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Building an evidence base for understanding veteran outcomes

SOCIAL WELLBEING AGENCY | TOI HAU TĀNGATA

Te Kāwanatanga o Aotearoa
New Zealand Government

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IDI disclaimer

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data.

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes and is not related to the data's ability to support Inland Revenue's core operational requirements.

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Data and Statistics Act 2022. The results presented in this study are the work of the author, not Stats NZ or individual data suppliers.

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Overview

The Social Wellbeing Agency (SWA) has worked with Veterans' Affairs to build the evidence base about veterans in Aotearoa New Zealand. Using the Integrated Data Infrastructure (IDI)[1], we sought to identify the veteran population, describe their demographic characteristics, and their experience of disability and employment outcomes. This information is intended to assist Veterans' Affairs, Ministry of Defence and other veteran serving agencies to better understand how veterans can be supported during and after the transition to civilian life. This report supports commitments by SWA under Te Arataki mō te Hauora Ngākau mō ngā Mōrehu a Tū me ō rātou Whānau (Te Arataki), The Veteran, Family and Whanau Mental Health and Wellbeing Policy Action Plan.

Summary

- To date, government agencies have been unable to source comprehensive data about the veteran population as there is no complete record of those who have served in the defence forces and no way to identify them in administrative data.
- Using the IDI, we constructed an indicator of veteran status, drawing together data from a range of datasets to identify a group of people who are likely to be veterans. This data contained information indicative of service in the defence force, including evidence of previous employment with the New Zealand Defence Force (NZDF), stated occupation or industry of employment in surveys or other government records.
- Our method was highly accurate at identifying veterans within the available administrative data. When validated against a list of known veterans of the Vietnam War, our method was successful in identifying 85% of them.
- Using the indicator, we identified a total of 43,941 veterans in the 2021 administrative data. Of these:
  - 31,467 (72%) were male and 12,474 (28%) were female.
  - Most (64%) veterans were aged between 30 and 64 years. Veterans aged 65 years and over made up the second largest group at 29%.
  - Most (84%) veterans identified as New Zealand European, 20% identified as Māori, 4% as Pacific People and 3% as Asian.
  - We were able to determine service length for a subset of veterans. Of these, 64% served in the defence forces for 5 years or less.
- Our findings suggest that most (54%) of the veteran population was not living with a disability in 2021.

[1] The IDI is a large research database that collects individual level data about people and households. It includes administrative data about education, income, benefits, migration, justice, and health and comes from government agencies, Stats NZ surveys, and non-government organisations (NGOs).

- Compared to the general population, veterans experienced fewer impairments before age 30, but more severe impairments from age 65. After age 65 most (75%) veterans were living with some impairment. Difficulty with hearing, walking, seeing, and remembering, were the most common impairments experienced by veterans.
- Many veterans were in stable employment. Almost half (49%) of working-aged veterans were employed continuously for the 24-month period over 2018 and 2019. However, one quarter of veterans had no employment income over the study period, 1.7 times higher than the rate for the general population.
- Compared to the general population, a considerably larger proportion of veterans worked in public order, safety and regulatory services, public administration, logistics and transport, manufacturing and air and space transport industries.
- Public order, safety and regulatory services (including police, fire and other emergency services) was the top industry of employment in 2019, employing 10.4% of all working age veterans. Professional, scientific and technical services (6.5%), public administration (5.4%), and construction services (5.3%) were other top industries along with preschool and school education (3.9%).

Introduction

Context

To date, government agencies have been unable to source comprehensive data about the veteran population as there is no complete record of those who have served in the defence forces and no way to identify them in administrative data. As such, Veterans' Affairs and the New Zealand Defence Force (NZDF) have little information about the size and demographic characteristics of veterans or their wellbeing outcomes. This is a common phenomenon across workforces for which there is no central or common system in place to capture information about members. This work involves developing a method to identify the veteran population using government administrative data. While this work focusses on veterans, the method may have applications for other workforce analyses and planning, particularly in the health and social sectors.

Data and research were identified as a priority area in Te Arataki mō te Hauora Ngākau mō ngā Mōrehu a Tū me ō rātou Whānau (Te Arataki), The Veteran, Family and Whanau Mental Health and Wellbeing Policy Framework.

Following the release of Te Arataki, in November 2022, the Social Wellbeing Agency was approached to explore ways we could support Veterans' Affairs and NZDF with data and research. The formal recognition of this came in the Te Arataki 2023/24 Action Plan which named the Agency with responsibility for the following actions:

- Collaborate with NZDF and Veterans' Affairs to produce data and insights to better understand mental health and wellbeing outcomes for veterans, and
- Veteran research and key information will be available through the Research Hub when developed.

Objectives

Our primary objective was to identify veterans in the IDI and create a population dataset that could be used as the foundation for future research on veteran mental health and wellbeing outcomes. Our secondary objectives were to describe key demographic characteristics of the veteran population, the experience of disability among veterans, and employment outcomes.

Defining the veteran population

The term "veteran" has different meanings in different contexts, any could include (among other definitions) both service in the armed forces and serving in a war or military conflict. The Veterans' Support Act 2014 (VSA2014) uses a definition based mainly on Qualifying Operational Service and Routine Operational Service (for persons serving before 1 April 1974).

In this work we used the more inclusive definition from Te Arataki which defines veterans as:

All those who have completed a period of military service, but who no longer serve. The majority of veterans will have served in the Navy, Army or Air Force of the New Zealand Defence Force– either the regular force, reserves or both.[2]

Approach

The analysis focussed on building an indicator of veteran status and identifying the veteran population in the IDI, at a particular point in time (2021). The IDI is a large research database that collects individual level data about people and households. It includes administrative data about education, income, benefits, migration, justice, and health and comes from government agencies, Stats NZ surveys, and non-government organisations (NGOs).[3] This de-identified information enables us to link and analyse information about the same people, from multiple datasets, while ensuring the identities of individuals remain confidential.

The following sections summarise the methods used to identify the veteran population in the IDI, and then explore the experience of disability and employment outcomes among veterans. Further details of the methods are provided in Appendix 1.

Identifying veterans within the IDI

Veteran status is not explicitly recorded within IDI datasets; however, datasets do contain information that can indicate a person served in the defence force. We constructed a veteran indicator to define this population, drawing together data from a range of datasets. We used the following datasets to determine a person's veteran status in the IDI:

[2] Veterans' Affairs and Te Ope Katua o Aotearoa, New Zealand Defence Force (2022). Te Arataki mō te Hauora Ngākau mō ngā Mōrehu a Tū me ō rātou Whānau The Veteran, Family and Whānau Mental Health and Wellbeing Policy Framework.

[3] For more information about the IDI, see https://www.stats.govt.nz/integrated-data/integrated-data-infrastructure/your-information-in-the-idi

- **Receipt of pensions and entitlements:** veterans may be entitled to certain kinds of pensions and entitlements in respect of past military service.
- **Employment by New Zealand Defence Force:** employers provide Inland Revenue with information relating to wages and salary paid to their employees.
- **Stated occupation:** individuals may be asked their occupation through surveys or at the time of key life events.
- **Stated industry of employment*:*** in some surveys a person may be asked their industry of employment, such as in the census.

The resulting population dataset included all the veterans we could identify, who were alive and in New Zealand at any point in 2021. As such, the veteran dataset does not include veterans who left the country after their service or those who have died. We selected 2021 as this was the most recent year for which there was complete data.

Limitations of the data

Coverage of the above datasets is incomplete. As such, our method is likely to underestimate the total veteran population. Data coverage is best for the period between 1999 and 2021, which means that we are likely to have captured most young veterans. We estimate that veterans aged 40-65 years are more likely than other age groups to be missed in our analysis. Veterans in this age group may have left the Defence Force before 1999 and may not yet be 65 years old. As a result, they are difficult to identify in the data as most will not be receiving service-related entitlements, with an exception of those with service-related injuries. We may also be missing a number of older veterans. Our approach to identifying veterans aged 65 years and above is heavily reliant on pension data. However, there may be a group of older veterans who are eligible for the Veteran's Pension but who may not have applied.

Our indicator successfully identified 85% of Vietnam War veterans in the IDI

Data relating to a confirmed group of Vietnam veterans became available in the IDI towards the end of 2023, which we used to validate our approach to identifying veterans. Of the 1,506 Vietnam veterans who were alive and in New Zealand in 2021, our indicator identified 1,284 (an 85% success rate).

Although the approach has some limitations, the identified population likely represents a significant portion of the total veteran population. For a full discussion of the data coverage and limitations, see Appendix 1.

Exploring veteran wellbeing outcomes

The resulting veteran population was linked to other data in the IDI and to other indicators previously developed by the Social Wellbeing Agency. These include an indicator of functional disability and indicators to investigate employment outcomes.

Investigating disability

To investigate the experience of disability among the veteran population, we used a proxy indicator developed by SWA in collaboration with experts in Disabled People's Organisations and government. The approach to identifying indicators of disability in the administrative data followed the Washington Group Short Set (WGSS) on Functioning. These questions were asked as part of Census 2018, the Household Labour Force Survey, and the General Social Survey (in 2016 and 2018). The WGSS is a series of six questions about difficulties people might encounter doing everyday things including, walking or climbing stairs, hearing, seeing, remembering or concentrating, self-care activities such as washing or dressing, and communication (understanding and being understood). These were supplemented with administrative data from the Ministry of Health.[4] The result is a three-level indicator for each of the six functional activities:

- No limitation: This group does not report any limitations in undertaking everyday tasks. They are unlikely to be disabled.
- Low functional limitation: This group reports some difficulty with everyday tasks. They are somewhat likely to be disabled.
- High functional limitation: This group reports a lot of difficulty with everyday tasks or cannot do them at all. They are very likely to be disabled.

