

Background Quality Report

1990/91 Gulf Conflict UK Gulf Veterans Mortality Data: Causes of Death since 1 April 1991

The purpose of a background quality report is to inform users of the statistics about the quality of the data used to produce the publication, and any statistics derived from that data. It also discusses existing uses of the statistics and user requirements.

This assessment relates to the annual statistics '1990/91 Gulf conflict UK Gulf Veterans Mortality Data: Causes of Death' published by Defence Statistics.

1. Introduction

1. This annual Statistical Notice provides summary statistics on the causes of deaths that occurred among the UK veterans of the 1990/91 Gulf Conflict since 1 April.
2. The statistics compare the mortality rates of 53,409 UK Armed Forces personnel that deployed to the 1990/91 Gulf Conflict to those of a comparison group, the Era cohort. The Era cohort consists of 53,143 UK Armed Forces personnel of similar age, gender, Service, regular/reservist status and rank who were in Service on 1 January 1991 but did not deploy to the Gulf. The findings include deaths among personnel whilst in Service and deaths that occurred after personnel had left the UK Armed Forces.
3. The report also compares the mortality rates of Gulf 1 veterans and the Era comparison group to rates observed in the UK general population over the same time period. This enables the mortality rates of the Gulf and Era cohorts to be placed in context. This analysis is presented as age and gender standardised mortality rates and Standardised Mortality Ratios (SMR).
4. The latest statistics are published as National Statistics, adhering to the UK Statistics Authority (UKSA)¹ protocols on pre-release access².
5. Ad-hoc interrogation of the data used to compile these statistics is regularly undertaken by Defence Statistics in order to answer Freedom of Information requests, Parliamentary questions and internal queries from within the Ministry of Defence.

Background

6. Gulf veterans' mortality data covering the period 1 April 1991 to 31 March 1999 were originally analysed by a team led by Professor Gary Macfarlane at the University of Manchester. Initial findings of this 'Mortality of UK Gulf War Veterans' study were published by Macfarlane et al (2000)³ with a later study, 'Long-term mortality amongst Gulf War Veterans: is there a relationship with experiences during deployment and subsequent morbidity?' published by Macfarlane et al (2005)⁴.
7. Updates were regularly presented to Parliament by the MOD between July 2000 and July 2003, and published in Hansard in January and July of each year. Since January 2004 the updates have been released by Defence Statistics as a National Statistics notice with agreement by MOD ministers. These data can be found on the Gov.uk website⁵.
8. Gulf 1 veterans consist of Service personnel deployed to any Gulf state between 1 September 1990 and 30 June 1991 and for the Navy afloat, all personnel aboard a ship

East of the Suez canal during that period. The geographical definition of the Gulf area varied according to the Service and was determined by the Ministry of Defence (MoD). It included all army personnel whose theatre of Service during this period was Kuwait, Muscat and Oman, Qatar, United Arab Emirates, Bahrain, Saudi Arabia, Iraq, Iran or Operation Granby. Royal Air Force personnel were included if they had served in the Saudi Arabian peninsula, and Royal Navy personnel if they had served on board a ship east of the Suez during the defined period. The data do not include civilian personnel employed by the MOD (including the Royal Fleet Auxiliary, the NAAFI, MOD civil servants), by other Government Departments, or civilians working for Defence Contractors, the media or charitable and humanitarian organisations.

9. The Era comparison group comprises 53,143 personnel, randomly sampled from all UK Armed Forces personnel in Service on 1 January 1991 and who did not deploy to the Gulf. This group is stratified according to the 53,409 Gulf veterans to reflect the socio-demographic and military composition of the Gulf cohort in terms of age, gender, Service (Naval Service, Army, and Royal Air Force), officer/other rank status, regular/reservist status, and a proxy measure for fitness. The single year age distribution among those aged 40 and over has since been found to show differences, with those in this age-group deployed to the Gulf generally younger than those in the Era group. Age adjusted estimates have been calculated and are explained further in the methodology section.
10. The UKSA has designated these statistics as National Statistics⁶, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice⁷ for Official Statistics.
11. 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.
12. Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Methodology

