Fatal Footprint: The Global Human Impact of Cluster Munitions

Preliminary Report,
November 2006

Handicap International

Table of Contents

Acknowledgments

This preliminary report was conducted, written and produced by Handicap International, with the financial support of the Government of Norway.

Handicap International (HI) would like to express its appreciation to the many mine action organizations, organizations working with people with disabilities, disabled people's organizations and the other individuals and organizations that provided information, time, resources and expertise for this study.

HI owes special thanks to the cluster submunitions and other mine/ERW survivors, families and communities who shared their experience.

The team values the support of the International Campaign to Ban Landmines/Landmine Monitor and the Cluster Munition Coalition networks.

It would also like to thank the following organizations and individuals for their assistance: Albanian Mine Action Executive (AMAE), Andrew Wells-Dang and Catholic Relief Services (CRS) Vietnam, Cambodia Mine UXO Victim Information System (CMVIS), Croatian Mine Action Center (CROMAC), Clear Path International (CPI), HIB-Cambodia, Julien Temple, Reuben Nogueria-McCarthy and Edith Karam from UNICEF, the Iraqi Health and Social Care Organization (IHSCO), John C. Brown from VVAF Iraq, Landmine Action UK (LMA UK), the Landmine Resource Center staff (LMRC), the National Demining Office (NDO) and the UN Mine Action Coordination Center for South Lebanon (MACC-SL) in Lebanon, Mines Advisory Group Iraq (MAG), the National Authority for Prosthetics and Orthotics (NAPO) and the UN Mine Action Office in Sudan (UNMAO), the National Demining Office in Chad (HCND), the Office of the Kosovo Protection Corps Coordinator (OKPCC) EOD Management Unit, Rosy Cave at the United Nations Institute for Disarmament Research (UNIDIR), Steve Goose, Mark Hiznay and Bonnie Docherty at Human Rights Watch (HRW), UN Mission in Ethiopia and Eritrea Mine Action Coordination Centre (UNMEE MACC) and Zamanuddin Noori and Olivier Moeckli of the International Committee of the Red Cross (ICRC) in Afghanistan, as well as several people who provided anonymous information.

Abbreviations and Acronyms

AMAE	Albanian Mine Action Executive
AO	*Aviatsionnaya Oskolochnyang* (Aviation Fragmentation)
ARCS	Afghan Red Crescent Society
BHMAC	Bosnia and Herzegovina Mine Action Center
BLU	Bomb Live Unit
CBU	Cluster Bomb Unit
CBR	Community-Based Rehabilitation
CCW	Convention on Certain Conventional Weapons
CEM	Combined Effects Munition
CMC	Cluster Munition Coalition
CMVIS	Cambodia Mine UXO Victim Information System
CPI	Clear Path International
CROMAC	Croatian Mine Action Center
Dispenser	Container or bomb from which submunitions are ejected
DPICM	Dual-Purpose Improved Conventional Munitions
EOD	Explosive Ordnance Disposal
ERW	Explosive Remnants of War
Footprint	Extent of surface area covered by a cluster munitions strike
GICHD	Geneva International Centre for Humanitarian Demining
HI	Handicap International
HRW	Human Rights Watch
ICBL	International Campaign to Ban Landmines
ICRC	International Committee of the Red Cross
IDP	Internally Displaced Person
IHSCO	Iraqi Health and Social Care Organization
IMSMA	Information Management System for Mine Action
KISR	Kuwait Institute for Scientific Research
LMA UK	Landmine Action UK
LIS	Landmine Impact Survey
MAC-MACC	Mine Action Center/Mine Action Cell - Mine Action Coordination Centre
MAG	Mines Advisory Group
MCC	Mennonite Central Committee
MRE	Mine Risk Education
NATO	North Atlantic Treaty Organization
NDO	National Demining Office
NGO	Non-Governmental Organization
NMAA	National Mine Action Authority
NRA	National Regulatory Authority
OKPCC	Office of Kosovo Protection Corps Coordinator
PTAB	*Protivotankovaya Aviatsionnaya Bomba* (Anti-tank Aviation Bomb)
TMAC	Tajik Mine Action Cell
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNIDIR	United Nations Institute for Disarmament Research
UNMACA	UN Mine Action Center for Afghanistan
UNMIK	United Nations Mission in Kosovo
UNOPS	United Nations Office for Project Services
UNMAO	United Nations Mine Action Office
UNMEE	United Nations Mission in Ethiopia and Eritrea
UXO	Unexploded Ordnance
VVAF	Vietnam Veterans of America Foundation

Introduction

The July-August 2006 Lebanon conflict drew widespread attention to the long-term impact of cluster munitions on civilian populations. Calls for a ban of this indiscriminate weapon are becoming louder. One country – Belgium – has already taken this step, adopting legislation supported by Handicap International, and initiatives are underway in at least eight other countries.

As in the case of Lebanon, previous usage of cluster munitions has sparked eloquent verbal condemnations and has been at the forefront of intermittent international interest and activism since the first extensive utilization in Southeast Asia in the 1960-70s. Since then – like the items themselves – the issue of cluster munitions and their impact lay largely dormant until the outbreak of the Balkan and Gulf conflicts. However, for more than 30 years, states failed to address the lasting humanitarian impact of cluster munitions.

More than half a century has passed since the design and first use of cluster munitions. Ensuing decades have seen both the number of casualties mount, and the use of these munitions proliferate. Spreading through new conflicts to destroy lives, disrupt communities, and deny vulnerable populations' access to resources needed for economic recovery, cluster munitions simultaneously assure both a costly and lethal legacy of war for post-conflict generations.

Cluster munitions are imprecise weapons, designed to strike a greater surface area than many other conventional weapons by dispersing smaller yet highly lethal explosive submunitions. The cluster submunitions scattered on the surface create a 'footprint'. The footprint of a single cluster munitions strike is often hundreds of meters wide, and more than 1,000 submunitions can be dispensed at a time. Oftentimes, targets are struck more than once to ensure success, creating wider and overlapping contamination. Within the footprint, submunitions indiscriminately kill and injure military targets and civilians.

Even when accepting the low official failure rates of optimal test conditions, large numbers of submunitions fail to explode upon impact. In reality, failure rates are often significantly higher due to soil and weather conditions, as well as incorrect delivery and frequent malfunctioning of self-destruct and self-neutralization mechanisms, as was seen in Lebanon. Consequently, a fatal footprint remains until all deadly debris is cleared and the actual strike is only the starting point of the long-lasting harm the weapon can cause.

Yet, unlike the initial blasts, the effects of unexploded submunitions do seem more discriminate; affecting many more civilians than military personnel, killing and injuring children at play, families returning after war and young men and women in the course of their daily lives, as well as those clearing failed submunitions and peacekeepers.

Unlike many instances of production, stockpiling and combat use, the human impact during and after the conflict have not been routinely recorded nor publicized. As a result, the full scope of the problem is largely unknown and undervalued.

Fatal Footprint: The Global Human Impact of Cluster Munitions is an unprecedented preliminary effort to document the impact of cluster munitions on the lives of people in 23 countries and areas that are not internationally recognized, which are confirmed to be affected by cluster munitions. Despite its preliminary character, this report is the first comprehensive study systematically analyzing the impact of cluster munitions on civilian populations through casualty data. It utilizes the limited

information available on casualties of cluster submunitions to track the human impact from the initial cluster munitions strikes, over the short-term post-strike emergency phase, to the post-conflict period, which can affect the lives of individuals, families and communities for generations. By identifying which people become casualties, when, how and why, the research goes beyond simply assessing whether cluster munitions are indiscriminate and excessively injurious.

Fatal Footprint is part of an ongoing project that seeks to improve understanding of the impact of cluster munitions by documenting short-, mid- and long-term casualties, cumulative effects of disability, mortality and resource denial on families and communities. It also provides insight into the items and activities posing the greatest threats in affected areas. This work has been made possible with the support of the Government of Norway, which has also taken a lead and pledged to work towards an international ban on cluster bombs.

At the international level, the Third Review Conference of the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons, to be held from 6 to 17 November 2006, provides a unique opportunity for Member States to acknowledge and tackle the lasting human impact of cluster munitions and hasten the establishment of a legally binding instrument on these weapons.

Brussels, 2 November 2006

Methodology and Research Team

Handicap International has utilized its field and research experience in the area of victim assistance and data collection to provide a better understanding of the consequences of cluster munitions use on people in 23 contaminated countries and areas not internationally recognized.

The report takes a regional approach, comprising individual country profiles, while taking into account both the wider regional and historical context and country-specific characteristics of cluster munitions used. A few selected cases of cluster munitions use and subsequent human impact have been elaborated for their relevance with regard to the scale of contamination, historical and contemporary significance, as well as various ways of dealing with and recording post-strike impact. The research has been divided into five regions: Africa, the Commonwealth of Independent States, the Greater Middle East and North Africa Region, Southeast Asia, and Southeastern Europe. Three countries in the Southeast Asia region, three countries in the Greater Middle East and North Africa Region, and Kosovo were chosen as key cases for their geographical, historical and contamination diversity and parallels.

Each country profile contains a short background section explaining cluster munitions use and contamination to describe the potential extent of unexploded cluster submunitions pollution. Secondly, the availability and completeness of casualty data and injury surveillance mechanisms are assessed in order to define the scope of underreporting. Thirdly, available casualty data are presented and analyzed to the fullest extent possible to draw a casualty profile to be used in assistance planning and to be taken into account when considering the unwanted effects of cluster munitions use. A selection of survivor testimonies is included to show the human face of cluster submunitions casualties.

Initial inquiries clearly indicated the need to analyze data of all casualties caused by cluster submunitions, including both those people killed and injured as a result of cluster munitions strikes and people involved in incidents resulting from submunitions as remnants of war.

The study outline and preparations started in April 2006 and the research resulting in this preliminary report was conducted from mid-July to mid-October 2006 by a team of researchers, information providers and experts with experience in mine action, mine victim assistance, data collection and post-conflict societies. A final report is scheduled to appear in 2007 as part of a larger project.

Initially, background information on cluster munitions use, technical specifications, as well as existing published information on cluster submunitions casualties was compiled in one place and studied. Following that, a broad range of research methods, including analysis of publications, email, telephone and face-to-face interviews (at international forums) were used. A data gathering and management system was developed to store, streamline and correlate casualty data, strike data and technical specifications. In addition, a field trip to Lebanon was undertaken from 30 August to 10 September in order to conduct first-hand research. Information from anterior field trips to, among others, Cambodia (April 2006), Kosovo (October 2005), and Afghanistan (August 2006) was also included. One team member is based in Vietnam and experience and resources within the Cluster Munition Coalition and the International Campaign to Ban Landmines were employed.

Tailor-made queries were drawn up for relevant experts and information providers supplying both casualty data and correlating strike data. The results of these enquiries, as well as other responses, were compiled, standardized,

crosschecked and analyzed. Where necessary, queries were refined and missing data was pursued by consulting known sources to obtain the most complete information possible. The study employed quantitative analysis of the statistical data available from existing data collection systems. The researchers extracted information on specific numbers of casualties, age, gender, groups most at risk, time, location, activity and nature of the incident, for each country profile.

The study aims to detail the human impact and the scope of the problem to increase the possibilities for improved, more effective and varied assistance for the *victims*, i.e. the affected individual, his or her family and affected communities. Handicap International sections, in partnership with other civil society groups in relevant European and cluster munitions-affected countries, will disseminate the *Fatal Footprint* study to provide systematic information and to support others in preventing similar incident from occurring in the future.

By looking at data collection mechanisms and examining the degree to which they are systematic and effective and how comprehensive the resulting data is, *Fatal Footprint* identified areas where information collection and database resources are in need of support.

At the preliminary report stage, the *Fatal Footprint* study has already compiled the most comprehensive publicly available data on casualties of cluster submunitions. But the authors acknowledge required information is missing. They call on relevant sources to provide casualty and strike data in their possession so that the humanitarian needs generated by cluster munitions can be addressed more adequately.

Research Team

- Habbouba Aoun (Coordinator, Landmine Resource Center, Balamand University, Beirut, Lebanon) was co-researcher for the Lebanon country profile and facilitated the field mission to Lebanon.
- Stan Brabant (Head, Policy Unit, Handicap International, Brussels, Belgium) assisted in many aspects of the report's production and development, and together with Katleen Maes and Hugh Hosman developed the vision of the study and defined the research methodology.
- Patricia Campbell (Victim Assistance Specialist, HI-Landmine Monitor, Maputo, Mozambique) conducted background research on various countries and issues.
- Hugh Hosman (Data Management Specialist, HI, Hue, Vietnam) conducted research on Southeast Asia, the Commonwealth of Independent States, several Balkan countries and was in charge of data management, as well as study conception.
- Katleen Maes (Victim Assistance Coordinator, HI, Brussels) conducted research on Afghanistan, Iraq and Lebanon and was in charge of general coordination and final editing of the report, as well as study conception.
- Loren Persi (Specialist Researcher, HI, Prague, Czech Republic) conducted research on Kosovo, Africa and several countries in the Greater Middle East and North Africa Region.
- Yolande Hoornaert and Hildegarde Vansintjan (HI Communications Department and Policy Unit) facilitated the printing and distribution process.

Focus: Southeast Asia

The Second Indochina War, which began in Vietnam, was characterized by high levels of US aerial bombardment, which spread to the neighboring countries of Cambodia and the Lao People's Democratic Republic (Lao PDR). Subsequently, all three countries face varying degrees of post-conflict cluster submunitions casualties and contamination.

CAMBODIA

Confirmed Casualties: 1998 – 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**120**	**N/A**	**N/A**	**120**
Injured	**91**			91
Killed	**29**			29
Unknown Status	**0**			0
Man	43			43
Woman	12			12
Boy	56			56
Girl	9			9
Military	0			0
Deminer	0			0
Unknown	0			0
Dominant Activity	Handling submunitions (70)			
Dominant Location	Livelihood areas (67)			

Key Findings

- Differentiation of ERW type casualties, including those caused by cluster submunitions, started in September 2006. The exercise has, so far, confirmed 120 cluster submunitions casualties (29 killed and 91 injured).
- The total number of cluster submunitions casualties is unknown, as complete information on strike, post-strike and post-conflict casualties is not available.
- From 1969-1973 the United States used a wide range of BLU cluster submunitions resulting in an estimated post-strike contamination of 1.92 to 5.77 million submunitions.

Use Background and Contamination

The US used cluster munitions in Cambodia from 1969-1973 in an attempt to interdict the flow of supplies on the Ho Chi Minh Trail, as well as Vietnamese regular and irregular forces operating from eastern Cambodia.[1] The number of cluster munitions strikes is estimated at 17,235.[2] Air-delivered submunitions used include: BLU-3, 18, 24/66, 26/36/59, 49, 61, 63/86, and 77, and M28. Of an estimated total of 19.23 million submunitions dispensed, the BLU-26 was the most common at nearly 54 percent (10.37 million units), followed by the BLU-24 at 20 percent (3.93 million units) and the BLU-61 and 63 at 17 percent (3.3 million units)[3].

Submunitions manufacturers of the period estimated a 10 percent failure rate, "but it is now generally agreed that the actual rate was approximately 30 percent because the ordnance was often not dropped in accordance with manufacturers' specifications."[4] Accepting a low failure rate of 10 percent, at least 1.92 million submunitions became ERW. However, using the higher rate of 30 percent, initial contamination could be as high as 5.77 million submunitions. In optimal condition testing at Nellis Air Force Base in 1966, BLU-26 submunitions had a 26 percent failure rate after deployment.[5] But given tree canopy and soil conditions in eastern Cambodia, the failure rate was likely at least 30 percent resulting in 3.11 million unexploded BLU-26s.

Data Collection

Data collection is considered nearly complete in Cambodia and the Cambodia Mine UXO Victim Information System (CMVIS) is the definitive source of landmine/ERW casualty data,[6] containing records on over 62,556 casualties collected through the Cambodian Red Cross network and mine action operators.[7]

© Handicap International

In 2005, CMVIS developed a new data collection form for differentiating ERW types, including cluster submunitions, among landmine/ERW casualties. In September 2006, a final review process of the new form was underway to expand the differentiation process through training of data collection implementers.[8]

Casualties and Analysis[9]

A CMVIS pilot project resulted in detailed records for 120 cluster submunitions casualties in 64 incidents: 29 killed and 91 injured in 18 provinces of Cambodia[10] and dated from 1998 to 2006. Analysis of available data shows that males are most at risk: 83 percent (99 casualties) were male; men accounted for 36 percent (43: 16 killed and 27 injured) and boys under 18 for 47 percent (56: 10 killed and 46 injured), respectively, of all cluster submunitions casualties. Boys were 86 percent of child casualties; only nine were girls (one killed and eight injured). Twelve casualties were women (two killed and 10 injured).

On average 1.8 persons were involved per incident. However, 18 percent of total incidents involved three or more people and accounted for 39 percent of total cluster submunitions casualties.

The most common incident activity was handling submunitions at 58 percent of all casualties (70), followed by "doing nothing" at 26 percent (31), and then livelihood activities at 13 percent (16). The most common incident locations were livelihood areas (such as rice fields and forests, etc.) at 56 percent (67), in villages at 25 percent (30), and along roads at 12.5 percent (15). Handling cluster submunitions in livelihood areas accounted for 37 percent (44) of all reported casualties. The worst of these incidents occurred on 1 April 2003, in the village of Chuuk (Krouch Chhmar District, Kampong Cham province), when two men, two women, a boy, and a girl, ranging in age from 17 to 24, encountered a submunition in a rice paddy: the girl was killed and the rest were injured.

© Handicap International

Conflict/Post-Conflict Comparison

All confirmed submunitions casualties reported are post-conflict: while specific information on civilian and military casualties during the conflict is not available, estimates range from as low as 30,000 to as high as 500,000 Cambodians killed during the US bombing campaigns: how many of these were due to cluster munitions will likely never be known.[11]

Comparison with Post-Conflict Casualties Attributed to Mines and ERW

There was insufficient data with differentiation of ERW item type to permit extensive comparison of trends among landmine and cluster submunitions casualties. However, a random sample of 120 landmine casualties showed a total of 104 incidents, as opposed to 64 for cluster submunitions.[12] Further analysis of the sample showed that only 42.5 percent of casualties (51) occurred in livelihood areas and seven percent (eight) in villages. Handling a landmine accounted for only nine percent (11) of landmine casualties. On average 1.2 people were involved per incident. Only three percent (three) of total landmine incidents involved three or more people, and these accounted for only nine percent (11) of landmine casualties.

Life Experience

In 2005, Choen Ha and two other boys were playing near their village in Kampong Speu province when they found four steel balls. Each took a turn throwing them, playing 'marbles'. They did not know that the balls were BLU-63s, or that they were dangerous. When the third boy's turn came, he struck his mark and one of the items exploded. One boy died of massive abdominal injuries from the shrapnel, while the two other boys were injured.

Ha was 17 at the time of the incident near Rol An Beng village and did not finish school. To pay for medical treatment his family spent their entire life savings. There are eight in his family and Ha is the third of six children (four boys and two girls): they are all "angry against the Americans" and during the interview called for clearance, destruction of stockpiles, and a ban on the production of cluster munitions.[13]

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Confirmed Casualties: 1973 – 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**4,813**	**N/A**	**N/A**	**4,813**
Injured	**2,165**			2,165
Killed	**2,521**			2,521
Unknown Status	**127**			127
Man	2,257			2,257
Woman	470			470
Boy	1,654			1,654
Girl	275			275
Military	0			0
Deminer	0			0
Unknown	157			157
Dominant Activities	Livelihood (2,674), tampering (809), playing with ERW (571)			
Dominant Locations	Livelihood areas (2,761), in villages (1,188)			

Key Findings

- Forty-two percent of incidents involve submunitions, leading to at least 4,813 confirmed cluster submunitions casualties.
- All recorded casualties are civilians – with 57 percent resulting from livelihood activities.
- From 1964-1973 the United States used a wide range of BLU submunitions resulting in an estimated contamination of 20.9 to 62.6 million submunitions.

Use Background and Contamination

Cluster munitions were used in vast quantities by the US from 1964 to 1973 in an attempt to interdict the flow of supplies on the Ho Chi Minh Trail in southern Lao, and in support of Royal Lao Government military campaigns in the north, during the conflict with Vietnam.[14] Air-delivered submunitions used include: BLU-3, 7, 18, 24/66, 26/36/59, 42/54, 43, 44, 45, 61, 63, 66, 73, and Mk 118.[15] The most common submunitions encountered are the BLU-3, 24, 26, 42, 61, and 63.[16] Of the approximately 208.75 million submunitions dispensed, the BLU-26 was the most common at 76 percent (158.79 million units), followed by the Mk 118 at six percent (13.18 million).[18]

Accepting low and high failure rates of 10 and 30 percent, respectively, between 20.9 and 62.6 million cluster submunitions became ERW. With a failure rate of 26 percent in optimal condition testing,[19] there were at least 41.3 million unexploded BLU-26s alone remaining at the end of the war, and 47.6 million given a more likely 30 percent failure rate. Cluster submunitions accounted for 46 percent (319,379 items) of all ERW located and destroyed by UXO Lao from 1996 to December 2005.[20]

In August and September 1995, a US military team visited Lao to examine demining/ERW clearance options and made the following assessment: "Submunitions consist of three types: impact fused, time delay fused, and anti-disturbance fused… [b]ecause there is no way to determine the type of fuse… they must all be treated as anti-disturbance devices. US doctrine considers all areas littered with submunitions… as minefields."[21]

Data Collection

Data collection is incomplete, since Lao has no nationwide data collection or injury surveillance system. However, the National Regulatory Authority (NRA) has as part of its mandate to develop and maintain a national casualty surveillance system and has begun the process.[22]

The Handicap International (HI) impact survey and UXO Lao are the primary sources of ERW casualty data and together provided individual records on 11,410 post-conflict casualties. Within this total, the HI survey data holds 10,639 detailed records, and an additional 1,279 who were not interviewed for a total of 11,918 reported casualties.[23] UXO Lao, which receives reports of new casualties but does not actively collect data, has records on 870 mine/ERW casualties (260 killed and 610 injured) from 1999 to December 2005,[24] though records for only 771 detailed records were available.

