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## Annual UK regular Armed Forces Land Transport Accident Deaths 1 January 2009-31 December 2013

### INTRODUCTION

1. This annual Official Statistic is providing summary statistics on Land Transport Accident deaths whilst in Service in the five-year period 2009-2013 among the UK regular Armed Forces. This report is published in March each year reporting on the previous calendar year. The next report will be published on 26<sup>th</sup> March 2015.
2. This report provides information on demographic, Service and vehicle types associated with Land Transport Accident deaths (LTA) and information on comparisons to the UK general population. In order to provide a balance between presenting analysis for a sufficient time period from which to provide meaningful data with the need to monitor the impact of MOD policy, this report presents time trend graphs since the start of data collection in 1984 and all tables and remaining graphs as numbers and rates aggregated for the latest 5 year period. Tables presenting the number of LTA deaths since 1984 by year and duty status (Table A1) can be found in Annex A.
3. The National Statistic on 'Deaths in the UK regular Armed Forces' is published in March each year. The notice published in March 2014 has shown that Land Transport Accident deaths were the second largest cause of death between 2009 and 2013 in the UK Armed Forces, after deaths due to Hostile Action. This report is being released to advise MOD and the public of the loss of life by LTA and has been developed in response to requests from the MOD road safety and health promotion areas for detailed analysis and to contribute to MOD's commitment to release information where possible.
4. The information shown has been compiled from data held by Defence Statistics on 6 February 2014.
5. 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. Non-regular members (for example Reservists) of the UK Armed Forces who died whilst deployed on operations are included in the data presented.

### KEY POINTS

6. In the five year period 2009-2013 112 deaths occurred among the UK regular Armed Forces as a result of Land Transport Accidents, the second largest cause of death among Armed Forces personnel after deaths as a result of hostile action.
7. Between 2009 and 2013, the highest number of LTA deaths were among Army personnel with 86 deaths at a rate of 15 per 100,000. There were 10 deaths at a rate of 6 per 100,000 in the Naval Service and 16 deaths in the RAF at a rate of 9 per 100,000.
8. In the latest calendar year, 2013 :
  - a total of 14 LTA deaths occurred among the UK regular Armed Forces, of which one was serving in the Naval Service, 11 in the Army, and two in the RAF.
  - the overall LTA mortality rate was 8 per 100,000, whilst in the Naval Service the rate was 3, the Army 10 and the RAF 5 per 100,000 strength.
9. The rate of LTA deaths among UK regular Armed Forces personnel has shown a downward trend following a peak in 2004-2006. In 2013 the rate was at its lowest since 1984 at 8 per 100,000.
10. Between 2009 and 2013, for the regular UK Armed Forces:
  - 109 (97%) of LTA deaths were among males;
  - Off-duty accidents accounted for 95 (85%) of LTA deaths.
  - 107 (96%) of deaths occurred amongst other ranks.
  - 69 deaths (62%) occurred among personnel previously deployed to Iraq

and/or Afghanistan;

- Motor Vehicle accidents were the single largest cause of LTA deaths: 49 deaths (44%);
- Motorcycle accidents were the second largest cause of LTA deaths: 36 deaths (32%);
- Pedestrian accidents accounted for 18 LTA deaths (16%);
- Occupation Specific accidents accounted for 9 LTA deaths (8%).

12. In 2013, the proportion of Pedestrian deaths decreased from 27% in 2012 to 7% in 2013. This may be as a result of a MOD poster campaign aimed at reducing off-duty pedestrian deaths.

13. Overall, for the five-year period 2009-2013 the UK regular Armed Forces were at a 80% increased risk of dying as a result of a LTA compared to the UK general population (SMR =180, 95% CI: 149-216). This result was statistically significant (tested for significance by identifying 95% confidence intervals that do not encompass 100, see paragraph 32).

14. Between 2009 and 2013, the regular UK Armed Forces at risk of death from Land Transport Accidents were:

- Army personnel in Motor Vehicle accidents: in particular those aged Under 30 who were at a 55% statistically significant increased risk of dying compared to the UK general population.
- Army personnel in Motorcycle accidents: in particular those aged 30 and over who were at a 193% statistically significant increased risk of dying compared to the UK general population.
- RAF personnel in Motorcycle accidents: were at a 135% increase risk of dying compared to the UK population.
- Armed Forces Personnel aged under 30 who were at a 268% increased risk of dying as a result of a pedestrian accident compared to the UK general population. This finding is a result of a high number of Army deaths.

## DATA SOURCES & METHODS

### *Data Sources*

15. 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 central registry.

16. 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.

17. 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 and does NOT include any deaths occurring in a vehicle as a result of Hostile Action. The definition therefore includes all occupational specific vehicles (specific to the UK Armed Forces) irrespective of where the accident took place. Road traffic accidents refer only to accidents on a public road. Subsequent analysis presented in this report includes motor vehicle, motorcycle and pedestrian related accidental deaths. The following deaths have been excluded for the latest 30 year period: All deaths related to vehicles that have been given either a suicide or open verdict by a coroner (n= 1) and any LTA deaths that did not involve a motor vehicle e.g. pedal cycles, animal riders and rail related incidents (n= 72 of which eight occurred in the latest five year period).

18. 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. 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 vehicle incident deaths are included in this report until a coroner's verdict is received confirming cause of death as due to a suicide or open verdict when it will then be removed from this report. However, one UK Armed Forces death in 2003 returned as an open verdict by the Procurator Fiscal for Scotland has been classified as an LTA in this report as it was a vehicle related incident involving multiple deaths and a MOD Board of Inquiry found all the deaths to be the result of an operational accident.

19. Defence Statistics maintains a database of individual deployment records from November 2001. Data prior to April 2007 was derived from the single services Operation Location tracking (OPLOC) systems<sup>a</sup> and data since April 2007 is obtained from the Joint Personnel Administration (JPA) system. The data covers deployments on Operation TELIC (Iraq) (2003-2011) and Operations VERITAS (Afghanistan) (2001-present) and HERRICK.

20. The deployment data presented in this report represent deployments to the theatre of operation and not deployment to a specific country i.e. deployment to Op TELIC includes deployment to Iraq and other countries in the Gulf region such as Kuwait and Oman. Therefore, this data cannot be compared to data on personnel deployed to a specific country such as Iraq.

21. Deployment markers were assigned using the criteria that an individual was recorded as being deployed to the Iraq and/or Afghanistan theatres of operation if they had deployed to these theatres prior to their death. Person level deployment data for Afghanistan was not available between 1 January 2003 and 14 October 2005. Therefore, it is possible that some UK Armed Forces personnel who were deployed to Afghanistan during this period and subsequently died have not been identified as having deployed to Afghanistan in this report but have been captured in the overall figures for LTA deaths. Please note: this report compares those who had been deployed before their death with those who have not been identified as having deployed before their death.

