



29 March 2012

Theme: Other - Defence

Issued by

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SUICIDE AND OPEN VERDICT DEATHS IN THE UK REGULAR ARMED FORCES 1984-2011

INTRODUCTION

1. This annual Statistical Notice provides summary information on suicides and open verdict deaths that have occurred among serving UK regular Armed Forces during the 28 year period 1984-2011. This information updates previous notices published by Defence Analytical Services and Advice (DASA) and includes new data for 2011.
2. 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. In accordance with ONS practice, throughout this notice, the term 'suicide' should be understood to include all suicide and open verdict deaths. To ensure the highest accuracy of information and that all cases previously recorded as 'awaiting verdict' were followed up, DASA carry out an annual update with data held by the ONS and other authorities (refer to '**Data Sources & Methods**' and '**Changes in previously published data**' at the end of this notice).
3. The data are presented for the Naval Service (Royal Navy and Royal Marines), the Army (including the Gurkhas), and the Royal Air Force.
4. Due to the low numbers of cases among female Service personnel (n=21), the analysis in this notice has been restricted to **males** only, aged 16-59 years.
5. Details of the data sources and methods used to collect and analyse the data and additional information not provided in this notice are available in the 1984-2002 notice on DASA's website. A summary can be found in the '**Data Sources & Methods**' section at the end of this notice.

KEY POINTS

6. For the 28-year period 1984-2011, 755 suicides and open verdicts occurred among UK regular Armed Forces personnel: 734 among males, and 21 among females. This represents an addition of five deaths in 2011 and six deaths that occurred in previous years and have now been given a suicide or open verdict.
7. The overall age-standardised suicide rate for the Army was significantly higher than for the other two services (13 per 100,000 strength compared to 9 per 100,000 for the Naval Service and 10 per 100,000 for the RAF).
8. Army males aged 20-24 years and those aged under 20 years had the highest rates at 17 and 15 per 100,000 strength respectively, however this difference was not significantly different to the Naval Service or RAF.
9. Overall, male suicide rates in the UK Armed Forces were significantly lower than the general UK population. The rates for all age groups within each Service were also lower than the UK general population, with the exception of Army males aged less than 20 years. Over the period 1984-2011 this group had a significantly increased risk of 46%. This increased risk was the same as previously reported in 2011.
10. Suicide rates by hanging, strangulation and suffocation increased in the 1990's but have fallen since the end of the decade (Army rate down from a high of 8 per 100,000 strength in 1996-2000 to 4 per 100,000 strength in 2007-2011).
11. Suicide rates by the use of poisonous gases have fallen since the early 1990s (single Service rates which were between 4 and 8 per 100,000 strength in 1986-1990 have fallen to less than one per 100,000 in 2007-2011).
12. Suicide by the use of firearms, particularly in the Army, increased in the mid 1990s (to 7 per 100,000 strength in 1992-1996) but has since fallen to less than one per 100,000 in 2007-2011.
13. As 29 deaths (13 in 2011) are still under investigation by a coroner (waiting verdicts) data may be revised in subsequent notices when verdicts are returned. Therefore findings for the most recent years should be interpreted with caution.

RESULTS

Overall Numbers and Rates

14. For the 28-year period 1984-2011, 755 suicides and open verdicts in the UK regular Armed Forces were reported to DASA. A further 29 deaths involving a wide range of external accidental or violent causes have been referred to a coroner (or, for Scotland, the Procurator Fiscal), some of which may be returned as suicides or open verdicts (13 of which occurred in 2011).

15. Only 21 cases (3%) occurred among female personnel during 1984-2011.

16. Details of the verdicts by gender are shown in **Table 1**.

Table 1: Suicide, open verdict and waiting verdict deaths by Service and gender, 1984-2011, numbers and percentages¹.

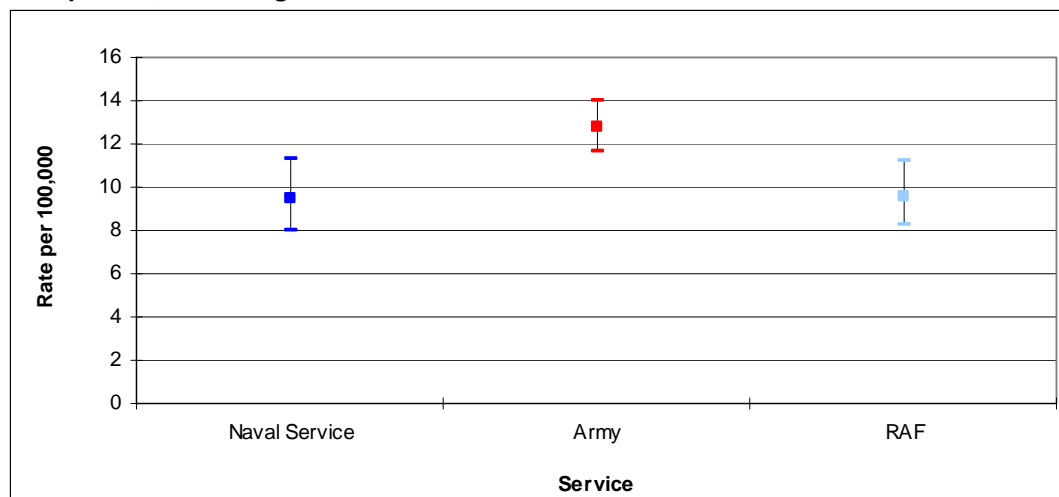
Verdict	All						Naval Service				Army				RAF			
	All		Male		Female		Male		Female		Male		Female		Male		Female	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Suicide	582	100	566	97	16	3	86	15	3	<1	355	61	7	1	125	21	6	1
Open	173	100	168	97	5	3	38	22	1	<1	95	55	4	2	35	20	0	0
Waiting Verdicts	29	100	27	93	2	7	3	10	0	0	23	79	2	7	1	3	0	0