Data Sources

13. Individuals in both the Gulf and Era cohorts were identified by the MoD from administration sources. Information provided for each cohort member included age (at Jan 1, 1991), sex, armed forces Service, rank, date of joining and leaving the armed forces (where applicable).
14. Details of everyone in both cohorts were sent, by the MoD, to the Office for National Statistics (ONS) for identification (or flagging) on the National Health Service (NHS) Central Register. The computerised register (together with corresponding registers held in Scotland and Northern Ireland) contained an entry for everyone who had been registered with a general practitioner in the UK since 1991, and all persons born in, or who were immigrants to, the UK from that date.
15. Defence Statistics receive monthly updates on the latest status of those identified on the register:
 - Alive & flagged (i.e. the individual is registered with a GP in England, Wales and Scotland)
 - Died (including the cause of death)
 - Alive & emigrated

- Not flagged (not identified as having died or emigrated; classed as 'Lost to follow up' with their study end date defaulted to the study start date (1 April 1991) date.)
16. NHS Digital (formerly known as the Health and Social Care Information Centre (HSCIC)) now hold the England central patient registry and the General Register Office (GRO) for Scotland and provide the monthly updates.
 17. Prior to the release of these statistics, published on 31 March 2015, Defence Statistics incorporated two new sources of data into this process, with the aim of improving the accuracy of the study end date for cohort members flagged as 'lost to follow up (LTFU)'. A search for all cohort members classed as LTFU was conducted on the Armed Forces Strength data, as captured on the MOD's Joint Personnel Administration (JPA) system and the Defence Statistics' Service Leavers Database in order to identify the last known date on which the MOD knew these individuals to be alive. The inclusion of these data has resulted in a more accurate study end date being used to calculate the mortality rate ratios.
 18. Deaths occurring whilst personnel are still serving in the UK Armed Forces are sent to the Office for National Statistics (ONS)⁸ for independent coding. Coroners' verdicts are provided by the NHS for deaths in England and Wales. For Scotland, accidental and violent deaths are investigated by the Procurator Fiscal⁹.
 19. Defence Statistics receives annual updates of UK population and deaths data from the ONS, GRO Scotland and Northern Ireland Statistics and Research Agency (NISRA)¹⁰ in order to make comparisons to mortality rates in the UK general population.

Process

20. Data from the various sources (as detailed above) are compiled in order to determine the following and to create one single dataset from which statistical analysis can be performed:
 - The latest flagging status for the Gulf and Era cohort members.
 - The length of time that each cohort member has been in the study (based on date of death, date of emigration, date LTFU or the default date of 31 December 2015 for members that are alive and flagged).
 - The cause of death for cohort members that have died.
21. Historically, the datasets used within this study have been compiled by using a MS Access database. This was a resource intensive process including a high level of manual data processing. Prior to the release of these statistics, published on 31 March 2016, Defence Statistics developed an automated process using SQL to compile, validate and manipulate the study data and produce a final dataset for analysis. This has reduced the time taken to process the data and also reduced the likelihood of human error when producing the statistics.
22. As a result of these process improvements some data discrepancies were identified that have resulted in minor revisions to previously published data covering the period 1 April 1991 to 31 December 2014. The revisions made have did affected the overall trends reported in these statistics, however the numbers reported in some of the specific cause groups changed. The following revisions were made:
 - The date of death was amended for 12 individuals.
 - The cause of death was amended for 125 individuals, resulting in revisions to the cause of death categories. For example:
 - i) One death was amended from the category 'land transport accident: pedal cyclist' to 'land transport accident: car occupant'.
 - ii) Two deaths were amended from the category of 'diseases of the circulatory system' to 'diseases of the nervous system'.

