



## NATIONAL STATISTICS NOTICE



**28 March 2013**

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## DEATHS IN THE UK REGULAR ARMED FORCES 2012

### INTRODUCTION

1. This annual National Statistical Notice provides summary statistics on deaths whilst in Service in 2012 among the UK regular Armed Forces, and trends over the ten year period, 2003-2012. This information updates previous notices and includes new data for 2012.
2. The information shown has been compiled from data held by Defence Statistics on 4 March 2013.
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 2003-2012 (**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 the Statistical Notice, "Suicide and Open Verdict deaths in the UK regular Armed Forces 1984-2012", also released 28 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 '**Data Sources & Methods**'.

### KEY POINTS

7. In 2012, a total of 129 deaths occurred among the UK regular Armed Forces, of which 19 were serving in the Naval Service, 95 in the Army, and 15 in the RAF.
8. In 2012 the overall mortality rate was 71 per 100,000, whilst in the Naval Service the rate was 53, the Army 89 and the RAF 43 per 100,000 strength.
9. During the ten year period 2003-2012, 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 increased from 52 per 100,000 in 2011 to 53 per 100,000 in 2012.
11. The Army mortality rate decreased from 90 per 100,000 in 2011 to 89 per 100,000 in 2012.
12. The RAF mortality rate increased from 32 per 100,000 in 2011 to 43 per 100,000 in 2012. The total number of deaths in the RAF remained the same for 2012 as in 2011 (15 deaths) but a reduction in the number of RAF personnel on strength, particularly in the under 20 age group has led to an increase in mortality rate.
13. Overall, in 2012 the UK regular Armed Forces were at a significantly lower risk of dying compared to the UK general population (SMR = 71, 95% CI: 60 – 85).
14. In 2012, 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 2012, for the regular UK Armed Forces:
  - o Hostile action was the single largest cause of death: 40 deaths (31%);
  - o Cancer was the second largest cause of death: 27 deaths (21%);
  - o Other accidents accounted for 26 deaths (20%);
  - o Land transport accidents (LTA) accounted for 15 deaths (12%);
  - o and suicides and open verdicts accounted for 7 deaths (5%).
16. In 2012 the UK Armed Forces were at a 65% significantly decreased risk of dying as a result of a disease related condition compared to the UK general population but were not at a statistically significant different 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 strength) by Service for the ten year period, 2003-2012.
2. In 2012, there were 129 deaths in the regular Armed Forces. Of these, 19 deaths were in the Naval Service, 95 in the Army and 15 in the RAF.

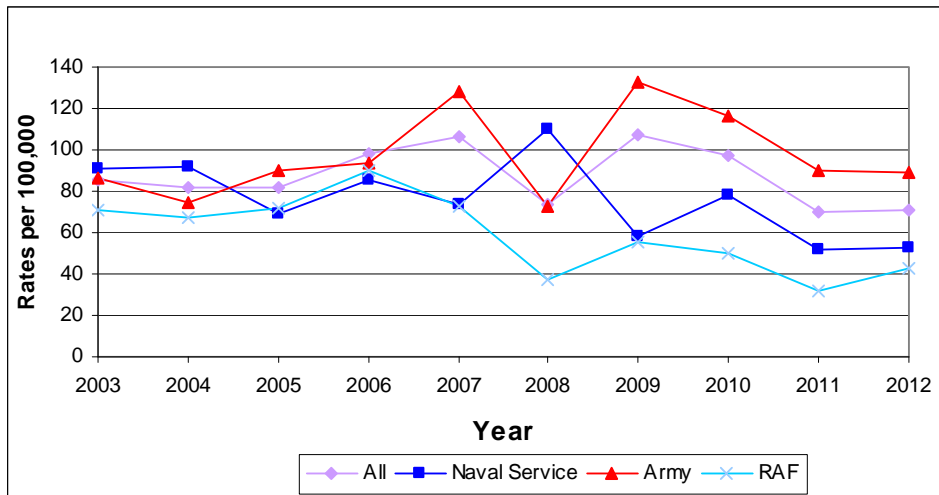
**Table 1: Deaths in the regular Armed Forces: Service, Year of occurrence 2003-2012, numbers, age and gender standardised rates<sup>1</sup>.**

Year	All		Naval Service		Army		RAF	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
2003	177	85	37	91	101	86	39	71
2004	170	82	37	92	96	75	37	67
2005	160	82	27	69	93	90	40	72
2006	191	98	33	85	111	94	47	90
2007	204	106	27	74	145	128	32	73
2008	137	74	40	110	79	73	18	37
2009	205	107	23	58	158	133	24	55
2010	187	97	30	78	136	116	21	50
2011	132	70	19	52	98	90	15	32
<b>2012</b>	<b>129</b>	<b>71</b>	<b>19</b>	<b>53</b>	<b>95</b>	<b>89</b>	<b>15</b>	<b>43</b>

<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength.

3. In 2012 the mortality rate for the UK Armed Forces was 71 per 100,000. This was a 1% increase on the 10 year low rate of 70 per 100,000 seen in 2011.
4. The highest mortality rate was observed in the Army (89 per 100,000). This was significantly higher than the mortality rate observed in the RAF (43 per 100,000) but there was no statistically significant difference when compared to the mortality rate observed in the Naval Service (53 per 100,000) (see **Table 4** later in this publication). The total number of deaths in the RAF remained the same for 2012 as in 2011 (15 deaths) but a reduction in the number of RAF personnel on strength, particularly in the under 20 age group has led to an increase in mortality rate from 32 per 100,000 in 2011 to 43 per 100,000 in 2012 (see paragraph 62 for further details).
5. **Figure 1** illustrates recent changes in overall mortality rates by Service.