Due to the relationship between age and functional disability, we examined the proportion of the veteran population who experienced low and high levels of impairment, and those without any disability, by age group.

The available data did not allow us to determine if the experience of functional disability among veterans was directly linked to their military service. Where possible, we have included data for the general (non-veteran) population alongside the veteran population to enable comparisons.

Investigating employment outcomes

To investigate employment among veterans, we used Employer Monthly Schedule (EMS) data in the IDI. This data links employees to employers for every month that they receive employment income and provides a basis for understanding patterns of employment. We used this data to count the number of months working age persons were employed over a two-year period, from January 2018 to December 2019. This period was selected to avoid potential disruption to employment caused by the COVID-19 pandemic in 2020 and 2021. In addition, we included months where a person was recorded as receiving paid parental leave payments from the government.

[4] Further information about the development, use and limitations of the disability indicator is available here: https://swa.govt.nz/assets/Te-Atatu-Developing-an-indicator-of-disability.pdf

We investigated industry of employment using the main source of employment income for the year, in the 2019 and 2021 financial years. As with employment spells, we've chosen to present 2019 results to avoid the disruption to employment caused by the COVID-19 pandemic in 2020 and 2021. Data for the employment spell analysis was limited to working age veterans and the general population aged 20-64 years; however, we are also limiting it to only people who are employed, and percentages within this section will reflect this smaller group.

The industry classifications used follow the Australian and New Zealand Standard Industrial Classification (ANZSIC06) framework.[5]

All code underlying this analysis is available on SWA's github page: https://github.com/nz-social-wellbeing-agency. We encourage other researchers to use and extend upon our methods to further examine the lives of veterans.

[5] See https://aria.stats.govt.nz/ for more detail about the classifications used in the ANZSIC06 framework and the industries included in each subdivision.

Veterans in Aotearoa New Zealand

We identified 43,941 veterans most of whom were male and aged 30-64 years

Using our indicator, we identified 43,941 veterans in the administrative data who were alive and in New Zealand in 2021. Of these, 31,467 (72%) were male and 12,474 (28%) were female.

The majority (64%) of veterans were aged 30-64 years. Veterans aged 65 years and over made up the second largest group at 29%. Young veterans (aged 18-30 years) were the smallest group, making up 7% of the population. All identified veterans were aged 18 years and over. The age structure of the veteran population by gender is displayed below. The age structure was similar for female/wāhine and males/tāne, with a higher number of female veterans in the 90-99 years age group compared to males. Many of the women in this age group are likely to have served in the Women's Auxiliary Army Corps, while some may be receiving the Surviving Spouse or Partner Pension. Those who are receiving the Surviving Spouse or Partner Pension are outside of the definition of a veteran for this work. However, within the data we are unable to differentiate between those who received the pension due to their own service and those who were receiving a pension as a surviving spouse or partner. As such, it is likely that some of the women we have identified in the older age groups may not be veterans. We estimate that this represents a small group which is unlikely to have much effect on any analyses completed using the veteran population we have constructed.

Breaking this population down further by age and gender reveals some demographic bulges, particularly in the male veteran population (Figure 1). These bulges appear to correspond to past conflicts or wars. The conflict dates are shown against the age-valued x-axis, based on an assumption of a 20-year-old serving during the period of the conflict, and are indicative only. Persons serving would have spanned a range of ages, and New Zealand may not have had a high level of commitment for all periods of the conflict.

Possible conflicts are flagged in Figure 1 and Figure 2 as a guide, to help understand the patterns in the data, due to the need for readers to map the ages (as at 2021) to possible years of service (based on assumptions of the age at the time of service). As not all persons who serve will be deployed, this is intended as an indication of what might be driving trends in the data (e.g. the noticeable peak in men aged 73-75), and not that persons will have served in a particular conflict or will not have served in other conflicts.

Figure 1. Male veterans (2021) by age and possible conflict based on 20-year-old serving

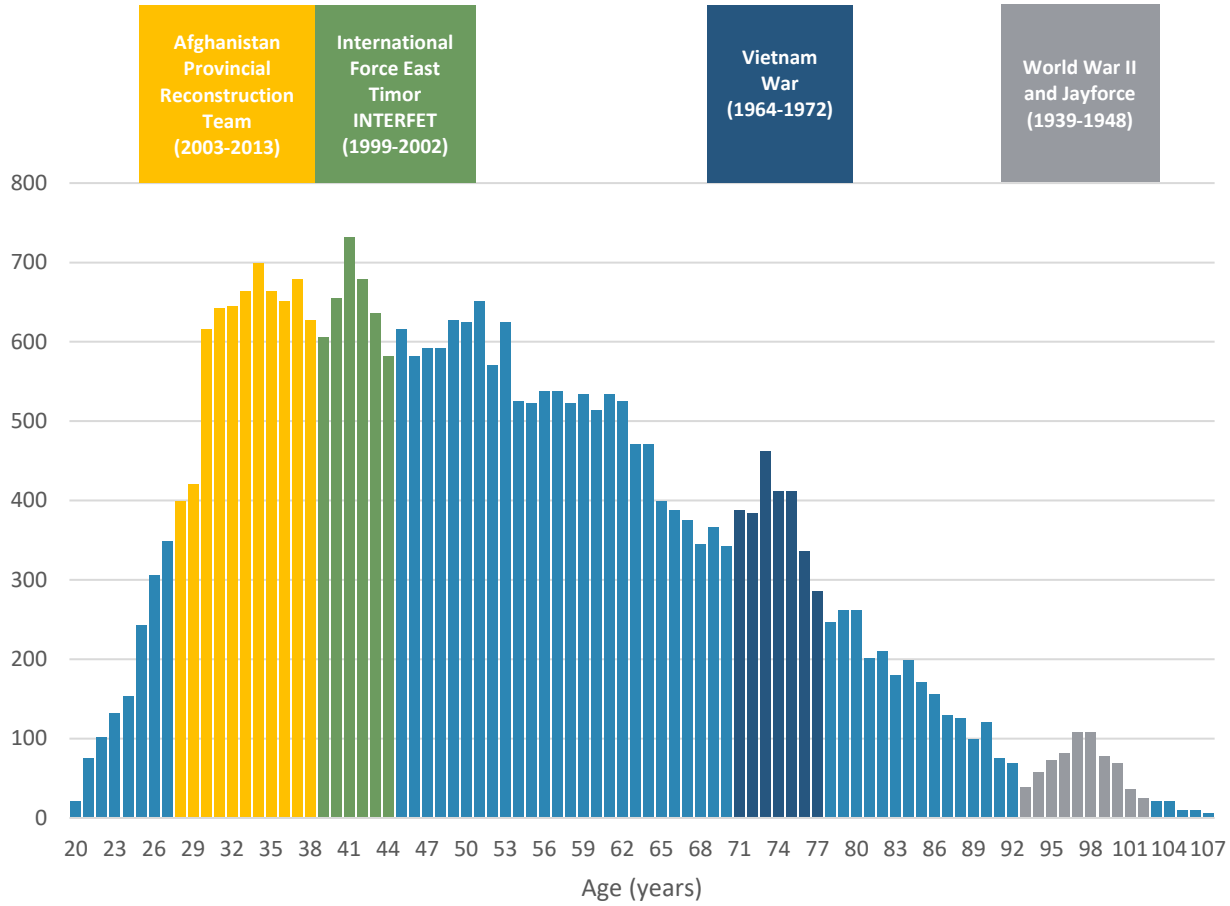
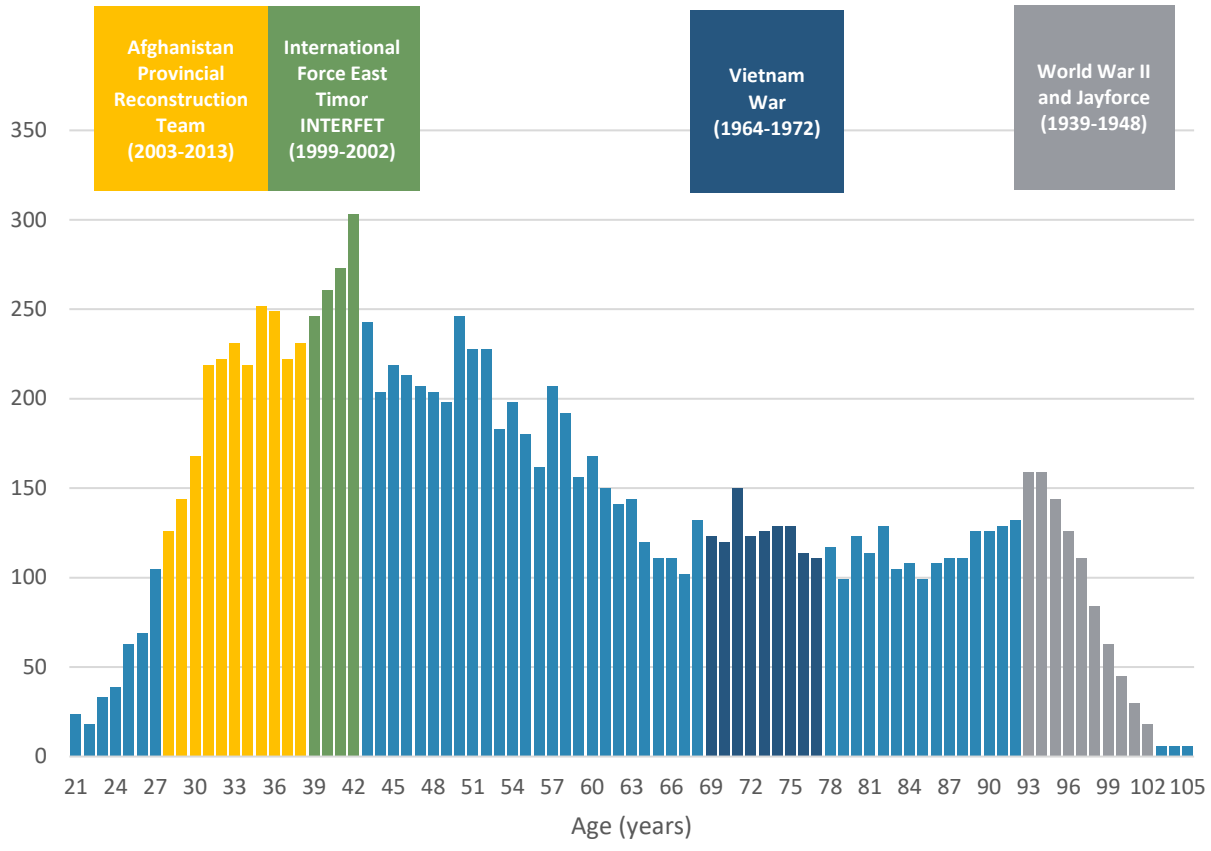