¹ Percentages (%) have been rounded to the nearest whole number. For percentages greater than 0, but less than 1, "<1" is shown. Percentages may not add to 100% due to rounding.

17. All subsequent analysis, tables and graphs in this notice focus on suicides and open verdicts deaths, referred to jointly as 'suicides', among males aged 16-59 years only. The confidence intervals presented in this publication provide the range of values within which we expect to find the real underlying value of the study indicator, with a probability of 95%. Please see paragraph 64 for more information about confidence intervals.

Service and Age

Figure 1: Male suicide rates and 95% confidence intervals by Service, 1984-2011, age-standardised¹ rates per 100,000 strength².



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

² Values presented to two decimal places

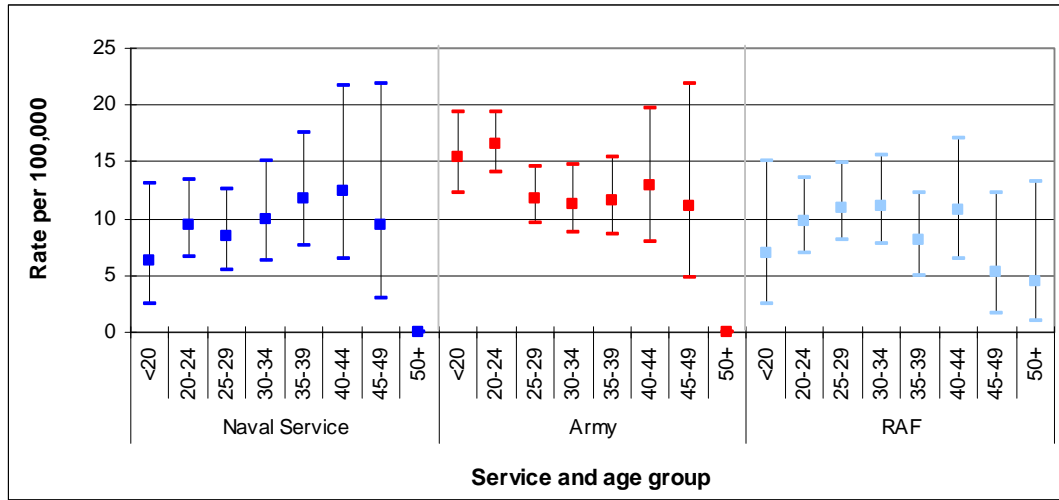
18. **Figure 1** illustrates that for the 28-year period 1984-2011, the Army had a significantly higher age-standardised suicide rate (13 per 100,000 strength, 95% CI: 12-14), than the Naval Service (9 per 100,000 strength, 95% CI: 8-11) or RAF (10 per 100,000 strength, 95% CI: 8-11).

19. **Figure 2** (see page 3) illustrates that for the 28-year period 1984-2011, trends for individuals in the 25-29 age groups and older did not show unusual patterns or differ between the Services to any degree. It is noted that the confidence intervals presented in **Figure 2** were large and so caution must be observed when interpreting these findings. This is especially true for the higher age bands and reflects the small numbers observed in these groups (see paragraph 43 for more information).

20. **Figure 2** shows the suicide rate for Army personnel in the under 20 and 20-24 age groups were higher

compared to the same age groups in the Naval Service and RAF, however, this difference was not significant.

Figure 2: Male suicide rates and 95% confidence intervals by Service and age group, 1984-2011, age-specific rates per 100,000 strength¹.