**Figure 1: Mortality rates<sup>1</sup> by Service, 2003-2012.**



<sup>1</sup>Rates have been age and gender standardised to the 2012 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 2012, 36 lives were lost as a result of hostile action (refer to **Table 7** later in this publication).
8. The increase in the RAF mortality rate from 67 per 100,000 in 2004 to 72 per 100,000 in 2005 was accounted for by a Hercules crash in Iraq 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 multiple deaths occurred in the same incident on several occasions during the ten year period 2003-2012 (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, 2003-2012, deaths and incidents, numbers.**

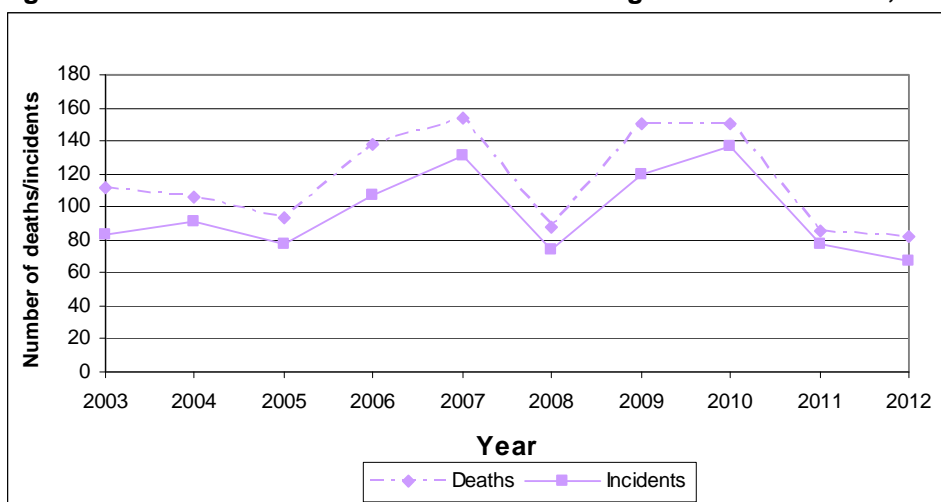
Year	All		Naval Service		Army		RAF	
	Number	Incidents*	Number	Incidents	Number	Incidents	Number	Incidents
2003	112	83	27	17	67	51	18	16
2004	106	91	16	13	73	62	17	16
2005	93	78	13	13	62	56	18	10
2006	138	107	23	21	87	76	28	16
2007	154	131	15	14	123	107	16	13
2008	r 88	r 74	27	22	r 57	r 50	4	3
2009	r 150	r 120	r 10	r 10	128	100	12	11
2010	150	137	22	22	118	105	10	10
2011	r 86	r 78	r 11	r 10	r 68	r 62	r 7	r 7
<b>2012</b>	<b>82</b>	<b>67</b>	<b>9</b>	<b>9</b>	<b>63</b>	<b>53</b>	<b>10</b>	<b>8</b>

\*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 48).

10. **Table 2** shows annual variations in the number of fatal incidents during the ten year period, 2003-2012 by Service. In 2012, there were 67 fatal incidents, representing a 14% decrease from the 78 incidents in 2011.
11. In 2012, 29 of the 67 fatal incidents occurred on operations, accounting for 42 deaths. In comparison, there were 41 fatal incidents on operations (accounting for 47 deaths) in 2011. The increase in the ratio of incidents to deaths in 2012 is partly accounted for by one incident, involving a Warrior armoured vehicle striking an IED which resulted in the loss of six lives in 2012 in Afghanistan.
12. In 2012, there were 38 non-operational fatal incidents (accounting for 40 deaths) compared to 37 non-operational fatal incidents (accounting for 39 deaths) in 2011.
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, 2003-2012, numbers.**



14. Since 2003 there have been thirteen major incidents (where four or more deaths occurred) involving multiple deaths that occurred in the Middle East accounting for the deaths of 81 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. Seven of these fifteen 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 'Data Sources & Methods' on page 12 for further clarification). If the 95% confidence interval does not encompass 100, then this difference is statistically significant. The width of the confidence interval gives us some idea about how uncertain we are about the reported statistic. The small numbers in some of the sub-group analysis presented in this notice may result in wide confidence intervals in the corresponding rate or ratios. The impact of this is that the range in which we expect the true value of that statistic to lie is large and there is a risk of misinterpreting a chance occurrence for a true finding (see paragraphs 61 and 64).

**Table 3: Deaths by Service, 2003-2012<sup>1</sup>, numbers, Standardised Mortality Ratios<sup>2</sup> (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)
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	r 70 (59-83)	19	r 48 (29-75)	98	r 100 (82-121)	15	r 30 (17-50)
2012	129	71 (60-85)	19	50 (30-78)	95	99 (81-121)	15	32 (18-52)

<sup>1</sup> Change in how UK deaths collated, prior to 2006 includes deaths occurred in year, post 2006 includes deaths registered in year (see paragraph 66).

<sup>2</sup> Standardised mortality ratios have been age and gender standardised.

'r' indicates a change in previously published data (see paragraph 48).

16. In 2012, the UK regular Armed Forces were at a statistically significantly lower risk of dying than the UK general population (SMR = 71, 95% CI: 60-85) (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 with the exception of 2004 which saw a rise in disease

related conditions. For all other years the Naval Service SMR was statistically significantly lower than the UK population. In 2012 there was a 50% statistically significant decreased risk of dying in the Naval Service compared to the UK population (SMR = 50, 95% CI:30-78).

18. In 2008, the Army SMR was statistically significantly lower risk of dying 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, this can be accounted by the increase in the number of operational deaths in Iraq and Afghanistan. For all other years the Army was not at a significantly different risk of dying from the UK population, with an SMR of 99 (95% CI:81-121) in 2012.
19. In 2006, the RAF was not at a statistically significantly different risk of dying from the UK population. For all other years, the RAF annual SMR was statistically significantly lower than the UK general population. In 2012 there was a 68% statistically significant decreased risk of dying in the RAF compared to the UK population. (SMR = 32, 95% CI:18-52).