Figure 2. Female veterans (2021) by age and possible conflict based on 20-year-old serving



Most veterans identified as New Zealand European or Māori

The majority (84%) of veterans in 2021 identified as New Zealand European, 20% identified as Māori, 4% as Pacific peoples and 3% Asian. The ethnic breakdown of the veteran population and the general population (non-veterans) aged 18 and over are presented in Table 1.

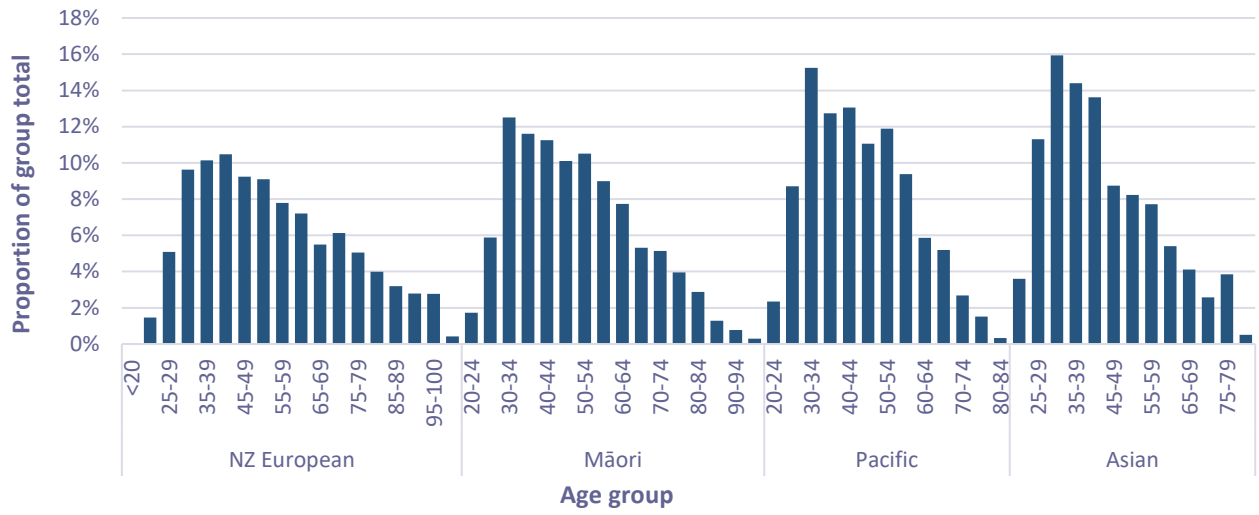
Those identifying as New Zealand European and Māori were overrepresented in the veteran population compared to the general population. NZ Europeans accounted for 71% of the general population aged 18 years and over but made up 84% of the veteran population. Similarly, Māori accounted for 15% of the general population, but 20% of the veteran population. Comparatively, those identifying as Pacific peoples or Asian were underrepresented in the veteran population compared to the general population.

Table 1. Main ethnic groups in the 2021 veteran population

Ethnicity*	Veterans	%	General population (18+ years)	%
NZ European	36,933	84.0	2,751,906	70.7
Māori	8,871	20.2	580,002	14.9
Pacific peoples	1,791	4.1	284,373	7.3
Asian	1,167	2.7	626,055	16.1
Population total	43,941		3,894,216	

*We used total response ethnicity which counts all those who indicate they belong to an ethnic group; therefore, the total number of people across all ethnic groups will be more than the population totals and percentages will total to more than 100.

Population age structures were similar among Māori and New Zealand European veterans. Pacific and Asian veteran populations had younger age structures, all were aged between 20 and 84 years. In contrast, we identified over 2,000 New Zealand European veterans who were 90 years or older. The age structure for each of the four main ethnic groups is presented in Figure 3.



Most veterans served for less than five years

We investigated service length for 18,609 veterans whose service ended between 1 April 2004 and 31 December 2019.[6] This period was limited by the availability of data, but included a large proportion of veterans, 42% of all veterans identified. We used employment data to measure 'service length' based on periods where payment of wages and salary was received.

Service length was measured by the longest continuous service divided into two groups:

- Short service, which is 5 years or less;[7]
- More than 5 years.

Table 2 displays the number of veterans with short service and those who served for more than five years. Nearly two-thirds (64%) of veterans had short service. Women had a higher proportion of short service (71%) than men (61%).

Table 2. Service length among male and female veterans

Gender	Service length	
	5 years or less	More than 5 years
Female/Wāhine	3,621	1,461
Male/Tāne	8,307	5,220
Total	11,928	6,681

[6] The start date was determined by the start of the employment data and allowing sufficient time that a person who began serving before the beginning of the data series would not be incorrectly classified as being in the 'short service' category. The end of the period was defined by our definition of veteran.

[7] The 5-year threshold for service length was based on advice from Veterans Affairs New Zealand about what is generally regarded as short service

Experience of functional disability among veterans

The treatment of, and long-term support for, disabilities related to military service are likely to require ongoing commitment of resources from government. International evidence suggests there is a lag of 20-30 years between deployment to an operational environment and making disability claims as primary medical issues related to military service are joined by secondary and tertiary comorbidities.[8-9] Australian research found that 40 years after deployment to Vietnam, almost 70% of veterans had at least one service-related disability but many veterans had multiple disabilities related to their service.[5]

We investigated the experience of functional disability among the veteran population in 2021. This data provides valuable information about the number of veterans who were experiencing functional limitations in 2021, which alongside the age profile of the veteran population, may help to inform planning for service provision in future.

Most of the veteran population was not living with a functional impairment in 2021

We were able to obtain disability information for a subset of 34,029 veterans, or 77% of the total identified veteran population (43,941). To enable comparison, we also obtained the disability information for the general population in 2021.

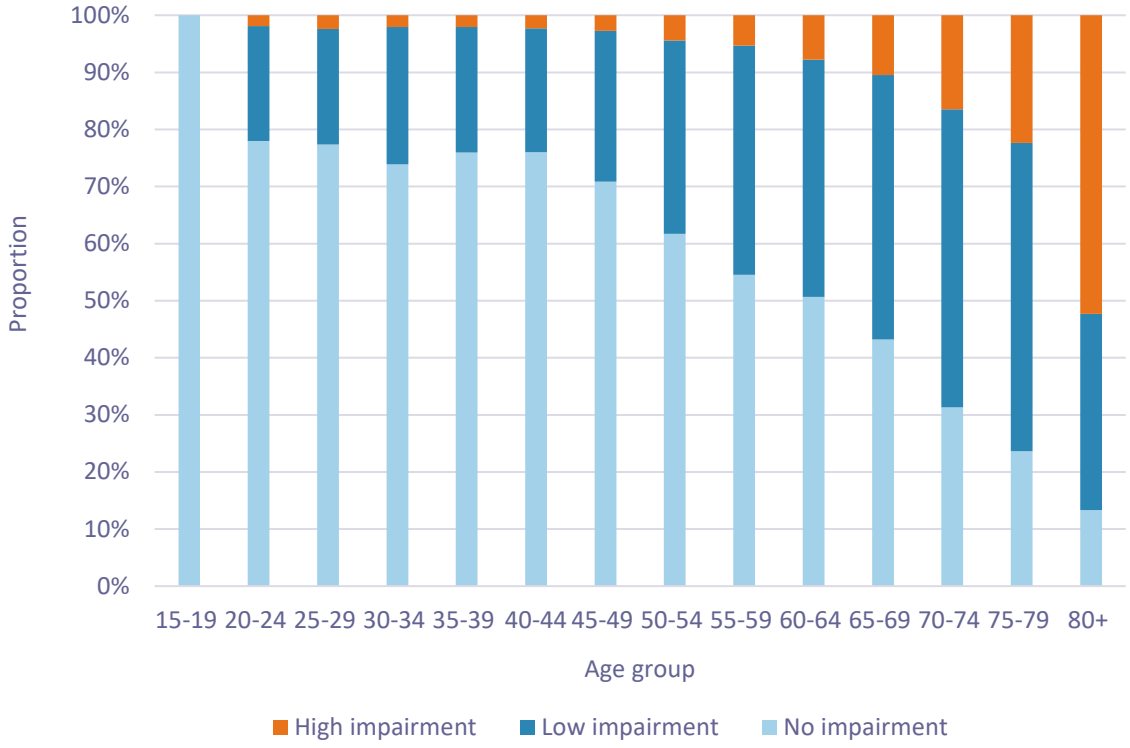
Of those with available information, 54% (18,417) of the veteran population did not experience any functional limitation in 2021. Thirty-four percent had low functional impairment (some difficulty completing everyday activities), and 12% had high functional impairment, that is, they experienced a lot of difficulty completing everyday activities.