All data sources in Lao differentiate ERW item types: for example, in the HI survey there were only 12 percent of items reported as 'unknown' and the UXO Lao data generally specifies the BLU type encountered.

Casualties and Analysis

In total, 4,813 cluster submunitions casualties were reported from 1973 to 2006: 2,521 killed, 2,165 injured, and 127 whose status was unknown.[25] This is 42 percent of the total 11,410 casualties with detailed records. Therefore, based on the extrapolation of an average rate of 42 percent cluster submunitions casualties among the 1,279 reported casualties lacking detailed records, there are likely at least 537 additional cluster submunitions casualties. This leads to an estimated total of 5,350 cluster submunitions casualties.

Analysis of available data for 4,656 cluster submunitions casualties (excluding 157 casual-

© Handicap International

ties for whom not all the required details were recorded) shows that males are most at risk and accounted for 84 percent (3,911) of all cluster submunitions casualties, with men representing 48 percent (2,257) and boys 36 percent (1,654), respectively. Boys make up nearly 86 percent of child casualties (1,929). Women accounted for 10 percent (470) and girls for six percent (275) of the total.

The most common incident activities were related to livelihood (digging, planting, harvesting, collecting forest products and cooking) at 57 percent (2,674), followed by tampering at 17 percent (809), and then playing with ERW at 12 percent (571). By far the most common activities for both women and girls were livelihood areas, accounting for 71 percent (532) of a total 745 female casualties; females make up 20 percent of casualties engaging in livelihood activities.

Locations where incidents were most likely to occur were livelihood areas (rice fields, forests, streams, etc.) at 59 percent (2,761) and villages at 26 percent (1,188) of casualties.[26] Again, by far the most common incident location for females were livelihood areas, accounting for 57 percent (423) of all female casualties. Approximately 39 percent (1,801) of cluster submunitions casualties occurred in livelihood areas and involved livelihood activities, while tampering in livelihood areas constituted nine percent (430) of total casualties and playing with ERW four percent (209).

Comparison with Casualties due to Mines/Other ERW

When unknown or unidentified ERW casualties are included, cluster submunitions casualties averaged 44 percent of all casualties for the period 1973-1996,[27] which was as much as all other ERW and mines together (12 percent unknown). From 1999-2005, this was an average of 42 percent, but in the first four months of 2006, it peaked to 72 percent of all recorded casualties.[28]

When the item type is known or differentiated in data collection, cluster submunitions casualties made up at least 51 percent of casualties between 1999 and 2006, similar to some other affected countries in the region.[29]

With high number of incidents involving livelihood activities that disturb soil or vegetation, in combination with (disturbance fuzed) munitions that have become increasingly unstable over the decades, cluster submunitions are the likely cause of a similar proportion of incidents where the device type is unknown. According to the NRA, annual ERW casualties are estimated from 200 to 400, so it is likely that between 80 (at 42 percent) and 200 (at 51 percent) per year are cluster submunitions casualties.[30]

In the HI national survey, 49 percent of 10,639 casualties with detailed records indicated that more than one person was involved in the incident (5,168). Cluster submunitions accounted for 43 percent (2,229) of multiple casualty incidents, with all other ERW combined at 47 percent (2,442), and mines at 10 percent (497).[31]

Cluster submunitions alone accounted for 40 percent (1,815) of 4,525 of those injured, and led to the greatest proportion of multiple injuries amongst all other casualties, with 64 percent (706) of 1,109 total multiple injuries. Among all survivors, 68 percent (3,060) had amputations and three percent (143) were multiple amputees: cluster submunitions survivors were 40 percent (1,211) of amputees and 43 percent (61) of multiple amputees.[32]

Life Experience

In 2003, Dam was injured near his home in Phalanexay district when he found and played with a BLU-63 submunition. His injuries were typical of many such incidents – massive abdominal trauma, shrapnel wounds, as well as a leg and an arm broken by the blast. Evacuated to Savannakhet he received initial treatment, and after two days seemed stable: however, his condition deteriorated as infection set in. The family had no money to pay for treatment so HI decided to evacuate Dam to Thailand. His father recalled that when the boy was ferried across the river he thought he would never see his son alive again.

Nearly 12 now, Dam was revisited by HI staff in September 2006. When questioned directly about what happened he did not reply. His father explained that Dam does not remember the event itself – instead he has recurring nightmares of the explosion. But he went on to say that he had returned to school and is doing well. One thing Dam did have to say was that he tries to avoid ERW, but they are everywhere in the fields near the village.[33]

© Handicap International

VIETNAM

Confirmed Casualties: 1973 – 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**1,275**	**N/A**	**N/A**	**1,275**
Injured	**557**			557
Killed	**278**			278
Unknown Status	**440**			440
Man	391			391
Woman	104			104
Boy	278			278
Girl	56			56
Military	5			5
Deminer	1			1
Unknown	440			440
Dominant Activities	Livelihood (596)			
Dominant Location	Livelihood areas (602)			

Key Findings

- Total post-conflict submunitions casualties are estimated at 34,550 to 52,350 – 1,275 are confirmed.
- The vast majority of casualties are civilians doing livelihood activities – at least 50 percent of incidents where the device is known were caused by submunitions.
- From 1965-1973, the United States used a wide range of BLU submunitions with an estimated contamination of between seven and 21.2 million.

Use Background and Contamination

Cluster munitions were used by the US from 1965-1973 during the conflict in Vietnam. Fifty-five out of 64 provinces were struck with cluster munitions and a number of cities were targeted, including Hai Phong, Hai Duong, Hanoi, Ho Chi Minh, and Hue.[34] Air-delivered device types used include: BLU-3, 24/66, 26/36/59, 32, 42/54, 43/44, 59, 61, 63/86, 77, and 87.[35] Artillery-delivered cluster munitions were also used in three provinces.[36]

US military records show that the level of all air-delivered munitions in the A Luoi district of Hue province peaked in 1972 to approximately 120,000, which is nearly half of all ordnance dropped between 1965 and 1973 and about three times the rate of 1971. Cluster munitions also accounted for nearly half of the total munitions dropped on the district in the final year of the war.[37]

In total, 413,130 tons of submunitions were dispensed in Vietnam, 34 percent of what was dropped on Lao, for an estimated 70.9 million.[38] Accepting a low failure rate of 10 percent, more than seven million submunitions became ERW; however, using the higher rate of 30 percent, initial contamination could have been 21.2 million submunitions.[39]

Data Collection

Casualty data collection is incomplete, as Vietnam has no national data collection or injury surveillance system.[40] Project RENEW and Clear Path International (CPI) are the primary operational sources collecting ERW casualty data. CPI has shared its new casualty data with RENEW, whose database contains records of casualties in Quang Tri province from 1975 to 2006. However, detailed full province data was unavailable from RENEW due to a database update in progress.[41] In both the RENEW and CPI data, ERW type is differentiated if known.

A survey was conducted in A Luoi district of Thua-Thien Hue province in 2001, which differentiated ERW types.[42] In 2005, the first phase of a national landmine/UXO impact survey was conducted in three provinces, but it is not known what level of detail was collected and the November 2005 summary report did not differentiate casualties per device type.[43] Catholic Relief Services (CRS) conducted an MRE baseline study, including casualty data in three districts and one municipality of Quang Tri in mid-2006.[44]

Casualties and Analysis[45]

In total, 1,275 cluster submunitions casualties were recorded from 1973 to 2006: 278 killed, 557 injured, and 440 with unknown status. At least one was military clearance personnel.[46]

An analysis of available data for 835 cluster submunitions casualties (excluding 440 unknown status casualties) shows that males are most at risk at 81 percent (675) of all cluster submunitions casualties. Adult men accounted for 48 percent (397) and boys 33 percent (278), respectively, of all reported casualties. Boys represented 82 percent of 334 child casualties. Women accounted for 12 percent (104) and girls for seven percent (56) of the total.

The vast majority of casualties, i.e. 71 percent (596), occurred during livelihood activities, followed by playing at six percent (48) and collecting war waste at five percent (39). Livelihood activities caused 79 percent of all female casualties (126).

Incidents in livelihood areas (rice fields, grazing areas, forests, and streams) accounted for 72 percent (602) of casualties and incidents


© Clear Path International

within villages accounted for 12 percent (99). More than three quarter of female casualties (122) occurred in livelihood areas.

Nearly 40 percent (329) of all cluster submunitions casualties reported that they were involved in an incident causing multiple casualties.

Comparison with Post-Conflict Casualties Attributed to Mines and ERW

Submunitions caused 33 percent (1,275) of all recorded landmine/ERW casualties (3,914), and accounted for 50 percent where the item was known in available data from 1973 to 2006 for Vietnam. Between 2003 and 2005, the rate of casualties known to be caused by cluster submunitions was 55 percent. This corresponds closely with the rate of cluster submunitions casualties among ERW casualties generally in both Lao and Tajikistan.[47] Therefore, it is likely that cluster submunitions cause a similar proportion of incidents where the device type is unknown.

According to estimates provided by the Ministry of Labor, Invalids and Social Affairs there were 104,701 civilian landmine/ERW casualties between 1975 and 2000, 38,849 people were killed and 65,852 injured.[48] If cluster submunitions casualties constituted 33 to 50 percent of total recorded casualties, they could account for an estimated 34,550 to 52,350 civilian casualties between 1975 and 2000.

Without nationwide data collection, insufficient data exists to establish a reliable annual landmine/ERW casualty rate, but estimates indicate that there are between 1,200 and 3,000 each year.[49] Taking the low estimate into account, this could mean there are between 396 and 600 cluster munitions casualties annually in Vietnam.

Conflict/Post-Conflict Comparison

Given the estimate of nearly four million Vietnamese civilians and 1.5 million military personnel killed during 30 years of conflict,[50] and nearly a decade of use of cluster munitions in 55 of 64 provinces, a significant portion of those casualties were certainly caused by cluster submunitions. However, the extent of these casualties will likely never be known.

Life Experience[51]

Ho Van Lai was injured in a cluster submunitions incident in August 2000, which killed two cousins and slightly wounded a sibling. The boys were playing among the pine trees near their homes, where the village children often play, when they found what looked like a small metal ball in the sandy soil – a ball which exploded minutes later as they were kicking it back and forth.

Lai was blinded in one eye and lost partial vision in the other. He lost a leg, part of the remaining foot, one hand and the thumb of the other, and was terribly scarred by the blast. After his initial recovery, he faced three surgical revisions to be fitted for prosthetics, spending months in recovery and rehabilitation. As with many young boys, playing football was Lai's passion, and something he thought he would never be able to do again. Eventually he returned to school and some three years later was again seen playing football.


© Clear Path International

Focus: Africa

Cluster munitions use in Africa demonstrates that even limited use of the weapon can have a significant human impact. However, the extent of the threat of unexploded submunitions has not been assessed and improved data collection is needed to asses the humanitarian impact and long-term needs of survivors.

CHAD

Key Findings

- Several locations in Chad are contaminated with cluster munitions.
- The absence of complete casualty data and data differentiated by item type impedes assessment of the human impact of cluster submunitions.

Use Background and Contamination

Cluster munitions were used in Chad by the Libyan army after the departure of its troops from the country in mid-1987.[52] The 2002 Landmine Impact Survey (LIS) reports 92 sites with cluster munitions contamination.[53] Submunitions and/or their containers have been found in several areas of the following regions of Chad: the Borkou Ennedi Tibesti (BET) region (northeastern Chad), the Biltine region (northeastern Chad), and east of N'Djamena.[54]

Two types of submunitions have been found, both of former Soviet Union (USSR) manufacture: PTAB-2.5 antivehicle submunitions and AO-1SCh antipersonnel submunitions.[55] There have also been reports of French use of cluster munitions in Chad.[56] However, as of 3 October 2006, mine clearance operators have not found evidence of unexploded French submunitions.[57]

In Chad, mines and other ERW seem to pose a graver danger than unexploded submunitions. The National High Commission for Demining (Haut Commissariat National de Déminage, HCND)[58] recorded clearance and destruction of only 157 submunitions. This is approximately 0.01 percent of the total of 158,034 ERW cleared between September 2000 and March 2006.[59]

Data Collection

There is no comprehensive data collection mechanism in Chad. HCND reports of ERW casualties are not differentiated by type of ordnance; even the distinction between mine and ERW incidents may not always be clearly recorded.[60] Fatal casualties often go unreported and accurate reporting of new casualties is affected by limited access to incident locations.[61] The LIS for Chad did not adequately differentiate between casualties of mines and ERW[62] and no differentiation for casualties of cluster submunitions was made.

Casualties and Analysis

HCND is not able to estimate the number of casualties related to cluster submunitions due to a lack of clear incident reporting.[63] The International Committee of the Red Cross (ICRC) does not know of cluster submunitions casualties, and is not in a position to provide information about some of the areas affected by cluster munitions.[64] Mines Advisory Group (MAG) does not have knowledge of casualties due to cluster submunitions in Chad.[65]

Of the 339 casualties of mines and ERW recorded in the LIS, 330, or 97 percent, were civilian. The most common activity type during incidents recorded in the LIS was tampering, representing 121 casualties, or 36 percent, the next most common activity was herding, 73 people, or 22 percent.[66] The LIS data show that many casualties sustained injuries to the upper body, and state that this is predominantly caused by tampering with ERW.[67,]

ERITREA

Key Findings

- Cluster submunitions casualties have been reported as the immediate result of at least two strikes, and as a result of post-strike contamination.
- The limited casualty data collection mechanism does not include specific reference to cluster submunitions casualties.

Use Background and Contamination

Ethiopian forces used cluster munitions in Eritrea during the Badme border area conflict, which started in 1998.[68] On 9 May 2000, the Korokon internally displaced persons' (IDP) camp was bombed with UK-manufactured BL755 cluster munitions each containing 147 submunitions. Soviet-designed PTAB and AO-1 type submunitions were also found in the Badme area.[69] Contamination from unexploded cluster submunitions was reported in the Korokon IDP camp in Gash Barka, as well as at an IDP camp in Adi Bare in Shambiko, both in Sector West of the Temporary Security Zone (TSZ).[70]

In May 2000, the Ethiopian airforce reportedly hit the military and civilian airports in Asmara with rockets and cluster munitions.[71] According to an Eritrean Ministry of Foreign Affairs press release, the bombing of the airport facilities and a nearby soap factory missed the intended targets.[72] It has also been alleged that the Eritrean ports of Massawa and Assab on the Red Sea coast were struck with cluster munitions in the same period.[73]

Data Collection

The Mine Action Coordination Centre (MACC) of the UN Mission in Ethiopia and Eritrea (UNMEE) collects casualty data in the TSZ. The information is entered into IMSMA but does not provide a breakdown according to device type beyond mine and ERW, making it difficult to identify cluster submunitions incidents. This lack of detail in reporting is believed to be exacerbated by the limited technical knowledge of investigators and reporters.[74] Casualty data in the TSZ is primarily reported by military observers, UNMEE MACC staff, ICRC, and NGO workers.[75]

Casualties and Analysis

The total number of cluster submunitions casualties is unknown, but recorded casualties include at least seven people killed and three injured: eight of them were children.

One child was killed during the cluster munitions strike on the Korokon IDP camp in May 2000. The low level of casualties during the strike has been attributed to the high failure rate of the submunitions, subsequently resulting in extensive ERW contamination.[76] Many of the unexploded submunitions found at Korokon failed to arm correctly, which may have also resulted in them being less sensitive to handling.

The May 2000 cluster munitions strike on Asmara airport facilities reportedly resulted in at least two civilians injured during the strike, as the intended targets were not hit. [77]

By August 2000, UNMEE MACC received reports of three children killed in separate incidents in the BL755-contaminated area near Korokon.[78] Also in 2000, a 16-year-old boy was killed attempting to open a BL755 submunition with a stone.[79] HALO Trust found some 20 BL755 submunitions collected by children at a nearby site. Some of the children had been using the copper cone of the submunitions' explosive charge to make bells. Other risk-taking behavior included adults moving unexploded submunitions to prevent children from playing with them.[80]

In January 2006, two boys were killed and one injured while tampering with ERW near the village of Ksad Ekka. Preliminary investigation by UNMEE determined that the device was either a grenade or a submunition.[81]

ETHIOPIA

Key Findings

- One cluster munitions strike reportedly caused more than 200 casualties in Ethiopia, but the scope of the problem is unknown due to the lack of an adequate casualty data mechanism.
- Use of cluster munitions and subsequent submunitions contamination has not been recorded or differentiated by mine action actors or in the Landmine Impact Survey.

Use Background and Contamination

The Eritrean army used cluster munitions against Ethiopia during the Badme border conflict that began in 1998. On 5 June of that year, Eritrea launched air-delivered Cluster munitions targeting the Mekele airport runway. At least two cluster munitions struck a school and a residential area in Mekele instead. The Eritrea Ethiopia Claims Commission in The Hague found that the cluster munitions strike resulted in civilian "deaths, wounds and suffering."[82] It was reported that submunitions pose "at least

some extent" of a threat on the Ethiopian side of the TSZ.[83] However, the UNMEE MACC has not found evidence of submunitions during landmine/ERW clearance. The UNDP remarked that the nationwide LIS undertaken in 2003-2004 did not report unexploded submunitions found as ERW. Moreover, the UNDP in Ethiopia is not aware of cluster weapons being used in Ethiopia or by Ethiopia.[84] However, the Survey Action Centre (SAC) – responsible for the LIS – indicated that the reason for not having information on cluster munitions contamination in Ethiopia is because, at the time of the LIS, cluster munitions were not considered to be a concern. According to SAC, the LIS could, if asked and needed, distinguish casualties from cluster munitions, as well as other ERW and landmines.[85]

Data Collection

There is no nationwide casualty data collection mechanism in Ethiopia. Existing data collection is not coordinated nor is it clear which organization has the mandate to collect data. It was reported that, in 2005 and 2006, the Ethiopian Mine Action Office (EMAO) was not able to collect casualty data due to a lack of political will, coordination and funding issues. Information contained in IMSMA at EMAO is not accessible. Various operators handed responsibility of casualty data collection to the local Bureaus of Labor and Social Affairs (BoLSA). However, these have not been able to generate data and it is unclear if data is collected.[86]

Casualties and Analysis

Cluster munitions targeting the Mekele airport instead struck the Ayder school and surrounding neighborhood, resulting in a total of 238 civilian casualties: 53 killed (including 12 children) and 185 injured (including 42 children).[87] Additionally, cluster munitions used on 11 June 1998 in Adigrat are reported to have killed four and injured 30.[88]

The number of post-strike casualties is unknown due to inadequate data collection and a lack of information on cluster munitions contamination, which impede a full grasp of the scope of the problem.

SIERRA LEONE

Key Findings

- There are at least 28 reported cluster submunitions casualties in Sierra Leone.

Use Background and Contamination

Cluster munitions were reportedly used in Sierra Leone by Nigerian forces undertaking an Economic Community of West African States Monitoring Group (ECOMOG) intervention mission after a military coup in May 1997. On 11 December 1997, three cluster munitions were allegedly dropped in Kenema, 240 kilometres from Freetown.[89] According to 1997 media reports, two cluster munitions also struck Lokosama, near Port Loko in September 1997. This was denied by ECOMOG.[90] In October 1997, Sierra Leone Armed Forces personnel accused Nigerian military pilots of using cluster bombs on civilian targets in Freetown.[91] It has been reported that French-manufactured Beluga cluster submunitions were collected in arms hand-ins in Sierra Leone.[92] British-manufactured BL755 munitions also appear to have been found near Freetown.[93]

Data Collection

There is no systematic ERW casualty data collection in Sierra Leone.[94]

Casualties and Analysis

The cluster munitions strike by the Nigerian ECOMOG mission in Kenema resulted in 28 casualties; 10 people were killed and 18 injured.[95] No further details regarding additional strike or post-conflict cluster submunitions casualties are available and no ERW incidents causing casualties have been recorded since the end of the civil war in 2002.[96] This is partly due to the non-existence of a data collection mechanism.

SUDAN

Key Findings

- At least 36 cluster submunitions casualties have been reported, of which several occurred during cluster munitions strikes in civilian areas.
- Data collection is not comprehensive and due to limited differentiation only 23 post-conflict casualties of cluster submunitions were recorded in IMSMA.