#### **Cause of death information - 2012**

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. One non-regular member of the UK Armed Forces, a Reservist, died whilst deployed on operations during 2012 as a result of hostile action. This death is 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, 2012, numbers, rates<sup>1</sup> and SMR<sup>2,3,4</sup>.**

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)
<b>All</b>	<b>129</b>	<b>71 (60-84)</b>	<b>71 (60-85)</b>	<b>19</b>	<b>53 (32-83)</b>	<b>50 (30-78)</b>	<b>95</b>	<b>89 (73-109)</b>	<b>99 (81-121)</b>	<b>15</b>	<b>43 (24-71)</b>	<b>32 (18-52)</b>
<b>Disease-related conditions</b>	<b>37</b>	<b>20 (15-28)</b>	<b>35 (26-49)</b>	<b>9</b>	<b>24 (11-46)</b>	<b>40 (18-75)</b>	<b>24</b>	<b>27 (17-40)</b>	<b>46 (30-69)</b>	<b>4</b>	<b>6 (2-16)</b>	<b>13 (4-34)</b>
Cancers	27	15 (10-22)	86 (57-125)	7	19 (8-39)	103 (41-212)	19	21 (13-33)	126 (76-197)	1	1 (0-8)	11 (0-59)
Diseases of the circulatory system	5	3 (1-6)	18 (6-41)	1	3 (0-16)	16 (0-88)	2	3 (0-11)	15 (2-53)	2	3 (0-10)	23 (3-85)
Other	5	3 (1-6)	11 (4-26)	1	2 (0-13)	10 (0-58)	3	3 (1-8)	13 (3-38)	1	2 (0-11)	8 (0-45)
<b>External causes of injury and poisoning</b>	<b>89</b>	<b>49 (40-60)</b>	<b>122 (99-151)</b>	<b>9</b>	<b>26 (12-50)</b>	<b>62 (28-118)</b>	<b>69</b>	<b>61 (48-77)</b>	<b>163 (129-207)</b>	<b>11</b>	<b>37 (18-66)</b>	<b>69 (34-123)</b>
<b>Deaths due to accidents</b>	<b>41</b>	<b>23 (17-31)</b>	<b>109 (81-149)</b>	<b>7</b>	<b>21 (8-42)</b>	<b>94 (38-194)</b>	<b>26</b>	<b>23 (15-33)</b>	<b>119 (78-174)</b>	<b>8</b>	<b>28 (12-55)</b>	<b>98 (42-193)</b>
Land Transport Accidents	15	8 (5-14)	136 (76-223)	2	6 (1-21)	95 (11-342)	12	11 (5-18)	177 (92-310)	1	9 (0-49)	46 (1-254)
Other	26	14 (9-21)	98 (64-144)	5	15 (5-34)	94 (31-219)	14	12 (7-21)	93 (51-155)	7	19 (8-40)	118 (47-242)
<b>Deaths due to violence<sup>4</sup></b>	<b>41</b>	<b>23 (17-31)</b>	-	<b>2</b>	<b>6 (1-21)</b>	-	<b>37</b>	<b>33 (24-45)</b>	-	<b>2</b>	<b>7 (1-24)</b>	-
Hostile Action <sup>3</sup>	40	22 (16-30)	-	2	6 (1-21)	-	36	32 (23-44)	-	2	7 (1-24)	-
Other	1	1 (0-3)	39 (1-216)	0	-	-	1	1 (0-4)	65 (2-363)	0	-	-
<b>Suicide and Open verdicts</b>	<b>7</b>	<b>4 (2-8)</b>	<b>22 (9-44)</b>	<b>0</b>	-	-	<b>6</b>	<b>5 (2-12)</b>	<b>32 (12-70)</b>	<b>1</b>	<b>2 (0-11)</b>	<b>14 (0-76)</b>
<b>Cause not currently available</b>	<b>3</b>	<b>2 (0-5)</b>	<b>79 (16-231)</b>	<b>1</b>	<b>3 (0-15)</b>	<b>128 (3-715)</b>	<b>2</b>	<b>1 (0-5)</b>	<b>95 (12-345)</b>	<b>0</b>	-	-

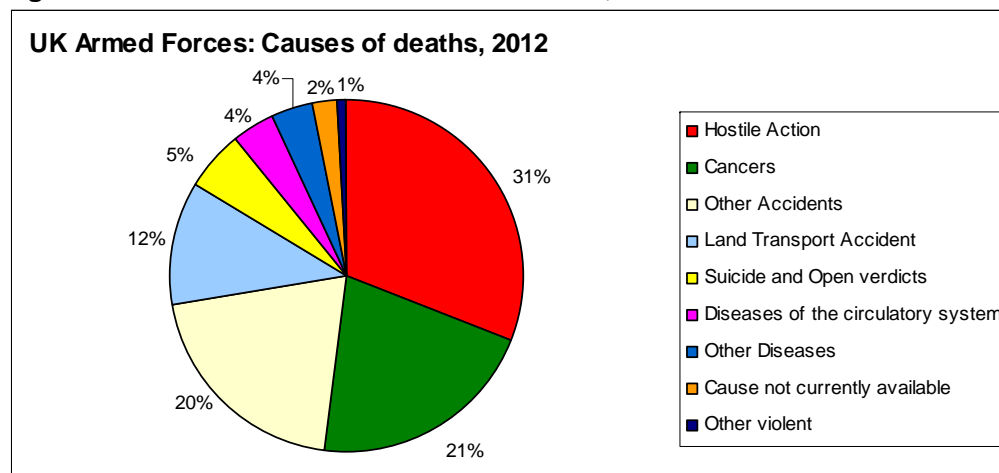
<sup>1</sup>Rates have been standardised to the 2012 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

<sup>2</sup>Standardised mortality ratios have been age and gender standardised.

