

CHAPTER 3 - HEALTH

INTRODUCTION

This chapter provides summaries and analyses of health-related information on UK Armed Forces personnel and Health & Safety for UK Armed Forces personnel and MOD Civilians. The key findings of three of DASA Health Information's annual National Statistics publications are summarised in this chapter, along with a range of other key outputs.

A summary of the numbers and rates of deaths in the UK Armed Forces is provided in **Tables 3.1** and **3.2**. The figures cover a 10 year time series and are broken down by Service, year of death and cause. Prior to the introduction of the Health chapter in this year's edition, in UKDS 2007 and in previous years the corresponding tables appeared as **Tables 2.24** and **2.25**.

The numbers of suicides and open verdict deaths in the UK Armed Forces are broken down further in **Tables 3.3** and **3.4**. Numbers, age standardised rates and standardised mortality ratios are reported for a 24 year time series, broken down by Service, gender and age.

Table 3.5 presents the number of deaths of UK Gulf 1 veterans and for a UK Military comparison group who did not deploy to the Gulf. Figures and mortality rate ratios are presented from 1991-2007 by cause of death and are compared to mortality rates in the UK general population.

The numbers of fatalities of UK Armed Forces personnel on operations in Afghanistan and Iraq are reported in **Table 3.6**. The numbers of very seriously injured and seriously injured casualties on operations in Afghanistan, Iraq and the Balkans are presented in **Table 3.7**.

The numbers of UK Military and civilian work-related fatalities are presented for the last 10 years in **Tables 3.8** and **3.9**. Figures are provided by year and are broken down by cause.

Tables 3.10 and **3.11** report numbers and rates of major and serious injuries and illnesses for UK Military and civilian personnel. Figures are provided for the last 10 years and are broken down by Service.

Table 3.12, in this year's edition of UKDS, regarding sickness absence, corresponds to Table 2.36 in previous years' editions.

Key Points and Trends

- In 2007, a total of 201 deaths occurred among the UK Regular Armed Forces (see **Table 3.1**), of which 27 were serving in the Naval Service, 143 in the Army and 31 in the RAF.
- During the 10-year period 1998-2007, the overall Armed Forces age and gender standardised mortality rates fluctuated between a low of 66 per 100,000 in 1999 to a high of 105 per 100,000 in 2007 (see **Table 3.1**).
- For the 24-year period 1984-2007, 712 suicides occurred among UK Regular Armed Forces personnel: 694 among males (see **Table 3.3**) and 18 among females.
- Overall, male suicide rates in the UK Armed Forces were statistically significantly lower than the general UK population, with the exception of Army males aged under 20. Over the period 1984-2007 this group had a statistically significantly increased risk of approximately 50%.
- Between 1 April 1991 and 31 December 2007 there were 918 deaths among the Gulf 1 veterans and 958 deaths among the Era comparison group (see **Table 3.5**). There were no statistically significant differences in the total number of deaths or for any of the main groups of cause of death.
- Since reporting began in 2001 until the end of 2007, there have been 86 UK fatalities on Operations in Afghanistan and 174 on Operations in Iraq (see **Table 3.6**).
- Since reporting began in 2001 until the end of 2007, there have been 104 very seriously injured and seriously injured casualties on Operations in Afghanistan and 212 on Operations in Iraq (see **Table 3.7**).
- Between 1 January 1998 and 31 December 2007 there were 461 work-related fatalities of which 192 were in hostile action, 97 were on-duty road traffic accidents and 172 were work-place incidents (see **Table 3.8**).
- The number of major injuries and illnesses reported on the Central Health and Safety Project (CHASP) system increased in 2006 to 430 from 85 in 1997, an increase of 406% (see **Table 3.10**). The rate of major injury and illnesses increased over the 9 years from 26 per 100,000 MOD personnel to 153 per 100,000.

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- The number of serious injuries and illnesses recorded on the CHASP system increased in 2006 to 1,550 from 530 in 1997, an increase of 192% (see **Table 3.11**). The rate of serious injury and illnesses reported on CHASP increased over the nine years from 162 per 100,000 MOD personnel in 1997 to 550 per 100,000 in 2006.
- The increases in the rates of major and serious injuries and illnesses are thought to be due to the introduction of single Service notification cells and increasing health and safety awareness in general.
- There has been a decline in the average number of working days lost per year amongst industrial civilian personnel since 2005. For non-industrial civilian personnel, the rate is at its lowest point in the past four years (see **Table 3.12**).

Denominator Data

Annual strength data for UK Regular Armed Forces personnel were obtained for the period 1984-2005 from AFPAA. Strength data for 2006 were obtained from both the Armed Forces Personnel Administration Agency (AFPAA) and Joint Personnel Administration (JPA).

Data on the size of the UK general population and the numbers of deaths by age, gender and year were obtained for the 22 year period 1984–2005 from the ONS, GROS and NISRA. Data for 2006 were not available at the time of publication; therefore the figures from 2005 were used as an estimate for 2006 as the year on year variation in the UK population figures is unlikely to affect the findings.

Gulf Veterans Definitions

Gulf veterans consist of Service personnel deployed to any Gulf state between 1 September 1990 and 30 June 1991 and for the Navy afloat, all personnel aboard a ship east of the Suez canal during that period. The data do not include civilian personnel employed by the MOD (including the Royal Fleet Auxiliary, the NAAFI, MoD civil servants), by other Government Departments, or civilians working for Defence Contractors, the media or charitable and humanitarian organisations.

The “Era” comparison group comprises 53,143 personnel, randomly sampled from all UK Armed Forces personnel in service on 1 January 1991 and who did not deploy to the Gulf. This group is stratified according to the 53,409 Gulf veterans to reflect the socio-demographic and military composition of the Gulf cohort in terms of age, gender, Service (Naval Service, Army, Royal Air Force), officer/other rank status, regular/reservist status, and a proxy measure for fitness.

Ethical and Confidentiality Issues

The information presented in this publication does not present any ethical issues because:

- Information relating to deaths is publicly available.
- No medical information is presented detailing the injuries sustained.
- As only aggregated data are presented, individuals cannot be identified.

Links To Websites

Further information on deaths in the UK Armed Forces, including cause of death breakdowns for each Service, can be found in the latest National Statistic Publication published in March 2008: <http://www.dasa.mod.uk/natstats/deaths/pdfs/deaths01mar08.pdf>

Further information on suicides in the UK Armed Forces is provided in the March 2008 National Statistic publication: <http://www.dasa.mod.uk/publications/pdfs/suicide/suicideMar08.pdf>

The March 2008 publication of the Gulf 1 Veterans Mortality National Statistic gives further information on the methodology used and provides a breakdown of deaths due to neoplasms (cancers): <http://www.dasa.mod.uk/natstats/gulf/pdfs/gulf0108.pdf>

The operational casualty and fatality tables are available on the MOD website, where further information on field hospital admissions and aero-medical evacuations is also available for operations in Afghanistan and Iraq:

<http://www.mod.uk/DefenceInternet/FactSheets/OperationsFactsheets/OperationsInIraqBritishCasualties.htm>

<http://www.mod.uk/DefenceInternet/FactSheets/OperationsFactsheets/OperationsInAfghanistanBritishCasualties.htm>

<http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/DoctrineOperationsandDiplomacyPublications/OperationsinTheBalkans/TheBalkanCasualtyTable.htm>

Further information on coding of deaths to ICD10, including a full breakdown of codes, can be found on the World Health Organisation website:

<http://www.who.int/classifications/apps/icd/icd10online>

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DEATHS IN THE UK ARMED FORCES

Table 3.1 Deaths in the UK Regular Armed Forces, year of occurrence by Service, numbers and rates¹

In order to make meaningful comparisons of the numbers of deaths between the Services and take their different strengths into account, rates were calculated and standardised for age and gender, using the 2006 Armed Forces strength as the standard population.

During the 10-year period 1998-2007, the overall Armed Forces age and gender standardised mortality rates fluctuated between a low of 66 per 100,000 in 1999 and a high of 105 per 100,000 in 2007.

In 2003 and 2004 there were increases in the number of deaths in the Naval Service due to 3 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 6 Royal Marines and one member of Navy personnel died on operations in separate incidents.