23. All cause categories where revisions have been made are marked with 'r' in the latest release of the statistics. However please note that the changes in the number of deaths in these categories since that last publication is not entirely due to revisions, and will also be due to the addition of new deaths reported among the Gulf and Era cohorts up to 31 December 2015.
24. Whilst testing the new automated process prior to the production of this Statistical Bulletin, Defence Statistics identified some potential discrepancies between the death information supplied for some individuals by the NHS Digital and death information held for the same individuals that have been sourced from in-Service death notifications and ONS death certificates. Defence Statistics plans to work with the NHS Digital to conduct a data validation exercise on these data to ensure that the cause of death information presented within this Statistical Bulletin remains accurate. Therefore all figures presented by cause of death within the latest release have been marked provisional ('p') until this exercise has been conducted and any discrepancies resolved.

Statistical Methods

25. **Classification of deaths:** Deaths data received by Defence Statistics are coded using the International Classification of Diseases & Related Health Problems version 10 (ICD-10)¹¹. Defence Statistics follows ONS guidelines¹² on how to classify deaths into the relevant cause groups. In December 2004 the ONS informed Defence Statistics they were now coding deaths where the inquest has been adjourned to the ICD-10 code Y33 ("Other specified events, undetermined intent"). In the releases of these statistics prior to January 2005 these deaths were included with the Intentional self-harm and events of undetermined intent.
26. **Age-adjusted Era cohort estimates:** In addition to the numbers of deaths amongst the Gulf and Era cohorts, age-adjusted estimates of deaths amongst the Era cohort are also presented. The Statistical Notice published on 17 January 2005 discussed the issue of an age bias found within the cohorts used to produce this series of Statistical Notices. To overcome this bias, age-adjusted estimates are presented for the Era comparison group to account for differences in the age profile of those in the Gulf and Era cohorts who were aged 40 and above on 1 January 1991. Age-adjusted estimated numbers for the Era comparison group were created by calculating the mortality rate for each single year of age at 1 January 1991 in each calendar year since 1991. This rate was applied to the equivalent numbers in each single year of age at 1 January 1991 and year of death in the Gulf population, from which deaths and emigrations from the UK were subtracted, to calculate the estimated total for each calendar year. These estimated numbers by calendar year were divided by the Gulf population, from which deaths and emigrations from the UK were subtracted, to produce the age-adjusted numbers.
27. **Mortality Rate Ratios:** Were calculated to compare mortality rates between the Gulf and Era / age-adjusted Era cohorts. Mortality rates were first calculated for the Gulf, Era and age-adjusted Era cohorts by dividing the number of deaths amongst each cohort by the total person-years at risk (the length of time each person has been in study), taking into account deaths and emigrations from the UK. People who had left the Services and subsequently emigrated were deemed to be LTFU because it is not possible to know if and when they may have died. The mortality rates calculated differ marginally from crude deaths rates owing to some small differences in the number of person years at risk between the Gulf and Era comparison groups. Mortality Rate Ratios were then calculated by dividing the mortality rates for the Gulf cohort by the mortality rates for the Era cohort and the age-adjusted Era cohort. A mortality rate ratio over (or under) 1 indicates a higher (or lower)

mortality rate for the Gulf cohort than the Era / age-adjusted Era cohorts. A mortality rate ratio of 1 indicates no difference in mortality rates.

