



DEATHS IN THE UK REGULAR ARMED FORCES 2011

29 March 2012

Theme: Other - Defence

Issued by

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INTRODUCTION

1. This annual National Statistical Notice provides summary statistics on deaths whilst in Service in 2011 among the UK regular Armed Forces, and trends over the ten year period, 2002-2011. This information updates previous notices published by Defence Analytical Services and Advice (DASA) and includes new data for 2011.
2. The information shown has been compiled from data held by Defence Analytical Services and Advice (DASA) on 13 February 2012.
3. The data are presented for the Naval Service (Royal Navy and Royal Marines), the Army (including the Gurkhas), the Royal Air Force, and on a Tri-Service basis (**Table 1** and **Figure 1**). Non-regular members of the UK Armed Forces who died whilst deployed on operations are included in the data presented.
4. This notice provides information on the major categories of cause of death for the ten year period 2002-2011 (**Tables 5-8** and **Figure 4**). This notice also presents information on comparisons to the UK general population. Previously published data on the number of incidents and cause of death have been updated from the latest information received from coroners. In line with National Statistics protocols, amendments have been annotated by the letter 'r' and explanations provided in the section '**Changes to previously published data**'.
5. For data on suicide, this Notice includes both coroner-confirmed suicides and open verdict deaths in line with the definition used by the Office for National Statistics (ONS) in the publication of National Statistics. These data are published in more detail in DASA's Statistical Notice, "Suicide and Open Verdict deaths in the UK regular Armed Forces 1984-2011", also released 29 March.
6. Details of the data sources and the methods used to collect and analyse the data and additional information are described in the section '**Methods**'.

KEY POINTS

7. In 2011, a total of 132 deaths occurred among the UK regular Armed Forces, of which 19 were serving in the Naval Service, 98 in the Army, and 15 in the RAF.
8. In 2011 the overall mortality rate was 70 per 100,000, whilst in the Naval Service the rate was 52, the Army 90 and the RAF 32 per 100,000 strength.
9. During the ten year period 2002-2011, the overall Armed Forces age and gender standardised mortality rates fluctuated with a high of 107 per 100,000 in 2009 and a low of 70 per 100,000 in 2011.
10. The Naval Service mortality rate decreased from 78 per 100,000 in 2010 to 52 per 100,000 in 2011. This was due to a decrease in the number of deaths as a result of hostile action from 15 in 2010 to 8 in 2011.
11. The Army mortality rate decreased from 116 per 100,000 in 2010 to 90 per 100,000 in 2011, due to a decrease in the number of deaths as a result of hostile action from 79 in 2010 to 34 in 2011.
12. The RAF mortality rate decreased from 49 per 100,000 in 2010 to 32 per 100,000 in 2011 due to a decrease in the number of deaths across all causes from 21 in 2010 to 15 in 2011.
13. Overall, in 2011 the UK regular Armed Forces were at a significantly lower risk of dying compared to the UK general population (SMR = 67, 95% CI: 56 – 79).
14. In 2011, the Naval Service and RAF were at a significantly lower risk of dying compared to the UK population, whilst, for the Army, there was no statistically significant difference.
15. In 2011, for the regular UK Armed Forces:
 - o Hostile action was the single largest cause of death: 43 deaths (33%);
 - o Land transport accident deaths were the second largest cause (LTA): 25 deaths (19%);
 - o Other accidents accounted for 23 deaths (17%);
 - o Cancers accounted for 19 deaths (14%);
 - o and suicides and open verdicts accounted for 5 deaths (or 4%).
16. In 2011 the UK Armed Forces were at a 75% significantly decreased risk of dying as a result of a disease related condition compared to the UK general population and were at a 42% significantly increased risk of dying as a result of external causes of injury and poisoning compared to the UK general population.

RESULTS

Overall numbers and rates

1. **Table 1** provides details of the number of deaths, together with the corresponding age and gender standardised rates (per 100,000) by Service for the ten year period, 2002-2011.
2. In 2011, there were 132 deaths in the regular Armed Forces. Of these, 19 deaths were in the Naval Service, 98 in the Army and 15 in the RAF.

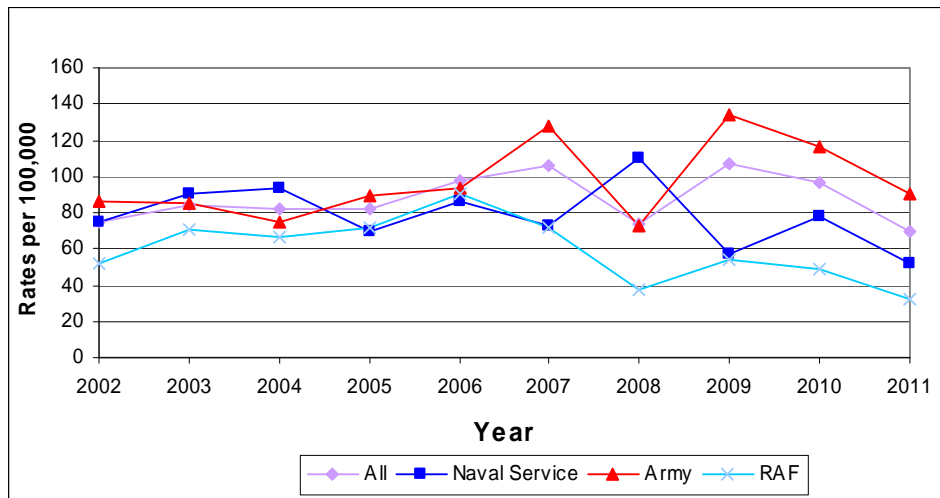
Table 1: Deaths in the regular Armed Forces: Service, Year of occurrence 2002-2011, numbers, age and gender standardised rates¹.

