures:

AIR

- BL755 (and its variant RBL755, which is designed to be dropped from higher altitude) contains 147 bomblets of which about 6% fail under test conditions (there are credible reports of higher failure rates in operations, depending on terrain).

16%

Excerpt from MoD briefing materials released as part of the Hutton Inquiry.

However, the recognition expressed here that “there are credible reports of higher [than 6%] failure rates in operations” (accompanied by 16% in the marginalia) contradicts a subsequent statement by the U.K. Minister of State for the Armed Forces that:

“No reports have been received which suggest that the BL755 cluster bomb failure rate increases when deployed on operations.”⁹⁹¹⁶²

As with efforts to understand military impact, without engagement and analysis on these issues from the bodies responsible for cluster munition use it is very difficult to gather sufficient and accurate data.

The willingness to make politically expedient statements in the absence of data, coupled with a failure to gather relevant information or to analyse relevant information that is held, conveys a disdain for the concerns raised by humanitarian agencies and the large number of parliamentarians who have asked questions on these issues. These concerns seem to have been treated more as problematic questions to be circumvented in the short-term rather than as issues needing more substantial investigation.

A useful contrast can be made to the approach of the 1999 Patten Report into policing in northern Ireland. In response to 11 deaths and 615 injuries over a 17 year period, the Patten report recommended that “an immediate and substantial investment should be made in a research programme to find an acceptable, effective and less potentially lethal alternative to the Plastic Baton Round (PBR).” This recommendation has been followed up by a Steering Group of government and policing agencies that presents its analysis in public reports and seeks input from concerned parties. The point being emphasised here is that these unwanted incidents of harm were (perhaps belatedly) considered to require a process of analysis so as to reduce the likelihood of such incidents in the future. This is not to suggest that the Patten report or subsequent process is ideal, but simply that these specific recommendations show some commitment to evidenced-based and transparent policy making. A critical difference may be that the deaths and injuries from plastic baton rounds in northern Ireland occurred within a population to whom the U.K. Government is accountable.

Early in 2007, in a speech on defence, U.K. Prime Minister Tony Blair raised related themes:

“Global interdependence requires global values commonly or evenly applied. But sometimes force is necessary to get the space for those values to be applied: in Sierra Leone or Kosovo for example.”

In its response to concerns raised about cluster munition use in Kosovo, the U.K. did not apply the same values as it did to concerns over baton rounds in northern Ireland. Despite U.K. Defence and Foreign Policy Select Committees recommending serious evaluations of the appropriateness of these weapons, no substantive evidence-based analysis can be identified as having been undertaken by the U.K. Government.

Annex A: HUMAN RIGHTS WATCH (HRW) DATA ON CIVILIAN CASUALTIES FROM CLUSTER MUNITIONS IN KOSOVO¹⁶³

Date (1999)	HRW Incident Number	Brief description	Confidence assessment (1-3 – 1 being highest)	NATO bombing data supports?	Killed (min)	Injured (min)
2 April	3	In a 1:30-2:00 a.m. attack on an unidentified target in the area of Orahovac in Nogavac (Negavac in Albanian) village in Kosovo.	3	NO	4	12
7 April	10	In 12:30 a.m. attacks on targets in and around Pristina in Kosovo, nine civilians are killed and eight are seriously wounded.	3	NO	9	8
10 April	14	In an 11:55 p.m. attack on unidentified targets in the area between Podujevo and Kursumilija on the Serbian-Kosovo border, five are killed and some three are injured near the villages of Merdare and Mirovac. Cluster bomb submunitions are later observed near the road from Podujevo to Kursumilija, near the village Merdare. This is the first confirmed instance of civilian deaths resulting from cluster bomb use.	1	NO	5	3
12 April	17	The Yugoslav government reports that the Djakovica-Klina road in Kosovo is struck with cluster bombs at 6:30 p.m. and that “several people were killed and wounded.” Human Rights Watch could find no authoritative source identifying the dead. Civil defense officials stated that five civilians died.	3	NO	>1	

Continued

Continued

Date (1999)	HRW Incident Number	Brief description	Confidence assessment (1-3 – 1 being highest)	NATO bombing data supports?	Killed (min)	Injured (min)
14 April	19	<p>Between 1:30-3:30 p.m., a refugee convoy is bombed along a twelve mile stretch of road between Djakovica and Decane in Kosovo, killing seventy-three individuals and injuring thirty-six.</p> <p>The incident ignites a major controversy about NATO bombings and various stories are put out by way of explanation- including allegations that the Serbian forces used cluster bombs on civilians after NATO had accidentally bombed them.</p>	2	NO	73	36
15 April	22	<p>One civilian is killed at 2:20 p.m. near the Hotel “Baciste” in the Kopaonik mountains in southern Serbian during the collection and clearing of cluster bombs. Mladen Stanojevic is killed during the clearing process. The cluster bomb attack occurred at 12:40 a.m. on April 13.</p> <p>Human Rights Watch received photo documentation of the cluster bomb clearing and the death from the Ministry of Health.</p>	1	NO	1	
17 April	26	<p>After a reported cluster bomb attack in the vicinity of the village of Kamena Glava, Urosevac municipality, in Kosovo at 3:30 p.m. on April 17, three civilians are injured. Two civilians subsequently die on April 18.</p>	1	Yes to bombing on this date and location 6 x CBU87	2	1