Use Background and Contamination

Sudanese government forces used cluster munitions against the Sudan People's Liberation Movement /Army (SPLM/A) in southern Sudan between 1995 and 2000.[97] Cluster munitions strikes were mostly conducted by aerial bombing.[98] The Sudanese government reportedly used cluster munitions, amongst

other weapons, specifically against non-military targets, including hospitals and IDP camps.[99]

Numerous cluster munitions strikes were identified between 1995 and 2000, including five cluster munitions dropped on cultivated land surrounding Chukudum on 20 April 1995; at least 16 cluster munitions dropped in Chukudum on 17 June 1996; at least seven locations struck in Bahr al-Ghazal province in early February 1998; Koba and Lomon in the Nuba Mountains attacked on 3 August 1998; one cluster munition dropped on Yei Hospital on 28 September 1998; Nimule struck on 30 September 1998; 24 cluster munitions dropped in Akak on 16 May 1999; two cluster munitions dropped on Kajo Keji Hospital and Médecins sans Frontières (MSF) in Kajo Keji on 20 June 1999.[100] In late April or early May 2000, government troops reportedly used cluster munitions around the town of Bentiu.[101]

The Government of Sudan reportedly used Chilean-manufactured CB-130, CB-500 or CB-250-K cluster munitions, containing PM-1 CEM combined effects submunitions.[102] In 1996, HALO Trust identified submunitions found at Chukudum as possible Soviet-manufactured PTAB-1.5 and Chilean-designed PM-1 type submunitions.[103] Cluster submunitions and/or dispensers have been found in Bahr al-Ghazal, Kordofan, Equatoria, Blue Nile and Upper Nile provinces.[104]

Data Collection

No comprehensive countrywide casualty data collection system exists in Sudan. The UN Mine Action Office (UNMAO) maintains casualty data in IMSMA;[105] a limited number of entries specify cluster submunitions as the cause of the incident. The South Sudan Regional Mine Action Center does not have detailed casualty information, particularly regarding cluster submunitions causalities.[106] Local actors also gather casualty data. However, many of these are not entered into the IMSMA database as the information is incomplete.[107]

A national census has been mandated under the Comprehensive Peace Agreement of 2005, and is scheduled for 2007.[108] The census is expected to include questions regarding people with disabilities and thus increase knowledge of mine/ERW casualties. Additionally, UNMAO plans to initiate a casualty data survey as a part of a US$1.7 million project funded by the UN Trust for Human Security.[109] The National Authority for Prosthetics and Orthotics (NAPO) has the capacity to collect data on cluster submunitions casualties through the patient files in its ICRC-supported database.[110]

Casualties and Analysis

There are at least 36 cluster submunitions casualties in Sudan, including 16 killed and 20 injured. At least six were children. UNMAO has recorded 23 post-strike cluster submunitions casualties, nine people were killed and 14 injured; 19 were males and four females. Of the 10 casualties whose ages were recorded two were children. The ages ranged from 10 to 32, the average age being 21. Activity at the time of the incident was recorded for twelve casualties: four activities were military; three were tending animals; three traveling; and one farming.[111] Most casualties occurred in Kordofan (13) and Bahr al-Ghazal (five).[112] In 2005, UNMAO recorded one submunition incident but the number of casualties was not known.[113] Additionally, a 15-year-old girl was killed and another injured in May 1996 when neighbors were burning submunitions from the Chukudum strike.[114]

Numerous casualties have been reported during strikes. However, there are some cases where more than one type of weapon may have been used, including in Labone IDP camp in 1997, as well as in Adet and Thiet in 1998.[115] Five people were killed and three injured due to submunitions in the Nuba Mountains in August 1998, and one person was injured in Yei hospital in September 1998. In May 1999, one child was killed and one injured during a strike in Akak (Bahr al-Ghazal).[116]

Focus: Southeast Europe

Cluster munitions were used in the Balkan region in conflicts resulting from the breakup of Yugoslavia. The largest numbers of known casualties in Kosovo were a consequence of unexploded submunitions scattered in the tens of thousands by NATO bombing. Children were those killed and injured the most by the attractive, but deadly submunitions.

ALBANIA

Key Findings

- The total number of cluster submunitions casualties is 56: 10 killed and 46 injured nearly all caused by KB-1 and BLU-97 submunitions.
- Cluster munitions were used by NATO and Serbian forces along the Albania-Kosovo border.

Use Background and Contamination

Cluster munitions were used in 1999 during the Kosovo conflict by both the North Atlantic Treaty Organization (NATO) and Serbian forces: BLU-97, M118, BL755, KB-1 and KB-2 (Yugoslav) submunitions were reported.[117] Additionally, at least two artillery-delivered cluster munitions strikes were confirmed by the Organization for Security and Cooperation in Europe (OSCE) in the Tropoja region.[118]

NATO executed six strikes along the Kosovo-Albania border, allegedly against Serbian military positions.[119] Non-NATO cluster munitions strikes occurred further into Albania and included 13 April 1999, when two cluster munitions struck the small border village of Zogaj in the context of other shelling;[120] on 15 April, five Serbian rocket-fired 262 mm cluster munitions fell on fields near the hamlet of Kolsh, near the city of Kukës;[121] on April 21, Russian-made cluster munitions were fired into Albania near Krume.[122]

Immediate surface clearance by the Albanian Armed Forces located and destroyed 2,759 unexploded submunitions: 97.5 percent were KB-1s.[123] The Albanian Mine Action Executive (AMAE) stated that 13 areas along the Kosovo-Albanian border have been identified as contaminated with submunitions.[124] Failure rates for NATO-used munitions were estimated at between 20 and 25 percent, whereas 30 to 35 percent of submunitions used by non-NATO forces failed.[125]

Data Collection

AMAE coordinates and conducts complete nationwide casualty data collection, which is stored in the IMSMA database at its regional office in Kukës. Data is collected by AMAE through its mine risk education (MRE) and community-based rehabilitation (CBR) programs, as well as its operational partners, primarily the Kukës-based NGO Victims of Mines and Weapons Association (VMA-Kukesi). In January 2006, AMAE completed identification of 467 previously unknown ERW casualties in the "hotspots" in central Albania by collecting IMSMA incident and needs assessment reports.[126]

Casualties and Analysis[127]

Between 1999 and 2006, 56 cluster munitions casualties occurred in 35 incidents and one accident, including 10 people killed (nine males and one female) and 46 injured (41 males, and five females). On 24 May 2004, a KB-1 submunition detonated during a training session for technical survey project personnel: two people were killed and 18 injured in the accident.[128] On average 1.7 persons were involved per incident,[129] and the mortality rate was nearly twice that of landmine casualties.[130]

All but three of the reported submunitions casualties were civilian: the United Nations Institute for Disarmament Research (UNIDIR) identified two. Additionally, a policeman was killed in the area of Kolsh when he picked up an unexploded submunition after the 15 April 1999 strike.[131] Additionally, it is unknown whether KLA casualties, if there were any, are included in AMAE records or recorded as such.[132]

All but two casualties occurred post-conflict. During the strike on Kolsh on 15 April 1999 a young goatherd was injured.[133]

Submunitions casualties reported by AMAE involved either KB-1 (24, with two killed, 22 injured) or BLU-97 (four killed) submunitions, while two other casualties resulted from unidentified submunitions.

Life experience

In September 2001, 13-year-old Gazmir was playing with some friends near his house in Krume, in the Kukës prefecture. Finding an interesting object, the children began to play with it. When the KB-1 submunition exploded Gazmir's eyes were injured to the extent he was declared legally blind. Before the incident Gazmir had been one of the top students in his class, though afterward his studies became unsatisfactory. Aside from his initial treatment, Gazmir has received support for a private tutor, along with English and computer skills lessons.[134]

BOSNIA and HERZEGOVINA

Key Findings

- Nine cluster submunitions casualties are confirmed and dozens unconfirmed. The total number of cluster submunitions casualties are unknown due to inadequate data collection.
- NATO and internal factions used cluster munitions.

Use Background and Contamination

NATO and internal factions used cluster munitions during the conflict from 1992 to 1995. Some examples of use include: Orkan M-87 multiple rocket launcher firing on the town of Livno and airplanes from a Krajina Serb-held area in Croatia bombing the UN safe area of Bihaç with cluster munitions.[135] Bosnian Serbs struck a refugee camp south of Tuzla with cluster munitions. Bosnian Serbs claimed that NATO strikes also hit civilian targets in Banja Luka.[136] The Bosnia and Herzegovina Mine Action Center (BHMAC) data does not confirm alleged casualties from these strikes.[137]

Data Collection

Incomplete nationwide casualty data is collected by BHMAC. Additionally, due to the unification and verification of all operator databases, detailed information on landmine/ERW casualties was not made available. The BHMAC database contains records on casualties occurring during and after the conflict, but it is not known whether submunitions are differentiated from other devices.[138]

Casualties and Analysis

The total number of submunitions casualties in Bosnia and Herzegovina is not known, as available data is very limited. There have been nine confirmed casualties between 1992-2006, including seven killed and two injured.

The cluster munitions strike on a refugee camp south of Tuzla killed seven and dozens more were reportedly injured. BHMAC identified only two deminers injured in separate accidents with KB-1 cluster submunitions in 2002: one in Vogosća and one in Gornji Vakuf. According to BHMAC, both accidents were caused by breach of procedure.[139]

CROATIA

Key Findings

- Cluster munitions were used on several occasions by forces of the self-proclaimed Republic of Serbian Krajina (RSK) and KB-1 submunitions caused all reported casualties.
- There are 277 confirmed cluster submunitions casualties, including 258 killed, 17 injured, and two unknown – two strikes on Zagreb accounted for 243 of these.

Use Background and Contamination

Cluster munitions were used on several occasions by forces of the self-proclaimed Republic of Serbian Krajina (RSK) between 1991 and 1995, most notably on 2 and 3 May 1995 when Orkan M-87 multiple rocket launchers were used to hit civilian targets in Zagreb, which caused the majority of reported casualties.[140]

Data Collection

The Croatian Mine Action Center (CROMAC) and Croatian Mine Victims Association (CMVA) conduct nearly complete nationwide data collection since 1991 and 1990 respectively. However, only 50 percent of the CROMAC casualties registered have complete details.[141] Casualties from cluster submunitions are differentiated from casualties caused by other devices, but the total number of cluster submunitions casualties is unknown since few conflict casualties were recorded.

Casualties and Analysis

Between 1993 and July 2005, 277 cluster submunitions casualties have been confirmed,

including 258 killed, 17 injured, and two whose status was unrecorded. The May 1995 strikes on Zagreb accounted for 243 (88 percent) of reported casualties: including seven people killed and 236 injured in the two-day period, five were killed and 186 injured the first day, two killed and 50 injured the second.[142]

Analysis of limited CROMAC data for 34 cluster submunitions casualties, including 10 killed, 22 injured and two unknown, shows that 97 percent were civilians. Males accounted for 82 percent of all casualties. Boys account for 43 percent of the male casualties and the highest risk activity for boys was playing (29 percent). CROMAC recorded two men and a woman injured during strikes on 1 January and 1 September 1993, in Zaton and Gospic, respectively.

From 1 January to 14 July 1993, there were 12 male casualties from 11 post-strike incidents, including five killed and seven injured in Zadar, Muc, Sibenik and Sukosan. In 1994, one six-year-old boy was killed. In 1995, there were nine casualties from four incidents: one man was killed and eight people were injured, including a woman, a girl, three boys, and three men.

The remaining nine casualties (three killed, four injured, and two unknown) occurred in the post-conflict period between 1996 and 2005. One deminer was killed clearing submunitions at a hospital in Zagreb. On average about 1.5 people were involved per incident. KB-1 submunitions have caused all known casualties reported by CROMAC.[143]

Life Experience

Ivan Mikulcic was 56 years old when the village of Pleso, some 500 metres from the Zagreb airport, was shelled with cluster munitions: "On that day, the 2nd of May, 1995, I was at my home at Pleso... On that morning at around 10.00, shelling started, and an unexploded cluster bomb of the Orkan type landed in my yard about 8 metres away from me... Some of the bomblets of the bomb remained unexploded, but there was one that exploded some 4 metres behind my back, injuring me and damaging my home.... At that point, I was on my way to the shelter and I only managed to get hold of the doorknob when I felt this very sharp pain in my back. And to this day I've been carrying three pieces of shrapnel in my back... the physician... told me that they were thus placed that they would cause more damage by taking them out than by leaving them there." [144]

KOSOVO[145]

Confirmed Casualties: 1999 – 2005				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**164**	**N/A**	**147**	**15**
Injured	**103**		96	7
Killed	**59**		51	8
Unknown Status	**2**		unknown	
Man	50		39	11
Woman	3		3	0
Boy	83		81	2
Girl	1		1	0
Military	7		7	0
Deminer	15		13	2
Unknown	5	unknown	3	unknown
Dominant Activities	By-standing/passing by (40)			
Dominant Location	Dakovica (29)			

Key Findings

- Cluster munitions used by NATO.
- At least 164 casualties of cluster submunitions recorded in Kosovo; the majority were children.
- Sixty percent of cluster submunitions incidents involved two or more people.

Use Background and Contamination

The vast majority of cluster munitions contamination in Kosovo is the result of use by NATO forces against the Federal Republic of Yugoslavia during 'Operation Allied Force' from March to June 1999. The United States and the Netherlands used CBU-87 cluster munitions each containing 202 BLU-97 combined effects submunitions. Some CBU-99 and CBU-100 munitions were also used. The United Kingdom used about 500 RBL755 munitions, each containing 147 dual-purpose antivehicle and antipersonnel blast and fragmentation submunitions.[146]

In 1999, NATO informed the United Nations Mission in Kosovo (UNMIK) Mine Action Coordination Centre (MACC) that 1,392 cluster munitions containing 289,536 submunitions were targeted at 333 strike locations in Kosovo.[147] However, research suggests NATO forces dropped more than 2,000 cluster munitions containing approximately 380,000 submunitions.[148] The credibility of the strike data NATO provided some ten months after the end of the conflict seemed questionable due to "glaring inaccuracies,"[149] and the problem appears to be wider than initially reported.[150]

In 2001, failure rates of BLU-97 submunitions were estimated at some seven percent, and RBL755 submunitions at about 11 percent.[151] The manufacturer assessed the failure rate of RBL755 submunitions at five percent.[152] At a failure rate of five percent, about 14,500 to 19,000 submunitions would have remained unexploded.

Clearance data indicates that at least 18,318 cluster submunitions have been destroyed in the period June 1999-2005,[153] and the MACC has estimated that more than 20,000 unexploded submunitions remained after the war.[154] All known strike areas were cleared to international standards by 2002.[155] However, UNMIK continued to find submunitions in areas not considered affected in 1999-2001 and by the end of 2005, 12 areas contaminated with submunitions still required clearance.[156] This seems to suggest either that the failure rate of the submunitions was higher than the official estimates or that more submunitions were used, considering that the submunitions cleared by KFOR EOD units and those destroyed by Yugoslav forces during the conflict are not included in these totals.[157] The unexploded submunitions were in a highly sensitive state, and could explode as a result of being moved or picked up.[158]

It has been alleged that the Federal Republic of Yugoslavia Air Force used BL755 cluster munitions in the Kosovo conflict but numbers used are not known.[159]

Data Collection

Between 1999 and 2001, the ICRC was the lead agency for data collection on mine/ERW incidents and collected the vast majority of the cluster submunitions casualty data stored by the MACC in the IMSMA system. The MACC and partners analyzed and verified data for 1999-2001, and included a comprehensive casualty and incident recording system that allowed data to be overlaid on maps depicting geographic features and contaminated areas.[160]

Since 2002, the Institute of Public Health (IPH) within the Ministry of Health, Environment and Spatial Planning has been responsible for investigating and recording all incidents involving mines, submunitions and ERW in Kosovo and shares data with the UNMIK Office of the Kosovo Protection Corps Coordinator (OKPCC) EOD Management Section.[161] However, the original MACC records could not be accessed after transfer to the IPH,[162] and maintenance of the database was a concern.[163] As a result, only basic total figures from the period based on UNMIK MACC monthly summaries are available. The original data appears to have contained information on name, status, place, age, gender, activity, marking, contact information, and often a brief note regarding the incident. The database also contained some records of people involved in an incident who escaped injury.

Casualties and Analysis[164]

The casualty data possessed by OKPCC EOD shows 164 civilian casualties of cluster submunitions in Kosovo from June 1999 to 2006. The total casualties are likely to be significantly higher, as the number of casualties during strikes is not known and casualty data might have been lost. Military, deminers and some civilian clearance casualties are probably not included in these totals.[165]

As the conflict ended, cluster submunitions caused "considerable casualties amongst the rapidly returning civilian population"[166] and at least 45 people were killed and 106 injured between 1999 and 2001. Incidents "generally involved groups of younger people, often with very tragic results."[167] Analysis of data from the first months after the strikes corroborates this: 81 casualties were boys under 18, compared to 62 adults. Only four female casualties of cluster submunitions were recorded in the post-strike period, three of them adults in a single civilian clearance accident. It seems likely that cluster submunitions incidents were unreported during the emergency post-strike phase, 1999-2001, due to data collection challenges and imprecise attribution of devices responsible. For example, among the 54 casualties of unknown devices from June 1999 to November 2000, one incident stands out as having similar characteristics to many submunition incidents: an incident in April 2000 injured four boys aged 10 to 14 and two women in their early 20s in their home when one of the boys brought back an object from the field looking "like a tin of Coca Cola" – a description often used for BLU-97 submunitions.[168]

All of the 10 casualties recorded in the post-conflict period from 2002 to 2006 were males.

The average age of all known civilian cluster submunitions casualties in Kosovo is 19. Individual cluster submunitions incidents are often responsible for causing multiple civilian casualties. Over 60 percent of all submunitions incidents resulted in two or more casualties, the average casualty rate per incident being 2.7. At 25 percent, the most common activity at the time of the incident was passing or standing nearby (40 people). Other activities include, tampering 16 percent (25), tending animals 14

percent (23), and playing and recreation nine percent (14); other/unknown accounted for 14 percent (23).

Cluster munitions casualties have been recorded in 20 municipalities, with most casualties recorded in Dakovica (29). Five other municipalities recorded over 10 casualties each: Kosovska Mitrovica (14), Urosevac (13) Kacanik (15), Podujevo (12) and Prizren (12).

Comparison with Post-Conflict Casualties Attributed to Mines and ERW

Cluster submunitions were responsible for 31 percent of total recorded casualties between 1999-2005, while mines caused 52, other ERW 16 percent and one percent was unknown. However, submunitions were responsible for 49 percent of deaths, compared to 34 percent from mines and 17 percent by other ERW. Between June 1999 and May 2001, cluster submunitions caused 84 percent of total ERW casualties.[169] In the period from 2002 to 2006, this declined to 14 percent of ERW casualties due to clearance efforts.

Conflict/Post-Conflict

All confirmed casualties reported in the original MACC database occurred as a result of unexploded munitions after NATO bombing between March and June 1999.[170] Seven incidents of NATO cluster bomb strikes resulting in civilian casualties in the (former) Federal Republic of Yugoslavia, including Kosovo, have been substantiated, and an additional five possible incidents are unconfirmed. It is believed that 90 to 150 civilians have been killed during cluster munitions strikes.[171] Human Rights Watch (HRW) identified at least 12 people killed and a further 50 injured during NATO cluster munitions strikes in Kosovo. However, many of the incidents were not independently verified.[172] Therefore, they are not included in the casualty statistics of this study. Seven casualties from a tampering incident with an unexploded submunition during the conflict period have been included in the post-strike data. All casualties were boys from the same family aged two to 16: five were killed and two injured.[173]

Civilian/Military Comparison

A total of 22 casualties were likely to have been involved in clearance activities or were military personnel, accounting for 13 percent of casualties. Some accidents include clearance by former KLA and foreign peacekeepers.[174] Two British KFOR soldiers were killed while clearing submunitions.[175] Former KLA soldiers were reportedly assisting at the time; three were also killed and another two were injured.[176] No Yugoslav/Serb forces have been identified as casualties of submunition contamination in Kosovo. The majority of incidents involving clearance/EOD and the military occurred between June and September 1999.

Life Experience[177]

In August, 1999, about three months after the NATO cluster munition strikes, Adnan's family went to swim in a small lake a few kilometers from their village. At the time, Adnan was almost seven years old. On the bank of the lake Adnan found a yellow metal can. He did not know that the object was an unexploded BLU-97 cluster submunition. Adnan brought the object back to his family.

Adnan's older brother, Gazmend (17 years old) was holding the submunition when it fell to the ground and exploded. The explosion killed both Gazmend and their father. Adnan sustained injuries to his left arm and leg and was taken to the closest hospital.

Adnan's sister, Sanije (14) later returned to the site to collect family belongings, which had been left behind. While at the site, Sanije stepped on a cluster munition and was killed.

Adnan received medical care for two months after the incident. He had lost a lot of blood and suffered from anemia. Due to the injuries to Adnan's left arm he is unable to lift heavy objects. Adnan could not return to school until late January 2000. By the age of 13, Adnan had lost interest in school, his grades were suffer-

© Robin Collins


© Robin Collins

ing and he was expected to drop out altogether.

Adnan's older sister, Ymrije, cares for both Adnan and their mother, who was severely traumatized. The family of three now live on a pension of just 62 euro a month.

MONTENEGRO

Key Findings

- Cluster munitions used by NATO.
- At least one civilian was killed and another three injured by cluster submunitions.

