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The Declining Risk of Death in Battle

Bethany Lacina

Stanford University

Nils Petter Gleditsch

Centre for the Study of Civil War, International Peace Research Institute

Bruce Russett

Yale University

A recent article using the new Correlates of War (COW) data on the distribution of interstate, intrastate, and extrastate wars from 1816 to 1997 claims there was a relatively constant risk of death in battle during that time. We show that the authors' information is skewed by irregularities in the COW deaths data, and contest their pessimistic interpretation. Using revised information on battle deaths from 1900 to 2002 we demonstrate that the risk of death in battle by no means followed a flat line, but rather declined significantly after World War II and again after the end of the Cold War. Future users should note that the deaths data collected for the three conflict types by COW are not comparable, and using them as such tends to underestimate the share of fatalities due to major interstate conflicts.

The Correlates of War (COW) data set tracking the incidence and characteristics of interstate, intrastate (civil), and extrastate (often called colonial or imperial) wars is one of the most widely cited sources of conflict data in international relations scholarship. Sarkees, Wayman, and Singer (2003) recently introduced readers of *ISQ* to an update of this data set through 1997. According to them, the data "reflect a disquieting constancy in warfare" (2003:49) with relatively little change over the past 150 years in the rate at which human lives are being lost to battle.

This pessimism is surprising given that the new COW data, in accord with similar conflict monitoring projects (Esty et al. 1998; Gleditsch et al. 2002; Harbom, Högbladh, and Wallensteen 2006; Marshall and Gurr 2006), find a decrease in the number of armed conflicts in recent years (Sarkees, Wayman, and Singer 2003:Figure 4).[1] There

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[1] Conflict monitoring studies usually normalize the number of conflicts by the number of states in the international system. The COW project excludes conflicts that do not include a diplomatically recognized state (Gleditsch 2004).

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has been no direct conventional war between major powers since 1954, and the incidence of interstate war has declined over the past half century.

Of course, the number of ongoing armed conflicts is not necessarily proportional to their total cost. It is here the authors make their case, arguing that "with the risk of death in battle trending neither up nor down since the date of Napoleon's exile," (Sarkees, Wayman, and Singer 2003:65) warfare is actually shifting between types—from imperial wars in the late nineteenth century, to interstate wars in the early 1900s, to civil wars in the post-World War II era—while the global level of battle violence remains relatively constant (Sarkees, Wayman, and Singer 2003:64). Their argument concurs with literature arguing that contemporary civil wars are fundamentally "new," in that they are driven by primordial ethnic hatreds and are especially vicious compared with conventional wars and ideological internal conflicts (Snow 1996; Duffield 1998; Kaldor 1999; Henderson 2002).

We challenge that conclusion by questioning the authors' interpretation of their own data and by pointing to several irregularities in the COW data. In the first section, we reinterpret the data presented by Sarkees et al., pointing out that their "flat-line" finding is driven primarily by the massive spikes in the middle of their timeline representing the two World Wars. These wars were several orders of magnitude more deadly than any conflicts before or since, and their presence in the regression line obscures other trends. We then discuss problems of consistency in the COW deaths data, leading to a reanalysis of the data on deaths in COW wars. We find that the annual incidence of battle deaths declined in the decades after World War II, and again after the end of the Cold War.[2]

Our argument supports the work of those who argue that levels of violence have declined worldwide (Mueller 1989, 2003, 2004a, 2004b; Easterbrook 2005; Marshall and Gurr 2005) and scholars of internal conflict who argue that contemporary civil conflicts by no means display unprecedented patterns of violence or an especially apolitical character (Kalyvas 2001; Lacina 2006).

A Flat Line?

A visual presentation of the COW data on battle deaths from 1816 to 1997 (Sarkees, Wayman, and Singer 2003:Figure 5) is very striking. World War I and World War II form massive peaks in the center of a timeline of battle deaths by decade, with lesser variation evident in the periods before and after those two wars. A curve fitted to the data would describe a steeply sloped, inverted U-curve or parabola with the two world wars as a zenith (Figure 1).