Date (1999)	HRW Incident Number	Brief description	Confidence assessment (1-3 – 1 being highest)	NATO bombing data supports?	Killed (min)	Injured (min)
24 April	31	In an 11:30 a.m. attack on an unidentified target, the Yugoslav government reports that five civilians are killed and two “gravely” injured when cluster bomblets fall in Doganovic village in Kacanik municipality south of Urosevac on the Macedonian border in Kosovo. Five Albanian boys from the Kodza family are reported killed when they pick up an unexploded bomblet.	2	NO	5	2
28 April	34	In 12:30-3:00 p.m. attacks on Golubovac airfield south of Podgorica in Montenegro, one civilian is killed and three are wounded. Cluster bomblets land in the villages of Gosici and Mataguzi, just to the east of the airfield.	2	NO	1	3
1 May	42	In an attack on unidentified targets near the village of Jablanica south of Prizren in Kosovo, two civilians are killed and sixteen are wounded. Some twenty homes are destroyed and another fifty are damaged. The Yugoslav government reports that three children and two adults are killed by a cluster bomb.	2	NO	2	16
3 May	46	In an attack between 11:45 a.m. and 13:30 p.m. in the area of Savine Vode in northwestern Kosovo, a bus and car are hit, killing seventeen and injuring forty-four civilians. Cluster bomb use is reported. NATO denied its planes were responsible for the attack, saying that it could find “no evidence” linking it with the incident. Human Rights Watch received photo documentation of cluster bomb remains and of the deaths from the Ministry of Health.	1	4 x CBU87 reported dropped approx 3 km from Savine Vode. Another 2 x CBU87 approx 6km away. All targeting ‘military vehicles.’	17	44

Continued

Date (1999)	HRW Incident Number	Brief description	Confidence assessment (1-3 – 1 being highest)	NATO bombing data supports?	Killed (min)	Injured (min)
4 May	47	At 3:00 p.m., a Ford Escort civilian passenger car is destroyed by the delayed explosion of a cluster bomb submunition on the Pec-Rozaje highway near the site at which the civilian bus had been hit on May 3. One person is killed and one person is reported to be wounded.	1	N/A	1	1
13 May	57	In an 11:50 p.m. attack on Yugoslav Army forces in the field, a refugee camp on the Prizren-Suva Reka primary road, near the village of Korisa in Kosovo, is bombed, killing at least forty-eight and as many as eighty-seven, and injuring as many as sixty. The Yugoslav government claimed cluster bombs had been used, and the White Book, Volume II, contains photographic evidence of remains of tactical munitions dispensers (TMDs) from the site. In an official statement on May 15, NATO says: This was a legitimate military target. The Serb claims of an attack involving cluster bombs against a non-military target are both false. On May 14, the first rumours emerge that suggest that Serb troops were using civilians as human shields in Korisa.	2	NO	48	<60
TOTALS			TOTALS		169	186

Endnotes

- 1 Landmine Action (2006) *Failure to Protect*, Richard Moyes & Dr. Brian Rappert, London.
- 2 See Prokosch (1995) *The Technology of Killing: a history of anti-personnel weapons*, Zed Books.
- 3 See Human Rights Watch (2002) *Fatally Flawed: Cluster bombs and their use by the United States in Afghanistan*, p.1 and (2003) *Off Target: The conduct of the war and civilian casualties in Iraq*, p. 56
- 4 See for example Human Rights Watch Press Release (11 May 1999) *NATO USE OF CLUSTER BOMBS MUST STOP*.
- 5 Human Rights Watch (1999), *Ticking Time Bombs: NATO's use of cluster munitions in Yugoslavia*. Online at <http://www.hrw.org/reports/1999/nato2/>
- 6 Human Rights Watch (2000), *Civilian deaths in the NATO air campaign*. Online at: <http://www.hrw.org/reports/2000/nato/>
- 7 "Have We Forgotten the Path to Peace?" by Jimmy Carter, *New York Times*, May 27, 1999
- 8 See for example UK Working Group on Landmine (Landmine Action), (2000), *Cluster bombs: the military effectiveness and impact on civilians of cluster munitions*; ICRC (2001), *Cluster bombs and landmines in Kosovo*, p.36, International Committee of the Red Cross, Geneva; Landmine Action (2002), *Explosive Remnants of War: unexploded ordnance and post conflict communities*.
- 9 Details from *Janes Air Launched Weapons*, August 1999.
- 10 U.S. Air Force, (1993) *Gulf War Air Power Survey*, vol. 2, part 1, p. 261
- 11 King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. P.19.
- 12 King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. P.19.
- 13 King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. Annexe E.
- 14 The designations of the actual submunitions within different RBL755 and BL755 systems (such as the GP bomblet and AAA bomblet) are not commonly used in secondary literature. For this reason the designation RBL755 is also used to refer to these submunitions throughout this report.
- 15 Details from *Janes Air Launched Weapons*, November 1998.
- 16 Landmine Action interview with Chris Martin, Insys UK (formerly Hunting Engineering – manufacturers of the BL755.), 5th July 2006.
- 17 Statement by John Spellar, Minister of State for Defence, 28 May 2000, *House of Commons Hansard*.
- 18 Statement by UK Secretary of Defence Soames, 20 December 1994, UK House of Commons, Hansard.
- 19 Statement by the Delegation of the Republic of Croatia to the Fourth Session of the Group of Governmental Experts to Prepare the Review Conference of the States Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed To Be Excessively Injurious or to Have Indiscriminate Effects.
- 20 Data on CBU-87 and CBU-99 from spreadsheet *CBU Locations US (S-NF)* authored at the Warrior Preparations Centre. Strikes in Serbia, Montenegro and Albania not included here. Data on RBL-755 from spreadsheet *Final RBL-755 Kosovo* authored at RAF Waddington. The total numbers reported by NATO do vary between the different data sets that they provided to UNMIK. For example spreadsheet *Final RBL-755 Kosovo* contains records of 429 cluster munitions used with coordinates within Kosovo. Spreadsheet *BL-755 CBU Locations* contains records of 424 cluster munitions used, including 73 that have no coordinates or are targeted in Serbia or Albania.
- 21 The designations of the actual submunitions within different RBL755 and BL755 systems (such as the GP bomblet and AAA bomblet) are not commonly used in secondary literature. For this reason the designation RBL755 is also used to refer to these submunitions throughout this report.
- 22 US Department of Defense, (2000) *Kosovo / Operation Allied Force: After Action Report, Report to Congress*, January 2000, p. 90.
- 23 This total figure for the number of BLU-97 submunitions used is from King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. p.24, based on figures from US Department of Defense. It is possible that Dutch cluster munition use is also included in this figure as a result of integrated operations. Numbers of TLAM-D and JSOW used (if any) are not known. The use of both of these systems is referred to in US Department of Defense (2000) *Kosovo / Operation Allied Force: After Action Report*. In data provided by NATO the spreadsheet *Kosovo BDA for EOD – declassified* reports one use of JSOW (no further designation) and 16 uses of TLAM (no further designation – multiple missiles used in some of these uses).
- 24 Total figure for Mk118 submunitions used is from King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. p.24, based on figures from US Department of Defense.
- 25 Statement by Baroness Symons of Vernham Dean (Minister of State (Defence Procurement), Ministry of Defence), *House of Lords Hansard*, 9 April 2001.
- 26 According to a letter from the Netherlands Ministry of Foreign Affairs / Ministry of Defence, 14 Feb 2001, the Netherlands used 165 cluster munitions (reportedly CBU-87s) during Operation Allied Force. Data on these strikes was reportedly included in the NATO data provided to UNMIK. See online at: <http://www.nieuwsbank.nl/inp/2001/02/14/E063.htm>
- 27 Contamination from VJ stockpiled BL755 cluster munitions (resulting not from their deployment but from destruction of the locations where they were stored) is evident in clearance reports (see for example *BACTEC clearance of the former VJ ammunition compound at Goles [Task dossier C9-13: Dangerous areas 1190, 1372 & 4041]*). The FRY Air Force are reported to have used cluster munitions, of the type BL755, but did not provide figures on the numbers used according to an email from Steven Saunders, Chief of EOD Management Section, UNMIK, 19 July 2004 cited in Landmine Action (2005), *Explosive remnants of war and mines other than anti-personnel mines: Global survey 2003-2004*, p.98. However, no further verification of FRY use of BL755 has been found. In Albania VJ forces are reported to have used KB-1 and KB-2 submunitions (see for example UNIDIR [2006] *Cluster munitions in Albania and Lao PDR*) but no explicit reference was found to use of these munitions within Kosovo.