Use Background and Contamination

NATO forces used cluster munitions against targets of the (former) Federal Republic of Yugoslavia during the 1999 Kosovo conflict. On 28 April 1999, NATO planes struck the Golubovci military airport south of Podgorica in Montenegro with cluster munitions.[178]

Data Collection

There is no comprehensive data on ERW casualties in Montenegro.[179]

Casualties and Analysis

The strike on the Golubovci airport in Montenegro caused four civilian casualties, one killed and at least three injured.[180] A 61-year-old woman was killed in a village near the airport as a submunition hit her head as she was running from the village.[181]

No post-conflict casualties are known.

SERBIA

Key Findings

- Cluster munitions used by NATO and possibly by Yugoslav forces.
- Total number of cluster submunitions casualties is unknown, 45 casualties were recorded, including 15 killed and 30 injured, most resulting from the NATO strike on the city of Nis.

Use Background and Contamination

NATO used cluster munitions in Serbia during the military intervention in 1999. Submunitions used during the NATO air campaign in Yugoslavia from March to June 1999 include: RBL755, BLU-97 and Mk 118 Rockeye.[182] Yugoslav factions used KB-1, and KB-2,[183] but it is unknown if these are contaminating Serbian territory. In early 2006, six main areas of Serbia remained contaminated with cluster submunitions: Nis, Kraljevo, Kursumlija, Sjenica, Mount Kopaonik and Vladimirci.[184]

Data Collection

Casualty data collection and registration of landmine/ERW survivors in Serbia is not comprehensive.[185] Press reports and ICRC records provide very limited information regarding strike, post-strike and post-conflict casualties.

Casualties and Analysis

The total number of submunitions casualties in Serbia is not known and casualty statistics from the Serbian Mine Action Center were not made available.

Between 1999 and August 2005, 45 casualties have been reported, including 15 killed and 30 injured, two of which were clearance personnel. All but three casualties occurred during the NATO strike on an airfield in the city of Nis on 7 May 1999, which also hit the nearby hospital and residential areas; the strike killed 14 and injured 28.[186] On 9 October 2000, an Army pyro-technician was seriously injured while defuzing six submunitions, losing both legs and hands, and his sight and hearing were permanently impaired.[187] A deminer was injured while clearing submunitions from a factory in Nis in August 2005.[188]

The ICRC recorded six civilian casualties from unexploded submunitions in Serbia and Montenegro between 1999 and 2002.[189] However, insufficient information is available to verify if these are included in the statistics above.

Life Experience

"Vladimir Jovanovic, a 72-year-old Serb, was injured in the 1999 cluster bomb attack on his home city of Nis, Serbia. He died on April 4, 2000, some eleven months later, while working in his yard with a shovel, an unexploded cluster bomblet from the same attack took his life."[190]

Focus: Commonwealth of Independent States

The Russian Federation has made extensive use of cluster munitions in Chechnya and, to a lesser extent, in Tajikistan. Allegedly, Tajik and Chechen factions have used cluster munitions as well. In Chechnya, civilian targets were often deliberately hit, but the full scope of the problem is unknown due to a lack of information.

CHECHNYA/ RUSSIAN FEDERATION

Key Findings

- Cluster munitions were used extensively by Russian Federation forces, often directly against civilian targets. Chechen use has also been alleged.
- The total number of cluster submunitions casualties in Chechnya is not known but there are at least 624 reported casualties, including 305 killed and 319 injured.

Use Background and Contamination

Cluster munitions have been used extensively by Russian Federation forces in Chechnya, both during the 1994-1996 war and again during the recurrence of hostilities starting in September 1999. Chechen use has also been alleged. Civilian targets, such as public markets, were struck on several occasions. And a HALO demining team got hit.[191] The entire array of cluster munitions in the Russian arsenal has been deployed in Chechnya and types used include: AO-2.5 and AO-1SCh, ODS-OS, OFAB-2.5, PTAB-1/M, PTAB-2.5/M, and ShOAB-0.5 bomblets.[192]

Specific information regarding the full extent of contamination is not available, as "...no comprehensive surveys have been done to document unexploded cluster munitions..."[193] However, HALO encountered unexploded submunitions in Chechnya between 1997 and 1999, including the AO-2.5RT.[194]

Data Collection

Documenting the human impact of cluster munitions is difficult due to episodic conflict. UNICEF, through its partner Voice of the Mountains, is the primary source of information on mine/ERW casualties in Chechnya.[195] However, UNICEF does not differentiate cluster submunitions casualties from other ERW casualties.[196] There have been numerous media reports of significant civilian casualties due to use in populated areas.

Casualties and Analysis[197]

The total number of submunitions casualties in Chechnya is not known. However, at least 624 casualties were identified: 305 killed and 319 injured. In the worst strike incident reported, Russian aircraft struck a public market, inflicting 246 civilian casualties: 60 were killed and 186 injured.

The worst post-strike incident involved at least 24 people, where seven were killed and at least 15 children injured.

This number is believed to be significantly lower than actual casualties owing to the lack of data collection, the intensity of bombardment, and the episodic nature of the conflict in Chechnya.

TAJIKISTAN

Key Findings

- A total of 48 cluster submunitions casualties were confirmed, all of which were caused by AO-2.5 submunitions; this is nearly 55 percent of all recorded ERW casualties.

Use Background and Contamination

In the period 1992-1997, cluster munitions were used in Tajikistan by unknown forces during the civil war,[198] reportedly delivered by helicopter and rocket. As recently as 2000, there

were reportedly instances of use along the border with Afghanistan.[199]

The Russian-manufactured RBK series (250, 275, and 500) and KMG-U cluster munitions were used in Tajikistan, and their submunitions payloads include: AO-2.5 and AO-1SCh, ODS-OS, OFAB-2.5, PTAB-1/M, PTAB-2.5/M, and ShOAB-0.5 bomblets.[200] The Tajik Mine Action Cell (TMAC) reported that it has cleared AO-2.5 (422), and ShOAB-0.5 (21) submunitions from 'mined areas'.[201]

Data Collection

Data collection is conducted by TMAC through the Red Cross Society of Tajikistan and is considered incomplete, though efforts were underway in 2006 to integrate all sources of casualty information into IMSMA. Information specifically regarding strike and post-strike casualties was not available.[160]

Casualty Data Analysis

The total number of submunitions casualties in Tajikistan is not known. TMAC reported 48 confirmed cluster submunitions casualties, including 30 killed and 18 injured as of 26 September 2006. All reported submunitions casualties were caused by AO-2.5 bomblets.[203] Cluster submunitions casualties accounted for 54.5 percent of all (80) ERW casualties reported by TMAC. This casualty rate is similar to that in Lao PDR and Vietnam where the ERW type is known.[204] The mortality rate for submunitions casualties in Tajikistan is 62.5 percent and is likely due to incidents occurring in remote locations where emergency transport is not available.[205]

Focus: Greater Middle East and North Africa Region

The greater Middle East region has seen some of the most extensive use of cluster munitions – in Iraq – as well as the most recent use of these weapons in Lebanon. In several countries in the region, cluster munitions have been used at various points in time, resulting in overlapping contamination. This, as well as hampered clearance due to the security situation in a couple of countries, exacerbated casualty rates and it is likely that this trend will continue for the foreseeable future.

AFGHANISTAN

Confirmed Casualties: 1980 – 1 July 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**701**	**216**	**71**	**414**
Injured	**550**	167	53	330
Killed	**150**	49	18	83
Unknown Status	**1**	0	0	1
Man	305	93	28	184
Woman	49	14	6	29
Boy	224	77	29	118
Girl	31	7	2	22
Military	82	25	6	51
Deminer	10	0	0	10
Unknown	0	0	0	0
Dominant Activities	Farming/Tending animals (284)			
Dominant Location	Herat (103)			

Key Findings

- Cluster munitions were used by the Soviet Union, the Taliban, the Northern Alliance and United States troops between 1980 and 2002.
- Until 1 July 2006, 701 casualties were recorded, but the majority of pre-2001 casualties are unrecorded.
- Projected average casualty rate is 25 to 30 casualties per year.

Use Background and Contamination

Cluster munitions were used during the Soviet invasion (1979-1989), the civil war (1992-1996), Taliban regime (1996-2001) and US offensive (2001-2002). Though unconfirmed which types of cluster munitions the Soviets used, the most commonly deployed canister was RBK-500, which can carry the following submunitions: OFAB-50UD, AO-2.5RTM, OAB-2.5RT, BetAB or improved BetAB-M, PTAB, and PTAB-1M.[206] In 1995, the Afghan government claimed that Russian forces bombed the city of Taloquan and surrounding areas with cluster bombs.[207] Taliban and Northern Alliance forces mainly used surface-delivered cluster munitions, fired from BM-21 122 mm multiple rocket launchers.[208]

During the offensive against the Taliban between 7 October 2001 and 18 March 2002, the United States mainly used air-delivered cluster munitions: CBU-87 combined effects munitions and CBU-103 with wind corrected munitions dispenser kits. Each of these munitions contain 202 BLU-97s. These types of munitions are used for large or moving targets, but this makes them dangerous in populated areas, to which the Taliban targets were often close.[209]

In 232 strikes, the US dropped approximately 1,228 cluster munitions containing 248,056 submunitions.[210] BLU-97 submunitions have an official failure rate of seven percent.[211] However, based on its clearance records the UN estimates that approximately 40,000 submunitions (16 percent) did not explode.[212]

Data Collection

Information on cluster submunitions casualties is collected as part of both the International Committee of the Red Cross (ICRC)

© John Rodsted

and UN Mine Action Centre for Afghanistan (UNMACA) databases. The ICRC started data collection in 1998 and is the principal source of ERW casualty data, providing the UNMACA with about 95 percent of its information on new casualties. The ICRC carries out community-based data gathering in all mine-affected areas via the Afghan Red Crescent Society (ARCS). UNMACA started data collection in 1988 and records data in the IMSMA-format. It is anticipated that the ICRC/ARSC data collection capacity will be handed over to UNMACA and integrated into one database by 2007.[212]

The Italian NGO Emergency also collects casualty data via its three surgical centers, which is not integrated in the ICRC or UNMACA database. These centers distinguish between mine and ERW casualties, but do not differentiate cluster submunitions casualties.[214] However, as Emergency Hospital in Kabul is the main referral hospital for serious trauma, it is likely that submunitions casualties are treated here.

The collection of comprehensive landmine casualty data in Afghanistan remains problematic, due in part to communication constraints and the time needed to centralize information. In 1998, ICRC data collection only covered a small part of the country, but as of 2006, it has a presence in all provinces. However, it is still believed that some of the casualties who die before reaching medical assistance are not recorded. It is, therefore, likely that, due to the generally higher mortality rate for cluster submunitions casualties, a significant number of these casualties were not recorded in earlier years.

Casualties and Analysis[215]

In total, the ICRC collected information on 701 submunitions casualties occurring between 1980 and July 2006 in Afghanistan, including 150 people killed, 550 injured, and one unknown. The vast majority of casualties were male: 57 percent (397) were men and 32 percent (224) were boys under 18. Girls under 18 made up four percent of casualties (31) and women seven percent (49).

Nearly half of the casualties between 1980 and 2006 occurred while carrying out livelihood activities: tending animals (149 or 21 percent), farming (135 or 19 percent) and collecting wood/food/hunting (56 or eight percent). Boys under 18 accounted for 52 percent (77) of the casualties tending animals. Boys and girls under 18 accounted for 84 percent (or 56) of 67 casualties occurring while playing; they also make up 48 percent of 42 tampering casualties. Two boys were injured due to military activity. Incidental passing by (59) and traveling (55) account for 16 percent of casualties.

Only 18 casualties, including seven deminer casualties, occurred in marked areas; this equals less than three percent of casualties. Most people sustained multiple all-body injuries and 49 people (partially) lost their eyesight: at least 273 people needed an amputation, often of multiple limbs. Seven percent of casualties (46) had received mine risk education, only one of them got injured while tampering with submunitions.

Conflict/Post-Conflict

A total of 121 casualties (17 percent) due to cluster submunitions were recorded as occurring during the six-month strike period between October 2001 and March 2002. While it is not possible to state with absolute certainty that these were due to new cluster munitions use, the location of the incidents in correlation with known strikes, media articles, and case studies seems to suggest this is likely for most incidents.[216] Due to incomplete data collection, only 95 casualties were recorded as occurring during the Soviet invasion.

Casualty rates were low in the immediate aftermath (12 months) of the Soviet invasion and the US strikes; 71 casualties or 10 percent, possibly because many people sought refuge in neighboring countries or in Kabul.

Most of the recorded casualties are post-conflict casualties, at 414 or 59 percent; 321 occurred 12 months or more after the end of the Soviet invasion and 93 after US cluster munitions strikes. Post-conflict cluster submunitions

casualties remain relatively constant in both cases. The recent return of refugees could contribute to the relatively consistent level of post-conflict casualties. The post-conflict average for nearly 12 years after the Soviet invasion was 27 casualties per year, but there has been a slight increase in the annual average to nearly 29 casualties per year in the post-conflict period after the US invasion. Experts confirm the apparent trend that there will be 25-30 new submunitions casualties per year, mostly due to old Soviet contamination, but also due to newer US munitions, which have not yet been cleared.[217]

Civilian/Military Comparison

Only 35 casualties (seven percent) of 464 cluster submunitions casualties recorded between 1998 and 2006 were military (including military deminers). Only four military casualties occurred during the six months of the US offensive when the majority of cluster munitions were used: in comparison, at least 117 civilian casualties occurred in the same period (7 October 2001-18 March 2002).

Between 1980 and 1997, 53 of 237 casualties (22 percent) were military (including military deminers), including one 14-year-old and a 12-year-old; 18 military casualties occurred during the conflict between 1980 and 1989.

Life Experience

Afghanistan, 2002: Three Afghan boys were photographed at a huge ammunition wasteland near Bagram Air Base in Afghanistan. Several days after this photo was taken, these three boys were killed, apparently trying to scavenge valuable metal from the ammunitions dump.[218]

© John Rodsted

IRAQ[219]

Total Confirmed Casualties 1991 – 2006: 2,060				
Confirmed Casualties March 2003 – May 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Total	**1,018**	**720**	**202**	**96**
Injured	**801**	613	131	57
Killed	**200**	90	71	39
Unknown Status	**17**	17	0	0
Man	336	324	11	1
Woman	87	84	3	0
Boy	119	108	11	0
Girl	59	56	3	0
Military	6	0	6	0
Deminer	0	0	0	0
Unknown	411	148	168	95
Dominant Activities	Accidental passing by/ livelihood actvities			
Dominant Location	Near home			

Key Findings

- Cluster munitions were used during the Iran-Iraq war, 1991 Gulf War, subsequent Coalition Forces operations and the 2003 war and its aftermath.
- At least 2,060 cluster submunitions casualties were recorded, estimated casualties (from various sources) are 5,500 to 6,000.
- Limited casualty data is available due to insecurity, a lack of political will, and the absence of a comprehensive data management system.

Use Background and Contamination

Analysis of MRE data collection in Iraq reportedly revealed cluster submunitions casualties as early as 1985:[220] frequent Iraqi use of 155-mm artillery projectiles could corroborate this.[221]

During Operation Desert Storm from 17 January to 27 February 1991, the US forces used at least 47,167 air-delivered cluster munitions containing more than 13 million submunitions: BLU-61/63, 97, BLU APAM, as well as Rockeyes. An estimated 2.6 to 5.9 million submunitions did not hit the intended target.[222] Additionally, an estimated 30 million sea-launched (with cruise missiles) or artillery-delivered DPICM submunitions were used.[223] More than 11 million submunitions were delivered by multiple-launch rocket systems (MLRS) such as the M26.[224] On 21 February 1991 alone, 220,248 M77 submunitions were fired from MLRS M270

launchers.[225] UK troops used 100 JP-233, eight BL755 and 385 CBU-87 cluster munitions;[226] resulting in at least 103,446 BLU-97 submunitions delivered. It is not known how many Beluga cluster munitions French troops used.

Cluster munitions were used to attack mobile SCUD missile launchers, tank and vehicle columns, and dual use targets in urban areas. As a result, unexploded submunitions were found on roads, bridges and civilian infrastructure. The failure rate was increased due to the height the cluster bombs were dropped from and the soft soil conditions; up to one-third reportedly did not explode.[227] When taking the official five percent failure rate,[228] a total of more than two million submunitions would have failed to explode.

Since the 1998 Operation Desert Fox, Joint Stand Off Weapons containing BLU-97 submunitions have been used, also in the no-fly zones, resulting in some of the most recent contamination in the northern part of the country.[229]

During the 2003 conflict, the US forces used a minimum of 10,782 artillery-delivered cluster munitions containing between 1.7 and two million submunitions;[230] including M42, M46 and M77 types. Analysis of strikes identified by Human Rights Watch and analysis of CBU[231] data for 1,555 strikes in 767 locations, indicates that Coalition Forces dropped at least 2,477 air-delivered cluster munitions between 20 March and 9 April 2003. At least 385,062 BLU-97, 44,954 Mk 118, 880 BLU-108, and 10,290 RBL755 submunitions were delivered: these total 441,186 submunitions, or 27,574 items per day for 16 days.[232]

Between 1 May 2003 and 1 August 2006, the US dropped 63 CBU-87 bombs, containing a total of 12,726 CBU-97 bomblets.[233]

BLU-97 submunitions have an estimated four to six percent failure rate; M77 submunitions have a five to 23 percent estimated failure rate;[234] M42 and M46 DPICM submunitions have an average failure rate of 14 percent.[235]

In the northern parts of Iraq, MAG cleared 205 sites, mostly in Erbil (90) and Kirkuk (96) containing mainly BLU-97s but also KB-1s.[236]

Data Collection

Sources of information on cluster submunitions casualties are fragmented and incomplete. During the 2003 conflict and its aftermath, the Coalition Provisional Authority (CPA) strongly discouraged casualty data collection, especially in relation to cluster submunitions.[237]

As of September 2006, there was no data collection mechanism for new mine/ERW/IED casualties in Iraq. This was largely due to the security situation, a lack of funds and capacity at the National Mine Action Authority (NMAA), which is responsible for casualty data collection, and the larger political context in Iraq. In the northern parts of Iraq, the regional mine action offices, MAG, and other service providers collect casualty data, but do not distinguish cluster submunitions casualties from other ERW casualties.

The Iraq Landmine Impact Survey (ILIS) differentiated cluster submunitions casualties in a limited number of southern and central areas of Iraq.

The Iraqi Health and Social Care Organization (IHSCO) set up a war victim surveillance system in mid-2004. Since early 2006, restrospective data collection focused on mine/ERW casualties occurring after March 2003 in six governorates (Baghdad, Karbala, al-Muthanna, Babel, Thi Qar and Diyala). It differentiates cluster submunitions casualties. As of August 2006, operations are on hold due to security reasons.[238]

In addition, the federal and regional Ministries of Health register war-injured with disabilities but this does not distinguish the device that caused the injury and includes people injured by IEDs and bullets.[239] In 2003, CIVIC collected information on civilian war victims that includes a number of cluster submunitions casualties.[240] Prior to 2003, UNOPS and MAG collected casualty data in Northern Iraq. In 2001, the ICRC reportedly collected data on mine and ERW casualties in southern Iraq.[241] However, this information was not made available. In Basra, southern Iraq, the UN set up a casualty monitoring system to remedy the lack of data collection. This system was never operationalized due to the 2003 war.

Casualties and Analysis

Data compiled from various sources does not indicate the scope of the problem, nor does it allow in-depth crosschecking and the creation of a casualty profile for risk education and survivor assistance purposes. However, the limited data available indicates that the number of casualties due to cluster submunitions is vastly underreported.

At least 2,060 people were confirmed casualties of cluster submunitions between 1991 and 2006, including 733 killed, 1,310 injured and 17 unknown. Among these casualties were at least 255 children.

These totals should be considered incomplete as they do not include any estimates or data that could not be cross-referenced in order to avoid duplication. Analysis of media and research documents including casualty esti-

mates would indicate that there were at least 5,500-6,000 casualties due to failed cluster submunitions in Iraq between 1991 and 2006.

