

Post-surge, pre-withdrawal: recent military fatalities in Afghanistan and Iraq by cause, notably improvised explosive device (IED) and friendly fire, and nationality

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Summary

Afghanistan & Iraq: a) In PERIOD 3 (5 February to 24 June 2007, 140 days) and first half of PERIOD 4 (25 June to 2 September 2007), the fatality rate of UK troops was equally high in Afghanistan {28 fatalities in 3,513 personnel-years} & Iraq {38 fatalities in 3,644 pys}, namely: 9 deaths per 1,000 personnel-years (95% CI: 7.0 – 11.4).

Afghanistan: b) In PERIODS 1+2+3 (1 May 2006 to 24 June 2007, 420 days), Canadian troops sustained heavy losses (45 deaths from estimated deployment 2,250 to 2,500 troops) at 17 per 1,000 personnel-years (95% CI: 12 to 22). These have persisted into PERIOD 4.

Afghanistan: c) Canadian losses from 1 May 2006 to 2 September 2007 have been 55 deaths in 3,173 personnel-years, or 17 per 1,000 personnel-years (95% CI: 13 to 22), nearly double the UK's fatality rate of 9 per 1,000 personnel-years (95% CI: 7 to 11) based on 67 fatalities in 7,253 personnel-years.

Afghanistan: d) Fatal IED (only) incidents increased significantly in frequency in the first half of PERIOD 4, when there were 15 in 70 days, compared to 12 in PERIOD 3.

Iraq: e) In PERIOD 3, UK fatalities doubled to 23 versus 12.3 deaths expected if hostilities had continued as in PERIODS 1+2 ($p < 0.005$). Sharp rise in US fatality rate from 5 to 7 deaths per 1,000 personnel-years was already evident in PERIOD 2.

Iraq: f) Relative to PERIOD 3, UK fatality rate rose again in the first half of PERIOD 4 ($p \sim 0.07$) to 14 per 1,000 personnel-years (95% CI: 8 to 23, based on 15 deaths in 1,058 pys), whereas the US post-surge fatality rate decreased very significantly in PERIOD 4 to 5.5 per 1,000 personnel-years (95% CI: 4.7 to 6.3, based on 178 deaths in 32,308 pys), close to US level a year previously in PERIOD 1 (1 May to 17 September 2006).

Iraq: g) In PERIOD 3, fatalities per fatal IED (only) incident increased to 280 deaths in 155 fatal IED (only) incidents versus expected 249 IED (only) fatalities based on IED incidents' lethality in PERIOD 2 (18 September 2006 to 4 February 2007: 217 fatalities in 135 fatal IED (only) incidents). But, in the first half of PERIOD 4, the frequency of fatal IED (only) incidents (52 fatal incidents in 70 days) reverted to the level a year previously (183 fatal incidents in 260 days) and their lethality to PERIOD 2's.

Friendly fire: h) From 1 May 2006 to 2 September 2007, friendly fire claimed one Canadian (4 September 2006) and at least three British lives (23 August 2007) in Afghanistan, and two US lives in Iraq (2 February 2007): all six in major combat.

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1. Background and rationale

Our analyses^{1,2} rely on icasualties.org, to which we make acknowledgement. Date and cause of fatalities on icasualties.org are subject to change (see below) as well as to updating.

Bird and Fairweather¹ showed that the vast majority of coalition fatalities in Operation Iraqi Freedom in 2006 to 17 September was ascribed as hostile (85%: 457/537). In particular, improvised explosive devices (IEDs) accounted for 53% of all fatalities, and for 62% of hostile deaths (282/457: 95% CI from 57% to 66%). Bird and Fairweather also reported on IED lethality: 271 deaths in 183 fatal IED (only) incidents in Iraq in 2006 to 17 September (260 days), and 222 deaths in 142 fatal IED (only) incidents in the subsequent 140 days (PERIOD 2 = 18 September 2006 to 4 February 2007), a pooled mean of 1.5 deaths per fatal IED (only) incident.

This update incorporates post-surge fatalities in PERIOD 3 (5 February 2007 to 24 June 2007: **490 deaths in Iraq, 96 in Afghanistan**) and also in the first half of PERIOD 4 (25 June 2007 to 2 September 2007: **194 deaths in Iraq, 63 in Afghanistan**). UK troops were withdrawn from Basra on 3 September 2007 which is why, unusually, we report on a 70-day interval rather than waiting until PERIOD 4 ends on 11 November.

