



Medications dispensed to contemporary ex-serving Australian Defence Force members, 2017-18

Web report | Last updated: 29 Nov 2019 | Topic: [Veterans](#) | [Media release](#)

About

This report looks at medications dispensed in 2017-18 to contemporary ex-serving ADF members with service from 1 Jan 2001. Nearly two-thirds (64%) of contemporary ex-serving ADF members were dispensed at least one medication subsidised by the PBS/RPBS. After adjusting for age and sex, similar proportions of the contemporary ex-serving population and Australian population were dispensed medications in 2017-18.

Cat. no: PHE 264

Findings from this report:

- Nearly two thirds (64%) of all contemporary ex-serving ADF members were dispensed at least one medication
 - 72% of members and 71% of Australians were dispensed at least one medication, adjusted for age and sex differences
 - 22% of members and 24% of Australians were dispensed cardiovascular medications, adjusted for age and sex differences
 - 20% of members and 15% of Australians were dispensed antidepressants, adjusted for age and sex differences
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Introduction

Key findings

1. In 2017-18, over 1 million medications were dispensed to around 70,000 contemporary ex-serving ADF members
2. Around two thirds (64%) of all contemporary ex-serving ADF members were dispensed at least one medication
3. 72% of contemporary ex-serving ADF members and 71% of all Australians were dispensed at least one medication, after adjusting for age and sex differences
4. 22% of contemporary ex-serving ADF members and 24% of all Australians were dispensed cardiovascular medications, adjusted for age and sex differences
5. 20% of contemporary ex-serving ADF members and 15% of all Australians were dispensed antidepressants, adjusted for age and sex differences
6. 41% of contemporary ex-serving ADF members and 41% of all Australians were dispensed anti-infectives (including antibacterials, antivirals and vaccines), adjusted for age and sex differences
7. 17% of contemporary ex-serving ADF members and 15% of all Australians were dispensed opioids, adjusted for age and sex differences
8. 15% of contemporary ex-serving ADF members and 12% of all Australians were dispensed non-steroidal anti-inflammatory drugs NSAIDs, adjusted for age and sex differences

Medications play a key role in the healthcare of Australians through treating or delaying onset of disease, relieving symptoms and preventing health complications. The Australian government subsidises many medications dispensed through the Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceutical Benefits Scheme (RPBS). The PBS is available to all Australian residents who hold a current Medicare card, providing subsidies for all prescription medications listed under the scheme, subject to patient entitlement status. The RPBS is funded by the Australian Government Department of Veterans' Affairs (DVA) and subsidises medications listed under the PBS, as well as additional medications and items for eligible veterans, war widows and widowers, and their dependents (Australia's Health 2018).

Analysis of the PBS and RPBS within the population of ex-serving Australian Defence Force (ADF) members can provide insights into the use of pharmaceuticals by Australian veterans.

DVA commissioned the Australian Institute of Health and Welfare (AIHW) to investigate the medications dispensed to Australians who have served in the ADF since 2001, described here as the **contemporary ex-serving ADF population**.

The results presented in this report are based on data generated by linking information from the Department of Defence staff and payroll management system—the Personnel Management Key Solution (PMKeyS)—with the PBS and RPBS in 2017-18. This means that the scope of the ex-serving ADF members examined in this report is defined by the PMKeyS.

This report analyses the contemporary ex-serving population as a whole, as well as different cohorts within this population. Results presented in the web report focus on patterns of medication dispensing under the PBS and RPBS, with the accompanying interactive data visualisations providing results at a more detailed level.

Scope of analysis

The contemporary ex-serving ADF population

'**Contemporary ex-serving ADF members**' includes ADF members who had at least 1 day of service on or after 1 January 2001. This date defines the study population because this is when PMKeyS software was introduced. The study population includes individuals who discharged after this date but before 1 July 2017. All data about ex-serving ADF members presented in this report refer to this population.

Cohorts within the contemporary ex-serving ADF population

DVA cardholders—contemporary ex-serving members who have ever held either a DVA Gold or White card.

Concession cardholders—contemporary ex-serving members who have never held a Gold or White card and dispensed at least 1 medication as a concession cardholder in 2017-18.

The underlying population for this cohort is calculated as all those members who have never held a Gold or White card and dispensed at least 1 medication as a concession cardholder in 2016-17 or 2017-18, as there is no indicator on the underlying PBS or RPBS databases which indicates whether or not a person has a concession card.

