

Tracking Civilian Casualties in Combat Zones using Civilian Battle Damage Assessment Ratios

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ABSTRACT

The Civilian Battle Damage Assessment Ratio (CBDAR) is a method for assessing and tracking proportional patterns of civilian casualties from combat. CBDARs can be applied by both military forces and humanitarian organisations towards the common goal of minimising the civilian impact of conflict. These ratios complement absolute numbers on casualties, are easily integrated into existing assessment systems, and can track proportions of civilians, women, or children among casualties. The ratios can be used for monitoring, and to make comparisons between time periods, geographic areas, combatant forces, and between weapons, tactics or rules of engagement. Though applicable to civilian casualty monitoring in any armed conflict, we introduce the CBDAR with a specific description of how it can be applied to Commander International Security Assistance Force's (COMISAF) Tactical Directive to minimise civilian casualties in Afghanistan.

INTRODUCTION

Tracking Civilian Casualties under COMISAF's Tactical Directive. The aim of this paper is to offer NATO, military forces generally, and the humanitarian community a common approach for monitoring civilian casualties in conflict zones through the use of Civilian Battle Damage Assessment Ratios (CBDAR). As we will describe, CBDARs can guide the collection of evidence and data on civilian casualties; they can identify proportional patterns within absolute numbers of civilian casualties, which can be used in assessment and to decrease future casualties; and they can track combat effects on civilian populations that are of particular humanitarian concern, such as women and children. The CBDAR process can also be useful in tracking civilian casualties for compensation purposes and for assessing the public health impact and economic costs of civilian morbidity and mortality. As pertains to NATO, the CBDAR has an explicit focus on civilian casualty tracking that corresponds to the recent, revised Tactical Directive⁴. We link CBDARs directly to existing military monitoring systems, such as the British Army's Planning Cycle and Battle Damage Assessment (BDA) / After Action Review processes, so that the method can be efficiently integrated into current systems. This should facilitate the use of CBDARs in monitoring by, for example, the ISAF Civilian Casualty Tracking Cell which began to standardise civilian casualty tracking in Afghanistan in August 2008, to complement its current tracking methods⁵.

The critical importance of minimising and monitoring civilian casualties in the Afghan theatre of operations is emphasized in the Commander International Security Assistance Force, Afghanistan, Tactical Directive on 30 December 2008⁶, and publically announced on January 14, 2009⁴. The CBDAR process described in this paper addresses an overall goal of the new Tactical Directive – “To minimise the risk of harming civilians” – as well as addressing the following specific components of the directive:

- *To demonstrate proportionality, restraint, and utmost discrimination in the use of firepower;*
- *To acknowledge civilian casualties immediately and transparently investigate allegations rapidly;*
- *To ensure a common approach is taken across the country;*
- *To establish a transparent methodology of civilian casualty reporting, COMISAF:*
 - *Establish a civilian casualties tracking cell monitoring incidents;*
 - *Systemise recording of allegations as well as resulting rebuttals and admissions;*
 - *Develop a two-tiered system of checking the validity of an allegation and conducting the actual investigation if the allegation was substantiated;*
 - *Enhance battle-damage assessments at Regional Command level;*
 - *Define modalities for improved ISAF HQ interaction with UNAMA (United Nations Assistance Mission in Afghanistan) and other national and international organizations on casualty reporting.*

DISCUSSION

Why track casualties? In Afghanistan, civilian casualties (i.e. injuries or deaths) have been of major concern to NATO military forces, to Afghanistan’s citizens and government, and to local and international humanitarian organisations. Recent publications have highlighted numbers of civilian casualties sustained in Afghanistan during 2008^{7,8,9,10,11}, nearly all of which have captured headlines and generated widespread international concern^{12,13}. These reports assist in informing protagonists in war of their responsibility to minimise civilian¹⁴ suffering in accordance with International Humanitarian Law and the Law of Armed Conflict¹⁵.

