Ministry of Defence

1990/1991 Gulf Conflict UK Gulf Veterans Mortality Data: Causes of Death

Published 31 March 2016

This annual Statistical Notice 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 2015.

The purpose of this Statistical Notice is to compare the mortality rates of 53,409 UK Armed Forces personnel that deployed to the 1990/91 Gulf Conflict to those of a comparison group, the Era cohort, who did not deploy. The statistics also compare the mortality rates of Gulf veterans and the Era comparison group to rates observed in the UK general population over the same time period in order to place the mortality rates for the Gulf and Era cohorts in context.

These statistics were created to monitor mortality rates for Gulf 1 veterans in response to concerns that Gulf 1 veterans experience an excess of ill-health, due to potential exposures during their deployment.

Key Points

- Between 1 April 1991 and 31 December 2015 there were 1,746[r] deaths among the Gulf veterans and 1,858[r] deaths in the Era comparison cohort, resulting in an estimate of 1,804[r] deaths in the age-adjusted Era comparison cohort
- The four main causes of death for the Gulf veterans, accounting for 75%[r,p] of all deaths, were: neoplasms (cancers); diseases of the circulatory system; suicides and open verdicts; and land transport accidents
- In comparison to the age-adjusted Era cohort, those in Gulf 1 did not have a significantly different rate of death for each of the four main causes of death implying, for the time period as a whole, there were no negative effects of deployment to Gulf 1 in terms of mortality rates for all causes of death, However, those deployed to Gulf 1 did have a significantly lower rate of death across all disease related deaths.
- In comparison to the UK population, those in Gulf1 had a significantly decreased risk of death due to neoplasms, diseases of the circulatory system and suicides and open verdicts. The decreased risk of disease related deaths may be due 'healthy worker effect' and the fact that certain groups of people are not able to be employed by the Armed Forces.
- In comparison to the UK population, those deployed to the Gulf had a significantly increased risk of death due to transport accidents, of which 82%[r,p] were due to land transport accidents. This finding is consistent with other studies that have shown that UK military personnel are more likely to display risk-taking driving behaviours and are at increased risk of death caused by a land transport accident compared to the UK population.

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Background Quality Report: https://www.gov.uk/government/collections/defence-statistics-background-quality-reports-index

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Introduction

Contents

Other bulletins in this series can be found at: *https://www.gov.uk/government/statistics/causes-of-deaths-that-occurred-among-the-uk-veterans-of-the-199091-gulf-conflict*

Supplementary tables (**Annex A**) containing all data presented in this publication can be found at: *https://www.gov.uk/government/statistics/causes-of-deaths-that-occurred-among-the-uk-veterans-of-the-199091-gulf-conflict*

1. This Statistical Notice compares the mortality rates of 53,409 UK Armed Forces personnel that deployed to the 1990/91 Gulf Conflict to those of a comparison group, the Era cohort. The Era cohort consists of 53,143 UK Armed Forces personnel of similar age, gender, Service, regular/reservist status and rank who were in Service on 1 January 1991 but did not deploy to the Gulf. The findings include deaths that occurred to personnel whilst in service and deaths that occurred after personnel had left the UK Armed Forces.

2. This Statistical Notice also compares the mortality rates of Gulf veterans and the Era cohort to rates observed in the UK general population over the same time period. This analysis is presented as age and gender standardised mortality rates and Standardised Mortality Ratios (SMR). SMR are also presented by cause of death, to enable comparisons with the general UK population.

3. These statistics cover deaths that occurred among Gulf 1 veterans and the Era cohort following the end of the Gulf conflict (from 1 April 1991). The number of in-Service deaths that occurred during the Gulf Conflict can be found in the following publication: https://www.gov.uk/government/collections/uk-armed-forces-operational-deaths-post-world-war-2.

4. This Statistical Notice updates the previous notice for deaths that occurred up to 31 December 2014, released on 26 March 2015. Information on deaths that have occurred during the period 1 April 1991 to 31 December 2015 are based on information supplied to the MOD before 1 February 2016. Deaths in this time period that were reported to the Ministry of Defence (MOD) on or after 1 February 2016 will be added to future publications.

5. During production of the January 2005 publication, an age bias was discovered that affected those aged 40 and above on 1 January 1991, with a higher proportion of older individuals in the Era cohort. Age adjusted figures were therefore calculated for deaths in the Era cohort to account for the different age structures, allowing for accurate comparisons to be made between the Gulf and Era cohorts. Please see the methodology section and background quality report for more information on the calculation of the adjusted figures.

Introduction (Cont.)

6. UK Gulf War veterans' mortality data were first analysed following reports of Gulf 1 veterans experiencing an excess of ill-health due to potential exposures during their deployment. The findings of this initial analysis were published by Macfarlane et al (2000)[1]. Further information on subsequent research conducted in this field can be found in the accompanying Background Quality Report. Updates were regularly presented to Parliament by the MOD between July 2000 and July 2003, and published in Hansard in January and July of each year. Since January 2004 the updates have been released by Defence Statistics as a National Statistics notice with agreement by MOD ministers. These data can be found on the Gov.UK website: https://www.gov.uk/government/publications/causes-of-deaths-that-occurred-among-the-uk-veterans-of-the-199091-gulf-conflict.

7. Due to potential inaccuracies in the data used to compile cause of death information all relevant figures within this publication are marked with a 'p'. Defence Statistics are investigating these potential errors and any corrections will be released in the next scheduled publication in March 2007.

[1]Macfarlane G et al, Mortality of UK Gulf War Veterans, *The Lancet*, 2000; **356**:17-21
http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(00)02428-4/abstract?cc=y

Results: Overall numbers and rates

Mortality Trends

Trends over time are compared to see whether the Gulf cohort follows a similar pattern in mortality rates to the Era cohort and the UK general population. No statistical difference can be inferred.

To ensure the mortality rates for the Era cohort and UK population are comparable both have been adjusted to match the age and gender structure of the Gulf cohort.

Although the Era cohort was originally selected to reflect the socio-demographic and military composition of the Gulf cohort, analysis by Defence Statistics identified that there were differences in the age structures between the two cohorts among personnel aged over 40, with those deployed in the over 40 group in the Gulf cohort younger than those in the Era group. Therefore the age profile has been adjusted creating the age-adjusted Era cohort.

The UK population's age and gender profile has been adjusted to create the age and gender adjusted UK general population.

Mortality rate ratios (RR) have been calculated to compare the rate of mortality between the Gulf and age-adjusted Era cohorts.

Statistically significant difference

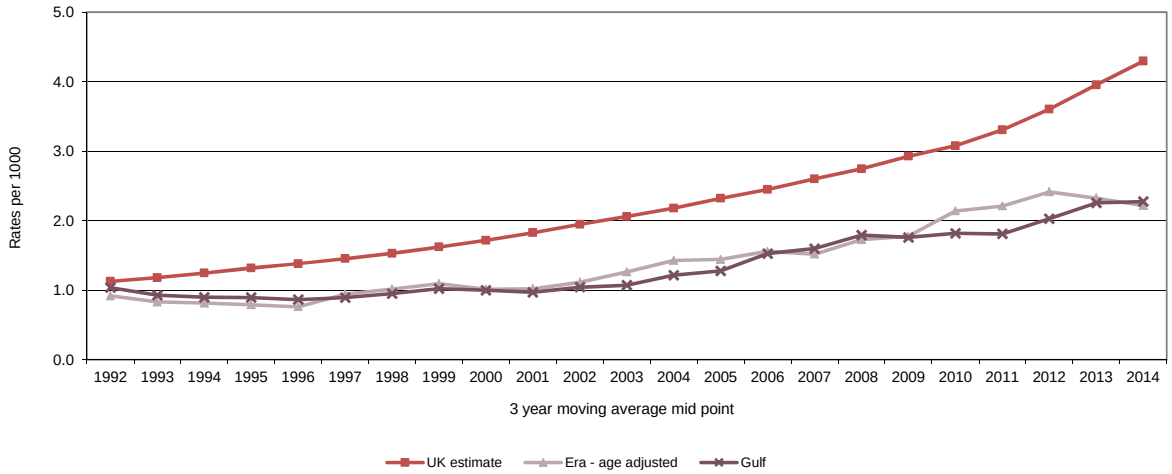
To make statistical comparisons between the deaths among the Gulf and Era cohorts with the general UK population Standardised Mortality Ratios (SMR) have been calculated. SMRs enable the mortality of two populations with different demographic structures to be compared. As part of the calculation the Gulf and Era cohorts have been age and gender standardised to the UK general population. An SMR below, equal to, or above 100 indicates that the rate for the cohort is respectively below, equal to, or higher than the rate in the general UK population (see 'Methodology' section for further information on SMR). If the 95% confidence interval does not encompass 100, then this difference is statistically significant.

