

Background Quality Report

GB veteran population projections to 2028

The purpose of this background quality report is to inform users about the model used to compile the projections, the model assumptions and their limitations, and appropriate use of the projections.

This assessment relates to the veteran population projections published by Defence Statistics on the Gov.UK website: <https://www.gov.uk/government/publications/population-projections-uk-armed-forces-veterans-residing-in-great-britain-2016-to-2028>

Introduction

This Statistical Bulletin presents annual projections for the veteran population residing in Great Britain (GB) to 2028. The projected 2028 veteran population is also presented by age group and gender. Note that a 'veteran' is anyone who has served for one day or more in the UK Armed Forces (Regular and Reserve).

In order to produce the projections Defence Statistics produced a new model, referred to as the '2018 GB Veterans Model'.

Model Overview

The 2018 GB Veterans Model is a deterministic model which uses the Annual Population Survey Veterans estimate¹, historic and projected workforce exit data, and Office for National Statistics Life tables. This is the first GB veteran projection model.

Modelling Purpose

The purpose of the 2018 GB Veterans Model is to gain an understanding of how the veteran population residing in GB will change in size and, age and gender structure, over the next 10 years.

Within the UK Government's Veteran Strategy² it has been highlighted that data is essential to gain an understanding of the veteran population and to inform policy making and service delivery. This model provides the projections for the future veteran population enabling MOD, other Government departments for example the NHS, the Devolved Administrations, and the charitable sector to develop policies and service deliveries to continue to meet the needs of veterans in the future.

Methodology

Model Input Data

Defence Statistics engaged with the U.S. Department of Veterans Affairs who have published Veteran Population Projection estimates to 2037³. Following their methodology, it was determined that there would be four primary sets of model input data:

a) *Baseline data on UK Armed Forces veterans*

The baseline data were sourced from 2016 Annual Population Survey (APS) responses which are used by Defence Statistics to compile estimated summary veteran statistics as at 2016¹. Note the APS veteran questions were not asked in Northern Ireland due to security concerns. Therefore, the baseline data only included veterans residing in GB. Veterans includes those who were previously Regular and/or Reserve and both those who were trained and untrained upon leaving the UK Armed Forces. In addition, the APS was only asked of those residing in households and

therefore the baseline data excluded individuals who were homeless or were living in communal establishments such as care homes or prisons.

- b) *Historical 2017 and 2018 data on Service personnel who left the UK Armed Forces and joined the veteran cohort*

Because the baseline data was not current, historical data were extracted from the Joint Personnel Administration (JPA) System for personnel leaving the UK Armed Forces during 2017 and 2018.

- c) *Projected numbers of Service personnel leaving the UK Armed Forces and joining the veteran cohort each year to 2028*

Defence Statistics' projections of the numbers of Service personnel leaving the UK Armed Forces in each year to 2028 were used to project the numbers joining the veteran population. These projections are routinely produced, using a set of stochastic models, as internal management information. Note the projections are for trained Regular Service personnel only.

Historical data on Service personnel leaving the UK Armed Forces, extracted from the JPA system, were used to make assumptions for future untrained Regulars and Reservists leaving the UK Armed Forces.

- d) *Projected veteran mortality each year to 2028*

Office for National Statistics' (ONS) England and Wales cohort life expectancy tables⁴, published as National Statistics, were applied to the baseline data and veterans 'joiners' data to estimate the numbers of veteran survivors each year between 2016 and 2028. These are considered robust estimates. The ONS has published Quality and methodology information for these statistics⁵.

Assumptions and Uncertainties

There are uncertainties around the veteran population projections since the input data was based on survey data, model outputs and assumptions that historical trends will remain stable. Appendix A provides full details of all input data sets, assumptions and uncertainties used within the model. A Red, Amber Green (RAG) rating system has been used to identify the level of risk for each set of input data. However, in summary, the projections are likely to be an undercount of veterans residing in GB by a minimum of 100,000. This potential undercount is driven by the exclusion of veterans who were homeless or were living in communal establishments, such as care homes or prisons, from the 2016 baseline data.

These uncertainties should be taken into consideration when using the veteran population projections.

Sensitivity Analysis

Where possible, sensitivity analysis has been performed to assess the uncertainty around the input data. Full details of sensitivity analysis conducted is provided in Appendix A. Specifically, sensitivity analysis was conducted around the following assumptions:

- a) Annual Population baseline estimates
- b) That the number of projected untrained Regulars leaving the UK Armed Forces would remain stable, in line with historical trends for the past three years.
- c) That the number of projected Reservists leaving the UK Armed Forces would remain stable, in line with historical trends for the past three years.