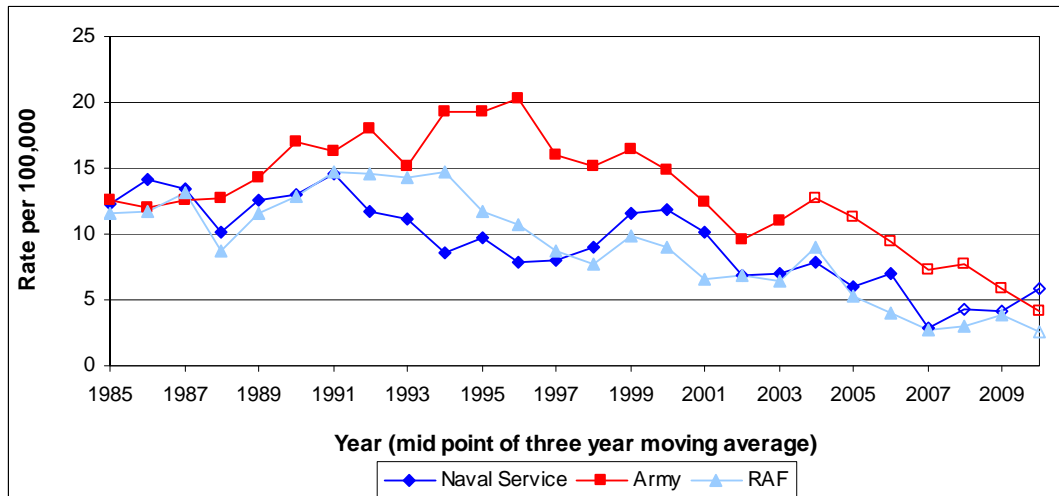


¹ Values presented to two decimal places

Trends over Time (1984-2011)

21. In order to compare trends in the rates for each Service over the period 1984-2011 and take into account the different age structures of the three Services, rates have been age-standardised. **Figure 3** illustrates these trends as a three-year moving average.

Figure 3: Male suicide rates by Service and three year time period¹, 1984-2011, age-standardised² rates per 100,000 strength^{3,4}.



¹ The year shown is the mid-point of a three-year average, e.g. 1985 refers to the period 1984-1986.
² Rates have been age standardised to the 2011 Armed Forces population, expressed per 100,000 strength.
³ If there are any waiting verdicts in the 3 year period, the data point is shown as hollow.
⁴ Values presented to two decimal places

- 22. The Naval Service suicide rate peaked in 1990-1992 at 15 per 100,000 strength. It fell to a low of 3 per 100,000 strength in 2006-2008 and has risen to 6 per 100,000 in 2009-2011.
- 23. The Army suicide rate rose from 13 per 100,000 strength in 1984-1986 to 20 per 100,000 strength in 1995-1997. It fell to a low of 4 per 100,000 strength in 2009-2011.
- 24. The RAF suicide rate rose from 12 per 100,000 strength in 1984-1986 to 15 per 100,000 strength in 1990-1992. It fell to a low of 3 per 100,000 strength in 2009-2011.

Comparisons with the UK General Population

25. In order to compare suicides among the UK regular Armed Forces with those among the UK general population, Standardised Mortality Ratios (SMR) and age-specific mortality ratios have been calculated for each Service and age group for the 28-year period 1984-2011 (shown in **Table 2**). Yearly changes in the UK general population have been taken into account in these calculations. An SMR value less than 100 indicates lower rates in that particular group than in the corresponding group in the UK general population. An SMR value of greater than 100 indicates higher rates in that particular group than in the same group in the UK general population. If the 95% confidence interval does not encompass 100, then this difference is statistically significant. See the 'Data Sources & Methods' section for further details.

Table 2: Male suicides by Service and age group, 1984-2011, numbers, SMR¹ and age-specific mortality ratios².

Age	All		Naval Service		Army		RAF	
	n	SMR (95%CI)	n	SMR (95%CI)	n	SMR (95%CI)	n	SMR (95%CI)
All	734	55 (51-59)	124	44 (37-53)	450	65 (59-71)	160	43 (37-50)
Under 20	84	121 (98-150)	7	60 (24-123)	71	146 (116-184)	6	66 (24-143)
20-24	222	67 (59-76)	30	46 (32-66)	158	81 (69-94)	34	47 (34-66)
25-29	153	48 (41-57)	24	37 (24-56)	88	53 (43-65)	41	48 (35-65)
30-34	111	46 (38-55)	22	42 (26-63)	57	48 (37-62)	32	46 (32-65)
35-39	92	45 (36-55)	24	50 (32-74)	47	49 (37-65)	21	34 (21-52)
40-44	51	50 (38-66)	12	52 (27-91)	21	54 (34-83)	18	45 (27-71)
45-49	18	36 (21-57)	5	42 (14-98)	8	49 (21-97)	5	23 (8-54)
50+	3	11 (2-32)	0	-	0	-	3	22 (5-64)

¹ Ratios have been standardised for age and calendar year.

² Ratios have been standardised for calendar year.