8. Between 1 April 1991 and 31 December 2015 there were 1,746[r] deaths among the Gulf veterans and 1,858[r] deaths in the Era cohort, resulting in an estimate of 1,804[r] deaths in the age-adjusted Era cohort (Table 1).

9. Statistically there was no significant difference in the rate of death between those in Gulf 1 and those in the age adjusted Era cohort as shown by the 95% confidence interval for the rate including 1 (RR: 0.97[r]; 95% CI: 0.91[r]-1.03[r]). Therefore across the whole time period there were **no negative effects of deployment to Gulf 1 in terms of mortality rates for all causes of death** (Table 1).

Results: Overall numbers and rates (cont.)

Figure 1: Gulf 1 veterans, the age-adjusted Era cohort and the UK general population deaths, 3-year moving average mortality rates[1,2,3,4,5,r]
1 April 1991 to 31 December 2015



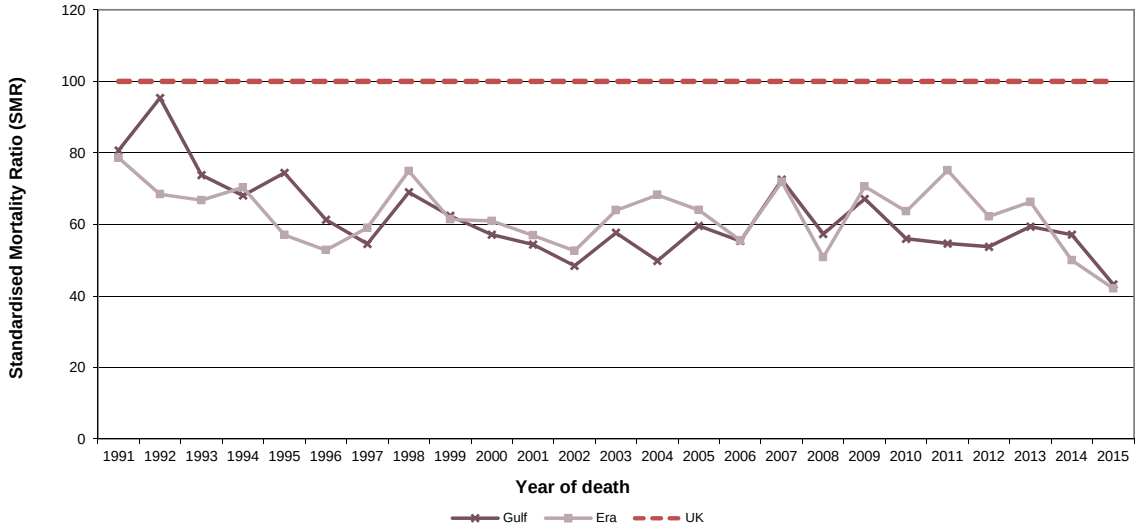
1. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
2. UK general population rates have been age and gender standardised to the Gulf veterans cohort
3. Data for 1 April 1991 – 31 December 1991 have been adjusted to a full year.
4. The year shown is a mid-point at a three year average. For example, 1992 refers to the period 1991-1993.
5. Rates are per 1,000 personnel.

r This figure has been produced using some revised figures from those previously published (as presented in Annex A Table 5), see Background Quality Report for more information.

10. The mortality rates for both the Gulf and the age-adjusted Era cohort have gradually increased over time, following a similar trend to the mortality rates for the age and gender adjusted UK general population (Figure 1), which reflects the natural ageing of all cohorts.

Results: Overall numbers and rates (cont.)

Figure 2: Gulf 1 veterans, the age-adjusted Era cohort and the UK general population deaths by year, Standardised Mortality Ratio (SMR)[1,2,p,r]
1 April 1991 to 31 December 2015



1. The dotted line indicates the value expected if the number of observed deaths in the Gulf and Era cohorts was the same as the number expected based on the age and gender structure of the UK population.
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991
p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.
r This figure has been produced using some revised figures from those previously published (as presented in Annex A Table 9), see Background Quality Report for more information.

11. Since 1993 both those in Gulf 1 and those in the Era cohort were at a statistically significant lower risk of dying than the UK general population (Figure 2). The Deaths National Statistic[2] showed that for the majority of the last ten years the UK regular Armed Forces were at a statistically significant lower risk of dying than the UK general population. As a number of those in both the Gulf and Era cohorts were no longer in Service as at 1 December 2015, this suggests that both serving and ex-serving personnel are likely to be more healthy than the general UK population. This potential 'healthy worker effect' is explored further later in the bulletin.

12. Over the 25 year period:
    - Those in Gulf 1 were at a 41% statistically significant lower risk of dying compared to the UK population (SMR =59, 95% CI: 56-62) (Annex A Table 3).
    - Those in the Era cohort were at a 39% statistically significant lower risk of dying compared to the UK population (SMR =61, 95% CI: 59-64) (Annex A Table 3).

[2] 'Deaths in the UK Regular Armed Forces: Annual Summary and Trends Over time 1 January 2006 to 31 December 2015' National Statistic

Results: Overall numbers and rates (cont.)

Table 1: Gulf veterans, the age-adjusted Era cohort, by cause of death, mortality rate ratio & 95% confidence intervals[1,2,3,4,5]

