



WEAPON CONTAMINATION IN URBAN SETTINGS: AN ICRC RESPONSE

Cover photo caption:

The penetrator warhead of an unexploded KAB-500KR guided bomb in the street in Homs, Syria, 2015

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ABBREVIATIONS

AXO	Abandoned explosive ordnance
CBRN	Chemical, biological, radiological and nuclear
CDA	Collateral damage assessment
CoH	Conduct of hostilities
DBM	Dead body management
ERW	Explosive remnants of war
GIS	Geographic information systems
IED	Improvised explosive device
IHL	International humanitarian law
NIAC	Non-international armed conflict
OSCE	Organization for Security and Co-operation in Europe
PCP	Protection of the civilian population
PPE	Personal protective equipment
RASB	Risk awareness and safer behaviour
SCMS	Security and Crisis Management Support
SMIP	Security Management Information Portal
TICs	Toxic industrial chemicals
UXO	Unexploded ordnance
WatHab	Water and Habitat
WeC	Weapon Contamination

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EXECUTIVE SUMMARY

Unexploded and abandoned ordnance constitutes a clear and serious danger to civilians and humanitarian operations wherever it is found. But its presence in urban settings raises particular concerns and challenges. This document outlines the risks and consequences that these weapons have in such settings for civilian communities, critical civilian infrastructure and humanitarian operations, including those of the ICRC.

The document also highlights the assistance that the ICRC's Weapon Contamination Unit can provide to ICRC units and programmes, as well as to the broader International Red Cross and Red Crescent Movement. This assistance aims to help the Movement assess and mitigate the dangers of weapon contamination (WeC) so as to protect staff and civilians and allow humanitarian services to be delivered unimpeded.

The document draws on two existing ICRC studies, *Urban Services in Protracted Armed Conflict* (2016) and *Explosive Weapons in Populated Areas* (2015), which emphasize the impact and challenges associated with the use of explosive ordnance in urban areas. It also includes a series of examples from the field, or operational vignettes, which illustrate the impact of weapon contamination and the actions taken by the WeC Unit in support of the work of ICRC delegations and National Red Cross and Red Crescent Societies.

In November 2017, a round-table discussion was held in Geneva to explore the growing interconnection between WeC activities and the work of other ICRC units. This discussion helped to identify a "spectrum of WeC response activities" that could be offered to ICRC and National Society programmes in a variety of situations. As reflected in the table below and elsewhere in this document, the services range from technical advice and guidance to actual explosive ordnance clearance and disposal.

The following table provides an overview of the ICRC's WeC activities.

TYPES OF SERVICE	EXAMPLES
Technical advice & situational assessment	<ul style="list-style-type: none"> Assessing risk from emplaced devices, ERW, CBRN hazards and unstable ammunition stockpiles. Providing advice on the effects of weapons and on risk mitigation. Developing conflict-specific guidelines on PPE, collective protection measures and decontamination procedures. Contributing to the development of international standards and policies.
Education & training	<ul style="list-style-type: none"> Risk-awareness and safer-behaviour training. Training on WeC data needs and data gathering.
Mitigation & resilience action	<ul style="list-style-type: none"> Low-profile passive-protection measures for ICRC facilities in support of WatHab. Proposing measures to enable the ICRC to do its work despite the presence of emplaced devices, ERW or CBRN hazards.
Clearance & decontamination	<ul style="list-style-type: none"> Disposing of emplaced devices and ERW, or coordinating this task by external agencies. Destroying unsafe stockpiles. CBRN decontamination.

The document concludes with a number of recommendations covering issues such as data collection, evidence-based decision making, and risk-awareness and safer-behaviour actions. An argument is also made for more clearly identifying where the ICRC's WeC Unit and its delegates could intervene to help unblock or enable humanitarian assistance.

The recommendations include the following:

- Data collection activities and analyses on how weapon contamination affects communities should be improved.
- Prot and other ICRC colleagues whose work is needed to capture field data related to weapon use should be given greater support, both in the field and in terms of training.
- Greater interaction between the WeC and SCMS units should be considered, in order to coordinate the risk-assessment processes being developed and ensure that they are mutually supportive.
- The ICRC's ability to identify where WeC expertise can be used to unblock humanitarian assistance should be expanded.
- National Societies, which are an important source of WeC-related information, should be seen as important partners in the implementation of WeC risk-management services.
- Evidence-gathering and assessments need to be coordinated between ICRC units, with WeC-related information part of the question sets, where relevant.
- A retrospective analysis of ICRC-wide data sets from the point of view of WeC could be a valuable guideline for future resource-allocation decisions. This would help other ICRC units to identify WeC-related issues and determine the feasibility of a joint response.
- The ICRC and the Movement as a whole should be informed of the services that the WeC Unit can provide in support of the ICRC's risk-management approach.

I. INTRODUCTION

PURPOSE OF THIS PAPER

This paper highlights the impact that weapon contamination can have on civilian communities and humanitarian operations, in particular the impact and challenges that arise in urban settings. A series of vignettes outlines the support that the WeC Unit can provide to ICRC delegations and the wider Red Cross and Red Crescent Movement in such situations. The paper concludes with recommendations to help anchor WeC activities more solidly within the ICRC's operational procedures.

WHAT IS WEAPON CONTAMINATION AND WHY IS IT A CONCERN TO THE ICRC?

Weapon contamination (WeC) is the term used to describe the presence of a range of weapons during and after an armed conflict and in other situations of violence. This includes emplaced devices, such as landmines, booby traps and improvised explosive devices (IEDs). It also includes unexploded and abandoned ordnance such as artillery shells, cluster munition bomblets, mortar projectiles, grenades and other munitions. Collectively, unexploded and abandoned ordnance are often referred to as explosive remnants of war (ERW). Weapon contamination also includes unstable or insecure ammunition stockpiles and small arms and light weapons that may pose a danger to civilian communities. It encompasses explosive (conventional) ammunition as well as chemical, biological, radiological and nuclear (CBRN) hazards.

Weapon contamination has severe consequences in humanitarian terms. These weapons will often kill and maim civilians, impede essential services and livelihoods, prevent the repair and reconstruction of infrastructure and hinder the delivery of humanitarian assistance – in some cases, for years or even decades after the last shot was fired. The exact nature of the hazard posed by this type of contamination varies depending on the length and nature of the conflict and the types and amounts of weapons used. But as history has repeatedly shown, wherever armed conflict arises, weapon contamination will surely follow.