26. For each Service and for the UK regular Armed Forces as a whole, the overall SMR shows that the suicide rate was statistically significantly lower than would be expected if the Armed Forces had the same age and year profile as the UK general population. The Naval Service was at a 56% decreased risk of suicide compared to the UK general population (SMR=44, 95% CI:37-53); the Army was at a 35% decreased risk of suicide compared to the UK general population (SMR=65, 95% CI:59-71); and the RAF was at a 57% decreased risk of suicide compared to the UK general population (SMR=43, 95% CI:37-50).

27. Overall, the age-specific mortality ratios for each Service, and for the UK regular Armed Forces as a whole, for each age group were also lower than expected, based on the UK general population rates. The only exception to this was Army males aged less than 20, who had a 46% statistically significant increased risk of suicides over the period 1984-2011 than the UK general population (SMR=146, 95% CI:116-184).

28. **Table 3** presents the trends over time for Army males in the under 20 and 20-24 age groups. It provides information on 28 years of male Army data in successive periods of five calendar years. The most recent five year period is also shown.

Table 3: Male suicides in Army personnel aged less than 25 years by five year time period & age group, 1984-2011, SMR¹ and age-specific mortality ratios².

Time period	Under 20		20-24	
	n	SMR (95%CI)	n	SMR (95%CI)
1984-2011	71	146 (116-184)	158	81 (69-94)
1984-1988	10	71 (34-130)	33	73 (52-102)
1989-1993	23	184 (117-276)	49	94 (71-124)
1994-1998	15	235 (132-388)	40	110 (80-149)
1999-2003	15	178 (99-293)	23	82 (52-123)
2004-2008	7	135 (54-277)	11	51 (25-91)
2007-2011	2	54 (6-193)	4	20 (6-52)

¹ Ratios have been standardised for calendar year.

29. **Table 3** shows that the overall trends for Army males as a whole (illustrated in **Figures 2 and 3**) were reflected in the mortality ratio trends for the under 20 and 20-24 age groups with numbers decreasing in more recent years. Breaking the whole time period down into five year time periods shows that mortality ratios for both age groups increased from 1984-1988 to peak during 1994-1998, after which they have

continued to fall.

30. In the latest five year period, 2007-2011, there was no significant difference between the mortality ratios of Army personnel under 20 and the UK general population. However, the small numbers in this age group result in wide confidence intervals for the SMR (see paragraph 43).

31. The data in the five-year periods 2004-2008 and 2007-2011 are not mutually exclusive therefore; any comparisons between these time periods should be interpreted with caution.

32. The numbers presented in Table 3 may be subject to change as deaths awaiting verdicts may be returned as suicides or open verdicts. For the time period 2007-2011, there are three deaths to Army males aged 20-24 and no deaths to Army males aged under 20 awaiting coroner verdicts.

Methods used to commit suicide

33. **Table 4** provides details of the methods used to commit suicide by personnel in all three Services over the period 1984-2011.

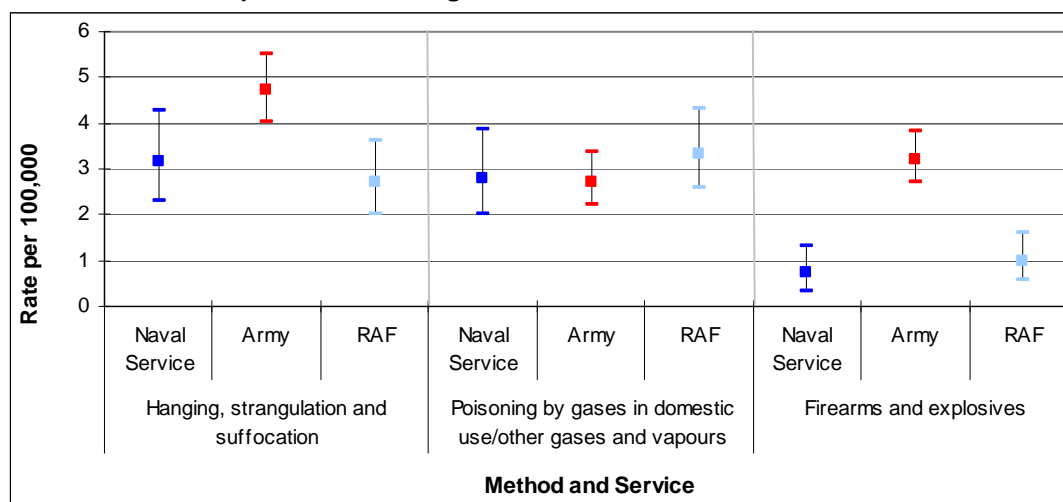
Table 4: Male suicides by Service and method, 1984-2011, numbers and percentages¹.