22. Operation TELIC is the name for UK operations in Iraq which started in March 2003 and finished on 21 May 2011. UK Forces were deployed to Iraq to support the Government's objective to remove the threat that Saddam posed to his neighbours and his people and, based on the evidence available at the time, disarm him of his weapons of mass destruction. The Government also undertook to support the Iraqi people in their desire for peace, prosperity, freedom and good government.

23. Operation VERITAS is the name for UK operations in Afghanistan which started in October 2001. The UK was involved in Afghanistan alongside Coalition forces, led by the US under Operation Enduring Freedom (OEF), from the first attacks in October 2001.

24. Operation HERRICK is the name for UK operations in Afghanistan which started in April 2006. UK Forces are deployed to Afghanistan in support of the UN authorised, NATO led International Security Assistance Force (ISAF) mission and as part of the US-led Operation Enduring Freedom (OEF).

#### *Data Coverage*

25. 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.

26. 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.

#### *Methods*

27. 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 2013 Armed Forces population. For this direct standardisation process, Defence Statistics have

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<sup>a</sup> Around 4% of data obtained prior to April 2007 could not be fully validated for a number of reasons including data entry errors, personnel not recording on the system in the theatre of operation, records of contractors or personnel from other Government Departments. However research carried out by the King's Centre for Military Health Research on a large Tri-Service sample of personnel deployed during the first phase of Op TELIC in 2003, who were identified from Defence Statistics' deployment database, reported a cohort error rate of less than 0.5 per cent.

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 2013 Armed Forces population).

28. Time trend analysis has been aggregated to give three year moving averages. This eliminates some of the random year on year variation that can occur and provides a clearer picture of possible trends. Due to the smaller numbers involved in sub-group analysis, five year moving averages have been presented.

29. 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 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.

30. The effects of standardisation may, on occasion, lead to unexpected results particularly where small numbers are involved. 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. With the recent changes to the Armed Forces population through redundancy programmes, changes in recruitment patterns and the move to the new employment model and the new structures required to meet Future Force 2020<sup>b</sup>, there will be an impact on the trends presented as the Armed Forces population shrinks and the age and gender profile of the serving population changes. As seen in 2012 for the RAF overall rate of deaths, caused by the reduction in recruitment of personnel under 20 years of age.

31. 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.

32. 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.

33. 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.

34. 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. This change has little effect on annual totals but allows the output of more timely mortality data. The UK death figures reported are based on deaths registered in the data year and therefore the year in which a death is registered may not correspond to the year in which the death occurred. 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 the year. Using UK population deaths that both occurred and were registered in year resulted in an increased denominator population for the 2006 SMR calculation and has therefore resulted in a lower SMR for 2006 (when compared with the 2006

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<sup>b</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/62487/Factsheet5-Future-Force-2020.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62487/Factsheet5-Future-Force-2020.pdf)

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

35. The UK population estimates used to calculate SMR refer to the usually resident population on 30 June of each year. The usually resident population is defined by the standard United Nations definition for population estimates and includes people who reside in the area for a period of at least 12 months whatever their nationality. ONS mid-year population estimates are based on updates from the most recent census, allowing for births, deaths, net migration and ageing of the population.

36. The UK general population data for 2013 was not available for this report to calculate standard mortality ratios (SMR), therefore, Defence Statistics has used the 2012 data as an estimate for the 2013 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 2013 data becomes available.

*Strengths and weaknesses of data presented in this notice*

37. 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 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 Accidents whilst waiting for final cause of death to be determined. This can lead to revisions in the number of deaths as a result of LTA when these verdicts are returned (see paragraph 41 for more information about the extent of these revisions).

38. In addition, death 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.

39. The release of the information in this notice is controlled by the statistics code of practice as outlined in the Statistics and Registration Act, 2007. This stipulates that statistics in their final form cannot be released prior to a publication. Thus because it can take many months or even years for a coroner's inquest, Defence Statistics do not update the numbers in between the publication of this notice, to ensure there is no breach of the code of practice. Therefore, any requests for information on deaths among the UK Armed Forces are provided using the underlying dataset used to compile this notice.

40. 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 by revealing detail on individual incidents such as mechanism or type of military vehicle involved; nor that risk inadvertently revealing individual identities and therefore breaching the rights of the families of the deceased personnel (for which the MOD has a residual duty of care). Defence Statistics are regularly asked to release information such as date of death, location of death, deaths within a unit or rank held by the deceased, however, these requests are assessed on a case by case basis to ensure the information presented is aggregated to a level to ensure individual's cannot be identified or that compromises operational security.

**Changes to previously published data**

41. 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 no amendments to the classifications given to the cause of death previously reported. There are currently three Accident deaths in 2013 that are awaiting coroner's verdict, so figures may be subject to change when the results of these deaths are returned.

**RESULTS**

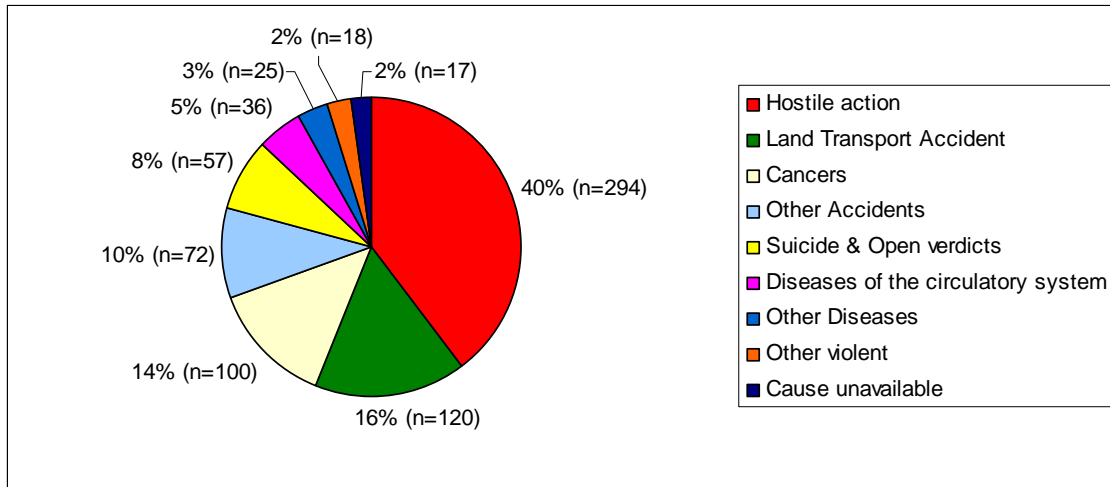
42. The National Statistic ‘Deaths in the UK Regular Armed Forces 2013’ has shown Land Transport Accidents (LTA) accounted for 16% (n=120) of all deaths among UK regular Armed Forces personnel<sup>c</sup> between 2009 and 2013. LTA's were the second largest cause of death during this period after deaths due to hostile action.