- 28 Human Rights Watch, *Pentagon Report Whitewashes Civilian Deaths in Yugoslavia*, February 8, 2000, online at <http://hrw.org/english/docs/2000/02/08/serbia417.htm>
- 29 Letter from Dutch Ministry of Defence, online at: http://www.mindef.nl/actueel/parlement/kamerbrieven/2000/4/311000_command.aspx translated by Miriam Struyk, Pax Christi Netherlands.
- 30 Cook, R. *Minutes of Evidence to Kosovo: Interim Report*, House of Commons Foreign Affairs Committee, Seventh Report, 14 April 1999 London: HMSO: paragraph 156.
- 31 For example, it is noted in *Janes Air Launched Weapons* (1998) that the UK BL-755 is for use against “a wide range of small hard and soft targets” and that “in addition to its anti-armour capability each bomblet casing disintegrates into over 2,000 fragments which are effective against non-armoured targets and personnel.” The BLU-97, the most widely used cluster munition of the campaign, explodes creating “scores of 30g fragments” capable of “injuring personnel at 150m.”
- 32 This analysis is based on DMPI records from spreadsheet *BL-755 CBU Locations*. The details of how DMPI terms were classified is explained in detail in notes 37 and 38 below. This data includes all strikes on the sheet, including those in Serbia and Albania.
- 33 Briefing of May 1999 cited in Landmine Action (2000), *Cluster bombs*, p.44-45 or online at <http://www.nato.int/kosovo/press/p990514b.htm>
- 34 The original text, as cited in the Landmine Action (2000), *Cluster bombs*, p.44-45 or online at <http://www.nato.int/kosovo/press/p990514b.htm> has the term “aerial targets” rather than “area targets”. This was considered to be a transcription error and changed to area targets in the citation here.
- 35 See for example comments by Major General Chuck Wald at another US DoD briefing also in May 1999 as cited in Landmine Action (2000), *Cluster bombs*, p.45-46
- 36 NATO press conference, 15 May 1999.
- 37 Including targets in Serbia, Albania and Montenegro. In splitting targets between mobile, static and unknown the following designations were made based on the DMPI (desired munition point of impact) recorded on spreadsheets *CBU Info* and *BL-755 CBU Locations*: **DMPI designations assessed as “static”**: TACTICAL COMMAND POST; SWITCHING YARD; STORAGE SITE; PRIZREN TV-FM XMTR RADREL STA SOUTH; PRIZREN ARMY BKS; PRISTINA PET PROD STOR SW UG RES; PRISTINA AMMO EXPLOSIVE STORAGE; PRISTINA AMMO DEPOT 510; PRISTIN AFLD; OBRVA AFLD; NOVI PAZAR MIL RADREL MOKRA GORA; NIS AFLD; ## N SECTION OF POSS ASSY BLDG; KAPAONIK MIL RADREL A AD CRP; Early Warning Radar; E RVT SPT BLDG; Decani Milicia Station; CTR W HALF TRANSFORMER YARD; CTR UDG TANK VENT; CTR TRANSFORMER YARD; CTR SWITCH; CTR NW HALF TRANSFORMER; YARD; CONTROL BUILDING; CONTROL BLDG; CENTER PORTION OF RUNWAY; CENTER OF STORAGE BUILDING; CENTER OF INTX OF RUNWAY AND TAXIWAY; CENTER OF HIGH KV YARD; CENTER OF BUILDING; CENTER 3-WAY INTX OF TAXIWAYS; CEN UI BLDG; CEN OF WEST SWITCHING YARD; CEN OF SWITCHYARD; CEN OF OPEN STOR AREA; CEN OF NORTH RADOME; CEN OF LOW KV SWITCHING YARD; CEN OF HIGH KV YARD; CEN OF EAST SWITCHING YARD; CEN OF BLDG; CEN NW END SWITCHING YARD; CEN AREA OF SWITCHYARD; CEN AMMO STOR BLDG; BUILDING; BELO POLJE AMMO STORAGE FAC; CEN RVT AMMO STOR BLDG; S SECT OF POSS ASSY BLDG; CEN AMMO STOR BLDG; CEN PWDR STOR/MIX BLDG; 01 CEN EXPL STOR BLDG; BLANK but BE.FacilityName = Krstac-FRY-Border Post. **DMPI designations assessed as “mobile”**: TROOPS; Tanks; Revetments; Mortars; MILITARY VEHICLE; FLEX SA-6; DONJA SEMANJA AREA; CONVOY; ARTILLERY POSITION; APC; ANTI-AIRCRAFT ARTILLERY. **DMPI designations assessed as “unknown”**: POL SITE; NO MATCH ON DMPI; DUMP TARGET; Default DMPI; BLANK and BE.FacilityName is also BLANK.