The ICRC undertakes a range of actions to prevent and mitigate the risks and impacts of weapon contamination, which are discussed in the sections that follow. Within the ICRC, WeC activities refer to operational activities aimed at identifying and assessing the risks of weapon contamination and at developing mitigation measures to ensure the safety of ICRC and National Society staff and volunteers, allow the continuity of the Movement's humanitarian operations and reduce the impact on the civilian population. The ICRC has been mandated by the Council of Delegates to be the lead organization for tackling weapon contamination within the International Red Cross and Red Crescent Movement and providing WeC support to National Societies.¹

¹ Movement Strategy on Landmines, Cluster Munitions and other Explosive Remnants of War: Reducing the Effects of Weapons on Civilians, Resolution 6, Council of Delegates of the International Red Cross and Red Crescent Movement, Nairobi, Kenya, 23–25 November 2009.

II. SOURCES OF WEAPON CONTAMINATION

Weapon contamination is typically, though not solely, found in situations of ongoing or past conflict. The contamination often takes the form of unexploded ordnance, emplaced devices and abandoned ordnance. These categories will be discussed in more detail below.

UNEXPLODED ORDNANCE (UXO): FAILURE AND ERROR

A significant cause of weapon contamination is the failure of manufactured ammunition to function as intended.

Weapon manufacturers generally claim that their weapons are highly reliable and will operate as designed. When promoting their ammunition, they normally cite a low failure rate. The purpose of this claim is twofold: to demonstrate the ammunition's military effectiveness, and to highlight the reduced chance of UXO (resulting in a low risk to civilians).²



A 155mm high-explosive artillery shell in the kitchen of a house in Libya, 2011

Claims of reliability are often exaggerated, however, and failure rates are generally much higher than advertised. This is often due to the fact that manufacturers test their ammunition in optimum conditions (e.g. good weather, hard targets, no obstructions, and with proper delivery of the munition).

² Self-destruct and self-neutralization mechanisms are often cited as a way to reduce failure rates. Yet these too often fall short. A study conducted by the Norwegian Defence Research Establishment (FFI) on a self-destructing cluster submunition (the M85 bomblet) concluded that, despite the manufacturer's claims, the failure rate was still around ten percent. The study concluded that: "Self-destruct mechanisms cannot be relied upon to reduce post-conflict contamination from cluster munitions to a level that is acceptable according to the policy positions of a number of states. Performance in combat may produce far higher levels of contamination than would be expected on the basis of tests": <https://www.npaid.org/content/download/1142/10896/file/m85.pdf>, accessed 4 December 2017.

Yet the reality of actual conflict is much different, and the situations in which weapons are used rarely match the manufacturers' testing conditions. The ammunition's functioning can be affected by a number of factors, such as the age, quality and physical condition of the munition; meteorological conditions at the time of use; and the stress and fatigue of the operators (often working at night or under fire themselves). These considerations will often interfere with targeting and undermine the accuracy of aerial, indirect- and direct-fire weapon systems. As a result, failure rates during conflict can be much higher than advertised or expected, leading to a significant amount of UXO.

EMPLACED DEVICES: MINES, BOOBY TRAPS AND IEDS

A second source of weapon contamination is that resulting from emplaced weapons such as mines, booby traps and IEDs. These devices are normally buried, laid or otherwise positioned on or near the ground by parties to a conflict so as to target each other and, in some instances, civilians.

These devices are not always produced to typical industrial manufacturing standards or with standard safe-to-arm mechanisms but are of a more improvised nature. In some areas, UXO is harvested and used as a component for improvised mines, booby traps and IEDs. The ability to tell a stand-alone piece of UXO apart from a piece of UXO that is the main charge in an improvised munition can sometimes mean the difference between life and death.



A TMM-1 anti-vehicle mine in a field in Kosovo, 2000

Whilst some emplaced devices are triggered on command or by a timing device, many are victim-activated, which is to say they are detonated by the presence, proximity or contact of a person. These weapons, which often no longer have any combat purpose, are a particular danger as they have no discriminatory ability. Some belligerents may make and keep decent minefield maps, but it would take a highly disciplined fighting force to record the location of all its emplaced mines, booby traps and IEDs. Many belligerents using improvised munitions are unlikely to keep careful records. All this conspires to produce a lethal landscape, especially in urban areas.

ABANDONED EXPLOSIVE ORDNANCE (AXO)

As belligerents fight over territory, hasty withdrawals mean that ammunition stockpiles are often abandoned. Not only are these stockpiles often unstable in technical terms, they are also frequently left unsecured, and the explosive ordnance they contain may be taken to produce IEDs. The stockpiles themselves may also be booby-trapped before being abandoned so that some or all of the stock would detonate if tampered with.



Abandoned 82mm high-explosive mortar projectiles beside a football field in Basra, Iraq, 2003

III. WEAPON CONTAMINATION AND THE CHALLENGES OF URBAN SETTINGS

EXPLOSIVE WEAPON USE IN POPULATED AREAS

Data on the use and effects of explosive ordnance in populated areas have been gathered by organizations such as Action on Armed Violence (AOAV) and Human Rights Watch.³ The ICRC also has some information on the effects of such use, which is recorded in the Prot 6 database and its predecessor EMOT.

Much of the data collected by these sources focuses on the high numbers of people killed and injured in incidents that take place in urban areas. Yet there are also substantial secondary casualties and effects that are harder to quantify. These include the ongoing consequences of the destruction of and damage to critical infrastructure such as water systems, electrical grids and medical facilities. This is discussed in more detail in the Impact on Urban Services section below.

Environmental hazards are another important consideration. Explosive ordnance, when employed in urban areas, can cause significant amounts of building dust. Materials such as asbestos can be transformed into fine airborne particles that could create long-term health problems in civilians.

In urban areas subjected to prolonged conflict, a multi-layered explosive hazard emerges. Months and years of aerial bombardment and indirect-fire weapon use can cause immeasurable damage. In many cases, weapons fail to function as intended and create a serious ERW hazard. Add to this house-to-house fighting where belligerents employ many different weapon systems and IEDs to achieve their aim, and the area quickly becomes extremely hazardous for civilians and for organizations seeking to provide humanitarian assistance and restore urban services.