Figure 4 displays the proportion of the veteran population with no, low, and high functional impairment by age group. As expected, the proportion of veterans in the low and high functional impairment groups increased with age and the proportion with no functional limitation declined with increasing age. From the age of 65 years, most (75%) veterans were living with either a low or high functional impairment. Among those aged 80 years and over, 52% were living with high functional limitation.

[8] Clarke, P. M., Gregory, R., Salomon, J.A. (2015). Long-term Disability Associated with War-related Experience Among Vietnam Veterans: Retrospective Cohort Study. Medical Care, 53, 5, 401-408.

[9] Geiling, J., Rosen, J.M, & Edwards, R. D. (2012). Medical Costs of War in 2035: Long-Term Care Challenges for Veterans of Iraq and Afghanistan, Military Medicine, 177, 11: 1235-1244.

Figure 4. Proportion of veterans with no, low and high functional impairment by age group



Compared to the general population, veterans experienced fewer impairments before age 30, but more impairment from age 65

The proportion of veterans with no, low and high impairment is displayed in Table 3. Before age 30 years, veterans experienced less impairment than the general population. This finding is expected as entry into the defence force is limited to those who are medically and physically fit. Between ages 30 and 54 years, the proportion of veterans with no impairment was similar to the general population, before declining with increasing age.

After age 30 years, the proportion of veterans with low impairment increased relative to the general population. Among veterans aged 80 years and over, the proportion with low impairment reduced, likely due to many from the low group moving into the high group. From age 65 years, a greater proportion of veterans experience high impairment compared to the general population. Veterans aged 80 years and over experience especially high rates of high impairment.

Table 3. Proportion of veterans and the general population with no, low and high impairment*

	No impairment		Low impairment		High impairment	
Age group	Veterans	General population	Veterans	General population	Veterans	General population
15-19	100.0	78.0	0.0	17.5	0.0	4.5
20-24	78.0	73.9	20.1	21.6	1.9	4.5
25-29	77.4	72.4	20.2	23.0	2.4	4.6
30-34	73.9	75.3	24.1	21.0	2.1	3.7
35-39	75.9	77.3	22.0	19.4	2.1	3.2
40-44	76.0	76.7	21.7	20.1	2.3	3.3
45-49	70.9	71.7	26.4	24.4	2.7	3.9
50-54	61.7	62.6	33.9	32.4	4.4	5.0
55-59	54.5	57.6	40.1	36.1	5.3	6.3
60-64	50.7	54.2	41.5	38.2	7.8	7.5
65-69	43.2	50.7	46.3	40.1	10.5	9.2
70-74	31.3	45.4	52.2	43.4	16.5	11.3
75-79	23.6	37.4	54.0	46.2	22.4	16.5
80+	13.3	21.6	34.4	41.6	52.3	36.8
Grand Total	**54.1%**	**61.9%**	**33.5%**	**30.1%**	**12.3%**	**8.0%**

* Appendix 2 contains the number of veterans in each of the above groups.

Difficulty with hearing was the most common impairment experienced by veterans

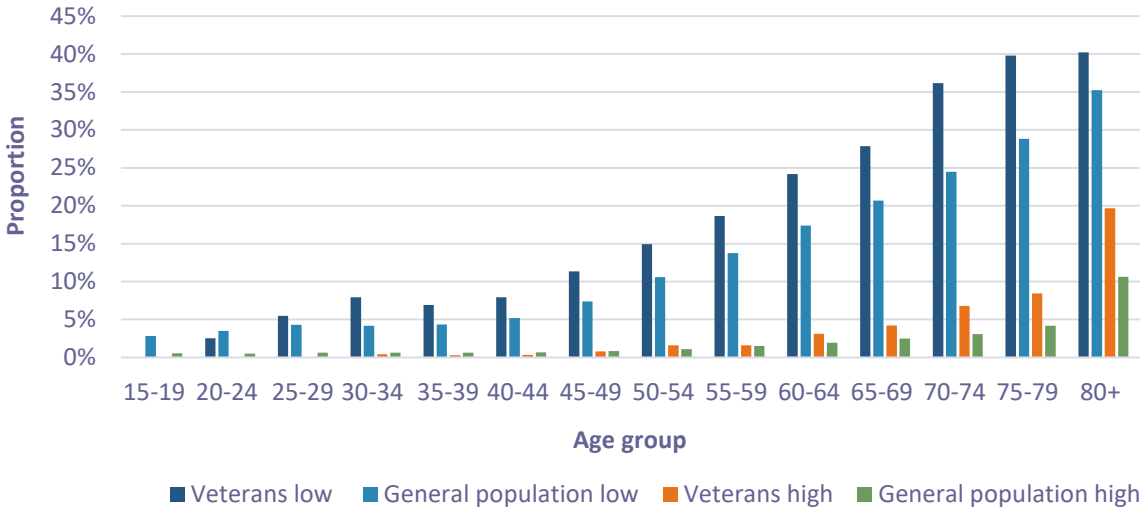
Overall, 20% of veterans experienced some difficulty hearing, while a further 4.5% experienced a lot of difficulty due to a hearing impairment.

As shown in Figure 5, the proportion of veterans with low or high hearing impairment increases with age. By the time veterans reach 75-80 years old, almost half (48.4%) experienced some form of hearing impairment, for those in the 80 years and older age group, this increased to almost three fifths (59.7%).

Compared to the general population, a higher proportion of veterans experienced hearing impairments, and experienced these from a younger age. A greater proportion of veterans experienced low functional impairment in every age group, beginning in the 25-29 years age group.

From age 50 years, a higher proportion of veterans experienced significant disability related to hearing loss compared to the general population. This difference was most pronounced among veterans aged 60 years and over, who were 62-119% more likely to experience significant difficulties hearing than the general public.

Figure 5. Experience of hearing impairment among the veteran and general population

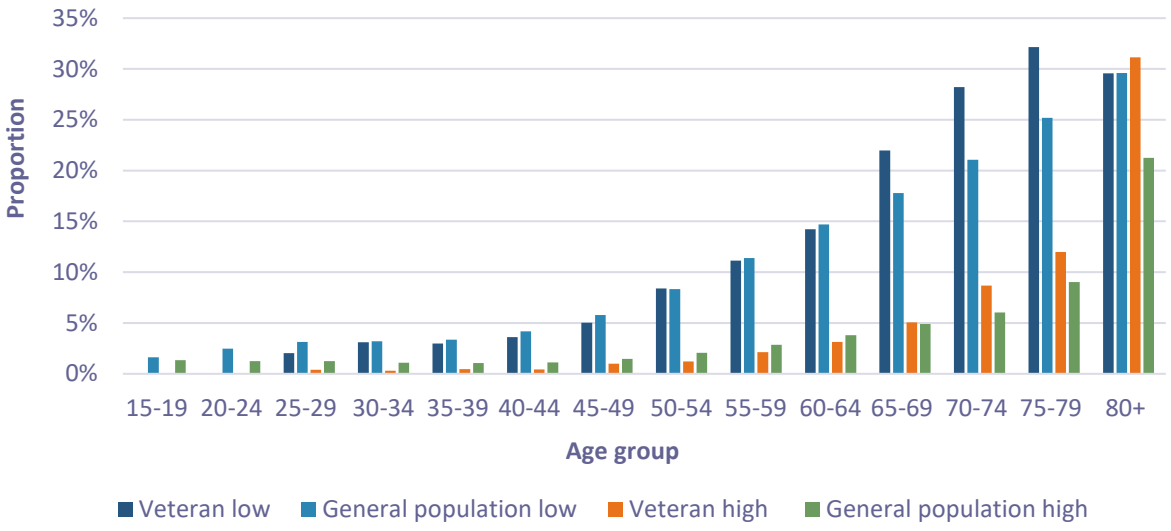


Many older veterans had impaired mobility

A total of 19% of veterans had some difficulty walking or climbing stairs in 2021, 13% experienced low impairment while 6% experienced high impairment. Within the general population, the proportion of those with impaired mobility was 14% in 2021, 10% with low and 4% with a high level of impairment.

Before age 50 years, fewer veterans had impaired mobility compared to the general population. Again, this finding may be expected due to the requirement that those in the defence force are in good physical health. From age 65 years, a higher proportion of veterans had difficulty walking compared to the general population (19-36% more likely to experience low or high difficulty). This difference was particularly pronounced among those aged 80 years and over, among which veterans were 46% more likely to experience high impairment than the general population.