The increase in the RAF mortality rate from 61 per 100,000 in 2004 to 71 per 100,000 in 2005 was accounted for by a Hercules crash in Iraq in January 2005 which claimed the lives of 9 RAF personnel. The similar increase from 71 to 84 per 100,000 in 2006 was accounted for by the loss of 12 RAF personnel in a Nimrod crash in Afghanistan in September 2006.

The increase in Army fatality rates from 94 per 100,000 in 2006 to 128 per 100,000 in 2007 was mainly accounted for by operations in Iraq and Afghanistan which resulted in 86 lives lost in 2007 (71 as a result of hostile action), compared to 67 lives lost (47 as a result of hostile action) in 2006.

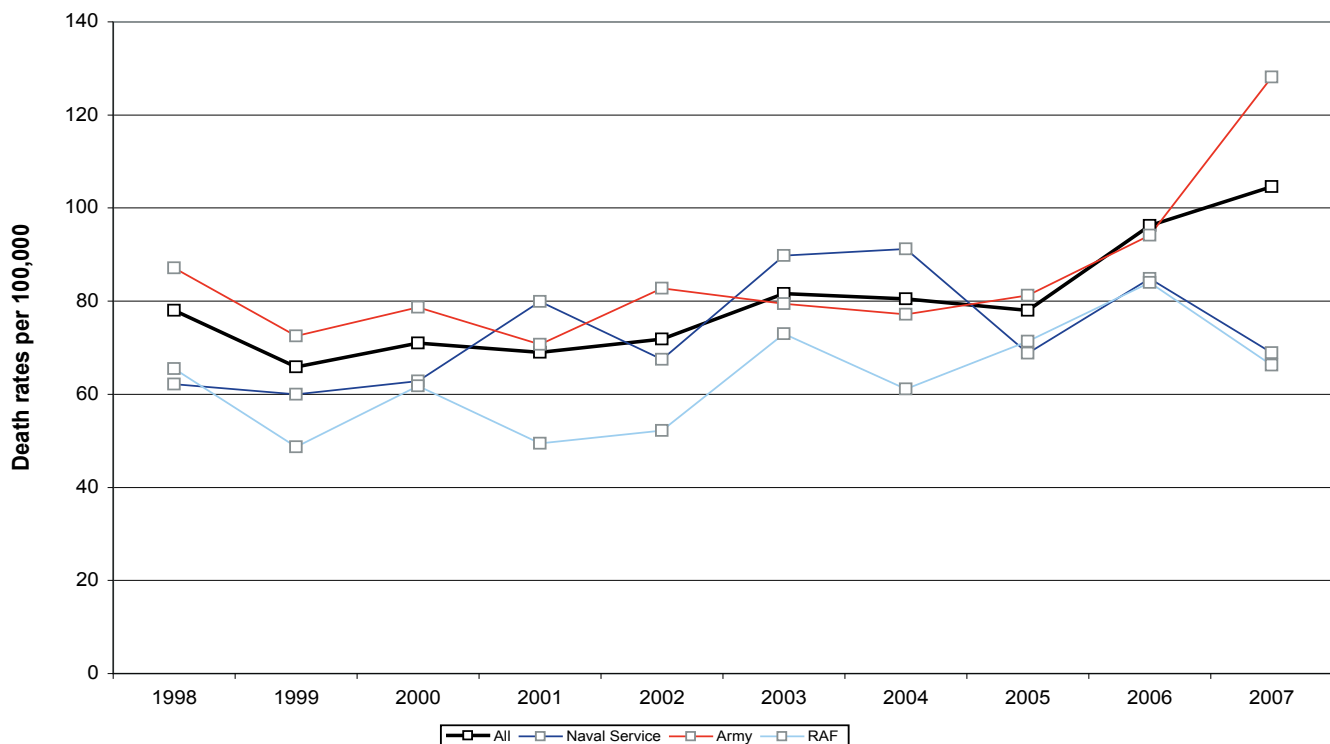
Numbers of deaths	1998	1999	2000	2001	2002	2003	2004	2005	2006 ²	2007
Total	165	141	147	142	147	173	169	158	190	201
Naval Service	26	26	25	33	26	37	37	27	33	27
Army	97	83	88	80	94	97	95	91	110 ^r	143
Royal Air Force	42	32	34	29	27	39	37	40	47 ^r	31

Death rates ^{3,4} per 100,000 strength	1998	1999	2000	2001	2002	2003	2004	2005	2006 ²	2007
Total	78	66	71	69	72	82	80	78	96²	105
Naval Service	62	60	63	80	67	90	91	69	85 ^r	69
Army	87	73	79	71	83	79	77	81	94 ^r	128
Royal Air Force	66	49	62	49	52	73	61	71	84 ^r	66

Source: DASA (Health Information)

- The information on deaths presented here is for the UK Regular Armed Forces (including Gurkhas) and includes all trained and untrained personnel. The data exclude the Home Service of the Royal Irish Regiment, mobilised reservists, full time reservists, Territorial Army and Naval activated reservists as DASA do not receive routine notification of all deaths amongst reservists and non-regulars, unless they are deployed on active service.
- Numbers and rates of deaths in 2006 have been revised since the last UKDS publication. The number of Army deaths has increased by one due to a missing member of personnel being declared dead. One RAF death was removed from the figures due to reclassification as a member of reservist personnel.
- Rates have been age and gender standardised to the 2006 Armed Forces population and are expressed per 100,000 strength.
- Changes in rates of deaths are due to the use of 2006 Armed Forces strengths denominator data, and also reflect the changes to numbers of deaths described above.

Mortality rates by Service 1998-2007



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Table 3.2 Deaths in the Regular Armed Forces, causes, numbers and rates 1998-2007^{1,2}

Over the 10 years 1998 to 2007 there has been little change in the rate of disease-related conditions. Similarly for deaths due to accidents there has been little change over the course of the last ten years. However, deaths as a result of hostile action (killed in action and died of wounds) have increased, reflecting the deployments in Iraq and Afghanistan, and the changing tempo of operations.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total	165	141	147	142	147	173	169	158	190	201
Disease-related conditions	52	40	35	41	40	40	43	45	40	37
<i>of which</i>										
Cancers	32	25	16	24	19	18	22	23	25	27
Diseases of the circulatory system	13	12	16	9	18	14	18	16	14	6
Other	7	3	3	8	3	8	3	6	1	4
External causes of injury and poisoning	112	99	111	100	107	133	125	113	147	160
Deaths due to accidents	91	70	71	80	89	69	90	71	88	80
Land transport accident	62	43	45	50	65	49	61	53	61	50
Other	29	27	26	30	24	20	29	18	27	30
Deaths due to Violence	2	2	4	5	3	39	16	22	49	73
Killed in Action ³	1	1	1	2	-	37	10	21	41	59
Died of Wounds ³	-	-	-	-	-	1	-	-	6	12
Other	1	1	3	3	3	1	6	1	2	2
Suicide and Open verdicts	19	27	36	15	15	25	19	20	10	7
Cause not currently available	1	2	1	1	-	-	1	-	3	4

Rate per 100,000 strength	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total	78	66	71	69	72	82	80	78	96	105
Disease-related conditions	26	20	17	21	21	19	22	22	20	19
<i>of which</i>										
Cancers	16	12	8	12	10	8	11	11	13	14
Diseases of the circulatory system	6	6	8	5	10	7	9	8	7	3
Other	4	2	1	4	2	4	2	3	1	2
External causes of injury and poisoning	52	45	53	48	50	63	58	56	74	84
Deaths due to accidents	42	31	34	39	42	33	42	35	45	42
Land transport accident	30	19	21	24	30	23	28	26	31	26
Other	13	12	12	15	12	10	14	9	14	16
Deaths due to Violence	1	1	2	2	1	18	8	11	25	38
Killed in Action ³	-	1	-	1	-	17	5	10	21	31
Died of Wounds ³	-	-	-	-	-	-	-	-	3	6
Other	-	-	1	1	1	-	3	-	1	1
Suicide and Open verdicts	9	13	17	7	7	12	9	10	5	4
Cause not currently available	-	1	1	-	-	-	-	-	2	2

Source: DASA (Health Information)