43. Analysis of LTA deaths within the UK general population have identified certain demographic characteristics of being at risk for different vehicle types. Therefore, the analysis in this report provides demographic, Service and vehicle type breakdowns to support the identification of risk groups within the Armed Forces for targeting of road safety initiatives and campaigns.

**Overall numbers and rates**

44. **Figure 1** presents the causes of death for the UK Armed Forces for the period 2009-2013.

**Figure 1: UK regular Armed Forces: Causes of death, 2009-2013, numbers<sup>1</sup> and percentages<sup>2</sup>**



1 LTA deaths include eight deaths which did not involve a motor vehicle (see paragraph 17).  
 2 Percentages may not add up to 100% due to rounding.

45. LTA's were the second single largest cause of death following hostile action deaths for each year between 2009 and 2011, however in 2013, LTA deaths were ranked third behind Cancer and Other Accidental deaths.

46. **Table 1** presents the number and annualised rate of LTA deaths by Service and year.

**Table 1 : UK regular Armed Forces LTA deaths by Service, 2009-2013, number, age and gender standardised rate<sup>1</sup> per 100,000 strength per year**

Year	All		Naval Service <sup>2</sup>		Army		RAF	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
<b>All</b>	<b>112</b>	<b>12</b>	<b>10</b>	<b>6</b>	<b>86</b>	<b>15</b>	<b>16</b>	<b>9</b>
2009	26	13	2	4	17	13	7	19
2010	34	17	3	8	26	21	5	14
2011	23	12	2	6	20	18	1	3
2012	15	8	2	6	12	10	1	9
2013	14	8	1	3	11	10	2	5

1 Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.  
 2 Naval Service includes Royal Navy and Royal Marines

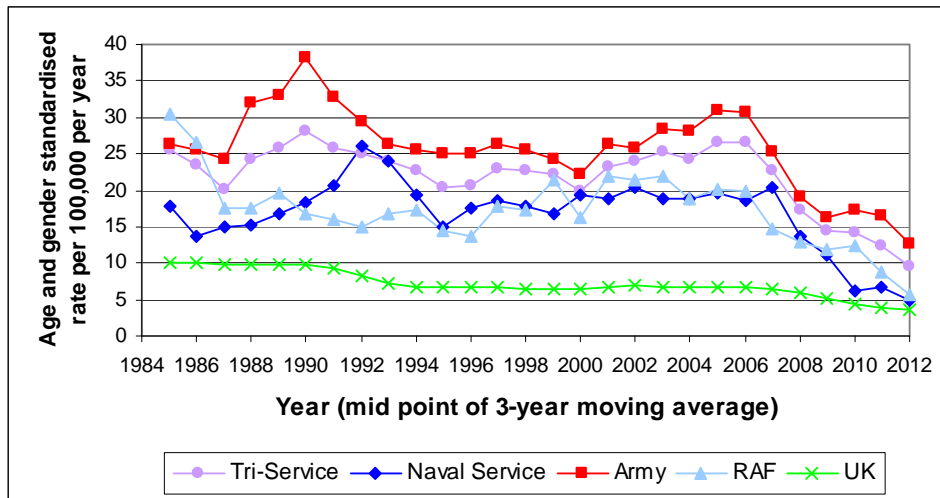
47. In 2013, the overall rate of LTA deaths for the UK Armed Forces was 8 per 100,000, consistent with 2012, representing the lowest annual rate in the latest five-year period. This represents a 53% decrease on the highest rate in the five-year period of 17 per 100,000 seen in 2010.

<sup>c</sup> National Statistics Notice: ‘Deaths in the UK regular Armed Forces’ available at [www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic](http://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic)

48. During the latest five year period (2009-2013) the rate of LTA deaths among Army personnel was 15 per 100,000. This was higher than the rate of LTA deaths among Naval Service personnel (6 per 100,000) and RAF personnel (9 per 100,000). The rate of Army deaths was significantly higher than the rate of Naval Service deaths but there was no statistically significant difference when compared with the rate of RAF deaths. In 2013, there was an increase in the number of RAF deaths but a decrease in the rate, this is due to the changing age and gender structure of RAF personnel on strength (see paragraph 30 for further details).

49. **Figure 2** illustrates changes in LTA mortality rates by Service since the start of data collection in 1984. Rates were presented as a three-year moving average to smooth out annual fluctuations and to highlight long term trends (see paragraph 28). The age and gender standardised rate for LTA deaths in the UK general population is also presented.

**Figure 2: UK regular Armed Forces , UK general population LTA deaths by Service, 1984-2013, three-year moving average age and gender standardised rates per 100,000 strength<sup>1</sup>**



1 Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.  
 2 Naval Service includes Royal Navy and Royal Marines.  
 3 The year shown is the mid-point of a three-year average, e.g. 1984 refers to the period 1983-1985.

50. **Figure 2** shows the rate among Army personnel was higher throughout the whole period 1984-2013 than the Naval Service and RAF, with the exception of 1984-1986 when 20 RAF personnel lost their life in a coach crash. Between 1989-1991, the loss of eight Army personnel in one incident in 1989 and the loss of a further 10 Army personnel during Op GRANBY (1990/91 Gulf conflict) contributed to the peak in the Army LTA rate of death at 38 per 100,000. There was no single contributing cause to the second peak in 2004-2006 of 27 per 100,000 personnel.

51. Since 2004-2006, there has been a downward trend and for the latest period, 2011-2013, the rate is at the lowest rate since 1984 at 9 per 100,000. This may in part be due to safety improvements in vehicles and roads as well as an increase in campaigns on road safety both within the UK general population and the Armed Forces. In 2000, the Government targeted a 40% reduction in people killed or seriously injured in road accidents to be achieved by 2010<sup>e</sup>, with campaigns continuing to run. In addition, the following MOD road safety campaigns were launched :

- i. 'Ride it Right' targeting motor cycle riders was launched in 2006 and again in 2007 following a rise in the number of off-duty motorcycle deaths
- ii. 'Grim Reaper' video shown to personnel returning from operational deployment since 2007 who are shown to have an increased likelihood of being involved in an accident.
- iii. 'You're tough but you're not invincible' series of British Forces Broadcasting Services (BFBS) television and radio commercials began in 2008 aimed at young soldiers returning from operational deployment with the message that whilst soldiers may have survived their tour of duty in Afghanistan, they are not invincible and are still at risk of being involved in a road traffic accident.

- iv. A poster campaign aimed at mitigating against the risk of off-duty service personnel attempting to walk home after a night out by making taxi funds available was developed in 2012 following a number of Service personnel pedestrian deaths which occurred whilst walking home after a night out.

52. In addition, **Figure 2** shows for the whole period 1984 to 2013, the overall rate of LTA among the UK regular Armed Forces and each Service was higher than the rate for the UK general population. A study of UK military personnel<sup>d</sup> has shown those who join the military may be more likely to be risk-takers and 19% of personnel studied were defined as risky drivers. This study found risky driving as more common among Army personnel compared to Naval Service and RAF personnel<sup>d</sup>. This suggests they exhibit the same behavioural factors such as reckless behaviour, aggressive driving and loss of control which play an important role in vehicle accident deaths within the UK<sup>e</sup>.