March 2003 – September 2006

Analysis of Human Rights Watch data indicates that there were at least 695 casualties of cluster munitions between March and September 2003, including 84 killed, 594 injured and the status of 17 is unknown. At least 157 of the casualties were children.[242] This total does not include estimates and casualties where the cause of injury was not confirmed to be due to cluster munitions. As a result, this does not include 635 civilian casualties (254 killed and 381 injured) in al-Najaf, which are reportedly mostly due to cluster munitions.[243] Human Rights Watch estimates the total number of casualties due to cluster munitions to be over 1,000.[244] However, UNICEF estimated that more than 1,000 children had been killed or injured "by weapons such as cluster bombs."[245]

Handicap International identified an additional nine child casualties occurring in April 2003, including three killed and six injured, all but one were boys.[246]

Spanish peace brigade members recorded nine people killed (including one woman) and 36 injured (five women, two boys, one girl and two men) in al-Rashid and Yusifia (Baghdad) during cluster munitions strikes on 25 and 26 March, and 3 April 2003. They also recorded five men and a child injured by cluster munitions in al-Dora on 2 April.[247]

Analysis of Iraqi Health and Social Care Organization (IHSCO) data recorded between March and June 2006 indicates that 148 of 193 casualties (77 percent) are due to cluster munitions (compared to 26 antipersonnel mine casualties), including 40 killed and 108 injured. The vast majority of cluster submunitions casualties, i.e. 83 percent were male (123). Children accounted for 57 casualties, and the age group between 11 and 20 is the largest with 43 casualties. In line with casualty profiles of other cluster contaminated countries, it is very likely that the overwhelming majority of these are male. Nearly half of the casualties occurred while carrying out livelihood activities (48 percent): farming (29 percent or 43 casualties), herding (18 percent or 26); and collecting water/wood/herbs (one percent, two). Self-clearance caused five casualties, military activity and collecting scrap metal one casualty each. Of total casualties, 92 people (62 percent) did not know the area was dangerous, but 34 (23 percent) knowingly went into a dangerous area for economic reasons. Most casualties occurred in Karbala (57) and Babylon (32).[248]

The Iraq Landmine Impact Survey recorded 95 recent casualties due to cluster munitions until April 2006.[249] It noted that in the south-central parts of Iraq (Karbala, Najaf; Qadissiyah, Wassit and al-Hilla), cluster munitions were "the most important cause of death and injury." These governorates "have the highest rates of victimization… due to the new contamination from the most recent war"[250] and cluster submunitions casualties account for 77 percent of recent casualties. In Najaf, 83 percent of recent casualties were due to cluster munitions, in Karbala 81 percent, in al-Hilla 80 percent, in Qadissiyah 72 percent and in Wassit 67 percent. In comparison, in the four southern governorates (Basra, Thi Qar, Messan and al-Muthanna), submunitions accounted for only nine percent of recent casualties. These figures are incomplete as only a limited number of communities were visited due to security reasons.

The list of civilian casualties compiled by CIVIC and the Iraqi Body Count (IBC) database includes at least 25 fatal casualties (12 men, one woman, seven boys and five girls) due to cluster munitions between March and April 2003. One additional cluster submunitions casualty is recorded in the IBC database as occurring on 19 March 2006.[251] However, the Iraq Body Count estimated in May 2003 that 200 to 372 civilians were killed by failed cluster submunitions, including at least 147 post-conflict.[252]

Pre-2003 Casualties due to Cluster Submunitions

Up to August 1991, 168 Iraqis were reported killed and 440 injured due to cluster submunitions.[253] More than 4,000 civilians have been killed or injured by failed cluster submunitions since the end of the 1991 Gulf War.[354] Up to February 1993, at least 1,600 people were killed, including 400 Iraqi civilians, and 2,500 injured due to submunitions.[255]

The media reported on various incidents, including an eight-year-old boy killed and his sister injured by an unexploded cluster submunition at a family picnic in 1993. In 1994, an unexploded submunition killed a 13-year-old boy and his 11-year-old sister. In 1997, a farmer was killed working his field in Qadissiyah governorate; one other person was injured in the incident.[256] In May 2000, three Iraqi children between 13 and 16 were killed, and one injured by an unexploded bomblet. Also in 2000, three children were injured in a rural area near Mosul.[257] In February 2001, a boy was killed by a cluster bomblet in Karbala province, six children were injured in an incident in the southern city of Basra, and two boys were injured by a cluster submunition while tending sheep in western Iraq.[258]

During the 1991 Gulf War, at least 80 US casualties, including 25 killed, were attributed to unexploded submunitions.[259] More than 100 EOD experts are reported to have died during clearance activities in the aftermath of the war, including one Egyptian Brigadier General.[260] Due to the high failure rate of artillery-delivered submunitions, the US military post-conflict casualty rate became so serious that it resulted in a Congressional investigation.[261]

KUWAIT

Key Findings

- Cluster submunitions from the 1991 Gulf War caused up to 4,000 casualties until 2003; but casualties in Kuwait declined as of 1995.
- The total number of cluster submunitions casualties in Kuwait is not known due to a lack of up-to-date data collection. Nevertheless, submunitions continue to cause casualties.

Use Background and Contamination

The United States, the United Kingdom and France used cluster munitions in Kuwait during the Gulf War in January and February 1991.[262] The following cluster munitions and their submunitions contributed to the ERW problem in Kuwait: US-manufactured CBU-52 cluster munitions (BLU-61 submunitions), CBU-58 (BLU-63), CBU-59 (BLU-77), CBU-71 (BLU-86), CBU-87 (BLU-97), Mk 20 Rockeye (M118), M483 and M864 projectiles (M42 & M46 DPICM), MLRS M270 (M77 DPICM); BL755 of UK manufacture[203] and French-made BL-66 Beluga (GR-66-EG).[264] According to the US General Accounting Office, unexploded submunitions created "de facto minefields, or 'dudfields'" in some battle areas of Kuwait.[265] Between 1991 and 2001, more than 1.6 million ERW and mines were cleared, reducing the long-term impact of unexploded submunitions,[266] and resulting in a drop in casualties by 1995.[267] However, by 2002, annual clearance still unearthed more than 2,400 submunitions, an amount similar to the previous year.[268] In February 2006, two cluster munitions were found during road construction in northern Kuwait, and there were unofficial reports that cluster munitions were discovered near a military airbase and in an industrial area.[269]

Data Collection

The Kuwait Institute for Scientific Research (KISR) collected the most comprehensive information on civilian war casualties. In January 2001, KISR established a casualty database for the period August 1990-January 2001. Casualty data collected by KISR from government hospitals includes: gender, age, nationality, residence, occupation of the casualties, date and location of the incident, type of injury, hospital name and treatment. However, cluster submunitions were not differentiated in all cases.[270] Funding constraints have prevented KISR from updating the database since 2001.[271]

Casualties and Analysis

Estimates by the Kuwaiti Defense Ministry and the US Army's National Ground Intelligence Center analysts indicate that more than 4,000 civilians were killed or injured by cluster submunitions since the end of the 1991 Gulf War, including at least 1,200 Kuwaiti civilians killed in the first two years after the war.[272]

KISR recorded 1,652 war casualties in Kuwait between 1991 and 1992. Between 1991 and 2001, ERW caused 175 (seven percent) of the 2,386 war injuries and 119 (28 percent) of the 421 deaths recorded.[273] According to Kuwaiti medical personnel, approximately 60 percent of those injured by ERW were children under 16.[374] Eighty-four people were killed and 200 injured during the ERW clearance operations in Kuwait.[275]

Submunition incidents continue to be reported: in 2000, a BLU-97 injured three people and a Rockeye submunition killed one person.[276] In 2005, a soldier was injured by a cluster submunition during clearance activity in northwest Kuwait.[277] On 1 May 2006, a truck transporting cleared cluster and other munitions exploded in Kuwait, injuring two people.[278]

LEBANON

Confirmed Casualties 1975 – 9 October 2006				
	Total	**Strike**	**Post-Strike**	**Post-Conflict**
Grand Total	**494**	**53**	**176**	**265**
Injured	**376**	35	141	200
Killed	**118**	18	35	65
Unknown Status	**0**	0	0	0
Man	276	31	72	173
Woman	46	6	13	27
Boy	92	10	31	51
Girl	22	6	7	9
Military	15	0	10	5
Deminer	4	0	4	0
Unknown	39	0	39	0
Dominant Activities	Near house (108)/ agriculture (73)/playing (59)			
Dominant Location	Near house (108)			

Key Findings

- At least four million submunitions were delivered in July-August 2006.
- After 14 August 2006, 142 casualties were recorded and prior to 12 July 2006, 338 were recorded.
- The average pre-2006 conflict casualty rate was 2 per year but the average post-2006 conflict rate is 2.5 per day.

Use Background and Contamination

Israel has used cluster munitions in Lebanon in 1978, 1982, 1996, December 2005[279] and July-August 2006. The most used types are, prior to 2006: BLU-18Bs, BLU-26B, BLU-63, Mk 118, M42 and M43.[280] Israel discontinued the use of cluster munitions for several years after 1982, when the Reagan administration announced in July of that year that it would prohibit new exports of cluster munitions to Israel, as Israel may have violated its 1952 Mutual Defense Assistance Agreement with the United States prohibiting use of cluster munitions in civilian areas, such as Fakhani, Sabra, Shatila, Burj al-Barajneh, Haret Hreik, and Dahya suburbs of Beirut.[281]

In the 2006 conflict, air-delivered BLU-63 (mainly produced in 1973), artillery-delivered M42, M46, M77 and M85, both the Israeli copy of the M42 and a newer model with a self-neutralisation and a self-destruct mechanism were used. In addition, Chinese-produced MZD-2[282] and a Chinese-manufactured KB-2 were reportedly found.[283] The media reported an army commander stating that Israeli Defense Forces (IDF) had launched 1,800 M26 rockets, which, together, contain 1.59 million M77 submunitions. This number does not include other ground-delivered or air-delivered cluster munitions. The UN found an emerging failure rate of approximately 40 percent,[284] which is higher than the official failure rate of between five and 23 percent.[285]

Media reports also stated that the IDF fired approximately 160,000 artillery projectiles of which 20 percent are assumed to be cluster munitions. This would mean an additional 2.8 million cluster submunitions were delivered.[286] Overlapping cluster munitions footprints, clearance of certain visible cluster munitions disturbing the footprints, and incomplete surveying make it impossible to estimate a total number of cluster munitions delivered, as well as an overall failure rate. However, the UN Mine Action Coordination Center in South Lebanon (MACC-SL) estimates the failure rates between 32 and 40 percent overall.[287] This would mean that 1.28 to 1.6 million unexploded submunitions remained on the ground. MAG experts estimate the failure rate of the BLU-63 at 80 percent on average and the failure rate of the M-series at 25 percent on average in the Nabatiyyah area. They did not locate cluster munitions strikes above the 703° line on the United Nations Interim Force in Lebanon (UNIFIL) map.[288]

Various explanations were given for the increased cluster munitions use in the last days before the ceasefire, such as the failure to destroy mobile rocket launchers with precision weapons and the change in command from an air force commander to an infantry general – the latter for whom cluster munitions would be a more operational weapon of choice.[289] Other experts stated that the strike patterns suggest use of cluster munitions as flank protection, especially in the Marjayoun valley, which is surrounded by the worst-contaminated areas. However, the bombing was done in such a way that two layers of submunitions were dropped: one layer before more powerful precision munitions destroyed the target, leading to cluster munitions in the rubble; and one after destruction, resulting in cluster munitions on top of the rubble.[290]

Hezbollah use of a small number of (KB-1) cluster munitions has been alleged.[291]

Data Collection

The Lebanon Mine Resource Center (LMRC) at the Faculty of Health Sciences of the University of Balamand maintains a mine casualty database, providing both the National Demining Office (NDO) and MACC-SL, with casualty data for their IMSMA databases. IMSMA is synchronized at the NDO. LMRC continuously updates its database by visiting new casualties and verifying and re-surveying previously recorded casualties and affected communities.

During the 12 July-14 August conflict, the Lebanese Red Cross collected data on its interventions, including medical information. The information is broken down so that the weapon-injured can be extracted.[292] However, this information was not made available.

Since the 2006 ceasefire, UN community liaison officers and EOD teams at MACC-SL record casualty data when they come across it during their activities. However, the collected IMSMA forms contain only the minimum necessary information (such as name, date, location, killed/injured), pending re-surveying and verification after the emergency phase. Unconfirmed cluster munitions casualties are also recorded pending verification.[293]

LMRC data collection and MRE teams, as well as NDO teams collect casualty information.


© Handicap International

In addition, the national media report extensively on new casualties, including those in the news bars on TV.

However, experts state that a significant number of casualties could go unreported.[294] Casualties are only reported from accessible areas,[295] which have electricity and means of communicating, but "As of September 5, 2006, nearly 80 percent of the villages in the South were still without electricity or water."[296] UNIFIL medics have also treated cluster munitions casualties, which are said not to be included in IMSMA.[297]

It is also understood that most Hezbollah casualties due to cluster submunitions during and after the conflict are not included in the databases, and that those included are not recorded as such.[298]

Casualties and Analysis

As of 9 October 2006, there are at least 494 recorded cluster munitions casualties in Lebanon, including 118 killed and 376 injured. Children make up 23 percent of casualties, but most of them, 92, are boys (19 percent of the total). A total of 338 casualties were recorded prior to 12 July 2006 and 156 casualties were recorded between 12 July and 9 October 2006. These recorded totals do not include up to 30 unconfirmed cluster munitions casualties occurring during or shortly after the 2006 conflict or people treated by the UNIFIL battalions (up to 145 people).[299] Nor does it include Hezbollah casualties due to cluster submunitions, as this information was not obtained.

Post 12 July 2006

During the Conflict (12 July – 14 August)

Cluster munitions were used throughout the conflict, but 90 percent seem to have been used in the last 72 hours. As most people left South Lebanon prior to 10 August, this undoubtedly reduced the number of civilian casualties during the conflict. However, approximately 100,000 civilians were unable to leave and a minority chose to stay behind to protect their property.[300]

Between 12 July and 14 August, the Lebanese Red Cross recorded 285 people killed and 886 injured.[301] The information is broken down so that the weapon-injured can be extracted. This information was not made available.

There are several confirmed and unconfirmed instances of cluster submunitions casualties. On 19 July 2006, one person was killed and 12 injured during a strike using artillery-fired cluster munitions in Blida; casualties included five girls and two boys under 18, four women and two men.[302]

On 18 and 21 July, two children were reportedly killed in a cluster munitions explosion in Naqoura.[303]

Members of the Cluster Munition Coalition (CMC) have records of at least four fatal civilian casualties, including two children, due to bombing during the conflict in Yaroun. However, it is unclear whether the casualties were directly inflicted by cluster munitions. One elderly man reported by the CMC died as a result of a cluster munitions strike in Beit Yahoun on 10 August 2006.[304]

Ragheb Harb Hospital run by the Iranian Red Crescent in Nabatiyyah, reported that it received 10 to 15 casualties with injuries consistent with cluster submunitions in the last four days of the conflict.[305] Villagers in Ayn Baal village (Tyre) stated that up to six children between one and 13 years of age died as a result of cluster munitions strikes on day 13 and 14 of the conflict. This happened along the road linking Ataroun and Tyre.[306] No additional evidence corroborates these statements.

Post-Strike (14 August – 9 October)

Analysis of the LMRC database indicates that there were at least 142 casualties, including 21 killed and 121 injured to 9 October 2006. Analysis is available of 107 detailed and verified records. The majority of casualties were male: 65 percent men (70) and 21 percent boys under 18 years of age (23); four casualties were girls (four percent) and six women (six percent); four percent were unknown. Most casualties (50) occurred near or in the house, 15 occurred while farming, 10 while shepherding. Eight casualties occurred while playing with the submunition, seven of them were children; another eight casualties occurred during clearance activities (including four military casualties). At least one person was a Syrian citizen.

Most casualties occurred in Nabatiyyah, Bint Jbeil, and Tyre. Thirteen casualties occurred on the first day of the ceasefire (14 August 2006), and 11 on 18 August. In the first month after the ceasefire, casualties average just over three per day, after that the average daily casualty rate went down to just over two.

There were additional unconfirmed reports of one Hezbollah militant killed in Yohmour and two injured in the greater Nabatiyyah area while carrying out clearance activities in the aftermath of the conflict. It was added that Hezbollah cleared many submunitions but "at a great cost."[307]

Casualties Prior to 12 July 2006

The LMRC recorded 338 cluster munitions casualties between 1975 and 2005, including 95 killed and 243 injured. Most of these casualties occurred in West Bekaa, Nabatiyyah and Hassabiyyah. Twenty-three percent of casualties were children (80), but 65 of 95 fatal casualties were children – 52 of them boys. The main activities at the time of the incident were agriculture (58) and activities near the house (58). Only five men were recorded as military casualties.

There were are on average two or three new casualties per year due to cluster munitions strikes before 2006. This rate is predicted to remain stable, as many markings have disappeared or deteriorated over time, whereas clearance activities are limited. However, it is likely that some casualties in the Western Bekaa area and border areas remain unrecorded.[308]

In 2005- 2006, there were several cluster munitions incidents due to munitions delivered in late 2005. However, no casualties were reported.[309]

© Handicap International

Comparison with Post-Conflict Casualties Attributed to Mines and ERW

As of September 2006, the database contained records of 3,457 casualties (929 killed and 2,528 injured). Before 12 July 2006, cluster munitions casualties constituted nearly 11 percent of casualties; as of 9 October, this is over 13 percent. Other ERW constitute 20 percent of casualties.

Life Experience

Salima (left) is a mother of five, three daughters and two sons, of whom two are disabled – Ali (23) and Maryam (42) – and still live with her. During the recent conflict, eight suspected Hizbollah militants were living in a neighbor's house and the neighborhood was repeatedly hit with cluster munitions so the family took refuge in Salima's parents' house until the ceasefire. While walking home with her father and the children, Salima noticed destruction everywhere, as well as several submunitions with ribbons. Salima's father carefully moved one submunition off the road with his foot so that his grandchildren would not step on it. When they arrived at the house, Maryam and Ali waited outside while Salima and her father proceeded to enter the house. Salima moved the big stones by hand and swept the small rubble away with a broom. All of a sudden, she felt something strange, but did not hear an explosion. She had hit a submunition with her broom. Salima sustained shrapnel injuries in her head, one on her forehead, and severe shrapnel injuries on her chest, thighs, and waist. She has undergone several operations and still needs regular treatment.

Salima, who worked in tobacco and has a small olive grove, may never be able to work again. The olive grove and the garden around the house are still off-limits because there are more submunitions scattered there, and all the olives will be lost unless the family engages in risk-taking behavior in order to harvest the crop.

Ali, in the meantime, is traumatized by the events and ever since he heard the 'boom' and then his mother screaming, he has cut himself off from society and only identifies with the cartoons on TV, something he did not do before the incident.[310]

© Handicap International

SAUDI ARABIA

Use Background and Contamination

Cluster munitions were used by the US against Iraqi forces in the 1991 Gulf War in Ras al-Khafji (northern Saudia Arabia) during the 'Battle of Khafji', from 29 January to 2 February 1991.[311] ERW is found in the northern border areas of Saudi Arabia, which are sparsely inhabited.[312]

Data Collection and Casualties

There is no known war casualty data collection mechanism in Saudi Arabia and there are no reported casualties due to cluster submunitions. Due to contamination being in sparsely populated areas, it is likely that the human impact is not significant. Nevertheless, due to the remote and inhospitable environment it is possible that casualties go unreported.

SYRIA

Key Findings

- The number of cluster munitions casualties in Syria is not known, but at least one foreign peacekeeper was killed.

Use Background and Contamination

Israel used cluster munitions in the Golan Heights area during the October 1973-May 1974 war and remaining contamination is reported.[313] Israel also reportedly used air-delivered cluster munitions against non-state armed group training camps near Damascus in 1973.[314]

Data collection

There is no casualty data collection mechanism in Syria but, in an ad hoc manner, local NGOs and health posts in mine/ERW-affected areas report casualties to the local governorate authorities for pension and compensation purposes. The local authorities do not keep a central database.[315] It is not known if casualties due to cluster submunitions are differentiated.

Casualties and Analysis

Due to the non-existence of a data management system, the number of casualties of cluster submunitions, as well as mines and other ERW, is unknown.

One incident resulting in at least one Austrian medic of the international peacekeeping force killed, was attributed to a cluster submunition having come loose from a hillside in the Golan Heights area due to melting snow.[316]

WESTERN SAHARA/ MOROCCO

Key Findings

- There have been at least two civilian cluster submunitions casualties in Western Sahara.
- Due to limited and inconsistent reporting, the total number of cluster submunitions casualties is not known; developments in data collection, combined with survey work, could improve knowledge about cluster submunitions casualties.

Use Background and Contamination

Cluster munitions were used in Western Sahara[317] between 1975 and 1991 by the Royal Moroccan Army, when it fought the Polisario Front intermittently.[318] The 1991 ceasefire resulted in a territory divided by 2,400 kilometers of defensive earthen walls – known as berms – between Polisario and Morocco and an extensive mine/ERW problem, with approximately 10,000 Saharawi nomads living in affected areas on either side of the berms.[319]

Submunitions used include US-manufactured artillery-delivered M42.[320] The full extent of cluster munitions contamination in Western Sahara in not known, but Landmine Action UK has reported significant pollution by air-dropped or ground-delivered cluster munitions.[321]

The UN Mission for a Referendum in Western Sahara (MINURSO) indicates that cluster submunitions are scattered in the areas of Mehaires, Tifariti and Bir Lahlou, where the Moroccan Army conducted offensive operations in August and September 1991.[322] Submunitions, other ERW, and mine contamination is mainly concentrated in Polisario-con-

trolled Western Sahara, but areas under Moroccan control are also affected.[323]

Data Collection

There is no comprehensive casualty data collection system in Western Sahara. MINURSO has maintained some casualty data. However, its archived records are not comprehensive and are difficult to access due to a lack of systematized and standardized record keeping, a lack of verification mechanisms, as well as time constraints.[324] MINURSO recorded incidents but did not always record casualty specifications for these incidents.[325] Data is stored in IMSMA, but training of MINURSO, Landmine Action UK and Polisario data collectors is needed to optimize data management between the parties.[326] At the end of 2006, Landmine Action UK was scheduled to undertake casualty data collection in Western Sahara in the course of a survey and clearance project.[327]

In November 2005, the Saharawi Campaign to Ban Landmines conducted a casualty survey in the four main refugee camps, but they could not provide the information, as the casualty form did not differentiate submunitions. However, this could be recorded in the general remarks.[328]

Casualties and Analysis

In 1998, one cluster submunitions incident resulted in two fatal casualties.[329] MINURSO recorded two cluster submunitions incidents out of a total of 39 mine and ERW incidents from 1992 to 2000. The number of casualties as a result of these two submunitions incidents is not known. In comparison, four incidents due to antipersonnel mines and 16 incidents due to unidentified ERW (41 percent) were reported in the same period.[330]

Conclusion

Cluster munitions, developed and first used during the Second World War by the Soviet Union and Germany respectively, emerged as a tool of modern warfare in Southeast Asia between 1964 and 1973. Since then, hundreds of millions, perhaps billions, of these munitions have been used in at least 23 countries or areas that are not internationally recognized, and their use has been alleged in several other places.