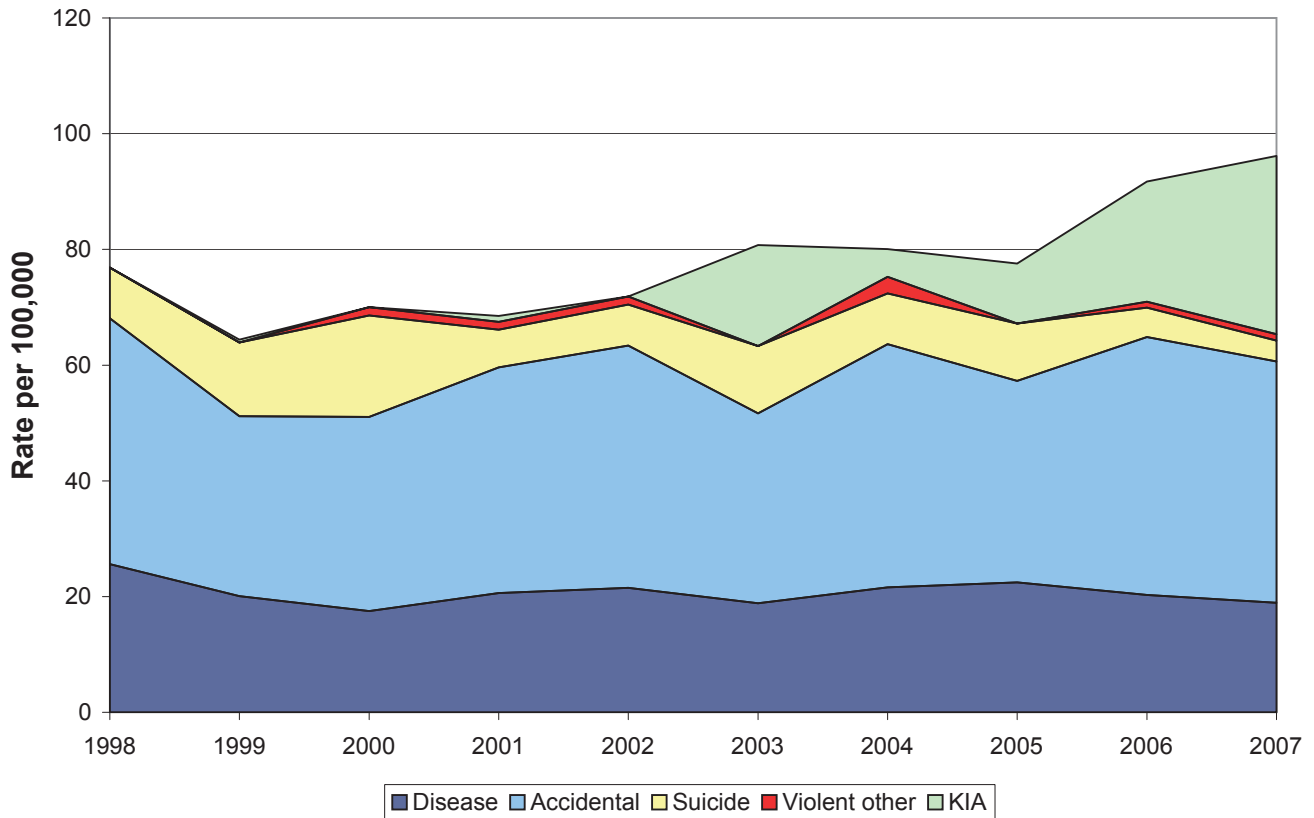
1. Rates have been age and gender standardised to the 2006 Armed Forces population and are expressed per 100,000 strength.
2. DASA code all cause of death information to the World Health Organisation's International Statistical Classification of Diseases and Health-related Problems 10th revision (ICD-10).
3. 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.

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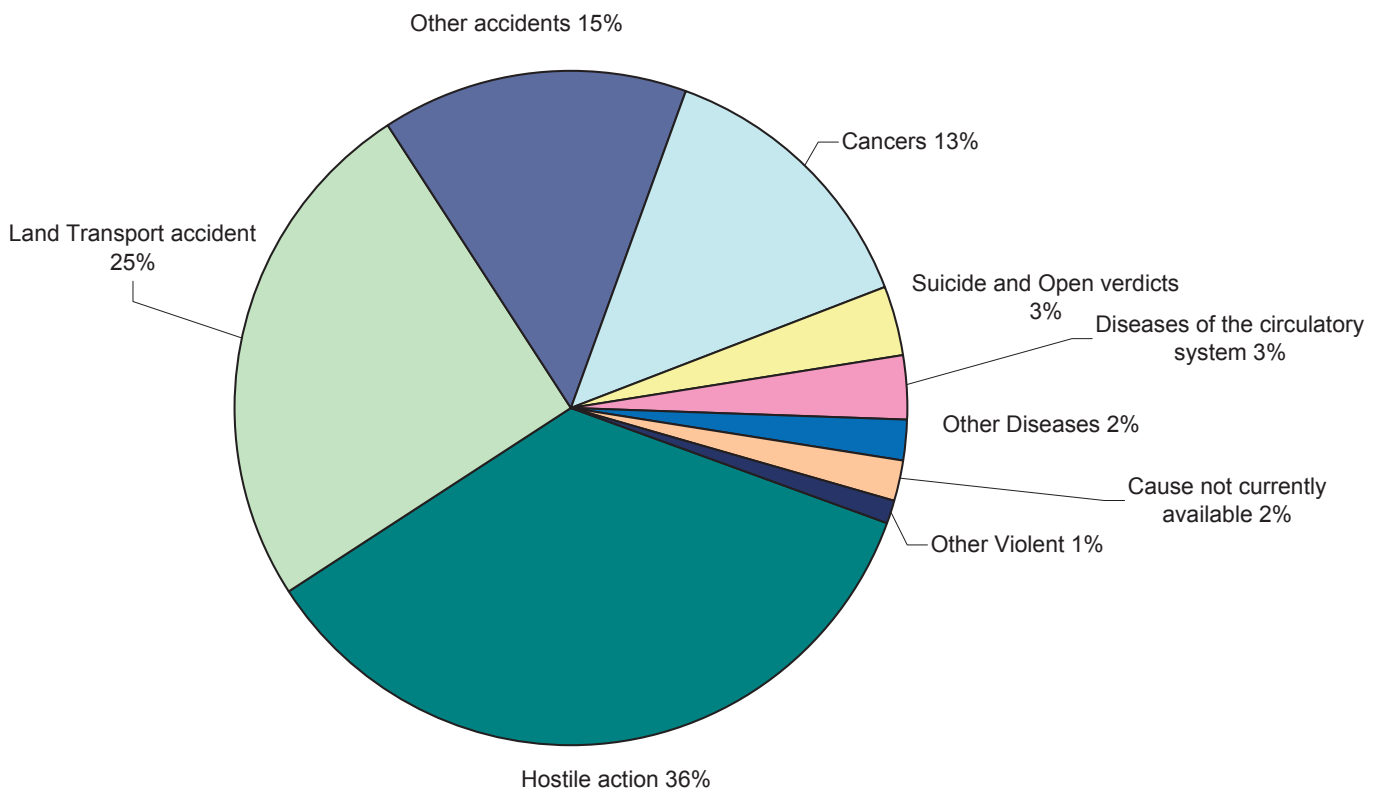
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Charts to Table 3.2 Deaths in the Regular Armed Forces, causes, numbers and rates 1998-2007

Cause of death for all Regular UK Armed Forces personnel, 1998-2007, rate per 100,000



Cause of death for all Regular UK Armed Forces personnel, 2007



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Service-specific age-standardised rates were calculated using the 2006 Regular Armed Forces male population only to make comparisons across the Services. Owing to the age composition of the UK Armed Forces, these analyses cover personnel aged 16-59 only. These rates estimate the rate of suicides among males for each Service, as if each Service had the same age distribution as the 2006 male Regular Armed Forces population.

Due to the small numbers involved when further breaking down annual numbers of suicides, the data for graphs have been aggregated to give 3 year moving averages. This eliminates some of the random variation that can occur from year to year and provides a clearer picture of possible trends.

The analyses made here are based on relatively small numbers. This presents a particular challenge for complex and detailed statistical analysis. As this section presents several sub-group analyses in which some categories may only involve a handful of cases, there is a risk of misinterpreting a chance association for a real finding. We strongly recommend caution in reading too much into past trends and assuming that they still apply today or will continue to do so in the future. In particular, they cannot take into account a large number of policy initiatives that have been introduced in the past few years.