NON-INTERNATIONAL ARMED CONFLICTS

It is increasingly common to see non-international armed conflicts culminate in urban areas. Experience has shown that this phase of conflict is seldom quick, conclusive or surgical; rather, it is often protracted. There is also rarely a clear cessation of hostilities or an immediate post-conflict period: civilians will often return to their homes whilst the battle rages a few blocks away.⁴ As has been demonstrated in the Iraqi cities of Raqqa, Ramadi, Mosul and Fallujah, the Syrian cities of Aleppo and Palmyra, and Marawi in the Southern Philippines, prolonged asymmetric conflict wreaks havoc on urban areas – and urban services – and decimates the living conditions of millions of people.

³ See: Action on Armed Violence, *Wide-Area Impact: Investigating the Wide-Area Effect of Explosive Weapons*, Action on Armed Violence, London, 2016: <https://aoav.org.uk/wp-content/uploads/2016/03/Wide-Area-Impact-explosive-weapons-in-populated-areas.pdf>, accessed 1 December 2018.

⁴ See the US military concept of the “Three Block War”: https://en.wikipedia.org/wiki/Three_Block_War, accessed 4 December 2017.

In many cases, humanitarian assistance operations cannot be run in such environments. The inability of humanitarian organizations or municipal authorities to operate means that people must often find solutions for themselves. Even in a “return to normalcy” period, weak governments and municipal authorities can struggle to make the right provisions for the dependent civilian population.

Thanks to its unique position, which relies on negotiated access and acceptance, the ICRC is often able to operate in areas where other humanitarian organizations cannot. However, the complexity of moving and delivering humanitarian aid and services safely in such situations requires knowledge about the risks posed by weapons systems and ERW – a risk that is often underestimated.

IMPACT ON URBAN SERVICES

The overall risk to civilian life resulting from the use of weapons in urban areas is closely connected to civilian infrastructure. Civilians who survive fighting among belligerents may face a number of second- and third-order effects:

The vulnerability of critical civilian infrastructure and the interdependence of essential services mean that the initial effects of the use of explosive weapons in populated areas can trigger humanitarian consequences affecting a much larger part of the population than those in the immediate vicinity of the impact area. Such effects are accentuated where there is protracted use of explosive weapons in populated areas, with consequent decline of essential services over time and serious risks for public health. For militaries planning operations in populated areas, the ability to access information on the location and function of essential infrastructure and services vary, depending on the context.⁵

The debilitating effect of prolonged conflict in urban areas and the associated effect of explosive ordnance on urban services has been well documented. As noted in the ICRC report, *Urban services during protracted armed conflict: A call for a better approach to assisting affected people*:⁶

[S]ome weapons can have humanitarian consequences far beyond their impact zone. This is particularly the case for essential services, given their highly interdependent nature – for example, fragments/shrapnel damaging the electrical panel of a water booster station with consequent cessation of the flow of water to a hospital or a whole neighbourhood.

In addition to the actual destructive effects that explosive ordnance can have on a piece of critical infrastructure, the presence of ERW can prevent infrastructure from being repaired. In many situations, WeC and WatHab colleagues cooperate on the ground to find solutions. This increasing collaboration, as illustrated by conflicts across the Middle East, is a driving factor in the production of this paper.

5 ICRC, *Expert Meeting: Explosive Weapons in Populated Areas*, ICRC, Geneva, 2015, p. 4: <https://www.icrc.org/en/publication/4244-explosive-weapons-populated-areas-expert-meeting#>, accessed 1 December 2018.

6 ICRC, *Urban Services during Protracted Armed Conflict: A Call for a Better Approach to Assisting Affected People*, ICRC, Geneva, 2015: <https://library.icrc.org/library/docs/DOC/icrc-002-4249.pdf>, accessed 1 December 2018.

The compound effects of conflict on urban services is illustrated in the following figure:

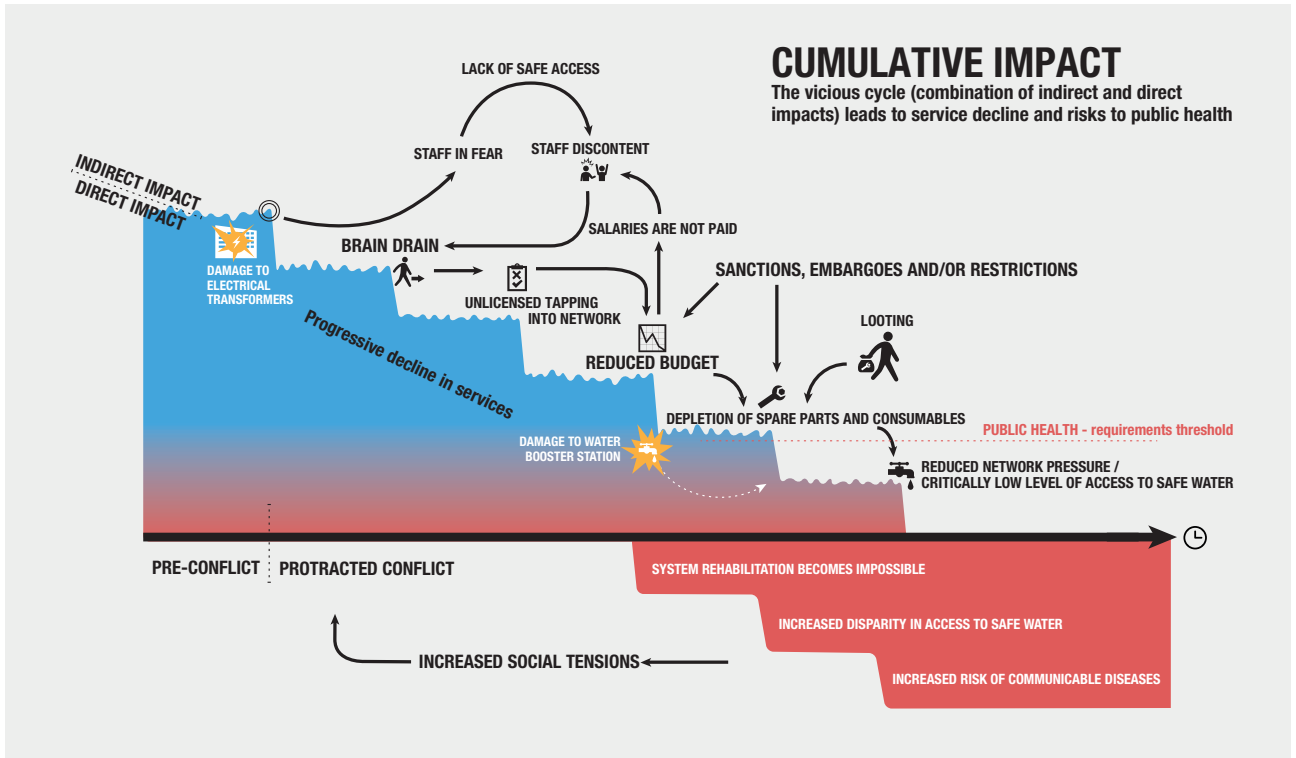


Figure 1. Vicious cycle: the impact of conflict on urban services and public health

IMPACT ON ICRC AND MOVEMENT OPERATIONS

Weapon contamination can limit the activities of the ICRC and the wider International Red Cross and Red Crescent Movement. In the area of protection, for example, basic operations such as the exhumation of dead bodies from collapsed buildings and dead body management are made more complex by the presence of explosive hazards in the rubble. The freedom of movement required by delegates to conduct PCP activities can also be hindered by the presence of weapons. Negotiated access is no protection against the known unknown of weapon contamination en route.