Therefore, it is not surprising that Sarkees, Wayman, and Singer (2003:65) find no significant linear relationship between the passage of time and the number of battle deaths. There is a steep positive slope in the numbers of battle deaths between 1816 and 1914 and a steep negative slope between 1945 and 1997; by fitting a straight line to the data these slopes essentially cancel each other out, resulting in a flat trend. But it does not follow that there have been no notable changes in the risk of death in battle worldwide, as the authors claim. They fail to test for the possibility that their finding is driven by the enormous toll of the World War I and II eras, which obscures trends in war deaths both before and after that time.

A Closer Look at the COW Data

Before we examine the Sarkees hypothesis of the constant death toll over time, we must discuss the problems that arise when the COW data on combat deaths in three

[2] We use battle deaths and combat deaths as synonyms and use conflict interchangeably with war. For the definition of war used by the COW project, see Sarkees (2000); for a definition of battle deaths, see both below and Lacina and Gleditsch (2005).

different types of wars are analyzed simultaneously. In the past, the COW project was criticized for focusing on "state deaths," meaning fatalities among the armed forces of the state actors in wars (Vasquez 1993:25–29; Henderson 2002). Civilians and fighters belonging to nongovernment forces (e.g., colonial rebels or internal insurgents) are not counted as state deaths, even in cases of civil or extrasystemic war (Singer 2003). However, the COW project also tabulates a field for "total deaths" in civil and extrasystemic wars; according to the COW coding rules, this category is meant to include all war-related fatalities, including those through starvation and disease. A comparable figure does not exist in the COW interstate war data set, which does not record civilian deaths, fatalities among irregular forces, or nonviolent deaths of any kind. Thus, if the "state death" figures for extrasystemic and intrastate wars are presumably too small to make a valid comparison with the interstate data, the "total death" figures are presumably too large.

Adding to the confusion, a number of miscodings in the COW data make civil wars, and to a lesser extent extrasystemic conflicts, appear to be *more* deadly compared with interstate wars, even when "state death" figures are considered. The COW interstate war data adhere much more closely to the original coding rules than do their data on extrasystemic and intrastate wars. Violent deaths of civilians and nonstate forces, as well as nonviolent deaths and estimates of deaths from starvation or disease, have all been thoroughly censored from the interstate war figures for "state deaths" but are frequently included in the "state deaths" category for extrasystemic or intrastate wars.

Thus, unwitting comparison of COW mortality figures can be enormously misleading. For example, the Korean War—an interstate conflict—is listed by COW with 909,833 total deaths, which is a plausible accounting of combat deaths among *only* military personnel. COW records 1.3 million "state deaths" in the civil war in the south of Sudan from 1983 to 1997, a reasonable estimate of all deaths that war caused due to massive famine and disease among civilians. Comparing those two figures would characterize the Korean War as the smaller conflict when, in fact, it was much larger. Five to six million people are believed to have starved to death during the Korean War; combat deaths in the Sudan through 1997 were less than 100,000.[3]

Problems of noncomparability occur consistently when one tries to compare COW interstate conflicts to extrasystemic or intrastate war based upon number of deaths. Neither the Armenian genocide nor the Holocaust is reflected in the COW deaths data, but such one-sided violence is included in some civil and extrasystemic wars; for example, the 1994 genocide in Rwanda. Irregular combatants are also handled inconsistently. Palestinian forces are included among the toll of battle dead in Lebanon's civil war but excluded from the 1948 war between Israel and the Arab League.