Although tracking casualties is not routine to all military forces, it is routine to the British Army, which monitors all the casualties that are treated by its medical personnel in its medical system. This is done for a number of reasons, not least of which is that the use of scarce health care resources and related opportunity costs are a perennial concern to civilian health care managers and Army medical commanders alike. An epidemiological approach to systematically monitor, react and apply capability to where it is most likely required is a well trodden and proven path ever since its first application in 1854¹⁶. Thus like their civilian counterparts, military health care commanders manage their resources in an evidence-based manner¹⁷. This approach of tracking military casualties extends to all people treated by the British Army’s health care professionals¹⁸ as not only does the British Army recognise this as the moral¹⁹ and legally²⁰ responsible thing to do, but it also allows the British Army to help organisations such as the International Committee of the Red Cross (ICRC) in the tracking of civilian casualties for next of kin purposes. This system of tracking civilian and military casualties treated by British Army health care professionals does not, however, include

injuries or deaths of civilians who have not entered the British Army medical treatment system. Likewise the British Army's medical system does not monitor or report on deaths as this is considered an administrative responsibility. It is for the above reasons that a more complete and systematic system for tracking all civilian casualties is needed.

In addition to the basic imperative to minimize civilian harm, asserted by both humanitarian principles and laws of war, and the need to assess health care needs, there are other reasons for assiduous casualty tracking by military forces. Civilian morbidity and mortality caused by conflict has a negative impact on security and confidence in the indigenous authority. In Afghanistan, both the Afghan authority and NATO forces are concerned that civilian injuries and deaths may be exploited in the media by insurgent forces. This statement by President Hamid Karzai on 26 April 2008 goes to the root of the civilian casualties issue:

'I am not happy with civilian casualties coming down; I want an end to civilian casualties... As much as one may argue it's difficult, I don't accept that argument... It seriously undermines our efforts to have an effective campaign against terrorism.'

Civilian casualties negatively affect the 'will of the people' and where clusters of casualties occur over a sustained period of time – the battle may well be lost without a military defeat, as we will discuss below in terms of destabilisation effects. The British Army's Counter Insurgency Operations (COIN) doctrinal publication²¹ clearly articulates the importance of this issue. In 2008 HQ ISAF and US forces in Afghanistan commenced tracking civilian casualties, as reported by UNAMA⁷:

'ISAF also introduced a centralised civilian casualties tracking cell that is mirrored within US Forces Afghanistan by a similar tracking cell, aimed at investigating all claims of civilian casualties attributed to ISAF/US Forces Afghanistan. International military forces showed themselves more willing than before to institute more regular and transparent inquiries into specific incidents (although the independence of these inquiries is still questionable).'

Given that military actors and humanitarian monitors seek the same end – a true reflection of the impact of conflict on civilians – we argue that the most mutually beneficial and most accurate solution is to pool resources, sources of information and expertise to provide a definitive, agreed casualty account. Working together (akin to the humanitarian system's 'Cluster Approach'²²) would foster closer relations and a better understanding of respective positions, would ensure impartial, credible, independent and accurate reporting of incidents in order to record and reduce the impact of conflict on civilians, and has been requested by 11 NGOs working in Afghanistan²³. Coordinated military, indigenous authority, and NGO civilian casualty tracking is analogous to the current working relationship that supports humanitarian responses to respond to natural disasters and armed conflict. As described by Michael Meyer, head of international law at the British Red Cross: *"The relationship between the Red Cross and the Armed Forces is nothing short of fundamental"*²⁴. We suggest that coordinated civilian casualty tracking should be done in all armed conflicts, and that civilian casualties should be reported in both crude absolute numbers and in CBDARs which show the proportional representation of civilians, women and children among casualties.

THE CIVILIAN BATTLE DAMAGE ASSESSMENT RATIO (CBDAR)

Calculation and Origin of CBDARS. As in most reports of civilian harm from war, civilian injuries and deaths in Afghanistan have generally been reported as absolute numbers (e.g. 2118 deaths in 2008). Although absolute numbers of casualties are an essential basis of recording civilian harm,

these absolute counts are accompanied by little in the way of proportional analysis for patterns. This limits their utility and scope of interpretation. For example, UNAMA reports⁷:

'UNAMA Human Rights recorded a total of 2118 civilian casualties between 01 January and 31 December 2008. This figure represents an increase of almost 40% on the 1523 civilian deaths recorded in the year of 2007. The 2008 civilian death toll is thus the highest of any year since the end of major hostilities which resulted in the demise of the Taliban regime at the end of 2001.'

Similarly, NATO/ISAF provides data for a diagram showing monthly counts of civilian deaths, with an analysis of the proportions of total civilian deaths attributable to different types of ISAF/OEF events⁵. Both UNAMA⁷ and NATO/ISAF⁵ carried out proportional analysis to report the % of civilians who were killed by ISAF/OEF forces (or 'pro-government forces' as reported by UNAMA) as compared to the % killed by insurgent forces.