<sup>3</sup>No 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.

<sup>4</sup>An 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, 2012.**



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

#### *Deaths due to disease*

23. In 2012, 37 UK Armed Forces deaths (29%) were caused by disease-related conditions, of which 27 were due to cancers, five due to circulatory system disorders and five due to other causes (**Table 4** and **Figure 3**).
24. In 2012, the Tri-Service rate of deaths due to disease related conditions was 20 per 100,000 (95% CI:15-28). The Army had the highest rate of deaths due to cancer at 21 per 100,000 (95% CI:13-33) in 2012, its highest during the ten year period 2003-2012 (**Table 7**). The rate for the Army was significantly higher than the RAF (1 per 100,000, 95% CI:0-8) but not significantly different to the Naval Service (19 per 100,000, 95% CI:8-39).
25. In 2012, the UK Armed Forces were at a 65% statistically significant decreased risk of dying of a disease related condition compared to members of the UK general population (SMR = 35, 95% CI:26-49).

#### *Deaths due to external causes of injury and poisoning*

26. In 2012, 89 deaths (69%) were due to external causes of injury and poisoning, a rate of 49 per 100,000 (95% CI: 40-60) (**Table 4** and **Figure 3**).
27. In 2012 the UK Armed Forces were not at a statistically significant different risk of dying as a result of external cause of injury and poisoning compared to the UK general population (SMR = 122, 95% CI: 99-151).
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 were at a 33% statistically significant decreased risk of dying as a result of external causes of injury and poisoning compared to the UK population (SMR=67, 95% CI:51-89).

#### *Deaths due to accidents*

29. In 2012, 41 deaths (32%) were caused by accidents (**Table 4** and **Figure 3**).
30. Other accidents caused 26 deaths (20%) in the Armed Forces in 2012. This is an increase from 2011 (13 deaths) but may be subject to change when the result of 14 deaths in 2012 which are awaiting coroner's verdict are returned (see paragraph 53).
31. Land Transport Accidents accounted for 15 deaths (12% of all deaths) in the Armed Forces, a 10 year low with a rate of 8 per 100,000 strength.
32. The highest mortality rate for LTA was observed among the Army (11 per 100,000, 95% CI: 5-18). 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 (9 per 100,000, 95% CI: 0-49).
33. In 2012, the UK Armed Forces were not at a statistically significant different risk of dying as a result of a Land Transport Accident compared to the UK general population (SMR = 136, 95% CI:76-223).
34. All of the 15 land transport accident deaths reported in **Table 4** were the result of road traffic accidents, occurring on a public road.

#### *Deaths due to violence*

35. In 2012, 41 deaths (32%) were due to violent causes. Of these, 40 were as a result of hostile action, the single largest cause of death in the UK Armed Forces in 2012 (**Table 4** and **Figure 3**).
36. Of the 41 deaths, two were in the Naval Service, 37 in the Army and two in the RAF. (**Table 4** and **Figure 3**).
37. The UK Armed Forces mortality rate for deaths due to hostile action was 22 per 100,000 (**Table 4**). In 2012 the Naval Service rate was 6 per 100,000, the Army rate was 32 per 100,000 and the

RAF rate was 7 per 100,000.

38. 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.

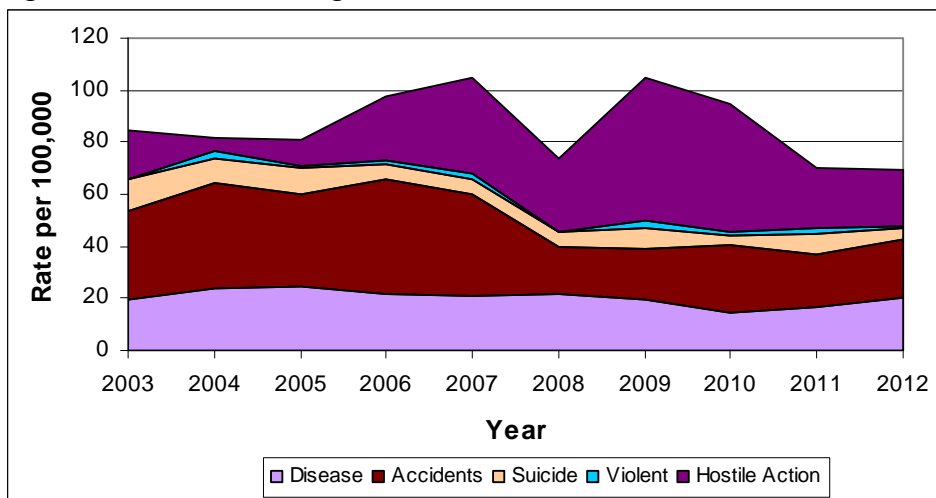
*Deaths given either suicide or open verdicts*

39. As at 4 March 2013 there were seven coroner-confirmed suicides for deaths in 2012 (**Table 4**). There are 21 deaths which occurred since 2007 (of which 14 were in 2012) awaiting a coroner's inquest and it is therefore possible that the suicide data presented here may be revised when the results of any outstanding inquests are known. These deaths are included in the 'Other Accidents' classification until a verdict is given (see paragraph 53).

**Time trends: Cause of death**

40. Deaths as a result of accidents have shown a downward trend since 2006, from a rate of 44 per 100,000 in 2006 to 23 per 100,000 in 2012. Whilst deaths as a result of hostile action accounted for the single largest cause of death each year since 2007, the rate has fluctuated year on year as a result of operational tempo (**Table 5** and **Figure 4**).