General beneficiaries—contemporary ex-serving members who have never held a Gold or White card and not dispensed any medications as a concession cardholder in 2017-18.

The underlying population for this cohort is calculated as all those members who have never held a Gold or White card and not dispensed any medications as a concession cardholder in 2016-17 or 2017-18, as there is no indicator on the underlying PBS or RPBS databases which indicates whether or not a person has a concession card.

Dispensings from the PBS/RPBS

In this report, the terms ‘dispensing’ and ‘medication dispensed’ have been used to describe the supply of a pharmaceutical benefit under the PBS, or RPBS. It does not measure prescriptions written, nor does it infer that the medications were taken.

It should be noted that more items are listed under the RPBS than the PBS. In addition, the pharmaceutical benefit received under the RPBS may not be a medication specifically, as other items are covered, for example, medical dressings. Medications that are not listed on either the PBS or RPBS Schedules (including over the counter medications) may also be prescribed for eligible RPBS members, where deemed appropriate. These unlisted items will not be included in breakdowns by medication class as no detailed coding information is available.

The PBS/RPBS does not cover medicines supplied to public hospital in-patients, non-RPBS over the counter medicines or private dispensings. See [Technical notes](#) for more information on what is included under the PBS and RPBS. More information on items covered by the RPBS is also available at the [PBS website](#).

All results presented of dispensings in the Australian population (crude and standardised rates) have been age-matched to the lower and upper age limits of the Australian population, 17-91 years.

References

AIHW (Australian Institute of Health and Welfare) 2018. *Australia's health 2018*. Australia's health series no. 16. Cat. no. AUS 221. Canberra: AIHW.

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Interactive data - profile of contemporary ex-serving ADF members in 2017-18

This data visualisation provides an overview of the structure of the contemporary ex-serving population who were dispensed at least one medication from the PBS in 2017-18. Users are able to see the number of individuals in each group and how total dispensings, average dispensings and total costs differed between groups.

Pharmaceutical use in contemporary ex-serving ADF members in 2017-18

In this study cohort, there were **107,358** contemporary ex-serving ADF members, **69,177** of them received at least 1 dispensing of medication in 2017-18.

Click through or hover over the icons to find cohort specific pharmaceutical use

Ex-Serving Cohort

DVA clients	Concession cardholder	General beneficiary
 21,862	 6,401	 40,833

Notes: 1. Contemporary ex-serving member includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time and before 1 July 2017. The 69,177 members who received at least 1 dispensing in 2017-18 represented 63% of the total contemporary ex-serving population.
2. For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort.
3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.
Source: AIHW analysis of linked PMKeyS—PBS/RPBS data 2017-18
<http://www.aihw.gov.au>

Medications dispensed to contemporary ex-serving ADF members in 2017-18

This section describes the contemporary ex-serving population and its characteristics, as well as how these characteristics may affect medication dispensing for this population.

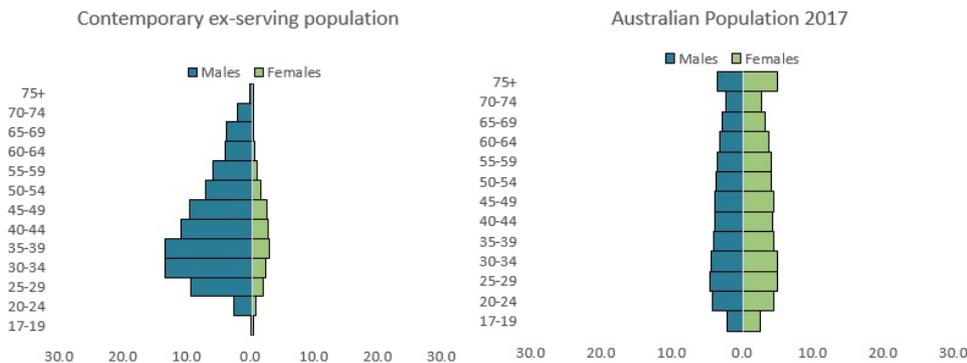
The contemporary ex-serving population

The *contemporary* ex-serving ADF population, is made up of all ADF personnel with at least one day of service since 1 January 2001, who were discharged after this date and prior to 1 July 2017.

As such, the contemporary population is a subset of the broader ex-serving population and has some distinct characteristics, most notably, it is a relatively young population, and has a smaller proportion of women compared with the Australian population (Figure 1).