We suggest that reports of civilian casualties would be much more informative and useful if they routinely and systematically included analysis for the following three proportional civilian outcomes, or CBDARs:

Civilian Battle Damage Assessment Ratio	Example Calculation Numerator/Denominator
% civilians among total deaths	No. civilian deaths/Total no. civilian and opposition combatant deaths
% women among civilian deaths	No. women deaths/Total no. civilian deaths
% children among civilian deaths	No. child deaths/Total no. civilian deaths

The CBDAR approach emphasising the use of proportional analysis builds upon the 'Dirty War Index (DWI)²⁵', a data-driven public health tool based on laws of war that systematically identifies rates of particularly undesirable or prohibited, i.e. 'dirty', war outcomes sustained by populations during armed conflict (e.g. civilian death, child injury or torture). Dirty War Indices (DWIs) are explicitly linked to international humanitarian law to make public health outcomes directly relevant to prevention, monitoring and humanitarian intervention to moderate war's effects. CBDAR calculations are carried out in the same way as DWIs and share the same basis of respect for international humanitarian law. As described for the DWI, and in an analysis of the effects of different weapon-types in Iraq²⁶, measuring the proportions of civilians, women, females or children among those killed by actions or by weapons can provide quantitative indicators of relatively indiscriminate or disproportionate force. For example, the % of child casualties can be an indicator of a weapon's or a tactic's indiscriminateness, as children are not targeted. Monitoring civilian, woman or child CBDARs can be useful in meeting the Tactical Directive requirement, "*To demonstrate proportionality, restraint, and utmost discrimination in the use of firepower*"²⁴. CBDAR findings can provide quantitative evidence to support tactical and strategic decisions to refrain from use of weapon-types that are shown to produce, for example, relatively high proportions of child casualties. Minimising use of such weapon-types can prevent child casualties in future actions and minimize the risk of harming civilians.

The CBDAR differs from the DWI in its terminology, which fits more productively with military psychology and language. The CBDAR also differs from the DWI in its direct linkage to existing military monitoring systems, particularly Battle Damage Assessment (BDA). The British Army currently assesses all its activities through the lens of the effects-based approach²⁷ informed by good military judgement²⁸ – 'Have we achieved our desired effect?'. This process conducts a Battle

Damage Assessment which is usually part of the intelligence and effects assessments team's responsibilities. The current system is primarily reliant on military evidence (photographs, satellite imagery and troop reports) as this is known, factual and first-hand account evidence. Where possible enemy and civilian casualties and deaths may be included in these reports and occasionally medical staff officers may be sought to corroborate any civilian morbidity or mortality figures through contacts in the civilian health services (Provincial Ministers of Health, hospital admission records, etc.). This is not conducted as a routine activity nor is it part of the formal BDA system. Given the new and ever-evolving nature of the modern battlefield (Hybrid Warfare²⁹ derived from concepts such as the US 3 Block War³⁰ or the British Contemporary Operating Environment) and the importance of winning the battle for the will of the people³¹ we would propose that surveillance, monitoring and assessment of the impact of civilian casualties to military operations should be routinely conducted by integrating CBDARs into the BDA system.

As discussed by Hicks and Spagat,²⁵ accurate data are essential to provide clear and valid results that will inform all actors in the conflict environment. Potential sources of bias in casualty data need to be recognised and addressed through careful choice of valid CBDAR measurements and accurate data sources that, ideally, can be corroborated. For example, some conflicts, such as in Afghanistan, involve one or more military forces that do not wear uniforms to distinguish themselves from civilians. This is a humanitarian violation that increases risk to civilians during combat, and it complicates distinguishing civilian from combatant casualties in the aftermath of combat. Cooperative assessment of civilian casualties by the military, NGOs and indigenous authorities may be crucial to provide credible civilian casualty tracking in this situation. Cooperative civilian casualty tracking that involves pooled, corroborated information from multiple actors can also compensate for possible bias that can occur if one actor has incomplete information. For example, it is unknown whether limited direct physical access by UNAMA⁷ to the insecure provinces of Afghanistan may have biased UNAMA estimates of civilian deaths in those provinces, where they had to rely on secondary rather than primary sources of information, despite every effort to compile comprehensive data. If ISAF/OEF military actors mutually compiled civilian casualty data with humanitarian groups such as UNAMA, and with indigenous authorities, the substantially more complete and corroborated data could compensate for gaps in the data of any one group.