**Figure 4: Deaths in the regular Armed Forces: Cause, 2003-2012, rates<sup>1</sup>.**



<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength.

41. **Tables 5-8** provide a breakdown of the main causes of death for the UK Armed Forces from 2003-2012 by Service. Information is presented as numbers, rates and standardised mortality ratios (SMR).

*Standardised mortality ratios (SMR)*

42. 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**).
43. For the period 2003 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, 2011 and 2012 there was no significant difference in deaths due to accidents between members of the UK Armed Forces and the UK general population (2012: SMR = 109, 95% CI:81-149).
44. For the periods 2003 to 2007 and 2009 to 2011, 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. However for the years 2008 and 2012 there was no significant difference in deaths due to land transport accidents between members of the UK Armed Forces and the UK general population (2012 : SMR = 136, 95% CI: 76-223).



45. With the exception of 2008 (when there were no violent related deaths in the UK Armed Forces) and 2009 (where there was a significantly increased risk of dying as a result of violence related deaths), 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 2003-2012 and therefore the calculated SMR are subject to variation, making it difficult to interpret underlying trends.
46. Between 2003 and 2012, 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.
47. 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, 2003-2012, numbers, rates<sup>1</sup> and standardised mortality ratios<sup>2,3,4,5,6</sup>**

Cause	Numbers											Rates											SMR														
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012							
<b>All</b>	177	170	160	191	204	137	205	187	132	129	85	82	82	98	106	74	107	97	70	71	76	76	75	87	96	65	99	94	r	70	71						
<b>Disease-related conditions</b>	40	43	44	40	38	38	36	26	31	37	20	24	25	22	21	21	20	14	16	20	29	32	33	31	30	30	29	21	r	29	35						
Cancers	18	21	23	25	27	23	19	16	19	27	8	13	13	14	15	13	10	9	10	15	50	58	67	72	81	70	58	48	r	59	86						
Diseases of the circulatory system	14	18	16	14	7	10	9	7	9	5	7	9	9	7	4	6	5	4	5	3	38	50	45	41	22	30	28	22	r	31	18						
Other	8	4	5	1	4	5	8	3	3	5	5	2	3	<1	2	3	5	2	2	3	12	6	8	2	7	8	13	5	r	6	11						
<b>External causes of injury and poisoning</b>	137	126	115	150	164	98	165	r	157	r	101	89	65	58	57	76	84	52	85	81	53	49	154	148	148	178	203	122	208	r	219	r	134	122			
<b>Deaths due to accidents</b>	71	89	71	88	77	r	36	r	36	r	39	41	34	41	35	44	39	18	19	27	21	23	160	213	179	202	171	r	83	r	83	r	138	r	100	109	
Land Transport Accidents	50	61	53	61	51	26	28	36	r	26	15	24	27	25	30	26	13	14	18	14	8	179	242	225	239	226	135	162	258	r	225	136					
Other	21	28	18	27	26	r	10	r	8	16	r	13	26	10	13	10	14	13	5	5	8	7	14	127	170	112	150	116	r	41	r	31	68	r	47	98	
<b>Deaths due to violence<sup>4</sup></b>	41	17	22	50	77	52	114	98	47	41	19	8	11	26	40	28	58	50	25	23	-	-	-	-	-	-	-	-	-	-	-						
Hostile Action <sup>3</sup>	40	11	21	48	73	52	107	95	43	40	19	5	10	25	37	28	55	49	23	22	-	-	-	-	-	-	-	-	-	-	-						
Other	1	6	1	2	4	0	7	3	4	1	<1	3	<1	1	2	-	3	1	2	1	28	139	30	52	118	-	274	108	r	150	39						
<b>Suicide and Open verdicts<sup>6</sup></b>	25	20	22	12	10	r	10	r	15	r	7	15	7	12	9	11	6	5	6	8	4	8	4	61	52	63	33	31	r	30	r	45	r	22	r	44	22
<b>Cause not currently available</b>	0	1	1	1	2	1	4	r	4	r	0	3	-	<1	1	1	1	1	1	2	2	-	2	-	26	28	24	48	27	105	r	100	r	-	79		

<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

<sup>2</sup>Standardised mortality ratios have been age and gender standardised.

<sup>3</sup>No 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.

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

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

<sup>6</sup>One 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 48).

**Table 6: Deaths in the Naval Service: Causes, 2003-2012, numbers, rates<sup>1</sup> and standardised mortality ratios<sup>2,3,4,5</sup>**

Cause	Numbers											Rates											SMR													
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012						
<b>All</b>	37	37	27	33	27	40	23	30	19	19	91	92	69	85	74	110	58	78	52	53	79	82	62	73	61	89	53	71	r	48	50					
<b>Disease-related conditions</b>	7	19	9	10	8	12	10	4	4	9	18	48	24	27	21	32	23	11	11	24	24	68	33	36	29	43	37	15	r	17	40					
Cancers	3	9	4	5	5	6	5	2	2	7	8	25	11	12	12	15	12	6	5	19	40	123	57	69	71	85	71	28	r	29	103					
Diseases of the circulatory system	4	8	4	5	2	4	3	1	2	1	10	18	10	15	4	12	7	3	5	3	51	106	53	68	28	54	43	14	r	31	16					
Other	0	2	1	0	1	2	2	1	0	1	-	5	2	-	4	5	4	3	-	2	-	16	8	-	8	15	16	8	-	-	10					
<b>External causes of injury and poisoning</b>	30	18	18	23	19	27	13	r	26	15	9	73	44	45	58	53	76	34	67	42	26	171	109	118	137	117	166	r	82	r	180	r	99	62		
<b>Deaths due to accidents</b>	13	15	12	15	10	11	r	2	7	r	2	7	30	37	31	38	28	29	4	18	6	21	151	187	156	175	112	126	r	23	93	r	26	94		
Land Transport Accidents	10	10	7	10	6	8	2	3	2	2	22	23	16	24	16	21	4	8	6	6	189	210	156	204	137	213	60	110	r	89	95					
Other	3	5	5	5	4	3	r	0	4	r	0	5	8	14	16	14	12	8	-	10	-	15	90	152	156	137	88	61	r	-	84	-	94			
<b>Deaths due to violence<sup>4</sup></b>	14	1	1	8	5	16	8	15	9	2	35	2	3	21	14	46	23	39	25	6	-	-	-	-	-	-	-	-	-	-	-					
Hostile Action <sup>3</sup>	14	0	0	8	5	16	7	15	8	2	35	-	-	21	14	46	20	39	23	6	-	-	-	-	-	-	-	-	-	-	-					
Other	0	1	1	0	0	0	1	0	1	0	-	2	3	-	-	-	-	3	-	2	-	-	121	152	-	-	-	198	-	r	191	-				
<b>Suicide and Open verdicts</b>	3	2	5	0	4	0	r	3	r	4	r	4	0	8	5	11	-	10	-	7	10	11	-	36	26	72	-	60	-	r	44	r	62	r	58	-
<b>Cause not currently available</b>	0	0	0	0	0	1	0	0	0	1	-	-	-	-	-	3	-	-	-	3	-	-	-	-	-	127	-	r	-	-	-	128				

