



This annual National Statistical Notice provides summary information on deaths whilst in service in 2022 among the UK regular armed forces, and trends over the ten-year period, 2013-2022. This information updates previous notices and includes new data for 2022. The information presented has been compiled from data held by Defence Statistics on 21 February 2023.

The data is presented for Tri-Service and separately for each of the services; Royal Navy (Royal Navy and Royal Marines), Army (including Gurkhas) and Royal Air Force (RAF). This release provides information on the major categories of cause of death for the ten-year period 2013-2022, also presenting comparisons to the UK general population and the number of on-duty armed forces reservist deaths.

## 2022 Key points and trends

	Tri-Service	Royal Navy	Army	RAF
Number of deaths in 2022	69	17	40	12
2022 mortality rate (per 100,000 personnel at risk)	46 per 100,000	49 per 100,000	50 per 100,000	30 per 100,000

In 2022, the three largest causes of death among the UK regular armed forces were

Other Accidents  
28% (n=19)<sup>P</sup>

Cancers  
26% (n=18)

Land Transport Accidents  
17% (n=12)<sup>P</sup>

As of 21 February 2023, there were 12 deaths (17%) from 2022 awaiting a Coroner's Inquest; the cause of death for Other Accidents, Land Transport Accidents and Suicides remain provisional and subject to change until these inquests are held.

Overall, in 2022, the UK regular armed forces were at a **statistically significant lower risk** of dying compared to the UK general population. More specifically, the UK regular armed forces had:

- a **77% significantly lower risk** of dying as a result of a **disease related condition**, and
- a **45% significantly lower risk** of dying as a result of **external causes of injury and poisoning** (accidental, violent or suicide) compared to the UK general population.

The lower risk of dying among UK regular armed forces personnel compared to the UK general population may be explained by the 'healthy worker effect', as discussed in the report.

However, in 2022, the UK regular armed forces were at a **statistically significantly increased risk** of dying as a result of a land transport accident compared to the UK general population.

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[Background Quality Report](#)

Would you like to be added to our **contact list** so that we can inform you about updates to these statistics and consult you if we are thinking of making changes? You can subscribe to updates by emailing: [Analysis-PQ-FOI@mod.gov.uk](mailto:Analysis-PQ-FOI@mod.gov.uk)

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Supplementary tables containing all data presented in this publication, including numbers, rates and 95% confidence intervals, can be found at the [gov.uk UK armed forces deaths in service statistics index](https://www.gov.uk/government/statistics/uk-armed-forces-deaths-in-service-statistics-index).

Note that previously published rates and SMRs may have changed in this release and in the accompanying tables. This is because they have been re-calculated using the 2022 armed forces population as a standard population, to allow comparisons over time. Full details of methods used are provided in the section ‘**Methodology**’.

## National Statistics Status

National Statistics Status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

The statistics last underwent a full assessment against the Code of Practice in 2012.

The continued designation of these statistics as National Statistics was confirmed in January 2021 following a compliance check by the [Office for Statistics Regulation](https://www.ofs.gov.uk/).

Since the latest review by the Office for Statistics Regulation, we have continued to comply with the Code of Practice for Statistics, and have made the following improvements:

- aided user understanding by adding further explanations on the use of provisional markers when presenting the number of other accidents and suicides in the report.
- aided user understanding by improving explanations on rates, confidence intervals and Standardised Mortality Ratios.

## Introduction

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This Notice provides information on the major categories of cause of death in the UK regular armed forces for the ten-year period 2013-2022. This Notice also presents information on comparisons to the UK general population. Data is presented for the Royal Navy (Royal Navy and Royal Marines), the Army (including Gurkhas), the Royal Air Force, and for the UK regular armed forces as a whole (Tri-Service). 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.

For data on suicide, this Notice includes suicides in line with the definition used by the Office for National Statistics (ONS) in the publication of National Statistics. More detail on this data can be found in the Official Statistic, "[Suicides in the UK Regular Armed Forces 1984-2022](#)", also published on 30 March 2023.

The bi-annual Official Statistic '[Training and Exercise Deaths in the UK Armed Forces](#)', also published on 30 March 2023, provides a detailed breakdown on the number of UK regular armed forces and on-duty reservist personnel who have died whilst taking part in training or on exercise. This report presents the number of deaths since January 2000 and the training activity being conducted at the time of death.

The '[UK armed forces operational deaths post World War 2](#)' Official Statistic provides summary information on the number of in service deaths among UK armed forces personnel that occurred as a result of a British, United Nations or North Atlantic Treaty Organisation medal earning operation since World War 2. This report is updated annually at the end of March and six weeks after the end of each medal earning operation.

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 of injury 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).

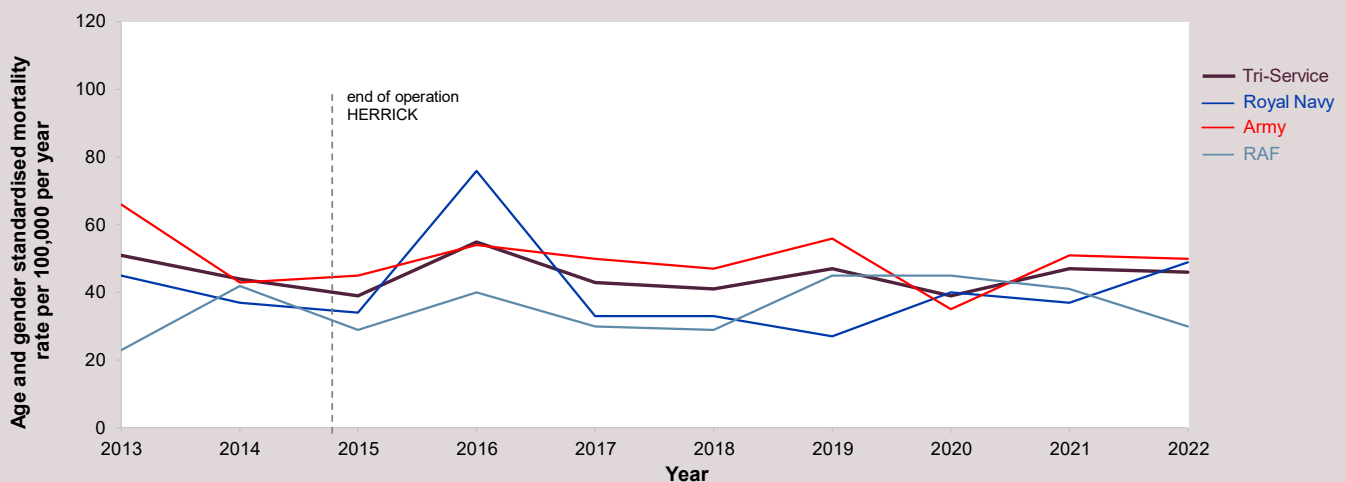
## UK regular armed forces overall and service comparison

In 2022, there were **69** deaths among serving personnel in the UK regular armed forces. Of these, **17** deaths were in the Royal Navy, **40** in the Army and **12** in the RAF.

**Figure 1** provides details of the age and gender standardised mortality rates (per 100,000 personnel at risk) by service for the ten-year period, 2013-2022. The rates have been age and gender standardised to take into account the different age and gender structures of each of the services.

**Rates** enable comparisons between groups over time, taking into account 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 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.

**Figure 1: UK regular armed forces mortality rates<sup>1</sup> by service<sup>2</sup> 2013-2022**



Source: Defence Statistics Health

<sup>1</sup> Rates have been age and gender standardised to the 2022 UK regular armed forces population, expressed per 100,000 personnel at risk.

<sup>2</sup> Royal Navy includes Royal Navy and Royal Marines.

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

**Since the conclusion of Operation HERRICK on 30 November 2014, the rate of deaths in the UK regular armed forces have remained stable.**

In 2022, the age and gender standardised mortality rate for the UK regular armed forces was **46 per 100,000** (n=69). This is similar to the rate in the previous year, which was 47 per 100,000 (n=71). In 2022, the Royal Navy (**49 per 100,000**) and the Army (**50 per 100,000**) had higher mortality rates than the RAF (**30 per 100,000**). However, as in previous years, there was **no statistically significant difference** in the mortality rates between each of the services (see **Table 1, page 9**).




Due to small numbers, year-on-year variation in the mortality rates of each service is to be expected. The following page presents more detail on the year-on-year changes.

## UK regular armed forces overall and service comparison (cont.)

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### Latest year

In 2022:

<b>Royal Navy</b>		The Royal Navy mortality rate rose by 32% from 37 per 100,000 in 2021 to <b>49 per 100,000</b> in 2022. This was an increase of four deaths compared to 2021.
<b>Army</b>		The Army mortality rate fell by 2% from 51 per 100,000 in 2021 to <b>50 per 100,000</b> in 2022. This was a decrease of two deaths compared to 2021.
<b>RAF</b>		The RAF mortality rate fell by 27% from 41 per 100,000 in 2021 to <b>30 per 100,000</b> in 2022. This was a decrease of four deaths compared to 2021.

### Ten-Year Trends

The rate of deaths among UK regular armed forces personnel over the latest ten-year period has remained stable. Following the conclusion of Operation HERRICK and the associated withdrawal of troops from Afghanistan, combat deaths have remained consistently low, with three lives being lost as a result of hostile action since 2014 (one each in 2015, 2018 and 2020).

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

- In 2016, the Royal Navy experienced a high mortality rate. This was because of a rise in the rate of deaths due to cancer deaths for that year, which has since returned to a rate similar to that seen in previous years.
- In 2019, the Army and RAF experienced higher mortality rates. These were because of a rise in the rate of deaths due to cancer for both the Army and RAF and an increase in land transport accident deaths in the RAF.
- In 2020, the Royal Navy experienced a higher mortality rate due to increased rates of other accident and circulatory disease deaths. The Army however experienced a lower mortality rate which was the result of a fall in the number of deaths due to cancer and land transport accidents.
- In 2021, the Army mortality rate returned to a similar rate seen prior to 2020. This was due to a rise in the rate of other accident deaths.
- In 2022, the Royal Navy experienced a higher mortality rate, primarily the result of an increase in cancers and land transport accident deaths, while the RAF experienced a reduced mortality rate due to a fall in deaths due to accidents.