2. Methods briefly

Our analysis relates primarily to 140-day periods, namely PERIOD 1= 1 May to 17 September 2006, PERIOD 2= 18 September to 4 February 2007, PERIOD 3= 5 February to 24 June 2007 {based on accessing icasualties.org on 16, 17, 27 June and 2 July 2007}, and to the first 70 days of PERIOD 4= 25 June to 2 September 2007 {based on accessing icasualties.org on 5 September 2007}.

We report fatality rates per 1,000 personnel-years. Four thousand troops in a theatre of operation for 3 months contribute 1,000 personnel-years. So too do 1,000 personnel in theatre for one year.

We analyse the lethality of IED (only) incidents. As in Bird and Fairweather¹, we exclude from this analysis multiply-ascribed deaths, such as IED and small arms fire (16 and 11 in PERIOD 3 and first half of PERIOD 4 respectively) or IED and rocket propelled grenade/grenades (two and zero respectively).

Our next update will relate to the second half of 140-day PERIOD 4 (3 September to 11 November 2007) when UK's deployment to Iraq may reduce below 5,500 troops^{3,4} and to Afghanistan may have increased to 7,700^{5,6}.

3. RESULTS

3.1 Fatalities in Afghanistan and Iraq in PERIODS 1+2¹; PERIOD 3; and first half of PERIOD 4

TABLE 1 summarises coalition military fatalities by nationality in Iraq and Afghanistan. The data for PERIODS 1+2 are reproduced from Bird and Fairweather¹.

TABLE 1: Coalition military deaths and estimated fatality rates per 1,000 personnel-years in consecutive 140-day or 70-day PERIODS; friendly fire deaths superscripted ^F

<i>Theatre</i>	<i>Iraq</i>				<i>Afghanistan</i>			
<i>PERIODS of 140 days, except the last</i>	<i>1 May to 17 Sept. 2006</i>	<i>18 Sept. to 4 Feb. 2007</i>	<i>5 Feb. to 24 June 2007</i>	<i>25 Jun to 2 Sept. 2007 (70 days)</i>	<i>1 May to 17 Sept. 2006</i>	<i>18 Sept. to 4 Feb. 2007</i>	<i>5 Feb. to 24 June 2007</i>	<i>25 Jun to 2 Sept. 2007 (70 days)</i>
Total fatalities	299	436*	490	194	117	40	96	63
US (estimated deployment)	280 (145,000 troops)	416 ^{FF} (145,000 troops)	463 (<= 165,000)	178 ^{****} (162,000 ⁸ - 168,000 troops ⁹)	54 ^{**}	18	50 ^{***}	31
UK (estimated deployment) & person-years, pys	14 (7,200 troops) 2,769 pys	12 (7,000 troops) 2,692 pys	23 (7,000 down to 5,500 ^{3,4}) 2,586 pys	15 (5,500 troops) 1,058 pys	33 ^{**} (4,500 troops) 1,726 pys	6 ^{JW} (up to 5,250 troops) 2,014 pys	15 (5,250 thro' 6,000 to 6,900 ^{5,6}) 2,186 pys	13 ^{FFF} (6,900 troops) 1,327 pys
Canada (estimated deployment) & person-years, pys	No deployment				17 ^F (2,250 troops) 865 pys	12 (2,250 troops) 865 pys	16 (2,500 troops) 962 pys	10 (2,500 troops) 481 pys
Other	5	8	4	1	13	4	15	9
Estimated fatality rates per 1,000 personnel-years (95% Poisson uncertainty)								
US	5.0 (4.4 to 5.6)	7.5 (6.8 to 8.2)	7.3 (6.6 to 8.0)	5.7 ⁸ (5.5 ⁹) (4.9 to 6.6 ⁸) (4.7 to 6.3 ⁹)	US troop numbers not ascertained			
UK	4.8 (3.1 to 7.0)		8.8 (5.6 to 13.3)	14.1 (7.9 to 23.4)	19 ^{**} (13 to 27)	3 (1 to 6)	7 (4 to 11)	10 (5 to 17)
Canada	No deployment				20 (11 to 31)	14 (7 to 24)	17 (9 to 27)	21 (9 to 27)
UK/Canada	No deployment				19 ^{**} (14 to 25)	6 (4 to 11)	10 (7 to 14)	13 (8 to 19)

* Now shown as 437 on icasualties.org.