28. **Standardised Mortality Rates:** To enable comparisons with the UK general population, UK mortality rates were calculated based on deaths and population data provided by the ONS (for England and Wales), GRO (for Scotland) and NISRA (for Northern Ireland). These UK mortality rates were then applied to the age and gender profile of the Gulf and age-adjusted Era cohorts to estimate comparable mortality rates for disease related deaths and deaths due to external causes.
29. **Standardised Mortality Ratios:** To enable statistical comparisons with deaths in the UK population, Standardised Mortality Ratios (SMR), adjusted for age, gender and year, were calculated. The use of SMR is a standard epidemiological technique for comparing mortality rates among an occupational cohort with a standard population. 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 Gulf and Era cohorts with the UK population.
30. The UK population estimates used to calculate SMR refer to the usually resident population on 30 June of each year. The usually resident population is defined by the standard United Nations definition for population estimates and includes people who reside in the area for a period of at least 12 months whatever their nationality. ONS mid-year population estimates are based on updates from the most recent census, allowing for births, deaths, net migration and ageing of the population. The UK general population data for 2015 were not available for this report to calculate standard mortality ratios (SMR), 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 here may be subject to minor fluctuations when the 2015 data become available.
31. In order to calculate SMR by cause of death, additional UK death data by individual age, year, gender and cause of death were obtained from the ONS (deaths in England and Wales), GRO (deaths in Scotland) and NISRA (deaths in Northern Ireland). This data has been used for all calculations where the Gulf and Era cohorts are compared to the UK population (SMR and UK estimated mortality rates). 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 year resulted in an increased denominator 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.

32. **95% confidence intervals:** In order to understand if differences in rates were statistically significant, 95% confidence intervals were 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 the confidence interval does not include 1.00, the result is deemed to be statistically significant.
33. The small numbers of deaths used as a basis for calculations in some of the analysis may result in wide confidence intervals in the corresponding rate ratios or SMR. 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. Therefore results based on small numbers should be interpreted with caution.
34. The rates and confidence intervals presented have been rounded to two decimal places and therefore when small numbers are presented the rate may lie towards one end of the confidence interval instead of more centrally between the lower and upper confidence interval.
35. **Three-year moving average:** Some of the figures in this report present three year moving averages due to fluctuations in the annual SMR, especially for cause groups where there are small numbers of deaths year on year. Calculating three year moving averages smooth out extreme values and highlight trends over time. The year shown on the graph is the mid-point at a three year average. For example, 1992 refers to the period 1991 - 1993.

2. Relevance

Coverage

36. As at 31 December 2015, 98,498 (92%) members of the Gulf and Era cohorts remained flagged by NHS Digital, as shown in the table below. Therefore Defence Statistics will continue to receive death notifications for these members. Only 4% of members were classed as emigrated and LTFU for which Defence Statistics will not receive death notifications unless flagging resumes for them in the future (e.g. they return to the UK and re-register with a GP).

Status of the Gulf and Era cohorts¹ by Service, as at 31 December 2015, numbers

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

37. Occasionally Defence Statistics will be notified that an individual has died but will not be provided with a cause of death. These individuals are included in the category of 'Other deaths for which cause data are not yet available'. Defence Statistics regularly check with the NHS Digital for updates on the cause of death and update the cause of death once received. As at 31 December 2015, there were 43 deaths with no cause in the Gulf cohort and 53 in the Era cohort. These will be sent back to NHS Digital and causes of death will be updated where available for the next annual release of these statistics.
38. Information on deaths in Northern Ireland was routinely notified through GRO for Scotland. However, the Central Services Agency¹³ now produces all coded death information for medical research in Northern Ireland. It is hoped that Defence Statistics will

be able to receive regular updates in line with England and Wales, and Scotland in the near future for Northern Ireland to improve the timeliness of information on flagged individuals in Northern Ireland.

User Needs

39. In specific reference to the UK Statistics Authority report, The Use Made of Official Statistics¹⁴, these statistics are used by:
- i) Government – Policy Making
 - ii) Government – Policy Monitoring
 - iii) Supporting Third Sector Activity (lobbying)

Additionally, by the nature of the content within the publications, these statistics play an important role in:

- v) Accountability (i.e. helping to ensure the MOD's accountability to the British public)
40. The key external users include the general public, the media and the charitable sector e.g. Royal British Legion and the National Gulf Veterans and Families Association (NGVFA) and Gulf veterans campaign groups
41. These statistics were created in response to internal and external interest in the mortality rates and causes of death amongst veterans of the Gulf 1 Conflict, following concerns that Gulf 1 veterans experience an excess of ill-health, due to potential exposures during their deployment. The latest statistics show that there were no negative effects of deployment to Gulf 1 on the mortality rates for Gulf veterans when compared with the Era comparison group, and when compared with the UK general population. However Defence Statistics plan to continue producing regular updates to monitor the mortality rates over time.
42. The information provided in the report is based on interest shown by internal and external users. For example, deaths due to neoplasms (cancer) are broken down further to show the numbers and mortality rates for each cancer group, due to concerns regarding possible links between exposures experienced by Gulf 1 veterans and certain types of cancer. Additionally, deaths due to motor neurone disease (MND) have been separately identified in the report as this cause of death has been of interest to Veterans groups external to the MOD.
43. Defence Statistics receive regular Freedom of Information (FOI) requests from external users of these statistics.

Strengths and Weaknesses in Relation to User Needs

Strengths:

44. 92% of surviving study members remained flagged by NHS Digital as at 31 December 2015, resulting in good coverage.
45. The information presented in this publication has been structured in such a way to release sensitive fatality information into the public domain in a way that contributes to the MOD's accountability to the British public but which doesn't compromise the operational security of UK Armed Forces personnel nor that risks breaching the rights of the families of deceased Service personnel and veterans (for which the MOD has a residual duty of care).
46. The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Once statistics have

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

Weaknesses:

47. Deaths where the inquest has been adjourned, or where the cause of death has not yet been provided mean the final cause of death information is not always timely and complete for recent years. This can lead to revisions in the cause of death categories when further information is received. Users should be aware of this weakness when using the information presented in this notice.
48. Information on deaths in Northern Ireland was routinely notified through GRO for Scotland. However, the Central Services Agency now produces all coded death information for medical research in Northern Ireland. It is hoped that Defence Statistics will be able to receive regular updates in line with England and Wales, and Scotland in the future for Northern Ireland to improve the timeliness of information on flagged individuals in Northern Ireland.
49. Several findings in this Statistical Notice are based on small numbers. This is evidenced by the wide confidence intervals presented in this report. We strongly recommend caution when interpreting these figures.

3. Accuracy

50. The NHS Digital are responsible for ensuring the quality of the current status and deaths data supplied to Defence Statistics.
51. The main sources of potential error in the Gulf 1 mortality statistics are as follows:
 - Incorrect information supplied in data extracts from the NHS Digital
 - Data processing errors resulting in incorrect data outputs
 - Manual error during production of report tables, graphs and commentary
52. To ensure that potential errors are identified and resolved, Defence Statistics implement a series of data quality checks throughout the report production. These checks involve close liaison with the NHS Digital when required, to ensure the accuracy of the figures published. Where there is concern over the accuracy of data, Defence Statistics will publish the information as provisional (p).
53. Some of the figures presented within the latest release (on 31 March 2016) are marked as revised for the following reasons:
 - The MOD has made improvements to the processing of the Gulf and Era cohort data which has resulted in some minor revisions within the underlying data (see paragraph 19 for full details).
 - Errors were identified in a previously published table and accompanying chart which showed the number of deaths and Standardised Mortality Ratio (SMR) by age group and cohort. Although the total number of death and SMR were correct in this table, the numbers and SMRs presented for each age-group were incorrect, due to a processing error. This has now been corrected in the latest publication table and graph (Annex A Table 15 and Figure 12).
54. As discussed in paragraph 21, Defence Statistics have identified possible inaccuracies between NHS Digital in the cause of death data held by the MOD. Therefore, all figures presented by cause of death within the latest release have been marked provisional (p) whilst MOD investigates.

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

4. Timeliness and Punctuality

56. From January 2004 to June 2007 figures were published on a bi-annual basis. Following user consultation the frequency of publication was reduced from bi-annual to annual from March 2008.

57. Figures as at 31 December each year are published at the end of March, three months after the cut-off date for study data.

58. The National Statistics reports have all been published on time to meet pre-announced release dates. Future publication dates will also be announced on the Gov.UK website at least one month in advance of publication.