Due to small numbers, these year-on-year fluctuations in rates should be viewed with caution.

Since the early 2000s, land transport accidents (LTA) have been one of the largest cause of deaths among the UK regular armed forces. The advancement of vehicle safety systems and road safety campaigns run by MOD has contributed to a declining trend in the rate of deaths as a result of LTA. Between 2017 and 2019, the number of UK regular armed forces personnel dying as a result of an LTA remained stable at around an average of 12 deaths each year. This figure fell to six in 2020 but has since returned to pre COVID-19 levels, with 12 in 2022. Restrictions on travel due to COVID-19 may have contributed to the fall in 2020. Further analysis on LTA deaths can be found in **Annex A**.

Operational activity and accidents resulted in multiple deaths from the same incident on several occasions during the latest ten-year period. Following the start of drawdown of operations from Afghanistan in 2012, the number of deaths per incident has fallen. In 2022, two deaths were the result of the same land transport incident. For further details see **Annex B**.

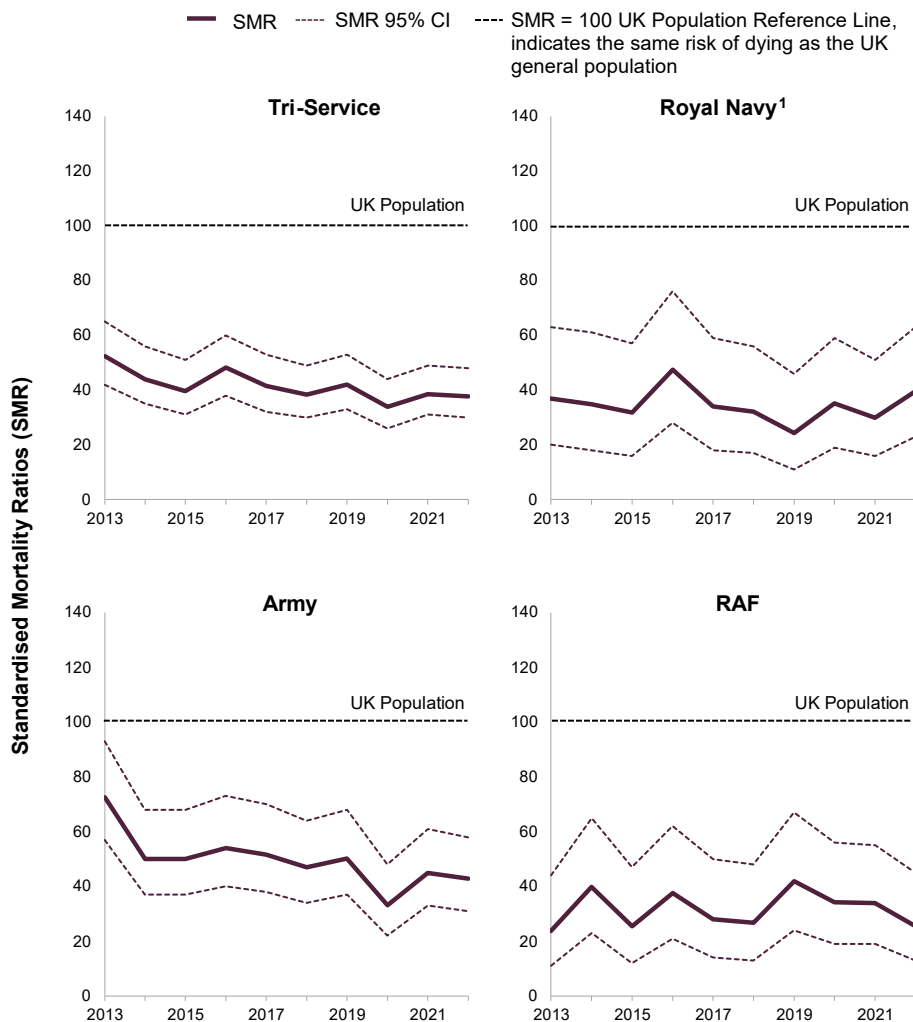
# UK regular armed forces overall and service comparison to the UK general population

## Standardised Mortality Ratios (SMR)

To make comparisons between death rates in the UK armed forces and the UK general population, an SMR is calculated which takes account of the different age and gender structure in the two populations. The SMR is the ratio of the number of deaths observed in the armed forces to the number of deaths expected if the armed forces population had the same age and gender specific rates as the UK general population in each year. An SMR over (or under) 100 indicates a higher (or lower) number of observed deaths than expected compared to the UK general population and represents whether the armed forces are at an increased or decreased risk of death compared to the UK population. An SMR of 100 implies there is no difference in rates when comparing the UK regular armed forces population with the UK population. An SMR where the 95% confidence interval does not encompass 100 implies there is a statistically significant difference in rates when comparing the UK regular armed forces population with the UK general population.

**Figure 2: UK regular armed forces deaths by service<sup>1</sup>, standardised mortality ratios<sup>2,3</sup> (SMR) (95% confidence intervals (CI))**

2013-2022



The graphs in Figure 2 show that the UK regular armed forces were at a **statistically significant lower risk** of dying compared to the UK general population, both as a whole and for each individual service, in each year for the ten-year period 2013 to 2022.

Source: Defence Statistics Health

<sup>1</sup> Royal Navy includes Royal Navy and Royal Marines.

<sup>2</sup> Standardised mortality ratios have been age and gender standardised.

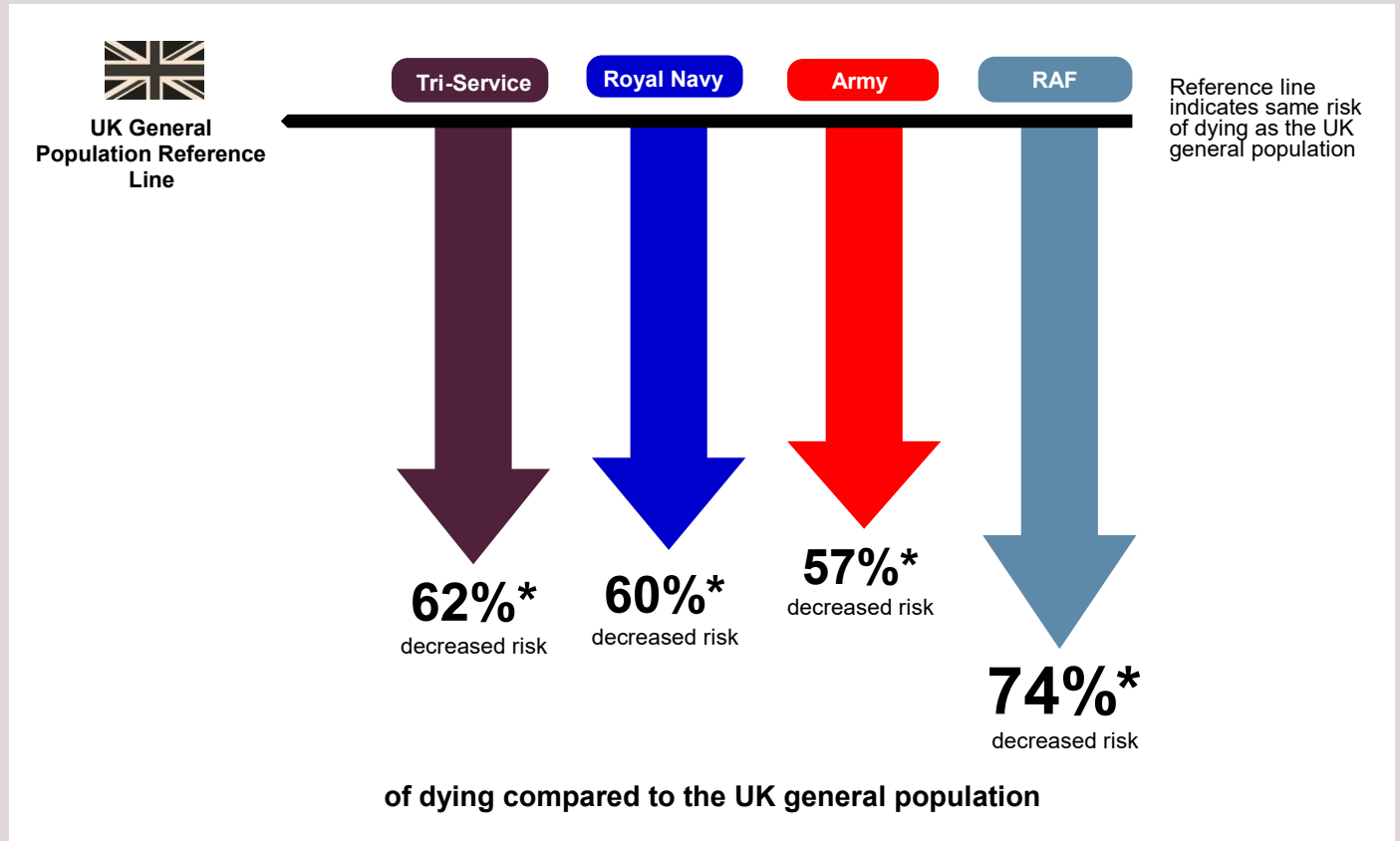
<sup>3</sup> An SMR below, equal to, or above 100 indicates that the rate for the UK regular armed forces or the service is respectively below, equal to, or higher than the rate in the general UK population (see 'Methodology' section for further clarification).

## UK regular armed forces overall and service comparison to the UK general population (cont.)

In the latest year (2022), all three services were at a **statistically significant lower risk** of dying compared to the UK general population (see **Figure 3**).