	All		Naval Service		Army		RAF	
	n	%	n	%	n	%	n	%
All	734	100	124	100	450	100	160	100
Hanging, strangulation and suffocation	245	33	41	33	159	35	45	28
Poisoning by gases in domestic use/other gases and vapours	183	25	36	29	90	20	57	36
Firearms and explosives	155	21	10	8	129	29	16	10
Poisoning by solid or liquid substances	49	7	7	6	31	7	11	7
Jumping from a high place	23	3	9	7	9	2	5	3
Road traffic incident	22	3	9	7	8	2	5	3
Rail incident	17	2	2	2	8	2	7	4
Submersion (drowning)	8	1	3	2	3	<1	2	1
Air transport incident	6	<1	0	0	2	<1	4	3
Cutting and piercing instruments	5	<1	2	2	2	<1	1	<1
Other and unspecified means	21	3	5	4	9	2	7	4

¹ Percentages (%) have been rounded to the nearest whole number. For percentages greater than 0, but less than 1, "<1" is shown. Percentages may not add to 100% due to rounding.

34. The following three methods account for 79% of all cases; hanging, strangulation and suffocation (33% of all cases); poisoning by gases in domestic use/other gases and vapours (25% of all cases – primarily car exhaust fumes); and firearms and explosives (21% of all cases). **Figure 4** illustrates that for the method of hanging, there was no significant difference in the suicide rates between the three services.

Figure 4: Male suicide rates and 95% confidence intervals by Service and method, 1984-2011, age-standardised rates¹ per 100,000 strength².

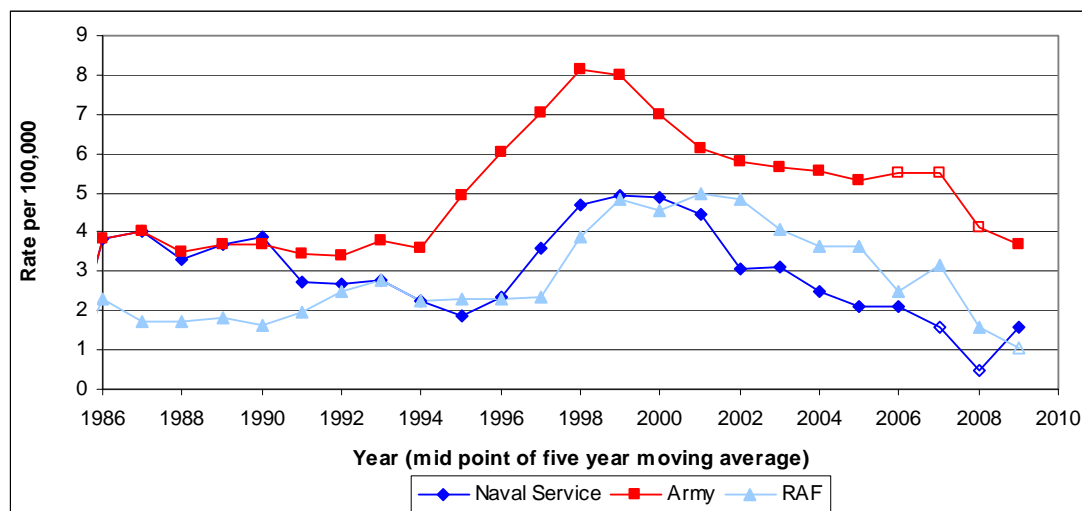


¹ Rates have been age standardised to the 2011 Armed Forces population, expressed per 100,000 strength

² Values presented to two decimal places

35. For the method of poisoning by gases in domestic use/other gases and vapours, there was no significant difference in the suicide rates between the three Services.
36. For the method of firearms and explosives, Army males had statistically significant higher suicide rates (3.2 per 100,000 strength, 95% CI: 3-4) than Naval Service males or RAF males (1 per 100,000 strength, 95% CI: 0-1, and 1 per 100,000 strength, 95% CI: 1-2 respectively).
37. **Figures 5, 6 and 7** illustrate the changes in the use of these three methods over the period 1984-2011. Due to small numbers involved, the data have been aggregated to give five year moving averages. This eliminates some of the random variation that can occur and provides a clearer picture of possible trends.
38. **Figure 5** illustrates that use of hanging, strangulation and suffocation increased in all three Services from the mid 1990s to the years 1996-2000. There has been a decline in the use of this method since then for all three Services to between 1 and 4 per 100,000 in 2007-2011.
39. **Figure 6** illustrates that use of poisoning by gases in domestic use/other gases and vapours has been on the decline in all three Services since the early 1990s. Single Service rates which were between 4 and 8 per 100,000 strength in 1986-1990 have fallen to less than one per 100,000 in 2007-2011.
40. **Figure 7** illustrates that use of firearms and explosives in the Naval Service and RAF have remained low throughout the period 1984-2010. It is worth noting that the rise for the RAF in the period 2001-2005 involves very small numbers (three cases in 2003 and one case in 2004), therefore this rise is likely due to a chance variation rather than the appearance of a new trend. Use of firearms and explosives appears to have changed noticeably in the Army: increasing from the beginning of the period to the mid-1990s, followed by a clear fall since then from 7 per 100,000 in the period 1992-1996 to less than one per 100,000 in the period 2007-2011.