Exactly how many cluster submunitions lie dormant, no one can say.

Exactly how many cluster submunitions casualties there are, no one can say either.

Nevertheless, *Fatal Footprint* compiled statistical evidence of at least **11,044** recorded and confirmed cluster submunitions casualties. This does **not** include extrapolations or estimates, which could be as high as 100,000 cluster submunitions casualties. This number is significant, and higher than anticipated at the outset of this study, given that:

- cluster munitions have been used in only 23 countries/areas (compared to more than 90 mine-affected countries and mine casualties in 125 countries)
- data collection, as well as information provided is limited and often incomplete

This study marks a watershed. It is the first time that all available casualty data has been compiled in one document. Nevertheless, the authors acknowledge that much information remains missing, was pieced together from various public sources, or was not made available. It is apparent that users of cluster munitions rarely provided information on casualties, be it their own or other casualties (civilian or military) – even though it is alleged that, in many cases, this type of information was recorded.

As a result, many casualties were not counted and it is unlikely that they will ever be. This means that the full scope of the problem will probably never be known.

Despite limited data, a few lessons can be drawn from the overwhelming similarities exhibited by various countries affected by cluster munitions, which will continue to pose a significant, lasting and non-discriminatory threat.

LESSON 1:

Data Collection, the Devil is in the Detail

Nearly all data collection mechanisms lack the capacity to carry out prospective, proactive data collection and only record casualties that are brought to their attention, rather than actively seeking out new casualties. In most countries, these mechanisms are not nationwide and contain insufficient detail. The main problem is that they do not differentiate between types of ERW or have only started doing so recently. But often personal details, the number of casualties involved in an incident and injury types are missing. Various data sets also exhibit a lack of common terminology for device, activity, and location types, standardized methodology, and categories of information collected, as well as quality control and verification mechanisms.

Additional issues impacting data collection are that many casualties or their communities do not know exactly what type of device caused the incident, data collectors might not have the expertise to deduce this type of information and casualty databases or injury surveillance mechanisms are not linked to strike or mine-use data. Consequently, a large percentage of casualties are recorded as caused by an unknown device or an erroneous device is inserted.

Analysis shows that only 17 percent (four) of cluster munitions-affected countries or areas have near complete data collection, 61 percent (14) have limited or episodic data collection and 22 percent (five) have no data collection system. Only 13 percent (three) possessed or shared data on conflict casualties and 43 percent (10) differentiated to some extent between

cluster submunitions and other ERW. An overwhelming majority, i.e. 91 percent (10,097), of all confirmed submunitions casualties occurred where there is limited or no data collection.

Complete information on cluster submunitions casualties for the three stages (strike, post-strike, and post-conflict) at which cluster munitions pose a threat is impossible to obtain. In most cases, the nature of conflict and its immediate aftermath do not lend themselves to effective data collection. Very little information is available about casualties during strikes, unless they are widely reported in the media. From existing data, it is often impossible to ascertain whether a casualty occurred during a strike or due to a failed submunition shortly afterward. Little effort is undertaken to improve information on strike and post-strike casualties retroactively. Even in countries where data collection is considered complete, such as Lebanon, information about casualties during strikes is scarce and it is believed that post-strike casualties are underreported.

Similarly, not all casualties are recorded, such as internally displaced people or refugees, but also insurgent, militant, and military casualties are not included in many databases. Sometimes this information is recorded but not made publicly available, possibly also to downplay the impact of cluster munitions on one's own troops.

While the military casualty figures are doubtless significantly underreported, civilian casualties were found to be vastly underreported in most high-use locations, namely: Afghanistan, Cambodia, Chechnya, Iraq, Lao PDR and Vietnam.

Planning of appropriate and comprehensive survivor assistance and MRE activities is inhibited by lack of sufficient data.

LESSON 2:

Cluster Munitions Cause Disproportionate Long-Term Civilian Harm

Nearly all recorded cluster submunitions casualties are civilian, i.e. **98 percent**. Only 124 military and 59 demining casualties have been recorded. Additionally, cluster submunitions incidents involve more people at a time, are more fatal and result in more multiple injuries than mines and other ERW. In countries where mine casualties are relatively few and ERW casualties are many, cluster munitions kill and injure more people than any other ERW device type.

Even limited information on casualties during strikes indicates that many cluster submunitions casualties were civilians. Cluster munitions are wide-surface weapons contaminating more than the military target; they were used in indiscriminately high quantities, as in Lao; they were often used near civilian areas, as in Afghanistan; and they sometimes explicitly targeted civilian targets, as in Chechnya.

Additionally, in the post-strike and post-conflict period, unexploded submunitions cause a lasting threat. Due to their instability in comparison with other ERW types, failed submunitions dominate among new incidents in post-conflict situations, regardless of how limited their use. In parts of Southeast Asia, cluster submunitions continue to cause nearly half of the recorded casualties more than three decades after their use, which is more than all other known item types combined. Failed submunitions used in the 1980s continue to cause casualties at a steady rate in Afghanistan and Lebanon.

In some areas of Iraq, cluster submunitions casualties represent between 75 and 80 percent of all casualties. While in Tajikistan submunitions casualties were only a small percentage of all casualties, they were 55 percent of ERW casualties.

In all instances of systematic cluster munitions use, failure rates of manufacturers are considerably lower than the experience of clearance operators or known and estimated levels of contamination. In some cases, submunitions with an unacceptably high failure rate are used. It was known from the outset that the most widely used submunition in the Southeast Asia conflict, the BLU-26, had a failure rate of 26 percent under optimal test conditions. One of the cluster submunitions in the Israeli stockpile used in Lebanon in 2006 is of the same type and age as those delivered more than three decades ago in Southeast Asia: the US-manufactured BLU-63. This submunition's failure rate has been far above the manufacturer specifications – as high as 80 percent by some estimates.

The recent Israeli use of cluster munitions in Lebanon, with the majority of submunitions delivered when the user knew the conflict was about to end, pointedly parallels a scene decades previous when US strikes escalated near the end of the Second Indochina War. The US continued sporadic use of cluster munitions after the end of both the 1991 and 2003 wars in Iraq.

Military personnel from user countries consider any post-cluster munitions strike environment a minefield, and the claim of disproportionate risk and harm posed to civilians is unquestionable.

LESSON 3:

Cluster Submunitions Casualties are Young Males at Work

Not only are civilians most at risk, but the vast majority of civilian casualties occur while people carry on their normal, daily livelihood activities in their usual and accustomed places. In Lao, almost three quarter of casualties occurred while farming, tending animals, and other livelihood activities in fields, rice paddies, or in the village. In Lebanon, both before and after July 2006, most casualties occurred near the home, while people were inspecting conflict damage, trying to salvage crops, or just walking around.

Males represent 84 percent of casualties, and constitute a similar percentage of casualties carrying out livelihood activities. However, under-18s represent a significant number of these male casualties at approximately 40 percent.[330] In many cases, for example in Kosovo and Cambodia, boys are the largest casualty group; in other cases, such as Vietnam, they are a close second. Boys constitute the vast majority of child casualties – averaging between 85 and 90 percent. The majority of male child casualties occur while carrying out livelihood activities, mostly tending animals. In Afghanistan, boys represent more than half of the casualties tending animals, for example.

A small percentage (around 10 percent) of casualties occur while tampering or playing with cluster submunitions. Again, boys make up the majority of these casualties.

The number of casualties that occure while carrying out livelihood activities shows the direct economic impact on cluster munitions-contaminated communities and countries. In many of these countries, men are the traditional breadwinners, and since adult males and boys represent the majority of casualties the socio-economic loss for both the immediate term and distant future cannot be underestimated.

The significant number of child casualties also requires adjusted survivor assistance programs.

LESSON 4:

Immediate and Comprehensive Clearance Reduces Civilian Casualties

The experiences of Afghanistan, Cambodia, Iraq, Lao PDR, and Vietnam speak volumes: extensive cluster munitions use generally and failed submunitions particularly pose a volatile and generational threat to civilians where clearance efforts are delayed. Immediate identification and clearance of submunitions contamination is the only way to minimize post-conflict casualties, as was shown in Kosovo and after the US offensive in Afghanistan. In Lebanon, it is acknowledged that emergency clearance is the only way to halt the daily casualty occurrence. However, when failed submunitions are cleared rapidly, new use will contribute to and exacerbate the existing problem until the last submunitions are cleared.

A full reckoning of casualties from both submunitions strikes and subsequent contamination is likely impossible, but a consistently disproportionate pattern of harm to civilians has been demonstrated from even this preliminary study. From Southeast Asia to Afghanistan, Iraq, Chechnya, Lebanon, and other places, reports of cluster munitions either targeted at or inadvertently used against civilians have continued, as do the reports of failed submunitions and their impact on communities – the number of casualties grows daily. Time and time again, this fatal footprint determines the fate of individuals and communities, often decades after the initial conflict.

TABLE 1:
Confirmed Cluster Submunitions Casualties in Affected Countries

Confirmed Cluster Submunitions Casualties	Total	Injured	Killed	Unknown Status	Man	Woman	Boy	Girl	Military	Deminer	Unknown
	11,044	5,581	3,830	1,633	3,694	780	2,524	458	124	59	3,405
Afghanistan	701	550	150	1	305	49	224	31	82	10	0
Albania	56	46	10	0	21	5	1	1	3	20	5
Bosnia-Herzegovina	9	2	7	0	0	0	0	0	0	2	7
Cambodia	120	91	29	0	43	12	56	9	0	0	0
Chad	N/A										
Croatia	277	258	17	2	10	3	12	1	1	4	246
Chechnya	624	319	305	0	4	0	1	1	0	0	618
Eritrea	10	7	3	0	0	0	4	0	0	0	6
Ethiopia	272	215	57	0	0	0	0	0	0	0	272
Iraq	2,060	801	200	1,059	336	87	119	59	6	0	1,453
Kosovo	164	103	59	2	50	3	83	1	7	15	5
Kuwait	5	4	1	0	0	0	0	0	0	1	4
Lao PDR	4,813	2,165	2,521	127	2,257	470	1,654	275	0	0	157
Lebanon	494	376	118	0	276	46	92	22	15	4	39
Montenegro	4	1	3	0	0	1	0	0	0	0	3
Saudi Arabia	N/A										
Serbia	45	30	15	0	1	0	0	0	0	2	42
Sierra Leone	28	18	10								28
Sudan	36	20	16	0	0	0	0	2	4	0	30
Syria	1	0	1	0	0	0	0	0	1	0	0
Tajikistan	48	18	30	0	0	0	0	0	0	0	48
Vietnam	1,275	557	278	440	391	104	278	56	5	1	440
Western Sahara	2	0	0	2	0	0	0	0	0	0	2

TABLE 2:

Status of Casualty Data Collection in Cluster Submunitions Affected Countries

Status of Casualty Data Collection	Complete Data Collection	Data Collection System	Limited or Episodic Data Collection	No Data Collection System	Data on Conflict Casualties	Differentiate ERW Type
Total	4	18	14	5	3	10
Afghanistan		●	●		●	●
Albania	●	●				●
Bosnia-Herzegovina*		●	●		●	
Cambodia	●	●				
Chad		●	●			
Croatia	●	●				●
Chechnya		●	●			
Eritrea		●	●			
Ethiopia		●	●			
Iraq		●	●			●
Kosovo*		●	●			●
Kuwait				●		
Lao PDR		●	●			●
Lebanon	●	●			●	●
Montenegro				●		
Saudi Arabia				●		
Serbia*		●	●			
Sierra Leone				●		
Sudan		●	●			●
Syria				●		
Tajikistan		●	●			●
Vietnam		●	●			●
Western Sahara		●	●			

*Was not able to provide data during the research period

Selected Bibliography

10-80 Committee, Hue Health Department, and Hatfield Consultants Limited, *A Luoi Thua-Thien Hue, Living with UXO: Results of the Survey of UXO Impacts on Socio-Economic and Human Health in A Luoi Valley, Thua Thien Hue Province*, 2001.

John Borrie, *Explosive remnants of war: Global survey*, Landmine Action, London, June 2003.

Catholic Relief Services (CRS), *Report on Baseline Survey in Dong Ha, Cam Lo, Dakrong and Huong Hoa Districts*, Hanoi, September 2006.

Rosy Cave, Anthea Lawson and Andrew Sherriff, *Cluster Munitions in Albania and Lao PDR: The Humanitarian and Socio-Economic Impact*, UNIDIR, Geneva, September 2006.

Handicap International, *Les systèmes d'armes à sous-munitions*, *Etat des lieux,* Lyon, August 2003.

Handicap International, *Living with UXO, National Survey on the Socio-Economic Impact of UXO in Lao PDR (Final Report)*, Vientiane-Brussels, 1997.

Human Rights Watch, *Essential Elements for Reducing the Civilian Harm of Cluster Munitions: Examples of Policy and Practice*, August 2006.

Human Rights Watch, *Overview of a Dirty Dozen Cluster Munitions*, Washington, D.C., August 2006.

Human Rights Watch, *Off Target: The Conduct of the War and Civilian Casualties in Iraq*, US, 2003.

Human Rights Watch, *Fatally Flawed: Cluster Bombs and Their Use by the United States in Afghanistan*, Washington, D.C., December 2002.

Human Rights Watch, *Cluster Bombs in Afghanistan: A Human Rights Watch Backgrounder*, October 2001.

Human Rights Watch, *Civilian Deaths in the NATO Air Campaign,* Vol. 12, No. 1 (D), February 2000.

Human Rights Watch, *Ticking Time Bombs: NATOs Use of Cluster Munitions in Yugoslavia,* Vol. 11, No. 6 (D), June 1999.

Iraq Landmine Impact Survey, *The Causes of Death and Injury in Iraq due to ERW,* Iraq, 18 May 2006.

International Campaign to Ban Landmines, *Landmine Monitor Report 2006: Toward a Mine-Free World*, Mines Action Canada, Canada, September 2006.

International Committee of the Red Cross, *Cluster Bombs and Landmines in Kosovo: Explosive Remnants of War*, Geneva, August 2000 (Revised June 2001).

Franklin Lamb, "Israel's Gift to Lebanon," in *A Quarter Century of Israel's Use of American Weapons in Lebanon (1978-2006)*, September 2006.

Landmine Action UK, *Explosive remnants of war: Unexploded ordnance and post-conflict communities*, London, March 2002.

Rae McGrath, *Cluster Bombs: The Military Effectiveness and Impact on Civilians of Cluster Munitions*, UK Working Group on Landmines, Calvert's Press, London, August 2000

Titus Peachey and Virgil Wiebe, *Cluster Bombs Appendix 1: Laos*, Mennonite Central Committee, November 2000.

Titus Peachey and Virgil Wiebe, *Clusters of Death*, Mennonite Central Committee, 2000.

Brian Rappert and Richard Moyes, *Failure to Protect: A case for the prohibition of cluster munitions*, LMA UK, London, September 2006.

William Shawcross, *Sideshow: Kissinger, Nixon and the destruction of Cambodia*, Cooper Square Press, 25 October 2002 (revised edition).

Survey Action Center and Handicap International, *Landmine Impact Survey: Republic of Chad*, Washington, D.C., 2000.

Swedish Committee for Afghanistan and Swedish Peace and Arbitration Society, *Cluster munitions in Afghanistan – implications for international action and regulation*, Stockholm, April 2006.

Virgil Wiebe, "Footprints of Death: Cluster Bombs as Indiscriminate Weapons Under International Humanitarian Law," *Michigan Journal of International Law*, Vol. 22, No. 1, Fall 2000, pp. 142-149.

Virgil Wiebe, *Cluster Bomb Use in the Yugoslavia/Kosovo War*, MCC, 1999.

Virgil Wiebe and Titus Peachey, *Drop Today, Kill Tomorrow: Cluster Munitions as Inhumane and Indiscriminate Weapons*, MCC, December 1997 (revised June 1999).

Notes

1 National Defense University, "19. Operation Plan El Paso," http://www.ndu.edu/inss/; BBC, "War and Protest - the US in Vietnam (1969 - 1970)," both accessed 3 October 2006; William Shawcross, *Sideshow: Kissinger, Nixon and the destruction of Cambodia*, Cooper Square Press, 25 October 2002 (revised edition).

2 Landmine Action UK, *Explosive remnants of war: Unexploded ordnance and post-conflict communities*, London, March 2002, pp. 48-49 (hereinafter LMA UK, *Explosive remnants of war*): "The GeoSpatial International Cambodia National Level One Survey Project … has evidence of at least 17,235 United States cluster bomb attack sites – although the actual number of bombs dropped on each of these target sites is not known."

3 Analysis of US strike data for Cambodia. Air-delivered antipersonnel and antivehicle mines were excluded from this total, as were all fuel air explosives, smoke, incendiary, and chemical munitions classified as BLU; see Andreas Parsch, *U.S. Military Aviation Designation Systems: Directory of U.S. Military Rockets and Missiles, Non-U.S. Military Aircraft and Missile Designation Systems*, http://www.designation-systems.net, accessed 4 September 2006.

4 Titus Peachey and Virgil Wiebe, *Cluster Bombs Appendix 1: Laos*, Mennonite Central Committee (MCC), November 2000, http://www.mcc.org/clusterbomb/, accessed 8 March 2006; UXO Lao, "Lao UXO Workplan 1999," Vientiane, 1999, p. 3.

5 Rae McGrath, *Cluster Bombs: The Military Effectiveness and Impact on Civilians of Cluster Munitions*, UK Working Group on Landmines, Calvert's Press, London, August 2000, p. 16 (hereinafter McGrath, *Military Effectiveness*).

6 International Campaign to Ban Landmines, *Landmine Monitor Report 2006: Toward a Mine-Free World*, Mines Action Canada, Canada, September 2006, pp. 264-266 (hereinafter *Landmine Monitor Report 2006*).

7 Casualty data provided by Kao Vannarin, Project Advisor, CMVIS-Handicap International (HI), Phnom Penh, 14 September 2006.

8 Email from Kao Vannarin, CMVIS-HI, Phnom Penh, 4 September 2006.

9 Unless otherwise stated, casualty analysis is based on 120 individual records provided by Kao Vannarin, CMVIS-HI, Phnom Penh, 14 September 2006.

10 The provinces with the most cluster submunitions casualties are also the four provinces with the most ERW incidents in comparison with mine incidents and account for 48 percent of submunitions casualties: Kampong Cham (18), Kandal (14), Kracheh (14), and Stueng Traeng (12).

11 William Shawcross, *Sideshow: Kissinger, Nixon and the destruction of Cambodia*, Cooper Square Press, 25 October 2002 (revised edition).

12 CMVIS complete data was filtered for mine incidents only and for 120 casualties spread across the same 18 provinces and in the same proportions as the cluster submunitions casualties.

13 Interview conducted by Vao Kannarin, CMVIS-HI, and Stan Brabant, Head, Policy Unit, Handicap International, Kampong Speu, 5 April 2006, photos taken by the authors.

14 Titus Peachey and Virgil Wiebe, *Cluster Bombs Appendix 1: Laos*, November 2000, http://www.mcc.org/clusterbomb, accessed 8 March 2006.

15 Handicap International, *Living with UXO, National Survey on the Socio-Economic Impact of UXO in Lao PDR (Final Report)*, Vientiane-Brussels, 1997, p. 77 (Hereinafter HI, *Living with UXO*); US Air Force CBU strike data summary (hereinafter USAF data summary) for Lao PDR based on UXO Lao records and summarized by Geneva International Centre for Humanitarian Demining (GICHD), September 2006. This information was provided anonymously, 22 September 2006.

16 HI, *Living with UXO*, p. 77.

17 Analysis of USAF data summary: air-delivered antipersonnel and antivehicle mines and minelets were excluded from this total, as were all fuel air explosives, smoke, incendiary, and chemical munitions classified as BLU.

18 Analysis of USAF data summary.

19 McGrath, *Military Effectiveness*, p. 31.

[20] UXO Lao, *Programme Progress Report 2005: [Draft] Summary of the 2005 UXO Lao Annual Report*, Vientiane, 2006, p. 6 (hereinafter UXO Lao, *Progress Report 2005*).

[21] Titus Peachey and Virgil Wiebe, *Cluster Bombs Appendix 1: Laos*, November 2000, p. 8, http://www.mcc.org/clusterbomb/, accessed 8 March 2006.

[22] *Landmine Monitor Report 2006*, p. 983.

[23] HI, *Living with UXO*, p. 24. The actual data set holds 10,639 records, though the final report indicates 10,649.

[24] UXO Lao, *Progress Report 2005*, p. 6.