5. Accessibility and Clarity

59. This Statistical Bulletin is published on the Gov.uk website and is made available to public from 0930 hours on the day of release:

<https://www.gov.uk/government/statistics/causes-of-deaths-that-occurred-among-the-uk-veterans-of-the-199091-gulf-conflict>.

60. 24 hour pre-release access to the report is available to a limited distribution list within MOD. The full list can be found in the pre-release access list available on the Gov.UK website:

<https://www.gov.uk/government/statistics/defence-statistics-pre-release-access-list>.

61. All tables and figures include full footnotes to ensure any conditions or caveats are made clear. Tables and figures from each statistic are separately available in MS Excel format for users to download. This allows for use in individual research and reports.

62. Key findings have been presented on the first page so that users can quickly focus on the important results, with more detailed commentary presented within the Statistical Bulletin.

6. Coherence and Comparability

Coherence

63. Defence Statistics also publish statistics on [causes of death among Falkland veterans](#)¹⁵. Although there are some differences in the methodology used between the Gulf 1 and Falklands reports, where possible, Defence Statistics attempt to keep summary tables and graphs consistent between the two publications to enable comparisons.

64. Defence Statistics uses ICD-10 classifications to present figures by cause of death. This is the standard coding system for cause of death used by the NHS for the general UK population, and also within Defence Statistics' other official statistics on cause of death in Service. This allows for comparisons to be made between reports and to the UK population.

Comparability Over Time

65. Trends over time are presented since the start of the study (1 April 1991) for each of the main causes of death among the Gulf and Era cohorts. The context behind trends over time is provided in the report commentary.
66. Defence Statistics ensure that any changes in data sources or corrections to data are clearly shown in report tables and graphs. Where appropriate, historic trend information is corrected and provided in the accompanying excel tables.

7. Trade-offs between output quality components

67. In order to provide timely statistics on deaths among the Gulf and Era cohorts, Defence Statistics publish the report within three months of the study cut-off date each year. However, due to the time lag between deaths occurring and being reported by the NHS Digital, this does result in some deaths in the latest year being missed from the publication. Once death notifications are received from the NHS Digital, any missing deaths are added to the next publication.
68. There can sometimes also be a time lag between NHS Digital providing a death notification and a full death certificate. This results in some deaths being reported in the publication with an unknown cause of death. Once a full death certificate has been received from NHS Digital, the cause of death will be updated in the next publication (see paragraph 34 for more details).

8. Assessment of User Needs and Perceptions

69. The MOD has previously held regular consultation meetings with users of Defence Official Statistics, which provided a forum for user feedback on their needs and perceptions. Proposed changes were set out at the consultation meetings in order to gain feedback from both internal and external users.
70. The MOD invites users to provide feedback to the statistical output teams on any of their publications or reports using the contact information on the front of the publication.
71. In 2012 the UK Statistics Authority (UKSA) carried out an assessment of the Gulf 1 mortality statistics to ensure compliance with the Official Statistics code of practice. Recommendations from the assessment included improvements to commentary to explain findings and trends, and improvements to descriptions of statistical methods and data sources used within the report. These improvements were implemented in subsequent versions of the statistics to improve the information available to users. The full assessment report can be found at:
<https://www.statisticsauthority.gov.uk/publication/statistics-on-defence-health/>

9. Performance cost and respondent burden

72. Annual updates of the Gulf 1 mortality statistics take one member of staff six weeks to prepare, including data input and preparation, validation, analysis and report writing.
73. A new automated process has recently been developed to improve the processing of study data and reduce the time and manual work required to produce the report, as detailed within the Methodology section of this Background Quality Report. This will reduce the time required to produce future versions of the publication.
74. Defence Statistics incur costs for the provision of death certificate and current status data by the NHS Digital. However the benefit of the MOD publishing these statistics is that

these data are placed in the public domain, and as Official Statistics, in a way that ensures their independence from political interference and adherence to quality standards. The small burden that this places on the data suppliers is considered to be worthwhile to achieve this and the consequent public accountability provided by their publication.