Figure 5: Male suicide rates by the use of hanging, strangulation and suffocation by Service and five year time period¹, 1984-2011, age-standardised² rates per 100,000 strength^{3,4}.



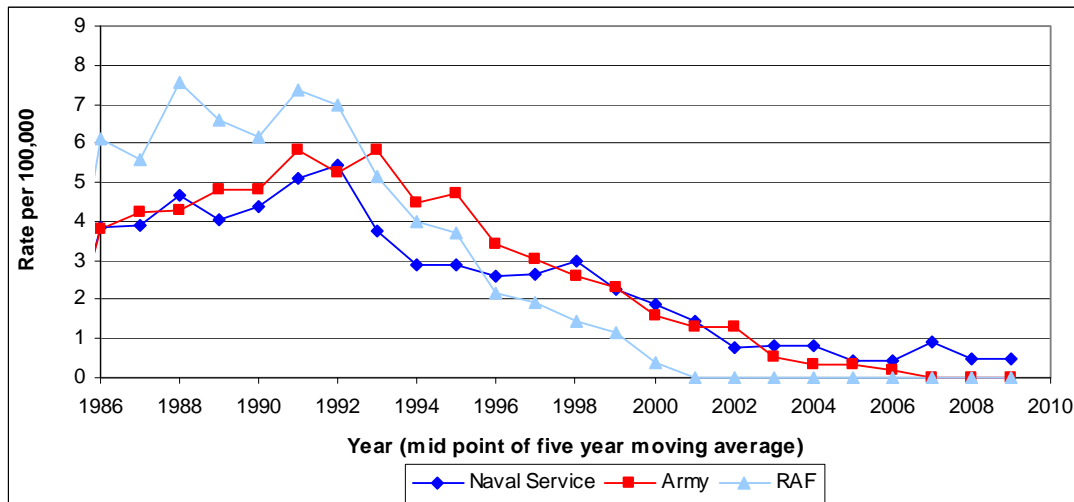
¹ The year shown is the mid-point of a five-year average, e.g. 1985 refers to the period 1983-1987.

² Rates have been age standardised to the 2011 Armed Forces population, expressed per 100,000 strength.

³ If there are any waiting verdicts in the 5 year period, the data point is shown as hollow.

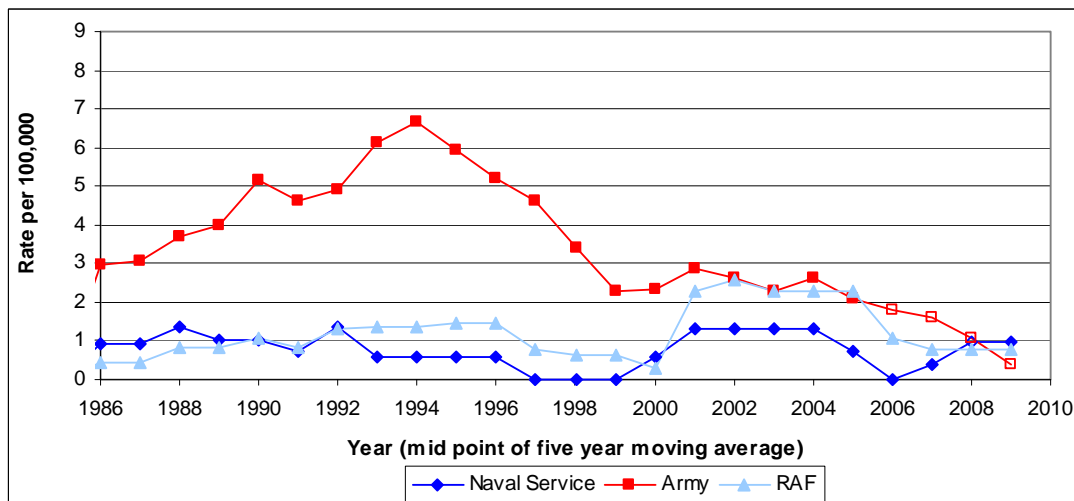
⁴ Values presented to two decimal places.

Figure 6: Male suicide rates by the use of poisoning by gases in domestic use/other gases and vapours by Service and five year time period¹, 1984-2011, age-standardised² rates per 100,000 strength^{3,4}.



¹ The year shown is the mid-point of a five-year average, e.g. 1985 refers to the period 1983-1987.
² Rates have been age standardised to the 2011 Armed Forces population, expressed per 100,000 strength.
³ If there are any waiting verdicts in the 5 year period, the data point is shown as hollow.
⁴ Values presented to two decimal places.

Figure 7: Male suicide rates by the use of firearms and explosives by Service and five year time period¹, 1984-2011, age-standardised² rates per 100,000 strength^{3,4}.



¹ The year shown is the mid-point of a five-year average, e.g. 1985 refers to the period 1983-1987.
² Rates have been age standardised to the 2010 Armed Forces population, expressed per 100,000 strength.
³ If there are any waiting verdicts in the 5 year period, the data point is shown as hollow.
⁴ Values presented to two decimal places.