The lower risk of death among the UK regular armed forces may partially be explained by the ‘healthy worker effect’ often observed in occupational studies<sup>1</sup>. 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 military 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 selected group of individuals who are likely to have higher than usual levels of fitness and are at lower risk of developing disease-related illness as a result.

**Figure 3: UK regular armed forces deaths by service<sup>1</sup>, standardised mortality rate<sup>2</sup> 2022**



Source: Defence Statistics Health

<sup>1</sup> Royal Navy includes Royal Navy and Royal Marines.

<sup>2</sup> Standardised mortality ratios have been age and gender standardised.

\* Statistically significant risk of dying compared to the UK general population. No asterisk (\*) indicates there was no statistical significant difference between the military and the UK general population.

**In 2022, the UK regular armed forces had a 62% statistically significantly lower risk of dying compared to the UK general population.**

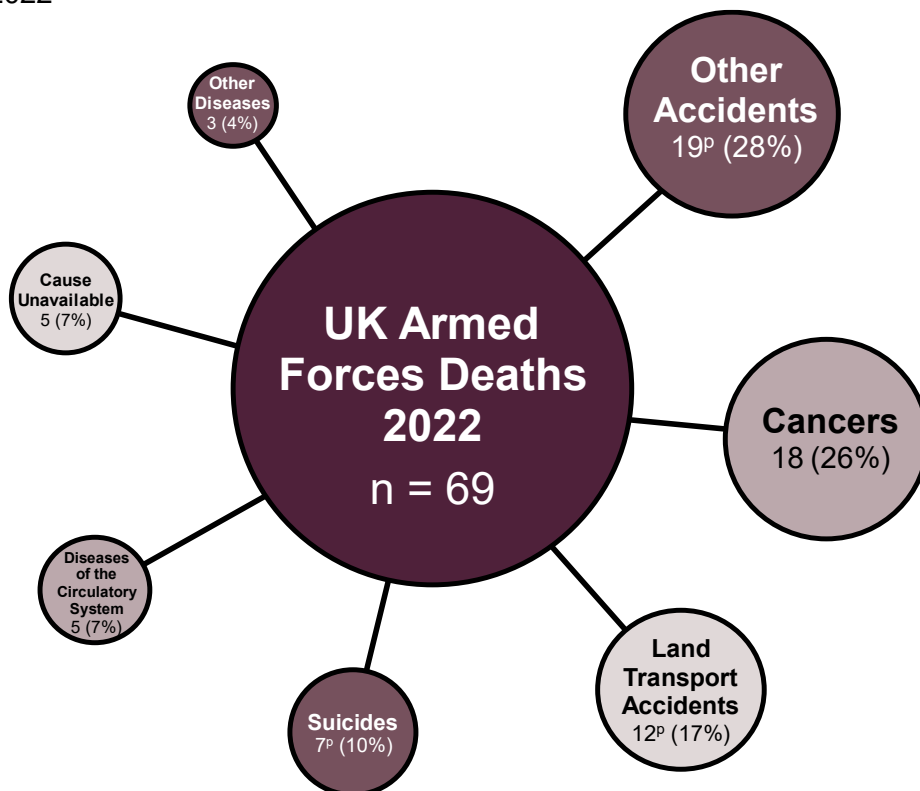
<sup>1</sup> McLaughlin et al., (2015) An Evaluation of the Effect of Military service on Mortality: Quantifying the Healthy Soldier Effect

## Cause of death

**Figure 4** provides a summary of the cause of death for the UK regular armed forces as a whole in 2022. This information is presented by service, along with rates and SMRs, in **Table 1**. Cause of death for the ten-year period 2013-2022 as a whole can be found in **Figure 4a** of the supplementary tables that accompany this report.

The information provided in Figure 4 and Table 1 include all deaths that occurred whilst in-service both on and off duty. This Notice does not 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 in the annual statistical notice '[Defence Personnel Health and Safety Statistics](#)'.

**Figure 4: UK regular armed forces: Cause of death, proportion 2022**



In 2022, there were 12 deaths (17%) currently shown as Other Accidents and Land Transport Accidents, where the mechanism of injury suggests possible suicide and are awaiting a Coroner's Inquest. It is likely that the number of deaths for **Other Accidents and Land Transport Accidents will fall** and the number of **suicides may increase** once the outcome of these inquests are known.

Source: Defence Statistics Health

\* Percentages may not add up to 100% due to rounding.

<sup>p</sup> Provisional, subject to change following coroner's inquests into 12 deaths

In 2022, the three leading causes of death among the UK regular armed forces were:

- **Other Accidents** (n=19<sup>p</sup>, 28% of all deaths), of which 11 are awaiting a coroner inquest and therefore the cause of death may be recategorised. It is likely that the number of deaths due to Other Accidents will fall once the outcome of the inquests are known.
- **Cancers** (n=18, 26% of all deaths).
- **Land Transport Accidents** (n=12<sup>p</sup>, 17% of all deaths), of which one is awaiting a verdict and may be recategorised following a coroner's inquest.

**Figure 4a**, in the supplementary tables, presents the proportion for each cause of death for the ten-year period 2013-2022 as a whole. Over the last ten years, cancers were the leading cause of death in the UK armed forces (24%), followed by suicide (19%) and other accidents (19%).

In the UK general population, the three leading causes of death were all diseased related (cancers, diseases of the circulatory system and other diseases).



## Cause of death (cont.)

**Table 1: UK regular armed forces deaths by cause of death and service<sup>1</sup>, numbers, rates<sup>2</sup> and SMR<sup>3</sup>**

1 January 2022 to 31 December 2022

Cause	All				Royal Navy <sup>1</sup>				Army				RAF							
	n	rate	(95% CI)	SMR (95% CI)	n	rate	(95% CI)	SMR (95% CI)	n	rate	(95% CI)	SMR (95% CI)	n	rate	(95% CI)	SMR (95% CI)				
<b>All</b>	<b>69</b>	<b>46</b>	<b>(36-58)</b>	<b>38</b>	<b>(30-48)</b>	<b>17</b>	<b>49</b>	<b>(29-79)</b>	<b>40</b>	<b>(23-63)</b>	<b>40</b>	<b>50</b>	<b>(37-69)</b>	<b>43</b>	<b>(31-58)</b>	<b>12</b>	<b>30</b>	<b>(16-53)</b>	<b>26</b>	<b>(13-45)</b>
<b>Disease-related conditions</b>	<b>26</b>	<b>17</b>	<b>(11-25)</b>	<b>23</b>	<b>(15-34)</b>	<b>6</b>	<b>17</b>	<b>(6-36)</b>	<b>22</b>	<b>(8-49)</b>	<b>12</b>	<b>17</b>	<b>(9-30)</b>	<b>22</b>	<b>(12-39)</b>	<b>8</b>	<b>18</b>	<b>(8-35)</b>	<b>26</b>	<b>(11-51)</b>
Cancers	18	12	(7-19)	64	(38-101)	6	17	(6-36)	88	(32-191)	8	11	(5-23)	61	(26-120)	4	10	(3-26)	49	(13-126)
Diseases of the circulatory system	5	3	(1-8)	17	(6-41)	0	-	-	-	-	2	3	(0-11)	15	(2-53)	3	6	(1-16)	37	(8-108)
Other	3	2	(0-6)	6	(1-16)	0	-	-	-	-	2	3	(0-11)	7	(1-27)	1	2	(0-11)	7	(0-38)
<b>External causes of injury and poisoning</b>	<b>38</b>	<b>25</b>	<b>(18-35)</b>	<b>55</b>	<b>(40-75)</b>	<b>8</b>	<b>23</b>	<b>(10-46)</b>	<b>52</b>	<b>(22-102)</b>	<b>26</b>	<b>31</b>	<b>(20-45)</b>	<b>68</b>	<b>(44-99)</b>	<b>4</b>	<b>12</b>	<b>(3-32)</b>	<b>26</b>	<b>(7-67)</b>
<b>Deaths due to accidents</b>	<b>31<sup>P</sup></b>	<b>21</b>	<b>(15-29)</b>	<b>76</b>	<b>(53-108)</b>	<b>8<sup>P</sup></b>	<b>23</b>	<b>(10-46)</b>	<b>88</b>	<b>(38-173)</b>	<b>19<sup>P</sup></b>	<b>22</b>	<b>(13-35)</b>	<b>85</b>	<b>(51-132)</b>	<b>4<sup>P</sup></b>	<b>12</b>	<b>(3-32)</b>	<b>43</b>	<b>(12-111)</b>
Land Transport Accidents	12 <sup>P</sup>	8	(4-14)	195	(101-340)	5	15	(5-34)	360	(117-840)	6 <sup>P</sup>	7	(2-15)	171	(63-373)	1	3	(0-19)	79	(2-438)
Other	19 <sup>P</sup>	13	(8-20)	55	(33-86)	3 <sup>P</sup>	9	(2-25)	39	(8-113)	13 <sup>P</sup>	16	(8-27)	69	(37-117)	3 <sup>P</sup>	9	(2-27)	38	(8-111)
<b>Deaths due to violence<sup>3</sup></b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Hostile Action	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Other	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
<b>Suicide and Open verdicts</b>	<b>7<sup>P</sup></b>	<b>5</b>	<b>(2-10)</b>	<b>26</b>	<b>(10-53)</b>	<b>0<sup>P</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7<sup>P</sup></b>	<b>9</b>	<b>(3-18)</b>	<b>46</b>	<b>(19-95)</b>	<b>0<sup>P</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Cause not currently available</b>	<b>5</b>	<b>3</b>	<b>(1-8)</b>	<b>186</b>	<b>(60-433)</b>	<b>3</b>	<b>9</b>	<b>(2-27)</b>	<b>486</b>	<b>(100-1419)</b>	<b>2</b>	<b>2</b>	<b>(0-8)</b>	<b>140</b>	<b>(17-505)</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

Source: Defence Statistics Health

<sup>1</sup> Royal Navy includes Royal Navy and Royal Marines

<sup>2</sup> Rates have been age and gender standardised to the 2022 UK regular armed forces population, expressed per 100,000 personnel at risk. Individual rates may not add up to totals due to rounding.