53. **Table 2** provides a summary of the key characteristics for LTA deaths for the five-year period 2009-2013.

**Table 2: UK regular Armed Forces LTA deaths, key characteristics by Service, 2009-2013, numbers and percentages<sup>1</sup>**

	All		Naval Service		Army		RAF	
	n	%	n	%	n	%	n	%
<b>All</b>	<b>112</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>86</b>	<b>100</b>	<b>16</b>	<b>100</b>
<b>Gender</b>								
Male	109	97	10	100	84	98	15	94
Female	3	3	0	0	2	2	1	6
<b>Age Band</b>								
Under 20	12	11	0	0	11	13	1	6
20-24	44	39	3	30	35	41	6	38
25-29	19	17	2	20	15	17	2	13
30-34	15	13	2	20	9	10	4	25
35-39	12	11	2	20	8	9	2	13
40+	10	9	1	10	8	9	1	6
<b>Rank</b>								
Officers	5	4	1	10	3	3	1	6
Other Ranks	107	96	9	90	83	97	15	94
<b>Duty Status</b>								
On Duty	17	15	3	30	11	13	3	19
Off Duty	95	85	7	70	75	87	13	81
<b>Deployment History<sup>2</sup></b>								
On deployment	7	6	0	0	5	6	2	13
Previously deployed	69	62	5	50	56	65	8	50
Not previously deployed	36	32	5	50	25	29	6	38
<b>Vehicle</b>								
Motor Vehicle	49	44	2	20	43	50	4	25
Motorcycle	36	32	7	70	21	24	8	50
Pedestrian	18	16	1	10	14	16	3	19
Occupation Specific <sup>3</sup>	9	8	0	0	8	9	1	6

<sup>1</sup> Percentages may not add to 100% due to rounding.

<sup>2</sup> To Iraq and/or Afghanistan (see paragraphs 19-24).

<sup>3</sup> Vehicles specific to the UK Armed Forces : nine deaths as a result of accidents in the following vehicles :Military Land Rover, Ridgeback, Seddon Atkinson truck.

<sup>d</sup> Fear et al., (2008) Risky Driving Among UK Regular Armed Forces Personnel from the United Kingdom, *American Journal of Preventative Medicine*, 35, 230-236.

<sup>e</sup> Ward et al., (2007) *Road Safety Research Report No. 76, Trends in Fatal Car-Occupant Accidents*, Department of Transport : London. Available at : <https://www.gov.uk/government/publications/road-safety-research-and-statistical-reports>



54. During the five year period 2009-2013, of the 112 UK regular Armed Forces personnel who died as a result of a LTA:

- 97% (n=109) of LTA deaths occurred among males.
- 67% (n=75) of LTA deaths occurred among those aged under 30.
- 96% (n=107) of LTA deaths were among Other ranks
- 85% (n=95) of LTA deaths occurred whilst off duty.
- 62% (n=69) of LTA deaths occurred among personnel previously deployed to Iraq and/or Afghanistan.
- 44% (n=49) of LTA deaths occurred as a result of a motor vehicle accident.

55. **Table 3** provides a breakdown of the number and an annualised rate of LTA deaths for the five-year period 2009-2013 by whether the deceased personnel had previously deployed to Iraq and/or Afghanistan and by year in which the death occurred.

**Table 3: LTA deaths in the UK regular Armed Forces, by deployment status to Iraq and/or Afghanistan<sup>1,2</sup>, 2009-2013, number<sup>3</sup> and rate per 100,000 strength per year**

Year of Death	Previously Deployed to Iraq and/or Afghanistan <sup>1,2</sup>		Not Previously Deployed to Iraq and/or Afghanistan <sup>2</sup>	
	number	rate	number	rate
<b>All</b>	<b>69</b>	<b>12</b>	<b>36</b>	<b>10</b>
2009	18	15	8	10
2010	18	15	10	13
2011	16	13	6	8
2012	10	8	5	7
2013	7	6	7	11

1 Deployment to the wider theatre of operation (see paragraph 20).

2 Data for Afghanistan between 1 January 2003 and 14 October 2005 were not available for person level deployment (see paragraph 21).

3 Excludes seven LTA deaths which occurred whilst on deployment.

56. Overall for the five-year period 2009 to 2013 and for each individual year with the exception of 2013, the rate of LTA deaths was higher among those previously deployed to Iraq and/or Afghanistan than those who had not previously deployed there. A study of UK military personnel<sup>o</sup> found one factor associated with risky driving in the Armed Forces was being previously deployed to Iraq. Defence Statistics have not investigated the period of time for which personnel returning from deployment are most at risk of LTA death.

57. As multiple deaths occurred in the same incident on several occasions during the five year period 2009-2013, **Table 4** provides details of the number of separate incidents and the number of individual deaths, by year of occurrence, for all Land Transport Accidents.

**Table 4: UK regular Armed Forces LTA deaths<sup>1</sup> by Service, 2009-2013, numbers and incidents**

Year	All		Naval Service		Army		RAF	
	Deaths	Incidents <sup>2</sup>	Deaths	Incidents	Deaths	Incidents	Deaths	Incidents
<b>All</b>	<b>112</b>	<b>103</b>	<b>10</b>	<b>10</b>	<b>86</b>	<b>77</b>	<b>16</b>	<b>16</b>
2009	26	23	2	2	17	14	7	7
2010	34	30	3	3	26	22	5	5
2011	23	21	2	2	20	18	1	1
2012	15	15	2	2	12	12	1	1
2013	14	14	1	1	11	11	2	2

<sup>1</sup>Includes operational deaths as a result of LTA

<sup>2</sup> 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.

58. For the period 2009-2013, there were 103 LTA incidents resulting in 112 deaths among UK Armed Forces personnel. The number of deaths and incidents in 2013 was the lowest in the five-year period (n=14). One on duty incident resulted in the largest loss of life when four Army personnel were killed when a vehicle overturned in 2010.

59. **Table 5** provides a breakdown of the number of deaths by vehicle type and year for the five-year period 2009-2013.

**Table 5: UK regular Armed Forces LTA deaths by vehicle type and year of death, 2009-2013, number and percentage<sup>1</sup>**

Year	All		Motor Vehicle deaths		Motorcycle deaths		Pedestrian deaths		Occupation Specific deaths <sup>2</sup>	
	n	%	n	%	n	%	n	%	n	%
<b>All</b>	<b>112</b>	<b>100</b>	<b>49</b>	<b>44</b>	<b>36</b>	<b>32</b>	<b>18</b>	<b>16</b>	<b>9</b>	<b>8</b>
2009	26	100	12	46	11	42	3	12	0	0
2010	34	100	17	50	8	24	4	12	5	15
2011	23	100	8	35	6	26	6	26	3	13
2012	15	100	4	27	6	40	4	27	1	7
2013	14	100	8	57	5	36	1	7	0	0

1 Percentages may not add to 100% due to rounding.

2 Vehicles specific to the UK Armed Forces : Military Land Rover, Ridgeback, Seddon Atkinson truck.

60. Between 2009 and 2012 pedestrian deaths have shown a rise from 12% to 27% of all LTA deaths. In 2013 pedestrian deaths fell to 7% (n=1), this may be as a result of a MOD poster campaign to reduce off-duty service personnel pedestrian deaths (see paragraph 51).