[25] Analysis and total confirmed cluster submunitions casualties are based on HI, *Living with UXO* survey data. This dataset was most used because of its completeness of information and the greater period of time it covers. Additional records were provided by UXO Lao for the years 1999-2003, and 2005-May 2006 (hereinafter, "UXO Lao" data); summarized UXO Lao data for 2004 was drawn from, Rosy Cave, Anthea Lawson and Andrew Sherriff, *Cluster Munitions in Albania and Lao PDR: The Humanitarian and Socio-Economic Impact*, UNIDIR, Geneva, September 2006, pp. 27-30. Together, these data sets cover the period 1973 – May 2006, with detailed records of 11,410 total landmine/ERW casualties.

[26] Analysis of HI, *Living with UXO* and "UXO Lao" data.

[27] HI, *Living with UXO*, p. 28.

[28] NRA, "Activities & News," http://www.nra.gov.la/#, accessed 5 October 2006. The NRA site, new in September 2006, mentions that "[t]his year there has been a marked increase in casualties, related directly to the increased value of scrap metal and the consequent hunting for and salvaging of UXO."

[29] "UXO Lao" data; see also the Tajikistan and Vietnam reports.

[30] NRA, "Activities & News," http://www.nra.gov.la/#, accessed 5 October 2006.

[31] Analysis of HI, *Living with UXO* data.

[32] Analysis of HI, *Living with UXO* data.

[33] Case study and photos provided by Yvon Le Chevanton, HI, Vientiane, September 2006.

[34] Technology Center for Bomb and Mine Disposal/Vietnam Veterans of America Foundation (BOMICEN/VVAF) administrative query of US ordnance records for tonnage delivered originally provided to Landmine Monitor Researcher Andrew Wells-Dang, dated 4 May 2004 (hereinafter BOMICEN/VVAF ordnance data). The top 10 strike locations in descending rank order, are: Quang Binh, Binh Phuoc, Quang Tri, Binh Dinh, Ha Tinh, Quang Nam, Thua-Thien Hue, Quang Ngai, Tay Ninh, and Kon Tum.

[35] 10-80 Committee, Hue Health Department, and Hatfield Consultants Limited, *A Luoi Thua-Thien Hue, Living with UXO: Results of the Survey of UXO Impacts on Socio-Economic and Human Health in A Luoi Valley, Thua Thien Hue Province*, 2001, Appendix A7, Chapter 2, pp. 24-27 (hereinafter *A Luoi Survey)*.

[36] BOMICEN/VVAF ordnance data. The provinces in descending order are: Quang Binh, Thua-Thien Hue and Quang Nam.

[37] *A Luoi Survey*, Appendix A4, Chapter 1, p. 1; Hatfield Consultants Limited and 10-80 Committee, *Development of Methodologies and Technology for Supporting Clearance of Landmines and Unexploded Ordnance in Viet Nam*, January 2003, Chapter 6, p. 5.

[38] This estimate is based on the ratio of the submunitions types dropped in Lao.

[39] BOMICEN/VVAF ordnance data.

[40] *Landmine Monitor Report 2004*, pp. 1171-1172.

[41] Email from Hoang Nam, Coordinator, Project RENEW, Dong Ha, 25 August 2006.

[42] *A Luoi Survey*, Appendix A7, Chapter 2, pp. 24-27.

[43] BOMICEN/VVAF, "Survey Analysis Results, Unexploded Ordnance and Landmine Impact Assessment and Technical Survey Report, Phase 1," Hanoi, 14 October 2005, pp. 7, 13

[44] Catholic Relief Services (CRS), *Report on Baseline Survey in Dong Ha, Cam Lo, Dakrong and Huong Hoa Districts*, Hanoi, September 2006 and data used for the MRE baseline study in Quang Tri province sent by Andrew-Wells Dang, Deputy Representative, CRS, 26 September 2006.

[45] Unless otherwise stated casualty data analysis is based on: Clear Path International (CPI) data sent by Tran Hong Chi, Program Coordinator, CPI, 17 April 2006, and Catholic Relief Services data for the MRE baseline study in Quang Tri province sent by Andrew-Wells Dang, CRS, 26 September 2006. Combined the data sets provide detailed records for 2,826 landmine/ERW casualties, including 835 cluster submunition casualties. Additionally, 440 cluster munitions casualties (out of 1,088) from the A Luoi survey are also included in the totals. But they are classified as unknown status since detailed records were not provided. See, *A Luoi Survey*, Appendix A7, Chapter 2, pp. 28-29, 34-35.

[46] *Landmine Monitor Report 2006*, pp. 1122-1123.

[47] See the Lao PDR and Tajikistan profiles in this study.

[48] *Landmine Monitor Report 2005*, p. 929.

[49] *Landmine Monitor Report 2004*, pp. 1171-1172.

[50] Vietnam War, "Vietnam War Casualties," http://www.vietnam-war.info/, accessed 10 September 2006: "The Hanoi government revealed on April 4 that the true civilian casualties of the Vietnam War were 2,000,000 in the north, and 2,000,000 in the south. Military

casualties were 1.1 million killed and 600,000 wounded...,"

51 Clear Path International (CPI): *Assisting Landmine Survivors, their Families and their Communities, Personal Stories, Ho Van Lai*, http://www.clearpathinternational.org/, accessed 27 September 2006. Photo courtesy of CPI: additional information not found in Lai's online case study provided by the author.

52 Email from Michel Destemberg, Chief Technical Advisor/Programme Manager, UNOPS/HCND, N'Djamena, 1 September 2006.

53 The Survey Action Center and Handicap International, *Landmine Impact Survey: Republic of Chad*, Washington, 2000, p. 59 (hereinafter *Chad LIS*).

54 Email from Michel Destemberg, UNOPS/HCND, N'Djamena, 1 September 2006.

55 Emails from Michel Destemberg, UNOPS/HCND, N'Djamena, 1 September 2006; Titus Peachey and Virgil Wiebe, *Clusters of Death,* "Chapter 2: Cluster Munitions in the Russian Arsenal," Mennonite Central Committee, 2000, http://www.mcc.org/clusterbombs/, accessed 7 September 2006 (hereinafter Peachey and Wiebe, *Clusters of Death*).

56 Handicap International, *Where Are Cluster Bombs Used?* www.handicap-international.org.uk, accessed 24 August 2006; Human Rights Watch (HRW), *Essential Elements for Reducing the Civilian Harm of Cluster Munitions: Examples of Policy and Practice*, August 2006, p. 1 (hereinafter HRW, *Essential Elements*).

57 Email from Didier Léonard, Program Manager, MAG, N'Djamena, 31 August 2006.

58 HCND: Haut Commissariat National de Déminage (National High Commission for Demining).

59 Emails from Michel Destemberg, UNOPS/HCND, N'Djamena, 1 September 2006 and 3 October 2006.

60 Telephone interview with Michel Destemberg, UNOPS/HCND, N'Djamena, 2 October 2006.

61 *Landmine Monitor Report 2006*, p. 283.

62 John Borrie, *Explosive remnants of war: Global survey*, Landmine Action, London, June 2003, p. 17 (Borrie, G*lobal survey*).

63 Email from Michel Destemberg, UNOPS/HCND, N'Djamena, 1 September 2006.

64 Telephone interview with Thomas Merkelbach, Head of Delegation, ICRC, N'Djamena, 7 September 2006.

65 Email from Didier Léonard, MAG, N'Djamena, 31 August 2006.

66 *Chad LIS*, p. 33.

67 *Chad LIS*, p. 7.

68 McGrath, *Military Effectiveness*, p. 41.

69 LMA UK, *Explosive remnants of war*, pp. 50-53.

70 *Landmine Monitor Report 2002*, p. 250.

71 David Gough, "Ethiopian planes bomb Eritrean capital as refugee crisis grows," *The Guardian* (Asmara), 30 May 2000, http://www.guardian.co.uk/, accessed on 5 October 2006.

72 Ministry of Foreign Affairs of Eritrea, "Press Release: Ethiopia Bombs Asmara Airport," Asmara, 29 May 2000, http://www.dehai.org/, accessed on 5 October 2006.

73 McGrath, *Military Effectiveness*, p. 41.

74 Email from Tedla Gebrehiwot, MRE Coordinator/Supervisor, UNMEE MACC, Asmara, 8 September 2006.

75 *Landmine Monitor Report 2006*, pp. 418-419.

76 LMA UK, *Explosive remnants of war*, pp. 50-51.

77 Ministry of Foreign Affairs of Eritrea, "Press Release: Ethiopia Bombs Asmara Airport," Asmara, 29 May 2000, http://www.dehai.org/, accessed on 5 October 2006.

78 UNMEE MACC, *UNMEE Mine Action Coordination Centre Sitrep,* Asmara, 14 December 2000, p. 1.

79 LMA UK, *Explosive remnants of war*, p. 53.

80 *Ibid.*, pp. 51-52.

81 *Landmine Monitor Report 2006*, p. 419.

82 Eritrea Ethiopia Claims Commission, *Partial Award-Central Front-Ethiopia's Claim 2 between The Federal Democratic Republic of Ethiopia and The State of Eritrea*, The Hague, 28 April 2004, pp. 24-28 and pp. 30-31.

83 Borrie, *Global survey*, p. 17.

84 Email from Scott Pilkington, Senior Technical Advisor UN Mine Action Advisory Team, UNDP, Addis Ababa, 12 September 2006.

85 Email from Mike Kendellen, Director for Survey, SAC, Washington, 29 September 2006.

86 *Landmine Monitor Report 2006,* pp. 436-438.

87 Eritrea Ethiopia Claims Commission, *Partial Award-Central Front-Ethiopia's Claim 2 between The Federal Democratic Republic of Ethiopia and The State of Eritrea*, The Hague, 28 April 2004, pp. 24-28.

88 Embassy of The Federal Democratic Republic of Ethiopia in London, "Ethiopia and Eritrea Border Conflict," http://www.ethioembassy.org.uk/, accessed 12 September 2006.

89 McGrath, *Military Effectiveness*, p. 41; "ECOMOG air raid," *IRIN* (Sierra Leone), 12 December 1997, available at University of Pennsylvania, African Studies Center www.africa.upenn.edu/Newsletters/, accessed 25 August 2006.

90 "ECOMOG shells Port Loko and coastal areas," *IRIN*, 4 October 1997, available at University of Pennsylvania, African Studies Center,

www.africa.upenn.edu/Newsletters/, accessed 25 August 2006.

91 Sierra Leone Web, News Archives, October 1997, http://www.sierra-leone.org/, accessed 25 August 2006.

92 Eric G. Berman, *Re-Armament in Sierra Leone: One Year After the Lomé Peace Agreement*, Occasional Paper No. 1, Small Arms Survey, Geneva, December 2000, p. 25; Control Arms, *The call for tough arms controls: voices from Sierra Leone,* Oxfam, Amnesty International, and the International Action Network on Small Arms (IANSA), January 2006, p. 12, available at www.controlarms.org, accessed 7 September 2006.

93 McGrath, *Military Effectiveness*, p. 41.

94 *Landmine Monitor Report 2001*, p. 145.

95 McGrath, *Military Effectiveness*, p. 41.

96 *Landmine Monitor Report 2006*, p. 650.

97 Peachey and Wiebe, *Clusters of Death,* "Chapter 4: Cluster Munition Use in Sudan."

98 *Ibid.*

99 McGrath, *Military Effectiveness*, p. 38.

100 McGrath, *Military Effectiveness*, p. 39; Peachey and Wiebe, *Clusters of Death,* "Chapter 4: Cluster Munition Use in Sudan."

101 McGrath, *Military Effectiveness*, p. 39; Peachey and Wiebe, *Clusters of Death,* "Chapter 4: Cluster Munition Use in Sudan."

102 McGrath, *Military Effectiveness*, p. 38.

103 *Ibid.*, p. 39; Peachey and Wiebe, *Clusters of Death,* "Chapter 4: Cluster Munition Use in Sudan.".

104 Email from Mohammad Kabir, Information Management Officer, UNMAO, Khartoum, 16 September 2006.

105 *Landmine Monitor Report 2006*, pp. 674-676.

106 Email from Bojan Vukovic, MRE/VA Coordinator, South Sudan Regional Mine Action Center, Juba, 4 September 2006.

107 *Landmine Monitor Report 2005*, pp. 543-545.

108 USAID, "U.S. Census Bureau Supports the Southern Sudan Center for Statistics and Evaluation," 2006, http://africastories.usaid.gov/, accessed 5 October 2006.

109 Email from Yousif Mohamed Osman, Training Director, NAPO, Khartoum, 4 September 2006.

110 Interview with Yousif Mohamed Osman, NAPO, Geneva, 20 September 2006.

111 Email from Mohammad Kabir, UNMAO, Khartoum, 8 October 2006.

112 Email from Mohammad Kabir, UNMAO, Khartoum, 16 September 2006.

113 *Landmine Monitor Report 2005*, p. 543-545.

114 Peachey and Wiebe, *Clusters of Death,* "Chapter 4: Cluster Munition Use in Sudan."

115 HRW, "Government Bombing of Relief Sites and Other Security Risks," *Famine In Sudan, 1998: The Human Rights Causes*, 8 February 1999, http://www.hrw.org/reports/, accessed 6 October 2006.

116 Peachey and Wiebe *Clusters of Death*, "Chapter 4: Cluster Munition Use in Sudan;" McGrath, *Military Effectiveness*, p. 39.

117 Interview with Arben Braha, Director, and Veri Dogjani, MRE-VA Officer, AMAE, Geneva, 18 September 2006; Virgil Wiebe and Titus Peachey, *Drop Today, Kill Tomorrow: Cluster Munitions as Inhumane and Indiscriminate Weapons*, MCC, December 1997 (revised June 1999), p. 5, http://www.mcc.org/cluster-bombs/, accessed 5 October 2006 (hereinafter Wiebe and Peachey, *Kill Tomorrow*).

118 Virgil Wiebe, *Cluster Bomb Use in the Yugoslavia/Kosovo War*, MCC, 1999, http://www.mcc.org/clusterbombs/, accessed 30 September 2006 (hereinafter Wiebe, *Yugoslavia*).

119 Rosy Cave, Anthea Lawson and Andrew Sherriff, *Cluster Munitions in Albania and Lao PDR: The Humanitarian and Socio-Economic Impact*, UNIDIR, Geneva, September 2006, p. 9 (hereinafter UNIDIR, *Cluster Munitions in Albania*).

120 Wiebe, *Yugoslavia*.

121 Wiebe, *Yugoslavia.*

122 *Ibid.*

123 Interview with Arben Braha and Veri Dogjani, AMAE, Geneva, 18 September 2006; UNIDIR, *Cluster Munitions in Albania*, p. 11.

124 Interview with Arben Braha and Veri Dogjani, AMAE, Geneva, 18 September 2006.

125 UNIDIR, *Cluster Munitions in Albania*, p. 10.

126 *Landmine Monitor Report 2006*, pp. 135-136.

127 Unless otherwise stated analysis of casualty data provided via email by Arben Braha, Director, AMAE, 15 September 2006.

128 UNIDIR, *Cluster Munitions in Albania*, pp. 10-11; Wiebe, *Yugoslavia*.

129 The training incident accounts for 36 percent of all incidents, excepting this incident, the casualty rate would be at 1.2 persons per incident.

130 UNIDIR, *Cluster Munitions in Albania*, p. 11.

131 Wiebe, *Yugoslavia*.

132 UNIDIR, *Cluster Munitions in Albania*, p. 8.

133 Wiebe, *Yugoslavia*.

134 Case study provided by Arben Braha, Director, AMAE, Tirana, 15 September 2006. At the request of AMAE, the name given is fictional to protect the privacy of the boy.

135 Roger Cohen, "NATO, Expanding Bosnia Role, Strikes a Serbian base in Croatia," *New York Times* (New York), 22 November, 1994; Michael

Beale, *Bombs Over Bosnia: The Role Of Airpower In Bosnia-Herzegovina*, Maxwell Air Force Base, Alabama, June 1996, http://www.fas.org/man/eprint/beale.htm, accessed 6 October 2006.

136 Wiebe and Peachey, *Kill Tomorrow*, p. 5.

137 BHMAC data consisted of summary reports prior to June 2005, which did not offer details on conflict or post-conflict mine/ERW casualties.

138 Email from Dejan Babalj, Project Development Officer, BHMAC, Sarajevo, 18 September 2006; *Landmine Monitor Report 2006*, pp. 222-223.

139 Email from Dejan Babalj, BHMAC, Sarajevo, 18 September 2006; Wiebe and Peachey, *Kill Tomorrow*, p. 5.

140 Brian Rappert and Richard Moyes, *Failure to Protect: A case for the prohibition of cluster munitions*, LMA UK, London, September 2006, p. 8 (hereinafter Rappert and Moyes, *Failure to protect*); Wiebe and Peachey, *Kill Tomorrow*, p. 5.

141 *Landmine Monitor Report 2006*, pp. 367-368.

142 Rappert and Moyes, *Failure to Protect*, p. 8; Wiebe and Peachey, *Kill Tomorrow*, p. 5; Wiebe, *Yugoslavia*.

143 Analysis of data provided via email by Ljiljana Calic-Zmiric, Mine Risk Education and Victim Assistance Advisor, CROMAC, 4 September 2006, and of casualties cited in Rappert and Moyes, *Failure to Protect*, p. 8. Unless otherwise stated all casualty analysis based on these sources.

144 The International Criminal Tribunal for The Former Yugoslavia, *Case No. IT-95-11 The Prosecutor Of The Tribunal Against Milan Martic*, http://www.un.org/icty/, accessed 7 October 2006.

145 The tabular information is a composite of data provided by email from Bajram Krasniqi, Public Information Assistant, OKPCC EOD Management, Pristina, 1 September 2006; OKPCC EOD, "Incidents of Cluster Munition in Kosovo 1999-2001 & 2001-2005," provided by Thomas Nash, Coordinator, Cluster Munition Coalition (CMC), London, 21 September 2006; and data originally from UNMIK MACC Database 1999-2001 provided by email from Richard Moyes, Policy and Research Manager, LMA UK, London, 21 September 2006. Unless stated otherwise, casualty analysis is based on these sources.

146 HRW, *Cluster Bombs in Afghanistan: A Human Rights Watch Backgrounder*, October 2001, www.hrw.org/backgrounder/arms/, accessed 22 September 2006 (hereinafter HRW, *Cluster Bombs in Afghanistan*); HI, *Cluster Munitions Systems: Situation and Inventory*, Lyon, August 2003, p. 14.

147 ICRC, *Cluster Bombs and Landmines in Kosovo: Explosive Remnants of War*, Geneva, August 2000 (Revised June 2001), p. 6.

148 Rappert and Moyes, *Failure to Protect*, p. 11.

149 *Landmine Monitor Report 2001*, p. 958.

150 GICHD and UNDP, "Case of Kosovo," *A Study of Socio-Economic Approaches to Mine Action*, Geneva, March 2001, p. 25.

151 *Landmine Monitor Report 2001*, p. 952.

152 United Kingdom Ministry of Defence, *Questions 59 and 60. RBL755*, *Select Committee on Public Accounts Minutes of Evidence, APPENDIX 1*, Supplementary memorandum submitted by the Ministry of Defence (PAC 00-01/170), 30 January 2001, http://www.publications.parliament.uk/, accessed 29 September 2006.

153 *Landmine Monitor Report 2006*, p. 1152.

154 HRW, *Cluster Bombs in Afghanistan*.

155 "UN set to transfer demining activities to Kosovo authorities," *ReliefWeb*, 14 December 2001, http://www.reliefweb.int/, accessed 29 September 2006.

156 *Landmine Monitor Report 2006*, pp. 1147-1148.

157 *Landmine Monitor Report 2001*, p. 952.

158 *Landmine Monitor Report 2001*, p. 952.

159 Landmine Action UK, Actiongroup Mine.de and Mines Action Canada, *Explosive Remnants of War and Mines other than Anti-Personnel Mines: Global survey 2003–2004*, Landmine Action UK, London, March 2005, p. 98.

160 GICHD and UNDP, "Case of Kosovo," *A Study of Socio-Economic Approaches to Mine Action*, Geneva, March 2001, pp. 105-106; *Landmine Monitor Report 2001*, p. 968.

161 UNMIK MACC, Monthly Summaries 1 June 1999 – 30 November 2000; *Landmine Monitor Report 2005*, p. 962.

162 Telephone interview with Bajram Krasniqi, OKPCC EOD Management, Pristina, 29 September 2006.

163 *Landmine Monitor Report 2004*, p. 1211.

164 The tabular information is a composite of data provided by email from Bajram Krasniqi, OKPCC EOD Management, Pristina, 1 September 2006; OKPCC EOD, "Incidents of Cluster Munition in Kosovo 1999-2001 & 2001-2005," provided by Thomas Nash, CMC, London, 21 September 2006; and data originally from UNMIK MACC Database 1999-2001 provided by email from Richard Moyes, LMA UK, London, 21 September 2006. Unless stated otherwise, casualty analysis is based on these sources.

165 Email from Bajram Krasniqi, OKPCC, UNMIK, EOD Management, Pristina, 3 October 2006. Detailed records of 154 casualties were not available at OKPCC EOD.

166 The Praxis Group, Ltd., *Willing to Listen: An Evaluation of the United Nations Mine Action Programme In Kosovo 1999-2001*, Riverside, Geneva, 12 February 2002, p. 100.

167 UNMIK MACC, *UNMIK Mine Action Coordination Centre Quarterly Report 1 June – 30 September 2000,* Skopje & Pristina, 2000, p. 4.