The persistent incompatibilities in the data all point in the same direction: interstate wars appear disproportionately small compared with civil and colonial wars.[4] When Sarkees et al. claim that war deaths have remained constant, this is partly because the percentage of warfare that is between states is much greater in the early than in the later periods in their data. For example, the authors' stress on the deadliness of the 1970s—"wars begun in the 1970s were particularly deadly, with 4.75 million fatalities" (Sarkees, Wayman, and Singer 2003:64)—is skewed by

[3] For discussion of the casualty estimates presented here for the Korean War and Sudanese civil war, see the documentation of the data set presented in Lacina and Gleditsch (2005) at www.prio.no/cscw/cross/battledeaths. Other relevant critiques of categorization and completeness of various kinds of wars include Henderson and Singer (2002) and Sambanis (2004).

[4] Many of the studies that have used the COW fatalities data have concerned themselves solely with interstate war, such as work on the democratic victory thesis (Reiter and Stam 1998; Lake 2003). We do not believe that the noncomparabilities within this category are severe or that our corrections would be likely to upset previous statistical results based on the COW interstate data on its own.

noncomparable data. COW lists the war in Afghanistan (1978–1992) with 1.3 million dead, and gives the number of deaths in Mozambique (1979–1992) as 1.2 million. But neither of those is a figure for deaths in combat: Afghanistan's civil war probably cost closer to half a million dead in battle, Mozambique's even less (Lacina and Gleditsch 2005). The COW estimates of state deaths in the Angolan civil war (1975–1991) and the Nigerian civil war in Biafra (1967–1971) are also orders of magnitude too large for state combat losses and instead represent the tremendous humanitarian crises that accompanied these wars. Thus, COW's figures provide valuable information about the human costs of civil wars, but these numbers produce a flawed comparison with interstate wars. Consider, for example, that Clodfelter (2002:479, 581) estimates that World War I left over 15 million dead (instead of the 8.6 million state soldiers listed by COW), and that the total population loss from World War II—including civilian battle deaths, the use of atomic weapons against Japan, massive ethnic genocide, and widespread disease and starvation in conflict zones and in states and colonies cutoff from food and medical supplies—was at least 40 million, whereas COW's figure is 14.4 million dead.

As interstate wars appear disproportionately small compared with civil and colonial wars, and because interstate war was more common in the beginning of the twentieth century than at the end, recent wars appear more deadly than if consistent definitions had been applied. Thus the COW project misses much of the downward trend in battle deaths in the post-World War II era.

A Revised Test of the Trend in Battle Deaths

To improve on the fatalities data for the COW conflicts we use estimates gathered by Lacina and Gleditsch (2005) for the Uppsala/PRIO data set on state-based armed conflicts between 1946 and 2002 (Gleditsch et al. 2002; Harbom and Wallensteen 2005). We matched the Lacina and Gleditsch data to the COW conflict list and backdated the deaths data to 1900. Our data are consistently limited, for all types of wars, to battle deaths alone.[5]

Figure 2, plotting battle deaths divided by global population, tracks this revised estimate of the likelihood or risk that an individual person would die in state-based armed combat, from 1900 to 1997.[6] Figure 3 presents the same graph from 1946 to 1997; the data are identical but it is hard to identify recent trends visually in Figure 2 because of the extremely high values for World Wars I and II.

The data strongly refute the assertion that the risk of battle death is a flat line. Rather there is a distinct apex in the era of World Wars I and II. The trend in battle deaths worldwide is also lumpy, revealing the influence of a few major conflicts within each era. The first years of the twentieth century were marked by a small spike in battle deaths in 1905—the Russo-Japanese War—and an escalating trend in violence starting in 1910, driven by the Mexican Revolution and the first and second Balkan Wars, and culminating in the enormous death toll of World War I. The 1920s and 1930s were much less deadly, but numbers of battle deaths climbed again in the years leading up to World War II, a conflict that caused more battle deaths, more indirect deaths through disease and starvation, and claimed more victims of genocide than any war before or since.

Figure 3 shows that the post-1946 era has also been one of successive spikes in the number of battle deaths worldwide, but each of these crises has generated fewer

[5] Lacina and Gleditsch define battle-related deaths as civilians and soldiers killed in the course of combat. Nonviolent deaths caused by war, such as those occurring through starvation or disease, and deaths due to unorganized violence (such as riots) or one-sided violence (such as genocide or execution of detainees) are not included. Consistent time-series data on one-sided violence and nonviolent deaths due to war do not exist.