Collection of Evidence through the CBDAR Collection Loop. The collection of evidence is exceedingly important and must be conducted as accurately as possible. But if well considered actors in this field such as UNAMA, ICRC and Human Rights Watch all describe difficulties in the collection of the evidence is there a uniform process or systems that can be considered for use? Mirsad Tokača, founder and President of the Research and Documentation Centre³² of Sarajevo has conducted a systematic review of all deaths caused by the conflict in the Balkans. He has placed all known individuals (up to 99% accuracy) who have either disappeared or died in the conflict to a GPS referenced database that links documentation and evidence to each person's file. This process provides a 'human face' to each death to go beyond data analysis into evidence analysis; hence we offer this process as the collection of evidence as well as the collection of data. This systematic and detailed approach we call the Civilian Battle Damage Assessment Ratio Collection Loop (CBDAR Collection Loop). The CBDAR Collection Loop in Figure 1.1 is a suggested process that identifies the sources of information required to conduct CBDAR analysis. Figure 1.1 is not exhaustive but we recommend it as the minimum number of sources advisable to conduct CBDAR analysis. As suggested above, a collaborative, multi-agency approach to the analysis will reduce inaccurate identification issues, bias, error and questions over independence or credibility. The Bosnian casualty database provides an electronic solution that could be used now by all militaries, GOs, IOs and NGOs that meets the CBDAR information requirement and is geo-spatially linked with Google Earth™ so that real time mapping of incidents can be created and evidence collected.