DISCUSSION

- 41. This paper presents the number and rates of suicides among the UK regular Armed Forces over the 28-year period 1984-2011 and includes comparisons with the UK general population.
- 42. Between 1984 and 2011, there were 582 coroner-confirmed suicides and 173 open verdict deaths, 29 deaths are waiting for coroner inquests, 2 of which are from 2010 and 13 in 2011. Once the coroners' verdicts are received the recorded number of suicides, and corresponding rates, may increase. Interpretation of recent trend data may be affected.
- 43. The analyses made here are based on relatively small numbers. This presents a particular challenge for complex and detailed statistical analysis. As this notice presents several sub-group analyses, in which some categories may only involve a handful of cases, there is a risk of misinterpreting a chance occurrence for a true finding. This is evidenced by the wide range in the confidence intervals presented in

this publication. We strongly recommend caution in reading too much into past trends and to continue to do so in the future.

44. Overall comparisons using male-specific rates show that the Army had a significantly higher rate of suicides than the Naval Service and the RAF. There were no significant differences in the age groups between each of the Services. It is important to bear in mind that while these analyses take account of the different age structures of the three Services, they make no allowance for other, largely occupational, confounding factors specific to the single Services which may have had an impact on the findings observed.
45. There have been some noticeable falls in recent years, particularly among male Army personnel :
 - Age-standardised rates fell from a high of 20 per 100,000 strength in 1995-1997 to 4 per 100,000 strength in 2009-2011 (illustrated in **Figure 3**).
 - Age-specific mortality ratios for the under 20 and 20-24 age groups showed a peak during 1994-1998, and a subsequent fall in the five year periods since this point (shown in **Table 3**).
 - For the latest five year period, 2007-2011, there was no increase in risk of suicide for Army personnel aged less than 20 than in the UK population. The risk for the 20-24 age group was significantly lower than the UK population (shown in **Table 3**). This lowered risk should be interpreted with caution as the small number of waiting verdicts for these age groups may be sufficient to alter the figures should they be returned as suicides by a coroner.
46. The use of SMRs is a standard epidemiological technique for comparing mortality rates among an occupational cohort with a standard population. In this notice, SMRs were calculated to allow comparisons between the three Services and the UK general population. Overall, for the 28-year period 1984-2011, the UK regular Armed Forces and each individual Service had a significantly lower number of suicides than would be expected if the Armed Forces had the same age and year profile as the UK population. Each age group within each Service were at a lower risk of suicide compared to the UK general population, with the exception of Army males in the under 20 age group, for whom the mortality ratio was significantly higher at 146 (95% CI: 116-184, n=71). In the previous notice, 1984-2010, this mortality ratio was 147 (95% CI: 117-186, n=71).
47. The low SMR and age-specific mortality ratios 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.
48. A number of other factors, specific to Service life both on and off duty, may also play a role in reducing the risk of suicide reflected in these low SMR. For instance, the strong group loyalty, bonding and mutual dependence encouraged at all levels in the Services, particularly in small combat units.
49. Some known suicide risk factors identified from academic research into the general population or other specific occupation groups remain unexplored at present. DASA are engaged in collaborative work with external academic colleagues in order to address some of these issues, such as psychiatric and physical morbidity.
50. The likelihood of committing suicide depends to some extent on the ease of access to, and knowledge of, an effective method. Three main types of method were used in 79% of the suicides reported in this notice: hanging, strangulation and suffocation (33%), poisoning by gases in domestic use/other gases and vapours (25%), and firearms and explosives (21%). Firearms and explosives were used mostly in the Army (Army firearms and explosives suicide deaths accounted for 83% of all firearms and explosives suicide deaths). This reflects the greater access to firearms and explosives in that particular Service.
51. It is clearly important to understand the link between access to means and trends over time, as described earlier, as this may aid policy makers to introduce preventative measures with the aim of reducing the incidence of suicides in the Services. The reduction in suicides by the use of poisoning by gases in domestic use/other gases and vapours across all three Service since the early 1990s is thought to reflect the change to catalytic converters on cars and in the size of the exhaust pipe.
52. The increase in the use of hanging, strangulation and suffocation across all three Services in the 1990s may have partly been a response to the new difficulties presented by the use of poisoning by gases in domestic use/other gases and vapours. All three Services, however, appear to show a decline in hanging, strangulation and suffocation in recent years. The reasons for this recent change still require exploration.

53. The changes in the use of firearms and explosives in Army males (illustrated by **Figure 7**), particularly the steep decline since 1992-1996 (from 7 per 100,000 strength to less than 1 per 100,000 by 2007-2011) has played a major part in the overall decline in the Army rates shown in **Figure 3**. This decline has been accelerated in recent years by similar declines observed in the use of poisoning by gases in domestic use/other gases and vapours as well as the use of hanging, strangulation and suffocation, as mentioned above.