- 38 In splitting the targets between specific target types the following designations were made based on the DMPI and other fields on spreadsheets *CBU Info* and *BL-755 CBU Locations*: **DMPI designations assessed as “buildings and compounds”**: TACTICAL COMMAND POST; SWITCHING YARD; STORAGE SITE; PRIZREN ARMY BKS; PRISTINA PET PROD STOR SW UG RES; PRISTINA AMMO EXPLOSIVE STORAGE; PRISTINA AMMO DEPOT 510; PRISTIN AFLD; OBRVA AFLD; NIS AFLD; ## N SECTION OF POSS ASSY BLDG; E RVT SPT BLDG; Decani Milicia Station; CTR W HALF TRANSFORMER YARD; CTR UDG TANK VENT; CTR TRANSFORMER YARD; CTR SWITCH; CTR NW HALF TRANSFORMER; YARD; CONTROL BUILDING; CONTROL BLDG;; CENTER OF STORAGE BUILDING;; CENTER OF HIGH KV YARD; CENTER OF BUILDING; CEN UI BLDG; CEN OF WEST SWITCHING YARD; CEN OF SWITCHYARD; CEN OF OPEN STOR AREA; CEN OF LOW KV SWITCHING YARD; CEN OF HIGH KV YARD; CEN OF EAST SWITCHING YARD; CEN OF BLDG; CEN NW END SWITCHING YARD; CEN AREA OF SWITCHYARD; CEN AMMO STOR BLDG; BUILDING; BELO POLJE AMMO STORAGE FAC; CEN RVT AMMO STOR BLDG; S SECT OF POSS ASSY BLDG; CEN AMMO STOR BLDG; CEN PWDR STOR/MIX BLDG; 01 CEN EXPL STOR BLDG; BLANK but BE.FacilityName = Krstac-FRY-Border Post / **DMPI designations assessed as “revetments”**: Revetments / **DMPI designations assessed as “jettisoned”**: BLANK and BE.FacilityName is BLANK and MisRep Comments suggest jettison; MILITARY VEHICLE but MisRep Comments state jettison / **DMPI designations assessed as “other”**: POL SITE; NO MATCH ON DMPI; DUMP TARGET; Default DMPI / **DMPI designations assessed as “airfield runways”**: CENTER PORTION OF RUNWAY; CENTER OF INTX OF RUNWAY AND TAXIWAY; CENTER 3-WAY INTX OF TAXIWAYS / **DMPI designations assessed as “radar and radio”**: PRIZREN TV-FM XMTR RADREL STA SOUTH; NOVI PAZAR MIL RADREL MOKRA GORA; KAPAONIK MIL RADREL A AD CRP; Early Warning Radar; CEN OF NORTH RADOME / **DMPI designations assessed as “troops”**: TROOPS / **DMPI designations assessed as “fielded weapons (artillery, mortars etc)”**: Mortars; FLEX SA-6; ARTILLERY POSITION; APC; ANTI-AIRCRAFT ARTILLERY / **DMPI designations assessed as “armoured vehicles”**: MILITARY VEHICLES (with additional note in MisRep Comments stating armoured vehicles; APC / **DMPI designations assessed as “tanks”**: Tanks; DONJA SEMANJA AREA with MisRep Comments stating T54-55MBT. / **DMPI designations assessed as “general vehicles”**: MILITARY VEHICLE; CONVOY; DONJA SEMANJA AREA with MisRep Comments stating Truck or Probably Communications Van.
- 39 From spreadsheet *UK Weapons Record*.
- 40 US Department of Defense (2000) *Kosovo/Operation Allied Force: After Action Report*.
- 41 Secretary of State for Defence, Geoff Hoon, giving evidence to the House of Commons Defence Committee, *Hansard*, 21 June 2000.
- 42 We use the term victory here and elsewhere though we note also that the validity of this term has been questioned in relation to NATO’s stated aims at the onset of the operation.
- 43 See UK House of Commons, Select Committee on Defence (2000), *Fourteenth Report and UK Ministry of Defence* (2000), *Kosovo: Lessons from the Crisis*.
- 44 The importance of the threat of ground troops to Milošević’s decision making has been challenged. Andrew Stigler has argued that the coercive function of aerial bombing, in the political context, was sufficient and that the evidence that Milošević considered ground invasion credible or likely is insufficient. See Stigler (2003), *A Clear Victory for Air Power: NATO’s Empty Threat to Invade Kosovo in International Security*, Vol. 27, No. 3 (Winter 2002/03), pp. 124-157.