Even more vulnerable are National Societies, for which conducting casualty evacuations and transport during and after hostilities is akin to running the gauntlet.

IV. ICRC ACTION TO ADDRESS WEAPON CONTAMINATION

The ICRC's weapon contamination activities aim to help identify and assess the risks of weapon-related hazards in order to ensure the safety of Red Cross and Red Crescent workers and the continuity of the Movement's humanitarian operations. They also seek to reduce the impact of such hazards on the civilian population.

The ICRC addresses weapon contamination in several ways. In contaminated communities, it seeks to inform staff, volunteers and civilians of the dangers of such weapons and to develop activities and encourage behavioural changes that will help mitigate the risks. Where necessary, it can also develop tailored interventions by the ICRC's WeC Unit to help ensure the safety and continuity of the Movement's operations. These interventions are almost always delivered in conjunction with other ICRC units or other components of the Movement. As such, they are intended as enabling activities, which permit the delivery of assistance. Illustrations of WeC work are provided in the operational vignettes below.

HOW THE ICRC ASSESSES AND MANAGES THE RISKS FROM WEAPON CONTAMINATION

The ICRC operates in a wide range of settings and encounters a variety of risks. In many situations, explosive hazards are a particular danger for ICRC staff, ICRC operations and vulnerable civilians.

The ICRC's approach to weapon contamination was validated by OP/DIR in November 2017.⁷ This document was subsequently approved by the ICRC Assembly in November 2018. The SCMS Unit has adopted a similar risk-management approach but employs slightly different risk-management terminology. The use of WeC-specific terminology is meant to ensure the risk-management process is specifically geared toward weapon-related hazards and methodologies for handling WeC scenarios.⁸ The WeC Unit developed the risk-management tool below, which the WeC team uses to help assess risk and develop tailored responses.

⁷ The ICRC's Security and Safety Risk Management (SSRM) Methodology is aligned with the following ISO standard: International Organization for Standardization, ISO 31000, Risk Management, ISO, Geneva, 2018: <https://www.iso.org/iso-31000-risk-management.html>, accessed 15 December 2018.

⁸ See page 12 of the following document: OP_ASSIST 17/010 (internal document), *ICRC Response to Weapon Contamination*, November 2017. See also Section 4 for a detailed treatment of risk awareness and safer behaviour.

WeC HIRA: Conventional Weapons:				LIKELIHOOD					
There is a risk that:				A. V. Unlikely	B. Unlikely	C. Possible	D. Likely	E. V. Likely	
	ICRC Staff Our staff and partners are exposed to weapon contamination hazards	ICRC Operations Our operations are disrupted due to weapon contamination hazards	Civilian Population Weapon contamination has a humanitarian impact on the civilian population	<ul style="list-style-type: none"> Well managed weapon stores No hostilities No known weapon contamination No casualties 	<ul style="list-style-type: none"> Well managed weapon stores No hostilities No known weapon contamination No casualties 	<ul style="list-style-type: none"> Poorly managed weapon stores Local tensions Suspected weapon contamination Suspected casualties 	<ul style="list-style-type: none"> Unmanaged weapon stores Low intensity conflict Confirmed weapon contamination Confirmed casualties 	<ul style="list-style-type: none"> Unmanaged/unstable weapon stores High intensity conflict Confirmed weapon contamination Confirmed casualties 	
CONSEQUENCE	5. Catastrophic	Life changing injury or fatality	Stop operations and staff evacuation	Mass casualties and/or mortality overwhelmed local medical capabilities	5A	5B	5C	5D	5E
	4. Severe	Injuries requiring immediate pre-hospital care, evacuation and clinical care	Operations cannot continue, all movement stopped	Serious injuries requiring clinical care and long-term rehabilitation	4A	4B	4C	4D	4E
	3. Significant	Injuries requiring emergency local pre-hospital and clinical care	Operations and staff limited to essential only	Serious injuries requiring clinical care, with no long term disability	3A	3B	3C	3D	3E
	2. Moderate	Injuries requiring local clinical care	Operations continue with further consideration of risk mitigation and protective measures required	Injuries requiring local treatment	2A	2B	2C	2D	2E
	1. Negligible	Minor injury requiring no medical assistance	No impact on operations	Minor injury to one or a few people requiring no medical attention	1A	1B	1C	1D	1E

Figure 2. Hazard identification matrix used to assess conventional weapon risk

In line with its objective to assist the ICRC and National Societies in mitigating the risk from weapon contamination, the ICRC has produced a set of guidelines designed to help the Movement to develop appropriate responses. Drawing on the risk-management approach, the guidelines address how to assess the risks arising from weapon contamination, analyse the data, design appropriate risk-awareness activities, facilitate the adoption of safe behaviour and measure the impact of the intervention. These guidelines also outline some operating procedures that could make a measurable difference to the safety of those living or operating daily in conflict zones and environments contaminated by conventional weapons and CBRN hazards.

OPERATIONAL VIGNETTES

The following operational vignettes illustrate the ICRC's weapon-contamination mitigation activities. They highlight the variety of situations where the WeC Unit has played a role as an enabler, advancing the humanitarian response in different yet significant ways. By identifying such situations, a spectrum of possible WeC activities can be proposed to delegations to assist them in meeting their objectives. These vignettes are organized in reverse chronological order.

Sa'dah, Yemen (2017)

The ICRC made a number of WatHab improvements at the At Talh field hospital, near Sa'dah, in 2017. The subdelegation invited the Senior WeC delegate to visit the hospital to help plan the work. The delegate was asked to provide input on two matters:

- mitigating the threat posed by a conflict-related explosive incident (airstrike, mortar attack, etc.)
- mitigating the threat posed by a patient arriving with UXO embedded in his/her body.