Appropriate and inappropriate Model Usage

Users with an interest in the projections can read a short summary of main messages within the Statistical Bulletin, with projections presented in supplementary Microsoft Excel tables. A glossary of key terms is also provided in the Statistical Bulletin for clarity.

These veteran population projections can be used as an indicator of potential change in the size and demographic profile of veterans residing in GB between 2016 and 2028, to assist users to develop policies and service deliveries to meet future veteran needs.

However, population projections are not forecasts and will inevitably differ to a greater or lesser extent from actual future population change, with the level of uncertainty increasing further into the 10-year period. In addition to the uncertainties in the underlying 2016 baseline data, our assumptions about the future cannot be certain as patterns of both those entering the veteran population and deaths are always liable to change and can be influenced by many factors.

Historic and projected numbers of veterans between 2016 and 2028 presented in the report have been rounded to the nearest thousand and should be used merely to demonstrate that it is likely that the number of veterans will continue to reduce year-on-year to 2028.

Projected percentages of veterans by age group and gender have been presented instead of numbers, as the projections are not to be used to determine the absolute numbers of veterans within each cohort but rather as an indicator of potential change within the demographic profile of the veteran population between 2016 and 2028.

Comparability

The Royal British Legion (RBL) published estimated numbers of UK veterans as at 2014, with forecasts to both 2025 and 2030, as part of their UK Household Survey of the Ex-Service Community report 2014⁶. This projects a decrease from 2.7 million in 2014, to 1.8 and 1.6 in 2025 and 2030 respectively. Whilst this number is higher than that projected in this bulletin, it is important to note a few key points:

- It followed a similar trend of decreasing by approximately one million across the time period.
- It started at a higher estimate in 2014 at 2.7 million compared to the 2.6 estimated by MOD from the 2014 Annual Population Survey⁷.
- It included veterans residing in Northern Ireland.

References

1. Annual population survey: UK armed forces veterans residing in Great Britain 2016:
<https://www.gov.uk/government/collections/annual-population-survey-uk-armed-forces-veterans-residing-in-great-britain>
2. The Strategy for our Veterans:
<https://www.gov.uk/government/publications/strategy-for-our-veterans>
3. The Veteran Population Projection Model 2016:
https://www.va.gov/vetdata/veteran_population.asp
4. ONS cohort life tables: Number surviving at exact age (lx), 2016-based, England and Wales, 1841 to 2066:
<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/dhocs/007937numbersurvivingatexactagelx2016basedenglandandwales1841to2066>
5. National life tables QMI: Quality and methodology information for the national life tables:
<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/methodologies/nationallifetablesqmi>
6. A UK household survey of the ex-Service community:
<https://www.britishlegion.org.uk/get-involved/campaign/public-policy-and-research/the-uk-ex-service-community-a-household-survey/>
7. Annual population survey: UK armed forces veterans residing in Great Britain 2014:
<https://www.gov.uk/government/statistics/annual-population-survey-uk-armed-forces-veterans-residing-in-great-britain-2014>

ASSUMPTIONS AND RISKS OF MODEL INPUT DATA

2016 Annual Population Survey (APS) Baseline data^a:

RAG Rating: **High Risk**

Risk 1: There was a level of uncertainty around the 2016 baseline veteran population as it was estimated from a survey. The 2016 APS estimates that 5% of the aged 16 and over GB population was a veteran however; this estimate was as low as 4.87% and as high as 5.13% when uncertainty (margin of error) was taken into account. The model was re-ran using the minimum (2.48 million) and maximum (2.62 million) baseline figures resulting in the 2028 projection ranging from 1.56 to 1.64 million.

Risk 2: The model does not account for the level of uncertainty around the estimated 2016 veteran population profile by age group and gender. The level of resource required to create a stochastic version of the model which would take account of this uncertainty was deemed as disproportionate to the level of precision/accuracy required and the timeframe in which the projection was required.

Risk 3: The Annual Population Survey (APS) veteran questions were not asked in Northern Ireland due to security concerns. Therefore, the baseline data excludes veterans residing in Northern Ireland. The MOD currently has no formal estimate, though a few sources suggest approximately 2% of veterans may reside in Northern Ireland. It was estimated that the baseline data (as at 2016) may increase to approximately 2.55 million (from 2.5 million) when adjusted to account for potential veterans in Northern Ireland, resulting in an increase of around 30,000 veterans as at 2028. Therefore, it was estimated that the 2028 projection may increase by 30,000 when adjusted to account for potential veterans in Northern Ireland.