** Includes large clusters of 10 US and 14 UK deaths respectively.

*** Includes a large cluster of eight US deaths

**** Includes large cluster of 14 US non-hostile deaths in helicopter crash (43/194 fatalities in Iraq were non-hostile deaths in first half of PERIOD 4)

F = friendly fire; JW = death of Jonathan Wigley from hostile fire, but questions raised.

In PERIODS 1+2+3 (420 days) and first half of PERIOD 4 (70 days), there were 54+13 = 67 UK deaths in Afghanistan in estimated 5,926 + 1,327 = 7,253 personnel-years, a cumulative fatality rate of 9 per 1,000 personnel-years (95% CI: 7 – 11); and 49+15 = 64 UK deaths in Iraq in 8,033 + 1,058 = 9,105 personnel-years, a fatality rate of 7 per 1,000 personnel-years (95% CI: 5 – 9). Friendly fire accounted for 3/131 UK fatalities (2%), equivalently for 0.2 deaths per 1,000 personnel-years. The three UK friendly fire deaths all

occurred during theatre-specific major combat which claimed 99 UK lives (Iraq 38, and Afghanistan 61).

In PERIOD 3 and first half of PERIOD 4, UK troops encountered similarly lethal hostilities in their two distinct theatres of operation (Afghanistan and Iraq): UK fatalities were 28+38 = 66 in estimated 3,513+3,644 = 7,157 personnel-years, a combined rate of 9 UK deaths per 1,000 personnel-years (95% confidence interval: 7 to 11), and at least equivalent to UK's fatality rate during the initial period of major combat in Iraq in 2003.

In Iraq, there is evidence that the UK fatality rate had increased very significantly in PERIOD 3 compared to PERIODS 1+2 (observed 23 fatalities versus 12.3 expected, $p < 0.005$) whereas the sharp rise in US fatality rate in Iraq clearly began from PERIOD 2. In the first half of PERIOD 4, the UK fatality rate in Iraq rose further ($p \sim 0.07$) to 14 per 1,000 personnel-years (95% CI: 8 to 23) whereas the US fatality rate in Iraq fell to 5.7 per 1,000 personnel-years (95% CI: 4.9 to 6.6) or less (see **TABLE 1**), approaching its level a year previously, see PERIOD 1. Friendly fire accounted for 2/879 US fatalities during major combat in Iraq (0.2%).

In Afghanistan in PERIOD 3, there were two large (7+ fatalities) clusters of deaths: eight US deaths in a helicopter crash, and seven lives lost when a helicopter was brought down in a rocket propelled grenade attack (5 US, 1 Canadian, 1 UK). In Iraq in the first half of PERIOD 4, there was a large cluster of 14 US deaths in a non-hostile helicopter crash.

In Afghanistan in PERIODS 1+2+3 (420 days), there were 45 Canadian deaths despite Canada's deployment being *at most* half the UK's so that there was reason to question the onerously high Canadian losses of 17 per 1,000 personnel-years (95% CI: 12 to 22). The same phenomenon persisted into PERIOD 4, see **TABLE 1**. Friendly fire accounted for 1/55 Canadian fatalities during major combat (2%).

3.2 Fatal IED (only) incidents: variation in frequency of incidents and in fatalities per fatal IED incident

TABLE 2 shows military fatalities in IED (only) incidents in Iraq and Afghanistan. The data are updated from Bird and Fairweather¹ because, when icasualties.org was accessed in June 2007, we identified only 217 fatalities in 135 fatal IED incidents for PERIOD 2 (18 September 2006 to 4 February 2007: 140 days), fewer than reported previously¹.

In Iraq, as reported previously¹, the rate at which fatal IED (only) incidents occurred had increased by 37% in PERIOD 2 (to one per day) compared to BASELINE (0.7 per day). That increase was sustained in PERIOD 3 but reverted in the first half of PERIOD 4. PERIOD 3 (5 February 2007 to 24 June 2007) in Iraq accounted for 280 fatalities in 155 fatal IED (only) incidents. Although the number of fatal IED incidents had not increased significantly from PERIOD 2, their lethality had.