<sup>3</sup> Standardised mortality ratios have been age and gender standardised.

<sup>4</sup> An overall SMR for deaths due to violence has not been calculated due to lack of comparable UK population data for deaths as a result of Hostile Action.

<sup>P</sup> Provisional, subject to change following coroner's inquests into 12 deaths in 2022 currently awaiting verdicts.

## Cause of death (cont.)

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Results presented in **Figures 4, 5 and 6** and **Table 1** present numbers, rates per 100,000 personnel at risk and comparisons with the UK general population (SMRs) by cause of death for 2022 and time trends over the latest ten-year period. Following the conclusion of operations in Afghanistan and the associated reduction in deaths as a result of Hostile Action, trends in the cause of death among UK regular armed forces personnel over the last ten years have remained stable.

### Deaths due to disease

**Throughout the last ten years, the UK regular armed forces have had a statistically significant lower risk of dying as a result of disease related conditions compared to the UK general population.** In 2022, the UK regular armed forces were at a **77% statistically significant decreased risk** of dying as a result of disease compared to the UK general population. The lower risk of death among the armed forces may partially be explained by the 'healthy worker effect' often observed in occupational studies, as discussed on page 7 of this notice.

In 2022, **26** UK regular armed forces deaths (**38% of all deaths**) were caused by disease-related conditions. In 2021, disease-related deaths accounted for a similar proportion of all deaths (37%, n=26). Of the disease-related conditions in 2022, 18 were due to cancers, five were due to circulatory system disorders and three were due to other diseases.

The overall UK armed forces rate of deaths due to disease related conditions in 2022 was **17 per 100,000**, a 6% decrease from 18 per 100,000 in 2021.

### Deaths due to COVID-19\*

In 2020, two UK regular armed forces personnel died where COVID-19 was mentioned in the death certificate. In 2021 and 2022, there was one death in each year for which a death certificate is not yet available but other data sources suggest it may have been a result of COVID-19.

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

**The UK regular armed forces have had a statistically significant lower risk of dying due to external cause of injury and poisoning since 2014.** In 2022, the UK regular armed forces were at a **45% statistically significant decreased risk** of dying due to external causes of injury and poisoning compared to the UK general population.

In 2022, **38** deaths (**55% of all deaths**) were due to external causes of injury and poisoning, a rate of **25 per 100,000**. In 2021, external causes of injury and poisoning accounted for 61% of all deaths (n=43), a rate of 28 per 100,000. The mortality rate for external causes of injury and poisoning has fallen by **11%** in 2022.

Of deaths due to external causes of injury and poisoning in 2022, **31<sup>P</sup>** were due to accidents and **seven<sup>P</sup>** were coroner confirmed suicides. These numbers are provisional and subject to change when the outcome of coroner's inquests are known.

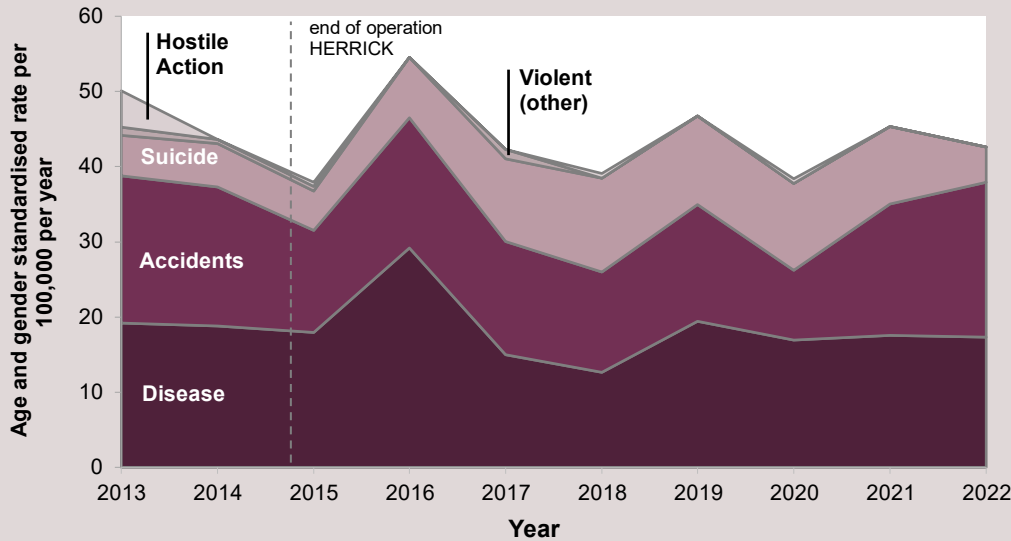
### Deaths due to hostile action

Following the start of the drawdown of operations in Afghanistan in 2012, the number of deaths as a result of hostile action has fallen and, since 2014, there have been three deaths as a result of hostile action, as follows: in 2015 one service person died from wounds sustained in Afghanistan in 2012, in 2018 one service person was killed in action in Syria, and in 2020 one service person was killed in action in Iraq.

\* Please note, the number of reservist deaths where data sources suggest the death may be related to COVID-19 is as follows: three in 2020 and one in 2021.

## Cause of death (cont.)

**Figure 5: UK regular armed forces deaths by cause, area chart, rate<sup>1,2,3</sup>**  
2013-2022



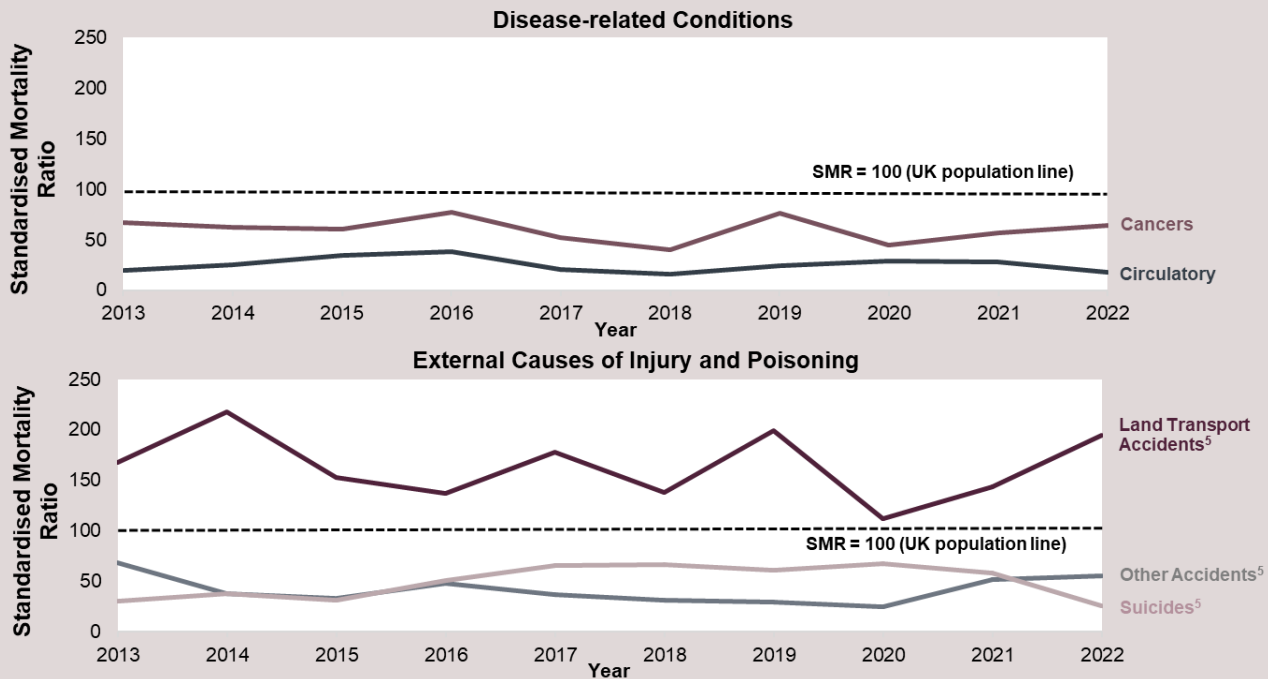
Source: Defence Statistics Health

<sup>1</sup> Rates have been age and gender standardised to the 2022 UK regular armed forces population, expressed per 100,000 personnel at risk.

<sup>2</sup> Operation HERRICK is the name for UK operations in Afghanistan which began 1 April 2006 and ended on 30 November 2014

<sup>3</sup> Please note, 29 deaths between 2018 and 2022 are awaiting a coroner's inquest; therefore, deaths as a result of accidents and suicide are provisional and are subject to change when the results of these inquests have been returned.

**Figure 6: Deaths in the UK regular armed forces: Causes, standardised mortality ratios<sup>1,2,3,4,5</sup>**  
2013-2022



Source: Defence Statistics Health

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

<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>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> 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).

<sup>5</sup> Please note, 29 deaths between 2018 and 2022 were awaiting a coroner's inquest; therefore, deaths as a result of accidents and suicide are provisional, subject to change when the results of these inquests have been returned.

## Cause of death (cont.)

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### Deaths due to accidents

In 2022, UK regular armed forces personnel **were at the same risk of dying as a result of accidents** as the UK general population.

In 2022, **31<sup>P</sup> deaths (45% of all deaths)** were caused by accidents in the UK regular armed forces, with **12<sup>P</sup> (17% of all deaths)** due to Land Transport Accidents (LTA) and **19<sup>P</sup> (28% of all deaths)** categorised as Other Accidents. Please note that one LTA death and 11 Other Accident deaths are awaiting coroner inquests and therefore the number of deaths in these categories is likely to fall once the outcome of these inquests are known.

In three of the last ten years (2022, 2019 and 2014), 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. In the rest of the ten-year period 2013-2022, the risk of death has been the same as the UK general population. **Annex A** provides a more detailed analysis of recent trends and populations at risk of Land Transport Accident deaths.