Risk 4: The APS was only asked of those residing in households and therefore the baseline data excluded individuals who were homeless or were living in communal establishments such as care homes or prisons. Within their 2014 UK Household Survey of the Ex-Service Community report^b the RBL estimated the number of individuals in UK communal establishments who are part of the ex-Service community. Using the same methodology, it was estimated that a minimum of 4% of the veteran population may reside in communal establishments. It was therefore estimated that the 2028 projection may increase from 1.6 million to over 1.7 million.

Risk 5: Estimates compiled from the APS data are reliant on responders correctly declaring themselves as a veteran or non-veteran.

Historical Service Leavers data 2017 – 2018:

RAG Rating: **Low Risk**

Historical data on Service personnel who left the UK Armed Forces during 2017 and 2018 were sourced from the Joint Personnel Administration (JPA) System, used for the administration of all UK Armed Forces personnel. The JPA System is the primary data source for many MOD National and Official Statistics.

^a Annual population survey: UK armed forces veterans residing in Great Britain 2016: <https://www.gov.uk/government/collections/annual-population-survey-uk-armed-forces-veterans-residing-in-great-britain>

^b A UK household survey of the ex-Service community: <https://www.britishlegion.org.uk/get-involved/campaign/public-policy-and-research/the-uk-ex-service-community-a-household-survey/>

Forecast Service leavers joining the veteran cohort each year to 2028:

RAG Rating: **Medium Risk**

Risk 6: The model assumed that the number of Service personnel forecast to leave the UK Armed Forces, and therefore enter the 2018 GB Veterans Model, was accurate. Defence Statistics projected the numbers of Service personnel leaving the UK Armed Forces in each year. These projections are routinely produced as internal management information for trained Regular Service personnel only. Defence Statistics has scrutinised their models and outputs and identified any risks. The main risks are:

- There is wide variation in Voluntary Outflow (VO) rates, both between groups and from one year to another. VOs encompass all trained personnel who voluntarily exit before the end of their agreed engagement or commission period. Therefore, the VO assumptions are particularly difficult to set which may impact the accuracy of the forecast of Service personnel leaving the UK Armed Forces.
- The 2010 Strategic Defence and Security Review^c recommended that a comprehensive analysis of military terms and conditions of service occurred; this review became the New Employment Model Programme^d. This programme concluded at the end of December 2017 with recommended changes to military terms and conditions. The impact of these changes may mean that historic trends are not representative of the future.
- Uncertainty increases further into the 10-year forecasting period. This reflects the compounding effect of uncertainty in assumptions and workforce requirement.
- Whilst the Defence Statistics Workforce Branches carry out sensitivity analysis on individual components of their models, they do not quantify the residual uncertainty due to the number of complex elements. Therefore, no sensitivity analysis has been conducted on the final year on year forecast numbers of Service personnel leaving the UK Armed Forces.

Risk 7: The trained Regular forecasts do not project Service personnel leaving the UK Armed Forces by gender. Historical data were analysed to determine the proportions of male and female Service personnel who left each of the three Services over the past three financial years (2015/16 to 2017/18). The model assumed that these historical proportions will remain stable at 92% male and 8% female over the next ten years. In 2015 the Minister of State for the Armed Forces set a target to increase female personnel to 15% of total intake by 2020. If this target is met this will result in an increase in the percentage of females leaving the UK Armed Forces. To assess the maximum impact of increasing the percentage of female Service personnel, the model was run with the assumption that 15% of those leaving the UK Armed Forces each year will be female. The increase in females in the model resulted in the projected number of female veterans increasing by 20,000, or 1%. Therefore, it was decided that using stable proportions for each of the three Services, based on historical data, was appropriate as the impact of the increased target is expected to be minimal over the next ten years.

Risk 8: The projected number of Service personnel leaving the UK Armed Forces included all trained Regulars, including anyone who may have been residing in Northern Ireland or overseas. It was assumed that of those leaving the UK Armed Forces, 4% were residing in Northern Ireland or overseas on exit. This was based on location of veterans in receipt of compensation or an Armed Forces pension^e. The projected number of Service personnel leaving the UK Armed Forces also included all reasons for exit including death in Service. This

^c 2010 Strategic Defence and Security Review: <https://www.gov.uk/government/publications/the-strategic-defence-and-security-review-securing-britain-in-an-age-of-uncertainty>

^d MOD New Employment Model Programme: <https://www.gov.uk/guidance/new-employment-model>

^e Location of armed forces pension and compensation recipients: <https://www.gov.uk/government/collections/location-of-armed-forces-pension-and-compensation-recipients>

was expected to be low as between 2015/16 and 2017/18 the percentage of Service leavers who died in Service was less than 0.5%^{f,g}. Whilst the projections may have resulted in an overcount, the impact of not removing those projected to leave the UK Armed Forces and reside outside of GB over the next ten years was minimal.

