



# Deaths in the UK Regular Armed Forces: Annual Summary and Trends Over Time 1 January 2006 to 31 December 2015

Published 31 March 2016

This annual National Statistical Notice provides summary information on deaths whilst in Service in 2015 among the UK Regular Armed Forces, and trends over the ten year period, 2006-2015. This information updates previous notices and includes new data for 2015. The information shown has been compiled from data held by Defence Statistics on 17 February 2016.

The data are presented for Tri-Service and separately for each of the services; Naval Service, Army and Royal Air Force. This release provides information on the major categories of cause of death for the ten year period 2006-2015 and also presents comparisons to the UK general population. This is the first release in the series also presenting the number of on-duty Armed Forces Reservist deaths.

# **Key Points and Trends**

The downward trend seen since 2010 in the overall UK regular Armed Forces age and gender standardised mortality rates was due to the fall in the number of hostile action deaths associated with the end of operations in Iraq and Afghanistan. Rates fell from a high of **106 per 100,000** in 2009 to a low of **39 per 100,000** in 2015.

In 2015, a total of **60** deaths occurred among the UK Regular Armed Forces, of which **11** were serving in the Naval Service, **39** in the Army, and **10** in the RAF.

The overall mortality rate for the UK Armed Forces was **39 per 100,000** personnel at risk:

- The Naval Service mortality rate decreased from 35 per 100,000 in 2014 to **32 per 100,000** in 2015, the lowest rate in the ten year period. 

  -9% from 2014.
- The Army mortality rate increased from 42 per 100,000 in 2014, the lowest rate in the ten year period, to **45 per 100,000** in 2015. 

  7% from 2014.

There was no significant difference in rates of death among the three Services.

In 2015, the three largest causes of death among the UK Regular Armed Forces were:

- Cancer (27%, n=16)
- Land transport accidents (22%, n=13)
- Other accidents (20%, n=12).

Overall, in 2015, the UK Regular Armed Forces were at a statistically significant lower risk of dying compared to the UK general population. The UK Regular Armed Forces were at a:

- 73% significantly decreased risk of dying as a result of a disease related condition and at a
- 49% significantly decreased risk of dying as a result of external causes of injury and poisoning (accidental, violent or suicide) compared to the UK general population.

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**Background quality report:** The Background Quality Report for this publication can be found here <a href="https://www.gov.uk/government/collections/uk-armed-forces-deaths-in-service-statistics-index">https://www.gov.uk/government/collections/uk-armed-forces-deaths-in-service-statistics-index</a>

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# Supplementary tables containing:

- all data presented in this publication
- updated tables from previous reports presenting numbers, rates and 95% confidence intervals

 $can \ be \ found \ at: \underline{https://www.gov.uk/government/collections/uk-armed-forces-deaths-in-service-\underline{statistics-index}}$ 

#### Introduction

This notice provides information on the major categories of cause of death in the UK regular Armed Forces for the ten year period 2006-2015. This notice also presents information on comparisons to the UK general population. 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. UK Armed Forces Reservists who died whilst deployed on operations are included in the data presented since they are classed as 'regulars' whilst on deployment.

This report is the first in this series presenting the number of on-duty deaths among UK Armed Forces Reservists<sup>1</sup> (presented at **Annex B**).

For data on suicide, this Notice includes both coroner-confirmed suicides and open verdict deaths in line with the definition used by the Office for National Statistics (ONS) in the publication of National Statistics. These data are published in more detail in the Statistical Notice, "Suicide and Open Verdict deaths in the UK Regular Armed Forces 1984-2015", also published 31 March 2016.

The statistical notice 'Annual UK Regular Armed Forces Land Transport Accident Deaths 2011-2015', also published 31 March 2016, provides a more detailed analysis of recent trends and populations at risk of Land Transport Accident deaths.

Details of the data sources and the methods used to collect and analyse the data and additional information are described briefly in the section 'Methodology' and in more detail in the Background Quality report. In line with National Statistics protocols, amendments have been annotated by the letter 'r' and explanations provided in the section 'Changes to previously published data'.

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).

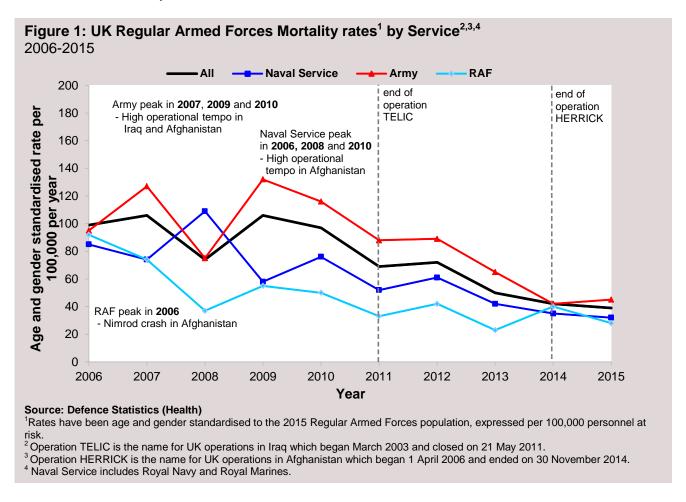
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<sup>&</sup>lt;sup>1</sup> Includes UK Armed Forces non-regular personnel Military Provost Guard Service (MGPS) and Non Regular Permament Staff (NRPS)

## **UK Regular Armed Forces overall and Service comparison**

**Figure 1** provides details of the number of deaths, together with the corresponding age and gender standardised rates (per 100,000 personnel at risk) by Service for the ten year period, 2006-2015. The rates have been age and gender standardised to take into account the different age and gender structures of each of the Services. These 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 (i.e. deaths) is divided by the number of personnel at risk and multiplied by 100,000 to calculate the rate.

In 2015, there were **60** deaths in the Regular Armed Forces. Of these, **11** deaths were in the Naval Service, **39** in the Army and **10** in the RAF.