- 45 Stephen Hosmer, (2001) *Why Milošević Decided to Settle When He Did?* The Conflict Over Kosovo, RAND Corporation Project Air Force.
- 46 Dana Priest, "A Decisive Battle That Never Was," *Washington Post*, September 19, 1999, p. A1. as quoted in Stigler (2003), *A Clear Victory for Air Power: NATO's Empty Threat to Invade Kosovo in International Security*, Vol. 27, No. 3 (Winter 2002/03), pp. 124-157. The same quote appears in Dana Priest, "Kosovo Land Threat May Have Won War", *Washingtonpost.com* September 19, 1999, online at <http://www.washingtonpost.com/wp-srv/national/daily/sept99/airwar19.htm>
- 47 *Newsweek Magazine*, 15 May 2000 available online at <http://mujweb.atlas.cz/www/kutija/nw000515.htm>
- 48 Landmine Action's 2000 report *Cluster bombs* drew on the *Newsweek* report but made a factual error in its representation of the data. That report made a comparison of the MEAT report data as stated by *Newsweek* with data presented by the Chairman of the Joint Chiefs of Staff, General Henry Shelton. Landmine Action's report mistakenly suggested that the Shelton data was presented subsequent to the MEAT data, as a politically acceptable alternative. In fact the Shelton data was presented before the MEAT assessment findings.
- 49 See <http://www.medill.northwestern.edu/whca/2001win.html>
- 50 "Newsweek and the 14 Tanks" in *Airforce Magazine Online, Journal of the Air Force Association*, July 2000 Vol. 83, No. 7 online at <http://www.afa.org/magazine/July2000/0700kosovo.asp>
- 51 See Rebecca Grant (2000) *True Blue: Behind the Kosovo numbers game*, in *Air Force Magazine*, August 2000.
- 52 <http://www.defenselink.mil/DODCMSShare/briefingslide%5C246%5C990610-J-0000K-007.jpg>
- 53 US Department of Defense (2000) *Kosovo/ Operation Allied Force: After Action Report*.
- 54 This methodology is as described in both Stephen Hosmer, (2001) *Why Milošević Decided to Settle When He Did?* The Conflict Over Kosovo, RAND Corporation Project Air Force and Rebecca Grant (2000) *True Blue: Behind the Kosovo numbers game*, in *Air Force Magazine*, August 2000.
- 55 See for example *Briefing and press conference on the Kosovo Strike Assessment*, September 16, 1999; U.S. Department of Defense news briefing, May 8, 2000; Barry and Thomas, *Newsweek Magazine*, 15 May 2000; "Newsweek and the 14 Tanks" in *Airforce Magazine Online, Journal of the Air Force Association*; Letters to the editor from John Barry and Stephen Aubin (2000) *Air Force Magazine*, August 2000 and Rebecca Grant (2000) *True Blue: Behind the Kosovo numbers game*, in *Air Force Magazine*, August 2000.
- 56 See online briefing slide available at: <http://www.defenselink.mil/DODCMSShare/briefingslide%5C246%5C990610-J-0000K-007.jpg> Landmine Action (2000) *Cluster bombs*, p.141 mistakenly reports Gen. Shelton's data as being prepared after the MEAT assessment.
- 57 According to Stephen Aubin the author of the *Airforce Magazine* rebuttal to the *Newsweek* article, in a letter online at <http://www.afa.org/magazine/Aug2000/0800letters.asp>, this data is based "on NATO's Kosovo Strike Assessment, the fruit of a nine-week-long, round-the-clock effort by 200 personnel. Its sources of information included not only the MEAT draft but also national satellite images, cockpit video, UAV video, and other intelligence. Data were correlated to establish what happened." Another letter by John Barry *Newsweek* National Security Correspondent disputes how these processes of corroboration actually worked.
- 58 As reported in "Newsweek and the 14 Tanks" in *Airforce Magazine Online, Journal of the Air Force Association*, July 2000 Vol. 83, No. 7 online at <http://www.afa.org/magazine/July2000/0700kosovo.asp>
- 59 King (2001) *Explosive Remnants of War: A study on submunitions and other unexploded ordnance*, ICRC, Geneva. p.24
- 60 General Sir Hugh Beach (2001), *Cluster bombs: a case for banning?*, ISIS Briefing Paper No.79, February 2001, International Security Information Service, London.
- 61 General Sir Hugh Beach (2001), p.9. *Cluster bombs: a case for new controls?*, ISIS Briefing Paper No.25, May 2001, International Security Information Service, London. Certainly some significant and unacknowledged assumptions were made in Sir Hugh Beach's initial analysis. We have already noted that cluster munitions were not only used against 'mobile' targets but that a significant number were targeted at buildings or groups of troops. Alternatively, we have also noted that unitary munitions were also used against mobile targets. Furthermore there was no clear rationale to his methodology by which only 50% of non-directly corroborated strikes were discounted. Finally, in terms of the UK contribution of ordnance the available data (see section 2.1 above) generally suggests that the UK delivered around 20% of the total number of submunitions used in the campaign.
- 62 Data on CBU-87 and CBU-99 from spreadsheet *CBU Locations US (S-NF)* authored at the Warrior Preparations Centre. Strikes in Serbia, Montenegro and Albania not included here.
- 63 Data on RBL-755 from spreadsheet *Final RBL-755 Kosovo* authored at RAF Waddington.
- 64 It is a difficulty for interpreting the U.S. DoD after action report that individual vehicles/pieces of equipment destroyed seems to be represented on the same scale as 'missions reporting hits'. This is only partly resolved by their recognition of multiple strikes against individual targets.
- 65 16 September 1999, available online at <http://home.scarlet.be/%7Ejansensa/KosovoStrikeAssessment.html>
- 66 <http://www.defenselink.mil/DODCMSShare/briefingslide%5C246%5C990610-J-0000K-007.jpg>
- 67 Although General Shelton's estimates were only provisional a similar timeline for the accumulation of successful hits in the final Strike Assessment is reported by Rebecca Grant in *Air Force Magazine*. Rebecca Grant (2000) *True Blue: Behind the Kosovo numbers game*, in *Air Force Magazine*, August 2000 notes: "By April 30, Day 38 of the campaign, NATO had validated strikes on only 11 tanks, 21 APCs, and 34 artillery pieces. But the situation began to change when more aircraft were deployed for Operation Allied Force and as planners found more targets. Pilots also became familiar with the Kosovo Engagement Zone. By the middle of May, weather improved, more aircraft were flying missions, and aircrews were able to find and hit more targets.
- Even then, the hit rates came in as steady rain, not a deluge. The greatest number of validated strikes on tanks in any one day was just seven, on May 30. One or two strikes per day was more typical. On some days, no hits are listed at all for any category. Finally, there were the big days, like May 22, May 30, and most of the days in June, when 30 or 40 or more hits were validated. From May 13, when strikes increased, to the end of May, an average of 18 successful strikes across all categories occurred each day. From June 1 to the end of the air war on June 9, the average was about 28 successful strikes per day. The day-by-day figures actually back up what pilots said: It took time to find and hit the Yugoslav army forces. What the numbers suggest is an air campaign that started by scratching at the Serb forces but then struck hard in the last three weeks."