1 April 1991 to 31 December 2015

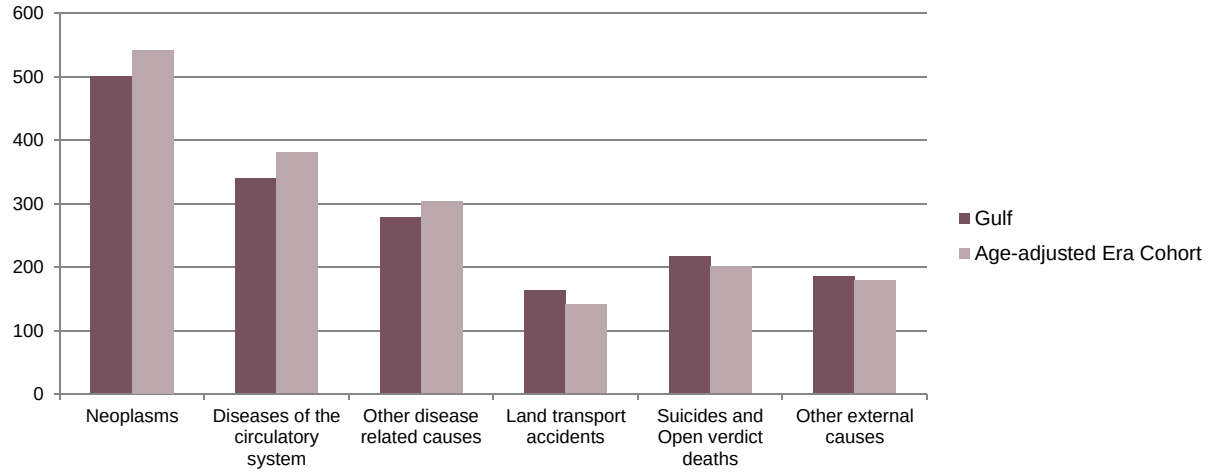
ICD-10 Chapter	Cause of death[1]	Gulf	Era	Age[2] Adjusted Era	Crude Mortality Rate Ratio	Adjusted[2] Mortality Rate Ratio	Adjusted[2] 95% Confidence Interval
	All deaths	**1,746** [r]	**1,858** [r]	**1,804** [r]	**0.93** [r]	**0.967** [r]	**(0.91** [r] **1.03** [r] **)**
	All cause coded deaths	**1,683** [r,p]	**1,797** [r,p]	**1,747** [r,p]	**0.93** [r,p]	**0.96** [r,p]	**(0.90** [r,p] **1.03** [r,p] **)**
I - XVIII	**Disease-related causes**	**1,119** [r,p]	**1,271** [r,p]	**1,225** [r,p]	**0.87** [r,p]	**0.92** [r,p]	**(0.84** [r,p] **0.99** [r,p] **)**
I	Certain infectious and parasitic diseases	15 [r,p]	13 [r,p]	11 [r,p]	1.14 [r,p]	1.29 [r,p]	(0.61 [r,p] 2.75 [r,p])
II	Neoplasms	501 [r,p]	561 [r,p]	541 [r,p]	0.88 [r,p]	0.93 [r,p]	(0.83 [r,p] 1.05 [r,p])
V	Mental and behavioural disorders	24 [p]	35 [p]	31 [p]	0.68 [p]	0.78 [p]	(0.45 [p] 1.34 [p])
VI	Diseases of the nervous system	41 [p]	56 [p]	54 [p]	0.73 [p]	0.76 [p]	(0.51 [p] 1.15 [p])
IX	Diseases of the circulatory system	340 [r,p]	391 [r,p]	381 [r,p]	0.86 [r,p]	0.89 [r,p]	(0.77 [r,p] 1.03 [r,p])
X	Diseases of the respiratory system	49 [r,p]	52 [r,p]	48 [r,p]	0.93 [r,p]	0.99 [r,p]	(0.66 [r,p] 1.48 [r,p])
XI	Diseases of the digestive system	104 [p]	106 [p]	105 [p]	0.97 [p]	1.00 [p]	(0.76 [p] 1.32 [p])
III, IV, XII - XVIII	All other disease related causes	45 [r,p]	57 [r,p]	54 [r,p]	0.78 [r,p]	0.82 [r,p]	(0.55 [r,p] 1.22 [r,p])
XX	**External causes of mortality**	**564** [r,p]	**526** [r,p]	**522** [r,p]	**1.06** [r,p]	**1.08** [r,p]	**(0.96** [r,p] **1.22** [r,p] **)**
	Transport accidents:	199 [r,p]	170 [r,p]	170 [r,p]	1.16 [r,p]	1.17 [r,p]	(0.95 [r,p] 1.43 [r,p])
	Land transport accident:	163 [r,p]	142 [r,p]	141 [r,p]	1.14 [r,p]	1.15 [r,p]	(0.91 [r,p] 1.44 [r,p])
	Pedestrian	16 [r,p]	8 [p]	9 [p]	1.98 [r,p]	1.89 [r,p]	(0.81 [r,p] 4.42 [r,p])
	Motorcycle rider	53 [r,p]	54 [r,p]	52 [r,p]	0.97 [r,p]	1.01 [r,p]	(0.68 [r,p] 1.49 [r,p])
	Car occupant	27 [r,p]	33 [r,p]	33 [r,p]	0.81 [r,p]	0.79 [r,p]	(0.47 [r,p] 1.34 [r,p])
	Other[3]	67 [r,p]	47 [r,p]	48 [r,p]	1.41 [r,p]	1.41 [r,p]	(0.97 [r,p] 2.04 [r,p])
	Water transport	5 [p]	2 [r,p]	3 [r,p]	2.48 [r,p]	2.16 [r,p]	(0.45 [r,p] 10.26 [r,p])
	Air and space transport	31 [p]	25 [r,p]	25 [r,p]	1.23 [r,p]	1.24 [r,p]	(0.73 [r,p] 2.10 [r,p])
	Other and unspecified transport accidents	0 [p]	1 [p]	1 [p]	0.00 [p]	0.00 [p]	(- [p] - [p])
	Other external causes of accidental injury:	124 [p]	117 [p]	112 [p]	1.05 [p]	1.06 [p]	(0.82 [p] 1.38 [p])
	Falls	13 [r,p]	19 [r,p]	17 [r,p]	0.68 [r,p]	0.75 [r,p]	(0.37 [r,p] 1.52 [r,p])
	Exposure to inanimate mechanical forces	20 [r,p]	17 [r,p]	18 [r,p]	1.17 [r,p]	1.10 [r,p]	(0.57 [r,p] 2.14 [r,p])
	Accidental drowning and submersion and other accidental threats to breathing	20 [r,p]	17 [r,p]	17 [r,p]	1.17 [r,p]	1.10 [r,p]	(0.56 [r,p] 2.14 [r,p])
	Accidental poisoning by and exposure to noxious substances	24 [r,p]	31 [p]	29 [p]	0.77 [r,p]	0.81 [r,p]	(0.46 [r,p] 1.41 [r,p])
	Accidental exposure to other and unspecified factors	35 [r,p]	22 [r,p]	23 [r,p]	1.58 [r,p]	1.58 [r,p]	(0.92 [r,p] 2.71 [r,p])
	Other	12 [p]	11 [p]	10 [p]	1.08 [p]	1.12 [p]	(0.49 [p] 2.59 [p])
	Intentional self-harm and events of undetermined intent[4]	216 [r,p]	204 [r,p]	202 [r,p]	1.05 [r,p]	0.52 [r,p]	(0.88 [r,p] 1.30 [r,p])
	Assault	7 [r,p]	12 [r,p]	13 [r,p]	0.58 [r,p]	1.03 [r,p]	(0.21 [r,p] 1.34 [r,p])
	Legal intervention and operations of war	7 [r,p]	8 [r,p]	8 [r,p]	0.87 [r,p]	0.94 [r,p]	(0.33 [r,p] 2.69 [r,p])
	Complications of medical care	0 [p]	2 [p]	0 [p]	0.00 [p]	0.00 [p]	(- [p] - [p])
	Sequelae of external causes of morbidity and mortality	1 [p]	3 [r,p]	2 [r,p]	0.33 [r,p]	0.46 [r,p]	(0.05 [r,p] 4.66 [r,p])
	Supplementary factors related to causes of morbidity and mortality classified elsewhere	0 [p]	1 [r,p]	1 [r,p]	0.00 [r,p]	0.00 [r,p]	(- [r,p] - [r,p])
	Deaths where the inquest has been adjourned	10 [p]	9 [p]				
	Other deaths for which cause data are not yet available[5]	**43** [p]	**53** [p]				
	Overseas deaths for which cause data are not available	**20** [p]	**8** [p]				

1. Causes of death have been coded and grouped in accordance with the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), 1992.
2. Numbers of deaths and mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
3. 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. **p** This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

Results: Causes of death

Figure 3: Gulf 1 veterans and the age-adjusted Era cohort deaths, by most common causes of death[1], percentages[2,3,p,r]

1 April 1991 to 31 December 2015



1. Causes of death have been coded and grouped in accordance with the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), 1992.
2. Numbers of deaths, and subsequently percentages, for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
3. Suicides and Open Verdict deaths Include 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.
p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information
r Percentages presented within this figure have been calculated using some revised data (as presented in Table 6), see Background Quality Report for more information.

13. Around 75% of all cause coded deaths amongst both the Gulf and Era cohorts were a result of four causes: Neoplasms (cancers), diseases of the circulatory system, suicides and open verdict deaths, and land transport accidents (Figure 2).

14. Across all four cause groups Gulf veterans were not found to be at a statistically significant increased risk of death when compared with the age-adjusted Era cohort (Table 1). However, when compared to the UK general population (Table 2), deaths due to transport accidents had a statistically significant increased risk (66%[p] and 43%[p] increase risk respectively).

15. More detailed results and commentary on disease related deaths and external causes of death among the Gulf and Era cohorts are presented later in this Statistical Bulletin.

Results: Causes of death (cont.)