Year	All		Naval Service		Army		RAF	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2002	147	75	26	75	94	86	27	52
2003	177	84	37	90	101	85	39	71
2004	170	82	37	93	96	75	37	66
2005	160	82	27	70	93	89	40	72
2006	191	98	33	86	111	94	47	90
2007	204	106	27	73	145	128	32	72
2008	137	74	40	110	79	73	18	37
2009	205	107	23	57	158	134	24	54
2010	187	97	30	78	136	116	21	49
2011	132	70	19	52	98	90	15	32

¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength.

3. In 2011 the mortality rate for the UK Armed Forces was 70 per 100,000. This is a 28% reduction on the rate of 97 per 100,000 seen in 2010.
4. The highest mortality rate was observed in the Army (90 per 100,000). This was significantly higher than the mortality rate observed in the RAF (32 per 100,000) but there was no statistically significant difference when compared to the mortality rate observed in the Naval Service (52 per 100,000) (see Table 4 later in this publication).
5. **Figure 1** illustrates recent changes in overall mortality rates by Service.

Figure 1: Mortality rates¹ by Service, 2002-2011.



¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength.

6. In 2003 and 2004 there were increases in the number of deaths in the Naval Service due to three helicopter incidents involving multiple deaths during operations in the Middle East. In 2006 there was one incident involving multiple fatalities when two Royal Marines died, however, another six Royal Marines and one Navy personnel died on operations in separate incidents. Operational fatalities due to hostile action amongst Royal Marines account for the increase in the mortality rate in the Naval Service in 2008.
7. The fluctuations in Army fatality rates since 2006 were accounted for by operational fatalities in Iraq and Afghanistan. In 2011, 34 lives were lost as a result of hostile action compared to 79 in 2010 (refer to **Table 7** later in this release).
8. The increase in the RAF mortality rate from 66 per 100,000 in 2004 to 72 per 100,000 in 2005

was accounted for by a Hercules crash in Iraq in January 2005 which claimed the lives of nine RAF personnel. The similar increase from 72 to 90 per 100,000 in 2006 was accounted for by the loss of 12 RAF personnel in a Nimrod crash in Afghanistan in September 2006.

9. As several deaths occurred in the same incident on several occasions during the ten year period 2002-2011 (e.g. air transport incidents), **Table 2** provides details of the number of separate incidents and the number of individual deaths, by year of occurrence, for all accidental and violent deaths excluding any suicides.

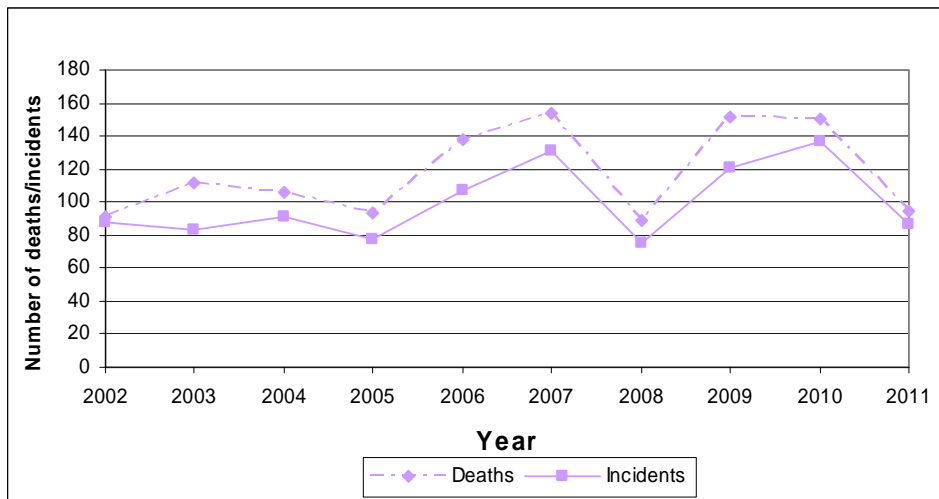
Table 2: Accidental and violent deaths (excluding suicides): By Service, 2002-2011, number of deaths and number of incidents.

Year	All		Naval Service		Army		RAF	
	Number	Incidents*	Number	Incidents	Number	Incidents	Number	Incidents
2002	91	88	13	12	61	59	17	17
2003	112	83	27	17	67	51	18	16
2004	106	91	16	13	73	62	17	16
2005	93	78	13	13	62	56	18	10
2006	138	107	23	21	87	76	28	16
2007	154	131	15	14	123	107	16	13
2008	r 89	r 75	r 27	r 22	58	51	4	3
2009	r 151	r 121	r 11	r 11	r 128	r 100	12	11
2010	r 150	r 137	22	22	118	105	r 10	r 10
2011	95	87	12	11	75	69	8	8

*In some instances, personnel from more than one Service have been killed in the same incident, therefore, the data for single Services may not add up to the total provided in the 'All incidents' column.
 'r' indicates a change in previously published data (see paragraph 47).

10. **Table 2** shows annual variations in the number of fatal incidents during the ten year period, 2002-2011 by Service. In 2011, there were 87 fatal incidents, representing a 36% decrease from the 137 incidents in 2010.
11. 41 of the 87 fatal incidents in 2011 occurred on operations, accounting for 46 deaths. This compares to 91 fatal incidents on operations (accounting for 103 deaths) in 2010.
12. In 2011, there were 46 non-operational fatal incidents (accounting for 48 deaths) compared to 46 non-operational fatal incidents (accounting for 47 deaths) in 2010.
13. These findings are illustrated in **Figure 2**, which shows both the annual changes in the number of deaths and the incidents for the total Armed Forces population.

Figure 2: Deaths and fatal incidents in the UK regular Armed Forces, 2002-2011.