- 68 The NATO Deputy Supreme Allied Commander Europe (DSACEUR), the Chairman of the NATO Military Committee and the UK Chief of Defence Intelligence all individually highlighted that the perceived prospect of a NATO ground invasion was an important part of this combination (See UK House of Commons, Select Committee on Defence (2000), *Fourteenth Report* and UK Ministry of Defence (2000), *Kosovo: Lessons from the Crisis.*)
- 69 DoD News Briefing, Thursday, May 13, 1999 (formerly online at: http://www.defenselink.mil/transcripts/1999/t05131999_t0513asd.html)
- 70 House of Commons – Select Committee on Defence. 2000. *Lessons of Kosovo* London: HMSO.
- 71 Note from original source: *Major Projects Report 1999*, Report by the Comptroller and Auditor General, HC (1999-2000), para 3.7
- 72 Note from original source: Such as ‘explosive reactive armour’ and ‘defensive aids suites’
- 73 Note from original source: HC (1999-2000) 613, *op cit*, para 3.8
- 74 Note from original source: HC (1999-2000) 613, *op cit*, para 3.8
- 75 Note from original source: Note of meeting between the All-Party Parliamentary Landmine Eradication Group and NATO officials, 24 July 2000
- 76 Note from original source: ‘Kosovo bombing misses the target, says MoD report’, *Flight International*, 15-21 August 2000
- 77 Note from original source: Its range is 8 km
- 78 Note from original source: HC (1999-2000) 613, *op cit*, pp 59-63
- 79 Note from original source: *ibid*, Figure 16
- 80 Note from original source: *ibid*, p 63
- 81 Note from original source: Thirty-third report of the Committee of Public Accounts, Session 1999-2000, *Ministry of Defence: Major Projects Report 1998*, HC 247, p19
- 82 Note from original source: HC (1999-2000) 613, *op cit*, para 3.8
- 83 Note from original source: Q 1214
- 84 Landmine Action interview, Saturday 20 May 2006, Kamena Glava, Kosovo
- 85 UNMAS (2002), *Explosive Remnants of War – Experience from Field Operations*. A discussion paper prepared by John Flanagan, former Programme Manager of the UN Mine Action Programme in Kosovo, for the United Nations Mine Action Service (UNMAS), Geneva 15 July 2002, CCW/GGE/II/WP.13
- 86 Spreadsheet *CBUINFO*
- 87 It is worth noting in this context that the NATO data regarding BL755 strikes includes information on 424 cluster munitions whereas statements in the UK parliament report 531 cluster munitions used (a difference of 107 cluster munitions). This discrepancy may in part relate to the NATO data being focused on Kosovo as opposed to Yugoslavia as a whole. However, it is possible that ‘dumped’ munitions were not systematically recorded in the same way as regular strikes.
- 88 See IMSMA completion surveys: 1470 and 1491.
- 89 Landmine Action interview, 22 May 2006, Bagjore, Kosovo.
- 90 Interview with Steve Saunders, Chief of EOD Management Section, UNMIK, Pristina, 23 May 2006
- 91 Letter from Gill Leaper, Collocated Headquarters, Command Secretariat RAF, to Richard Moyes, Landmine Action, 7 August 2006. The UK has also noted in a working paper to the CCW (CCW/GGE/X/WG.1/WP.1) that in Iraq “UK pilots decided not to release the weapons on 73 occasions either owing to bad weather, no targets found, or a lack of positive identification.”
- 92 *Working Paper on the Military Utility of Cluster Munitions* (CCW/GGE/X/WG.1/WP.1), prepared by The United Kingdom, March 2005.
- 93 BBC report *Too close for comfort: Tourism and fishing have suffered since unexploded Nato bombs were discovered*, May 27, 1999, online http://news.bbc.co.uk/1/hi/programmes/from_our_own_correspondent/353520.stm
- 94 Data on CBUs reported as True for Jettisoned on spreadsheet *CBU Locations US (S-NF)*.
- 95 Spreadsheet *CBUINFO* cites the following: 1) jettisoned before reaching TGT area due to evasive manoeuvres; 2) GeoCoords given were that of MLV that he was targeted against. hung weapon/jettisoned into the Adriatic Sea. 3) AT Rotar prior to landing due to wet runway – jettisoned; 4) (LOC IVO): in Adriatic due to wet runway/area 2; 5) (LOC IVO): in Adriatic due to wet runway/area 2.
- 96 See BACTEC clearance of the former VJ ammunition compound at Goles [*Task dossier C9-13: Dangerous areas 1190, 1372 & 4041*].
- 97 Landmine Action interview. 19 May 2006, Rahova, Kosovo
- 98 Human Rights Watch (2000), *Civilian deaths in the NATO air campaign*, February 2000, http://www.hrw.org/reports/2000/nato/Natbm200-02.htm#P440_116432
- 99 See different arguments reported in Human Rights Watch (2000), *Civilian deaths in the NATO air campaign*, February 2000.
- 100 USAF Major Phil Haun (2001), *Air power versus a fielded army: A construct for air operations in the 21st century*, Research Report, Air Command and Staff College, Air University. Quotation is a combination of body text and footnote.
- 101 From spreadsheet *UK Wpns in Kosovo for EOD – declassified (2)*.
- 102 The first part of this analysis is based on the spreadsheet *000714 CBU Information Info (KU)*, worksheet one *CBU87-hdg* attributed to company HQ USEUCOM.
- 103 The spreadsheet *CBU87 spread pattern estimates from spreadsheet CBU-87 AND CBU-99* presents estimated spread patterns for CBU87 based on data derived from the Joint Munitions Effectiveness Manual (and estimated at 500 KTAS, release angle of 45° and at 1G.) Converted into metres from original data in feet it provides the following breakdown by release altitude:

Release alt. (m)	Length (m)	Width (m)	Area (m ²)
3048	62.91	61.48	3,867.64
4572	62.09	59.41	3,688.36
6096	43.74	52.00	2,274.37
7010	41.94	51.30	2,151.46

- 104 Online at <http://www.publications.parliament.uk/pa/cm199900/cmselect/cmcaff/28/2802.htm>
- 105 For example: Human Rights Watch background paper (May 11, 1999), *NATO's Use of Cluster Munitions in Yugoslavia*, available online at <http://www.hrw.org/backgrounder/arms/clus0511.htm>
- 106 Landmine Action (2001), *Cluster bombs*, p.45.
- 107 Letter from Tony Blair to Harry Cohen MP, 26 July 1999.
- 108 As recorded on the sheet "UK weapons record", UK bombing data submitted to Landmine Action by UNMACC Kosovo.
- 109 As recorded on the sheet "UK weapons record", UK bombing data submitted to Landmine Action by UNMACC Kosovo.
- 110 UNMAS (2002), *Explosive Remnants of War – Experience from Field Operations*. A discussion paper prepared by John Flanagan, former Programme Manager of the UN Mine Action Programme in Kosovo, for the United Nations Mine Action Service (UNMAS), Geneva 15 July 2002, CCW/GGE/II/WP.13
- 111 From UN mine and ordnance casualty database, Kosovo.
- 112 For this analysis depth values between 0 and 5 cm were discounted because it was not certain if these had been recorded in error. Some reports indicated a clearance depth of 1cm which would not seem to accord with standard practices and could be a misreporting of 10cm.
- 113 For example the Landmine Monitor (2001) Kosovo states that: "at the end of 2000, 162 CBU strike areas had been surface and sub-surface cleared and 217 surface-cleared, leaving 219 areas to be cleared in 2001."
- 114 It should be noted that many submunitions are designed to explode on impact with armoured vehicles. This perhaps explains why so many different ground conditions (ploughed fields, sandy soil, vegetation cover) can all be suggested as relatively unsuitable.
- 115 Landmine Action (2002), *Explosive remnants of war, unexploded ordnance and post-conflict communities*, p.26, London.
- 116 UNMAS (2002), *Explosive Remnants of War – Experience from Field Operations*. A discussion paper prepared by John Flanagan, former Programme Manager of the UN Mine Action Programme in Kosovo, for the United Nations Mine Action Service (UNMAS), Geneva 15 July 2002, CCW/GGE/II/WP.13
- 117 Under this article users of explosive ordnance must:
- (...) record and retain information on the use of explosive ordnance or abandonment of explosive ordnance, to facilitate the rapid marking and clearance, removal or destruction of explosive remnants of war (...); and,
- (...) make available such information to the party or parties in control of the affected area, bilaterally or through a mutually agreed third party including inter alia the United Nations or, upon request, to other relevant organisations which (...) are or will be undertaking risk education and the marking and clearance, removal or destruction of (ERW) in the affected area.
- Furthermore, according to the guidelines set out in the technical annex, users of explosive ordnance should record, retain and provide the following information regarding UXO:
- (i) the location of areas targeted using explosive ordnance;
- (ii) the approximate number of explosive ordnance used in the areas under (i);
- (iii) the type and nature of explosive ordnance used in areas under (i);
- (iv) the general location of known and probable UXO;
- 118 See for example PowerPoint Presentation entitled *CBU show* produced by the US Air Force, McGinley S, in March 2000.
- 119 UNIDIR (2006), *Cluster Munitions in Albania and Lao PDR*, Geneva. This section is also quoted in McCormack and Mtharu (2006) *The Foreseeability of Expected Civilian Damage and the Proportionality Equation: To What Extent Should the Mid to Longer Term Consequences of Explosive Remnants of War be taken into Consideration in the Proportionality Assessment*. Paper prepared for the Review Conference of the Convention on Prohibitions or Restrictions on the use of Certain Conventional Weapons which may be deemed Excessively Injurious or to have Indiscriminate Effects, 7-17 November 2006
- 120 Email from John Pike to Richard Moyes, 9th November 2006.
- 121 From an introduction to explosive remnants of war. Based on ICRC talks with a KFOR explosive ordnance disposal specialist, 10 February 2000. Online at <http://www.icrc.org/web/eng/siteeng0.nsf/html/57JQYV>
- 122 Extract from a talk, text online at: <http://www.esr.org.nz/events/even2002/Kosovo.html>
- 123 Landmine Monitor (2002) *Kosovo*.
- 124 Landmine Action interview, Sunday 21 May 2006
- 125 However within these 142 casualties 5 do not record the age of the casualty and of these 3 do not record the gender of the casualty.
- 126 ICRC (2001), *Cluster bombs and landmines in Kosovo*, p.11, International Committee of the Red Cross, Geneva.
- 127 Vietnam Veterans of America Foundation (VVAf) (2000) *Socio-Economic Survey of Mine/UXO Survivors in Kosovo*, November 2000, p.2
- 128 See Landmine Action (2001) *Explosive Remnants of War: Unexploded ordnance and post-conflict communities*; Landmine Action (2005) *Explosive remnants of war and mines other than anti-personnel mines: a global survey 2002-2003*; Moyes (2004) *Tampering: deliberate handling of live ordnance in Cambodia*, HI-B, MAG, NPA.
- 129 Vietnam Veterans of America Foundation (VVAf) (2000) *Socio-Economic Survey of Mine/UXO Survivors in Kosovo*, November 2000, p.2
- 130 See for example Moyes (2004) *Tampering: deliberate handling and use of live ordnance in Cambodia*, HI-B, MAG, NPA.
- 131 ICRC (2001), *Cluster bombs and landmines in Kosovo*, p.12, International Committee of the Red Cross, Geneva.
- 132 The 'other' category in this chart included collecting food, wood or water, demining, farming, military activities and travelling.
- 133 Mines Advisory Group (1999) *Kosovo*, p. 13.
- 134 Transcript of UK Prime Minister Tony Blair's comments, 22 June 1999, to the BBC, audio file online at <http://news.bbc.co.uk/1/hi/uk/374893.stm>
- 135 UNDP / GICHD (2001) "Case Study of Kosovo," Appendix 1, *A Study of Socio-Economic Approaches to Mine Action*, Geneva: UN Development Program/Geneva International Center for Humanitarian Demining, p. 101.