### Suicides

Suicide remains a rare event in the UK armed forces, however the number of suicides has risen in the last five years. The rate of suicide among UK regular armed forces remained low between 2013 and 2016, before rising from eight per 100,000 in 2016 to 12 per 100,000 in 2020.

There were **seven** coroner-confirmed suicides in 2022, a rate of **five per 100,000**. However, due to the time taken for coroner inquests to be held, the number of suicides reported may rise. As of 21 February 2023, there were **12** deaths (**17% of all deaths**) from 2022 and **13** deaths (**18%**) from 2021 where the mechanism of injury suggests possible suicide that were awaiting a coroner's inquest. It is therefore likely that the suicide data presented here may be revised when the results of any outstanding inquests are known (see 'Methodology' and 'Changes to previously published data' sections).

Due to the small number of suicides in each year and the number of deaths awaiting coroner inquest since 2018, annual comparisons with the UK general population (SMRs) may not be reliable. The Statistical Notice ['UK armed forces suicides: 2022'](#) provides comparisons to the UK general population over the latest 20-year time period to address this issue. Please note that the analysis in the notice is primarily on males only due to the small number of suicides among UK armed forces females.

**Additional Tables 1-4** provide a breakdown of the main causes of death for the UK armed forces for the years 2013-2022 by service, and can be found in the supplementary web tables.

## Glossary

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**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.

**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). This enables us to estimate the precision of results.

**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.

**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.

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

**International Statistical Classification of Diseases and Health-Related Disorders 10th edition (ICD-10)** is the standard diagnostic tool for epidemiology, health management and clinical purposes. It is a medical classification list developed by the World Health Organisation.

**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.

**Royal Navy** includes the Royal Navy and Royal Marines.

**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).

**Operational Accident** is any accident that occurred whilst deployed on operations.

**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 Scottish legal system) and handle criminal complaints against the police.

## Glossary (cont.)

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**Road Safety Campaigns** - Over time, there have been safety improvements in vehicles and roads as well as an increase in campaigns on road safety<sup>2</sup> both within the UK general population and the armed forces. In 2000, the Government targeted a 40% reduction in people killed or seriously injured in road accidents to be achieved by 2010, with campaigns continuing to run<sup>3</sup>. In addition, the following MOD road safety campaigns were launched:

- 'Ride it Right' targeting motor cycle riders was launched in 2006 and again in 2007 following a rise in the number of off-duty motorcycle deaths
- 'Grim Reaper' video shown to personnel returning from operational deployment since 2007 who are shown to have an increased likelihood of being involved in an accident.
- 'You're tough but you're not invincible' series of British Forces Broadcasting Services (BFBS) television and radio commercials began in 2008 aimed at young soldiers returning from operational deployment with the message that whilst soldiers may have survived their tour of duty in Afghanistan, they are not invincible and are still at risk of being involved in a road traffic accident.
- A poster campaign aimed at militating against the risk of off-duty service personnel attempting to walk home after a night out by making taxi funds available was developed in 2012 following a number of service personnel pedestrian deaths which occurred whilst walking home after a night out.
- 'Hidden Dangers' posters for motorcyclists were launched in 2014 following a rise in the number of off-duty motorcycle deaths.
- 'Driver Distractions' awareness campaign ran for mobile phone use and driver distractions in 2015.
- 'The Honest Truth' campaign ran informing about safer driving using real stories in 2017.
- 'Survive the Drive' campaign focussed on risky driving behaviours in 2018 and is currently still ongoing.

**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 Royal Navy.

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

**Strength** is defined as the number of serving UK armed forces personnel.

**Suicide** includes deaths given an underlying cause of intentional self-harm or an injury/poisoning of undetermined intent. In line with the definition used by the Office for National Statistics (ONS) in the publication of National Statistics, all deaths are coded to the International Classification of Diseases 10th edition (ICD-10) which is produced by the World Health Organisation (WHO). Text held in death certificates and coroners reports is analysed and assigned the appropriate ICD code to ensure that deaths included in this notice are only those which meet the National Statistics definition of Suicide. The codes used to define suicides are:

- X60-X84: intentional self harm;
- Y10-Y34: injury or poisoning of undetermined intent;
- Y87.0 and Y87.2: sequelae of intentional self harm, injury or poisoning of undetermined intent.

<sup>2</sup> ROSPA - A History of Road Safety Campaigns: <http://www.rospa.com/road-safety/advice/road-users/campaign-history/>

<sup>3</sup> <http://think.direct.gov.uk/>

## Glossary (cont.)

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**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.

**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 Royal Navy 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.

**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.

**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.)

**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.

# Methodology

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## **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 NHS Digital and The General Registrars Office Scotland. Regarding suicides, to ensure the highest accuracy of information and that all cases previously recorded as 'waiting verdict' have been followed up, Defence Statistics carry out an annual audit of MOD data held by the ONS and other authorities.

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.

To record information on cause of death, coding is carried out according to World Health Organisation's International Classification of Diseases 10th edition (ICD-10) and internationally agreed rules. This allows for international comparisons.

When identifying deaths due to COVID-19, Defence Statistics report using the definition used by the Office for National Statistics. Deaths were identified as those with an underlying cause, or any mention of COVID-19 on the death certificate. Defence Statistics do not use the UK Health Security Agency's (previously known as Public Health England) method of reporting those who had a positive COVID-19 test within 28 days prior to death.

A definition of which Land Transport Accident deaths are excluded from analysis in Annex A can be found on page 22.

For calculations including breakdowns by deployed status in Annex A, Defence Statistics maintains a database of individual deployment records from November 2001. Data prior to April 2007 was derived from the single services' Operation Location tracking (OPLOC) systems and Souls on Board (Navy) and data since April 2007 is obtained from the Joint Personnel Administration (JPA) system. The data covers deployments on Operations VERITAS, HERRICK and TORAL (Afghanistan) (2001-2021).

At the end of each calendar year Defence Statistics cross reference the medical information it holds against publicly available death certificate information available from NHS Digital.

## **Data coverage**

The information on deaths presented in the main report are for the UK 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 on-duty deaths among non-regular armed forces personnel; Annex B presents this information.

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



## Methodology (cont.)

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### **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 (i.e. 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 2022 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 2022 armed forces population).

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.

#### Calculating Standardised Mortality Ratios (SMR)

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 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 may result in wide confidence intervals. The impact of this is that the range in which we expect the true value of that statistic to lie is large and there is a risk of misinterpreting a chance occurrence for a true finding.

The UK population estimates and deaths data for 2022 were not available for this report to calculate standard mortality ratios (SMR), therefore, Defence Statistics has used the 2021 data as an estimate for the 2022 figures as there is little year on year variation for the UK figures. Thus, any patterns reported here may be subject to minor fluctuations when the UK population 2022 data becomes available.

#### Calculating a Confidence Interval

**Confidence Intervals** use the standard error to derive a range in which we think the true value is likely to lie. It gives an indication of the degree of uncertainty of an estimate and helps to decide how precise a sample estimate is by giving a range of values likely to contain the given statistic. The wider the interval, the less precise the estimate is.

A 95 % confidence intervals means that if we drew 20 random samples and calculated a 95% confidence interval for each sample using the data in that sample, we would expect that, on average, 19 out of the 20 (95%) resulting confidence intervals would contain the true population value and 1 in 20 (5%) would not.

In order to calculate confidence intervals around an estimate we use the standard error for that estimate. The estimate and its 95% confidence interval are presented as: the estimate plus or minus the margin of error. The lower and upper 95% confidence limits are given by the sample estimate plus or minus 1.96 standard errors. The margin of error is calculated as:

Margin of error = 1.96 × standard error

## Methodology (cont.)

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### ***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 possible suicides) 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 individuals cannot be identified or that compromises operational security.

## Changes to previously published data

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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.

Amendments to the classifications given to the cause of death previously reported in the 2021 report are as follows:

For 2016:

- One new 'Other Accident' death. This individual had been missing since 2016 and was declared dead at a coroner's inquest in 2022. The date of death was recorded as 2016.

For 2018:

- One 'Other Accident' amended to 'Cause not available'

For 2020:

- One 'Cause Unavailable' amended to 'Cancer'
- One 'Cause Unavailable' amended to 'Other Disease'
- One 'Cancer' amended to 'Other Disease'
- One 'Land Transport Accident' amended to 'Suicide'
- For Annex C (on-duty reserves deaths), one 'Cause not available' amended to 'Diseases of the circulatory system'

For 2021:

- One 'Cause not available' amended to 'Cancer'
- Two 'Cause not available' amended to 'Other Accident'
- Nine 'Other Accident' amended to 'Suicide'
- For Annex C (on-duty reserves deaths), one 'Cause not available' amended to 'Diseases of the circulatory system'

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 on gov.uk](#).

## Further Information

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### 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

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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 the [gov.uk FOI page](#).

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Royal Navy Workforce	<a href="mailto:Analysis-Navy@mod.gov.uk">Analysis-Navy@mod.gov.uk</a>
Army Workforce	<a href="mailto:DefStrat-Stat-Army-Enquiries@mod.gov.uk">DefStrat-Stat-Army-Enquiries@mod.gov.uk</a>
RAF Workforce	<a href="mailto:Analysis-Air@mod.gov.uk">Analysis-Air@mod.gov.uk</a>
Tri-Service Workforce	<a href="mailto:Analysis-Tri-Service@mod.gov.uk">Analysis-Tri-Service@mod.gov.uk</a>
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# Annex A – Number of Land Transport Accidents (LTA) resulting in deaths among UK regular armed forces personnel

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## Introduction

**Annex A** provides summary information on Land Transport Accident (LTA) deaths whilst in service among UK regular armed forces personnel for the five-year period 2018-2022. LTA were the **fourth largest cause of death** in the UK regular armed forces during this period after deaths due to Cancer, Suicide and Other Accidents.

This information is being released to advise the MOD and the public of the loss of life by LTA and has been developed in response to requests from the MOD road safety and health promotion areas for detailed analysis and to contribute to the MOD's commitment to release information where possible.