14. Since 2003 there have been eight major incidents involving multiple deaths that occurred in the Middle East accounting for the deaths of 58 individuals. In the same time period, there were two other major incidents involving the deaths of ten Service personnel that were not linked to the deployment in the Middle East. Six of these ten major incidents involved aircraft.

Comparisons with the UK general population

15. In order to compare deaths among the UK regular Armed Forces with those among the

general UK population, Standardised Mortality Ratios (SMR) have been calculated for each Service overall. The year on year changes in the UK general population have been taken into account in these calculations. An SMR below, equal to, or above 100 indicates that the rate for the Armed Forces or the Service is respectively below, equal to, or higher than the rate in the general UK population (see 'Methods' on page 10 for further clarification). If the 95% confidence interval does not encompass 100, then this difference is statistically significant.

Table 3: Deaths by Service, 2002-2011¹, numbers, Standardised Mortality Ratios² (SMR) (95% confidence intervals (CI)).

Cause	All		Naval Service		Army		RAF	
	Number	SMR (95% CI)	Number	SMR (95% CI)	Number	SMR (95% CI)	Number	SMR (95% CI)
2002	147	62 (53-73)	26	53 (35-78)	94	79 (65-97)	27	38 (25-56)
2003	177	76 (66-88)	37	79 (57-108)	101	87 (72-106)	39	56 (41-77)
2004	170	76 (65-88)	37	82 (59-113)	96	86 (70-105)	37	55 (40-76)
2005	160	75 (64-88)	27	62 (41-91)	93	88 (71-107)	40	62 (46-85)
2006	191	87 (76-101)	33	73 (52-103)	111	100 (83-120)	47	75 (57-100)
2007	204	96 (84-110)	27	61 (40-89)	145	132 (112-155)	32	55 (39-78)
2008	137	65 (55-76)	40	89 (65-122)	79	72 (58-90)	18	32 (19-50)
2009	205	99 (86-113)	23	53 (33-79)	158	146 (125-170)	24	43 (28-64)
2010	187	94 (81-108)	30	71 (50-102)	136	131 (111-155)	21	39 (24-60)
2011	132	67 (56-79)	19	46 (28-72)	98	94 (78-115)	15	29 (16-48)

¹ Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year (see paragraph 62).

² Standardised mortality ratios have been age and gender standardised.

16. For the UK regular Armed Forces as a whole, the SMR in 2011 was statistically significantly lower than the UK population (SMR = 67, 95% CI: 56-79) (see **Table 3**).
17. For the years 2003, 2004, 2006, 2008 and 2010 the Naval Service was not significantly different to the UK general population. Operational incidents account for the higher SMR for the Naval Service for these years. For all other years the Naval Service SMR was statistically significantly lower than the UK population. In 2011 there was a 54% statistically significant decreased risk of dying in the Naval Service compared to the UK population (SMR = 46, 95% CI:28-72).
18. For the years 2002 and 2008, the Army SMR was statistically significantly lower than the UK general population. In 2007, 2009 and 2010, the Army was at a significantly increased risk of dying compared to the UK population. For all other years the Army was not significantly different from the UK population. In 2011, the Army was at the same risk of dying compared to the UK population (SMR = 94, 95% CI:78-115).
19. For the years 2002-2005 and 2007-2011, the RAF annual SMR was statistically significantly lower than the UK general population. In 2006, the RAF was not statistically significantly different from the UK population. In 2011 there was a 71% statistically significant decreased risk of dying in the RAF compared to the UK population. (SMR = 29, 95% CI:16-48).

Cause of death information - 2011

20. **Table 4** provides a breakdown of the main cause of death for the Armed Forces as a whole and for each of the single Services.
21. The information provided in the following tables includes all deaths that occurred in-Service both on and off duty. It is not possible from the information presented in this National Statistic release to identify those deaths that were work related that may or may not have been the result of health and safety failures.
22. Two non-regular UK Armed Forces personnel died whilst deployed on operations during 2011, both of whom were Reservists. Both died as a result of hostile action and these deaths are included in the figures presented since reservists are classified as 'regular' personnel for the duration of their overseas deployment.

Table 4: Deaths in the UK Armed Forces: Causes by Service, 2011, numbers, rates¹ and SMR^{2,3,4}.

Cause	All			Naval Service			Army			RAF		
	Number	Rate (95% CI)	SMR (95% CI)	Number	Rate (95% CI)	SMR (95% CI)	Number	Rate (95% CI)	SMR (95% CI)	Number	Rate (95% CI)	SMR (95% CI)
All	132	70 (59-83)	67 (56-79)	19	52 (32-82)	46 (28-72)	98	90 (74-110)	94 (78-115)	15	32 (18-52)	29 (16-48)
Disease-related conditions	31	16 (12-23)	25 (18-36)	4	10 (3-26)	15 (4-39)	20	21 (13-33)	33 (20-51)	7	10 (4-21)	20 (8-41)
Cancers	19	10 (6-16)	58 (35-90)	2	5 (1-18)	28 (3-101)	11	12 (6-21)	70 (35-125)	6	9 (3-20)	59 (22-129)
Diseases of the circulatory system	9	5 (2-9)	28 (13-53)	2	5 (1-19)	28 (3-101)	6	6 (2-14)	39 (14-85)	1	1 (0-7)	10 (0-57)
Other	3	2 (0-5)	5 (1-15)	0	-	-	3	3 (1-9)	10 (2-29)	0	-	-
External causes of injury and poisoning	100	53 (44-64)	142 (117-173)	15	42 (24-69)	107 (60-176)	77	68 (54-85)	189 (151-236)	8	21 (9-42)	51 (22-101)
Deaths due to accidents	48	25 (19-34)	131 (98-173)	3	9 (2-26)	41 (9-121)	38	34 (25-47)	176 (128-243)	7	19 (8-38)	88 (35-181)
Land Transport Accidents	25	13 (9-20)	186 (120-274)	2	6 (1-21)	77 (9-278)	21	19 (12-29)	257 (159-393)	2	5 (1-19)	74 (9-268)
Other	23	12 (8-18)	99 (63-148)	1	3 (0-17)	21 (1-119)	17	15 (9-24)	127 (74-204)	5	13 (4-31)	95 (31-222)
Deaths due to violence⁴	47	25 (19-33)	-	9	26 (12-49)	-	37	32 (23-44)	-	1	3 (0-14)	-
Hostile Action ³	43	23 (17-31)	-	8	23 (10-46)	-	34	29 (21-41)	-	1	3 (0-14)	-
Other	4	2 (1-5)	147 (40-376)	1	3 (0-15)	187 (5-1042)	3	2 (0-7)	186 (38-543)	0	-	-
Suicide and Open verdicts	5	3 (1-6)	16 (5-38)	3	7 (2-22)	48 (10-140)	2	2 (0-6)	11 (1-41)	0	-	-
Cause not currently available	1	1 (0-3)	25 (1-141)	0	-	-	1	1 (0-5)	47 (1-260)	0	-	-