Photo demonstrating the vulnerability of the triage area

The WeC delegate assessed the premises and provided recommendations for the living quarters, the mass casualty triage area and the operating theatre. The triage area was deemed particularly vulnerable owing to the complete lack of cover from public view, which a party to the conflict could take advantage of to inflict further harm on wounded combatants and civilians.

The recommendations included building shelters, reinforcing existing buildings and creating safe rooms. Other recommendations focused on the need to provide adequate access to and egress from the facility, in order to improve the site's overall security and speed the process of admitting casualties.

Because the WeC delegate, working with WatHab staff, was able to analyse the situation and make recommendations during the planning and construction phases of the project, the ICRC was able to implement essential mitigation measures early on. This helped create a more secure environment for patient admissions and hospital operations, potentially saving lives.

Ein el Helwe, Lebanon (2016)

The Ein el Helwe Refugee Camp in Lebanon experiences violence on a regular basis, with factions regularly clashing using small arms and rifle grenades. These clashes may last as little as 30 minutes but often escalate and stretch over several hours or even days. When the fighting is intense, school buildings may be hit in the crossfire.

There are two main compounds within the camp, each with four or five schools. The clashes often take place near the schools. Although children are not directly targeted, they are frequently caught in the crossfire and require protection.

A joint WatHab, Protection, WeC and First Aid project was launched in 2016 by the ICRC subdelegation in Tyr. The aim of the project was to enhance the resilience of schools. In conjunction with the United Nations Relief and Works Agency (UNRWA), which oversees the schools, and working through the Palestinian Red Crescent Society (PRCS), the ICRC assisted in designing evacuation procedures and training.

The WeC and WatHab Units worked together to streamline the process for evacuating students. They achieved this by increasing the number of escape routes and reinforcing parts of the schools in order to provide cover from both view and fire. Safe areas were established so as to allow one school to evacuate into another, and onwards as required. In addition, risk-awareness and safer-behaviour training was delivered to teachers and students alike; it covered such topics as understanding the dangers of ERW, taking cover and providing first aid.

This project drew on one WeC delegate's tactical knowledge and familiarity with weapon effects, in conjunction with the ICRC's broader expertise. In one of the project's major outcomes, the school communities became more resilient. This helped students to feel safer in their environment and bolster their chances of progressing safely towards long-term educational goals.

Ramadi, Iraq (2016)

The ICRC shut down its office during the occupation of Ramadi by the Islamic State group. After the government forces re-occupied the city, the ICRC sought to re-start operations from the office, but the hazard from ERW, IEDs and potential booby traps was unknown.



On the left, moving furniture semi-remotely, and on the right, a technical survey of a possible weapon entry point

Over the course of eight days, a WeC delegate conducted a survey in which every room was checked, every item of ERW cleared and every piece of furniture moved semi-remotely to check for booby traps.

During this process, a quantity of small arms ammunition and empty casings, along with the components of an IED, were identified. These items were removed, in some cases with the support of the Iraqi military. Once this was completed, the delegation was allowed to move back into the office.

Thanks to this WeC operation, the ICRC was able to safely house a team in Ramadi and greatly increase its ability to deliver humanitarian aid in that area.

Donbas, Ukraine (2015–2016)

The armed conflict in Donbas is taking place in highly populated areas. Hundreds of thousands of people depend on vital infrastructure such as water pump stations, gas plants and electricity lines for their survival. These installations are located on or close to the contact line and serve civilian communities along with schools and hospitals.

The Donetsk Filtration Station (DFS) is a key piece of civilian infrastructure. If an artillery shell or other explosive projectile were to hit the station, the water supply to approximately 1,500,000 people living on both sides of the contact line would likely stop. An additional concern is that damage to the pressurized chlorine gas canisters, which are used for water purification, could result in the accidental release of chlorine gas. This could cause serious respiratory problems across a population of several hundred thousand people living nearby.

The access route to the DFS passes through Yasynuvata/Yasinovataya, which has been a hot spot on the confrontation line and is dotted with checkpoints that DFS personnel must get through to reach the plant. In addition to the risk of crossfire, the route has been damaged by shelling and is covered with sharp metal fragments and UXO. Furthermore, driving through checkpoints requires particular care, as anti-vehicle mines line both sides of the road. The area surrounding the DFS is also heavily mined.

The ICRC has been working with the DFS since the beginning of the conflict. The WatHab and WeC Units have supported DFS technical staff with passive protection measures. The ICRC improved the DFS bomb shelter with additional life-support resources. In view of the mine threat, signs reading “Danger! Mines!” were provided by the ICRC and set up around the DFS by the military authorities.

The ICRC facilitated two ceasefire agreements, where the parties to the conflict agreed to halt military clashes so that the DFS could be repaired and the water supply restored. During these ceasefires, demining experts removed a large quantity of UXO from the area around the DFS. However, regular clashes around the DFS have caused structural damage to the facility and left hundreds more pieces of UXO scattered over the site.

Aden, Yemen (2015)

During a May 2015 airstrike, two BLU-109 penetrator bombs (1,000 kg) failed to detonate and landed some distance from their intended targets. The two bombs came to rest 60 m and 300 m from an ICRC field hospital. This was the only operational field hospital in Aden at the time, and it was staffed by both MSF and ICRC personnel.

A WeC delegate was sent to the area to identify the munition and assess the situation. Through technical consultations with ICRC headquarters and communications with the belligerent party responsible for dropping the bomb, it was determined that there were no long-delay timers or anti-handling features in the bomb’s fuzing system.



One of the BLU-109 precision-guided bombs, 300 m from the field hospital

In conjunction with the local municipality, a truck and work party were brought in. They moved the bomb to a location away from the hospital and outside the urban area. The result was that the field hospital could remain open and continue to treat those in need – a fundamental aim of the ICRC.⁹

Donetsk Airport, Ukraine (2015)

The conflict in 2014–2015 caused significant destruction in and around Donetsk International Airport. The area experienced prolonged fighting as the belligerents fought to gain control of this strategic point. The terminal building, as well as some private homes adjacent to the airport, was destroyed.

In March 2015, the area was still a flashpoint, as neither side controlled the airport. Both sides suffered losses, and the ruins of the terminal building held many human remains. The belligerent parties asked for the bodies to be retrieved from this no-man’s land. The civilian authorities teamed up with representatives of the OSCE, emergency services in Donetsk and the ICRC subdelegation on this initiative.