[168] United Nations-Islamabad: "UXO Blues: Photographs by Luke Powell," *Situation in and around Afghanistan*, http://www.un.org.pk/, accessed 3 October 2006.

[169] LMA UK, *Explosive remnants of war*, p. 8.

[170] *Landmine Monitor Report 2001*, p. 968.

[171] HRW, "Civilian Deaths in the NATO Air Campaign," *A Human Rights Watch Report*, Vol. 12. No. 1 (D), February 2000, p. 8 (hereinafter HRW, "Civilian Deaths"); Human Rights Watch, *Cluster Bombs: Memorandum for CCW Delegates,* 16 December 1999, http://www.hrw.org/arms/memo-cluster.htm, accessed 25 September 2006.

[172] HRW, "Civilian Deaths," Appendix A: Incidents Involving Civilian Deaths in Operation Allied Force.

[173] Wiebe, *Yugoslavia*.

[174] John Borrie, *Global survey*, p.13; LMA UK, *Unexploded Ordnance and Post-conflict Communities*, London, 2002, p. 13.

[175] Mark Tran, "Soldiers were killed by NATO bombs," *Guardian Unlimited*, 22 June 1999, http://www.guardian.co.uk/, accessed 7 September 2006.

[176] "UK Nato bomb caused Gurkha deaths," *BBC* (UK), 22 June 1999, http://news.bbc.co.uk/; CNN, "Officials: Peacekeepers killed while clearing NATO bombs from village," 22 June 1999, *CNN* (Pristina), http://www.cnn.com/, both accessed 7 September 2006.

[177] Testimony collected by HI in 2005.

[178] Select Committee on Defence, Fourteenth Report, Annex B, available at http://www.publications.parliament.uk/, accessed 6 October 2006.

[179] *Landmine Monitor Report 2006*, p. 644.

[180] HRW, "Civilian Deaths," Appendix A: Incidents Involving Civilian Deaths in Operation Allied Force.

[181] Wiebe, *Yugoslavia*.

[182] HRW, *Cluster Bombs in Afghanistan*, pp. 4-5.

[183] CMC, Clusters Profile: Serbia and Montenegro, http://www.stopclustermunitions.org/, accessed 6 October 2005.

[184] *Landmine Monitor Report 2006,* p. 637.

[185] *Landmine Monitor Report 2006*, p. 644.

[186] HRW, *Ticking Time Bombs: NATO's Use of Cluster Munitions in Yugoslavia*, Vol. 11, No. 6 (D), June 1999, http://www.hrw.org/reports/1999/nato2/, accessed 4 September 2006; Steve Goose, "Cluster munitions: Towards a global solution," *Human Rights Watch World Report 2004,* New York, 2004, http://hrw.org/wr2k4/12.htm, accessed 5 October 2006.

[187] *Landmine Monitor Report 2001,* p. 927.

[188] *Landmine Monitor Report 2006,* p. 643.

[189] CMC, Clusters Profile: Serbia and Montenegro, http://www.stopclustermunitions.org/, accessed 6 October 2005.

[190] Virgil Wiebe, "Footprints of Death: Cluster Bombs as Indiscriminate Weapons Under International Humanitarian Law," *Michigan Journal of International Law*, Vol. 22, No. 1, Fall 2000, pp. 142-149 (hereinafter Wiebe, "Footprints").

[191] Wiebe, "Footprints," pp. 142-149; Peachey and Wiebe, *Clusters of Death,* "Chapter 3: Cluster Munitions Use by Russian Federation Forces in Chechnya;" Wiebe and Peachey, *Kill Tomorrow*.

[192] HRW, *Overview of a Dirty Dozen Cluster Munitions*, Washington, D.C., August 2006 (hereinafter HRW, *Dirty Dozen*).

[193] Peachey and Wiebe, *Clusters of Death,* "Chapter 3: Cluster Munitions Use by Russian Federation Forces in Chechnya."

[194] Peachey and Wiebe, *Clusters of Death,* "Chapter 3: Cluster Munitions Use by Russian Federation Forces in Chechnya."

[195] *Landmine Monitor Report 2006*, pp. 1142-1143.

[196] Analysis of casualty data provided by Zaur Tsitsaev, Programme Assistant, Child Protection/Mine Action, UNICEF North Caucasus, Nazran, 19 September 2006.

[197] Analysis of casualty reports contained in: Wiebe, "Footprints;" Peachey and Wiebe, *Clusters of Death,* "Chapter 3: Cluster Munitions Use by Russian Federation Forces in Chechnya;" Wiebe and Peachey, *Kill Tomorrow*, p. 5.

[198] HRW, *Essential Elements*, August 2006.

[199] CMC, Stop Cluster Munitions, Clusters Profile: Tajikistan, http://www.stopclustermunitions.org/, accessed 25 September 2006.

[200] HRW, *Dirty Dozen*.

[201] Email from Reykhan Muminova, Victim Assistance Officer, TMAC, Dushanbe, 26 September 2006.

[202] *Landmine Monitor Report 2006*, p. 699; email from Reykhan Muminova, TMAC, Dushanbe, 26 September 2006.

[203] Email from Reykhan Muminova, TMAC, Dushanbe, 26 September 2006.

[204] See the Lao PDR and Vietnam reports for details.

[205] *Landmine Monitor Report 2006*, pp. 700-701.

[206] Greg Goebel, "Dumb Bombs and Smart Munitions," 1 November 2004, http://www.vectorsite.net/twbomb2.html, accessed 19 September 2006.

[207] Wiebe and Peachey, *Kill Tomorrow*, p. 8.

[208] HRW, *Cluster Bombs in Afghanistan*, p. 2.

[209] HRW, *Fatally Flawed: Cluster Bombs and Their Use by the United States in Afghanistan*, Washington, D.C., December 2002, p. 21 (hereinafter HRW, *Fatally Flawed*).

[210] Bonnie Docherty, "The Legality of U.S. Cluster Munition Use; Civilian Casualties During and After Attack," at the *Cluster Bombs – The Case of Afghanistan International Seminar*, Stockholm, Sweden, 5 May 2006.

[211] HRW, *Cluster Bomblets Litter Afghanistan*, New York, 16 November 2001, http://hrw.org/english/docs/, accessed 19 September 2006.

[212] Swedish Committee for Afghanistan and Swedish Peace and Arbitration Society, *Cluster munitions in Afghanistan – implications for international action and regulation*, Stockholm, April 2006, p. 44.

[213] Interview with Zamanuddin Noori, Mine Action Programme Manager, ICRC, Kabul, 8 August 2006.

[214] Email from Alessandro Greblo, Human Resources Coordinator, Emergency, Milan, 1 June 2006.

[215] Unless stated otherwise: analysis of ICRC casualty data sent by Zamanuddin Noori, ICRC, Kabul, 4 September 2006.

[216] HRW, *Fatally Flawed*; see also MCC for casualties reported in the media, http://www.mcc.org/clusterbomb/afghanistan/index.html.

[217] Interview with Zamanuddin Noori, ICRC, Kabul, 8 August 2006.

[218] Photo by John Rodsted, Afghanistan, 2002.

[219] Analysis of casualty data provided by HRW, IHSCO, CIVIC, ILIS, Spanish Brigade against the War, Iraqi Body Count, HI and media reports. Only casualty data that allowed detailed analysis for crosschecking purposes was included in the casualty table. Other estimates and figures are mentioned but not included in the totals.

[220] Interview with previous technical advisor of IHSCO, Geneva, 17 September 2006.

[221] Interview with Salomon Schreuder, Senior Mine Action Advisor, UNDP-Iraq, Geneva, 20 September 2006.

[222] McGrath, *Military Effectiveness*, p. 33.

[223] HRW, "Four U.S. Cluster Munitions of Concern," *Human Rights Watch Briefing Paper: Cluster Munitions a Foreseeable Hazard in Iraq*, March 2003, http://www.hrw.org/backgrounder/arms/ (hereinafter, HRW, "Four of Concern").

[224] HI, *Les systèmes d'armes à sous-munitions, Etat des lieux*, Lyon, August 2003, p. 43.

[225] McGrath, M*ilitary Effectiveness*, p. 36.

[226] *Ibid.*, p. 34.

[227] HRW, *U.S. Cluster Bombs for Turkey*, Vol. 6, No. 19, December 1994, http://www.hrw.org/reports/1994/turkey2/, (hereinafter HRW, *Bombs for Turkey*); U.S. Congress, General Accounting Office (GAO), *Operation Desert Storm: Casualties Caused by Improper Handling of Unexploded U.S. Submunitions*, GAO/NSIAD-93-212, August 1993, p. 4.

[228] *Ibid.*

[229] Emails from mine action operators in northern Iraq (MAG-VVAF) September 2006.

[230] HRW, *Off Target: The Conduct of the War and Civilian Casualties in Iraq*, US, 2003, p. 80 (hereinafter HRW, *Off Target*).

[231] Human Rights Watch and Handicap International analysis of US strike data identified the units used as CBU-87, 99, 103, 105, AGM-154, BGM-109, and RBL-755. Data summary available upon request.

[232] HRW, *Off Target*, p. 56.

[233] Information provided to Titus Peachey, Mennonite Central Committee, by Department of the Air Force, 20th Fighter Wing, Shaw Air Force Base, South Carolina, Letter dated: 23 August, 2006, Signed by Mary F. Huff, Base Freedom of Information Act Mg.

[234] HRW, *Dirty Dozen*.

[235] HRW, "Four of Concern."

[236] Information provided by Nabaz Tahir Abdulla, IMSMA Manager, MAG, Erbil, 24 September 2006.

[237] Emails from Iraqi and international sources, both governmental and nongovernmental, during August 2005, reaffirmed in August-September 2006.

[238] Email from Ahmed al-Zubaidi, Director, IHSCO, Baghdad, 23 August 2006.

[239] Email from Muna Saffar, Advisor, VVAF, Baghdad, 16 May 2006.

[240] Email from Marla Ruzicka, Founder, CIVIC, 28 August 2004.

[241] *Landmine Monitor Report 2001*, p. 1008.

[242] HRW, *Off Target*, pp. 56-61, pp. 85-92, pp. 105-110, pp. 128-132 and hospital records sent by Bonnie Docherty, Researcher, Human Rights Watch, New York, 1 September 2006.

[243] HRW, *Off Target*, p. 130.

[244] HRW, *U.S.: Minimize Civilian casualties in Iraq*, New York, 17 March 2006.

[245] UNICEF, Press Release: In Iraq, unexploded munitions become child's play," Geneva, 17 July 2003.

[246] HI, *Les systèmes d'armes à sous-munitions, Etat des lieux*, Lyon, August 2003, p. 43.

[247] Group of Members of the Spanish Brigade Against the War, *Evaluation of the Attacks on the Civilian Population of Baghdad Carried out by the Governments of the United States of America, The United Kingdom and Allied Countries Between 20 March and 15 April 2003*, 26 April 2003, pp. 10-11, pp. 17-18.

[248] Emails from Ahmed al-Zubaidi, Director, IHSCO,

Baghdad, 16 September 2006 and 1 October 2006.

249 Recent casualties are those occurring in the 24 months prior to the date of the survey. In total, 13 of 18 governorates were surveyed, data collection in Salah al-Din (Tikrit) is ongoing and full data of Tameem (Kirkuk) and Wasit has not been released.

250 ILIS, "The Causes of Death and Injury in Iraq due to ERW," pp. 1-2; provided by John C. Brown, Iraq Country Team Leader, VVAF, Iraq, 18 May 2006.

251 CIVIC and Iraqi Body Count, "Named and identified victims of the war in Iraq: a memorial," February 2006, http://www.iraqbodycount.org/.

252 Iraqi Body Count, *How Many Civilians were Killed by Cluster Bombs?* 6 May 2003, http://www.iraqbodycount.org/.

253 "Iraq Says Bombs Left Over From Gulf War Kill 168 Civilians," *Reuters*, 7 Augustus 1991.

254 HRW, *Persian Gulf: U.S. Cluster Bomb Duds a Threat*, Washington, 18 March 2003.

255 HRW, *Bombs for Turkey*.

256 Peachey and Wiebe, *Clusters of Death*.

257 McGrath, *Military Effectiveness*, p. 40.

258 *Landmine Monitor Report 2002,* p. 672.

259 HRW, "Four of Concern."

260 "Growing Death Toll in EOD Operations," *Jane's Defence Weekly*, June 20, 1992, p. 1061.

261 HRW, *Bombs for Turkey*.

262 HRW, *Cluster Munitions: Measures to Prevent ERW and to Protect Civilian Populations*, Memorandum to Delegates to the Convention on Certain Conventional Weapons Group of Governmental Experts on Explosive Remnants of War, Geneva, 10-14 March 2003, http://www.hrw.org/backgrounder/arms/clustero31003.htm, accessed 25 September 2006.

263 HRW, *Dirty Dozen*.

264 Email from Rafaat Misak, Landmine Monitor Researcher, KISR, Kuwait, 28 August 2006; HRW, *Human Rights Watch Briefing Paper: Cluster Munitions a Foreseeable Hazard in Iraq*, March 2003, available at www.hrw.org/backgrounder/arms/clustero31803.htm, accessed 25 August 2006.

265 United States General Accounting Office, "Appendix III: U.S. Gulf War Casualties by Service," *GAO-02-1003: Military Operations: Information on U.S. Use of Land Mines in the Persian Gulf War*, September 2002, p. 3 and p. 32.

266 HRW, *Human Rights Watch Briefing Paper: Cluster Munitions a Foreseeable Hazard in Iraq*, March 2003, available at www.hrw.org/backgrounder/arms/clustero31803.htm, accessed 25 August 2006.

267 Ali Muhammad Khuraibe, "Nine years after the invasion of Kuwait: the impacts of the Iraqi left-over ordnance," *The Environmentalist*, Volume 19, Number 4, the Netherlands, December 1999, pp. 361-368.

268 HRW, *Persian Gulf: U.S. Cluster Bomb Duds A Threat: Warning Against Use of Cluster Bombs in Iraq*, Washington, 18 March 2003, available at http://hrw.org/english/docs/2003/03/18/usint5409.htm, accessed 25 September 2006.

269 *Landmine Monitor Report 2006*, p. 964.

270 *Landmine Monitor Report 2001*, pp. 1017-1018.

271 *Landmine Monitor Report 2006*, p. 996.

272 HRW, *Ticking Time Bombs: NATO's Use of Cluster Munitions in Yugoslavia*, Vol. 11, No.6 (D), June 1999, available at http://www.hrw.org/reports/1999/nato2/, accessed 4 September 2006.

273 Information provided in an email by Rafaat Misak, KISR, Kuwait, 28 August 2006.

274 HRW, *NATO's use of cluster munitions in Yugoslavia*, www.hrw.org/backgrounder/arms/clus0511.htm, accessed 25 August 2006.

275 *Landmine Monitor Report 1999*, p. 894.

276 Email from Rafaat Misak, KISR, Kuwait, 28 August 2006.

277 *Landmine Monitor Report 2005*, p. 781.

278 *Landmine Monitor Report 2006*, p. 965.

279 "Lebanon finds 25 cluster bombs: army," *Xinhua* (Beirut), 17 December 2005.

280 Franklin Lamb, "Israel's Gift to Lebanon," in *A Quarter Century of Israel's Use of American Weapons in Lebanon (1978-2006)*, September 2006, http://www.ifamericansknew.org/cur_sit/clusterbombs.html (hereinafter Lamb, "Israel's Gift").

281 *Ibid*.

282 Presentation by Thomas Nash, CMC, Geneva, 21 September 2006.

283 Interview with Andrew Gleeson, Programme Manager- Technical Operations Manager, MAG, Nabatiyyah, 5 September 2006.

284 Presentation by Christopher Clark, Operations Manager, MACC-SL, Geneva, 19 September 2006.

285 HRW, *Dirty Dozen*.

286 Presentation by Christopher Clark, MACC-SL, Geneva, 19 September 2006.

287 Interview with Lt. Col. Hassan Fakeeh, Lebanese Armed Forces Representative, MACC-SL, Tyre, 8 September 2006.

288 Interview with Andrew Gleeson, MAG, Nabatiyyah, 5 September 2006.

289 Interview with Christopher Clark, MACC-SL, Geneva, 19 September 2006.

290 Interview with Andrew Gleeson, MAG, Nabatiyyah, 5 September 2006.

[291] Interview with Georges Kettaneh, National Director of First Aid Teams & Emergency Services, Lebanese Red Cross, Beirut, 4 September 2006.

[292] Interview with Lt. Col. Hassan Fakeeh, MACC-SL, Tyre, 8 September 2006.

[293] Interviews with Sean Sutton, Overseas Information Manager, MAG, Geneva, 21 September 2006 and with Christopher Clark, MACC-SL, Geneva, 19 September 2006.

[294] Interview with Jihad Samhat, Quality Assurance Officer (MDD), MACC-SL, Tyre, 8 September 2006.

[295] Lamb, "Israel's Gift."

[296] *Ibid*.

[297] Observations made during research field mission to Lebanon from 31 August to 10 September 2006.

[298] Lamb, "Israel's Gift."

[299] HRW, *Fatal Strikes: Israel's Indiscriminate Attacks against Civilians in Lebanon*, Vol. 18 No. 3 (E), August 2006, p.6; see also Letter to National Security Advisor Hadley on Requested U.S. Cluster Munition Transfer to Israel, Washington, 11 August 2006, http://hrw.org/english/docs/2006/08/11/israb13972.htm.

[300] Interview with Georges Kettaneh, Lebanese Red Cross, Beirut, 4 September 2006.

[301] HRW, *Israeli Cluster Munitions Hit Civilians in Lebanon*, Beirut, 24 July 2006, http://hrw.org/english/docs/2006/07/24/isrl-pa13798.htm.

[302] Lamb, "Israel's Gift."

[303] Interview with Thomas Nash, CMC, Geneva, 21 September 2006. One included in total.

[304] Interview with Adel Maksoudi, Vice-President, Ragheb Harb Hospital, Nabatiyyah, 6 September 2006. Not included in total.

[305] Interviews in Ain Baal, 8 September 2006. Not included in total.

[306] Interview with Sean Sutton, MAG, Geneva, 21 September 2006.

[307] Interview with Nasser Aboulteif, Director, Vision Association, West Bekaa, 7 September 2006.

[308] *Landmine Monitor Report 2006*, p. 875.

[309] Testimony collected by Handicap International, Yohmour, Lebanon, 6 September 2006.

[310] James Titus, *The Battle Of Khafji: An Overview And Preliminary Analysis*, Airpower Research Institute, Maxwell Air Force Base, Alabama September 1996, p. 25; Carlyle Murphy and Molly Moore, "Attacks at Saudi Border Kill 12 U.S. Marines," *Washington Post*, 31 January 1991; Page A01.

[311] Borrie, *Global survey*, p. 72.

[312] Telephone interview with Marc Lucet, Programme Officer, UNICEF, Damascus, 11 September, 2006; telephone interview with Dr. Helmut Friza, Health Attaché, Austrian Permanent Mission to the United Nations, Geneva, 25 September 2006.

[313] HRW, *Essential Elements*.

[314] *Landmine Monitor Report 2006*, p. 1097-1098.

[315] Telephone interview with Dr. Helmut Friza, Austrian Permanent Mission to the United Nations, Geneva, 25 September 2006.

[316] The sovereignty of the Western Sahara remains the subject of a dispute between the government of Morocco and the Polisario Front. The Polisario's Saharawi Arab Democratic Republic is not universally recognized and had no official representation in the UN.

[317] HRW, *Essential Elements*. Polisario is the acronym for Frente Popular de Liberación de Saguía el Hamra y Río de Oro (Popular Front for the Liberation of Saguia el-Hamra and Río de Oro).

[318] *Landmine Monitor Report 2006*, p. 1196.

[319] Rappert and Moyes, *Failure to Protect*, p. 7.

[320] *Landmine Monitor Report 2006*, p. 1197.

[321] MINSURIO, "Mines and UXOs," http://www.minurso.unlb.org/mines.htm, accessed 7 September 2006.

[322] Borrie, *Global survey*, p. 63; MINSURIO, "Mines and UXOs," http://www.minurso.unlb.org/mines.htm, accessed 7 September 2006.

[323] *Landmine Monitor Report 2001*, pp. 1063-1064; *Landmine Monitor Report 2006*, p. 1199-1200; email from Enrico Magnani, (then) Information Officer/IMSMA Focal Point, MINURSO, Laayoune, 7 September 2005.

[324] *Landmine Monitor Report 2006,* p. 1200.

[325] Telephone interview with Charlotte McAulay, Western Sahara Desk Officer, LMA UK, London, 4 October 2006.

[326] Telephone interview with Charlotte McAulay, LMA UK, London, 4 October 2006; *Landmine Monitor Report 2006*, p. 1200.

[327] Saharawi Campaign to Ban Landmines casualty data collection form provided by Boybat Abdelhay Cheich, Coordinator, Saharawi Campaign to Ban Landmines, Tindouf, 21 September 2006.

[328] United Nations Security Council, "Report of the Secretary-General on the Situation Concerning Western Sahara, (S/1998/316)," 13 April 1998, p. 3.

[329] *Landmine Monitor Report 2001*, pp. 1063-1064; *Landmine Monitor Report 2004*, pp. 1241-1242.

[330] These are percentages for casualties whose gender details and age are known, excluding 3,405 'unknowns'.