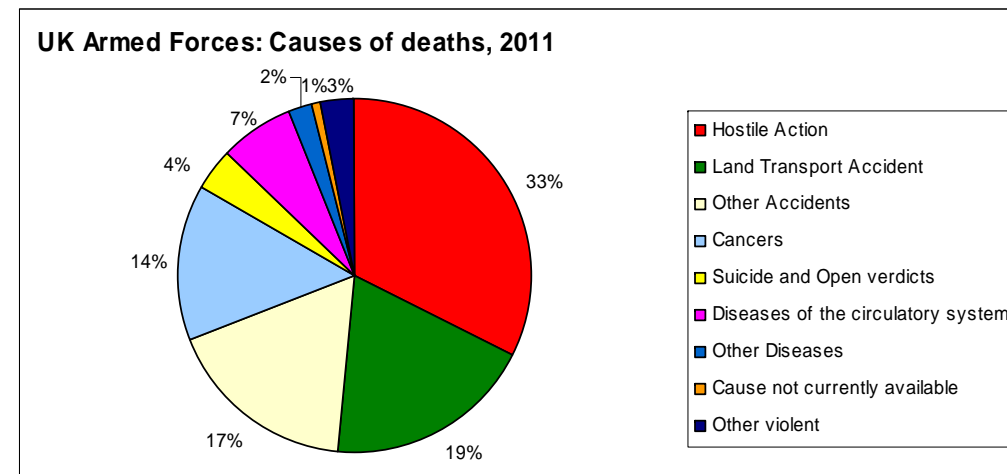
¹Rates have been standardised to the 2011 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

²Standardised mortality ratios have been age and gender standardised.

³No comparisons between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

⁴An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

Figure 3: UK Armed Forces: Causes of deaths, 2011.



*Percentages may not add up to 100% due to rounding.

Deaths due to disease

23. In 2011, 31 UK Armed Forces deaths (23%) were caused by disease-related conditions, of which 19 were due to cancers, nine due to circulatory system disorders and three due to other causes (**Table 4** and **Figure 3**).
24. In 2011, the rate of deaths due to disease related conditions was 16 per 100,000 (95% CI:12-23).
25. In 2011, the UK Armed Forces were at a 75% statistically significant decreased risk of dying of a disease related condition compared to members of the UK general population (SMR = 25, 95% CI:18-36).

Deaths due to external causes of injury and poisoning

26. In 2011, 100 deaths (76%) were due to external causes of injury and poisoning, a rate of 53 per 100,000 (95% CI: 44-64) (**Table 4** and **Figure 3**).
27. In 2011 the UK Armed Forces were at a 42% statistically significant increased risk of dying as a result of external cause of injury and poisoning compared to the UK general population (SMR = 142, 95% CI: 117-173).
28. If hostile action deaths are excluded from the SMR calculation for deaths due to external causes of injury and poisoning, the UK Armed Forces had the same risk of dying as a result of external causes of injury and poisoning compared to the UK population (SMR=81, 95% CI:62-105).

Deaths due to accidents

29. In 2011, 48 deaths (36%) were caused by accidents (**Table 4** and **Figure 3**).
30. Land Transport Accidents were the second largest cause of death in the Armed Forces overall with 25 deaths (19% of all deaths), two in the Naval Service, 21 in the Army and two in the RAF.
31. The highest mortality rate for LTA was observed among the Army (19 per 100,000, 95% CI: 12-29). This was not significantly higher than the mortality rate observed among either the Naval Service (6 per 100,000, 95% CI: 1-21) or the RAF (5 per 100,000, 95% CI: 1-19).
32. In 2011, the UK Armed Forces were at 86% statistically significant increased risk of dying as a result of a Land Transport Accident compared to the UK general population (SMR = 186, 95% CI:120-274). Army personnel were at a significantly increased risk of 157% of dying as a result of an LTA compared to the UK general population (SMR = 257, 95% CI: 159-393). Naval Service and RAF personnel had the same risk of dying as a result of a Land Transport Accident compared to the UK general population.
33. Of the 25 land transport accident deaths reported in **Table 4**, 23 deaths (equivalent to 12 per 100,000 personnel) were the result of road traffic accidents.

Deaths due to violence

34. In 2011, 47 deaths (36%) were due to violent causes, the single largest cause of death (**Table 4** and **Figure 3**).
35. Of the 47 deaths, nine were in the Naval Service, 37 in the Army and one in the RAF. (**Table 4** and **Figure 3**). Of the 47 deaths, 43 were a result of hostile action.
36. The mortality rate for deaths due to hostile action was 23 per 100,000 (**Table 4**). In 2011 the Naval Service rate was 23 per 100,000, the Army rate was 29 per 100,000 and the RAF rate was 3 per 100,000.
37. No comparisons were made between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action as there is no equivalent cause of death in the UK population.