Prior to the request, there had been significant interaction between the subdelegation and emergency services on a plan for dead body management (DBM) on both the government-controlled and opposition sides. The teams had already been equipped with some basic tools and materials. Owing to a number of previous ammunition depot explosions, emergency services were already well-versed in operating in a weapon-contaminated environment.



View of the destruction at the Donetsk airport

⁹ It must be emphasized that this was not a classic “render safe procedure”. But it was the best option, given the balance of risks at that point in time. This is a valuable reminder that, in conflict zones, there are no simple by-the-book decisions. The best way forward is to weigh out risks sensibly, with the help of technical knowledge, and come up with a plan that mitigates risk at each stage as much as possible.

Emergency services recovered the bodies, following negotiations by the ICRC and in cooperation with the OSCE. WeC personnel from the ICRC provided advice on gaining safe access to the bodies and on subsequent handling procedures to mitigate the risk of booby traps. Some examples of the types of ERW and emplaced devices encountered are shown below.

Many of the dead combatants had grenades in their pockets, which were removed before the bodies were bagged and transported to the mortuary. At this point the bodies could be safely identified and further transferred.



RPG-7 propelled grenades, not yet prepared for firing



OZM-72 bounding fragmentation anti-personnel mine

Gaza (2015–2018)

For Gazans, the border area is essential for their agricultural sector. This area, which lies 100 to 1,000 meters from the Israeli security fence, comprises around 35% of the most fertile and arable land in the Gaza Strip.

Over the past 20 years, the area has suffered significantly from repeated incursions by the Israel Defence Forces (IDF), which have resulted in the destruction of property, land and infrastructure. Major incursions in 2001–2002, 2006, 2009 and 2014 – along with hundreds of minor ones – have made extensive cultivation impossible. Given the ongoing urbanization of the highly populated Gaza Strip at the expense of fertile agricultural land, better access to land in the border area and improved farming practices would help bolster food security for the Gaza Strip's two million residents.

Farmers have varying access to the sensitive 100- to 300-meter zone in the border area. Although the access regime has not been consistently communicated or implemented by the IDF, farmers have been able to work more of their land since November 2012, in most cases up to 300 meters from the security fence.

In May 2015, the ICRC rehabilitated the land located between 100 and 300 meters from the security fence in four communities: Beit Hanoun, Wadi Al Salqa, Qarara and Abassan. These communities were selected for the first phase of the project because they face a lower risk of security incidents than other communities. The ICRC's 2015 project was considered particularly important, as it allowed more than 300 farmers to access their land for the first time in 7 to 15 years and again cultivate some 240 hectares of agricultural land.

In 2017, following an assessment, the communities of Shoka and Fukhary were added to the project. As a result, 280 more farmers who owned or rented land in the zone lying between 100 and 300 meters from the security fence – 200 hectares in all – were able to farm the land for the first time since 2006. By May 2018, farmers from these communities had increased their income by 700 ILS (190 USD)/dunum¹⁰ annually.

For this joint EcoSec/WeC project to take place, the following steps were taken:

- EOD Police, in conjunction with the WeC team, conducted a visual survey for UXO over 200 hectares of land. The EOD police remain ready to step in if new UXO is found.
- The WeC team conducted UXO awareness sessions for farmers, workers, and tractor and bulldozer operators.
- Contractors levelled 200 hectares of land in the presence of the ICRC team.
- The land was ploughed by a contractor and fertilized and planted by skilled ICRC labourers in the presence of the ICRC team.
- The ICRC teams are on hand during the harvest season to enhance the farmers' safety.

As a result of this work, 200 hectares of land were visually surveyed and UXO cleared where necessary. The land was levelled, ploughed, fertilized and cultivated with drought-resistant wheat. Thanks in part to the ICRC's protective presence during the harvest period, 300 kg of wheat per dunum was produced.

¹⁰ 1 dunum = 0.1 hectare.

Medellín, Colombia (2012)

In 2012, Medellín, Colombia was ranked as one of the most violent cities in the world. Numerous armed actors used violence to control many areas in the city. To respond to the humanitarian consequences of this violence, the ICRC worked closely with the National Society on a project called MEHMA (More Humanitarian Spaces More Alternatives). The objective was to reduce, mitigate and prevent the direct and indirect consequences of urban armed violence. It also aimed to address the consequences of this violence in schools, which were often affected by the rivalries between armed groups (including as a recruiting ground for the groups). It was clear to the ICRC that the existing violence in schools reflected the wider violence in the city.

Three types of activity were developed. First, the ICRC worked with teachers and the National Society on an educational initiative in which they developed manuals to promote respect for life, highlight the humanitarian consequences of violence and develop resilience to conflict. Second, “educational brigades” were formed; they used a peer-to-peer model to provide training in areas such as IHL and first aid. Finally, risk-awareness and safer-behaviour training taught nearly 1,000 teachers to identify risks, reduce their vulnerabilities and develop practical strategies they could use before, during and after a bout of armed violence. These strategies included identifying evacuation routes and safe areas and briefing parents on what to do in a conflict situation. Following this training-the-trainer initiative, teachers were able to share these practical strategies with 25,000 students.



One of the interesting effects of using the schools as centres of risk-awareness and safer-behaviour training was that the messages often filtered into the surrounding communities. As a result, the schools were treated with increasing respect by the armed groups, and a culture of protection for schools emerged among these groups.

It should be emphasized that the National Society was closely involved in the design and delivery of this intervention. This allowed it to take a lead in the region and assist other National Societies with similar interventions.

V. ROUND TABLE ON WEC ACTIVITIES

On 1 November 2017, a round table was held in Geneva with colleagues from a number of ICRC units. The purpose was to discuss the impact of weapon contamination – in particular on ICRC operations – and how to improve data collection in this area. The meeting also provided an opportunity to highlight the role that the WeC Unit could play in addressing these issues. The discussion helped identify WeC capabilities and services that could help other ICRC units achieve their objectives.