Risk 9: The model assumed that the number of untrained Regular personnel who leave the UK Armed Forces, and therefore enter the 2018 GB Veterans Model, will remain stable over the next ten years.

Over the past three financial years, 2015/16 – 2017/18, the numbers of untrained Regular personnel leaving the UK Armed Forces remained stable (at an average of around 2,600 per year), making up 18% of all Regular exits. However, prior to 2015/16 there were a number of financial years where the numbers of untrained personnel leaving were much higher, and made up over one-quarter of all Regular exits e.g. 2006/7. Therefore, the model was run both with the assumption that the numbers of untrained Service leavers entering the veteran population would remain stable at around 2,600 per year, and with the assumption that one quarter of Regular Service leavers entering the veteran population would be untrained. The latter, which had the largest potential impact on the final projection, resulted in an estimated increase in veterans by 10,000. Since the model was projecting over 1.6 million veterans, it was decided that the impact of assuming a stable outflow of untrained Regulars was minimal.

Risk 10: The model assumed that the number of Reservists who leave the UK Armed Forces, and therefore enter the 2018 GB Veteran Model, will remain stable (at an average of 5,100 per year), based on historical data between 2015 and 2018. However, the recent focus on increasing the numbers of Reservists in the UK Armed Forces is likely to lead to an increase in the number of Reservists leaving the UK Armed Forces.

The model was run with both the assumption that annual numbers of Reservists would remain stable at around 5,100 per year in each of the next ten years, and with the assumption that the numbers of Reservists leaving each year will increase gradually, to the point where the numbers have doubled in 2028. The latter was considered a maximum estimate and resulted in an estimated increase of veterans by around 20,000. Since the model was projecting over 1.6 million veterans, it was decided that the impact of assuming a stable outflow of Reservists was minimal.

Risk 11: The model assumed that all Service personnel projected to leave the UK Armed Forces over the next ten years will remain as veterans and not re-join the UK Armed Forces. Therefore, model outputs may be an overcount, though the impact of not removing potential re-joiners was expected to be minimal.

Forecast Service leavers leaving the veteran cohort each year to 2028:

RAG Rating: **Low Risk**

The Office for National Statistics' (ONS) cohort life tables are published as National Statistics. They are used by both Government departments and non-Government organisations to inform policy, planning and research in areas such as health, population, pensions and insurance. The ONS has published Quality and methodology information for these statistics^h.

^f UK armed forces deaths in service statistics: <https://www.gov.uk/government/collections/uk-armed-forces-deaths-in-service-statistics-index>

^g Quarterly service personnel statistics: <https://www.gov.uk/government/collections/quarterly-service-personnel-statistics-index>

^hNational life tables QMI: Quality and methodology information for the national life tables: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/methodologies/nationallifetablesqmi>

Risk 12: The Office for National Statistics' (ONS) cohort life tables used in this model have only been compiled using England and Wales data. Therefore, the assumption was that mortality rates for veterans residing in Scotland was the same as for those residing in England and Wales.

Risk 13: The model assumed that veterans will have the same mortality rates as non-veterans. However, occupational studies have found a 'healthy worker effect'ⁱ, deemed to occur when 'workers' were found to have lower mortality or other adverse health outcome rates than the general population since certain groups of people were excluded from employment, particularly those who were ill or who had disabilities. This was to be expected in studies of UK Armed Forces mortality, as they were generally a highly selected group of individuals who were likely to have higher than usual levels of fitness and possibly lower levels of ill-health. Therefore, the projected number of veterans in 2028 may be an undercount.

Risk 14: There was a level of uncertainty around the principal projection used from the ONS England and Wales cohort life tables. The ONS publish projections using both principal and variant assumptions for a number of their life tables^j. However, variant assumptions were not published for the cohort life tables.

ⁱ McLaughlin et al., (2015) An Evaluation of the Effect of Military Service on Mortality: Quantifying the Healthy Soldier Effect

^j ONS Mortality assumptions:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/compendium/nationalpopulationprojections/2016basedprojections/mortalityassumptions#assumptions-for-mortality-variants>