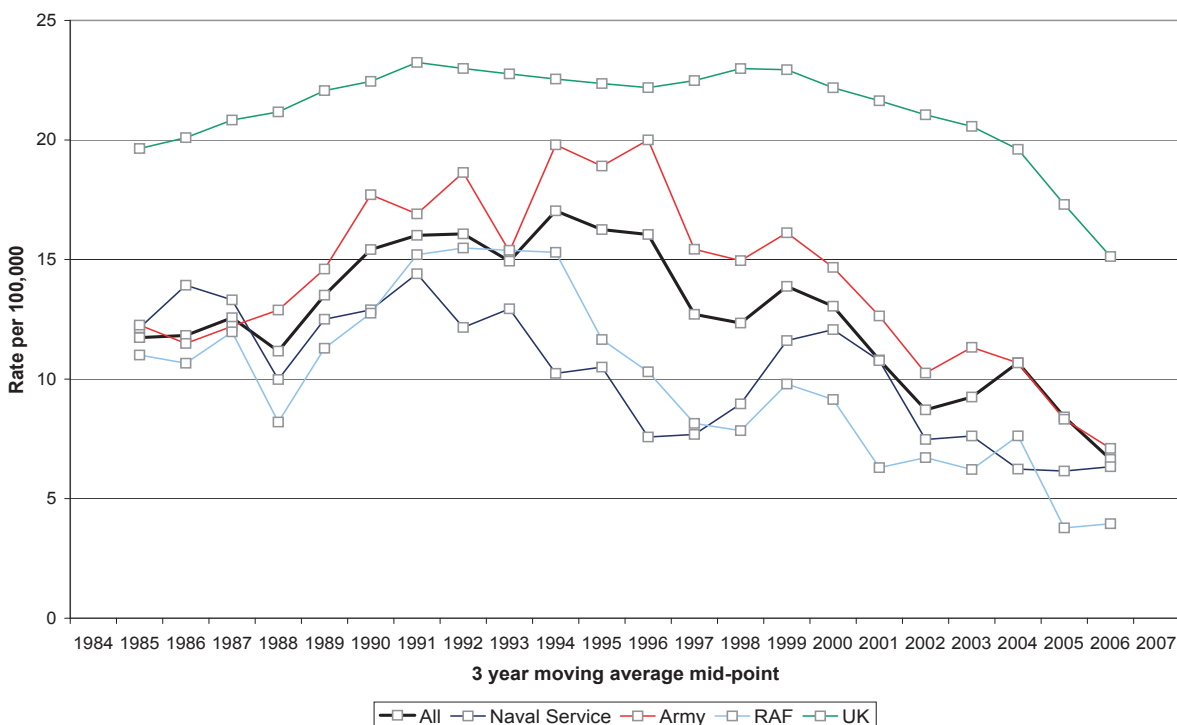
The data presented includes both coroner-confirmed suicides and open verdict deaths. In accordance with ONS practice, the term 'suicide' should be understood to include all suicide and open verdict deaths. There are 21 deaths in the "awaiting verdict" category involving a wide range of external accidental or violent causes. These have been referred to a coroner (or, for Scotland, the Procurator Fiscal) and some may be returned as suicides or open verdicts. Due to the low numbers of cases among female Service personnel (18 deaths), most of the analyses have been restricted to males only (aged 16-59 years).

Table 3.3 Number of suicide and open verdict and awaiting verdict deaths by Service and gender, 1984-2007

	Verdict	Total	Male	Female
All Services	Suicide	544	531	13
	Open	168	163	5
	Awaiting	21	21	-
Naval Service	Suicide	83	81	2
	Open	37	36	1
	Awaiting	1	1	-
Army	Suicide	335	329	6
	Open	96	92	4
	Awaiting	20	20	-
Royal Air Force	Suicide	126	121	5
	Open	35	35	-
	Awaiting	-	-	-

Source: DASA (Health Information)

Age standardised rates of suicides, by Service, males, 1984-2007^{1,2,3}



1. Data points for 2002-2004, 2003-2005, 2004-2006 and 2005-2007, may change when information on waiting verdicts is received.
 2. Each year shown is the mid point of a 3 year period, e.g. 1985 refers to 1984-1986.
 3. Standardised to the 2006 regular Armed Forces strengths.

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Table 3.4 Number of Suicides, Standardised Mortality Ratios and Age Specific Mortality Ratios 1984-2007, males only

To enable comparisons with the number of suicides in the UK population, Standardised Mortality Ratios (SMR), adjusted for age and year, have been calculated. An SMR is defined as the ratio of the number of deaths observed in the study population (UK Armed Forces) to the number of deaths expected if the study population had the same age group and year specific rates as the standard (UK general population). 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.

95% confidence intervals (95% CI) were calculated based on the Normal approximation, except where the number of observed events was less than 30, when they were derived directly from the Poisson distribution. If independent samples of the same size are repeatedly drawn from a population, with a 95% confidence interval calculated from each sample, then 95% of these intervals should contain the population mean. The width of the confidence interval gives us some idea of how uncertain we should be about the unknown parameter. Smaller samples result in wider confidence intervals, whereas larger and more representative samples will give narrower confidence intervals (providing greater accuracy).

The mortality rate is scaled for the standard population to be 100 (here the standard population is the UK population). The same scaling is used when measuring the mortality rate for the population being considered. If the mortality rate for this population is the same as for the UK population the underlying (true) mortality rate would be 100. The calculation of the rate based on data for a sample of the population over a restricted time period gives an estimate of the true rate. The observed mortality rate can be used to test the null hypothesis that the true mortality rate for this sample = 100 (the same as for the UK population) against the alternative hypothesis that it is not equal to 100 (differs from the UK population), using a 5% significance level.

When calculating a 95% confidence interval for the mortality rate, the lower and upper end-points of the interval are calculated from the observed value, giving 95% confidence that the true value lies within this interval. There is an exact relationship between the test and confidence interval. If there are very few deaths in the time period used to estimate the mortality rates, the estimate for the mortality rate will not be accurate (its standard deviation will not be small).

For each Service, and for the UK Regular Armed Forces as a whole, the overall SMR was statistically significantly lower than expected on the basis of rates in the UK general population. For the Naval Service the SMR was 47 (95% CI=39-56) compared to the UK standard of 100, for the Army the SMR was 70 (95% CI=64-77) and for the RAF the SMR was 46 (95% CI=39-54).

For each Service and for the UK Regular Armed Forces as a whole, the age-specific mortality ratios for each age group were also lower than expected on the basis of rates among the UK general population, with the exception of young Army males aged under 20 years. These young Army males have experienced 50% more suicides over the period 1984-2007 than their UK general population counterparts, a finding which is statistically significant.

		Age in years					
	Total	<20	20-24	25-29	30-34	35-39	40+
Total	694	81	214	147	104	87	61
Standardised Mortality Ratio	58	124	71	52	49	50	41
95% Confidence Interval	(54-63)	(100-155)	(62-81)	(44-61)	(40-59)	(40-61)	(32-53)
Naval Service	117	7	29	23	22	24	12
Standardised Mortality Ratio	47	63	48	39	46	57	38
95% Confidence Interval	(39-56)	(25-129)	(32-70)	(25-59)	(29-69)	(37-85)	(20-67)
Army	421	68	153	83	50	43	24
Standardised Mortality Ratio	70	150	87	57	49	55	47
95% Confidence Interval	(64-77)	(118-190)	(75-102)	(46-70)	(37-65)	(40-74)	(30-70)
Royal Air Force	156	6	32	41	32	20	25
Standardised Mortality Ratio	46	69	47	52	50	37	40
95% Confidence Interval	(39-54)	(25-150)	(34-67)	(38-70)	(35-70)	(22-56)	(26-59)

Source: DASA (Health Information)

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UK GULF VETERANS MORTALITY

Table 3.5 Deaths among UK Gulf 1 veterans¹: 1 April 1991 - 31 December 2007

This section provides summary statistics on the causes of deaths that occurred among the UK veterans of the 1990/91 Gulf Conflict between 1 April 1991 and 31 December 2007. The mortality rates were analysed alongside those of a comparison group, the Era cohort, who were not deployed to the Gulf.

Mortality rate ratios were calculated to compare deaths in the Gulf and Era cohorts. The rate ratios provided here were calculated using as denominator the total person-years at risk (the length of time each person has been in study), taking into account deaths and emigrations from the UK. People who had left the Services and subsequently emigrated were deemed to be lost to follow up because we had no means of knowing if and when they may have died. The mortality rate ratios given here differ marginally from the crude deaths ratio owing to some small differences in the number of person years at risk between the Gulf and Era comparison groups.