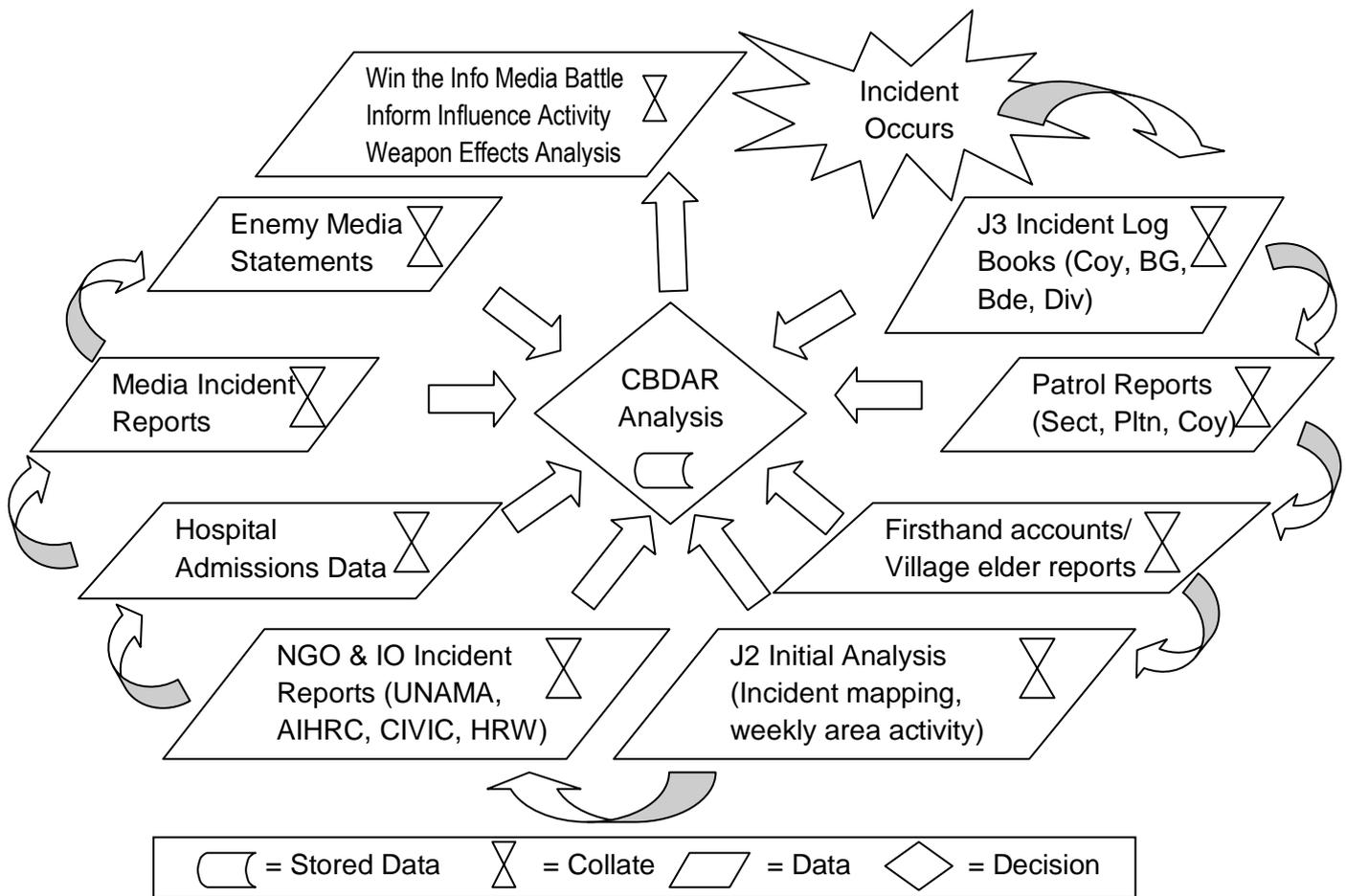


Figure 1.1 – Civilian Battle Damage Assessment Ratio Collection Loop

Key – MoPH = Ministry of Public Health, Sect = Section, Pltn = Platoon, Coy = Company, BG = Battle Group, Bde = Brigade, Div = Division, J2 = Military Intelligence, J3 = Military Operations.

Often the immediate military imperative is to provide as best an understanding of each incident as quickly as possible, not only to determine whether the military effect has been achieved but also to win the information battle and to inform the Battle Damage Assessment process. This may not be ideal for the accurate and detailed analysis that is suggested for the CBDAR Collection Loop process. However, both should be completed in hours, complement each other and where information is unavailable, CBDAR Collection Loop plans should be articulated and initiated to be completed in a specified timeframe. In the modern battlefield where multiple ‘troops in contact’ (TIC) incidents overlap and interlock on an hourly basis over a geographic area measuring in the hundreds of square kilometres, a detailed electronic database should be maintained for each TIC even when no civilian deaths are identified. As with the Bosnian example cited above, mapping the location of every civilian death to the causes of conflict will over time provide all actors a picture on how conflict has affected communities and potentially, infrastructure. The more a community is affected by conflict the less confidence they may have in their Government and its ability to maintain stability; therefore it is in the military’s interest to map every civilian death and, where possible, injury. Up-to-date mapping that is considered during operational and tactical planning stages may well alter the Commander’s decision, as in the modern battlefield it is more the will of the people that is being fought for rather than solely the destruction of the enemy. Thus a ‘mowing the lawn’³³ approach may well be detrimental to the overall campaign. Such mapping when married to existing military³⁴, governmental organisations³⁵ and humanitarian³⁶ publications will also provide guidance to humanitarian, reconstruction, compensation and development actors by informing them as to which communities have been most affected and therefore may be the most in need.

The CBDAR Cycle. The suggested CBDAR cycle at Figure 1.2 places the impact of civilian deaths within the military planning, execution and review contexts. When CBDAR analysis is implemented,

we believe that it will contribute to reducing overall civilian mortality from combat involving military forces that abide by international humanitarian law and that value civilian lives.