Table 2: Gulf 1 veterans, and the Era cohort deaths, by most common causes of death[1], Standardised Mortality Ratios (SMR)[2] & 95% confidence intervals[3]

1 April 1991 to 31 December 2015

	Gulf cohort			Era cohort		
Cause of death	Number	SMR	95% CI	Number	SMR	95% CI
All causes	**1,746 p**	**59 p**	**(56 p - 62 p)**	**1,858 p**	**61 p**	**(59 p - 64 p)**
All disease related deaths	**1,119 p**	**48 p**	**(45 p - 50 p)**	**1,271 p**	**52 p**	**(49 p - 55 p)**
Neoplasms	501 p	62 p	(57 p - 68 p)	561 p	67 p	(61 p - 72 p)
Circulatory	340 p	47 p	(43 p - 53 p)	391 p	52 p	(47 p - 57 p)
All external causes	**564 p**	**94 p**	**(87 p - 102 p)**	**526 p**	**89 p**	**(81 p - 97 p)**
Suicide & open verdict	216 p	73 p	(64 p - 83 p)	204 p	70 p	(61 p - 80 p)
Transport accidents	199 p	166 p	(144 p - 190 p)	170 p	143 p	(123 p - 166 p)

1. Causes of death have been coded and grouped in accordance with the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), 1992.
2. Standardised mortality ratios have been age and gender standardised
3. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.

p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

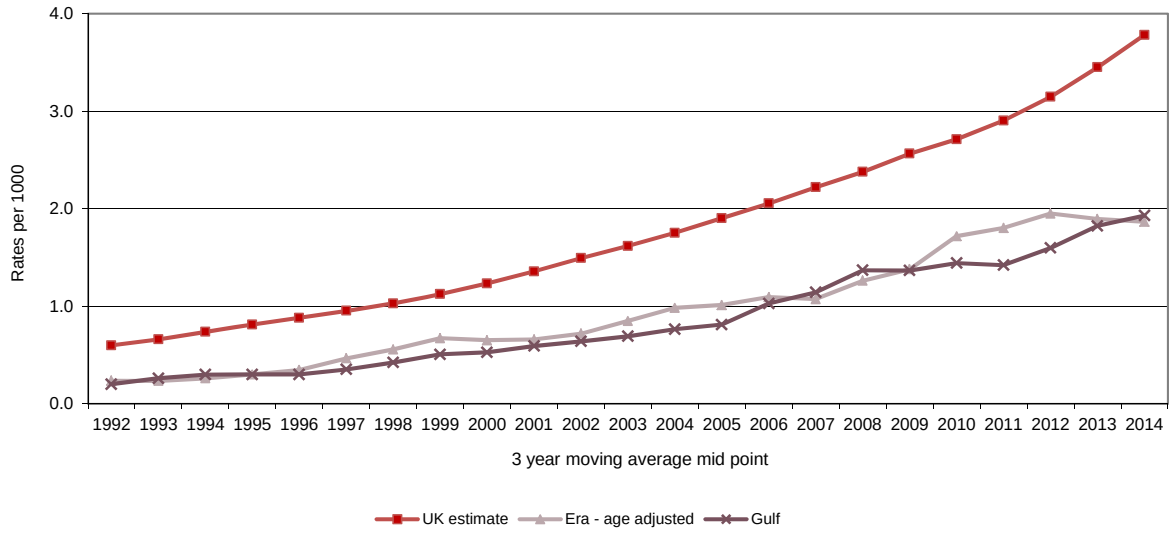
r Revised figure, see Background Quality Report for more information.

Results: Disease-related deaths

16. Between 1 April 1991 and 31 December 2015 there were 1,119[r,p] disease-related deaths among the Gulf veterans and 1,271[r,p] disease-related deaths among the Era cohort, resulting in an estimate of 1,225[r,p] deaths in the age-adjusted Era cohort (Annex A Table 1).

17. The rate of disease-related deaths among Gulf veterans was statistically significantly lower than in the age-adjusted Era cohort (RR: 0.92[p]; 95% CI: 0.84[p]-0.99 [p]) (Table 1). We would not expect to find any difference in the mortality rates between the Gulf and Era cohorts as they were both from the same Service population and were in Service at the same time. This finding will continue to be monitored.

Figure 4: Gulf 1 veterans, the age-adjusted Era cohort and UK general population mortality rates for disease-related deaths, 3-year moving average rates[1,2,3,4,p,r]
1 April 1991 to 31 December 2015



1. UK general population rates have been age and gender standardised to the Gulf veterans cohort,
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
3. Data for 1 April 1991 – 31 December 1991 have been adjusted to a full year.
4. The year shown is a mid-point at a three year average. For example, 1992 refers to the period 1991-1993.
5. Rates are per 1,000 personnel.

p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

r This figure has been produced using some revised figures from those previously published (as presented in Table 7), see Background Quality Report for more information.

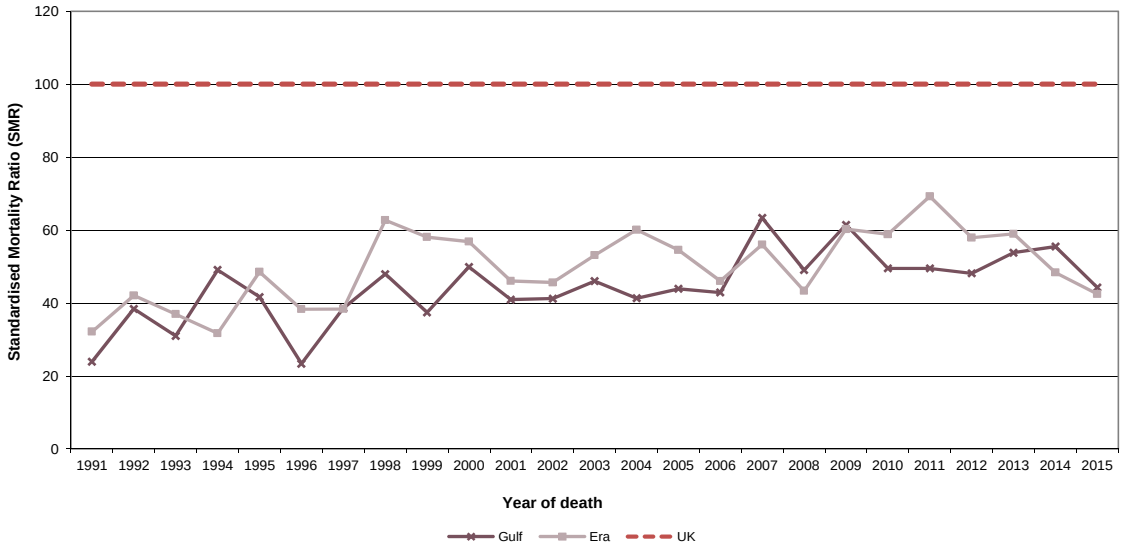
18. Mortality rates for disease-related causes for both Gulf veterans and the age-adjusted Era cohort have gradually increased over the time period, following a similar trend in mortality rates among the age and gender adjusted UK general population for disease-related deaths (Figure 3). This reflects the natural ageing of all cohorts.

Results: Disease-related deaths (cont.)

19. The SMRs presented in Figure 5 show for each year over the 25 year period those in Gulf 1 and in the Era cohort were at a statistically significant lower risk of disease-related death than the UK general population (Annex A – Table 10). This may be due to 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

Figure 5: Gulf 1 veterans, the age-adjusted Era cohort and the UK general population disease-related deaths by year, Standardised Mortality Ratio (SMR)[1,2,p,r]

1 April 1991 to 31 December 2015



1. The dotted line indicates the value expected if the number of observed deaths in the Gulf and Era cohorts was the same as the number expected based on the age and gender structure of the UK population.
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991
p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.
r This figure has been produced using some revised figures from those previously published (as presented in Table 10), see Background Quality Report for more information.

20. Over the 25 year period those in Gulf 1 were at a 52% (SMR =48, 95% CI: 45-50) statistically significant lower risk of disease-related death and the Era cohort were at a 48% (SMR =52, 95% CI: 49-55) statistically significant lower risk of disease-related death compared to the UK population (Table 2).

21. The main causes of disease-related deaths amongst both Gulf veterans and the Era comparison group were neoplasms and diseases of the circulatory system (Table 1), accounting for half of all disease-related deaths amongst both cohorts. For both causes there was no statistically significant difference between the rates of death for the Gulf and age-adjusted Era cohorts; there was a statistically significant decreased risk of death when compared to the UK general population for both cohorts (Table 1 and Table 2)

Results: Disease-related deaths (cont.)