Had there been no change in lethality from BASELINE + PERIOD 2, 155 fatal IED (only) incidents in Iraq would have resulted in 237.9 IED fatalities rather than 280 observed, $p < 0.01$. Lethality may even have increased in PERIOD 3 compared to PERIOD 2: 280 IED (only) deaths are set against an expectation of 249.1 based on IED incidents' lethality in PERIOD 2, $p \sim 0.05$. By the first half of PERIOD 4, IEDs' lethality may have reverted in

Iraq but not so in Afghanistan where the frequency of fatal IED (only) incidents increased markedly with 15 in 70-days compared to 12 in 140-day PERIOD 3.

Remarkably, in PERIOD 3, in both Iraq (5) and Afghanistan (1), there were fatal IED (only) incidents which claimed 6+ lives. There were no such incidents previously in Afghanistan, nor were there any in Iraq from 1 January 2006 to 4 February 2007. In the first half of PERIOD 4, only one such incident occurred – in Afghanistan where six Canadian lives were lost an IED attack.

TABLE 2: IED fatalities in Iraq and Afghanistan

<i>Theatre</i>	<i>Fatal IED incidents in Iraq</i>					<i>In Afghanistan</i>		
PERIOD & Number of deaths in a fatal IED incident	BASE: 1 Jan. to 17 Sept. 2006 (271 IED deaths in 183 fatal IED incidents in 260 days)	PERIOD 2: 18 Sept. 2006 to 4 Feb. 2007 (217 IED deaths in 135 fatal IED incidents in 140 days)	POOL BASE + PERIOD 2: (488 IED deaths in 318 fatal IED incidents in 400days)	PERIOD 3: 5 Feb. to 24 June 2007 { POOLED-expectation } (280 IED deaths in 155 fatal IED incidents in 140 days)	1 st half of PERIOD 4: 25 June to 2 Sept 2007 (83 IED deaths in 52 fatal IED incidents in 70 days)	76 IED deaths in 46 fatal IED incidents from 1 Oct. 2001 to 4 Feb. 2007 (1,953 days)	22 IED deaths in 12 fatal IED incidents from 5 Feb. to 24 June 2007, (140 days)	30 IED deaths in 15 fatal IED incidents from 25 June to 2 Sept 2007, (70 days)
1	128	88	216	97 { 105.3 }	33	28	8	9
2	33	23	56	22 { 27.3 }	9	11	1	1
3	14	14	28	20 { 13.6 }	8	2	2	3
4	5	9	14	10 { 8.8 }	2	5	0	1
5	3	1	4	1			0	0
6+				5			1	1
TOTAL	183	135	318	155	52	46	12	15
<i>Fatal IED incidents per day</i>	0.7	1.0	0.8	1.1	0.7	0.02	0.1	0.2
<i>Mean deaths per fatal IED incident</i>	1.5	1.6	1.5	1.8	1.6	1.7	1.8	2.0

4. DISCUSSION

4.1 Afghanistan versus Iraq: dicing with death

Overall in PERIODS 1+2+3 and first half of PERIOD 4 (490 days), UK troops' fatality rate of 9 per 1,000 personnel-years (95% CI: 7 - 11) in Afghanistan was 30% greater than their death-rate in Iraq of 7 fatalities per 1,000 personnel-years (95% CI: 5 - 9). Canada's high military fatality rate throughout PERIODS 1+2+3 and first half of PERIOD 4 of 17 deaths per 1,000 personnel-years (95% CI: 13 to 22) in Afghanistan warrants closer scrutiny.

In the most recent epochs, however, namely PERIOD 3 and first half of PERIOD 4, UK troops have encountered similarly lethal hostilities in both theatres of operation (Afghanistan and Iraq): their common fatality rate was 9 UK deaths per 1,000 personnel-

years (95% CI: 7 - 11), and at least equivalent to UK's fatality rate during the initial short period of major combat for Iraq - but sustained for longer, by fewer troops.