Analysis by service and vehicle types associated with LTA deaths and comparisons to the UK general population are presented in this Annex. To provide a balance between presenting analysis for a sufficient time period from which to provide meaningful data with the need to monitor the impact of MOD policy, this report presents time trend graphs since the start of data collection in 1984 and all tables and remaining graphs as numbers and rates aggregated for the latest five-year period.

The main purpose of Annex A is to provide evidence to internal stakeholders to monitor and measure the impact of road safety policy for UK armed forces personnel. Deaths relating to incidents on bicycles or horses, and rail-related incidents, have been excluded from the analysis presented in Annex A since they are beyond the scope of road safety policy or the numbers are too small to provide meaningful analysis.

Please note no suicides or hostile action deaths involving vehicles have been included in this annex. These will appear in the main section of this report under suicides or hostile action deaths.

## Key Points

- The rate of UK regular armed forces deaths due to LTA has shown a downward trend since 2005.
- Motor vehicle accidents accounted for the largest proportion of deaths due to LTA (43% of LTA deaths).
- Since the end of the 1980's, the Army have had the highest rate of LTA deaths. However, the RAF have had the highest rate of LTA deaths in the latest period (2020-2022) at 9 per 100,000.
- The UK regular armed forces were at a significantly higher risk of dying due to a motorcycle accident than the UK general population in the latest five-year period, 2018-2022.

## Latest five-year period results (2018-2022)

Please note three deaths from the period 2018-2022 have been excluded from all analysis in this Annex for the reasons stated above. Therefore, the numbers presented in this Annex will differ slightly from the number of LTA deaths in the main report and the two should not be compared.

Comparing LTA to other causes of death over the latest five-year period, 2018-2022:

- LTA were the **fourth largest cause of death** (15% of all deaths, n=47)
- The proportion of UK regular armed forces deaths due to LTA each year has now returned to pre COVID-19 levels, at 16% (n=11) in 2022, compared to a low of 11% (n = six) in 2020

**Tri-Service** For the latest five-year period the **Tri-Service** rate of deaths due to LTA was **6 per 100,000**

**Royal Navy** For the latest five-year period the **Royal Navy** rate of deaths due to LTA was **5 per 100,000**

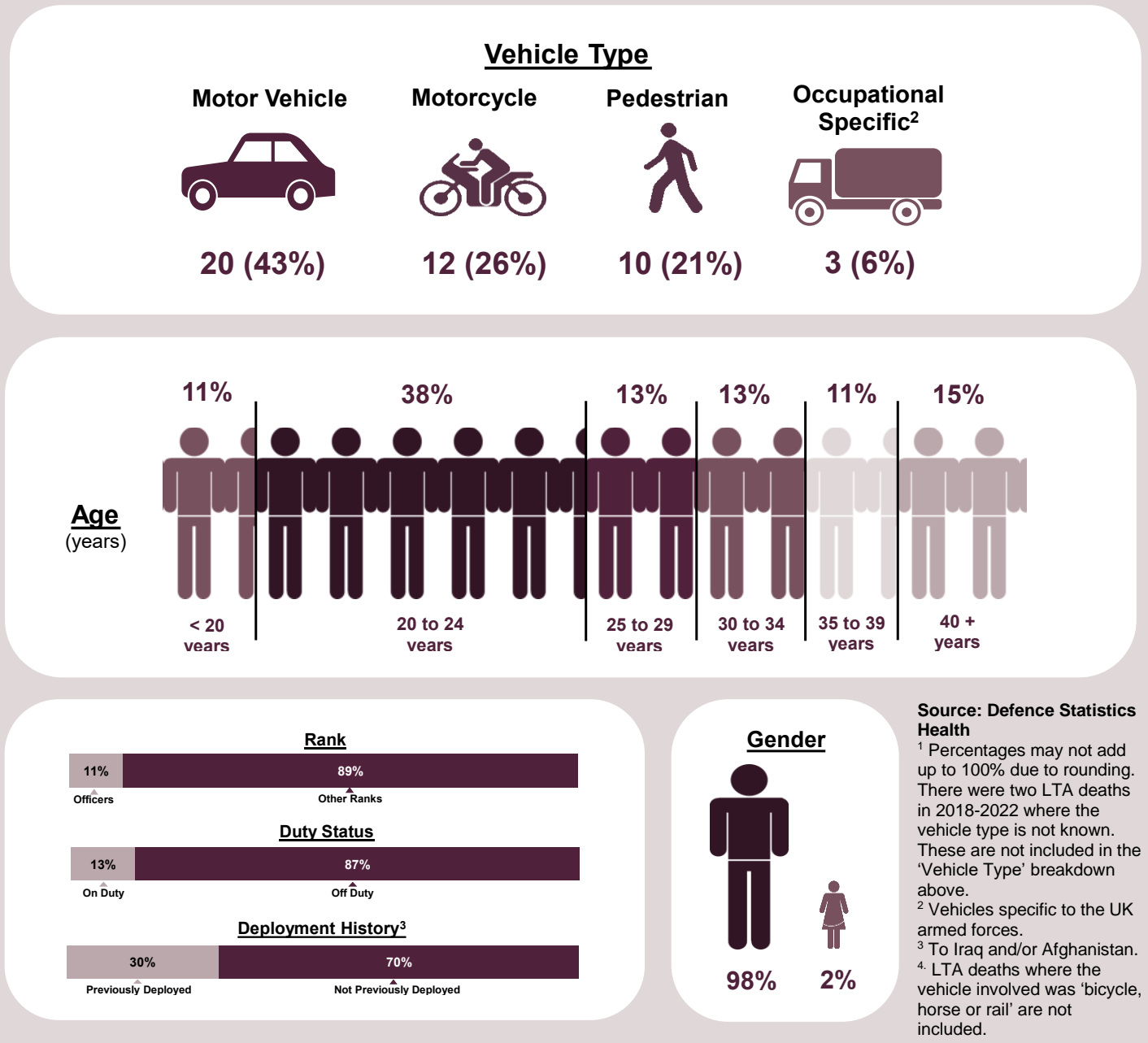
**Army** For the latest five-year period the **Army** rate of deaths due to LTA was **7 per 100,000**

**RAF** For the latest five-year period the **RAF** rate of deaths due to LTA was **9 per 100,000**

# Annex A – Number of Land Transport Accidents (LTA) resulting in deaths among UK regular armed forces personnel (cont.)

Figure A1 provides a breakdown of LTA deaths by key characteristics for LTA deaths occurring in 2018-2022. In the latest five-year period, **motor vehicle accidents** accounted for **43%** of LTA deaths. The majority of deaths (**87%**) occurred when personnel were **off duty**

**Figure A1: UK regular armed forces LTA deaths by key characteristics, percentages<sup>1</sup>**  
2018-2022



**Source: Defence Statistics Health**  
<sup>1</sup> Percentages may not add up to 100% due to rounding. There were two LTA deaths in 2018-2022 where the vehicle type is not known. These are not included in the 'Vehicle Type' breakdown above.  
<sup>2</sup> Vehicles specific to the UK armed forces.  
<sup>3</sup> To Iraq and/or Afghanistan.  
<sup>4</sup> LTA deaths where the vehicle involved was 'bicycle, horse or rail' are not included.

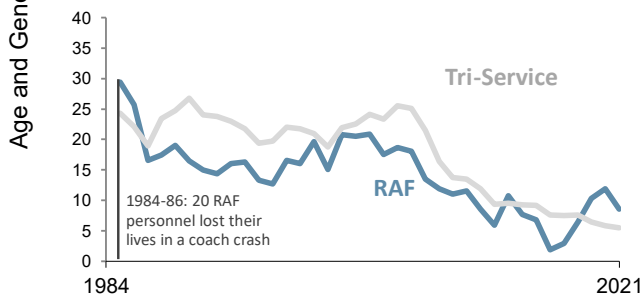
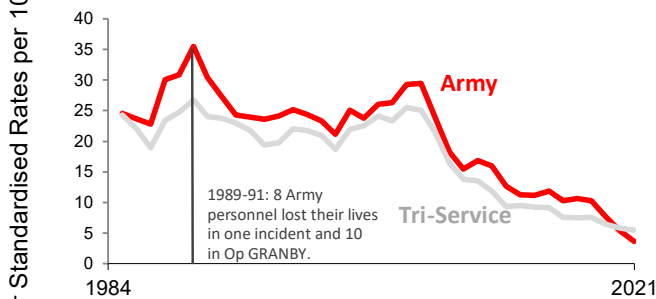
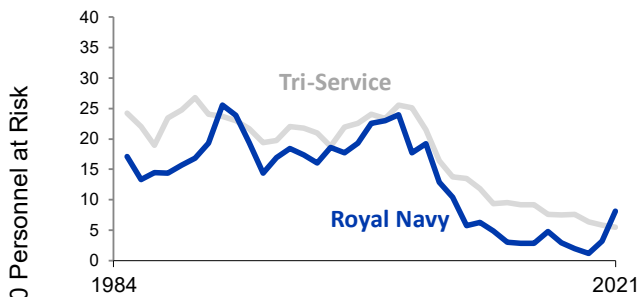
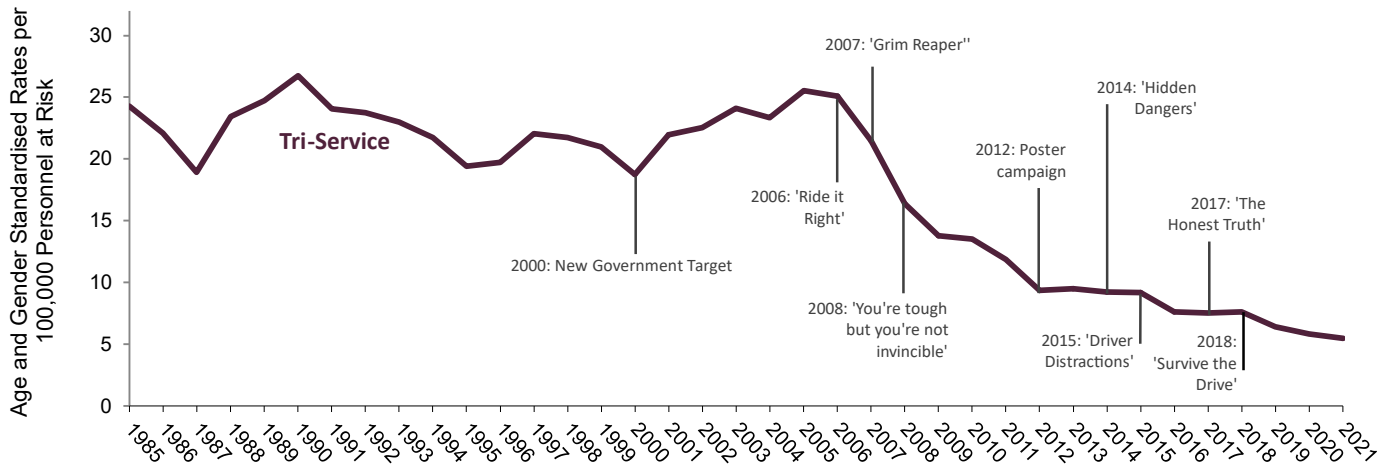
Note that high percentages of LTA deaths among certain groups may be explained by those groups experiencing higher risk factors, or they may be a reflection of the breakdown of these characteristics in the UK regular armed forces. For example 98% of LTA deaths among males may be due to the risky driving found to be associated with males<sup>4</sup>, or may be explained by the fact males account for [89% of UK regular armed forces](#).