22. Over the 25 year period:

- Those in Gulf 1 were at a 38% statistically significant lower risk of dying due to neoplasms compared to the UK population (SMR =62, 95% CI: 57-68) (Table 2)
- Those in Gulf 1 were at a 53% statistically significant lower risk of dying due to diseases of the circulatory system compared to the UK population (SMR =47, 95% CI: 43-53) (Table 2)
- Those in the Era cohort were at a 33% statistically significant lower risk of dying due to neoplasms compared to the UK population (SMR =67, 95% CI: 61-72) (Table 2)
- Those in the Era cohort were at a 48% statistically significant lower risk of dying due to diseases of the circulatory system compared to the UK population (SMR =52, 95% CI: 47-57) (Table 2)

23. There were 11 deaths from motor neurone disease (MND) among Gulf veterans compared with an estimate of 15 in the age-adjusted Era cohort. Deaths due to motor neurone disease have been separately identified as this cause of death has been of interest to Veterans groups external to the MOD.

24. Deaths caused by neoplasms amongst the Gulf veterans and the age-adjusted Era cohort are presented in Table 3 to provide further detail on specific cancer sites. Detailed information on neoplasms is provided in the publication, due to concerns regarding possible links between exposures experienced by Gulf 1 veterans and certain types of cancer. Gulf veterans were found to have a statistically significant lower rate of death from a malignant neoplasm of the bronchus and lung than the Era comparison group. This significant finding has been reported in each release of these statistics since March 2012. It is not currently understood why the age-adjusted Era cohort is at greater risk of death from this cancer site. These findings will continue to be monitored.

Results: Disease-related deaths (cont.)

Table 3: Gulf 1 veterans, the Era cohort and the age-adjusted Era cohort deaths due to neoplasms[1], by cancer site[2], numbers, mortality rate ratios and 95% confidence intervals[3]
1 April 1991 to 31 December 2015

ICD-10 code	Cancer site	Gulf	Era	Age[2] Adjusted Era	Crude Mortality Rate Ratio	Adjusted[3] Mortality Rate Ratio	Adjusted[3] 95% Confidence Interval
C00-D48	**Neoplasms**	**501** r,p	**561** r,p	**541** r,p	**0.88** r,p	**0.93** r,p	**(0.83** r,p **1.05** r,p **)**
C00-C99	**Malignant Neoplasms (MN)**	**496** r,p	**555** r,p	**535** r,p	**0.89** r,p	**0.93** r,p	**(0.83** r,p **1.055** r,p **)**
C00-C14	**MN of lip, oral cavity and pharynx**	**20** r,p	**14** r,p	**13** r,p	**1.41** r,p	**1.50** r,p	**(0.75** r,p **3.01** r,p **)**
	MN of tonsil	6 p	2 p	2 p	2.97 p	2.71 p	(0.58 p 12.59 p)
C15-C26, C48	**MN of digestive organs and peritoneum**	**163** p	**192** p	**189** p	**0.84** p	**0.89** p	**(0.73** p **1.10** p **)**
C15	MN of oesophagus	39 r,p	40 p	40 p	0.97 r,p	1.04 r,p	(0.67 r,p 1.59 r,p)
C16	MN of stomach	18 p	23 p	21 p	0.78 p	0.89 p	(0.49 p 1.64 p)
C18	MN of colon	22 p	40 p	36 p	0.54 p	0.61 p	(0.36 p 1.03 p)
C19	MN of rectosigmoid junction	6 p	9 p	9 p	0.66 p	0.68 p	(0.24 p 1.90 p)
C20	MN of rectum	16 p	14 p	14 p	1.13 p	1.13 p	(0.55 p 2.31 p)
C22	Malignant neoplasm of liver and intrahepatic bile ducts	11 p	16 p	17 p	0.68 p	0.70 p	(0.34 p 1.47 p)
C25	MN of pancreas	40 p	39 p	40 p	1.02 p	1.03 p	(0.67 p 1.60 p)
C26	MN of other and ill-defined digestive organs	6 p	5 p	5 p	1.19 p	1.15 p	(0.36 p 3.67 p)
C30-C39	**MN of respiratory and intrathoracic organs**	**82** p	**115** p	**108** p	**0.71** p	**0.76** p	**(0.57** p **1.01** p **)**
C34	MN of bronchus and lung	76 p	109 p	102 p	0.69 p	0.74 p	(0.55 p 0.99 p)
C40-C45, C47, C49-C50	**MN of bone, connective tissue, skin and breast**	**41** r,p	**41** r,p	**41** r,p	**0.99** r,p	**1.02** r,p	**(0.66** r,p **1.58** r,p **)**
C41	MN of bone and articular cartilage of other and unspecifies sites	3 p	3 r,p	3 r,p	0.99 r,p	0.96 r,p	(0.20 r,p 4.74 r,p)
C43	Malignant melanoma of skin	21 p	20 p	19 p	1.04 p	1.15 p	(0.62 p 2.12 p)
C45	Mesothelioma	2 r,p	8 r,p	9 r,p	0.25 r,p	0.26 r,p	(0.06 r,p 1.08 r,p)
C49	MN of other connective and soft tissue	6 r,p	4 p	4 p	1.49 r,p	1.46 r,p	(0.41 r,p 5.22 r,p)
C50	MN of breast	5 p	6 p	6 p	0.83 p	0.80 p	(0.23 p 2.75 p)
C51-C68	**MN of genitourinary organs**	**58** p	**43** p	**40** p	**1.34** p	**1.45** p	**(0.97** p **2.16** p **)**
C56	MN of ovary	5 p	2 p	2 p	2.48 p	2.44 p	(0.49 p 12.23 p)
C61	MN of prostate	16 p	20 p	17 p	0.79 p	0.90 p	(0.46 p 1.78 p)
C64	MN of kidney, except renal pelvis	23 p	13 p	14 p	1.75 p	1.74 p	(0.89 p 3.40 p)
C67	MN of bladder	10 p	7 p	6 p	1.41 p	1.58 p	(0.60 p 4.21 p)
C69-C80	**MN of other and unspecified sites**	**76** r,p	**95** r,p	**91** r,p	**0.79** r,p	**0.81** r,p	**(0.60** r,p **1.10** r,p **)**
C71	MN of brain	40 p	56 p	54 p	0.71 p	0.73 p	(0.48 p 1.10 p)
C79	Secondary MN of other and unspecified sites	1 p	5 p	5 p	0.20 p	0.18 p	(0.02 p 1.60 p)
C80	MN without specification of site	27 p	30 p	28 p	0.89 p	0.91 p	(0.54 p 1.56 p)
C81-C96	**MN of lymphatic and haematopoietic tissue**	**54** r,p	**55** r,p	**53** r,p	**0.97** r,p	**1.03** r,p	**(0.71** r,p **1.50** r,p **)**
C81-C85, C91.4, C96	Lymphomas	26 r,p	30 r,p	30 r,p	0.86 r,p	0.90 r,p	(0.54 r,p 1.52 r,p)
C81	Hodgkin's disease	4 p	6 p	7 p	0.66 p	0.63 p	(0.18 p 2.21 p)
C82-C85, C91.4, C96	Non-Hodgkin's lymphoma	22 r,p	24 r,p	23 r,p	0.91 r,p	0.98 r,p	(0.55 r,p 1.74 r,p)
C91-C95 excl C91.4	Leukaemias	20 p	17 p	17 p	1.17 p	1.19 p	(0.62 p 2.30 p)
C92	Myeloid leukaemia	13 p	8 p	9 p	1.61 p	1.56 p	(0.65 p 3.71 p)
C97	**Malignant neoplasms of independent (primary) multiple sites**	**2** p	**0** p	**0** p	**-** p	**-** p	**(-** p **-** p **)**
D00-D48	**In situ neoplasms, benign neoplasms and neoplasms of uncertain behaviour or unspecified nature**	**5** p	**6** r,p	**6** r,p	**0.83** r,p	**0.79** r,p	**(0.23** r,p **2.76** r,p)