<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

<sup>2</sup>Standardised mortality ratios have been age and gender standardised.

<sup>3</sup>No 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.

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

<sup>5</sup>Change 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 48).

**Table 7: Deaths in the Army: Causes, 2003-2012, numbers, rates<sup>1</sup> and standardised mortality ratios<sup>2,3,4,5,6</sup>**

Cause	Numbers											Rates											SMR										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012			
<b>All</b>	<b>101</b>	<b>96</b>	<b>93</b>	<b>111</b>	<b>145</b>	<b>79</b>	<b>158</b>	<b>136</b>	<b>98</b>	<b>95</b>	<b>86</b>	<b>75</b>	<b>90</b>	<b>94</b>	<b>128</b>	<b>73</b>	<b>133</b>	<b>116</b>	<b>90</b>	<b>89</b>	<b>87</b>	<b>86</b>	<b>88</b>	<b>100</b>	<b>132</b>	<b>72</b>	<b>146</b>	<b>131</b>	<b>100</b>	<b>99</b>			
<b>Disease-related conditions</b>	<b>19</b>	<b>7</b>	<b>18</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>17</b>	<b>13</b>	<b>20</b>	<b>24</b>	<b>20</b>	<b>5</b>	<b>23</b>	<b>14</b>	<b>17</b>	<b>16</b>	<b>18</b>	<b>14</b>	<b>21</b>	<b>27</b>	<b>29</b>	<b>11</b>	<b>29</b>	<b>21</b>	<b>23</b>	<b>23</b>	<b>28</b>	<b>21</b>	<b>38</b>	<b>46</b>			
Cancers	7	2	7	9	9	8	10	8	11	19	6	2	10	10	12	9	10	9	12	21	43	12	46	56	58	52	65	51	71	126			
Diseases of the circulatory system	4	4	8	4	4	4	4	4	6	2	4	2	10	4	4	5	5	4	6	3	25	25	52	26	27	26	27	26	43	15			
Other	8	1	3	0	1	2	3	1	3	3	9	1	4	-	1	2	3	1	3	3	25	3	10	-	3	6	10	3	13	13			
<b>External causes of injury and poisoning</b>	<b>82</b>	<b>89</b>	<b>75</b>	<b>97</b>	<b>129</b>	<b>65</b>	<b>138</b>	<b>120</b>	<b>78</b>	<b>69</b>	<b>66</b>	<b>70</b>	<b>66</b>	<b>79</b>	<b>109</b>	<b>57</b>	<b>112</b>	<b>99</b>	<b>69</b>	<b>61</b>	<b>166</b>	<b>189</b>	<b>173</b>	<b>204</b>	<b>278</b>	<b>142</b>	<b>304</b>	<b>291</b>	<b>181</b>	<b>164</b>			
<b>Deaths due to accidents</b>	<b>43</b>	<b>57</b>	<b>50</b>	<b>48</b>	<b>56</b>	<b>24</b>	<b>23</b>	<b>36</b>	<b>31</b>	<b>26</b>	<b>35</b>	<b>44</b>	<b>44</b>	<b>39</b>	<b>47</b>	<b>20</b>	<b>19</b>	<b>30</b>	<b>28</b>	<b>23</b>	<b>171</b>	<b>242</b>	<b>221</b>	<b>191</b>	<b>213</b>	<b>95</b>	<b>91</b>	<b>165</b>	<b>138</b>	<b>119</b>			
Land Transport Accidents	29	42	38	40	38	17	19	28	22	12	24	33	32	32	31	14	15	23	20	11	177	284	272	261	277	146	181	334	316	177			
Other	14	15	12	8	18	7	4	8	9	14	11	12	12	6	16	6	4	7	7	12	159	170	139	81	143	51	27	59	58	93			
<b>Deaths due to violence<sup>4</sup></b>	<b>24</b>	<b>16</b>	<b>12</b>	<b>39</b>	<b>67</b>	<b>33</b>	<b>105</b>	<b>82</b>	<b>37</b>	<b>37</b>	<b>20</b>	<b>13</b>	<b>10</b>	<b>33</b>	<b>56</b>	<b>30</b>	<b>84</b>	<b>67</b>	<b>32</b>	<b>33</b>	-	-	-	-	-	-	-	-	-	-			
Hostile Action <sup>3</sup>	24	11	12	38	63	33	99	79	34	36	20	8	10	32	52	30	80	65	29	32	-	-	-	-	-	-	-	-	-	-			
Other	0	5	0	1	4	0	6	3	3	1	-	4	-	1	4	-	5	2	2	1	-	203	-	45	202	-	400	183	192	65			
<b>Suicide and Open verdicts<sup>5</sup></b>	<b>15</b>	<b>16</b>	<b>13</b>	<b>10</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>2</b>	<b>10</b>	<b>6</b>	<b>11</b>	<b>13</b>	<b>12</b>	<b>7</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>2</b>	<b>9</b>	<b>5</b>	<b>67</b>	<b>76</b>	<b>69</b>	<b>49</b>	<b>33</b>	<b>43</b>	<b>53</b>	<b>11</b>	<b>52</b>	<b>32</b>			
<b>Cause not currently available</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>47</b>	<b>90</b>	<b>-</b>	<b>147</b>	<b>140</b>	<b>-</b>	<b>95</b>			