CONCLUSIONS

54. The analyses provided here are based on small numbers. This is evidenced by the wide range in the confidence intervals presented in this publication and we strongly recommend caution in reading too much into past trends and to continue to do so in the future

55. The findings of this notice for the overall number of suicides in the UK regular Armed Forces over the period 1984-2011 are similar to those published in 2011 covering the 27 year period 1984-2010.

56. The updates for recent years show a declining trend for all three Services, particularly in the suicide rates among young Army males in the use of hanging, strangulation and suffocation, poisoning by gases in domestic use/other gases and vapours and the use of firearms and explosives.

CHANGES IN PREVIOUSLY PUBLISHED DATA

57. In preparing this document, DASA carried out a review of the data recorded on deaths to Service personnel to ensure the highest accuracy of information and that all cases previously recorded as 'awaiting verdict' have been followed up with the ONS and other authorities.:

- Six deaths previously reported as waiting verdicts have now been notified as suicides.
- Two deaths previously reported as open verdicts have now been reclassified as accidental deaths.
- Thirteen new waiting verdicts for the year 2011.

DATA SOURCES & METHODS

58. DASA receive weekly notifications of all UK regular Armed Forces deaths from the Joint Casualty and Compassionate Centre (formerly the Single Service Casualty Cells). DASA also receive cause of death information from military medical sources in the single Services and the Defence Inquest Cell.

59. DASA regularly check all deaths against the information held on the Armed Forces Memorial Database (AFMDB) owned by the Joint Casualty and Compassionate Centre (JCCC).

60. DASA also regularly check all deaths for information on coroner's verdicts (England & Wales) and the results of investigations by the Procurator Fiscal for Scotland where possible. For Northern Ireland, DASA liaise with the Northern Ireland Statistics and Research Agency (NISRA) who handle the official information on behalf of the Northern Ireland Office. In this notice, all these sources of information are referred to as "coroner's verdicts". There is an obligation for all accidental deaths, and those resulting from violent action, to be referred to these officials. Inquests are usually held within a few months of the death, but occasionally a few years may elapse, therefore some recent deaths may not have clearly defined causal information. In these cases, deaths are identified as waiting verdicts and are not analysed in the main body of this notice.

61. 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.

62. Deaths presented here are for the UK regular Armed Forces. The dataset includes all trained and untrained regular Service personnel. Non-regular Service personnel that were deployed on operations at the time of their death are also included. The data here exclude the Home Service of the Royal Irish Regiment, full time reservists, Territorial Army and Naval Activated Reservists who were not deployed on operations at the time of their death, as DASA do not receive routine notifications of all deaths among reservists and non-regulars, and because reliable denominator data to produce interpretable statistics are not available.

63. In order to compare time trends and to take into account the different age and gender structures of their respective strengths, rates have been age and gender standardised. In order to facilitate comparisons with previously published reports data has been standardised to the 2011 Armed Forces population and therefore the rates presented estimate the rate of suicides among males for each Service as if each Service had the same age distribution as the 2011 male Armed Forces population.

64. 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.

65. In 2011, DASA undertook a review of all Armed Forces personnel data from the Joint Personnel Administration (JPA) system. This resulted in very small changes for Armed Forces strength data from April 2006 to April 2009 (inclusive). In previous publications of this report all JPA data considered provisional but this annual publication incorporates the finalised JPA strengths figures for the first time (for data up till April 2009). DASA is continuing to review JPA data post April 2009 and aims to finalise this data in due course.
66. 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.
67. 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.
68. 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.
69. The UK general population data for 2011 were not available for this report to calculate standard mortality ratios (SMRs), therefore, DASA has used the 2010 data as an estimate for the 2011 figures as there is little year on year variation for the UK figures. Thus, any patterns reported here may be subject to minor fluctuations when the 2010 data becomes available.
70. In 2006 the ONS changed from reporting the number of deaths that occurred in each year to the number of deaths that were registered in each year. Therefore the UK death data used by DASA up to and including 2005 is based on deaths that occurred in the year. The UK death data used by DASA for 2007 onwards is based on deaths that were registered in the year. To produce the UK death data for 2006 DASA have followed advice provided by the ONS and used deaths that both occurred and were registered in year.
71. For a detailed description of the sources of data used in this notice and their analysis refer to the references cited below.
72. Whilst values are presented to two decimal places in the graphs in this report for accuracy, the values presented in the text are as whole values due to the small numbers of suicide and open verdict deaths.
73. DASA are undertaking a review of the deaths for which a verdict is 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. The outcome will be reported in the next release of this statistical notice.

REFERENCES

- i. Blatchley, N. F., Ward, V. R., & Fear, N. T. (2004). Suicide and open verdict deaths among males in the UK regular Armed Forces, 1984-2003. DASA; Ensligh, Bath.
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