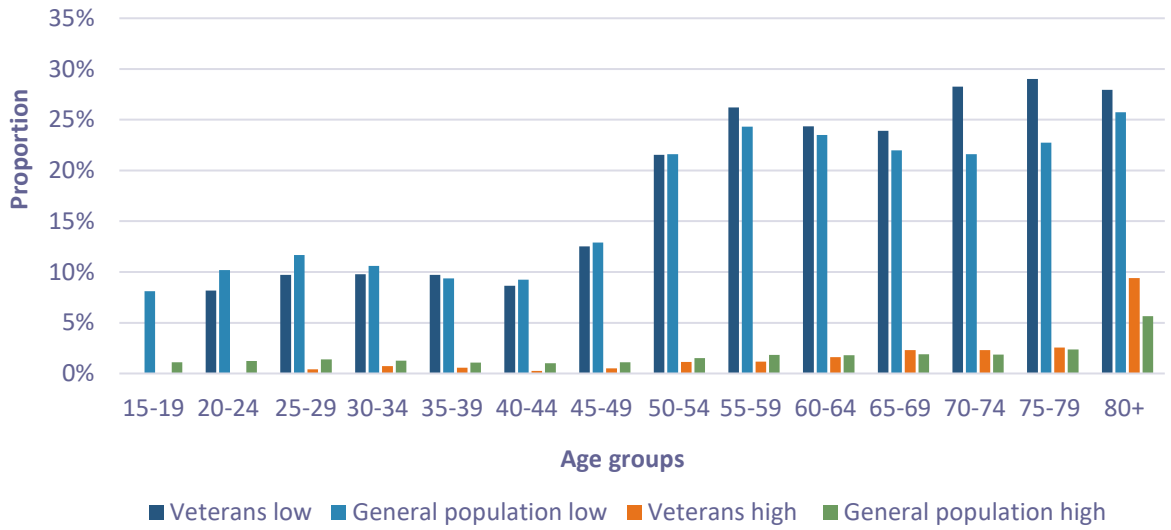
Figure 6. Experience of impaired mobility among the veteran and general population



The experience of visual impairments among veterans was similar to the general population

Overall, the proportion of veterans with sight impairments was similar to the general population, 21% and 19%, respectively. The experience of low and high impairment due to sight among veterans and the general population are shown in Figure 7. Again, veterans experienced less impairment than the general population before age 35 and then more severe impairment in the older age groups. Veterans over 80 years were 66% more likely to experience high levels of impairment (a rate of 9.4% contrasted with 5.7% for non-veterans).

Figure 7. Experience of visual impairment among veterans and the general population

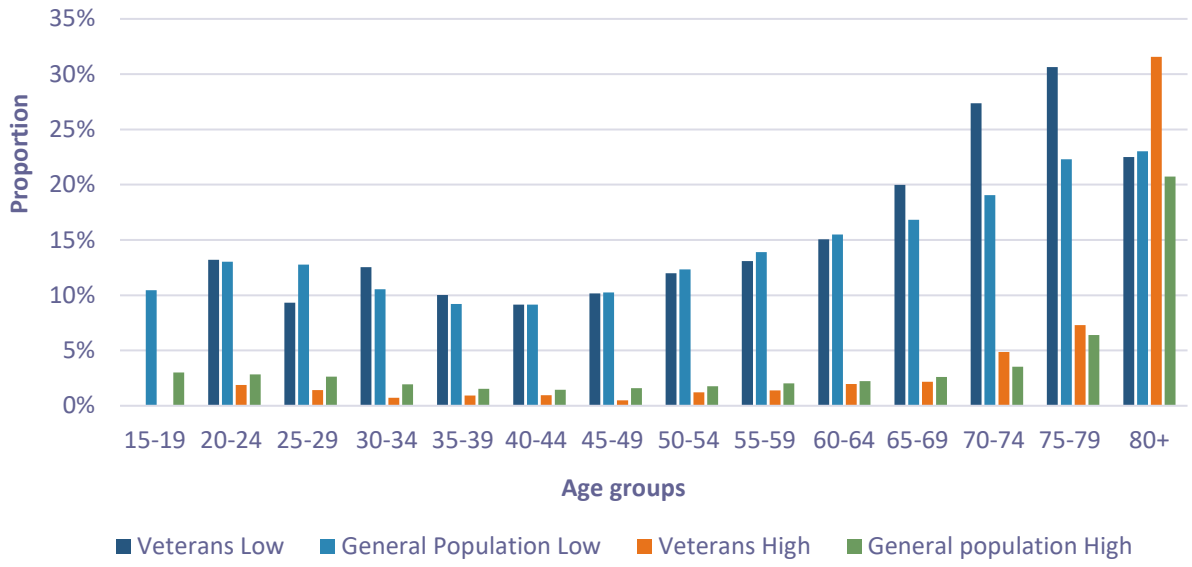


One fifth of veterans had difficulty remembering or concentrating

In 2021, 16% of veterans were living with low cognitive impairment and 6% were living with high impairment.

From age 50 years, the proportion of veterans experiencing impairment (low or high) increased relative to the general population (between 14% and 43% higher compared to non-veterans). Among the 80 years plus age group, 32% of veterans experienced high impairment compared to 21% of the general population (a 52% higher rate).

Figure 8. Experience of cognitive impairment among veterans and the general population

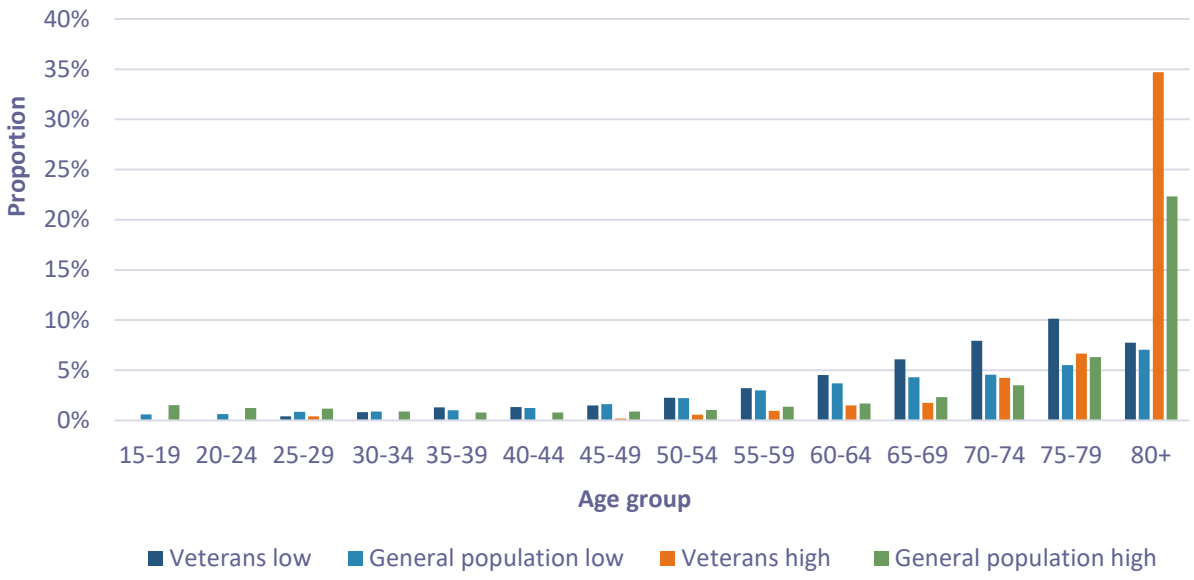


Few veterans had difficulty with self-care activities before age 65

Overall, 4% of veterans experienced some difficulty with self-care (washing and dressing) while 6% experienced a lot of difficulty. This was similar to the general population.

As shown in Figure 9, there is a was a large spike in veterans experiencing difficulty with self-care activities in the 80 years plus age group, with 35% experiencing high difficulty (55% higher than the non-veteran rate of 22%). This is likely due to other physical and cognitive limitations which are also commonly experienced among this age group.

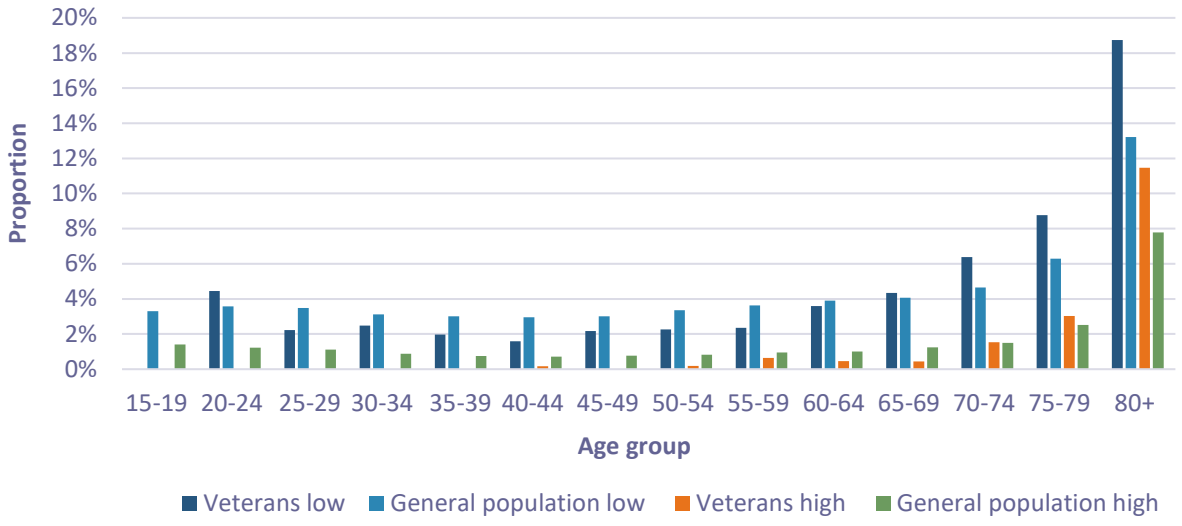
Figure 9. Experience of difficulty with self-care activities among veterans and the general population



From age 70, the proportion of veterans with difficulty communicating is higher than the general population

Difficulty communicating (understanding and being understood) was experienced by a total of 7% of veterans and 6% of the general population. Before age 65 years, 97% of veterans do not have recorded difficulty with communication. From age 70 years, the proportion of veterans experiencing limitations relating to communication increases with increasing age and relative to the general population.