61. In 2013, motor vehicle accidents accounted for 57% of all LTA deaths, the highest in the latest five year period.

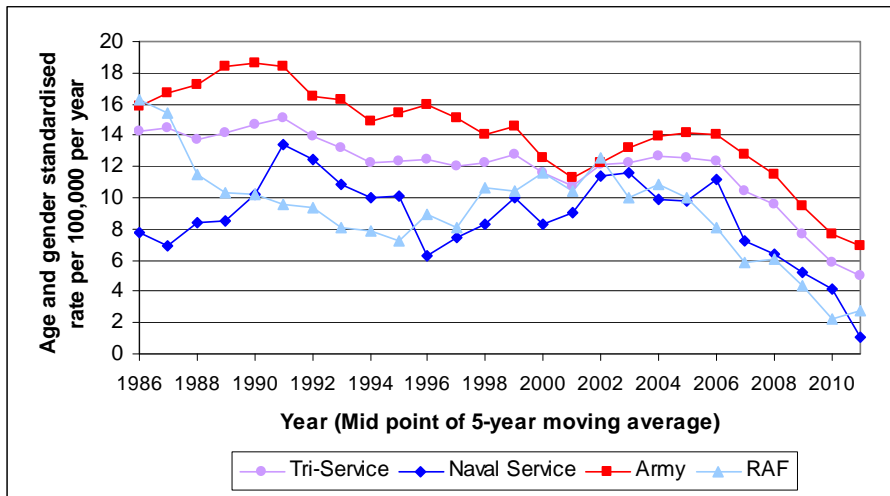
62. In 2013, motorcycle deaths accounted for 36% of all LTA deaths. It should be noted that within the UK general population, despite forming only 1% of road traffic, motorcyclist deaths accounted for 18% of road deaths and serious injuries<sup>f</sup>. Defence Statistics do not hold information on road usage among UK Armed Forces personnel; however it would appear this finding in the UK general population is also seen among the military.

63. The number of deaths seen in occupation specific vehicles over the five-year period 2009-2013 was at it's highest in 2010 (n=five) when one on-duty incident involving a vehicle overturning in Germany accounted for four deaths.

64. **Figures 3, 4 and 5** illustrate changes in LTA mortality rates by vehicle type and Service since the start of data collection in 1984. Due to the small numbers involved, occupation specific vehicles have been excluded and the remaining data has been aggregated to present five year moving averages (see paragraph 28). This eliminates some of the random year on year variation that can occur and provides a clearer picture of possible trends.

<sup>f</sup> ROSPA (2006) Motorcycling Safety Policy Paper available at : <http://www.rospea.com/roadsafety/policy/statements/motorcycling.aspx>

**Figure 3: UK regular Armed Forces motor vehicle accident deaths, by Service, 1984-2013, five-year moving average age and gender standardised rates per 100,000 strength<sup>1,2</sup>**



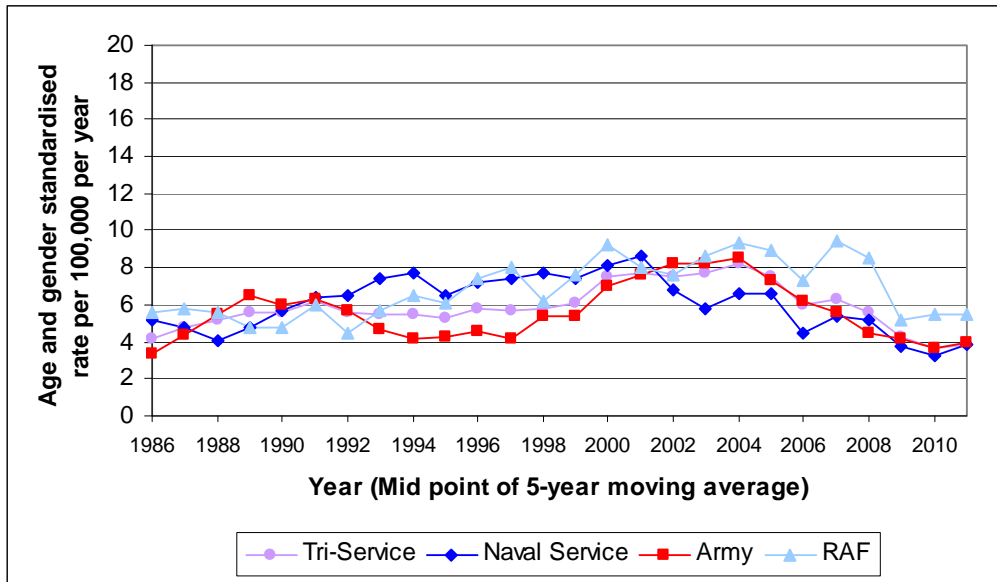
<sup>1</sup> Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.  
<sup>2</sup> The year shown is the mid-point of a five-year average, e.g. 1986 refers to the period 1984-1988.

65. The five-year moving average rates of motor vehicle accident deaths has been consistently higher in the Army compared to the Naval Service and the RAF with the exception of 1984-1988 when one coach crash claimed the lives of 20 RAF personnel in Germany (**Figure 3**).

66. The Naval Service five year average motor vehicle rate peaked in 1989-1993 at 13 per 100,000, in 2001-2005 at 12 per 100,000 and again in 2004-2008 at 11 per 100,000. Since 2004-2008 there has been a downward trend, falling to a low of 1 per 100,000 in 2009-2013. The Army rate peaked in 1988-1992 at 19 per 100,000, partly due to the loss of eight lives in one incident in 1989 and the loss of 10 lives on Op GRANBY in 1990/91. Following a further peak at 14 per 100,000 in 2003-2007, it has since fallen to a low of 7 per 100,000 in 2009-2013. The RAF motor vehicle rate showed two peaks; in 1984-1988 the rate was 16 per 100,000 as a result of 20 RAF personnel dying in a coach crash and in 2000-2004 was 13 per 100,000. It has since fallen, reaching a low of 2 per 100,000 in 2008-2012.