The following ICRC units participated:

- Health Care in Danger Project (OP_DIR)
- Arms Unit (DP_JUR_ARMS)
- Protection of the Civilian Population Unit (OP_PROT-CIV)
- Water and Habitat Unit (OP_ASSIST_EH)
- Weapon Contamination Unit (OP_ASSIST_WEC)

The meeting attendees outlined a range of weapon-related concerns, which are summarized in the annex. Specific WeC capabilities and services that were highlighted as key elements of an ICRC response to weapon contamination in support of the activities of other units include the following:

- Assessing the risk of conventional and CBRN hazards and, where necessary, providing relevant risk-awareness and safer-behaviour training to ICRC staff, in coordination with SCMS.
- Providing technical advice on the effects of weapons and measures to mitigate the risks when operating in weapon-contaminated environments.
- Assisting in the development of conflict-specific guidelines for personal protective equipment (PPE), decontamination and collective protection capabilities, where required.
- In coordination with the relevant unit, facilitating access (including clearance, when necessary) when weapon contamination or toxic industrial chemicals are present and represent an obstacle to the delivery of ICRC services.
- Assessing ammunition stockpiles when they may pose a humanitarian danger.
- Providing weapon-contamination-related data to assist in reinforcing the work of DP_JUR_ARMS.
- Assisting in building an evidence base for events in which weapon contamination has been a humanitarian impediment.
- Supporting the work of OP_PROT-CIV as well as other units in documenting, analysing and intervening in weapon-related matters.
- Providing risk-awareness and safer-behaviour training to National Societies and other agencies.

The activities listed above and highlighted in the operational vignettes represent the broad scope of work that the WeC team can carry out in a variety of situations and in support of other ICRC units. The following table summarizes and groups these activities.

TYPES OF SERVICE	EXAMPLES
Technical advice & situational assessment	Assessing risk from emplaced devices, ERW, CBRN hazards and unstable ammunition stockpiles. Providing advice on the effects of weapons and on risk mitigation. Developing conflict-specific guidelines on PPE, collective protection measures and decontamination procedures. Contributing to the development of international standards and policies.
Education & training	Risk-awareness and safer-behaviour training, Training on WeC data needs and gathering. ¹¹
Mitigation & resilience action	Low-profile passive-protection measures for ICRC facilities where appropriate. Proposing measures to enable the ICRC to do its work despite the presence of emplaced devices, ERW or CBRN hazards.
Clearance & decontamination	Disposing of emplaced devices and ERW, or coordinating this task. Destroying unsafe stockpiles. CBRN decontamination.

These groupings can be applied to the scenarios highlighted in the operational vignettes described above.

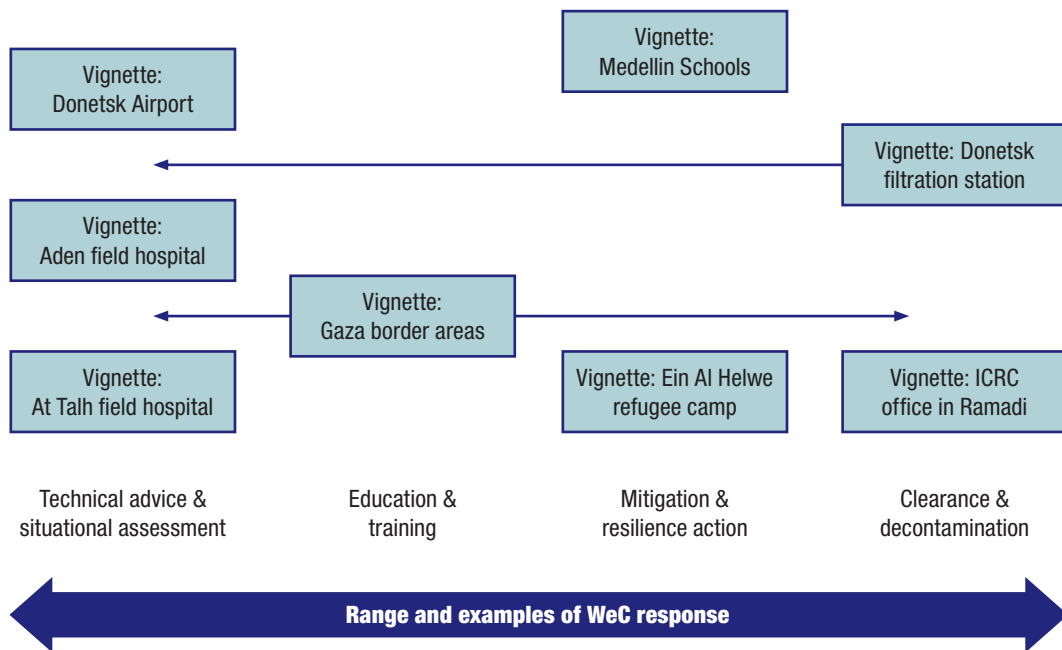


Figure 3. The spectrum of WeC activities

¹¹ As an example, the WatHab guidance for engineers encountering ERW in the field is quoted below. This kind of approach should be trained across the disciplines.
 “If the site is deemed safe to access and if a WeC delegate is not present, then collect the following data (to the extent possible) with WeC in mind:
 - photos of weapon components, crater, fragmentation pattern, etc. (note: use airplane mode for mobile phone devices);
 - if possible, try to photograph weapon specific details such as script, numbers, colour markings, shape, nose, fins, etc., while using a standardized object as a reference guide on size; and
 - map or get a GPS reading of the impact area.”

VI. CONCLUSIONS AND RECOMMENDATIONS

There are a number of conclusions that can be drawn from the information provided in this document.

- Weapon contamination presents a safety risk to ICRC operations, those of its partners and the civilian population.
- The ICRC has the lead within the Movement for assessing the risks linked to weapon contamination and the efforts to mitigate the dangers to Movement operations and civilians.
- WeC activities are not ends in themselves but exist to enable broader ICRC objectives and programmes as well as those of National Societies.
- There is a growing interconnection between WeC activities and those of other ICRC units, specifically WatHab, Health, EcoSec, Prot and JUR.
- The WeC Unit has developed weapon-relevant risk-management tools and processes to support the ICRC's broader risk-management strategy.
- WeC services span a spectrum of activities, from light-touch consultancy through concrete, hands-on explosive ordnance clearance and disposal.¹²

RECOMMENDATIONS

Moving forward, the following recommendations are submitted for further discussion and consideration.

- Data collection activities and analyses on how weapon contamination affects communities should be improved.
- Prot and other ICRC colleagues whose work is needed to capture field data related to weapon use should be given greater support, both in the field and in terms of training.
- Greater interaction between the WeC and SCMS units should be considered, in order to coordinate the risk-assessment processes being developed and ensure that they are mutually supportive.
- The ICRC's ability to identify where WeC expertise can be used to unblock humanitarian assistance should be expanded.
- National Societies, which are an important source of WeC-related information, should be seen as important partners in the implementation of WeC risk-management services.
- Evidence-gathering and assessments need to be coordinated between ICRC units, with WeC-related information part of the question sets, where relevant.
- A retrospective analysis of ICRC-wide data sets from the point of view of WeC could be a valuable guideline for future resource-allocation decisions. This would help other ICRC units to identify WeC-related issues and determine the feasibility of a joint response.
- The ICRC and the Movement as a whole should be informed of the services that the WeC Unit can provide in support of the ICRC's risk-management approach.