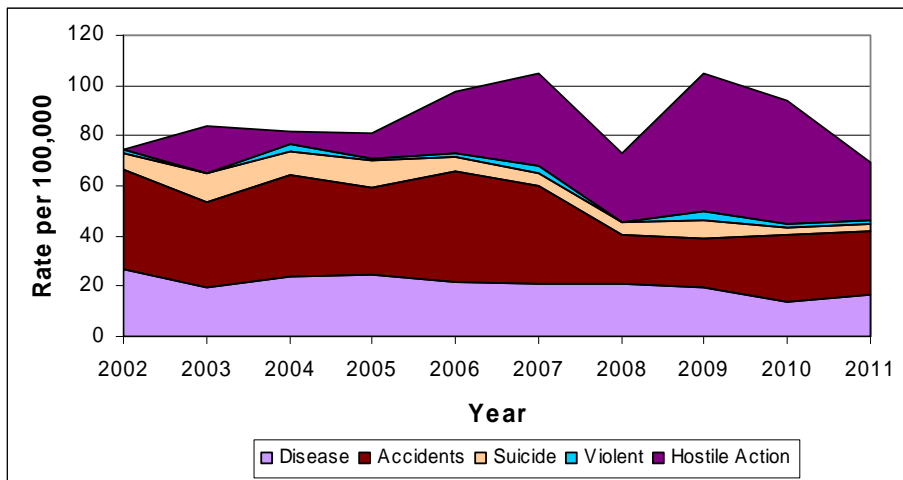
Deaths given either suicide or open verdicts

38. As at 13 February 2012 there were five coroner-confirmed suicides for deaths in 2011 (**Table 4**). It is possible that the suicide data presented here may be revised when the results of any outstanding inquests are known.

Time trends: Cause of death

39. The only cause of death that has shown an increasing trend during the period 2002 to 2011 was hostile action which has varied from 0 per 100,000 (in 2002) to a high of 55 per 100,000 (in 2009) (Table 5 and Figure 4).

Figure 4: Deaths in the regular Armed Forces: Cause, 2002-2011, rates¹.



¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength.

40. **Tables 5-8** provide a breakdown of the main causes of death for the UK Armed Forces from 2002-2011 by Service. Information is presented as numbers, rates and standardised mortality ratios (SMR).

Standardised mortality ratios (SMR)

41. Throughout the last ten years, the UK regular Armed Forces have been at a significantly decreased risk of dying as a result of disease related condition compared to the UK general population (**Table 5**).
42. For the period 2002 to 2007 and 2010 the UK Armed Forces were at a significantly increased risk of dying as a result of accidents compared to the UK general population. For the years 2008, 2009 and 2011 there was no significant difference in deaths due to accidents between members of the UK Armed Forces and the UK general population (2011: SMR = 131, 95% CI:98-173).
43. With the exception of 2008, the UK regular Armed Forces have been at a significantly increased risk of dying as a result of land transport accidents compared to the UK general population throughout the last ten years (2011 : SMR = 186, 95% CI: 120-274).
44. With the exception of 2008 (when there were no violent related deaths in the UK Armed Forces), the UK Armed Forces showed no significant difference with the UK general population for the occurrence of deaths related to violence, excluding hostile action deaths. The number of deaths due to violence related causes remains small throughout the period 2002-2011 and therefore the calculated SMR are subject to variation.
45. Between 2002 and 2011, the UK Armed Forces have been at a significantly decreased risk of dying as a result of a suicide compared to the UK general population. Please note that this comparison includes deaths among males and females. The Statistical Notice "Suicide and Open Verdict deaths in the UK Armed Forces" provides comparisons to the UK general population for males only.
46. The low SMR for UK regular Armed Forces deaths as a result of a disease related condition may partially be explained by the 'healthy worker effect' often observed in occupational studies. This is deemed to occur when 'workers' are found to have lower mortality or other adverse health outcome rates than the general population due to the fact that certain groups of people are excluded from employment, particularly those who are ill or who have disabilities. This is to be expected in studies of Armed Forces mortality, as they are generally a highly selected group of individuals who are likely to have higher than usual levels of fitness and possibly lower levels of ill-health. A number of other factors specific to Service life both on and off duty may play a role in the increased risk of UK Armed Forces dying as a result of an accident compared to the UK population.

Table 5: Deaths in the UK Armed Forces: Causes, 2002-2011, numbers, rates¹ and standardised mortality ratios^{2,3,4,5,6}