[6] Population data are from Gleditsch (2005) and are lagged 1 year.

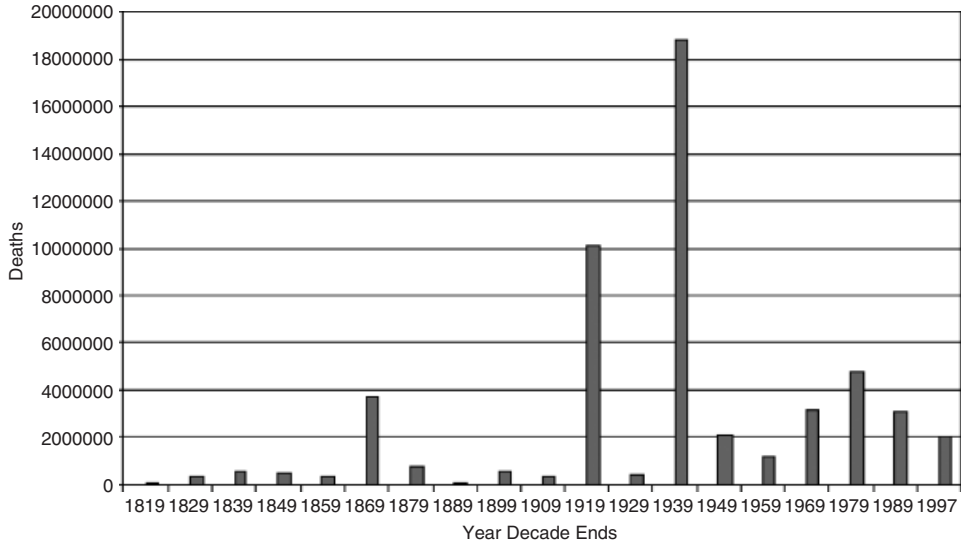

FIG. 1. Sarkees, Wayman and Singer's Estimate of Total War Deaths per Decade in COW Conflicts (Deaths Reported by Year in which War Began; Data for 1819 and 1997 Normalized for 10 Years)
Source: Sarkees, Wayman, and Singer (2005: Figure 5).

deaths per year than that preceding it. The 1950s were bloodied by the Chinese civil war, the Korean War, and the French Indochina war.

The next major peaks in the graph track the Cold War proxy wars in Vietnam, Cambodia, and Laos. Similarly, in the 1980s, the superpower-supplied Iran–Iraq War and the Soviet invasion of Afghanistan generated the largest battles. Finally, at the end of the Cold War there is an upsurge in combat deaths due to war in the Balkans, former Soviet republics, and Persian Gulf. The trend from that peak to