67. During the last five years (using five-year moving averages):
- i. Among Naval Service personnel there was a 86% decrease in the rate of motor vehicle accident deaths (from 7 per 100,000 in 2005-2009 to 1 per 100,000 in 2009-2013) (**Figure 3**).
  - ii. Among Army personnel there was a 46% decrease in the rate of motor vehicle accident deaths (from 13 per 100,000 in 2005-2009 to 7 per 100,000 in 2009-2013) (**Figure 3**).
  - iii. Among RAF personnel there was a 50% decrease in the rate of motor vehicle accident deaths (from 6 per 100,000 in 2005-2009 to 3 per 100,000 in 2009-2013) (**Figure 3**).

**Figure 4: UK regular Armed Forces motorcycle accident deaths, by Service, 1984-2013, five-year moving average age and gender standardised rates per 100,000 strength<sup>1,2</sup>**



<sup>1</sup> Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.

<sup>2</sup> The year shown is the mid-point of a five-year average, e.g. 1986 refers to the period 1984-1988.

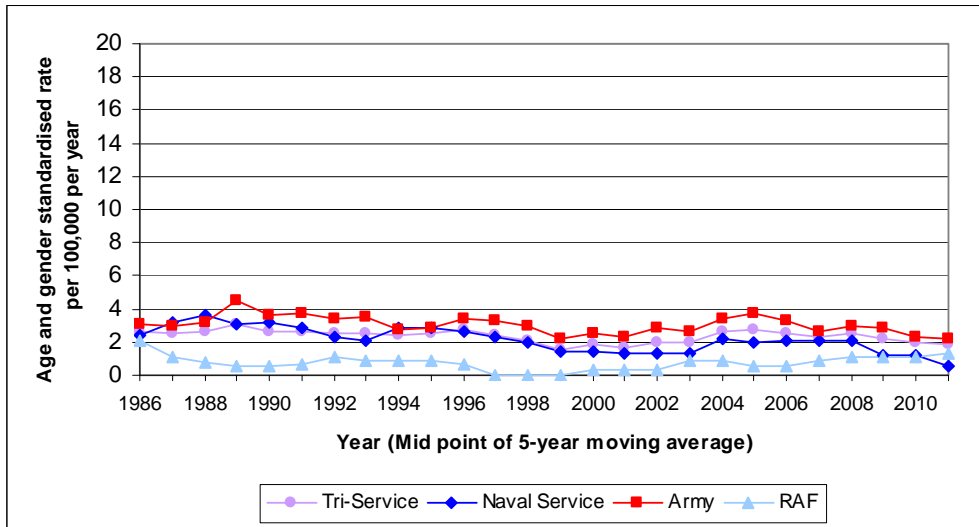
68. Since 2001-2005, the five year average rate of motorcycle deaths was higher among RAF personnel compared to Naval Service and Army.

69. The Naval Service five year average motor cycle rate rose from 4 per 100,000 in 1986-1990 to a peak in 1999-2003 of 9 per 100,000. It then fell to a low of 3 per 100,000 in 2008-2012. The Army rate peaked in 1987-1991 at 6 per 100,000 before falling to 4 per 100,000 in 1992-1996. After 1995-1999, the rate rose to 9 per 100,000 in 2002-2006, before showing a downward trend, falling to a low of 4 per 100,000 in 2008-2012. The RAF motor cycle rate peaked at 9 per 100,000 in 2005-2009, falling to a low of 5 per 100,000 in 2007-2011.

70. During the last five years (using five-year moving averages from the start to the end of the timer period):

- ii. Among Naval Service personnel there was a 20% decrease in the rate of motorcycle accident deaths (from 5 per 100,000 in 2005-2009 to 4 per 100,000 in 2009-2013) (**Figure 4**).
- iii. Among Army personnel there was a 33% decrease in the rate of motorcycle accident deaths (from 6 per 100,000 in 2005-2009 to 4 per 100,000 in 2009-2013) (**Figure 4**).
- iv. Among RAF personnel there was a 45% decrease in the rate of motorcycle accident deaths (from 9 per 100,000 in 2005-2009 to 5 per 100,000 in 2008-2012) (**Figure 4**).

**Figure 5: UK regular Armed Forces pedestrian accidental deaths, by Service, 1984-2013, five-year moving average age and gender standardised rates per 100,000 strength<sup>1,2</sup>**



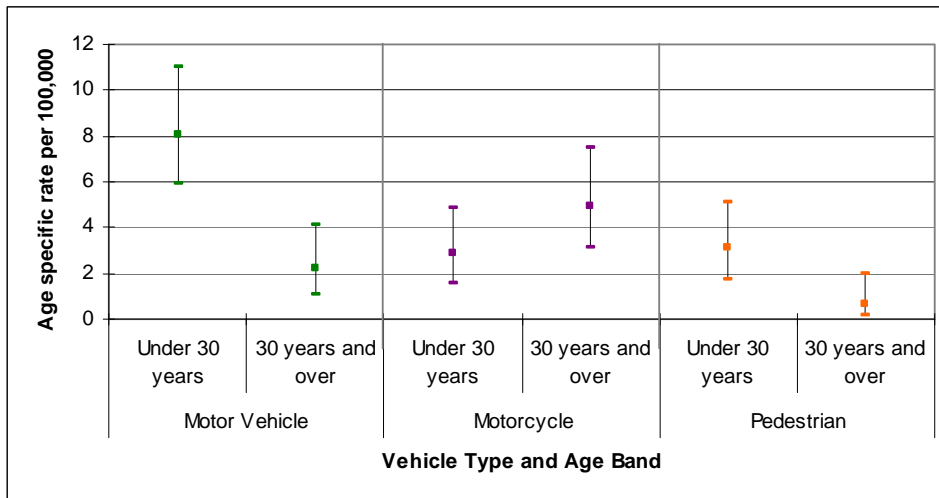
<sup>1</sup> Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.  
<sup>2</sup> The year shown is the mid-point of a five-year average, e.g. 1986 refers to the period 1984-1988.

71. Since 1987-1991, the five-year moving average rate of pedestrian accidental deaths has been higher among Army personnel than the Naval Service and the RAF (**Figure 5**).

72. There has been little change in the rates for all three Services over the period 1984-2013, this may be due to the small numbers of deaths.

73. **Figure 6** shows the age-specific rates for deaths between 2009 and 2013 by age group and vehicle type. As the numbers of deaths by vehicle type were small, two age groups have been presented; those aged under 30 and those aged 30 and over.

**Figure 6: LTA deaths in the UK regular Armed Forces, by vehicle type and age group, 2009-2013, age-specific rates<sup>1</sup>(95% CI) per 100,000 strength per year**



<sup>1</sup> Rates have been age and gender standardised to the 2013 UK Armed Forces population, expressed per 100,000 strength.

74. **Figure 6** illustrates significantly higher rates were observed for motor vehicle deaths in those aged under 30 compared to those aged 30 years and over. The rate for deaths as a result of motor vehicle accidents for those aged under 30 years was 8 per 100,000 compared to 2 per 100,000 in those aged 30 years and over.