<sup>4</sup> Fear et al., (2008) Risky Driving Among UK regular armed forces Personnel from the United Kingdom, American Journal of Preventative Medicine, 35, 230-236.

# Annex A – Number of Land Transport Accidents (LTA) resulting in deaths among UK regular armed forces personnel (cont.)

## Trends over time

**Figure A2: UK regular armed forces LTA deaths by service<sup>1</sup>, three-year moving average, rate<sup>2,3</sup> 1984-2022**



**Source: Defence Statistics Health**

- <sup>1</sup> Royal Navy includes Royal Navy and Royal Marines
- <sup>2</sup> Rates have been age and gender standardised to the 2022 UK armed forces population, expressed per 100,000
- <sup>3</sup> The year shown is the mid-point of a three-year average, e.g. 1986 refers to the period 1985 to 1987.

Rates are presented as a three-year moving average to smooth out annual fluctuations and to highlight long term trends

Since 2005-2007, there has been a **downward trend** in the Tri-Service rate of LTA deaths. The latest three-year moving average rate (2020-2022) was **5 per 100,000**.

Since the end of the 1980's, Army personnel have had the highest rate of LTA deaths among each of the services however, since 2019, **RAF personnel** have had the highest rate of LTA deaths with **9 per 100,000** in the latest period (2020-2022). **Royal Navy personnel** have also seen an increase in the rate of LTA deaths this year, with a rate of **8 per 100,000** in the period 2020-2022, the highest rate for this service since 2008-2010.

The advancement in vehicle safety systems and road safety campaigns run by MOD throughout this period contributed to the downward trend in deaths as a result of LTA. The dates of each MOD safety campaign are shown in the first graph of figure A2. See the **'Glossary'** for details of campaigns and the government target.

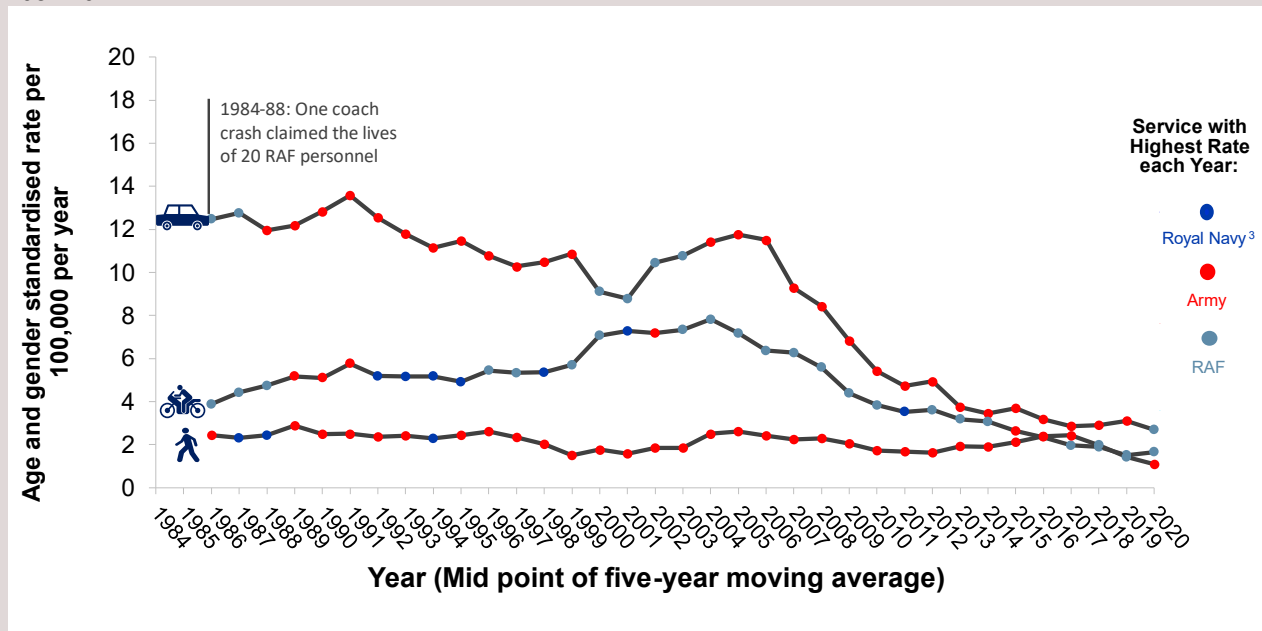
# Annex A – Number of Land Transport Accidents (LTA) resulting in deaths among UK regular armed forces personnel (cont.)

## Trends over time for LTA deaths by vehicle type

Due to the small numbers of deaths for individual vehicle types, five-year moving averages have been used for the following section to eliminate some of the random year-on-year variation.

**Figure A3** provides a summary of LTA mortality rates by vehicle type for the time period 1984-2022. The marker colours on the graph represent the service for which the LTA rate was highest in each year.

**Figure A3: UK regular armed forces LTA deaths by vehicle type, five-year moving average, rates<sup>1,2</sup> 1984-2022**



Source: Defence Statistics Health

<sup>1</sup> Rates have been age and gender standardised to the 2022 UK armed forces population, expressed per 100,000 personnel at risk.

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

<sup>3</sup> Royal Navy includes Royal Navy and Royal Marines.

Throughout the period 1984-2022, LTA mortality rates due to motor vehicle accidents were highest. There has been a downward trend in the rate of deaths since 2005. This trend has been seen in both motor vehicle and motorcycle accidents. The rate of pedestrian accidents has remained stable throughout the period.

Comparisons based on a five-year moving average:

-   Motor vehicle mortality five-year moving average rates decreased from **3.7** per 100,000 in 2013-2017 to **2.7** per 100,000 in 2018-2022.
-   Motorcycle mortality five-year moving average rates decreased from **2.6** per 100,000 in 2013-2017 to **1.7** per 100,000 in 2018-2022.
-   Pedestrian mortality five-year moving average rates decreased from **2.1** per 100,000 in 2013-2017 to **1.1** per 100,000 in 2018-2022.

## Comparisons with UK general population

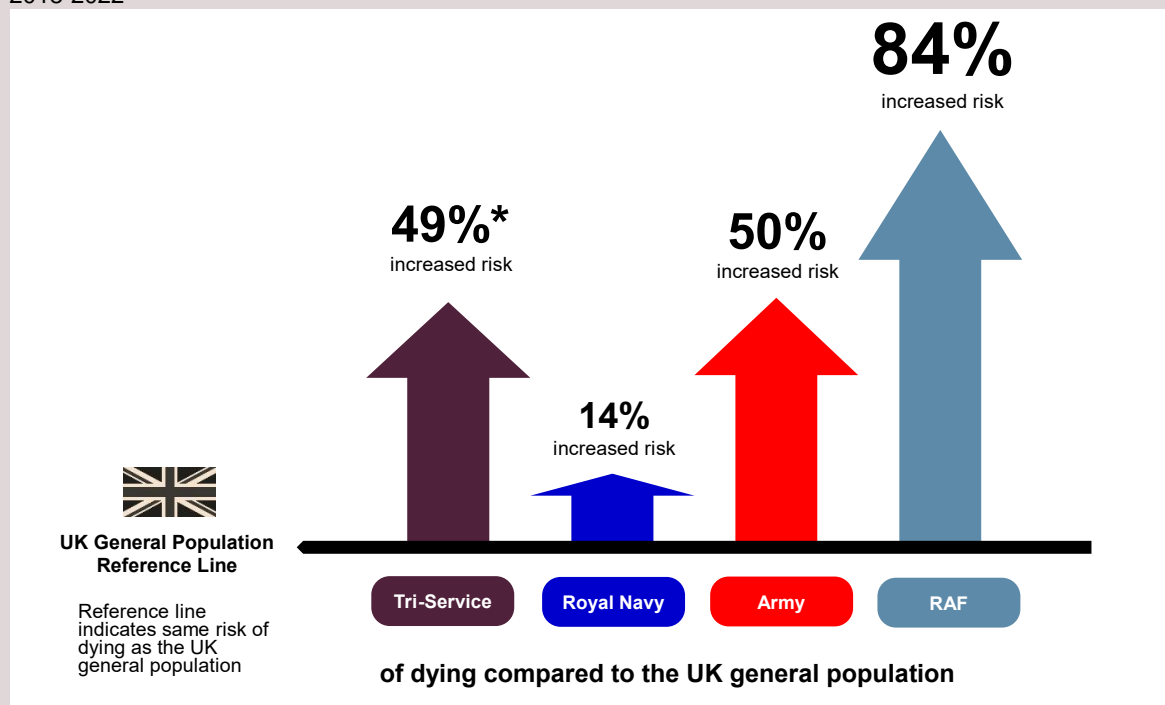
To enable comparisons with LTA deaths in the UK general population, **Standardised Mortality Ratios (SMR)**, adjusted for age, gender and year, were calculated. **Figure A4**, on the following page, compares five-year (2018-2022) Standardised Mortality Ratios by service.