The single year age distribution among those aged 40 and over has been found to show differences, with those in this age-group deployed to the Gulf generally younger than those in the Era group. Therefore, age adjusted estimates for the Era comparison group have been created by calculating the mortality rate for each single year of age at 1 January 1991 in each calendar year since 1991. This rate was applied to the equivalent numbers in each single year of age at 1 January 1991 and year of death in the Gulf population, from which deaths and emigrations from the UK were subtracted, to calculate the estimated total for each calendar year. These estimated numbers by calendar year were divided by the Gulf population, from which deaths and emigrations from the UK were subtracted, to produce adjusted rates.

ICD Chapter ²	Cause of death	Number			Crude Mortality Rate Ratio	Adjusted ³ Mortality Rate Ratio	Adjusted ³ 95% Confidence Interval
		Gulf	Era	Ad-justed ³ Era			
	All deaths	918	958	936	0.95	0.98	(0.89 - 1.07)
	All cause coded deaths	905	951	931	0.94	0.97	(0.89 - 1.07)
I - XVIII	Disease-related causes	463	550	528	0.83	0.88	(0.78 - 1.00)
I	Certain infectious and parasitic diseases	7	3	3	2.31	2.51	(0.60 - 10.56)
II	Neoplasms	212	232	219	0.90	0.97	(0.80 - 1.17)
V	Mental and behavioural disorders	14	24	22	0.58	0.65	(0.33 - 1.27)
VI	Diseases of the nervous system	15	22	23	0.67	0.70	(0.37 - 1.33)
IX	Diseases of the circulatory system	154	183	179	0.83	0.87	(0.70 - 1.07)
X	Diseases of the respiratory system	13	12	12	1.07	1.06	(0.47 - 2.39)
XI	Diseases of the digestive system	34	49	48	0.69	0.71	(0.46 - 1.11)
III, IV, XII, XVIII	All other disease related causes ⁴	14	25	22	0.55	0.63	(0.31 - 1.25)
XX	External causes of mortality	442	401	403	1.09	1.09	(0.95 - 1.25)
	Transport accidents:	190	159	162	1.18	1.17	(0.94 - 1.45)
	Land transport accident:	157	134	136	1.16	1.14	(0.91 - 1.45)
	Pedestrian	17	7	8	2.40	2.26	(0.93 - 5.47)
	Motorcycle rider	47	40	40	1.16	1.16	(0.76 - 1.78)
	Car occupant	46	37	38	1.23	1.21	(0.78 - 1.87)
	Other ⁵	47	50	50	0.93	0.92	(0.61 - 1.38)
	Water transport	5	2	2	2.47	2.43	(0.46 - 12.78)
	Air and space transport	28	23	24	1.20	1.20	(0.69 - 2.08)
	Other external causes of accidental injury:	71	68	67	1.03	1.04	(0.74 - 1.45)
	Falls	9	11	11	0.81	0.87	(0.37 - 2.06)
	Exposure to inanimate mechanical forces	14	18	19	0.77	0.70	(0.34 - 1.43)
	Accidental drowning and submersion and other accidental threats to breathing	10	8	8	1.24	1.16	(0.45 - 3.03)
	Accidental poisoning by and exposure to noxious substances	15	13	11	1.14	1.23	(0.56 - 2.69)
	Accidental exposure to other and unspecified factors	17	11	11	1.53	1.54	(0.72 - 3.31)
	Other	6	7	6	0.85	0.90	(0.29 - 2.78)
	Intentional self-harm and events of undetermined intent ⁶	162	144	144	1.11	1.12	(0.89 - 1.40)
	Assault	5	10	10	0.49	0.46	(0.15 - 1.37)
	Legal intervention and operations of war	6	10	11	0.59	0.63	(0.23 - 1.72)
	Sequelae of external causes of morbidity and mortality	-	2	1	-	-	* *
	Deaths where the inquest has been adjourned	8	8	*	*	*	* *
	Other deaths for which cause data are not yet available	1	2	*	*	*	* *
	Overseas deaths for which cause data are not available	12	5	*	*	*	* *

Source: DASA (Health Information)

1. Service and Ex-Service personnel only.

2. Causes have been coded to the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), 1992.

3. Adjusted for the single years of age structure of the Gulf cohort at 1 January 1991. The numbers may not add up to the totals shown due to rounding.

4. Includes cases with insufficient information on the death certificate to provide a known cause of death.

5. Under ICD-10 coding if the death certificate does not specifically mention the type of vehicle that was involved in the accident, the death is coded to "motor- or non-motor vehicle accident, type of vehicle unspecified". There were 37 of these deaths among Gulf veterans compared to 35 in the Era group.

6. Includes both coroner-confirmed suicides and open verdict deaths in line with the definition used by the Office for National Statistics (ONS).

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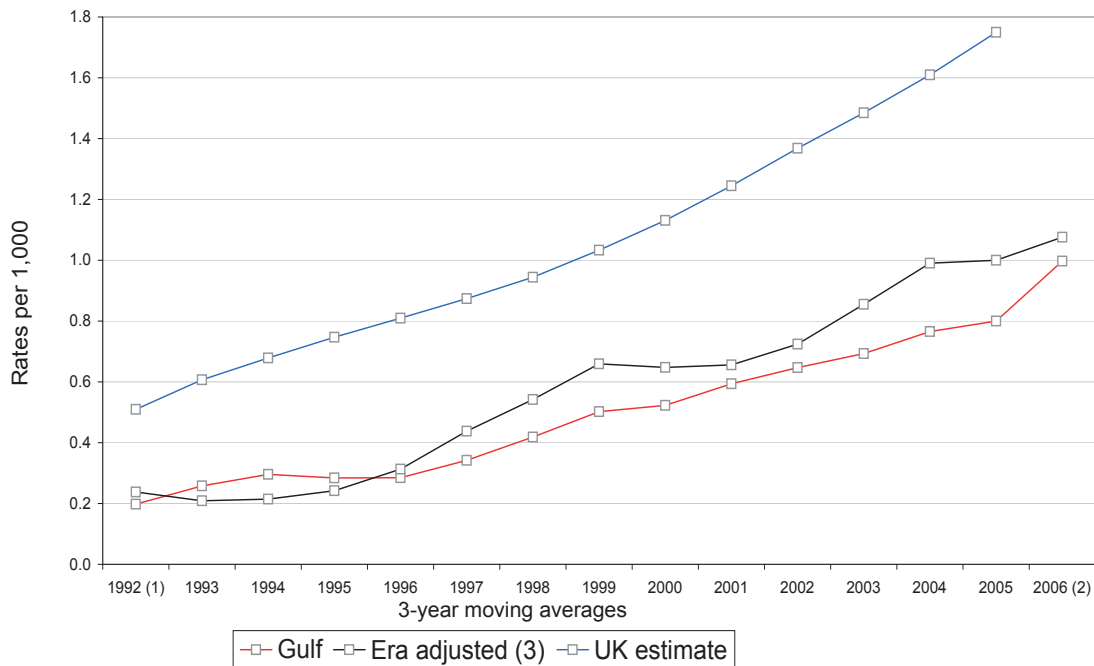
Charts to Table 3.5 Deaths among UK Gulf 1 veterans¹: 1 April 1991 - 31 December 2007

Estimated mortality rates for a similar sized cohort of the general UK population with the same age and gender profile are calculated using mortality and population information provided by the ONS. These are applied to the Gulf and Era populations to produce comparable mortality rates.