Contrary to initial reports in the British press, the marked rise in UK fatalities in Iraq in PERIOD 3 was highly significant and, moreover, was anticipated by an earlier sharp increase in US fatalities rate in PERIOD 2. The UK fatality rate in Iraq rose further in the first half of PERIOD 4 to 14 per 1,000 personnel-years (95% CI: 8 to 23) when it greatly exceeded that of US troops.

The US rate of 7 deaths per 1,000 personnel-years, which had been sustained from PERIOD 2 into PERIOD 3 despite a surge of 20,000 to 30,000 additional US troops, fell very significantly in the first half of PERIOD 4 to 5.7 per 1,000 personnel-years⁸ (95% CI: 4.9 to 6.6) or less⁹, namely 5.5 per 1,000 personnel-years 95% CI: 4.7 to 6.3), closer to its level a year previously. The extra US deployment from the outset of PERIOD 3 may have displaced some insurgents in PERIOD 3 to operate in other regions of Iraq, including those patrolled by British forces.

Current and former infantry commanders emphasise that fatality rates per 1,000 deployed personnel-years – as reported here - seriously under-estimate, by a factor of two or more, the fatality rate of frontline soldiers¹⁰. That rate would require us to keep track of the deployed numbers of infantry and artillery and engineers.

4.2 Increased lethality and frequency of IEDs in Iraq reverts, but not in Afghanistan
Bird and Fariweather¹ identified that the frequency of fatal IED (only) incidents in Iraq had increased very significantly (by 37%) in PERIOD 2 compared to earlier in 2006, but that the mean number of deaths per fatal IED incident was essentially unchanged, there having been 1.5 deaths per fatal IED (only) incident overall.

In PERIOD 3, a further important change in IEDs occurred. Their lethality increased markedly since 155 fatal IED incidents claimed 280 lives, not the hitherto-expected 238, or even 249 (if based on PERIOD 2 only). Unprecedented in Afghanistan or in Iraq in 2006 were fatal IED incidents which claimed 6+ lives – five such incidents in Iraq and one in Afghanistan.

Although not demonstrable statistically for Afghanistan, there must be military concern that a common source for IEDs may servicing both theatres of operation so that the already-statistically-demonstrable increased lethality in Iraq in PERIOD 3 is a forewarning for Afghanistan with, already, an IED incident of six fatalities in PERIOD 3 and a second in the first half of PERIOD 4 which cost 6 Canadian lives.

In the first half of PERIOD 4, the frequency and lethality of fatal IED (only) incidents in Iraq reverted to the lower levels of a year previously but in Afghanistan frequency at least doubled: 15 fatal IED incidents in 70 days compared with 12 in 140-day PERIOD 3.

4.3 Friendly fire deaths

If we consider, which is not unreasonable, that troops of all nationalities have, to all intents and purposes, been engaged in major combat in both Iraq and Afghanistan throughout PERIODS 1+2+3 and first half of PERIOD 4, then friendly fire fatalities during major combat may be summarised as follows: US = 2/1,490 deaths (0.13%) in one friendly fire incident; and UK = 3/131 deaths¹¹, Canada = 1/55 deaths, others = 0/59 deaths which sum to 4/245 (1.6%) in two friendly fire incidents. UK's slow progress on combat identification and unacceptable delays in conducting inquests into friendly fire deaths risk current operations and perpetuation of 3-fold or greater international differences in the proportion of military fatalities by friendly fire. The attributable proportion has been thankfully low in recent major combat compared to the initial periods of major combat in Afghanistan (prior to 1 May 2002) and Iraq (prior to 1 May 2003) when (4+9)/(57+139) US deaths (7%) and (4+6)/(9+33) other coalition deaths (24%) were from friendly fire. However, each friendly fire fatality remains desperate for all concerned.

4.4 Projection update halfway through PERIOD 4

In the 140-day PERIOD 4 (25 June to 11 November 2007), from a combined deployment of 13,200 troops (and just over 5,000 personnel-years), our previously-reported expectation was 40 UK military fatalities (95% CI: 27 to 49) in Afghanistan+Iraq as singleton deaths or in small clusters.

Twenty-eight deaths have occurred in the first half of PERIOD 4. In the second half of PERIOD 4, UK military fatalities in Iraq may decrease now that British troops have withdrawn from Basra, but mortar attacks remain a concern – they claimed four UK lives in the first half of PERIOD 4. We make no change in the current projection.

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