In 2015 the mortality rate for the UK Regular Armed Forces was **39 per 100,000**. This represents a 7% decrease on the previous ten year low rate of 42 per 100,000 seen in 2014.

Within each of the Services, the highest mortality rate in 2015 was observed in the Army (**45 per 100,000**), however there was no statistically significant difference in the mortality rates in each of the Services (see **Table 1** later in this publication).

## Overall numbers and rates in UK Regular Armed Forces deaths 2006 – 2015 (cont.)

There was a downward trend in the rate of deaths among UK Armed Forces personnel over the latest ten-year period. This was the result of operational activity in Iraq and Afghanistan with a higher number of deaths during the period 2006 to 2012 before falling following the drawdown of troops from Afghanistan. In 2014, for the first year since 2002, there were no lives lost as a result of hostile action.

When looking at changes in the rate of death for specific years:

- In 2006 a Nimrod crash in Afghanistan claimed the lives of 12 RAF personnel which accounted for the RAF rate of 92 per 100,000 in that year.
- In 2007 and 2009, the high mortality rates for the Army were the result of operational activity in Iraq and Afghanistan. There was a loss of 63 and 99 lives respectively in these years as a result of hostile action.
- In 2008, the Naval Service rate was at its highest over the ten year period presented. This was due to the loss of sixteen Royal Marines in Afghanistan; 2010 saw another period of highoperational tempo resulting in the loss of 15 Royal Marines on operations.

The advancement of vehicle safety systems and road safety campaigns run by MOD throughout this period also contributed to a declining trend in the rate of deaths as a result of Land Transport Accidents (LTA) since 2006. Further analysis on this can be found at:

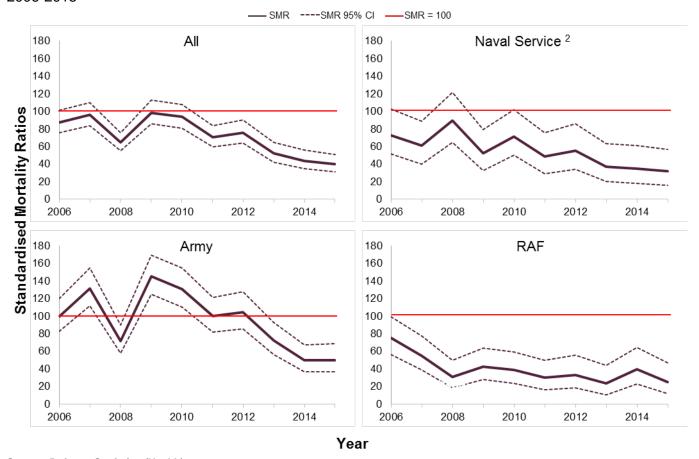
https://www.gov.uk/government/collections/uk-armed-forces-land-transport-accidents-index.

Operational activity and transport accidents resulted in multiple deaths from the same incident on several occasions during the latest ten-year period (see Annex A for further details). Since the start of drawdown of operations from Afghanistan in 2013, the number of multiple deaths per incident has fallen. In 2015, there were 13 Land Transport Accident deaths, all a result of separate incidents. For further details see Annex A.

# UK Regular Armed Forces overall and Service comparison to the UK general population

In order to compare deaths among the UK Regular Armed Forces with those among the general UK population, Standardised Mortality Ratios (SMR) have been calculated for each Service overall. The year on year changes in the UK general population have been taken into account in these calculations. An SMR below, equal to, or above 100 indicates that the rate for the Armed Forces or the Service is respectively below, equal to, or higher than the rate in the general UK population (see 'Methodology' section for further clarification). If the 95% confidence interval does not encompass 100, then this difference is statistically significant. The width of the confidence interval gives us some idea about how uncertain we are about the reported statistic. The small numbers in some of the sub-group analysis presented in this notice may result in wide confidence intervals in the corresponding rate or ratios. The impact of this is that the range in which we expect the true value of that statistic to lie is large and there is a risk of misinterpreting a chance occurrence for a true finding (see 'Methodology' section).

Figure 2: UK Regular Armed Forces deaths by Service, Standardised Mortality Ratios<sup>1</sup> (SMR) (95% confidence intervals (CI)) 2006-2015



Source: Defence Statistics (Health)

For the majority of the latest ten year period, the UK regular Armed Forces were at a statistically significant lower risk of dying than the UK general population. High numbers of operational deaths accounted for the years where the risk of dying was higher or the same as the UK general population.

#### In the latest year:

- The Naval Service were at a 68% statistically significant lower risk of dying compared to the UK population (SMR = 32, 95% CI: 16-57).
- The Army were at a 50% statistically significantly lower risk of dying than the UK general population (SMR = 50, 95% CI: 37-69).
- The RAF were at a 74% statistically significant lower risk of dying (SMR = 26, 95% CI: 12-47).

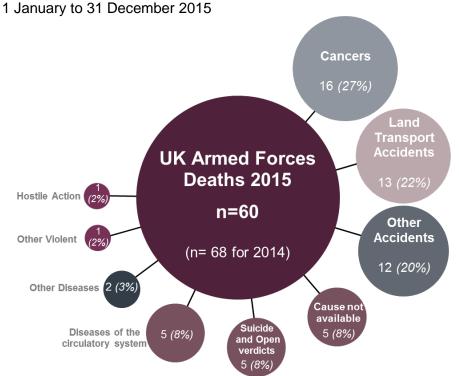
<sup>&</sup>lt;sup>1</sup>Standardised mortality ratios have been age and gender standardised.

<sup>&</sup>lt;sup>2</sup> Naval Service includes Royal Navy and Royal Marines.

**Figure 3 and Table 1** provide a breakdown of the cause of death for the UK Regular Armed Forces as a whole and for each of the single Services in 2015.