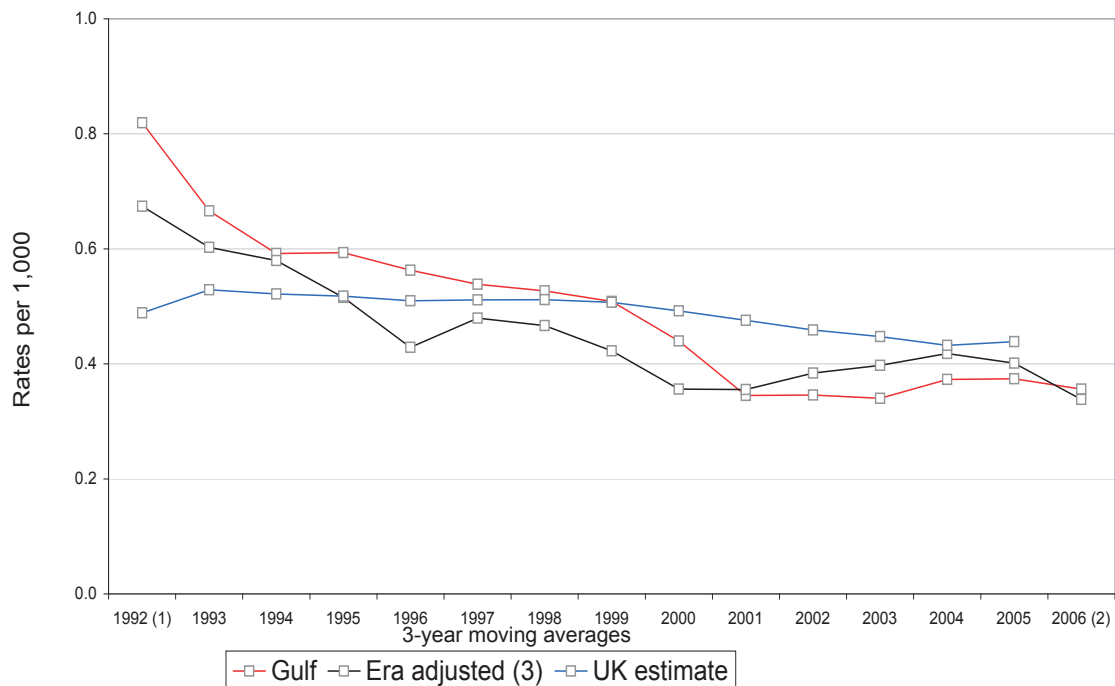
Mortality rates for disease-related causes for both Gulf veterans and the age-adjusted Era comparison group have gradually increased between 1991 and 2007. These follow the trends in rates for disease-related causes among the UK general population cohort. This suggests that the increase in disease-related deaths among Gulf veterans over time reflects the natural aging of the cohort. However, the mortality rates due to disease-related causes for both Gulf veterans and the age-adjusted Era group are statistically significantly lower than for the UK general population cohort.

Mortality rates for external causes for both the Gulf veterans and the age-adjusted Era comparison group have decreased between 1991 and 2007. However the estimated mortality rates for the UK general population cohort have stayed reasonably constant during this period.

Gulf and era³ mortality rates for disease-related causes



Gulf and era³ mortality rates for external causes



1. Data for 1 April 1991 - 31 December 1991 have been adjusted to a full year.
 2. 2007 cause data for the UK general population are not currently available.
 3. Adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.

CHAPTER 3 - HEALTH

OPERATIONAL FATALITIES AND CASUALTIES

This section provides the numbers of fatalities and casualties involving personnel deployed on operations. The casualty data include the Naval Service, Army, RAF, Royal Fleet Auxiliary (RFA) personnel, and MOD Civilians. The figures provided below exclude those individuals categorised as VSI or SI whose condition was identified to be caused by illness. In agreement with Under Secretary of State for Defence, DASA are responsible for reporting on all medium scale operations since 2001. Data on operations smaller than medium-scale are not centrally compiled. The operations reported on below reflect those operations for which data have been published on the MOD website. The tables present the numbers of fatalities and casualties since reporting began in 2001 up until end of 2007.

Although there are no known data quality issues, the data in these tables are outside the scope of National Statistics because they do not currently meet all of the high professional assurance standards set out in the National Statistics Code of Practice, with regards to guidance on release practice procedure.

Table 3.6 Number of UK Operational Fatalities^{1,2,3,4}

	2001	2002	2003	2004	2005	2006	2007
Afghanistan Total	-	3	-	1	1	39	42
Killed in Action	-	-	-	1	1	20	36
Died of Wounds	-	-	-	-	-	1	1
Other	-	3	-	-	-	18	5
Iraq Total	-	-	53	22	23	29	47
Killed in Action	-	-	39	10	18	18	24
Died of Wounds	-	-	1	-	2	9	13
Other	-	-	13	12	3	2	10

Source: DASA (Health Information)

1. Figures include UK Regular and Reservist Armed Forces Personnel.
2. 2001 data for Afghanistan starts 7 October.
3. Some deaths may not have clearly defined cause information and could be subject to change depending on the outcome of the Boards of Inquiry and/or Coroners' Inquest.
4. These data include all deaths occurring as a result of accidental or violent causes while deployed and deaths due to disease related causes during the deployment.

Table 3.7 Number of UK Operational Casualties^{1,2,3,4,5}

Notification of Casualty (or "NOTICAS") is the name for the formalised system of reporting casualties within the UK Armed Forces. The NOTICAS reports raised for casualties contain information on how serious medical staff in theatre judge their condition to be. They are not strictly medical categories but are designed to give an indication of the severity of the illness to inform what the individual's next of kin are told. Very seriously injured and seriously injured are the two most serious categories into which personnel can be classified: Very Seriously Ill/Injured/Wounded or VSI – The illness or injury is of such severity that life is imminently endangered. Seriously Ill/Injured/Wounded or SI – The patient's condition is of such severity that there is cause for immediate concern, but there is no imminent danger to life.

The VSI and SI categories are defined by Joint Casualty & Compassionate Policy & Procedures. The figures provided below exclude those individuals categorised as VSI or SI whose condition was identified to be caused by illness. The data include Naval Service, Army, RAF, MOD Civilians and Royal Fleet Auxiliary (RFA) personnel. Validated NOTICAS data for casualties in Afghanistan, Iraq and Kosovo are held from January 2001 onwards. In agreement with the Under Secretary of State for Defence, operational casualty data prior to 2001 have not been examined.

	2001 ¹	2002	2003	2004	2005	2006 ²	2007
Afghanistan Total	-	1	1	6	2	31	63
Very Seriously Injured or Wounded (VSI) ^{3,4}	-	1	-	3	2	18	23
Seriously Injured or Wounded (SI) ^{3,4}	-	-	1	3	-	13	40
Iraq Total	-	-	46	45	20	32	69
Very Seriously Injured or Wounded ^{3,4}	-	-	14	14	5	11	24
Seriously Injured or Wounded ^{3,4}	-	-	32	31	15	21	45
Balkans⁵ Total	6	2	3	2	-	2	2
Very Seriously Injured or Wounded ^{3,4}	2	2	-	-	-	-	-
Seriously Injured or Wounded ^{3,4}	4	-	3	2	-	2	2

Source: DASA (Health Information)

1. 2001 data starts at 7 October for Afghanistan.
2. Civilians are not included in the figures prior to 01/01/2006.
3. The VSI and SI injury data includes records classified as 'Other Causes'. This classification is used when there is insufficient information to attribute a casualty to injury or natural cause.
4. The casualty figures provided exclude those individuals categorised as VSI or SI whose condition was identified to be caused by illness.
5. The Balkans covers operational casualties in Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Kosovo, Montenegro and Macedonia.

CHAPTER 3 - HEALTH

HEALTH AND SAFETY

The information provided here covers a range of health and safety incidents as set out by the HSE Reporting of Injuries, Diseases and Dangerous Occurrences regulations 1995 (RIDDOR). Cases include both MOD and non-MOD personnel: regular Service personnel, members of the volunteer and regular reserves if they have been mobilised, MOD civilian staff, and any other civilians on MOD property or injured in or by MOD vehicles. Civilians are required to notify the HSE when they are involved in an incident. For Service personnel, there is no current legal requirement, set out by the RIDDOR, for their injuries to be notified to the HSE. However, all these incidents should be recorded on the MOD's Central Health and Safety Project system (CHASP). The CHASP system was introduced in 1997 to enable the MOD to monitor and analyse accident trends throughout the Department and ensure compliance with current health and safety legislation.

A MOD reporting form should be raised for recording any of the following events:

- deaths resulting from work activity;
- injuries or ill health to MOD employees resulting from their work activity, which in normal circumstances would cause more than one hour loss of work time;
- deaths, injuries or illness to any other person where the cause might be attributable to MOD activities or where it has occurred on MOD land or property, which can be linked to a failure in responsibility by the MOD with regard to land or property;
- including those involving hostile activity during peacekeeping (excluding war);
- an event which would normally have resulted in one of the above outcomes but no person was affected (near hit, maritime hazardous incident or an event deemed worthy of reporting such as fire or property damage).