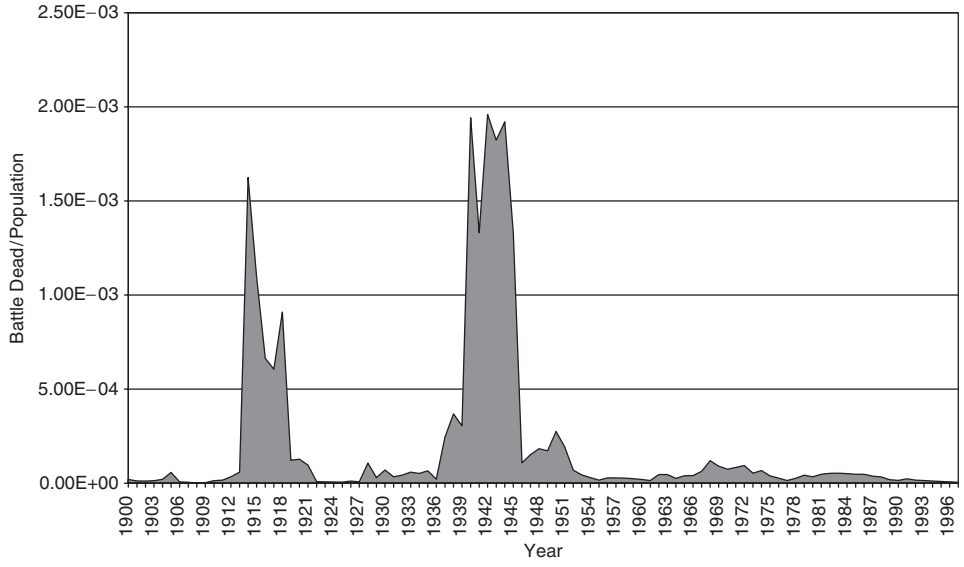

FIG. 2. The Risk of Death in Battle Worldwide, 1900–1997
Source: Conflict events defined by COW data set (Sarkees 2000); battle deaths data from Lacinda and Gleditsch (2005). See authors note for website.

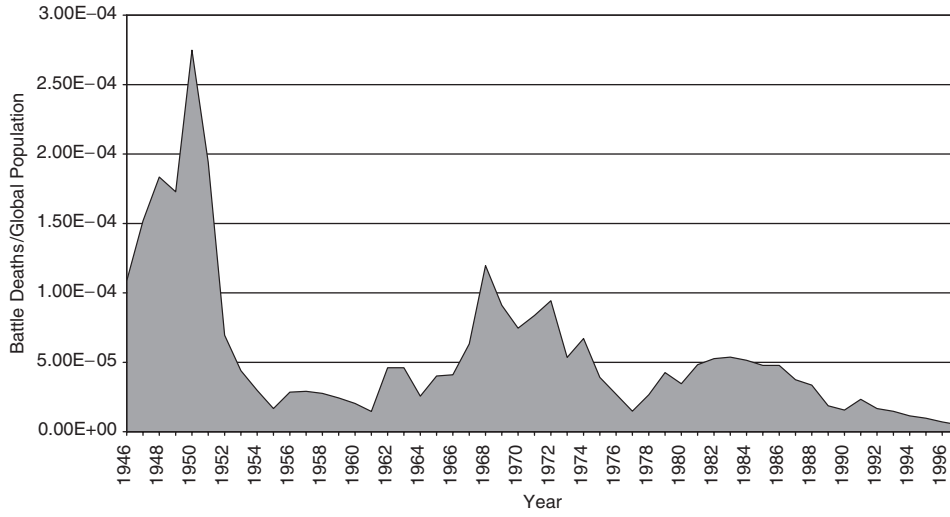

FIG. 3. The Risk of Death in Battle Worldwide, 1946–1997
Source: Lacina and Gleditsch (2005). See authors' note for website.

1997 was steadily downward, with the most recent years being some of the most peaceful of the last century.

A few key features stand out in this review of battle deaths in the twentieth century. First, the largest peaks in combat deaths are in interstate wars, followed by internationalized civil wars, and for the most part feature at least some conventional, rather than guerilla, warfare. Purely conventional wars have been the most deadly. In the post-World War II period, each peak is lower than the last reflecting, in part, that there has not been an interstate conflict between major powers since the Korean War. Second, civil wars seem to have grown less frequent (Harbom, Högbladh, and Wallensteen 2006), less deadly, and less likely to become internationalized since the end of the Cold War (Lacina 2006). These trends reflect in part the de-escalation of the superpower rivalry and the declining levels of superpower military aid to regional conflicts. For example, declining tension between the United States and the USSR sped the de-escalation of the Soviet war in Afghanistan and decreased rates of mortality there (Sliwinski 1989:40–41). Other countries experiencing the dismantling of superpower proxy wars include El Salvador, Nicaragua, Angola, Ethiopia, Mozambique, Namibia, and Cambodia.