The information provided in the following tables includes all deaths that occurred in-Service both on and off duty. It is not possible from the information presented in this National Statistic notice to identify those deaths that were work related that may or may not have been the result of health and safety failures. Further information on health and safety related injuries, illness and deaths are available at: https://www.gov.uk/government/collections/defence-health-and-safety-statistics-index.

Figure 3: UK Regular Armed Forces: Cause of death, Proportion



Source: Defence Statistics (Health)

In 2015 the three leading causes of death among the UK regular Armed Forces consisted of one disease-related condition and two accident related causes:

- Cancers
- Land Transport Accidents
- Other Accidents

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In comparison, in 2014 (latest UK population data available) the three leading causes of death among the <u>UK general population</u> were disease-related conditions:

- Cancers
- Circulatory disease
- Respiratory disease

The section 'Time trends: Cause of death' later in this report examines possible explanations for the differences in cause of death between the UK Regular Armed Forces and the UK general population.

<sup>\*</sup>Percentages may not add up to 100% due to rounding.

# Cause of death information for 2015 (cont.)

Table 1: UK Regular Armed Forces deaths by Cause of death and Service, numbers, rates<sup>1</sup> and SMR<sup>2</sup> 1 January to 31 December 2015

		All			Naval Se	rvice <sup>4</sup>	Army				RAF		
Cause	n	r (95% CI)	SMR (95% CI)	n	r (95% CI)	SMR (95% CI)	n	r (95% CI)	SMR (95% CI)	n	r (95% CI)	SMR (95% CI)	
All	60	39 (30-50)	40 (31-51)	11	32 (16-57)	32 (16-57)	39	45 (33-61)	50 (37-69)	10	28 (13-51)	26 (12-47)	
Disease-related conditions	23	15 (9-22)	27 (17-41)	6	16 (6-35)	30 (11-65)	11	15 (7-26)	27 (13-48)	6	15 (6-33)	25 (9-54)	
Cancers	16	10 (6-17)	60 (34-98)	5	13 (4-30)	79 (26-184)	8	11 (5-21)	64 (28-127)	3	7 (2-22)	38 (8-111)	
Diseases of the circulatory system	5	3 (1-8)	21 (7-50)	1	3 (0-17)	18 (0-98)	2	2 (0-8)	19 (2-67)	2	6 (1-23)	29 (4-105)	
Other	2	1 (0-5)	6 (1-21)	0	-	-	1	2 (0-11)	6 (0-32)	1	2 (0-9)	11 (0-59)	
External causes of injury and poisoning	32	21 (15-29)	51 (36-72)	5	16 (5-37)	37 (12-87)	23	24 (15-36)	66 (42-98)	4	12 (3-31)	29 (8-73)	
Deaths due to accidents	25	16 (10-24)	71 (46-105)	5	16 (5-37)	67 (22-156)	16	17 (10-27)	81 (46-131)	4	12 (3-31)	52 (14-132)	
Land Transport Accidents	13	8 (4-14)	140 (74-239)	3	9 (2-27)	154 (32-451)	10	11 (5-19)	182 (87-334)	0	-	-	
Other	12	8 (4-13)	47 (24-82)	2	6 (1-23)	36 (4-130)	6	6 (2-14)	42 (15-92)	4	12 (3-31)	68 (18-173)	
Deaths due to violence <sup>3</sup>	2	1 (0-5)	-	0	-	-	2	2 (0-8)	-	0	-	-	
Hostile Action	1	1 (0-4)	-	0	-	-	1	1 (0-6)	-	0	-	-	
Other	1	1 (0-4)	63 (2-353)	0	-	-	1	1 (0-5)	109 (3-607)	0	-	-	
Suicide and Open verdicts	5	3 (1-8)	19 (6-45)	0	-	-	5	5 (2-12)	35 (11-81)	0	-	-	
Cause not currently available	5	3 (1-8)	164 (53-382)	0	-	-	5	6 (2-14)	309 (100-720)	0	-	-	

Source: Defence Statistics (Health)

<sup>&</sup>lt;sup>1</sup>Rates have been age and gender standardised to the 2015 Regular Armed Forces population, expressed per 100,000 personnel at risk. Individual rates may not add up to totals due to rounding. <sup>2</sup>Standardised mortality ratios have been age and gender standardised. <sup>3</sup>An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data. <sup>4</sup>Naval Service includes Royal Navy and Royal Marines.

# Cause of death information for 2015 (cont.)

#### Figure 3 and Table 1 show:

#### Deaths due to disease

In 2015, **23** UK Armed Forces deaths (**38%**) were caused by disease-related conditions, this was a 12% increase compared to the previous year. Of the disease-related conditions:

- 16 were due to cancers
- five were due to circulatory system disorders and
- **two** were due to other diseases.

The Tri-Service rate of deaths due to disease related conditions in 2015 was **15 per 100,000**. There was no significant difference between the rates of each of the three services.

In 2015, the UK Armed Forces were at a **73**% statistically significant decreased risk of dying of a disease related condition compared to members of the UK general population.

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

In 2015, **32** deaths (**53**%) were due to external causes of injury and poisoning, a rate of **21 per 100,000.** There was no significant difference between the rates of each of the three services.

In 2015 the UK Armed Forces were at a **49%** statistically significant decreased risk of dying as a result of external cause of injury and poisoning compared to the UK general population. This is the third time in the latest ten year period that the UK Armed Forces had a statistically significant lower risk of dying as a result of external cause of injury and poisoning.

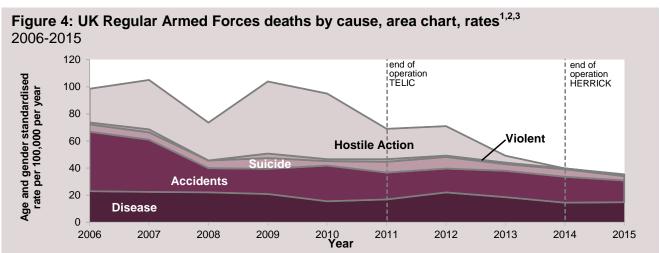
#### Deaths due to accidents

In 2015, **25** deaths (**42%**) were caused by accidents in the Armed Forces, of which Land Transport Accidents (LTA) accounted for **13** deaths (22%% of all deaths). This was a **38%** decrease from the previous year. Other accidents resulted in **12** deaths (**20%**) in the Armed Forces in 2015; two of these deaths were the result of a Puma helicopter accident in Afghanistan.