Although there are no known data quality issues, the data in these tables are outside the scope of National Statistics because they do not currently meet all of the high professional quality assurance standards set out in the National Statistics Code of Practice, with regards to the guidelines on release practice procedures

Table 3.8 Work related fatalities by type of incident, UK Service personnel and Civilians

'Work-related fatalities' have been defined as injury related deaths occurring on-duty or on MOD property after excluding suicides. 'Hostile action' is the combination of the JCCC reporting categories killed in action and died of wounds for operational deaths that are a result of hostile fire. Between 1997 and 2006 the UK Regular Armed Forces have been deployed to Northern Ireland, Sierra Leone, the Balkans, Afghanistan and Iraq. Road traffic accidents are those which occur on public highways whilst the Service personnel are on duty.

A 'work place incident' is the result of a fatality for whom the MOD is responsible, that is they are deemed to be 'within the wire', thus work place incidents will include any vehicle incidents that occur on MOD property.

Type of Incident	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total	43	28	18	30	25	57	43	39	77	101
Hostile action	1	1	1	2	-	38	10	21	47	71
Road traffic accident - on duty	22	10	4	10	8	7	10	7	8	11
Work place incident	20	17	13	18	17	12	23	11	22	19

Source: DASA (Health Information)

Table 3.9 On-duty work place incidents resulting in injury-related deaths by cause, UK Service personnel and Civilians

Work Place Incidents	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total	20	17	13	18	17	12	23	11	22	19
Adventure training	1	-	1	3	1	-	1	3	-	1
Diving	-	-	-	2	1	-	-	-	-	-
Drowning	2	1	-	-	-	1	1	-	-	1
Electrocution	-	-	1	1	1	-	-	-	-	-
Explosive device	-	2	-	1	2	1	-	1	-	-
Fall	1	-	3	1	-	1	1	-	1	-
Fixed wing aircraft	4	5	-	1	1	1	2	-	14	-
Gunshot wound	1	-	1	1	1	2	2	3	1	2
Heat Injury	1	-	-	-	-	1	-	1	1	-
Parachute failure	-	-	2	1	2	-	-	2	-	1
Sport	-	-	-	-	1	-	-	1	-	-
Rotary blade aircraft	4	3	1	4	2	2	11	-	1	7
RTA - MOD property	2	1	1	-	1	1	-	-	-	1
Land transport accident	4	2	1	2	1	2	3	-	3	2
Other	-	3	2	1	3	-	2	-	1	4

Source: DASA (Health Information)

CHAPTER 3 - HEALTH

HEALTH AND SAFETY

The CHASP system was introduced in 1997 for the reporting of all work related incidents. In April 2000 a second version of CHASP was launched, introducing improvements to the system and clarification of the data types required for analysis and reporting. This new version was widely publicised and promoted, leading to a noticeable improvement in reporting adverse health and safety incidents on the CHASP system. During 2004/05, the Army trialled a new system for reporting health and safety incidents, allowing Army personnel to report health and safety incidents to a dedicated 24 hour call centre (Army Incident Notification Cell, AINC). Following the success of the Army system both the Navy (Naval Service Incident Notification Cell, NSINC) and Defence Equipment and Support (Defence Equipment and Support Incident Notification Cell, DINC) have rolled out similar systems for collating health and safety incidents. These initiatives have resulted in improvements in the number of events reported on the system, as can be seen in Tables 3.10 and 3.11 below.

The number of major injuries and illnesses reported on the Central Health and Safety Project (CHASP) system increased in 2006 to 430 from 85 in 1997, an increase of 406% (see Table 3.10). The rate of major injury and illnesses increased over the 9 years from 26 per 100,000 MOD personnel in to 153 per 100,000.

The number of serious injuries and illnesses recorded on the CHASP system increased in 2006 to 1,550 from 530 in 1997, an increase of 192% (see Table 3.11 below). The rate of serious injury and illnesses reported on CHASP increased over the nine years from 162 per 100,000 MOD personnel in 1997 to 550 per 100,000 in 2006.

The increases in the rates of major and serious injuries and illnesses are thought to be due to the introduction of single Service notification cells and increasing health and safety awareness in general.

The data in these tables are outside the scope of National Statistics because they do not meet all of the high professional quality assurance standards set out in the National Statistics Code of Practice.

Table 3.10 Major injuries and illnesses UK Service personnel and Civilians, by financial year, numbers and rates per 100,000^{1,2,3,4}

Major injuries and illnesses are defined by the HSE as work-related cases which:

- could result in death or in hospitalisation (or being confined to bed, if at sea) for more than 24 hours
- could result in a person not in MOD employment and who was not at work to be taken from a MOD site to a hospital for treatment as a result of MOD work activity or site infrastructure.

Numbers	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total	85	215	215	210	200	200	205	280	295	430
Naval Service	30	50	25	40	25	30	20	20	40	90
Army	15	80	105	80	105	95	75	145	155	245
Royal Air Force	20	25	30	40	25	30	40	50	40	30
Civilian	20	60	55	55	45	45	70	60	60	65

Rate (per 100,000 strength)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total	26	67	67	68	66	67	69	93	101	153
Naval Service	65	111	55	94	62	75	51	52	106	230
Army	14	73	95	73	95	86	69	132	143	227
Royal Air Force	37	41	56	70	49	53	75	93	76	65
Civilian	17	55	50	51	44	49	73	66	64	75

Source: DASA (Health Information)

Table 3.11 Serious injuries and illnesses UK Service personnel and Civilians by financial year, numbers and rates per 100,000^{1,2,3,4}

Serious injuries and illnesses are those that are not defined as "major" according to the HSE criteria, but which could result in a person being unable to perform their normal duties for more than three days.

Numbers	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total	530	1 370	1 365	1 370	1 235	990	1 010	1 190	1 300	1 550
Naval Service	60	180	125	130	115	60	60	75	75	120
Army	45	325	370	360	430	415	430	630	765	980
Royal Air Force	90	235	200	245	180	155	180	185	165	110
Civilian	340	630	675	635	515	360	335	300	295	340

Rate (per 100,000 strength)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total	162	428	432	438	405	330	337	398	447	550
Naval Service	132	408	285	305	269	145	148	185	194	306
Army	39	296	335	328	392	376	385	563	704	914
Royal Air Force	156	419	365	446	337	293	339	345	327	230
Civilian	294	572	623	600	515	379	361	324	320	388

Source: DASA (Health Information)

1. The numbers provided in the table include both regular and reservist personnel, MOD civilian staff, and any other civilians injured on MOD property or in/by MOD vehicles.
2. Figures exclude Health & Safety related fatalities
3. Rates calculated using Armed Forces strengths as the denominator
4. The numbers of injuries have been rounded to the nearest 5, and therefore may not always add up to the totals provided.

CHAPTER 3 - HEALTH

HEALTH AND SAFETY

Chart to Table 3.10 Major injuries and illnesses UK Service personnel and Civilians, rates ^{1,2,3} per 100,000, by financial year