<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

<sup>2</sup>Standardised mortality ratios have been age and gender standardised.

<sup>3</sup>No 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.

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

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

<sup>6</sup>One 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 48).

**Table 8: Deaths in the RAF: Causes, 2003-2012, numbers, rates<sup>1</sup> and standardised mortality ratios<sup>2,3,4,5</sup>**

Cause	Numbers											Rates											SMR										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012			
<b>All</b>	<b>39</b>	<b>37</b>	<b>40</b>	<b>47</b>	<b>32</b>	<b>18</b>	<b>24</b>	<b>21</b>	<b>15</b>	<b>15</b>	<b>71</b>	<b>67</b>	<b>72</b>	<b>90</b>	<b>73</b>	<b>37</b>	<b>55</b>	<b>50</b>	<b>32</b>	<b>43</b>	<b>56</b>	<b>55</b>	<b>62</b>	<b>75</b>	<b>55</b>	<b>32</b>	<b>43</b>	<b>39</b>	<b>30</b>	<b>32</b>			
<b>Disease-related conditions</b>	<b>14</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>16</b>	<b>12</b>	<b>9</b>	<b>9</b>	<b>7</b>	<b>4</b>	<b>19</b>	<b>28</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>23</b>	<b>16</b>	<b>18</b>	<b>11</b>	<b>6</b>	<b>30</b>	<b>38</b>	<b>39</b>	<b>41</b>	<b>41</b>	<b>32</b>	<b>25</b>	<b>25</b>	<b>22</b>	<b>13</b>			
Cancers	8	10	12	11	13	9	4	6	6	1	10	18	19	19	26	19	6	12	9	1	63	79	99	95	121	87	39	58	60	11			
Diseases of the circulatory system	6	6	4	5	1	2	2	2	1	2	9	9	7	9	2	3	4	3	1	3	45	46	32	43	9	19	20	20	11	23			
Other	0	1	1	1	2	1	3	1	0	1	-	2	1	1	3	1	6	3	-	2	-	5	5	6	12	6	18	6	-	8			
<b>External causes of injury and poisoning</b>	<b>25</b>	<b>19</b>	<b>22</b>	<b>30</b>	<b>16</b>	<b>6</b>	<b>14</b>	<b>11</b>	<b>8</b>	<b>11</b>	<b>51</b>	<b>37</b>	<b>43</b>	<b>61</b>	<b>43</b>	<b>14</b>	<b>37</b>	<b>29</b>	<b>22</b>	<b>37</b>	<b>113</b>	<b>89</b>	<b>114</b>	<b>150</b>	<b>87</b>	<b>33</b>	<b>79</b>	<b>68</b>	<b>47</b>	<b>69</b>			
<b>Deaths due to accidents</b>	<b>15</b>	<b>17</b>	<b>9</b>	<b>25</b>	<b>11</b>	<b>1</b>	<b>11</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>32</b>	<b>34</b>	<b>21</b>	<b>52</b>	<b>27</b>	<b>1</b>	<b>29</b>	<b>24</b>	<b>15</b>	<b>28</b>	<b>141</b>	<b>168</b>	<b>95</b>	<b>253</b>	<b>112</b>	<b>11</b>	<b>116</b>	<b>109</b>	<b>69</b>	<b>98</b>			
Land Transport Accidents	11	9	8	11	7	1	7	5	2	1	21	18	19	25	18	1	19	15	5	9	177	158	154	206	155	26	202	176	85	46			
Other	4	8	1	14	4	0	4	4	4	7	11	15	2	27	10	-	10	9	10	19	91	181	23	307	75	-	66	74	63	118			
<b>Deaths due to violence<sup>4</sup></b>	<b>3</b>	<b>0</b>	<b>9</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>-</b>	<b>14</b>	<b>5</b>	<b>15</b>	<b>7</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>7</b>	-	-	-	-	-	-	-	-	-	-			
Hostile Action <sup>3</sup>	2	0	9	2	5	3	1	1	1	2	3	-	14	3	15	7	3	3	3	7	-	-	-	-	-	-	-	-	-	-			
Other	1	0	0	1	0	0	0	0	0	0	2	-	-	2	-	-	-	-	-	-	118	-	-	116	-	-	-	-	-	-			
<b>Suicide and Open verdicts</b>	<b>7</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>15</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>-</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>66</b>	<b>20</b>	<b>44</b>	<b>22</b>	<b>-</b>	<b>25</b>	<b>26</b>	<b>14</b>	<b>13</b>	<b>14</b>			
<b>Cause not currently available</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>92</b>	<b>97</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>102</b>	<b>99</b>	<b>-</b>	<b>-</b>			

<sup>1</sup>Rates have been age and gender standardised to the 2012 Armed Forces population, expressed per 100,000 strength. Individual rates may not add up to totals due to rounding.

<sup>2</sup>Standardised mortality ratios have been age and gender standardised.

<sup>3</sup>No 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.

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

<sup>5</sup>Change 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 48).