75. For pedestrian deaths, higher rates were also observed among those aged under 30 years (3 per 100,000) compared to those aged 30 and over (1 per 100,000), however this difference was not

significant.

76. For motorcycle deaths, those aged 30 and over had a higher rate of death (5 per 100,000) than those aged under 30 (3 per 100,000), however this difference was not significant.

77. The findings for age-related risk of motor vehicle and motorcycle deaths reflect those seen in the UK general population<sup>e,f</sup>. Deaths in motor vehicles in the UK general population are predominately among young drivers aged between 16 and 29 years<sup>e</sup> (see **Table 6** for a more detailed comparison between Service personnel and UK general population). Ward and ROSPA suggested that young male car drivers are more likely to choose higher speed, drive more recklessly, as well as have a lower seatbelt wearing rate and have a tendency to drive older cars. Conversely, motorcyclist deaths in the UK population are higher in those aged over 30 years<sup>f</sup> and may be a result of older drivers returning to the road on more powerful machines (see **Table 7** for a more detailed comparison between Service personnel and UK general population). Excessive speed and lack of judgement of their own path are related factors in UK general population motorcycle deaths. Defence Statistics do not currently have access to off-duty accident information which would enable identification of contributing factors in accidents involving Armed Forces personnel.

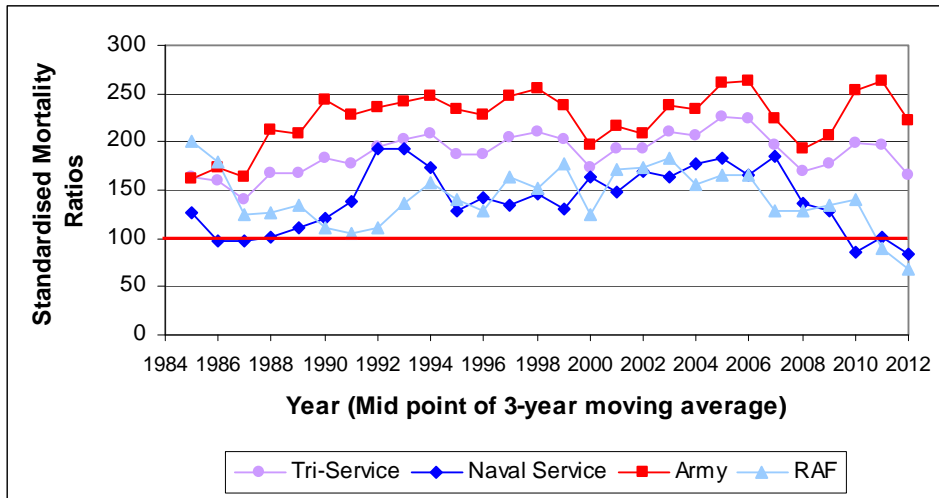
78. Findings illustrated in **Figure 6** that younger pedestrians are at higher risk of death among UK Service personnel did not reflect that seen in the UK general population, where a higher proportion of deaths are seen among those aged between 30 and 59 years than those aged 16 and 29 years (see **Table 8** for a more detailed comparison between Service personnel and UK general population).

### **Comparisons with the UK general population**

79. To enable comparisons with LTA 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. 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 **Figure 8 and Tables 6, 7 and 8** may result in wide confidence intervals. 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

80. **Figure 7** illustrates changes in LTA Standardised Mortality Ratios by Service since the start of data collection in 1984. SMR are presented as a three-year moving average to eliminate some of the random year on year variation (see paragraph 28).

**Figure 7: UK regular Armed Forces LTA deaths by Service, 1984-2013, three-year moving average standardised mortality ratios<sup>1,2,3</sup>**



<sup>1</sup>Standardised for age, gender and calendar year.

<sup>2</sup>The red line indicates the value expected if the number of observed LTA deaths in the UK Armed Forces was the same as the number expected based on the age and gender structure of the UK population.

<sup>3</sup>The year shown is the mid-point of a three-year average, e.g. 1985 refers to the period 1984-1986.

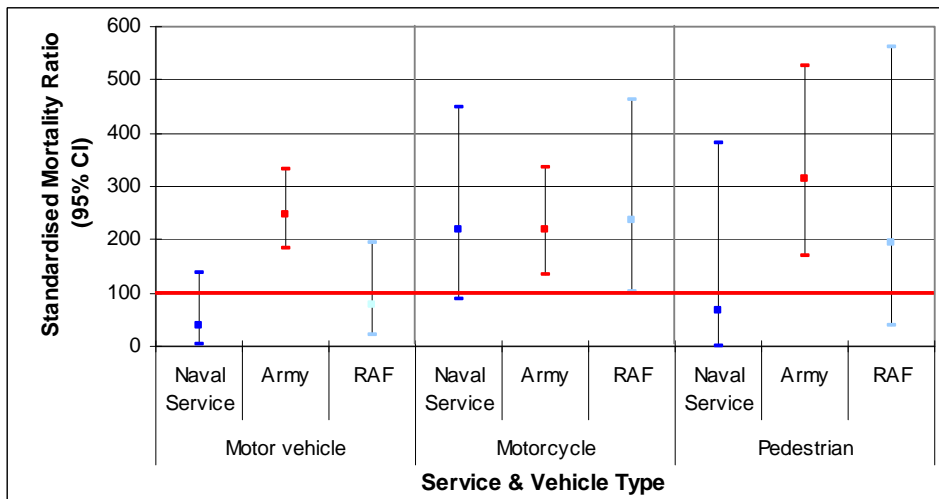
81. Overall, in the last 30 years, the UK regular Armed Forces were at a greater risk of dying as a result of an LTA compared to the UK general population.

82. Personnel in each Service were at greater risk of dying of as a result of an LTA than the UK population in all years with the exception of the periods 2009-2011 and 2011-2013, when, for the first time, the Naval Service had the same risk of dying in an LTA as the UK population and 2010-2012 when the RAF had the same risk of dying in an LTA as the UK population.

83. **Figure 7** shows that with the exceptions of 1984-1986 and 1985-1987, the SMR for Army LTA deaths was higher than that of the RAF and higher than the Naval Service for all years.

84. **Figure 8** provides a comparison between each Service and the UK general population for the five-year period 2009-2013 by Service and vehicle type.

**Figure 8: UK regular Armed Forces LTA deaths, by Service and vehicle type, 2009-2013, standardised mortality ratio<sup>1,2</sup> (95% confidence interval)**



<sup>1</sup>Standardised for age, gender and calendar year.

<sup>2</sup>The red line indicates the value expected if the number of observed LTA deaths in the UK Armed Forces was the same as the number expected based on the age and gender structure of the UK population.

85. **Figure 8** shows the Naval Service had the same risk of death as the UK general population for any vehicle type. Army personnel were at a statistically significantly higher risk of motor vehicle, motorcycle and pedestrian accidents compared to the UK general population (SMR: 247, 95% CI: 183-333; SMR: 219, 95% CI: 135-335 and SMR: 312, 95% CI: 171-524 respectively). The RAF had the same risk of death as the UK general population for motor vehicle and pedestrian deaths but were at a statistically significantly higher risk of motorcycle accidents compared to the UK general population (SMR: 235, 95% CI: 101-463).