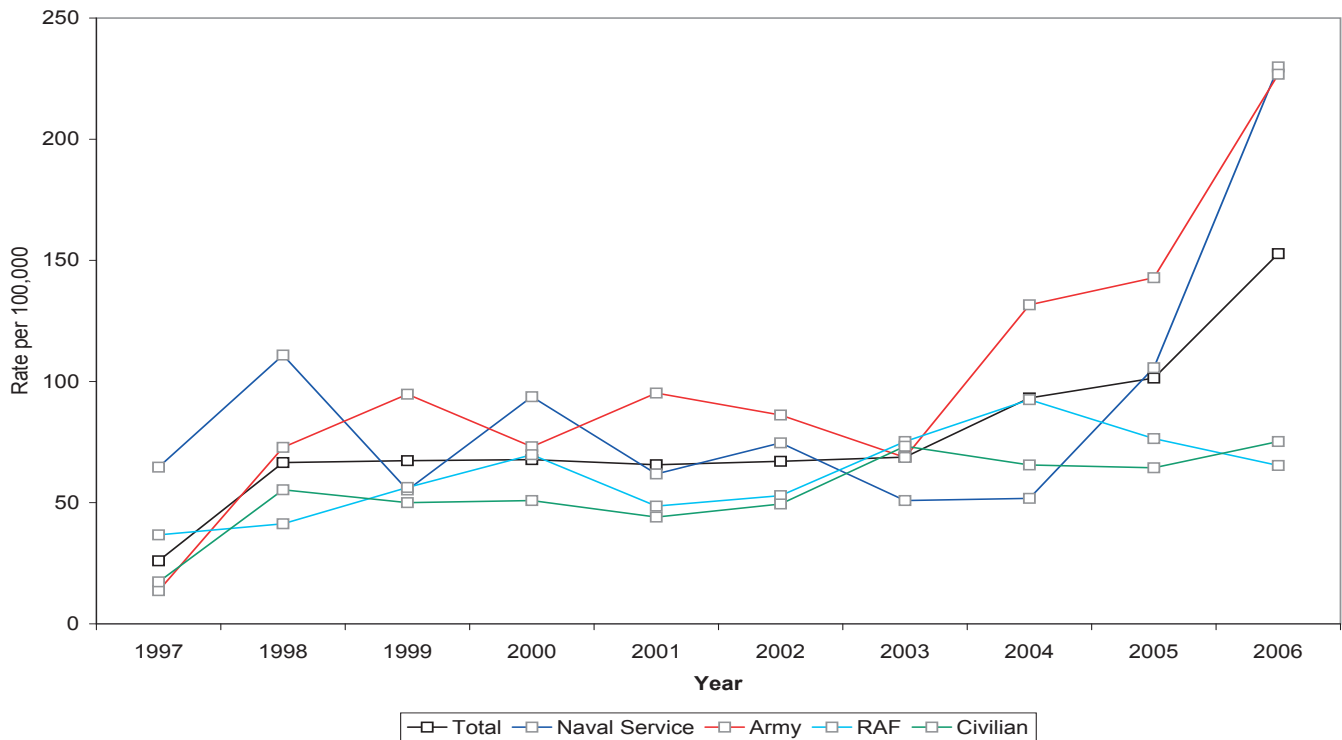
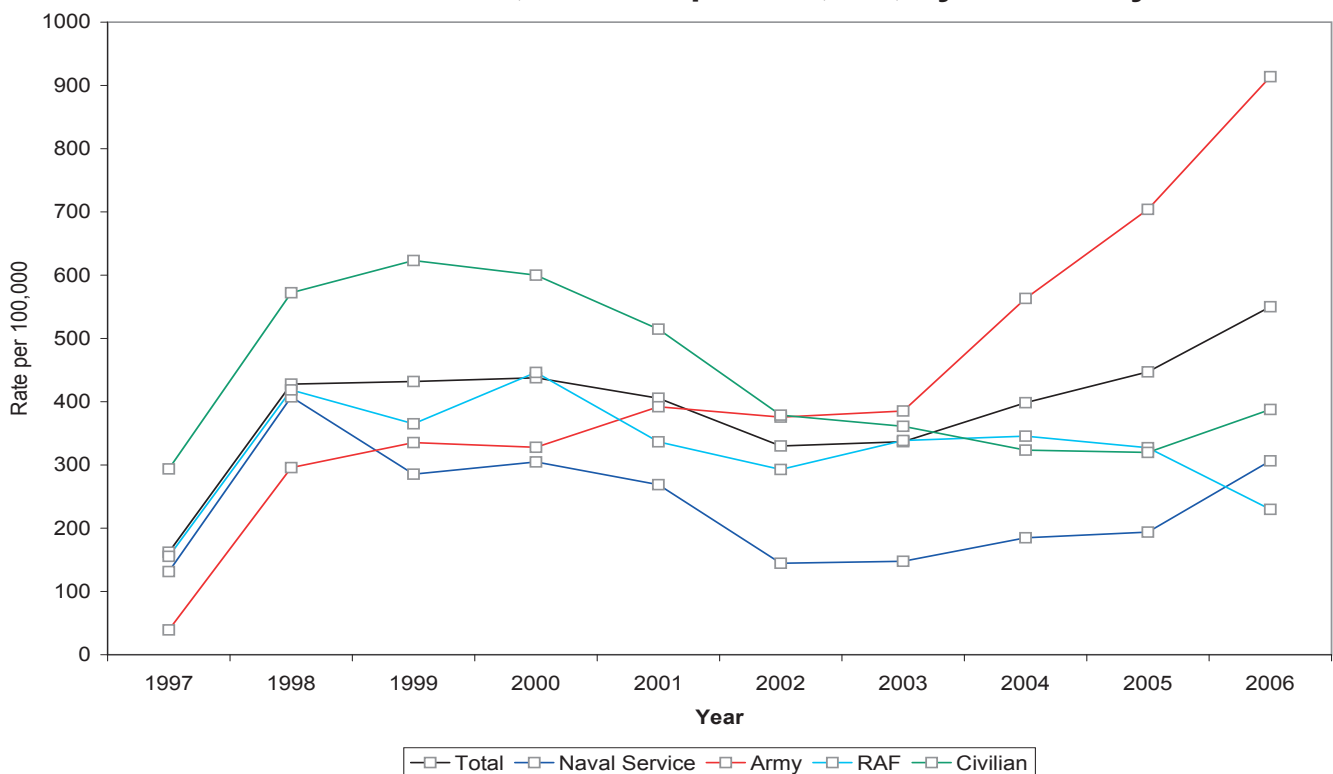


Chart to Table 3.11 Serious injuries and illnesses UK Service personnel and Civilians, rates ^{1,2,3} per 100,000, by financial year



1. Figures exclude Health & Safety related fatalities.
2. Rates calculated using Armed Forces strengths as the denominator.
3. The numbers presented in the graphs include both regular and reservist personnel, MOD civilian staff, and any other civilians injured on MOD property or in/by MOD vehicles.

CHAPTER 3 - HEALTH

CIVILIAN PERSONNEL SICKNESS ABSENCE

Table 3.12 Number of working days lost per year due to sickness of civilian personnel¹, by ICD Code and industrial/ non-industrial marker

	Working days (thousands)			
	Year ending 31 December			Year ending 31 March
	2005	2006	2007	2007/08
Non-industrial total	548.4	486.8	471.7	453.0
<i>ICD category²</i>				
IPO Certain infectious and parasitic diseases	33.9	41.0	41.1	39.9
NGB Neoplasms	13.6	14.4	14.7	14.7
PSD Mental and behavioural disorders	106.8	104.2	99.6	97.7
NSS Diseases of the nervous system	16.0	17.3	16.9	16.9
CIR Diseases of the circulatory system	21.6	16.9	18.3	18.2
DRS Diseases of the respiratory system	85.2	63.6	64.0	56.9
DDS Diseases of the digestive system	35.8	37.4	35.4	34.8
ACI Injury, poisoning and certain other consequences of external causes	37.1	36.2	37.1	36.2
BFO Diseases of the blood forming organs and certain disorders	2.4	4.2	2.7	2.7
DEM Diseases of the ear and mastoid process	5.7	5.3	4.6	4.7
DEY Diseases of the eye and adnexa	4.6	5.0	4.6	4.7
DGY Diseases of the genito-urinary system	15.0	17.8	16.4	15.6
EMN Endocrine, nutritional and metabolic diseases	3.5	3.5	3.4	3.5
MSD Diseases of the musculoskeletal system and connective tissue	66.6	62.0	64.1	62.1
OPP Factors influencing health status and contact with health service	44.9	32.6	31.1	29.5
PCP Pregnancy, childbirth and the puerperium	6.0	7.4	6.7	6.7
SCO Diseases of the skin and subcutaneous tissue	4.0	3.9	3.4	3.4
SID Cause of absence not yet known	45.6	14.1	7.5	4.7
Industrial total	186.4	172.8 ^r	154.8	147.5

Source: DASA (Quad-Service)

Sickness rates³ - number of days divided by the average strength (FTE) for that period.

	Year ending 31 December			Year ending 31 March
	2005	2006	2007	2007/08
	Non-industrial total	8.55	8.04	8.22
Industrial total	12.54	12.14 ^r	11.85	11.54

Source: DASA (Quad-Service)

1. This excludes Royal Fleet Auxiliary, Trading Fund and locally engaged personnel.

2. International Statistical Classification of Diseases and Related Health Problems, Version 10.

3. Rates are based on absence days and are FTE working days lost. For example, if a part-time employee working 50% of full-time hours is sick for 7 calendar days, this is $5 \times 50\% = 2.5$ FTE working days lost.