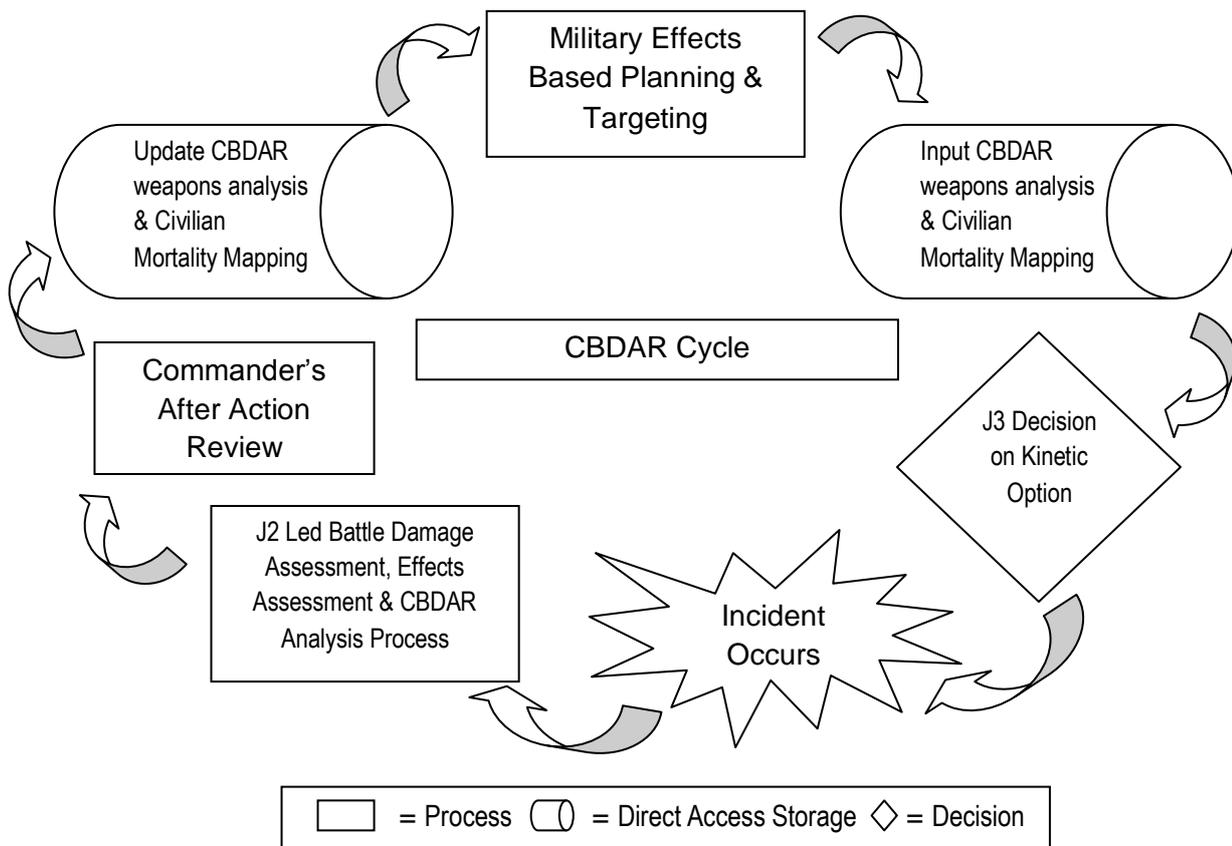


Figure 1.2 – Civilian Battle Damage Assessment Ratio Cycle.

Applications of the CBDAR. To elaborate on the applications described earlier, there are three ways that the CBDAR analytical process can be used in military analysis. These are Period Review, Kinetic³⁷ Analysis and Destabilisation Analysis. The following hypothetical examples use a CBDAR that gives the proportion of civilian deaths among total civilian and opposition combatant deaths.

Period Review is used to measure a protagonist’s civilian mortality incidents over periods of time. It provides a ratio value up to 100%; the higher the figure the more likely that the protagonist can be said to be indiscriminately using force and or deliberately targeting civilian populations. Conversely, the lower a value, the more careful and ‘surgical’ the protagonist is in the use of force, with the lowest possible value being 0% civilian casualties. Period Review should be used to indicate trends when comparing different periods. Military forces in the field should consider CBDAR figures on a monthly basis and annually. Annual analysis could be conducted with the various humanitarian rights organisations which will ensure that as close to an agreed interpretation can be reached. Period Review could also be conducted between geographical regions or between troop-contributing nations to compare or indicate differences in approach and rules of engagement³⁸. Table 1.1 provides a hypothetical example for a regional monthly CBDAR analysis. Differences between Provinces are exposed in that Province 2 is highly kinetic causing significant mortality to civilians and protagonists alike whereas in Province 6 combat occurs but in a very surgical manner by both sides. Equally in this example, human rights monitoring organisations would be very concerned that insurgents appear to be targeting civilians in 5 out of the 6 Provinces and through such analysis apply pressure on Government Forces especially in Provinces 1 & 2 to reduce civilian mortality.