- 136 Landmine Action (2002), *Explosive remnants of war, unexploded ordnance and post-conflict communities*, p.31, London.
- 137 *Landmine Monitor Report 2006*, these rankings exclude the European Union. It is also worth noting that in addressing these problems after the fact, Protocol V serves to push the burden of cost away from the military and onto humanitarian budget lines. For states that fund clearance of cluster munitions but do not support legal initiatives to prevent harm from these weapons this can raise serious challenges of development policy coherence.
- 138 This calculation incorporates the estimate of \$85 million for the period mid-1999 to end of 2001 produced by The Praxis Group in their 2002 report *Willing to Listen: an evaluation of the United Nations Mine Action Programme in Kosovo, 1999-2001*.
- 139 See for example BACTEC clearance of the former VJ ammunition compound at Goles [Task dossier C9-13: Dangerous areas 1190, 1372 & 4041]
- 140 The HALO Trust (2006) *Failing the Kosovars: The Hidden Impact and Threat from ERW*.
- 141 Descriptions paraphrased from those contained in The HALO Trust (2006) *Failing the Kosovars: The Hidden Impact and Threat from ERW*.
- 142 Landmine Action (2002), *Explosive remnants of war, unexploded ordnance and post-conflict communities*, London.
- 143 Interview on 17 November 2005 by Thomas Nash with Bujar Sokolaj, brother and cousin of the two boys killed.
- 144 GICHD (2002), *Explosive Remnants of War (ERW): A Threat Analysis*, Geneva. p 12.
- 145 Reference in source material: "Based on the widely quoted 10-15 per cent failure rates for cluster bomblets in Kosovo."
- 146 Reference in source material: "International Campaign to Ban Landmines, *Landmine Monitor Report 2001: Towards a Mine Free World*, Human Rights Watch, Washington DC, 2001."
- 147 Clearance figures from Landmine Monitor 2006, Kosovo section. Although the munitions were cleared over a longer period than that in which the casualties were incurred these figures can still reasonably be used as a proxy for the number of munitions people were exposed to (so long as the comparison is only being undertaken across munition types in the same geographic context). It could be argued that the population was not significantly exposed to the munitions cleared after the initial phase of clearance and casualties (thus the rapid decline in the rate of accidents). On that basis, and taking the data for clearance June 1999 – end 2001 (Landmine Monitor 2006) instead of data for the longer period, the IR (total) for different types is as follows: APM (0.0107), submunition (0.0089). AVM (0.0038), UXO (0.0019). This analysis makes submunitions even closer to anti-personnel mines in terms of their individual risk.
- 148 Only the detailed casualty data from June 1999 to May 2002 is used in this analysis. Subsequent data does not split mines into anti-personnel and anti-vehicle. Data from 2002 onwards (which overlaps by a few months with the detailed data set) contains the following additional killed and injured by type: AMP (7), submunitions (9), UXO (51), unknown (0). The sudden rise in non-submunition UXO casualties and the complete absence of any unknowns are in stark contrast the detailed data set gathered from June 1999 to May 2002 and are frankly rather suspicious.
- 149 Landmine Action interview, 19 May 2006, Bare, Kosovo
- 150 Quoted in United States General Accounting Office (GAO), *Military Operations: Information on U.S. Use of Land Mines in the Persian Gulf War*, Report to the Honorable Lane Evans, House of Representatives, Sep. 2002; available at URL <http://www.gao.gov/new.items/d021003.pdf>.
- 151 See Human Rights Watch (2002) *Fatally Flawed: Cluster bombs and their use by the United States in Afghanistan*, p.1 and (2003) *Off Target: The conduct of the war and civilian casualties in Iraq*, p. 56
- 152 See Human Rights Watch drawing on a U.S. DoD Report to Congress, *Time to Take Stock: The Current US Cluster Munition Stockpile*, online at: <http://hrw.org/backgrounders/arms/cluster0705/2.htm>
- 153 United Kingdom (2005), *Working Paper on the Military Utility of Cluster Munitions*, March 2005, Geneva, CCW/GGE/X?WG.1/WP.1
- 154 *Statement by the United Kingdom Ambassador for Multilateral Arms Control and Disarmament on Entry into Force of CCW Protocol V and Cluster Munitions*, Special Plenary Meeting on Protocol, 13 November 2006.
- 155 *Written Ministerial Statement on Cluster Munitions*, 4 December 2006, by Kim Howells (Minister of State, Foreign and Commonwealth Office.)
- 156 *UK House of Commons Hansard*, Written Answer by Adam Ingram, Minister of State for the Armed Forces, Ministry of Defence, 7 November 2006.
- 157 Robertson, G. *House of Commons Hansard* London: HMSO 5 Jul 1999: Column: 344.
- 158 Letter from Tony Blair to Harry Cohen MP, 26 July 1999.
- 159 Letter of 20 April 2006 from Headquarters Land Command, Army to Landmine Action.
- 160 Written answer from Adam Ingram, Minister of State for the Armed Forces, 19th July 2006, *UK House of Commons Hansard*.
- 161 "Briefing material used by Kate Wilson", available online at <http://www.the-hutton-inquiry.org.uk/content/evidence-lists/evidence-mod.htm>
- 162 *UK House of Commons Hansard*, 18 July 2006, Written answer from Adam Ingram, Minister of State for the Armed Forces.
- 163 Extracted from Human Rights Watch (2000), *Civilian deaths in the NATO air campaign*, online at: http://www.hrw.org/reports/2000/nato/Natbm200-02.htm#P440_116432

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