In 2015, the UK Armed Forces were at the same risk of dying as a result of an accident compared to the UK general population.

#### Deaths given either suicide or open verdicts

As at 17 February 2016 there were **five** coroner-confirmed suicide and open verdict deaths in 2015, a rate of 3 per 100,000. There were **12** deaths which occurred since 2007 (of which **five** were in 2015) awaiting a coroner's inquest and it is therefore possible that the suicide data presented here may be revised when the results of any outstanding inquests are known. These deaths are included in the 'Other accidents' classification until a verdict is given (see 'Methodology' and 'Changes to previously published data' sections).

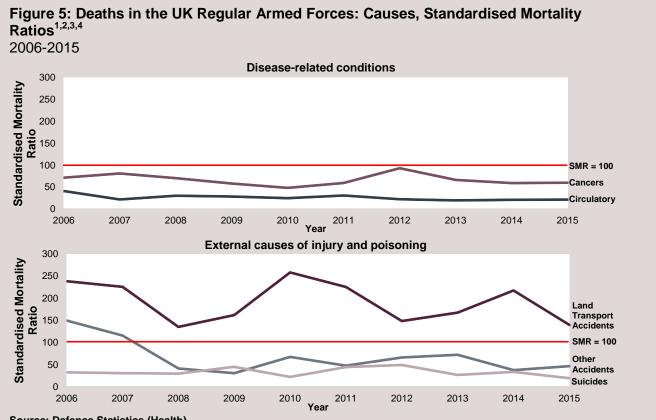


Source: Defence Statistics (Health)

<sup>1</sup>Rates have been age and gender standardised to the 2015 Regular Armed Forces population, expressed per 100,000 personnel at

risk.
<sup>2</sup> Operation TELIC is the name for UK operations in Iraq which began March 2003 and closed on 21 May 2011.

<sup>&</sup>lt;sup>3</sup> Operation HERRICK is the name for UK operations in Afghanistan which began 1 April 2006 and ended on 30 November 2014.



**Source: Defence Statistics (Health)**<sup>1</sup>Standardised mortality ratios have been age and gender standardized.

<sup>&</sup>lt;sup>2</sup> No comparisons between members of the UK Regular Armed Forces and members of the UK general population for deaths due to hostile action were made as there is no equivalent cause of death in the UK population.

<sup>&</sup>lt;sup>3</sup> An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data.

<sup>&</sup>lt;sup>4</sup> An SMR below, equal to, or above 100 indicates that the rate for the Armed Forces or the Service is respectively below, equal to, or higher than the rate in the general UK population (see 'Methodology' section for further clarification).

## Time trends: Cause of death 2006-2015 (cont.)

Deaths as a result of hostile action accounted for the single largest cause of death each year between 2007 and 2012, the rate has fluctuated year on year as a result of operational tempo and has fallen since 2012 as the result of the drawdown of operations in Afghanistan to none in 2014 and one in 2015 due to injuries which occurred in an incident in 2012. Deaths as a result of accidents have shown a downward trend from a rate of 44 per 100,000 in 2006 to 16 per 100,000 in 2015, largely as a result of a fall in Land Transport Accident deaths.

**Tables 3-6** provide a breakdown of the main causes of death for the UK Armed Forces from 2006-2015 by Service and can be found in the supplementary excel tables.

#### Disease-related conditions

Throughout the last ten years, the UK regular Armed Forces were at a significantly decreased risk of dying as a result of disease related conditions compared to the UK general population.

This lower risk of death may partially be explained by the 'healthy worker effect' often observed in occupational studies. This is deemed to occur when 'workers' are found to have lower mortality or other adverse health outcome rates than the general population due to the fact that certain groups of people are excluded from employment, particularly those who are ill or who have disabilities. This is to be expected in studies of Armed Forces mortality, as this population are generally a highly selected group of individuals who are likely to have higher than usual levels of fitness and are possibly at lower risk of developing disease-related illness as a result of this.

#### Accidental deaths

For the years 2006, 2007 and 2010 the UK regular Armed Forces were at a significantly increased risk of dying as a result of accidents compared to the UK general population. For all other years there was no significant difference in deaths due to accidents between members of the UK Armed Forces and the UK general population. A number of factors specific to Service life both on and off duty may play a role in the increased risk of UK Armed Forces dying as a result of an accident compared to the UK population.

There has been a downward trend in the rate of accidental deaths among UK regular Armed Forces since 2006, similar to that seen among the UK general population. Advancements in vehicle safety systems and MOD-run road safety campaigns have contributed to this fall. However, in six of the last ten years, the UK regular Armed Forces have been at a significantly increased risk of dying as a result of Land Transport Accidents compared to the UK general population and for the remaining years (2008, 2012, 2013 and 2015) there was no significant difference. The statistical notice 'Annual UK Regular Armed Forces Land Transport Accident Deaths 2011-2015' provides a more detailed analysis of recent trends and populations at risk of Land Transport Accident deaths: https://www.gov.uk/government/collections/uk-armed-forces-land-transport-accidents-index

The rate of suicide remained low between 2006 and 2015 and the UK regular Armed Forces were at a significantly lower risk of dying as a result of a suicide compared to the UK general population throughout the period. Please note that this comparison includes deaths among males and females. The Statistical Notice "Suicide and Open Verdict deaths in the UK Armed Forces" provides comparisons to the UK general population for males only:

https://www.gov.uk/government/collections/uk-armed-forces-suicide-and-open-verdict-deaths-index

## Glossary

**Army** The British Army consists of the General Staff and the deployable Field Army and the Regional Forces that support them, as well as Joint elements that work with the Royal Navy and Royal Air Force. Its primary task is to help defend the interests of the UK.