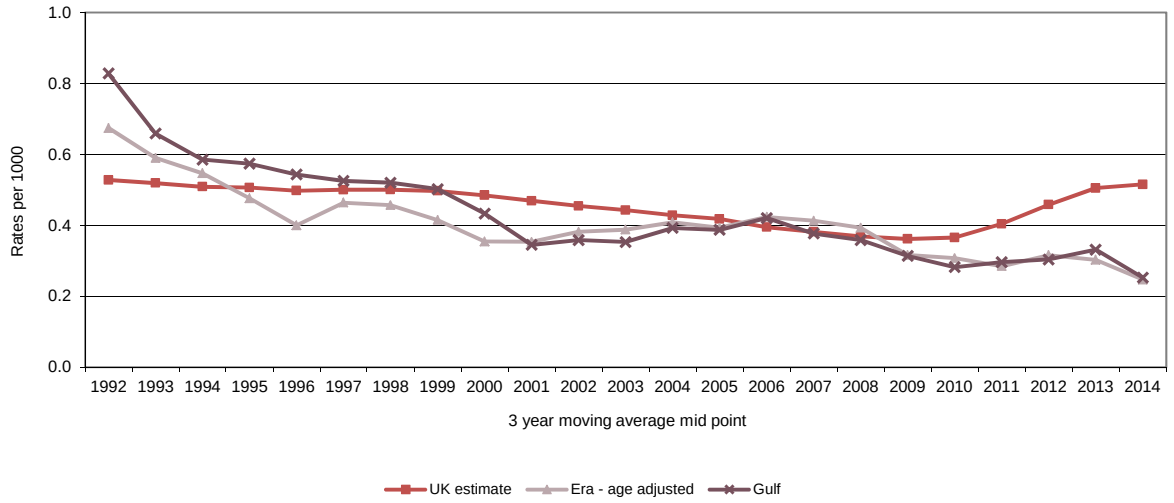
1. Deaths due to neoplasms have been coded and grouped in accordance with the World Health Organisation's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), 1992.
2. Where major cancer sites are not shown, there are no deaths within this group in either of the cohorts.
3. Numbers of deaths and mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.
r Revised figure, see Background Quality Report for more information.

Results: Deaths due to external causes

25. Between 1 April 1991 and 31 December 2015 there were 564[r,p] deaths due to external causes among the Gulf veterans and 526 [r,p] deaths due to external causes in the Era cohort, resulting in an estimate of 522 [r,p] deaths in the age-adjusted Era cohort (Table 1).

26. There was no statistically significant difference between the rate of deaths due to external causes between the Gulf and age-adjusted Era cohorts, across the whole time period, there was no negative effect of deployment to Gulf 1 in terms of all external causes mortality rates (RR: 1.08[r,p] 95% CI: 0.96[r,p]-1.22[r,p]) (Table 1).

Figure 6: Gulf 1 veterans, age-adjusted Era cohort and UK general population mortality rates for external causes of death, 3-year moving average rates[1,2,3]
1 April 1991 to 31 December 2015



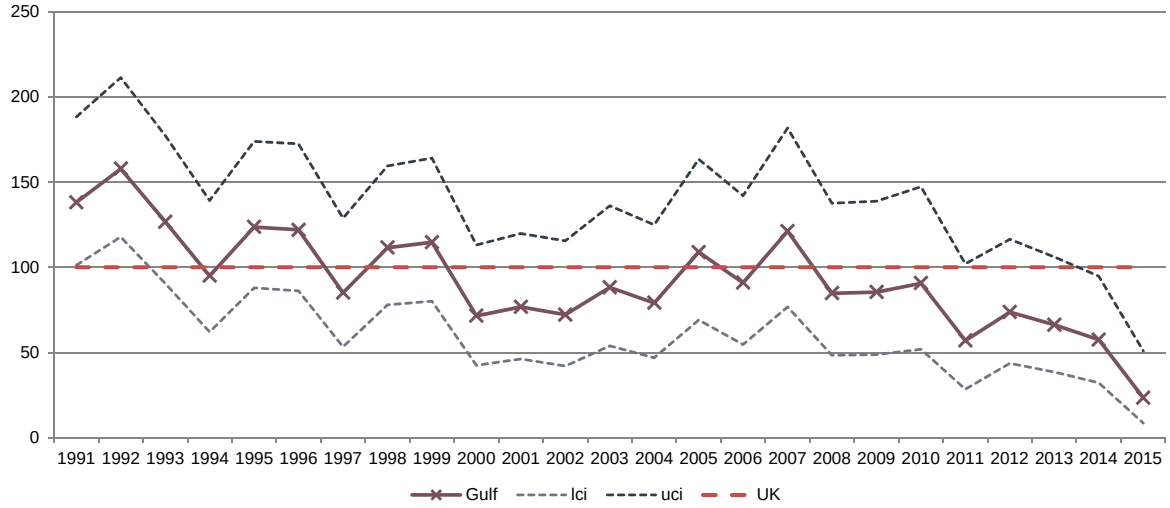
1. UK general population rates have been age and gender standardised to the Gulf veterans cohort
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991.
3. Data for 1 April 1991 – 31 December 1991 have been adjusted to a full year.
4. The year shown is a mid-point at a three year average. For example, 1992 refers to the period 1991-1993.
5. Rates are per 1,000 personnel.

p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.
r This figure has been produced using some revised figures from those previously published (as presented in Table 8), see Background Quality Report for more information.

27. Mortality rates for deaths due to external causes for both the Gulf veterans and the Era comparison group have decreased over time, following a similar trend in mortality rates among the age and gender adjusted UK general population (Figure 6). However, as shown in the SMRs in Figure 7 during the early post-Gulf 1 years Gulf veterans were at a statistically significant greater risk of dying from external causes compared to the UK general population. Conversely, in more recent years Gulf veterans were at a significantly decreased risk of dying (Figure 7). These findings are primarily driven by deaths due to land transport accidents and are discussed further in paragraph 30.

Results: Deaths due to external causes (cont.)

Figure 7: Deaths due to external causes among the Gulf 1 cohort by year, Standardised Mortality Ratios (SMR) and upper (uci) and lower (lci) confidence intervals1
1 April 1991 to 31 December 2015



1. The dotted line indicates the value expected if the number of observed deaths in the Gulf and Era cohorts was the same as the number expected based on the age and gender structure of the UK population.
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991

p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

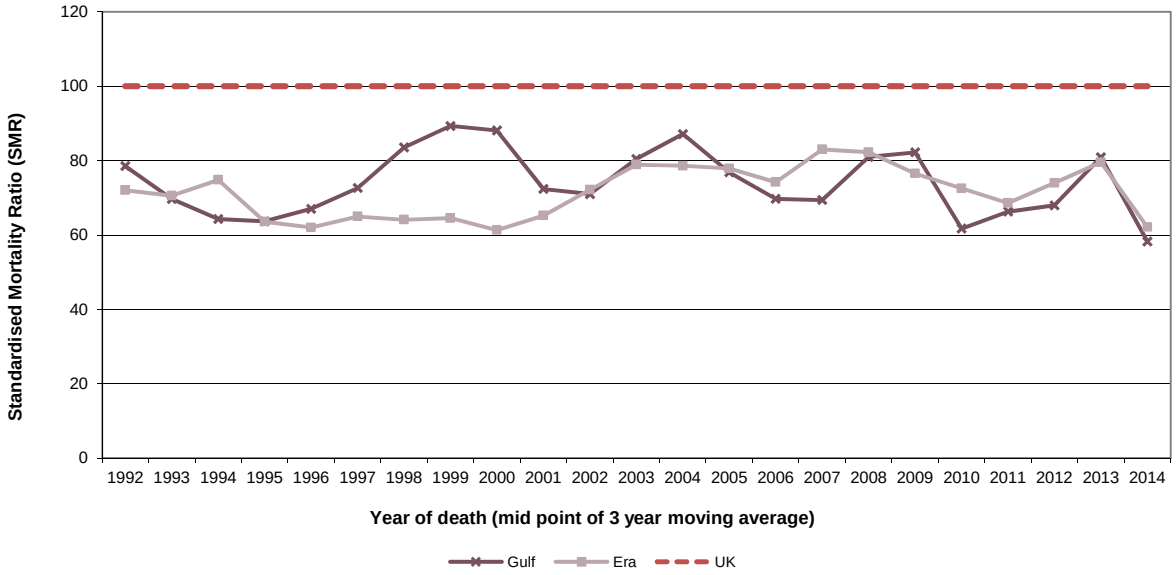
r This figure has been produced using some revised figures from those previously published (as presented in Table 13), see Background Quality Report for more information.