Cause	Numbers											Rates											SMR										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011			
All	147	177	170	160	191	204	137	205	187	132	75	84	82	82	98	106	74	107	97	70	62	76	76	75	87	96	65	99	94	67			
Disease-related conditions	41	40	43	44	40	38	38	36	26	31	27	19	24	24	21	21	21	20	14	16	29	29	32	33	31	30	30	29	21	25			
Cancers	19	18	21	23	25	27	r 23	19	16	19	12	8	13	13	14	15	13	10	9	10	51	50	58	67	72	81	r 70	58	48	58			
Diseases of the circulatory system	19	14	18	16	r 14	7	r 10	9	7	9	12	7	9	8	7	4	6	5	4	5	51	38	50	45	r 41	22	r 30	28	22	28			
Other	3	8	4	5	1	4	r 5	8	3	3	2	5	2	3	<1	2	3	5	2	2	4	12	6	8	2	7	r 8	13	5	5			
External causes of injury and poisoning	106	137	126	115	150	164	r 98	165	r 156	100	48	65	58	57	76	84	52	85	80	53	116	154	148	148	r 178	203	r 122	208	217	142			
Deaths due to accidents	88	71	89	71	88	77	r 37	r 37	52	48	40	34	41	35	45	39	19	19	27	25	197	160	213	179	202	171	r 85	r 86	138	131			
Land Transport Accidents	64	50	61	53	61	51	26	28	36	25	28	24	28	26	30	26	13	14	18	13	236	179	242	225	239	226	135	162	258	186			
Other	24	21	28	18	27	26	r 11	r 9	16	23	12	10	13	10	14	13	6	5	8	12	137	127	170	112	150	116	r 46	r 35	68	99			
Deaths due to violence⁴	3	41	17	22	50	77	52	114	98	47	1	19	8	11	26	40	28	58	50	25	-	-	-	-	-	-	-	-	-	-			
Hostile Action ³	0	40	11	21	48	73	52	107	95	43	-	19	5	10	25	37	28	55	49	23	-	-	-	-	-	-	-	-	-	-			
Other	3	1	6	1	2	4	0	7	3	4	1	<1	3	<1	1	2	-	4	1	2	76	28	139	30	52	118	-	274	108	147			
Suicide and Open verdicts⁶	15	25	20	22	r 12	10	9	r 14	6	5	7	12	9	11	6	5	5	7	3	3	35	61	52	63	r 33	31	27	r 42	19	16			
Cause not currently available	0	0	1	1	1	2	1	4	r 5	1	-	-	<1	1	1	1	1	2	3	1	-	-	26	28	24	48	27	105	125	25			

¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

²Standardised mortality ratios have been age and gender standardised.

³No comparisons between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

⁴An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

⁵Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year.

⁶One death in 2003 given an open verdict by the coroner has been included as a hostile action death and not a suicide and open verdict death. There was one death in 2003 returned as an open verdict by the Procurator Fiscal for Scotland, which has been classified as an RTA, as it was an incident involving multiple deaths and an MOD Board of Inquiry found all the deaths to be the result of an operational accident.

'r' indicates a change in previously published data (see paragraph 47).

Table 6: Deaths in the Naval Service: Causes, 2002-2011, numbers, rates¹ and standardised mortality ratios^{2,3,4,5}

Cause	Numbers											Rates											SMR										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011			
All	26	37	37	27	33	27	40	23	30	19	75	90	93	70	86	73	110	57	78	52	53	79	82	62	73	61	89	53	71	46			
Disease-related conditions	9	7	19	9	10	8	12	10	4	4	32	18	48	24	27	21	31	23	11	10	31	24	68	33	36	29	43	37	15	15			
Cancers	5	3	9	4	5	5	r 6	5	2	2	14	8	25	12	12	12	15	12	6	5	65	40	123	57	69	71	r 85	71	28	28			
Diseases of the circulatory system	3	4	8	4	5	2	4	3	1	2	13	10	18	10	15	4	12	7	3	5	38	51	106	53	68	28	54	43	14	28			
Other	1	0	2	1	0	1	r 2	2	1	0	5	-	5	2	-	4	5	4	3	-	7	-	16	8	-	8	r 15	16	8	-			
External causes of injury and poisoning	17	30	18	18	23	19	r 27	13	25	15	43	73	45	46	59	53	75	34	65	42	93	171	109	118	137	117	r 166	81	173	107			
Deaths due to accidents	13	13	15	12	15	10	r 11	3	7	3	35	30	37	32	38	28	30	7	18	9	148	151	187	156	175	112	r 126	r 35	93	41			
Land Transport Accidents	7	10	10	7	10	6	8	2	3	2	18	22	24	16	24	16	21	4	8	6	134	189	210	156	204	137	213	60	110	77			
Other	6	3	5	5	5	4	r 3	1	4	1	17	8	14	15	14	12	8	3	10	3	169	90	152	156	137	88	r 61	r 19	84	21			
Deaths due to violence⁴	0	14	1	1	8	5	16	8	15	9	-	35	3	3	21	14	46	23	39	26	-	-	-	-	-	-	-	-	-	-			
Hostile Action ³	0	14	0	0	8	5	16	7	15	8	-	35	-	-	21	14	46	20	39	23	-	-	-	-	-	-	-	-	-	-	-		
Other	0	0	1	1	0	0	0	1	0	1	-	-	3	3	-	-	-	3	-	3	-	-	-	121	152	-	-	-	198	-	187		
Suicide and Open verdicts	4	3	2	5	0	4	0	r 2	3	3	9	8	5	11	-	10	-	4	7	7	46	36	26	72	-	60	-	r 29	47	48			
Cause not currently available	0	0	0	0	0	0	r 1	0	1	0	-	-	-	-	-	-	-	3	-	2	-	-	-	-	-	-	r 127	-	119	-			

¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

²Standardised mortality ratios have been age and gender standardised.

³No comparisons between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

⁴An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

⁵Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year.

'r' indicates a change in previously published data (see paragraph 47).

Table 7: Deaths in the Army: Causes, 2002-2011, numbers, rates¹ and standardised mortality ratios^{2,3,4,5,6}