**Code of Practice for Official Statistics** promotes the production and dissemination of official statistics that inform decision making, and supports the continuous improvement of those statistics. It is a concise and specific statement that requires sound judgement and interpretation. Compliance with the Code is a statutory requirement on bodies that produce statistics that are designated as National Statistics through the Authority's Assessment process.

**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).

**Coroner -** A government official whose standard role is to confirm and certify the death of an individual within a jurisdiction. A coroner may also conduct or order an inquest into the manner or cause of death, and investigate or confirm the identity of an unknown person who has been found dead within the coroner's jurisdiction.

**Defence Inquest Unit (DIU)** was established in 2008 to coordinate and manage all Defence related inquests into the deaths of Service and MOD personnel, who die on, or as a result of injuries sustained while on operations; and those who die as a result of training activity. The Unit's key role is to assist Coroners so that they complete relevant inquests fully, thoroughly and as quickly as possible and to support the families through the inquest process.

**Died of Wounds (DOW)** - A battle casualty who dies of wounds or other injuries received in action, after having reached a medical treatment facility. This only includes those who have died of wounds whilst under the care of Defence Medical Services.

**FTRS** (**Full-Time Reserve Service**) are personnel who fill Service posts for a set period on a full-time basis while being a member of one of the Reserve Services, either as an ex-Regular or as a volunteer. An FTRS reservist on:

**Full Commitment (FC)** fulfils the same range of duties and deployment liability as a Regular Service person:

Limited Commitment (LC) serves at one location but can be detached for up to 35 days a year.

**Home Commitment (HC)** is employed at one location and cannot be detached elsewhere.

Each Service uses FTRS personnel differently:

The Naval Service predominantly uses FTRS to backfill gapped Regular posts. However, they do have a small number of FTRS personnel that are not deployable for operations overseas. There is no distinction made in terms of fulfilling baseline liability posts between FTRS Full Commitment (FC), Limited Commitment (LC) and Home Commitment (HC).

The Army employ FTRS(FC) and FTRS(LC) to fill Regular Army Liability (RAL) posts as a substitute for Regular personnel for set periods of time. FTRS(HC) personnel cannot be deployed to operations and are not counted against RAL.

The RAF consider that FTRS(FC) can fill Regular RAF Liability posts but have identified separate liabilities for FTRS(LC) and FTRS(HC).

**Gurkhas** are recruited and employed in the British and Indian Armies under the terms of the 1947 Tri-Partite Agreement (TPA) on a broadly comparable basis. They remain Nepalese citizens but in all other respects are full members of HM Forces. Since 2008, Gurkhas are entitled to join the UK Regular Forces after 5 years of service and apply for British citizenship.

Hostile Action (HA) includes deaths categorised as Killed in Action or Died of Wounds.

International Statistical Classification of Diseases and Health-Related Disorders 10<sup>th</sup> edition (ICD-10) is the standard diagnostic tool for epidemiology, health management and clinical purposes.

**Joint Casualty and Compassionate Cell (JCCC)** provide a focal point for casualty administration and notification and requests for compassionate travel (for those personnel serving overseas) in respect of members of the British armed forces. The JCCC is part of Defence Business Services (DBS) in the MoD.

**Joint Personnel Administration (JPA)** is the system used by the Armed Forces to deal with matters of pay, leave and other personnel administrative tasks. JPA replaced a number of single-Service IT systems and was implemented in April 2006 for RAF, November 2006 for Naval Service and April 2007 for Army.

**Killed in Action (KIA)** A battle casualty who is killed outright or who dies as a result of wounds or other injuries before reaching a medical treatment facility.

Land Transport Accident - 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.

**Military Provost Guard Service (MPGS)** provides trained professional soldiers to meet defence armed security requirements in units of all three Services based in Great Britain. MPGS provide armed guard protection of units, responsible for control of entry, foot and mobile patrols and armed response to attacks on their unit.

**Ministry of Defence** The Ministry of Defence (MOD) is the United Kingdom government department responsible for the development and implementation of government defence policy and is the headquarters of the British Armed Forces. The principal objective of the MOD is to defend the United Kingdom and its interests. The MOD also manages day to day running of the armed forces, contingency planning and defence procurement.

**Mobilised Reservists** are Volunteer or Regular Reserves who have been called into permanent service with the Regular Forces on military operations under the powers outlined in the Reserve Forces Act 1996. Call-out orders will be for a specific amount of time and subject to limits (e.g. under a call-out for warlike operations (Section 54), call-out periods should not exceed 12 months, unless extended.)

Naval Service includes the Royal Navy and Royal Marines.

**National Health Service (NHS)** was launched in 1948. The National Health Service is the publicly funded healthcare system for England.

**National Records of Scotland (NRS)** is a non-ministerial department of the Scottish Government. Its purpose is to collect, preserve and produce information about Scotland's people and history and make it available to inform current and future generations. It was established on 1 April 2011, following the merger of the General Register Office for Scotland (GROS) and the National Archives of Scotland (NAS).

Non Regular Permanent Staff (NRPS) are members of the Army Volunteer Reserve Force employed on a full time basis. The NRPS comprises Commissioned Officers, Warrant Officers, Non Commissioned Officers and soldiers posted to units to assist with the training, administrative and special duties within the Army Reserve. Typical jobs are Permanent Staff Administration Officer and Regimental Administration Officer. Since 2010, these contracts are being discontinued in favour of FTRS (Home Commitment) contracts. NRPS are not included in the Future Reserves 2020 Volunteer Reserve population as they have no liability for call out.

**Northern Ireland Statistics and Research Agency (NISRA)** is the principal source of official statistics and social research on Northern Ireland.