Figure 10. Proportion of veteran and the general population with low and high functional limitations communicating



Employment among veterans

Employment outcomes among veterans have been investigated in the international literature,[10,11,12] but evidence of poorer outcomes for veterans compared to the general population is inconsistent and there is little available evidence about New Zealand veterans.

Employment spells

Forty-nine percent of veterans were in stable employment

We investigated the number of months working age persons were employed over a two-year period, from January 2018 to December 2019. Overall, almost half (49.0%) of veterans were employed for all 24-months during the 2018-2019 period, higher than the general population (45.6%), indicating that a large proportion had stable employment during this time. However, a higher proportion of veterans than the general population were not associated with any employer during the period. Approximately one quarter (24.7%) of veterans did not have recorded income from employment during the study period, compared with 19.3% of the general population. The overall proportion of veterans employed one to 23-months during the two-year period was similar to, but lower than, the general population.

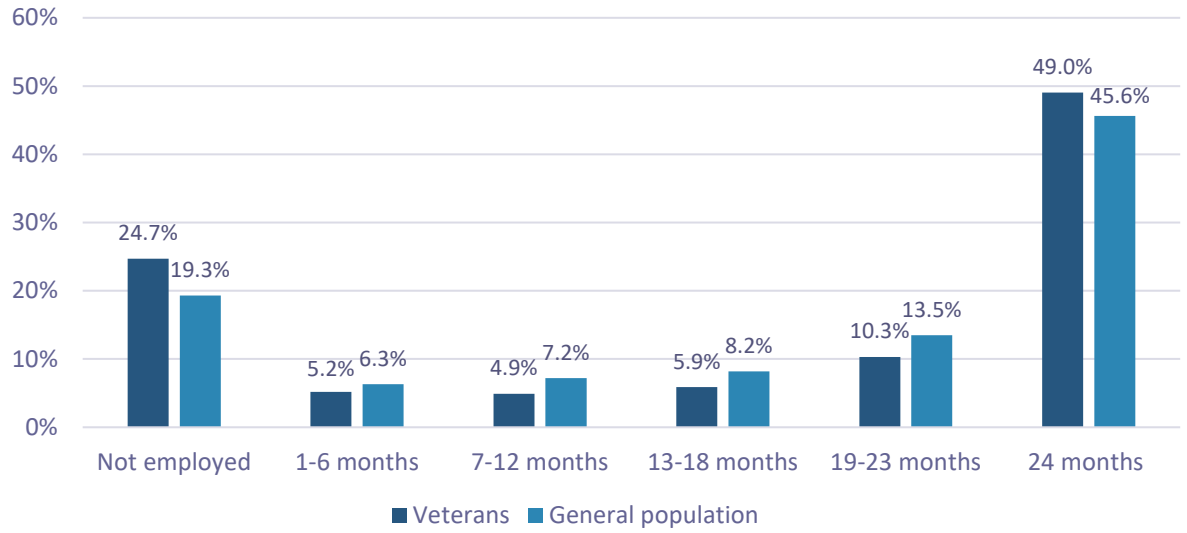
The charts below compare the number of months in employment for veterans and the general population aged 20-64 years who worked for at least one month over the period. While the working age population is generally considered to begin at 15 years, the small number of identified veterans under 20 meant that under 20s were excluded from this analysis.

[10] MacLean, M. B., Campbell, L., Poirier, A. & Sweet, J. (2016). Military Occupation and Post-Military Employment and Income Outcomes. Research Directorate, Veterans Affairs Canada, Charlottetown. https://oaresource.library.carleton.ca/wcl/2016/20160613/V32-269-2016-eng.pdf

[11] Mavromaras, K., Mahuteau, S., Wei, Z. (2013). Younger veterans' transitions to civilian occupations: the role of further education. National Institute of Labour Studies, Flinders University. Adelaide: Australia. Younger veterans' transitions to civilian occupations: the role of further education - FINAL REPORT (dva.gov.au)

[12] Madden, K., Sbisaa, A., Della, L., Van Hooff, M., McFarlane, A., Lawrence-Wood, E. (2024). Employment outcomes among transitioned Australian Defence Force members: An exploration of sex differences. Journal of Military, Veteran and Family Health, 10 (1). doi:10.3138/jmvfh-2022-0082

Figure 11. Number of months veterans and the general population were employed between January 2018 and December 2019



The proportion of veterans in employment varied by age group

Between ages 20 and 49 years, the proportion of veterans who were not associated with an employer was higher than for the general population. This was most pronounced in the 35-39-year age group where 25.6% of veterans received no income during the two-year period compared to 16.6% of the general population.

Compared to the general population, a greater proportion of veterans aged 20-49 years were employed for the full 24-month period.

Care needs to be taken in interpreting these findings. The figures below include both men and women. Self-employment, where an owner was not paid wages or salary from their business, would not appear in the monthly employment data. The population would include persons who were not resident in New Zealand for the entire two-year period. This area could be explored further by subsequent work.

Table 4. Proportion of veterans and the general population who were not employed and employed for 24-months between Jan 2018 and Dec 2019

	Not employed		**Employed for 24 months**	
Age	Veterans	General population	Veterans	General population
20-24 years	14.7%	10.7%	36.8%	30.2%
25-29 years	16.0%	10.3%	44.2%	42.0%
30-34 years	23.7%	13.4%	45.2%	44.4%
35-39 years	25.6%	16.6%	49.0%	47.3%
40-44 years	25.0%	18.5%	52.2%	51.2%
45-49 years	23.0%	20.5%	55.3%	53.1%
50-54 years	25.6%	23.7%	51.2%	52.1%
55-59 years	30.0%	28.3%	49.0%	49.1%
60-64 years	30.5%	36.4%	46.5%	42.3%
Grand total	**24.7**	**19.3%**	**49.0%**	**45.6%**

Industry of employment

Top industries of employment

Among veterans, public order, safety and regulatory services was the top industry of employment in 2019, employing 10.4% of all working age veterans. This industry includes law enforcement, firefighting, paramedic, and corrections roles, but does not include defence roles. Professional, scientific and technical services (6.5%), public administration (5.4%), and construction services (5.3%) were other top industries as well as preschool and school education (3.9%).

Top industries of employment were similar between veterans and the general population, with Professional, Scientific and Technical Services, Preschool and School Education, and Construction Services featuring in the top five industries of employment for the general population (see Table 5). The most notable differences were in the Public Order, Safety and Regulatory Services industry, which employed 2% of the general population compared to 10% of the veteran population. Other industries with a high proportion of veterans relative to the general population included public administration, road transport, heavy and civil engineering construction, machinery and equipment wholesaling, transport support services, transport equipment manufacturing, and air and space transport. Entry into these industries after leaving the defence force may reflect the skills developed through a period spent serving in the armed forces.

Highlighted rows in Table 5 indicate where there are large differences in the proportion of the veteran and general population for a given industry.

Table 5. Top 50 industries of employment for veterans and the general population in 2019