## Changes to previously published data

48. In preparing this document, Defence Statistics 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 16 amendments to the classifications given to the cause of death previously reported :
- 2008 - one record has been amended from Other Accident to Suicide.
  - 2009 - one record has been amended from Other Accident to Suicide.
  - 2010 - one record has been amended from Cause Unavailable to Other Accident and one from Other Accident to Suicide.
  - 2011 - ten records have been amended from Other Accident to Suicide, one from Other Accident to Land Transport Accident and one from Cause Unavailable to Other Accident.

## DATA SOURCES & METHODS

### *Data Sources*

49. Defence Statistics receive weekly notifications of all regular Armed Forces deaths from the Joint Casualty and Compassionate Cell (formerly the single Service casualty cells). Defence Statistics also receive cause of death information from military medical sources in the single Services. At the end of each calendar year, Defence Statistics cross-reference the medical information it holds against publicly available death certificate information available from the NHS. Regarding suicides and open verdicts, to ensure the highest accuracy of information and that all cases previously recorded as 'awaiting verdict' have been followed up, Defence Statistics carry out an annual audit of MOD data held by the ONS and other authorities.
50. To record information on cause and circumstances of death, Defence Statistics uses the World Health Organisation's International Statistical Classification of Diseases and Health-related Problems 10<sup>th</sup> revision (ICD-10). In addition, Defence Statistics 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.
51. Defence Statistics 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.
52. 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.
53. Defence Statistics 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, Defence Statistics 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**.
54. Defence Statistics have undertaken a review of the deaths for which a verdict was outstanding (waiting verdict), as a proportion of those reported in this notice occurred a number of years ago and in some instances the deaths occurred overseas. Following investigations with ONS and the Defence Inquest Unit, Defence Statistics have been unable to trace awaiting verdicts prior to 2007 and it have deemed it unlikely that the final outcome of these deaths (such as inquests) will be traced. The majority of the waiting verdicts that Defence Statistics were aware of prior to 2007 were for deaths that occurred to Service personnel overseas. As such Defence Statistics have identified that the earliest death still awaiting a coroner's inquest occurred in 2007. This has resulted in the deaths awaiting verdicts prior to 2007 being finalised as accidental deaths (see para 53).
55. 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.

### *Data Coverage*

56. 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.

57. The data here exclude the Home Service of the Royal Irish Regiment, full time reservists, Territorial Army and Naval Activated Reservists since Defence Statistics 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.
58. The Naval Service includes both the Royal Navy and the Royal Marines.
59. In 2012, Defence Statistics 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 May 2009 to October 2011 (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.

#### *Methods*

60. In order to compare time trends and to take into account the different age and gender structures of their respective single Service strengths, rates have been age and gender standardised. In order to facilitate comparisons with previously published reports data has been standardised to the 2012 Armed Forces population. For this direct standardisation process, Defence Statistics have estimated the rates that would have been observed if each study population (i.e. each of the single Services) had the same age and gender structure as the standard population (the 2012 Armed Forces population).
61. 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. The small number of deaths in some of the sub-group analysis may result in wide confidence intervals in the corresponding rate or ratios. The impact of this is that the range in which we expect the true value of that statistics to lie is much larger, making it harder to interpret the true underlying trend.
62. 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, as seen in 2012 for the RAF overall rate of deaths, caused by the reduction in recruitment of personnel under 20 years of age.
63. 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.
64. 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. The small number of deaths in some of the sub-group analysis may result in wide confidence intervals in the corresponding rate or ratios. The impact of this is that the range in which we expect the true value of that statistics to lie is much larger, making it harder to interpret the true underlying trend.
65. 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.
66. 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. A major driver for this change was that for an annual extract of death occurrences to be acceptably complete, it must be taken some months after the end of the data year to allow for late death registrations. Therefore the UK death data used by Defence Statistics up to and including 2005 is based on deaths that occurred in the year. The UK death data used by Defence Statistics for 2007 onwards is based on deaths that were registered in the year. To produce the UK death data for 2006 Defence Statistics have followed advice provided by the ONS and use deaths that both occurred and were registered in year. Using UK population deaths that both occurred and were registered in year resulted in an increased dominator population for the 2006 SMR calculation and has therefore resulted in a lower SMR for 2006 (when compared with the 2006 SMR reported in publications before this

change in methodology). Users should note that this revised corrected methodology has brought the 2006 SMR calculations in line with the SMR calculations for other years.

67. The UK general population data for 2011 and 2012 was not available for this report to calculate standard mortality ratios (SMRs), therefore, Defence Statistics has used the 2010 data as an estimate for the 2011 and 2012 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 and 2012 data becomes available.

*Strengths and weaknesses of data presented in this notice*

68. A strength of this publication is that considerable validation is undertaken against military and public records to ensure that the information provided is complete and accurate and users of this publication should be confident that the numbers of fatalities presented are accurate. However, some causes of death (including Suicide and Open Verdict deaths) require a Coroner's report before the cause of death can be formally classified and there is often a time lag between when the death occurred and when the Coroner's inquest takes place. This can result in final cause of death information not being timely and complete for recent years and these deaths are reported as other accidents whilst waiting for final cause of death to be determined. This can lead to revisions in the cause of death categories when these verdicts are returned (see paragraph 48 for more information about the extent of these revisions).
69. In addition, deaths certificates for personnel who die overseas are issued by the MOD and if buried overseas, are not always subject to a coroner's inquest to certify cause of death. Users should be aware of this when using cause of death information.
70. The information presented in this publication has been structured in such a way to release sensitive deaths information into the public domain in a way that contributes to the MOD accountability to the British public but which doesn't compromise the operational security of UK Armed Forces personnel nor that risk breaching the rights of the families of the deceased personnel (for which the MOD has a residual duty of care).