**Officer** An officer is a member of the Armed Forces holding the Queen's Commission to lead and command elements of the forces. Officers form the middle and senior management of the Armed Forces. This includes ranks from Sub-Lt/2nd Lt/Pilot Officer up to Admiral of the Fleet/Field Marshal/Marshal of the Royal Air Force, but excludes Non-Commissioned Officers.

**Office for National Statistics** is the UK's largest independent producer of official statistics and the recognised national statistical institute of the UK.

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

**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 support the Government's objective to remove the threat that Saddam Hussein posed to his neighbours and his people and, based on 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 and freedom.

Operational Accident is any accident that occurred whist deployed on operations.

**OPLOC** was the single Service Operation Location Tracking system used to identify personnel deployed to Iraq and Afghanistan prior to April 2007.

**Other Ranks** Other ranks are members of the Royal Marines, Army and Royal Air Force who are not officers but Other Ranks include Non-Commissioned Officers.

**Personnel at Risk** is defined as the number of serving UK Armed Forces personnel eligible for mental healthcare. This includes Regular UK Armed Forces personnel, Ghurkhas, Military Provost Guard Staff, mobilised reservists, Full Time Reserve Service personnel and Non-Regular Permanent Staff.

**Procurator Fiscal** is a public prosecutor in Scotland. They investigate all sudden and suspicious deaths in Scotland (similar to a coroner in other legal systems), conduct fatal accident inquiries (a form of inquest unique to the Scotlish legal system) and handle criminal complaints against the police.

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. 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. For this direct standardisation process, Defence Statistics have estimated the rates that would have been observed if each study population (i.e. each of the single Services) had the same age and gender structure as the standard population (the 2015 Armed Forces population).

Royal Air Force (RAF). The Royal Air Force (RAF) is the aerial defence force of the UK.

**Royal Marines** (RM) Royal Marines are sea-going soldiers who are part of the Naval Service. RM officer ranks were aligned with those of the Army on 1 July 1999.

**Royal Navy** (RN) The sea-going defence forces of the UK but excludes the Royal Marines and the Royal Fleet Auxiliary Service (RFA).

**Statistics and Registration Service Act 2007** is an Act of the Parliament of the United Kingdom which established the UK Statistics Authority (UKSA). It came into force in April 2008.

**Strength** is defined as the number of serving UK Armed Forces personnel.

**UK Regulars** are full time Service personnel, including Nursing Services, but excluding FTRS personnel, Gurkhas, Naval activated Reservists, mobilised Reservists, Military Provost Guarding Service (MPGS) and Non Regular Permanent Service (NRPS). Unless otherwise stated, includes trained and untrained personnel.

**UK Statistics Authority** is an independent body operating at arm's length from government as a non-ministerial department, directly accountable to Parliament. It was established on 1 April 2008 by the Statistics and Registration Service Act 2007. The Authority's statutory objective is to promote and safeguard the production and publication of official statistics that serve the public good. It is also required to promote and safeguard the quality and comprehensiveness of official statistics, and ensure good practice in relation to official statistics.

## Methodology

#### Data Sources

Defence Statistics receive weekly notifications of all Regular Armed Forces deaths from the Joint Casualty and Compassionate Cell (formerly the single Service casualty cells). Defence Statistics also receive cause of death information from military medical sources in the single Services. At the end of each calendar year, Defence Statistics cross-reference the medical information it holds against publicly available death certificate information available from the NHS. Regarding suicides and open verdicts, to ensure the highest accuracy of information and that all cases previously recorded as 'awaiting verdict' have been followed up, Defence Statistics carry out an annual audit of MOD data held by the ONS and other authorities.

Defence Statistics are currently working with NHS and ONS to access death certificate data, if there are any amendments to cause of death classifications they will be provided in the next release of this statistical publication.

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.

Defence Statistics have included the Joint Casualty Compassionate Cell categories of killed in action and died of wounds which together provide information on the number of Service personnel who have died on operations as a result of hostile action. The term 'killed in action' is used when a battle casualty has died outright or as a result of injuries before reaching a medical facility, whilst 'died of wounds' refers to battle casualties who died of wounds or other injuries after reaching a medical treatment facility.

In line with the definitions in ICD-10 a land transport accident is defined as any accident involving a device that has been designed for, or is being used at the time for, the conveyance of either goods or people from one place to another on land. The scope of this definition covers incidents that occur on and off the public highways and incidents that involve non-motorised forms of transport. The definition therefore includes all military specific vehicles irrespective of where the accident took place. Road traffic accidents refer only to accidents on a public road.

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

Defence Statistics have undertaken a review of the deaths for which a verdict was outstanding (awaiting verdict), as a proportion of those reported in this notice occurred a number of years ago and in some instances the deaths occurred overseas. Following investigations with ONS and the Defence Inquest Unit, Defence Statistics have been unable to trace awaiting verdicts prior to 2007 and have deemed it unlikely that the final outcome of these deaths (such as inquests) will be traced. The

majority of the awaiting verdicts that Defence Statistics were aware of prior to 2007 were for deaths that occurred to Service personnel overseas. As such Defence Statistics have identified that the earliest death still awaiting a coroner's inquest occurred in 2007. This has resulted in nine deaths awaiting verdicts prior to 2007 being finalised as accidental deaths (see 'Changes to previously published data' section). A further 11 deaths which occurred after 2007 (of which five occurred in 2015) are awaiting a coroner's verdict.

Where trends over time have been presented, an update on previous data published has been provided in the section 'Changes to previously published data' and annotated with an 'r' to indicate a revision has been made.

## Data Coverage

The information on deaths presented in the main report 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.

The data in the main report exclude the Home Service of the Royal Irish Regiment, full time reservists, Army Reserve 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. However, Defence Statistics are informed of onduty deaths among non-regular Armed Forces personnel; Annex B presents this information.

The Naval Service includes both the Royal Navy and the Royal Marines.

#### Methods

Calculating a 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.