Industry	Veterans count	% of employed veterans	General population count	% of employed general population
Public Order, Safety and Regulatory Services	2,510	10.4%	48,300	2.0%
Professional, Scientific and Technical Services (except Computer Systems Design and Related Services	1,570	6.5%	160,900	6.8%
Public Administration	1,310	5.4%	68,400	2.9%
Construction Services	1,270	5.3%	107,600	4.6%
Preschool and School Education	930	3.9%	140,700	6.0%
Road Transport	795	3.3%	43,600	1.8%
Food Product Manufacturing	710	2.9%	80,700	3.4%
Hospitals	710	2.9%	81,400	3.4%
Heavy and Civil Engineering Construction	690	2.9%	39,400	1.7%
Other Store-Based Retailing	650	2.7%	122,100	5.2%
Administrative Services	640	2.7%	88,100	3.7%
Medical and Other Health Care Services	600	2.5%	74,400	3.2%
Tertiary Education	590	2.5%	51,300	2.2%
Machinery and Equipment Wholesaling	560	2.3%	32,200	1.4%
Building Construction	550	2.3%	46,500	2.0%
Transport Support Services	530	2.2%	21,000	0.9%
Agriculture	520	2.2%	79,000	3.3%
Transport Equipment Manufacturing	480	2.0%	13,100	0.6%
Food and Beverage Services	470	2.0%	131,700	5.6%
Air and Space Transport	390	1.6%	11,600	0.5%
Personal and Other Services	380	1.6%	49,600	2.1%
Computer System Design and Related Services	380	1.6%	37,400	1.6%
Machinery and Equipment Manufacturing	375	1.6%	29,100	1.2%
Repair and Maintenance	300	1.2%	29,900	1.3%
Residential Care Services	270	1.1%	53,300	2.3%
Basic Material Wholesaling	270	1.1%	23,700	1.0%
Building Cleaning, Pest Control and Other Support Services	260	1.1%	41,800	1.8%
Social Assistance Services	260	1.1%	35,400	1.5%
Food Retailing	250	1.0%	71,500	3.0%
Sport and Recreation Activities	250	1.0%	26,500	1.1%
Finance	240	1.0%	38,500	1.6%
Fabricated Metal Product Manufacturing	236	1.0%	27,100	1.1%
Grocery, Liquor and Tobacco Product Wholesaling	225	0.9%	26,800	1.1%
Adult, Community and Other Education	210	0.9%	19,100	0.8%
Wood Product Manufacturing	188	0.8%	18,300	0.8%
Electricity Supply	180	0.7%	9,000	0.4%
Agriculture, Forestry and Fishing Support Services	175	0.7%	29,700	1.3%
Property Operators and Real Estate Services	170	0.7%	21,700	0.9%
Accommodation	170	0.7%	35,300	1.5%
Motor Vehicle and Motor Vehicle Parts Retailing	165	0.7%	19,900	0.8%
Rental and Hiring Services (except Real Estate)	155	0.6%	15,000	0.6%

Other Goods Wholesaling	150	0.6%	24,000	1.0%
Non-Metallic Mineral Product Manufacturing	138	0.6%	9,100	0.4%
Waste Collection, Treatment and Disposal Services	132	0.5%	7,000	0.3%
Heritage Activities	130	0.5%	7,700	0.3%
Auxiliary Finance and Insurance Services	130	0.5%	17,200	0.7%
Water Transport	126	0.5%	2,150	0.1%
Basic Chemical and Chemical Product Manufacturing	105	0.4%	8,400	0.4%
Motor Vehicle and Motor Vehicle Parts Wholesaling	94	0.4%	9,600	0.4%
Telecommunications Services	93	0.4%	11,100	0.5%

Industry of employment was similar for male and female veterans

Public Order, Safety and Regulatory Services was the top industry of employment for both males and female veterans. Public Administration and Professional, Scientific and Technical were also top employing industries for male and female veterans. Others included construction, engineering and manufacturing for male veterans, and education and medical and healthcare services for female veterans. The top 10 industries of employment for veterans by gender are shown in Table 6.

Table 6. Top 10 industries of employment for male and female veterans in 2019

Top 10 industries - Male veterans	Proportion	Top 10 industries – Female veterans	Proportion
Public Order, Safety and Regulatory Services	11.0%	Public Order, Safety and Regulatory Services	8.7%
Construction Services	6.6%	Preschool and School Education	8.5%
Professional, Scientific and Technical Services	6.0%	Public Administration	8.2%
Public Administration	4.6%	Professional, Scientific and Technical Services	8.0%
Road Transport	4.1%	Medical and Other Health Care Services	7.2%
Heavy and Civil Engineering Construction	3.5%	Hospitals	7.0%
Food Product Manufacturing	3.3%	Food and Beverage Services	3.2%
Building Construction	2.9%	Other Store-Based Retailing	3.1%
Machinery and Equipment Wholesaling	2.7%	Tertiary Education	3.1%
Administrative Services	2.6%	Personal and Other Services	2.9%

Differences were evident when comparing employment industry within gender groups, by veteran status

Compared to the general population, both male and female veterans made up a higher proportion of those employed in Public Order, Safety and Regulatory Services, and public administration. There was also a large proportion employed in public administration, higher than among general population.

Preschool and School Education were top employers of women in both the general and veteran population, as were Professional, Scientific and Technical services. A larger proportion of female veterans were employed in Medical and Other Health Care services and Hospitals than the general population.

The top 20 industries of employment for male veterans and the general population, and female veterans and the general population are shown in Figure 12 and Figure 13, respectively. Note these charts include data for all people in employment and are not restricted to those aged 20-64 years.

Figure 12. Top 20 industries of employment for veterans and the general population in 2019 – Male/Tāne

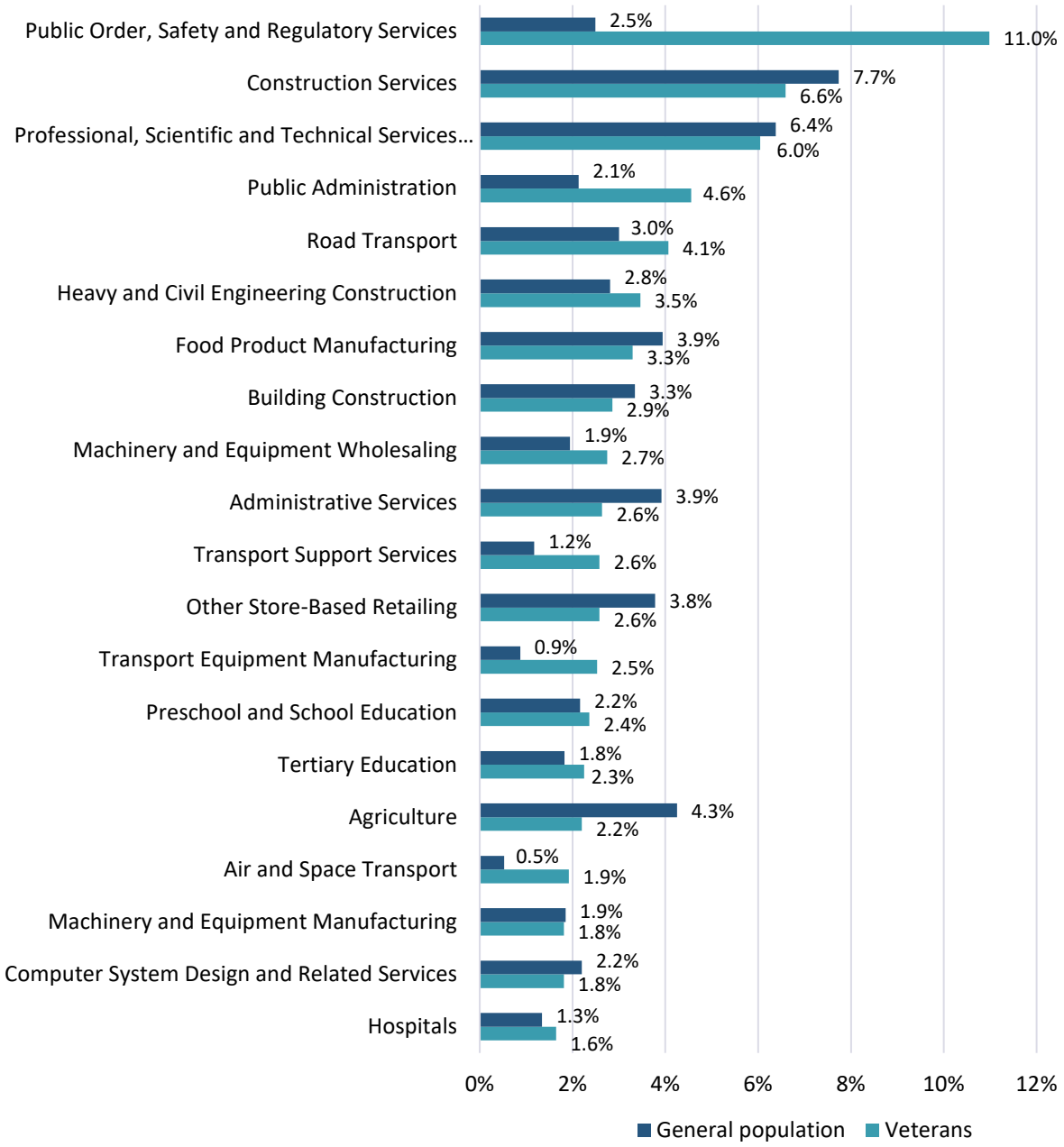
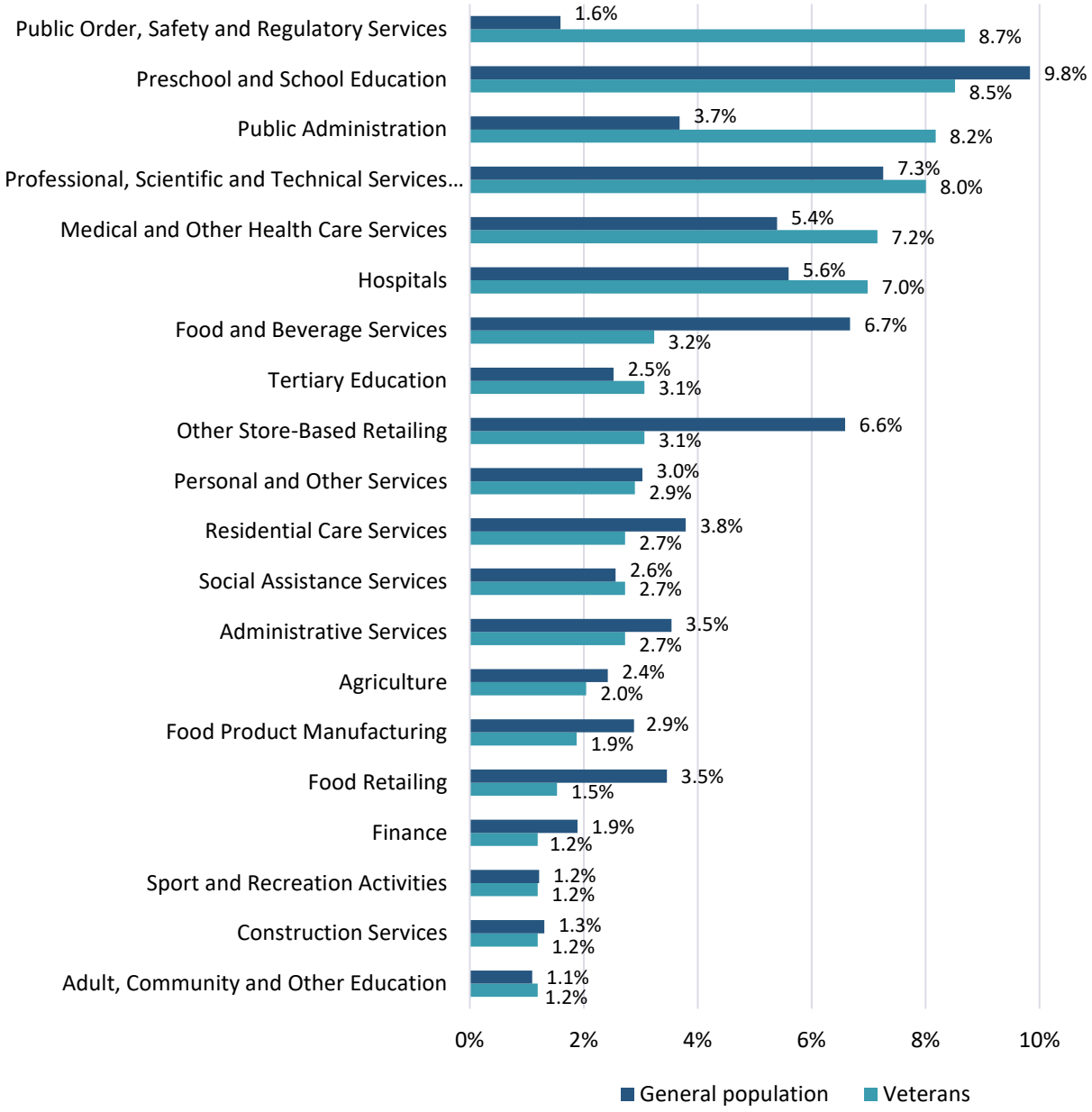