## Annex A – Number of Land Transport Accidents (LTA) resulting in deaths among UK regular armed forces personnel (cont.)

For the five-year period 2018-2022, UK regular armed forces personnel as a whole were at a **49% statistically significant increased risk** of dying due to an LTA compared to the UK general population. There was no statistically significant difference in risk within each among service compared to the UK general population. See **Figure 6** in the main report for SMR time trends for the armed forces as a whole and **Additional Figure 1** in the Excel supplementary tables for three-year SMR moving average comparisons by service over time.

**Figure A4: UK regular armed forces LTA deaths by service<sup>1</sup>, standardised mortality ratio<sup>2,3</sup>**  
2018-2022



Source: Defence Statistics Health

<sup>1</sup> Royal Navy includes Royal Navy and Royal Marines.

<sup>2</sup> Standardised for age, gender and calendar year.

<sup>3</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).

\* Statistically significant risk of dying compared to the UK general population. No asterisk(\*) indicates there was no statistically significant difference between the military and the UK general population

### Comparisons by vehicle type, service and age groups at risk, 2018 to 2022

UK regular armed forces personnel were at a **106% statistically significant increased risk** of dying as a result of a **motorcycle accident** compared to the UK general population in the period 2018-2022. However, there was **no statistically different risk** of UK regular armed forces personnel dying as a result of a **motor vehicle accident** or a **pedestrian accident** compared to the UK general population in the period 2018-2022.

Between 2018 and 2022, UK regular armed forces personnel aged below 30 were at a **72% statistically significant increased risk** of dying as a result of an LTA compared to the UK general population, while personnel aged 30 or over were at the same risk as the UK general population. Army personnel aged below 30 were at a **78% statistically significant increased risk** of dying as a result of an LTA compared to the UK general population. There were no statistically significant differences compared to the UK general population for either under 30s or over 30s for any individual vehicle types.

**Figure A5, Additional Tables 5-7 and Additional Figure 2**, available in the supplementary tables accompanying this report, provide further details of SMRs by vehicle type, service and 30-year age split.

## Annex B – Number of incidents resulting in deaths among UK regular armed forces personnel

As multiple deaths occurred in the same incident on various occasions during the latest ten-year period, **Table B1** 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 B1: UK regular armed forces Accidental and Violent deaths (excluding Suicides) by service, deaths and incidents, numbers<sup>1</sup>**

2013-2022

Year <sup>2</sup>	All		Royal Navy <sup>3</sup>		Army		RAF	
	Deaths	Incidents	Deaths	Incidents	Deaths	Incidents	Deaths	Incidents
2013	44	41	3	3	36	34	5	4
2014	32	26	3	3	22	17	7	7
2015	24	23	5	5	16	16	3	2
2016	26 <sup>r</sup>	25 <sup>r</sup>	4	4	17	17	5 <sup>r</sup>	4 <sup>r</sup>
2017	25	23	3	3	20	18	2	2
2018	21 <sup>p</sup>	21 <sup>p</sup>	3	3	15 <sup>r</sup>	15 <sup>r</sup>	3 <sup>p</sup>	3 <sup>p</sup>
2019	22 <sup>p</sup>	22 <sup>p</sup>	1	1	15 <sup>p</sup>	15 <sup>p</sup>	6	6
2020	15 <sup>p</sup>	15 <sup>p</sup>	3	3	6 <sup>p</sup>	6 <sup>p</sup>	6 <sup>p</sup>	6 <sup>p</sup>
2021	27 <sup>p</sup>	26 <sup>p</sup>	6 <sup>p</sup>	6 <sup>p</sup>	15 <sup>p</sup>	14 <sup>p</sup>	6 <sup>p</sup>	6 <sup>p</sup>
2022	31 <sup>p</sup>	30 <sup>p</sup>	8 <sup>p</sup>	7 <sup>p</sup>	19 <sup>p</sup>	19 <sup>p</sup>	4 <sup>p</sup>	4 <sup>p</sup>

Source: Defence Statistics Health

<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>2</sup> 'Year' refers to the year in which the death or incident occurred.

<sup>3</sup> Royal Navy includes Royal Navy and Royal Marines.

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

<sup>p</sup> indicates that numbers are provisional and subject to change.

**Table B1** shows that the number of fatal incidents resulting in multiple deaths since 2013 is low, with the exception of 2014 when three multiple incidents resulted in nine deaths.

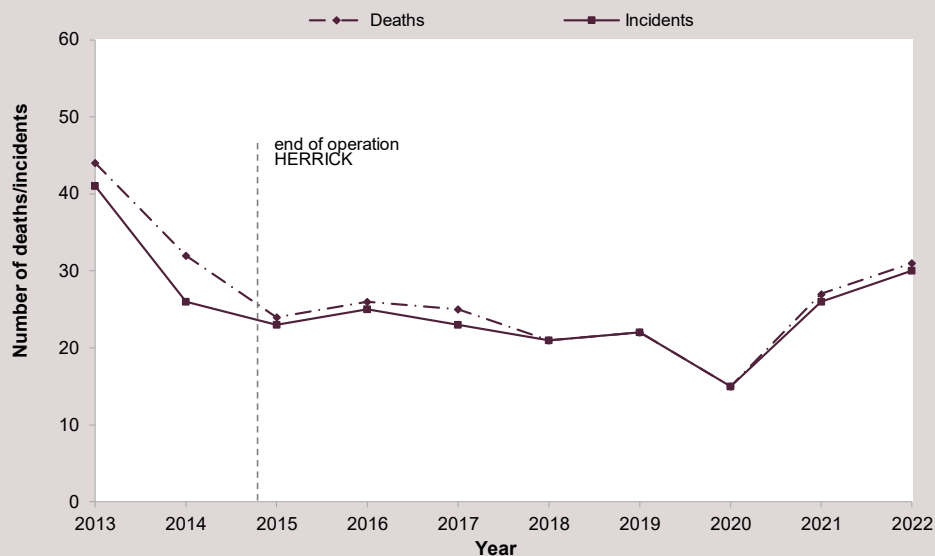
Before the conclusion of combat operations in Afghanistan towards the end of 2014, hostile action incidents in Iraq and Afghanistan contributed to a higher rate of incidents resulting in multiple deaths.

In 2022, **one** incident due to a land transport accident resulted in **two** Royal Navy personnel deaths.

These findings are illustrated in **Figure B1**, which shows both the annual changes in the number of deaths and the incidents for the total armed forces population.

**Figure B1: UK regular armed forces deaths and fatal incidents, numbers<sup>1,2</sup>**

2013-2022



Source: Defence Statistics Health

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

<sup>2</sup> 'Year' refers to the year in which the death or incident occurred.

## Annex C – On duty deaths in the UK armed forces reservist forces, 2013-2022

**Table C1: UK armed forces reservist<sup>1,2</sup> deaths whilst on duty, by type of reservist, numbers**  
2013-2022

Reserve type	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>All</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
Territorial Army	0	0	0	0	0	0	0	0	0	0
Other Volunteer Reserves	3	1	1	0	1	1	1	1	1	1
Full-Time Reserve Service	0	0	0	0	0	0	2	1	1	0
Military Provost Guard Service	0	0	0	0	0	0	0	0	0	1
Non Regular Permanent Staff	0	1	0	0	0	0	0	0	0	0

Source: Defence Statistics Health

<sup>1</sup> 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>2</sup> Includes UK armed forces non-regular personnel, Military Provost Guard Service (MGPS) and Non regular Permanent Staff (NRPS).

† indicates a change in previously published data (see 'Changes to previously published data' section)

**Table C2: UK armed forces reservist<sup>1,2</sup> deaths whilst on duty, by cause of death, numbers**  
2013-2022

Cause	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>All</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Disease-related conditions</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>
Cancers	0	0	0	0	0	0	1	0	1	0
Diseases of the circulatory system	0	1	0	0	1	1	1	2 †	1 †	1
Other	0	1	0	0	0	0	0	0	0	0
<b>External causes of injury and poisoning</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Deaths due to accidents</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Land Transport Accidents	0	0	0	0	0	0	1	0	0	0
Other	3	0	0	0	0	0	0	0	0	0
<b>Deaths due to violence</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Hostile Action <sup>1</sup>	-	-	-	-	-	-	-	-	-	-
Other	0	0	0	0	0	0	0	0	0	0
<b>Suicide and Open verdicts</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Cause not currently available</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b> †	<b>0</b> †	<b>1</b>

Source: Defence Statistics Health

<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.

<sup>2</sup> Includes UK armed forces non-regular personnel, Military Provost Guard Service (MGPS) and Non regular Permanent Staff.

† indicates a change in previously published data (see 'Changes to previously published data' section)

There were **two** on-duty UK reservist deaths in 2022, one was due to a disease of the circulatory system and the cause of death is not currently available for the other.

The number of on-duty UK reservist deaths over the last ten years remains small.

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.

## References and useful links

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### References

1. McLaughlin et al., (2015) An Evaluation of the Effect of Military service on Mortality: Quantifying the Healthy Soldier Effect
2. [ROSPA - A History of Road Safety Campaigns:](#)
3. <http://think.direct.gov.uk/>
4. Fear et al., (2008) Risky Driving Among UK regular armed forces Personnel from the United Kingdom, American Journal of Preventative Medicine, 35, 230-236.

### Useful links

[Reported Road Casualties in Great Britain: Main Results 2014:](#)

[Statistics and Registration Act, 2007:](#)