28. The main causes of death due to external causes amongst both Gulf veterans and the age-adjusted Era cohorts were suicides and open verdicts (intentional self-harm and events of undetermined intent) and transport accidents (Table 1), accounting for over 38% and 35%, respectively, of all external cause related deaths across both cohorts.

29. Suicides: There was no statistically significant difference between the rates of suicide for the Gulf and age-adjusted Era cohorts (Table 1) showing, across the whole time period there was no effect of deployment to Gulf 1 in terms of mortality rates for suicides. For both cohorts across the majority of the past 25 years, they had a statistically decreased risk of suicide when compared to the UK general population (Figure 8). Due to the low number of suicides this result should be interpreted with caution.

Results: Deaths due to external causes (cont.)

Figure 8: Gulf 1 veterans, the age-adjusted Era cohort and the UK general population deaths due to intentional self harm & events of undetermined intent (suicide and open verdicts) by year, Standardised Mortality Ratio (SMR), three year moving averages[1,2,3,p]
1 April 1991 to 31 December 2015



1. The dotted line indicates the value expected if the number of observed deaths in the Gulf and Era cohorts was the same as the number expected based on the age and gender structure of the UK population.
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991
3. The year shown is a mid-point at a three year average. For example, 1992 refers to the period 1991-1993.
p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

30. Transport Accidents: Overall, for the whole time period (1991-2015), there was no statistically significant difference between the rates of deaths due to transport accidents among Gulf veterans and the age-adjusted Era cohort (Table 1). However, both Gulf veterans and those in the Era cohort had a statistically significant increased risk of death from a transport accident when compared with the UK general population (66% and 43% respectively) (Table 2). As 82% of transport accidents were due to land transport accidents this finding was consistent with the 'Annual UK Regular Armed Forces Land Transport Accident Deaths: 1 January 2011 – 31 December 2015' Official Statistics, which showed that annual rates of deaths caused by land transport accidents among the UK regular Armed Forces were statistically significantly higher than the rates for the UK general population. A possible explanation was explored by a study of UK military personnel[3] which showed those who join the military may be more likely to be risk-takers.

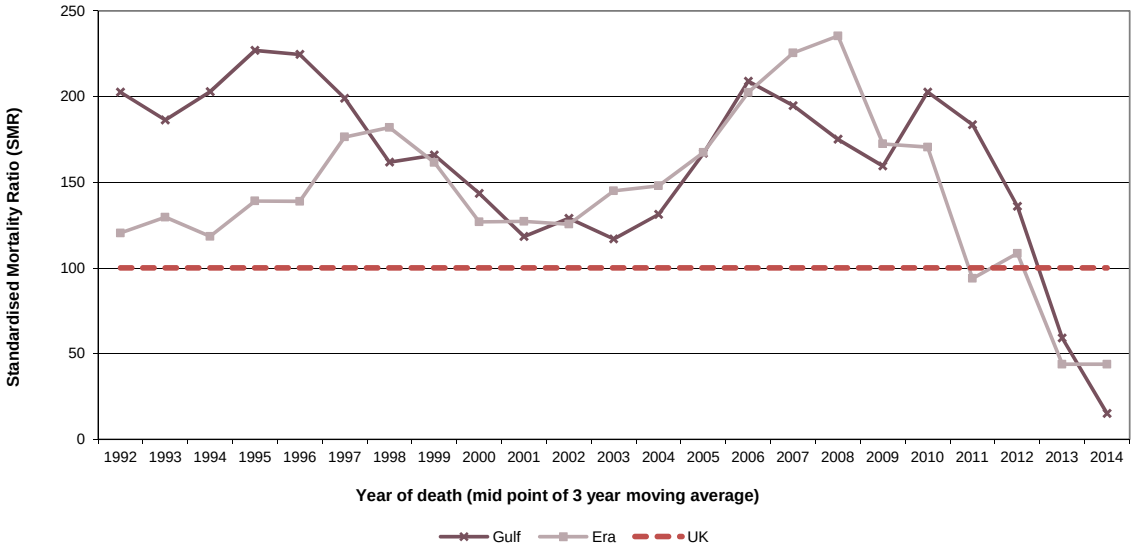
31. There was a peak in transport SMRs amongst the Gulf veterans in the early post-Gulf 1 years (Figure 9). This peak may be due to an increase in risk taking behaviours following a deployment as discussed by Kings College Centre for Military Health Research (Kings Centre for Military Health Research: a ten year report, September 2006). There was an additional peak for both cohorts between 2006 and 2009, which may be due to increased risk taking behaviour following deployments to Iraq and Afghanistan.

Results: Deaths due to external causes (cont.)

[3] Fear et al., (2008) Risky Driving Among UK Regular Armed Forces Personnel from the United Kingdom, *American Journal of Preventative Medicine*, 35, 230-236.

Figure 9: Gulf 1 veterans, the age-adjusted Era cohort and the UK general population deaths due to transport accidents by year, Standardised Mortality Ratio (SMR), three year moving averages

1 April 1991 to 31 December 2015



1. The dotted line indicates the value expected if the number of observed deaths in the Gulf and Era cohorts was the same as the number expected based on the age and gender structure of the UK population.
2. Mortality rates for the Era cohort have been adjusted for the single years of age structure of the Gulf cohort at 1 January 1991
3. p This figure has been produced using some provisional figures due to potential inaccuracies in the data, see Background Quality Report for more information.

Methodology

This section provides a brief summary of the methodology and data sources; more detailed information is available in the background quality report for this bulletin.

Data Sources

32. The main source of information on the deaths described here is the Health and Social Care Information Centre (HSCIC) (England and Wales) and the General Register Office (GRO) for Scotland. In-Service deaths are sent to the ONS for independent coding. Coroners' verdicts are provided by the NHS for deaths in England and Wales. For Scotland, accidental and violent deaths are investigated by the Procurator Fiscal.

33. Defence Statistics receive monthly updates of deaths from the HSCIC and GRO for individuals in the Gulf and Era cohorts. Sometimes Defence Statistics will be notified that an individual has died but will not be provided with a cause of death. These individuals are included in the category of 'Other deaths for which cause data are not yet available'. Defence Statistics regularly check with the HSCIC and GRO for updates on the cause of death for these records and update the cause of death once received. As at 31 December 2015, there were 43 deaths with no cause in the Gulf cohort and 53 in the Era cohort. These will be sent back to HSCIC and causes of death will be updated where available for the next release of these statistics.

34. Defence Statistics receive monthly updates from the same sources with the latest flagging status for cohort members. This shows whether an individual is currently flagged (i.e. The individual is registered with a GP and Defence Statistics will be notified when this individual dies) or whether they have died, emigrated, or become lost to follow up (LTFU).

Data Coverage

35. As at 31 December 2015, 92% of the surviving Era cohort members were still flagged within the study. Therefore Defence Statistics continues to receive death notifications for a high proportion of the cohorts. Only 4% of members were classed as emigrated and LTFU for which Defence Statistics will not receive death notifications unless flagging resumes for them in the future (e.g. they return to the UK and re-register with a GP).

36. Table 4 provides a breakdown of the record status of the Gulf and Era cohorts by Service

Table 4: Status of the Gulf and Era cohorts by Service, numbers
As at 31 December 2015

Status	All	Royal Navy	Royal Marines	Army	RAF
All	**106,552**	**10,773**	**1,149**	**74,516**	**20,114**
Flagged	98,498	9,980	1,062	68,847	18,609
Dead	3,604	344	35	2,477	748
Emigrated	1,320	128	12	914	266
Lost to follow up	3,130	321	40	2,278	491

Methodology (Cont.)