Cause	Numbers											Rates											SMR										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011			
All	94	101	96	93	111	145	79	158	136	98	86	85	75	89	94	128	73	134	116	90	79	87	86	88	100	132	72	146	131	94			
Disease-related conditions	22	19	7	18	r 13	14	r 14	17	r 13	20	31	20	5	23	14	17	16	18	14	21	34	29	11	29	r 21	23	r 23	28	21	33			
Cancers	10	7	2	7	9	9	8	10	8	11	16	6	2	9	10	12	9	10	9	12	61	43	12	46	56	58	52	65	51	70			
Diseases of the circulatory system	11	4	4	8	r 4	4	r 4	4	r 4	6	15	4	2	9	4	4	5	5	4	6	70	25	25	52	r 26	27	r 26	27	26	39			
Other	1	8	1	3	0	1	2	3	1	3	1	9	1	4	-	1	2	3	1	3	3	25	3	10	-	3	6	10	3	10			
External causes of injury and poisoning	72	82	89	75	r 97	129	65	138	r 120	77	55	65	70	66	79	109	57	112	99	68	142	166	189	173	r 204	278	142	304	292	189			
Deaths due to accidents	58	43	57	50	48	56	25	r 23	36	38	43	35	45	44	39	47	21	19	30	34	230	171	242	221	191	213	99	r 92	165	176			
Land Transport Accidents	44	29	42	38	40	38	17	19	28	21	32	24	33	32	32	31	14	15	23	19	277	177	284	272	261	277	146	181	335	257			
Other	14	14	15	12	8	18	8	r 4	8	17	11	11	12	12	6	16	7	4	7	15	149	159	170	139	81	143	59	r 27	59	127			
Deaths due to violence⁴	3	24	16	12	39	67	33	105	82	37	3	20	12	10	33	56	30	85	67	32	-	-	-	-	-	-	-	-	-	-			
Hostile Action ³	0	24	11	12	38	63	33	99	79	34	-	20	8	10	32	52	30	80	64	29	-	-	-	-	-	-	-	-	-	-			
Other	3	0	5	0	1	4	0	6	3	3	3	-	4	-	1	4	-	5	2	2	135	-	203	-	45	202	-	400	183	186			
Suicide and Open verdicts⁵	11	15	16	13	r 10	6	7	r 10	2	2	10	11	13	12	7	6	6	8	2	2	48	67	76	69	r 49	33	r 37	53	11	11			
Cause not currently available	0	0	0	0	1	2	r 0	3	r 3	1	-	-	-	-	1	1	-	3	3	1	-	-	-	-	47	90	r -	147	140	47			

¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

²Standardised mortality ratios have been age and gender standardised.

³No comparisons between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

⁴An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

⁵Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year.

⁶One death in 2003 given an open verdict by the coroner has been included as a hostile action death and not a suicide and open verdict death. There was one death in 2003 returned as an open verdict by the Procurator Fiscal for Scotland, which has been classified as an RTA, as it was an incident involving multiple deaths and an MOD Board of Inquiry found all the deaths to be the result of an operational accident.

'r' indicates a change in previously published data (see paragraph 47).

Table 8: Deaths in the RAF: Causes, 2002-2011, numbers, rates¹ and standardised mortality ratios^{2,3,4,5}

Cause	Numbers											Rates											SMR										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011			
All	27	39	37	40	47	32	18	24	21	15	52	71	66	72	90	72	37	54	49	32	38	56	55	62	75	55	32	43	39	29			
Disease-related conditions	10	14	17	17	17	16	12	9	9	7	17	20	27	28	29	29	23	16	17	10	21	30	38	39	41	41	32	25	25	20			
Cancers	4	8	10	12	11	13	9	4	6	6	7	10	17	19	19	25	18	6	12	9	31	63	79	99	95	121	87	39	58	59			
Diseases of the circulatory system	5	6	6	4	5	1	2	2	r 2	1	9	9	9	7	9	2	3	4	3	1	37	45	46	32	43	9	19	20	20	10			
Other	1	0	1	1	1	2	1	3	1	0	2	-	2	1	1	3	1	5	3	-	5	-	5	5	6	12	6	18	6	-			
External causes of injury and poisoning	17	25	19	22	30	16	6	14	r 11	8	35	51	37	43	60	43	14	37	29	21	74	113	89	114	150	87	33	79	68	51			
Deaths due to accidents	17	15	17	9	25	11	1	11	r 9	7	35	31	34	21	52	27	1	28	24	19	159	141	168	95	253	112	11	116	109	88			
Land Transport Accidents	13	11	9	8	11	7	1	7	5	2	27	21	19	19	25	18	1	18	15	5	214	177	158	154	206	155	26	202	176	74			
Other	4	4	8	1	14	4	0	4	r 4	5	8	10	15	2	27	10	-	10	9	13	86	91	181	23	307	75	-	66	74	95			
Deaths due to violence⁴	0	3	0	9	3	5	3	1	1	1	-	5	-	15	5	16	7	3	3	3	-	-	-	-	-	-	-	-	-	-			
Hostile Action ³	0	2	0	9	2	5	3	1	1	1	-	3	-	15	3	16	7	3	3	3	-	-	-	-	-	-	-	-	-	-			
Other	0	1	0	0	1	0	0	0	0	0	-	2	-	-	1	-	-	-	-	-	-	118	-	-	116	-	-	-	-	-			
Suicide and Open verdicts	0	7	2	4	2	0	2	2	1	0	-	15	3	7	4	-	6	5	2	-	-	66	20	44	22	-	25	26	14	-			
Cause not currently available	0	0	1	1	0	0	0	1	1	0	-	-	2	1	-	-	-	2	3	-	-	-	92	97	-	-	-	102	99	-			

¹Rates have been age and gender standardised to the 2011 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

²Standardised mortality ratios have been age and gender standardised.

³No comparisons between members of the UK Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

⁴An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

⁵Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year.

'r' indicates a change in previously published data (see paragraph 47).

Changes to previously published data

47. In preparing this document, DASA carried out a review of the data recorded on deaths to Service personnel to ensure the highest accuracy of information and that all cases previously recorded as 'awaiting verdict' have been followed up with the ONS and other authorities. There have been 13 amendments to the classifications given to the cause of death previously reported :
- o 2006 - one record has been amended from Other Accident to Suicide and one from Circulatory Disease to Other Accident.
 - o 2008 - one record has been amended from Cancer to Other Disease, one from Other Accident to Cause Unavailable and one from Cause Unavailable to Circulatory Disease.
 - o 2009 - four records have been amended from Other Accident to Suicide.
 - o 2010 - one record has been amended from Other Accident to Suicide, one from Cause Unavailable to Circulatory Disease, one from Cause Unavailable to Other Accident and one from Circulatory Disease to Other Accident.