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 2015 Armed Forces population. For this direct standardisation process, Defence Statistics have estimated the rates that would have been observed if each study population (i.e. each of the single Services) had the same age and gender structure as the standard population (the 2015 Armed Forces population).

In order to understand if a difference in rates is statistically significant, 95% confidence intervals are used. Statistical significance indicates that a finding is not due to chance. The 95% confidence interval for a rate provides the range of values within which we expect to find the real value of the indicator under study, with a probability of 95%. If a 95% confidence interval around a rate excludes the comparison value, then a statistical test for the difference between the two values would be significant at the 0.05 level. If two confidence intervals do not overlap, a comparable statistical test would always indicate a statistically significant difference. The small number of deaths in some of the sub-group analysis may result in wide confidence intervals in the corresponding rate or ratios. The impact of this is that the range in which we expect the true value of that statistics to lie is much larger, making it harder to interpret the true underlying trend.

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>2</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.

#### Calculating Standardised Mortality Ratios (SMR)

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.

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 statistic to lie is much larger, making it harder to interpret the true underlying trend.

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.

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 used deaths that both occurred and were registered in the year. Using UK population deaths that both occurred and were registered in an increased dominator population for the 2006 SMR calculation which resulted in a lower SMR for 2006 (when compared with the 2006 SMR reported in publications before this change in methodology). Users should note that this revised corrected methodology has brought the 2006 SMR findings in line with the SMR findings for other years.

The UK population estimates used to calculate SMRs 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.

The UK general population data for 2015 was not available for this report to calculate standard mortality ratios (SMRs), therefore, Defence Statistics has used the 2014 data as an estimate for the 2015 figures as there is little year on year variation for the UK figures. Thus, any patterns reported

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<sup>&</sup>lt;sup>2</sup> https://www.gov.uk/government/uploads/system/uploads/attachment\_data/file/62487/Factsheet5-Future-Force-2020.pdf

here may be subject to minor fluctuations when the 2015 data becomes available.

#### Strengths and weaknesses of data presented in this notice

A strength of this publication is that considerable validation is undertaken against military and public records to ensure that the information provided is complete and accurate and users of this publication should be confident that the numbers of fatalities presented are accurate. However, some causes of death (including Suicide and Open Verdict deaths) require a Coroner's report before the cause of death can be formally classified and there is often a time lag between when the death occurred and when the Coroner's inquest takes place. This can result in final cause of death information not being timely and complete for recent years and these deaths are reported as 'other accidents' or 'cause not available' whilst waiting for final cause of death to be determined. This can lead to revisions in the cause of death categories when these verdicts are returned (see 'Changes to previously published data' section for more information about the extent of these revisions).

In addition, deaths certificates for personnel who die overseas are issued by the MOD and if buried overseas, are not always subject to a coroner's inquest to certify cause of death. Users should be aware of this when using cause of death information.

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.

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.

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.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs:
- are well explained and readily accessible:
- are produced according to sound methods; and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

# Changes to previously published data

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 eight amendments to the classifications given to the cause of death previously reported for 2014:

- three deaths have been amended from Cause Unavailable to Diseases of Circulatory system
- one deaths has been amended from Cause Unavailable to Cancer
- one deaths has been amended from Cause Unavailable to Suicide and Open Verdict
- one deaths has been amended from Cause Unavailable to Other Diseases
- two deaths have been amended from Other Accidents to Suicide and Open Verdict.

Where trends over time have been presented, an update on previous data published has been annotated with an 'r' to indicate a revision has been made.

More detailed information on the data, definitions and methods used to create this report can be found in the Background Quality Report (BQR) published at <a href="https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic">www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic</a>.

#### **Further Information**

# **Symbols**

- || discontinuity in time series
- \* not applicable
- .. not available

## Rounding

Where rounding has been used, totals and sub-totals have been rounded separately and so may not equal the sums of their rounded parts.

## **Further Information (cont.)**

#### **Contact Us**

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:

**Defence Statistics (Health)** Telephone: 030 6798 4423

Email: <u>DefStrat-Stat-Health-PQ-FOI@mod.uk</u>

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

## Other contact points within Defence Statistics are:

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020 7807 8896	DefStrat-Stat-Tri-Hd@mod.uk
020 7218 1359	DefStrat-Stat-Civ-Hd@mod.uk
030 6798 4423	DefStrat-Stat-Health-Hd@mod.uk
	030 6793 2100 023 9254 7426 01264 886175 01494 496822 020 7807 8896 020 7218 1359

Please note that these email addresses may change later in the year.

#### If you wish to correspond by mail, our postal address is:

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London
SW1A 2HB

For general MOD enquiries, please call: 020 7218 9000

# Annex A - Number of incidents resulting in deaths among UK Regular Armed Forces Personnel

As multiple deaths occurred in the same incident on several occasions during the latest ten year period, **Table A1** provides details of the number of separate incidents and the number of individual deaths, by year of occurrence, for all accidental and violent deaths excluding suicides.

Table A1: UK Regular Armed Forces Accidental and Violent deaths (excluding Suicides) by Service, deaths and incidents, numbers<sup>1</sup>

2006-2015

	All		Naval Service <sup>2</sup> Army		1	RAF		
Year	n <i>Inc</i>	idents	n <i>Inc</i>	idents	n Inc	idents	n <i>Inc</i>	idents
2006	138	107	23	21	87	76	28	16
2007	154	131	15	14	123	107	16	13
2008	88	74	27	22	57	50	4	3
2009	150	120	10	10	128	100	12	11
2010	150	137	22	22	118	105	10	10
2011	86	78	11	10	68	62	7	7
2012	74	59	8	8	59	49	7	5
2013	45	42	3	3	37	35	5	4
2014	32 r	26 r	2 r	2 r	23 r	18 r	7	7
2015	27	26	5	5	18	18	4	3

Source: Defence Statistics (Health)

**Table A1** shows a downward trend in the number of fatal incidents and deaths since 2010. This is accounted for by the drawdown of operations in Iraq (in 2011) and Afghanistan (in 2014) and a fall in transport accidents.