Table 1 shows a regression analysis of these data. Time is simply a yearly index running from zero in 1900 up to 1997. An ordinary least-squares regression for time as a predictor of battle deaths from 1900 to 1997 finds a downward linear trend, significant at the 90% confidence level. Adjusting the model to allow for a nonlinear temporal trend reveals this downward tendency even more clearly; the estimated coefficients on a term for time and its square imply that the trend in battle deaths over time has been an upside down parabola with an apex in the early 1940s. There are also negative linear trends in battle deaths in the post-World War period and after the Cold War.[7]

[7] Analysis of the battle deaths data collected for the Uppsala/PRIO data set of armed conflicts (Lacina and Gleditsch 2005) indicates that these downward trends are robust through 2002. Marshall and Gurr (2005) confirm this decline for the magnitude of armed conflict through 2004, as do Enders and Sandler (2006:61) for number of international terrorist events through 2003. In a response to an earlier version of this paper, Sarkees, Wayman, and Singer 2005:2.3, 2.4) gathered data on conflict through 2003. Their analysis confirms a significant (.01 level) decline in battle deaths since 1945, in absolute numbers as well as adjusted for the number of states in the global system—a

TABLE 1. OLS Regression of the Risk of Death in Battle Worldwide, 1900–1997

Model	*A*	*B*	*C*	*D*
Regressand: Battle Deaths per Person	*1900–1997*	*1900–1997*	*1946–1997*	*1989–1997*
	Coefficient	*Coefficient*	*Coefficient*	*Coefficient*
	(Standard Error)	*(Standard Error)*	*(Standard Error)*	*(Standard Error)*
Regressors	*P-Value*	*P-Value*	*P-Value*	*P-Value*
Index for time (0–97)	− 2.8e-06	1.3e-05	− 2.0e-06	− 1.9e-06
	(1.6e-06)	(6.2e-06)	(4.2e-07)	(3.9e-07)
	.085	.039	.000	.002
Square of index for time		− 1.6e-07		
		(6.2e-08)		
		0.010		
Constant	3.4e-05	9.0e-05	2.0e-04	1.9e-04
	(9.1e-05)	(1.3e-04)	(3.0e-05)	(3.6e-05)
	.000	.49	.000	.001
N	98	98	52	9
R^2	0.031	0.097	0.31	0.78

Source: Conflict events defined by COW data set (Sarkees 2000; battle deaths data from Lacinda and Gleditsch (2005). See authors' note for website.

Conclusion

We have sounded a note of some optimism about the international system. The post-World War II international system witnessed a remarkable decline in the numbers of combat deaths worldwide. This is in large part due to the decreasing incidence of interstate and Great-Power wars, the most deadly type of conflict humans have ever faced, and to decreased casualty levels in civil wars due to less frequent intervention by major powers. Thus, the success of the post-World War II period has been in building a historically unprecedented network of peaceful ties among the most powerful states in the international system.[8] The challenge going into the twenty-first century is to expand these gains into areas still torn by domestic conflict, terrorism, and interstate feuds.

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possible objection to these findings is that we cannot test the trends in deaths due to war outside of battle, as in one-sided violence or through humanitarian disaster, because such data do not exist over time. There is reason to expect that there has been a negative trend in all types of death related to war given the enormity of the humanitarian disasters and acts of genocide that accompanied the World Wars, the Chinese Civil War, and the Korean War. Lacina and Gleditsch (2005) discuss this topic in more detail, and argue that nonviolent mortality is the most important and understudied cause of death in the majority of current conflicts.

[8] It is impossible within the scope of this article to test hypotheses for this success. Candidate explanations include the spread of democracy and economic interdependence (Russett and Oneal 2001; Bennett and Stam 2004:chapter 5), the breadth and success of UN peacekeeping and peacebuilding (Human Security Report 2005; Doyle and Sambanis 2006), and concentration of systemic power first into bipolarity (Waltz 1979) and then to unipolarity (Wohlforth 1999; but see Oneal 2006).

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