Statistical Methods

37. Full details of the statistical methods used to produce these statistics can be found in the accompanying Background Quality Report. To summarise, the following statistical methods are used:

- Deaths data received by Defence Statistics are clinically coded using the International Classification of Diseases & Related Health Problems version 10 (ICD-10). Defence Statistics follows ONS guidelines on how to classify deaths into the relevant cause groups.

- Age-adjusted estimates are calculated for the Era cohort to account for differences identified in the age structures of the Gulf and Era cohorts. This enables accurate comparisons to be made of the mortality rates in the two cohorts.

- Mortality Rate Ratios (RR) are calculated to compare mortality rates between the Gulf cohort and the Era / age-adjusted Era cohorts. A mortality rate ratio over (or under) 1 indicates a higher (or lower) mortality rate for the Gulf cohort than the Era / age-adjusted Era cohorts. A mortality rate ratio of 1 indicates no difference in mortality rates.

- UK general population mortality rates are applied to the Gulf and age-adjusted Era cohorts to estimate the number of deaths that would be expected within these cohorts, based on their age and gender profile.

- Standardised Mortality Ratios (SMR), adjusted for age, gender and year are calculated, to enable statistical comparisons with deaths in the UK 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 Gulf and Era cohorts with the UK population.

- 95% confidence intervals are calculated in order to understand if differences in rates/standardised mortality ratio (SMR) are statistically significant.

- Some of the figures in this report present three year moving averages due to fluctuations in annual the SMR, especially for cause groups where there are small numbers of deaths year on year. Calculating three year moving averages smooths out extreme values and highlight trends over time.

Strengths and weaknesses of the data presented in this report

Strengths:

38. This study continues to include 92% of surviving individuals within the Gulf and Era cohorts, resulting in good coverage.

39. The information presented in this publication has been structured in such a way to release sensitive fatality information into the public domain in a way that contributes to the MOD's accountability to the British public but which doesn't compromise the operational security of UK Armed Forces personnel nor that risks breaching the rights of the families of deceased Service personnel and veterans (for which the MOD has a residual duty of care).

Methodology (Cont.)

40. The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Weaknesses:

41. Deaths where the inquest has been adjourned, or where the cause of death has not yet been provided mean the final cause of death information is not always timely and complete for recent years. This can lead to revisions in the cause of death categories when further information is received (see paragraph 23 for more information about the extent of these revisions). Users should be aware of this weakness when using the information presented in this notice.

42. Information on deaths in Northern Ireland was routinely notified through GRO for Scotland. However, the Central Services Agency now produce all coded death information for medical research in Northern Ireland. It is hoped that Defence Statistics will be able to receive regular updates in line with England and Wales, and Scotland in the future for Northern Ireland to improve the timeliness of information on flagged individuals in Northern Ireland.

43. Several findings in this Statistical Notice are based on small numbers. This is evidenced by the wide confidence intervals presented in this report. We strongly recommend caution when interpreting these figures.

Glossary

3-year moving averages

A moving average is a method for smoothing time series by averaging a fixed number of consecutive terms (in this reports case three years).

95% confidence interval

For a given statistic calculated for a sample of observations (e.g. the mean), the confidence interval is a range of values around that statistic that are believed to contain, with a certain probability (e.g.95%), the true value of that statistic (i.e. the population value).

Age-adjusted era cohort

The Age-adjusted Era cohort 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. The single year age distribution among those aged 40 and over has since been found to show differences, with those in this age-group deployed to the Gulf generally younger than those in the Era group. Age adjusted estimates have been calculated.

Age and gender adjusted UK general population

To enable comparisons with the UK general population, UK mortality rates have been calculated based on deaths and population data provided by the Office for National Statistics (for England and Wales), General Register Office (for Scotland) and Northern Ireland Statistics and Research Agency (for Northern Ireland). These UK mortality rates were applied to the age and gender profile of the Gulf cohort to estimate comparable mortality rates for disease related deaths and deaths due to external causes. The UK deaths data were also applied to the Gulf cohort to calculate the expected number of deaths in a similar sized cohort taken from the general UK population with the same age and gender profile as that of the Gulf cohort.

Era cohort

The Era comparison group comprises 53,143 personnel, selected using a random stratified sample 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.

Gulf 1 veteran cohort

The Gulf veteran cohort comprises 53,409 UK Armed Forces 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 Navy, Army and Air Force Institutes (NAAFI), MOD civil servants), by other Government Departments, or civilians working for Defence Contractors, the media or charitable and humanitarian organisations.

Health and Social Care Information Centre (HSCIC)

HSCIC are the national provider of information, data and IT systems for commissioners, analysts and clinicians in health and social care.

Glossary (cont.)

Healthy worker effect	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.
Lower confidence interval (lci)	The lower confidence interval is the minimum value in which we which we expect to find the real value of the indicator under study, with a probability of 95%.
Mortality rate	Rates enable comparisons between groups and over time, taking account of the number of personnel in a group (personnel at risk) at a particular point in time. The number of events (ie. deaths) is divided by the number of personnel at risk and multiplied by 100,000 to calculate the rate.
National Records of Scotland (formerly General Register Office for Scotland)	Registrar of births, marriages and deaths for Scotland which provides information for researchers and genealogists.
National Health Services (NHS)	National Health Service (NHS) was launched in 1948. The National Health Service is the publicly funded healthcare system for England.
Office for National Statistics (ONS)	The UK's largest independent producer of official statistics and the recognised national statistical institute of the UK.
Rate ratios	Rate ratios are used to compare incident rates of events occurring at any given point in time e.g. comparing rates in an exposed group to a non-exposed group.
Standardised Mortality Ratio (SMR)	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.
Statistically significant	A figure is said to be statistically significant if the result is caused by something other than chance and is tested using hypothesis testing.
Upper confidence interval (uci)	The upper confidence interval is the maximum value in which we which we expect to find the real value of the indicator under study, with a probability of 95%.

Further Information

Links for further information

44. Further information on Gulf veterans illness can be found at the following link: https://www.gov.uk/guidance/gulf-veterans-illnesses

Symbols

- Not calculated due to value of zero
p Provisional
r Revised

Revisions

45. The figures presented in this Statistical Notice are from deaths reported to the MOD before 1 February 2016. Further deaths for the period 1 April 1991 to 31 December 2015 received after 1 February 2016 will be included with the next update of this Statistical Bulletin. As the information presented in each release of this is from a snapshot of data received by a certain date, these are not classified as revisions

46. If errors are found or updates are made during the production of this report, which result in changes to published statistics, these will be corrected and the Statistical Notice republished.

Revisions and provisional data within this Statistical Bulletin

47. Prior to the production of this Statistical Bulletin, Defence Statistics made improvements to the processing of the data, both to automate the process and the to include new data sources. These improvements resulted in minor revisions to the data. Any figures compiled from the revised data are marked with an 'r'. Full details of the process improvements and revisions are presented within the accompanying Background Quality Report.

48. Whilst testing the new automated process, Defence Statistics noted some potential inaccuracies in the data used to compile cause of death information. Further details on these potential errors are discussed within the accompanying Background Quality Report. Defence Statistics are investigating these potential errors and therefore this Statistical Bulletin presents some information as provisional, with relevant figures marked with a 'p', until any potential errors are corrected. A revised Statistical Bulletin will be published with finalsed figures as at 31 Deceber 2015 once this investigation is complete..

49. Whilst compiling the data to produce this Statistical Bulletin, Defence Statistics identified errors in Annex A Table 16 and Annex A Figure 13 of the previously published Statistical Bulletin (as at 31 December 2014), published on 27 March 2015. Full details of the errors are highlighted within the accompanying Background Quality Report and figures in the relevant table in this Statistical Bulletin (now Table 16) have been marked with an 'r'.

Contact Us

50. Defence Statistics welcome feedback on our statistical products. If you have any comments or questions about this publication or about our statistics in general, you can contact us as follows:

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Further Information (Cont.)

If you require information which is not available within this or other available publications, you may wish to submit a Request for Information under the Freedom of Information Act 2000 to the Ministry of Defence. For more information, see:
https://www.gov.uk/make-a-freedom-of-information-request/the-freedom-of-information-act

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RAF Manpower	01494 496822	DefStrat-Stat-Air-Hd@mod.uk
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