In 2015, only one incident resulted in two deaths; this was due to a Puma helicopter accident in Afghanistan.

Of the **26** fatal incidents in 2015, 50% (n=13) were the result of transport accidents and accounted for 52% (n=14) of deaths. This is in contrast to the period 2006 to 2013 where hostile action incidents in Iraq and Afghanistan contributed to the majority of deaths; for example in 2009, 68% (n=82) of incidents were due to hostile action and resulted in 71% (n=107) of deaths in that year.

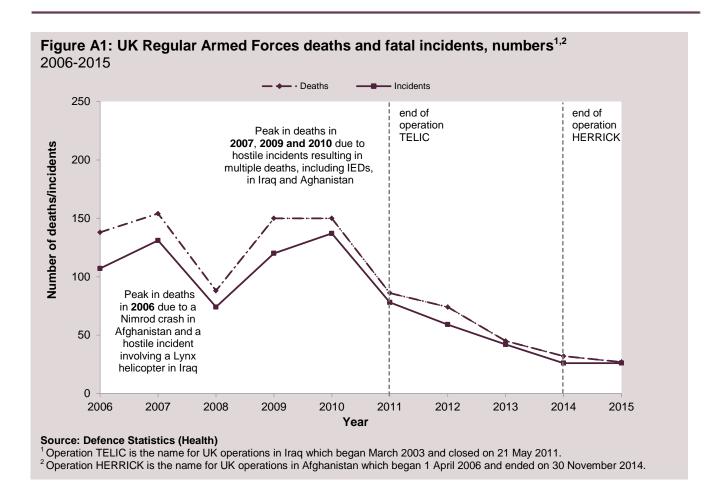
These findings are illustrated in **Figure A1**, which shows both the annual changes in the number of deaths and the incidents for the total Armed Forces population.

<sup>&</sup>lt;sup>1</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.

<sup>&</sup>lt;sup>2</sup>Naval Service includes Royal Navy and Royal Marines.

<sup>&#</sup>x27;r' indicates a change in previously published data (see 'Changes to previously published data' section)

Annex A - Number of incidents resulting in deaths among UK Regular Armed Forces Personnel (cont.)



#### Annex B - Deaths in the UK Armed Forces Reservist Forces, 2006-2015

Prior to 2015, only deaths of reserves deployed on operations were published in this notice. With the move to Future Force 2020 and the impact of increasing reserve forces whilst reducing the number of regular Armed Forces personnel, it is important that the MOD continues its commitment to better inform public debate and contribute to the public accountability and transparency of the department's activities. This is the first notice in this series to present information on the number of on-duty deaths to reservists and this information broken down by cause of death.

Table B1: UK Armed Forces Reservist<sup>1,2</sup> deaths whilst on duty, by type of reservist, numbers

2006-2015

		Year								
Reserve type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
All	4	5	2	7	2	5	2	3	3	1
Territorial Army	2	3	1	1	0	0	0	0	0	0
Other Volunteer Reserves	1	1	1	4	2	3	1	3	2	1
Full-Time Reserve Service	1	1	0	1	0	1	0	0	0	0
Military Provost Guard Service	0	0	0	0	0	1	1	0	0	0
Non Regular Permanent Staff	0	0	0	1	0	0	0	0	1	0

<sup>&</sup>lt;sup>2</sup> Includes UK Armed Forces non-regular personnel, Military Provost Guard Service (MGPS) and Non Regular Permanent Staff (NRPS).

Table B2: UK Armed Forces Reservist <sup>1,7</sup>	deaths whilst on duty, by Cause of death, numbers
2006-2015	

	Year									
Cause	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
All	4	5	2	7	2	5	2	3	3	1
Disease-related conditions	2	4	1	3	2	3	2	0	2	(
Cancers	0	0	0	0	1	2	1	0	0	(
Diseases of the circulatory system	1	4	0	2	0	1	1	0	0	
Other	1	0	1	1	1	0	0	0	2	
External causes of injury and poisoning	2	1	1	4	0	1	0	3	0	
Deaths due to accidents	1	1	1	3	0	1	0	3	0	
Land Transport Accidents	1	1	0	1	0	0	0	0	0	
Other	0	0	1	2	0	1	0	3	0	
Deaths due to violence	0	0	0	0	0	0	0	0	0	
Hostile Action <sup>1</sup>	-	-	-	-	-	-	-	-	-	
Other	0	0	0	0	0	0	0	0	0	
Suicide and Open verdicts	1	0	0	1	0	0	0	0	0	
Cause not currently available	0	0	0	0	0	1	0	0	1	

Source: Defence Statistics (Health)

Source: Defence Statistics (Health)

1 UK Armed Forces Reservists who died whilst deployed on operations are included in the data presented in the main report, and are therefore not included in this Annex.

<sup>&</sup>lt;sup>1</sup> Non-Regular members of the UK Armed Forces who died whilst deployed on operations are included in the data presented in the main report, and are therefore not included in this Annex.

Includes UK Armed Forces non-regular personnel, Military Provost Guard Service (MGPS) and Non Regular Permanent Staff.

# Annex B - Deaths in the UK Armed Forces Reservist Forces, 2006-2015 (cont.)

The number of on-duty UK Reservist deaths over the last ten years remains small and has fallen further since the end of operations in Iraq and Afghanistan. One Reservist died in 2015 following a battle injury sustained in Afghanistan in2012. This death has been included in the figures presented in the main report and excluded from this Annex since reservists are classified as 'regular' personnel for the duration of their overseas deployment.

Rates for on-duty Reservist deaths have not been calculated as there are currently data quality issues with accurately identifying the number of personnel at risk.

The information presented in this Annex does not include deaths to all UK Armed Forces Reservist personnel as MOD are not routinely informed of deaths among this population which occur off-duty.