10. Confidentiality, Transparency and Security

75. These statistics do not contain any identifiable personal data. The information presented in this publication has been structured in such a way to release sensitive information into the public domain in a way that contributes to the MOD's accountability to the British public but which doesn't compromise the data protection of those in recovery.
76. The Statistical Bulletin provides commentary on the key features of the outputs and identifies any issues or caveats to the data. This quality report provides further information on the method, production process and quality of the output.
77. All Defence Statistics staff involved in the production have signed a declaration that they have completed the government wide Protecting Information Level 1 training and they understand their responsibilities under the Data Protection Act and the Official Statistics Code of Practice. All staff involved in the production process have signed the Data Protection Act, and all MOD, Civil Service and data protection regulations are adhered to. All data are stored, accessed and analysed using the MOD's restricted network and IT systems.
78. Additionally, Defence Statistics have data sharing agreements with the NHS Digital with respect to obtaining deaths and current status data for members of the Gulf and Era cohorts. Each individual who works with the study data is also required to complete an 'Approved Researcher' application, which is then approved by the NHS Digital before an individual is allowed to have access to, and carry out analysis on the study data.
79. Defence Statistics ensure that all Gulf 1 study data is kept confidential by holding the data on a secure server. Only individuals who work on the reports have access to the data. In presenting information on deaths among the Gulf 1 and Era cohorts, Defence Statistics provide as much detail as possible, whilst maintaining the medical confidentiality considerations of serving and ex-serving UK Armed Forces personnel.
80. Under Regulation 5 of the Health Service (Control of Patient Information) Regulations 2002 to Defence Statistics were given approval to process patient identifiable information without consent. The MOD does not hold contact details for the veterans who have left Service and therefore it would not be practically possible for the research database team at Defence Statistics to obtain consent from all the Service personnel within the study.
81. Should any individual within the study request that they are withdrawn, the Gulf marker on the register held by NHSCR will be deleted and death certificate/cancer registration information will not be passed to Defence Statistics. If the individual informs Defence Statistics that they withdraw consent, MOD will contact NHSCR and ensure their data are removed from the cohort, cancer and deaths databases.
82. Defence Statistics adhere to the principles and protocols laid out in the Code of Practice for Official Statistics and comply with pre-release access arrangements.

11. References

1. UK Statistics Authority (UKSA): <https://www.statisticsauthority.gov.uk/>

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<https://www.gov.uk/government/statistics/causes-of-deaths-that-occurred-among-the-uk-veterans-of-the-199091-gulf-conflict>
6. Types of Official Statistics: <https://www.statisticsauthority.gov.uk/national-statistician/types-of-official-statistics/>
7. UKSA Code of Practice: <https://www.statisticsauthority.gov.uk/monitoring-and-assessment/code-of-practice/>
8. NHS Digital <https://www.digital.nhs.uk/>
9. General Register Office (GRO): <http://www.gro.gov.uk/gro/content/>
10. Office for National Statistics (ONS): <https://www.ons.gov.uk/>
11. Procurator Fiscal: <http://www.crownoffice.gov.uk/>
12. Northern Ireland Statistics and Research Agency (NISRA):
<http://www.nisra.gov.uk/jobs/jobs.html>
13. International Classification of Diseases & Related Health Problems version 10 (ICD-10):
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14. ONS Guidelines for Classifying Deaths:
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15. Central Services Agency: <http://www.centralservicesagency.net/>
16. The use Made of Official Statistics:
<https://www.statisticsauthority.gov.uk/archive/assessment/monitoring/monitoring-reviews/monitoring-brief-6-2010---the-use-made-of-official-statistics.pdf>
17. Causes of deaths among the UK armed forces veterans of the 1982 Falklands campaign:
<https://www.gov.uk/government/collections/causes-of-deaths-among-the-uk-armed-forces-veterans-of-the-1982-falklands-campaign>

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