MONTHLY REGIONAL CBDAR ANALYSIS

Regional Analysis	Forces	Civilians Killed	Opposing Forces Killed	Total Killed	CBDAR
Province 1	Government Forces	26	99	125	21%
	Insurgents	40	12	52	77%
Province 2	Government Forces	81	176	257	32%
	Insurgents	210	22	232	91%
Province 3	Government Forces	2	23	25	8%
	Insurgents	7	1	8	88%
Province 4	Government Forces	0	0	0	0%
	Insurgents	0	0	0	0%
Province 5	Government Forces	3	34	37	8%
	Insurgents	19	3	22	86%
Province 6	Government Forces	0	24	24	0%
	Insurgents	15	0	15	100%
Whole Region	Government Forces	112	356	468	24%
	Insurgents	291	38	329	88%
		403	394	797	51%
		Total Civilians Killed	Total Combatants Killed	Total Deaths	

Destabilising Effect

Table 1.1 – Hypothetical Monthly Regional CBDAR Analysis.

To the civilian, it is almost irrelevant who caused a death as any death has a destabilising effect and the impression that law and order and governmental control has been lost. Any figure in this column has a destabilising effect, but clearly, the higher the % CBDAR for civilians among the dead, the more likely that the will of the people may be being lost, even though in attritional terms Government Forces may be winning the Tactical and Operational physical battles against the insurgent. The destabilising effect ratio is just one part of an overall destabilisation analysis; were civilian conflict related morbidity to also be included a total conflict related violence resulting in injury or death analysis could occur. Similarly, issues of intimidation (e.g. 'night letters' - written threats left by the Taliban under cover of darkness), governance, corruption, rule of law, access to healthcare, access to education and employment opportunities can each have their own destabilising effect.

Kinetic Analysis is the continuous monitoring and review of civilian deaths caused by specific weapon systems. When this analysis is introduced in military effects based planning phases, the civilian mortality effect can be assessed given the type of kinetic options being made available. Table 1.2 is a hypothetical monthly analysis of various weapon systems that may be employed by a military component. This historically evidence-based analysis allows military commanders to consider what type of kinetic option to employ in order to reduce civilian mortality and morbidity²⁵. In the example below, there is no difference in military effect between the use of a 500lbs bomb and a 2000lbs bomb, in terms of number of insurgent deaths, although there is a significant difference in the CBDAR proportional effect on civilians: a higher % of those killed by the 2000lbs bomb are civilians. Logically, as both systems produce the same military effect the Commander should equip his Close Air Support (CAS) capability with 500lbs bombs in order to reduce the probability of civilian injury and death. Equally, consideration should be given to the use of Multiple Launch

Rocket Systems (MLRS) as opposed to CAS given its greater military effect and lesser probability chance of civilian death³⁹. There should also be consistency between Table 1.1 and 1.2 – total civilian and combatant deaths must be the same as well as the monthly CBDAR figure for that month. An area not covered in either table is attributing ‘blue on blue’ (own force mortality and morbidity) probabilities to a weapon system.

MONTHLY CBDAR KINETIC ANALYSIS

Weapon System	Civilian Deaths	Insurgent Deaths	Total Deaths	CBDAR
Small Arms	2	18	20	10%
81mm HE	9	60	69	13%
105mm	11	25	36	31%
155mm	11	25	36	31%
MLRS	14	88	102	14%
500lbs bomb	23	70	93	25%
2000lbs bomb	42	70	112	38%
	112	356	468	24%
	Total Civilian Deaths	Total Combatant Deaths		

Table 1.2 – Hypothetical Monthly CBDAR Kinetic Analysis.

Destabilisation Analysis incorporates the period review analysis, incident mortality mapping (both previously discussed) and the cost of mortality and morbidity. Economic models⁴⁰ that identify the causes of conflict attempt to quantify the cost of conflict mainly at the macro-economic level and others such as Christopher Cramer⁴¹ and Frances Stewart⁴² attempt to consider more meso and micro-economic issues. All, however, accept that conflict increases poverty. The true cost to household members who have lost their main income provider or to an individual who suffers life-long disability due to conflict is often difficult to quantify and should be assessed over a lifetime rather than a one-off payment. Government and international⁴³ forces all recognise the need for a simple compensation system⁴⁴ to civilians affected by the conflict in Afghanistan which tend to be assessed on a one off payment pro-rata basis. The Quality Adjusted Life-Year (QALY⁴⁵) and Disability Adjusted Life-Year (DALY) approach to assessing the cost of healthcare has for some time been used by the National Institute of Clinical Excellence⁴⁶ in the United Kingdom in assessing individual healthcare needs and related costs⁴⁷. A similar approach could be adopted to assess the level of compensation to be paid to civilians injured or to relatives who have lost a family member to conflict. Whilst conceptually the academic and healthcare community understand and apply the QALY and DALY approaches in their respective states, in low income, conflict-affected fragile states a workable system has yet to be researched and internationally accepted. Despite this, Destabilisation Analysis can and should still occur using period review analysis and incident mortality mapping whilst accepting the real cost of death or injury of civilians to the individual, family and society is not completely appreciated at this time.