METHODS

48. DASA receive weekly notifications of all regular Armed Forces deaths from the Joint Casualty and Compassionate Cell (formerly the single Service casualty cells). DASA also receive cause of death information from military medical sources in the single Services.
49. The information on deaths presented here are for the regular Armed Forces, including all trained and untrained personnel and non-regulars who died on deployment are also included since they are classified as 'regular' personnel for the duration of their overseas deployment.
50. The data here exclude the Home Service of the Royal Irish Regiment, full time reservists, Territorial Army and Naval Activated Reservists since DASA do not receive routine notifications of all deaths among reservists and non-regulars, and because reliable denominator data to produce interpretable statistics are not available.
51. The Naval Service includes both the Royal Navy and the Royal Marines.
52. To record information on cause and circumstances of death, DASA uses the World Health Organisation's International Statistical Classification of Diseases and Health-related Problems 10th revision (ICD-10). In addition, DASA also record the casualty reporting categories used by the Joint Casualty and Compassionate Cell, used for reporting to the Chain of Command and for notifying the next of kin.
53. DASA have included the Joint Casualty Compassionate Cell categories of killed in action and died of wounds which together provide information on the number of Service personnel who have died on operations as a result of hostile action. The term 'killed in action' is used when a battle casualty has died outright or as a result of injuries before reaching a medical facility, whilst 'died of wounds' refers to battle casualties who died of wounds or other injuries after reaching a medical treatment facility.
54. In line with the definitions in ICD-10 a land transport accident is defined as any accident involving a device that has been designed for, or is being used at the time for, the conveyance of either goods or people from one place to another on land. The scope of this definition covers incidents that occur on and off the public highways and incidents that involve non-motorised forms of transport. The definition therefore includes all military specific vehicles irrespective of where the accident took place. Road traffic accidents refer only to accidents on a public road.
55. DASA regularly check all deaths for information on coroner's verdicts (England & Wales) and the results of investigations by the Procurator Fiscal for Scotland where possible. For Northern Ireland, DASA liaise with the Northern Ireland Statistics and Research Agency (NISRA) who handle the official information on behalf of the Northern Ireland Office. In this notice, all these sources of information are referred to as 'coroner's verdicts'. There is an obligation for all accidental deaths and those resulting from violent action to be referred to these officials. Inquests are usually held within a few months of the death, but occasionally a few years may elapse. Therefore some recent deaths may not have clearly defined cause information. Where this is the case, deaths are included with accidental deaths in **Tables 4, 5, 6, 7 and 8**.
56. In order to compare time trends and to take into account the different age and gender structures of their respective strengths, rates have been age and gender standardised. In order to facilitate comparisons with previously published reports data has been standardised to the 2011 Armed Forces population.
57. The 95% confidence interval for a rate provides the range of values within which we expect to find the real value of the indicator under study, with a probability of 95%. If a 95% confidence interval around a rate excludes the comparison value, then a statistical test for the difference between the two values would be significant at the 0.05 level. If two confidence intervals do not overlap, a comparable statistical test would always indicate a statistically significant difference.
58. The effects of standardisation may, on occasion, lead to unexpected results particularly where small numbers are involved. For example, in 2005, the Army age and gender-standardised mortality rate had increased compared to 2004 despite a reduction in the actual number of deaths. Where several years' data are presented rates may fluctuate from one year to the next owing to the small number of cases

involved and to relative changes in strengths, although effects of the latter are less noticeable. Standardised rates can also be strongly influenced by variations in the age and gender structure of the deaths concerned, even when totals may remain the same.

59. In 2011, DASA undertook a review of all Armed Forces personnel data from the Joint Personnel Administration (JPA) system. This resulted in very small changes for Armed Forces strength data from April 2006 to April 2009 (inclusive). In previous publications of this report all JPA data was considered provisional but this annual publication incorporates the finalised JPA strengths figures for the first time (for data up till April 2009). DASA is continuing to review JPA data post April 2009 and aims to finalise this data in due course.
60. To enable comparisons with deaths in the UK population, Standardised Mortality Ratios (SMR), adjusted for age, gender and year, were calculated. An SMR is defined as the ratio of the number of deaths *observed* in the study population to the number of deaths *expected* if the study population had the same age- and gender-specific rates as the standard population in each specific year multiplied by 100 by convention. An SMR over (or under) 100 indicates a higher (or lower) number of observed deaths than expected (based on standard population rates). An SMR of 100 implies that there is no difference in rates when comparing the UK Regular Armed Forces population with the UK population.
61. The 95% confidence interval for a SMR provides the range of values within which we expect to find the real value of the indicator under study, with a probability of 95%. If the confidence interval for an SMR does not include 100, the result is deemed to be statistically significant.
62. Deaths data in England and Wales are supplied by and used with the permission of ONS. Deaths in Northern Ireland are supplied by and used with the permission of NISRA and GRO supply deaths in Scotland.
63. In 2006 the ONS changed from reporting the number of deaths that occurred in each year to the number of deaths that were registered in each year. Therefore the UK death data used by DASA up to and including 2005 is based on deaths that occurred in the year. The UK death data used by DASA for 2007 onwards is based on deaths that were registered in the year. To produce the UK death data for 2006 DASA have followed advice provided by the ONS and use deaths that both occurred and were registered in year.
64. The UK general population data for 2011 were not available for this report to calculate standard mortality ratios (SMRs), therefore, DASA has used the 2010 data as an estimate for the 2011 figures as there is little year on year variation for the UK figures. Thus, any patterns reported here may be subject to minor fluctuations when the 2011 data becomes available.
65. Where trends over time have been presented, an update on previous data published has been provided in the section '**Changes to previously published data**' and annotated with an 'r' to indicate a revision has been made.