86. **Table 6** provides a comparison of motor vehicle deaths between each Service and the UK general population for the last five years by age group. As the number of deaths by Service were small and to enable comparison to UK general population results, two age groups have been presented; those aged under 30 and those aged 30 and over.

**Table 6: UK regular Armed Forces motor vehicle accident deaths, by Service and age, 2009-2013, numbers and SMR<sup>1,2</sup> (95% CI)**

	All		Naval Service		Army		RAF	
	n	SMR (95%CI)	n	SMR (95%CI)	n	SMR (95%CI)	n	SMR (95%CI)
<b>2009-2013</b>	<b>49</b>	<b>175 (133-232)</b>	<b>2</b>	<b>38 (5-137)</b>	<b>43</b>	<b>247 (183-333)</b>	<b>4</b>	<b>76 (21-195)</b>
Under 30	39	199 (145-272)	2	56 (7-203)	33	255 (181-359)	4	128 (35-328)
30+	10	120 (58-221)	0	0 -	10	224 (107-412)	0	0 -

<sup>1</sup> Standardised mortality ratios have been standardised for age, gender and calendar year.

<sup>2</sup> Due to small numbers these findings are volatile and should be viewed with caution.

87. Overall, Armed Forces personnel aged under 30 were at a significantly higher risk of dying as a result of a motor vehicle accident compared to the UK general population (SMR: 199, 95% CI: 145-272) for the period 2009 to 2013. See paragraph 77 for explanation of possible factors contributing to differences in risk by age group.

88. During the last five years, both the Naval Service and RAF risk of dying in a motor vehicle accident was the same as the UK general population.

89. During the last five years Army personnel in both age groups were at a significantly increased risk of dying as a result of a motor vehicle accident compared to the UK general population. Those aged under 30 were at a 155 % increased risk (SMR: 255; 95% CI: 181-359) and those aged 30 and over were at a 124% increased risk (SMR: 224; 95% CI: 107-412).

90. **Table 7** provides a comparison of motor cycle accident deaths between those aged under 30 and those aged 30 and over in each Service and the UK general population for the last five years.

**Table 7: UK regular Armed Forces motorcycle accident deaths, by Service and age, 2009-2013, numbers and SMR<sup>1,2</sup> (95% CI)**

	All		Naval Service		Army		RAF	
	n	SMR (95% CI)	n	SMR (95% CI)	n	SMR (95% CI)	n	SMR (95% CI)
<b>2009-2013</b>	<b>36</b>	<b>222 (160-308)</b>	<b>7</b>	<b>218 (88-450)</b>	<b>21</b>	<b>219 (135-335)</b>	<b>8</b>	<b>235 (101-463)</b>
Under 30	14	167 (91-280)	2	130 (16-469)	9	164 (75-311)	3	220 (45-643)
30+	22	282 (177-427)	5	300 (97-700)	12	293 (151-512)	5	245 (79-571)

<sup>1</sup> Standardised mortality ratios have been standardised for age, gender and calendar year.

<sup>2</sup> Due to small numbers these findings are volatile and should be viewed with caution.

91. Overall, Armed Forces personnel aged 30 and over were at a statistically significant higher risk of dying as a result of a motorcycle accident compared to the UK general population (SMR: 282, 95% CI: 177-427) for 2009 to 2013. See paragraph 77 for explanation of possible factors contributing to differences in risk by age group.

92. During the last five years Naval Service personnel risk of dying in a motor cycle accident was the same as the UK general population.

93. During the last five years Army personnel aged 30 and over were at a 193% statistically significant increased risk of dying as a result of a motorcycle accident compared to the UK general population (SMR: 293; 95% CI: 151-512).

94. Overall, RAF personnel were at a 135% statistically significant increased risk of dying as a result of a motorcycle accident compared to the UK general population (SMR: 235; 95% CI: 101-463).



Due to the small number of deaths in each age group and the resulting wide confidence intervals, no specific age group was at increased risk.

95. **Table 8** provides a comparison of pedestrian accident deaths between the different age groups of each Service and the UK general population for the last five years. Due to the small number of pedestrian deaths an SMR for each Service and age group has not been calculated.

**Table 8: UK regular Armed Forces pedestrian accident deaths, by Service and age, 2009-2013, numbers and SMR<sup>1,2</sup> (95% CI)**

	n	All		Naval Service	Army	RAF
		SMR	(95%CI)	n	n	n
<b>2009-2013</b>	<b>18</b>	<b>240</b>	<b>(142-379)</b>	<b>1</b>	<b>14</b>	<b>3</b>
Under 30	15	368	(206-606)	1	13	1
30+	3	88	(18-256)	0	1	2

<sup>1</sup> Standardised mortality ratios have been standardised for age, gender and calendar year.

<sup>2</sup> Due to small numbers these findings are volatile and should be viewed with caution.

96. Overall, UK Armed Forces personnel were at a 140% statistically significant increased risk of dying as a result of a pedestrian accident compared to the UK general population (SMR: 240; 95% CI 142-379) (**Table 8**). See paragraph 77 for information on the differences between UK Service personnel and UK general population risk groups by age.

97. During the last five years all Service personnel aged under 30 were at a 268% statistically significant increased risk of dying as a result of a pedestrian accident compared to the UK general population (SMR: 368; 95% CI: 206-606). This was a result of a high number of Army deaths in this age group.

**Annex A - UK Armed Forces Land Transport Accident Deaths 1984-2013, additional tables**

**Table A1: UK Armed Forces LTA deaths by year and on/off duty, 1984 - 2013, numbers**

Year	All <sup>1</sup>	On Duty	Off Duty
<b>All</b>	<b>1,817</b>	<b>421</b>	<b>1,396</b>
1984	120	19	101
1985	116	38	78
1986	79	21	58
1987	100	20	80
1988	74	19	55
1989	120	32	88
1990	101	24	77
1991	89	24	65
1992	84	24	60
1993	74	13	61
1994	60	14	46
1995	54	13	41
1996	42	4	38
1997	54	10	44
1998	62	29	33
1999	43	13	30
2000	44	6	38
2001	47	11	36
2002	63	10	53
2003	49	9	40
2004	57	13	44
2005	51	7	44
2006	60	10	50
2007	50	14	36
2008	26	8	18
2009	26	0	26
2010	34	9	25
2011	23	6	17
2012	15	1	14
2013	14	1	13

1: Deaths classified as LTA in this notice exclude any deaths that did not involve a motor vehicle e.g. pedal cycles, animal riders and rail related incidents. Therefore the figures seen in this notice will differ from those presented in the 'Deaths in the UK Regular Armed Forces' National Statistic (see paragraph 17).