Figure 13. Top 20 industries of employment for veterans and the general population in 2019 - Female/Wāhine



Conclusion

This work was the first to produce robust demographic information about the New Zealand veteran population, their experience of disability and their employment outcomes. The findings of this work provide data and evidence that may be useful in informing the planning of veteran supports in the short term and in anticipating future demand.

A key outcome of this work has been the creation of a population dataset within the IDI that can be reused by veteran serving agencies and researchers to explore areas of further interest. In addition to the wellbeing outcomes covered in this report, there is the opportunity within the IDI to explore a broad range of mental health and wellbeing outcomes including suicide and unmet need for mental health and addiction services.

The method developed to identify the veteran population also has applications for other workforce analyses and may have particular value for health and social sector workforce analysis and planning.

Appendix 1 – Detailed description of methods and data sets

Datasets used to construct the veteran population

We used the following datasets to determine a person's veteran status in the IDI:

1. **Receipt of pensions and entitlements:** veterans may be entitled to certain kinds of pensions and entitlements in respect of past military service. MSD data (including pensions) from 1990 is available in the IDI, however, as people receive it in respect of their prior service in the armed forces and continue to receive it periodically, this enables us to identify people who served much earlier.

   Receipt of pension requires both eligibility and uptake. All persons who served in the armed forces before 1 April 1974 will be eligible for the veteran's pension, whereas those who served after that date will only be eligible if they have 'qualifying operational service' (as defined in the Veterans Support Act 2014).[13] This means that veterans under 65 years of age will need 'qualifying operational service' in order to be eligible (assuming a minimum age of 18 to serve), and that some veterans over 65 years will be not eligible, depending on when they first served.

   As most people will only receive the veteran's pension once they turn 65 (there are exceptions for persons with service-related injuries), we would expect pension data to:

   - most reliably identify older veterans;
   - become less comprehensive over time at identifying 65+ year old veterans, as more of this group will have served only after 1 April 1974.

2. **Employment by New Zealand Defence Force:** employers provide Inland Revenue with information relating to wages and salary paid to their employees. This data enables an employee to be linked to the industry of their employer. The industry of the employer is recorded using the Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC06), which identifies "Defence" as a distinct industry, enabling us to determine previous employment within the Defence Force. This data goes back to 1999, so enables us to identify employment by the New Zealand Defence Force since then.

3. **Stated occupation:** individuals may be asked their occupation through surveys or at the time of key life events. Occupation information can be broken down into two kinds:

   - *Sources where occupation is classified against a framework (for example, Australia New Zealand Standard Classification of Occupation).* The advantage of an existing classification framework is that it limits the number of possible responses and enables us to determine all those that corresponded to military occupations. Examples of this include information collected through the census (2013 and 2018) and social surveys (e.g. Household Labour Force Survey (HLFS), General Social Survey).

[13] For reference, a person who was 18 at 1 April 1974 would be 65 at 1 April 2021.

- *Sources recording free text responses.* A free text response is where a person can write down their own description of their occupation. While this has the advantage that people may describe themselves as 'ex-servicepeople' (which we can then identify as being a veteran), this requires us to correctly identify the responses that indicate military service, amongst all the responses, using a combination of keywords and manual inspection. Examples of this tend to be records of significant life events, such as marriages and civil unions, births of children, hospitalisations, and deaths.

The datasets used in this cover a range of time periods. For example, the earliest social survey available to us is HLFS from 2006, whereas births, deaths, and marriages data goes back to 1840. While this data will generally identify someone's occupation at the time of the event, the possibility of including 'ex-serviceperson' responses to this question means that in some cases more recently collected data can identify people who served at a much earlier time.

4. **Stated industry of employment*:*** in some surveys a person may be asked their industry of employment, such as in the census. In practice, this was not a large source of information for this research, given the overlap with other sources, but may be more useful in other contexts.

The comparator population used the New Zealand resident population, as defined in the IDI,[14] as at June 2021.

Once the data relating to potential veterans was identified, we used monthly employment data to exclude persons who were currently or very recently employed during each time period.

This population was linked to other data and to other indicators previously developed by the Social Wellbeing Agency. All code underlying this analysis is available on SWA's github page: https://github.com/nz-social-wellbeing-agency. We encourage other researchers to use and extend upon our methods to further examine the lives of veterans.

Limitations of the data

This work took place within the constraints of the data that is captured by government administrative processes and made available in a de-identified form through the IDI. Not all data collected by government is made available in the IDI, and the data covered a limited period. As a result, more data was available for recent periods, the most comprehensive data was available from 1999-2021, and identification of the older veteran population was more reliant pension data.

This means our method is likely to underestimate the veteran population, and in particular, we believe that veterans aged 40-65 are more likely than other age groups to be missed. While we expect to identify everyone who served since 1999 through the employment data (and other datasets), those who left the Defence Force before 1999 and who are not yet 65 years old will generally not be receiving service-related entitlements, with an exception of those with service-related injuries.

As shown in Figure 14, occupation data becomes more significant as a source for veterans aged 45 years and older in 2021, with greater numbers being identified solely through this source.

[14] The snz_res_pop table.

Pension data is also a material source for those aged 65 years and older, identifying nearly all veterans aged 80 years and older (although it may not be the only source), but identifying relatively fewer of the younger veterans within this group. This may reflect the change in eligibility for those who served based on whether they served before or from 1 April 1974, with more of the older age cohorts serving before 1 April 1974, than those in the younger cohorts. In addition, veterans who are eligible must also apply for the pension, and it is possible that not all who are eligible do so, which could result in some older veterans being missed. Although the method may underestimate the total veteran population, the identified population represents a material group.

The method may not have captured those who served in the Territorials/Reserve forces prior to 1999. Due to Compulsory Military Training and National Service, we would expect larger numbers of people in their 70s and 90s than we have captured. We likely have not captured these groups as tax data is available before 1999. Further, it is unlikely we would capture this group through other data sources such as stated occupation in surveys. Those who completed compulsory service may be less likely to describe themselves as an ex-service person in surveys and more likely to report their usual occupation in official forms. Similarly, those who served in the Reserves may be more likely to report their main occupation in official forms or in response to survey questions. We also found that those aged 75 and above had low response rates in 'stated occupation' data sources.

In certain cases, declared occupation or industry may have identified foreign service people. Where a person also receives a pension or appears in employment data, we can discount this risk. However, 23% of veterans (including 41-48% of veterans aged 40-69 years) were identified using only occupation or industry data. It is expected that this would only affect a small number of individuals, given the requirement that they be alive and in New Zealand in 2021, and any impact would be limited to where they had different experiences from New Zealand veterans.

Identifying veterans

The main data source for the veteran population varied by age. Younger veterans were more likely to be identified in employment and occupation data, while older veterans were more likely to be identified from pension data. The count of veteran by age group and source of the signal is shown in Figure 14.

Figure 14 Number of identified veterans, by age and data source