¹² It is worth noting that the WeC Unit HR pool is made up of a variety of specializations. Different skills are required for different types of WeC support. For instance, an individual with mine action experience, which is valuable for a specific type of WeC support, cannot necessarily provide the technical weapons forensic input that is required for PCP. Recruitment policies should (as always) be dependent on the operational demand and weighted by where WeC services are mostly provided.

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ANNEX – ROUND TABLE




WEAPON CONTAMINATION-RELATED CONCERNS AND POSSIBLE SOLUTIONS: ROUND TABLE ON WEC IN URBAN CONTEXTS, 1 NOVEMBER 2017

ICRC FUNCTION/ FOCUS	CONCERN	CAUSES/DETAILS	HUMANITARIAN IMPACT	NOTES	POSSIBLE WEC RESPONSE/ SERVICE
1 2 3 4 5 6 7	Area risks	Heavy weapon use and UXO throughout area of operations	Impeded access to those requiring medical attention	Blood banks and radioactive sources	Assessment of risk, promulgation of risk-awareness and safer-behaviour training pertaining to UXO in coordination with SCMS
	First responders' safety	Little knowledge of WeC issues and effect on their own and patients' safety	First-responder injuries have debilitating knock-on effects on medical response		Delivery of weapon effect advice and manoeuvre advice
	Suitable PPE in ambulance response	Little understanding of matching PPE to weapon effects	Unnecessary PPE use can hinder operations		Development of conflict-specific PPE guidelines
	CBRN preparation	Many agencies unprepared for this type of risk	Risk of contamination to entire medical chain		Assessment, risk-awareness and safer-behaviour training, decontamination and collective protection capabilities where required
	Extended network (National Society and beyond) awareness	ICRC umbrella for issues pertinent to healthcare and has moral duty to assist other agencies	Delivery partners incur increased risk of injury and damage to equipment, hence degrading the medical response		Risk-awareness and Safer-behaviour training tailored for national societies and other agencies
Health Care in Danger	Safe access	Getting local WatHab personnel into position to assess and repair Respond when items of UXO brought to meetings, for example	Urban service degradation has well-documented humanitarian effect; restoration of these services carries a large humanitarian dividend	Pressurized chlorine	Where UXO, ERW or TIC limits this access, WeC to provide assessment (and clearance where necessary) to allow safe access for restoration and repair
WatHab	Transversal issues	The linkages between JUR, WeC, WatHab, Prot and FAS in matters related to Protection of Civilian Population (PCP)	Multi-disciplinary assessment of damage to civilian objects can drive a more credible dialogue with belligerents	"Scene Analysis" FAS dependency	Contribution of technical assessment to cross-functional evidence-gathering process, feeding in to dialogue with parties to the conflict

ICRC FUNCTION/ FOCUS	CONCERN	CAUSES/DETAILS	HUMANITARIAN IMPACT	NOTES	POSSIBLE WEC RESPONSE/ SERVICE	
8	Manoeuvring safely	The ability of Prot personnel to reach the people they need to, navigating the UXO risk	Core business of ICRC. If Prot personnel are unable to accurately assess the situation, those needing protection may not be reached or Prot personnel incur greater amount of personal risk than is acceptable		Assessment of risk, promulgation of risk-awareness and safer-behaviour training pertaining to UXO in coordination with SCMS Provision of technical “reach-back” or escorting where appropriate to allow on-the-ground decision making	
	Medical evacuation of trapped civilians	Prot activity can coordinate to some extent with belligerents but cannot coordinate UXO		Linkage to Health Care in Danger	Same as 8	
	10 Protection	Dual use of detention facilities for stockpiling ammunition	Arms and ammunition frequently found in detention facilities often due to previous tactical decisions	Serious risk to detainees as stockpiles can be sizeable and with unstable items or UXO within them		Remote assessment of stockpiles in detention facilities, escort where situation requires/permits
		11	Unidentified objectives	Appropriate marking/designation of civilian objects	Belligerents may not be aware of civilian objects or may be using this to inform collateral damage assessments	Explosion consequence analysis or post-explosion scene analysis to support Prot
	12	Children playing with UXO or in areas contaminated by UXO	Many pieces of UXO are attractive to children who lack toys	Injuries and fatalities to non-combatants	Link to “Protocol on ERW” below	Risk-awareness and safer-behaviour training
	13	Strengthen dialogue with belligerents	By demonstrating technical analysis of event alongside other evidence gathered, Prot increases credibility	Feedback to belligerents more credible and is taken more seriously as technical and anecdotal evidence is mutually-supporting		Same as 7 Education of and assistance to Prot colleagues to fill in Prot6 databases for data capture
	14	To move from protection responses to prevention	Aggregation of evidential data in order to engage with belligerents, reminding them of their obligations under IHL			Analysis of aggregated protection data to support this effort
15		Behaviour of belligerents	Use body of evidence plus IHL to drive behavioural change and prevent attacks on civilians, civilian objects etc.		Same as 14	
16 Arms Unit		Chemical and conventional effects in urban areas	Use appropriate legal frameworks to remind belligerents of their responsibilities and the difficulty of avoiding collateral damage in urban areas			Provision of CBRN-related data to assist in strengthening this activity
		17	Protocol on ERW	A legal instrument that enshrines the responsibility of belligerents for ammunition that has not functioned as intended		Assist in building evidence base in which UXO has been a humanitarian impediment

The ICRC helps people around the world affected by armed conflict and other violence, doing everything it can to protect their lives and dignity and to relieve their suffering, often with its Red Cross and Red Crescent partners. The organization also seeks to prevent hardship by promoting and strengthening humanitarian law and championing universal humanitarian principles. As the reference on international humanitarian law, it helps develop this body of law and works for its implementation.

People know they can rely on the ICRC to carry out a range of life-saving activities in conflict zones, including: supplying food, safe drinking water, sanitation and shelter; providing health care; and helping to reduce the danger of landmines and unexploded ordnance. It also reunites family members separated by conflict, and visits people who are detained to ensure they are treated properly. The organization works closely with communities to understand and meet their needs, using its experience and expertise to respond quickly and effectively, without taking sides.

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