SUMMARY. CBDAR analysis of civilian casualties enables a common systematic approach for military and humanitarian organisations alike. Use of collaborative action, with pooling of actors’ resources to develop a systematic evidence-based database that is geographically linked, enables actors to better understand the effects of conflict on civilians, as well as reducing bias in reporting and increasing awareness of the effects of conflict. Period Review, Kinetic Analysis and Destabilisation Analysis combine to inform military actors of their obligations under International Humanitarian Law, of civilian mortality rates, of the civilian lethality probability of individual weapon systems and of the destabilising effect that civilian deaths may have in conflict. The financial cost of civilian injury and death attributed to conflict needs to be researched and discussed further. The

simplicity of the CBDAR approach allows all actors in conflict-affected states to at least consider its implementation (especially the military as it meets COMISAFs Tactical Directive for civilian casualty minimisation and monitoring). It is a common approach towards tracking leading to reducing civilian deaths and injuries from conflict that must surely be in everyone's interests.

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⁶ HQ ISAF Unclassified Open Source Letter; *COMISAF Tactical Directive*; HQ ISAF/COM/08 dated 30 December 2008; http://www.nato.int/isaf/docu/official_texts/Tactical%20Directive_090114.pdf site accessed 02 May 2009.

⁷ United Nations Assistance Mission to Afghanistan (UNAMA), Human Rights Unit; *AFGHANISTAN Annual Report on Protection of Civilians in Armed Conflict, 2008*; Jan 2009.

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⁸ Campaign for Innocent Victims in Conflict (CIVIC); *Losing the People, The Costs and Consequences of Civilian Suffering in Afghanistan*; 2009.

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⁹ Afghanistan Independent Human Rights Commission; *From Hope to Fear, An Afghan Perspective on Operations of Pro-Government Forces in Afghanistan*; December 2008.

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¹⁰ Afghanistan Independent Human Rights Commission; *Insurgent Abuses Against Afghan Civilians*; December 2008. http://www.aihrc.org.af/2008_Dec/PDF_Anti_G/Eng_anti_G.pdf site accessed 01 March 2009.

¹¹ HRW; *Troops in Contact, Airstrikes and Civilian Deaths in Afghanistan*; 08 September 2008.

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¹³ The New York Times; *Afghan Civilian Deaths Rose 40 Percent in 2008*; 17 February 2009,

http://www.nytimes.com/2009/02/18/world/asia/18afghan.html?_r=1&ref=world site accessed 01 March 2009.

¹⁴ For the purposes of this article the use of 'civilian' assumes that all civilians are 'non-combatants'. The Geneva Convention and Protocols provide guidance on combatant and non-combatant classification, International Committee of the Red Cross; *International Humanitarian Law – Treaties and Documents, Convention (II) with Respect to the Laws and Customs of War on Land and its Annex*.

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¹⁵ International Committee of the Red Cross; *International Humanitarian Law – Treaties and Documents, 1949 Geneva Conventions & Additional Protocols, and their Commentaries*;

<http://www.icrc.org/ihl.nsf/CONVPRES?OpenView> site accessed 01 March 2009.

¹⁶ John Snow's investigation to the source of London's Cholera epidemic in 1854 (Broad Street Pump).

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¹⁷ Milne I; *Sir John Pringle's Observations on the Diseases of the Army—an early scientific account of epidemiology and the prevention of cross infection*; *Journal of Epidemiology and Community Health* 2005;59:966; <http://jech.bmj.com/cgi/content/full/59/11/966> site accessed 02 May 2009.

¹⁸ Lieutenant General Sir Louis Lillywhite CB MBE QHP L/RAMC; United Kingdom's Surgeon General; MoD Defence News; *Medical Care of UK Troops in Afghanistan*; dated 23 January 2009.

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<http://news.bbc.co.uk/1/hi/uk/7845408.stm> site accessed 01 March 2009.

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