For medication dispensing, this has the potential to affect the results between these two populations, as certain medications can be sex-specific, or are prescribed in the treatment and management of health conditions that occur more commonly in older age groups. Therefore, results have been disaggregated by age and sex in the data visualisations that accompany this report, as well as in the supplementary tables. Age and sex standardisation is used wherever comparisons are made between the contemporary ex-serving population and the whole Australian population to account for the differences. See [Introduction](#) for details on how this population have been determined.

Figure 1: Age and sex of the Contemporary ex-serving population in 2017-18 and the Australian population on 31 December 2017 (per cent)



Sources: AIHW analysis of linked PMKeYS dataset, 2017-18 (Contemporary ex-serving population); ABS Estimated Resident Population aged 17 and over as at 31 December 2017 (Australian population).

The contemporary ex-serving population and sub-populations

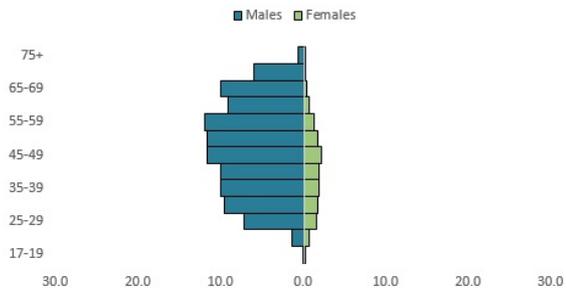
The contemporary ex-serving population itself is not a homogenous population. Within the contemporary ex-serving population, three sub-populations or cohorts, have been created for analysis in this report: DVA cardholders; Concession cardholders; and, General beneficiaries. See [Scope of analysis](#) and [Technical notes](#) for details on how these cohorts have been determined.

Figure 2 below highlights the different age and sex structures of the three different cohorts analysed in this report. All cohorts had relatively few women, DVA cardholders were relatively evenly distributed with regards to age, while concession cardholders had a bimodal distribution with a large proportion aged 30-39 and 65-69 and general beneficiaries a younger distribution with regards to age.

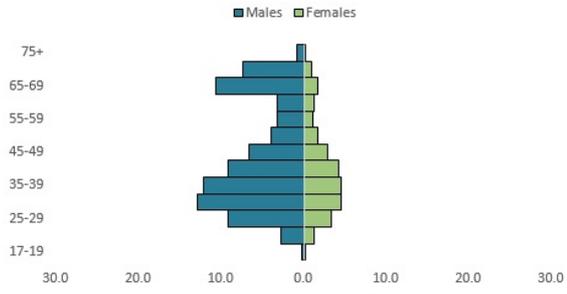
The age distribution of the DVA cardholder cohort reflects the requirements associated with gaining a DVA card which include age, illness and particular [service experience](#). The bimodal distribution of the concession cardholder population reflects these members having either age-based cards (such as pension cards), or income-based cards (such as a health care card).

Figure 2: Age and sex of the contemporary ex-serving cohorts in 2017-18 (per cent)

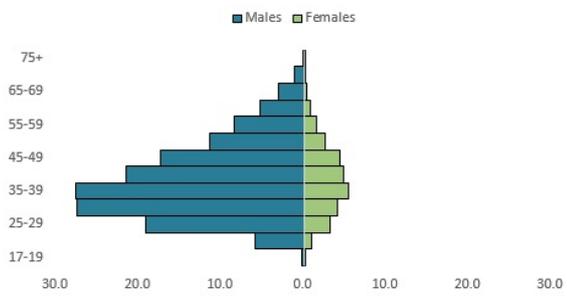
DVA cardholders



Concession cardholders



General beneficiaries



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

Dispensings for contemporary ex-serving ADF members in 2017-18

On this page:

- Dispensings for contemporary ex-serving members in 2017-18
- DVA cardholders and the RPBS and PBS
- Dispensings by age and sex

This section presents results for contemporary ex-serving ADF members dispensed a medication under the PBS or RPBS in 2017-18. Results are presented for all contemporary ex-serving members, as well as three cohorts within this population (see [Medications dispensed to contemporary ex-serving ADF members in 2017-18](#)).

In 2017-18, over 1 million medications were dispensed to around 70,000 contemporary ex-serving ADF members, an average of 16 dispensings per person (Table 1). Almost two thirds (64%) of all contemporary ex-serving members were dispensed at least one medication in 2017-18.

After accounting for age and sex, similar proportions of the contemporary ex-serving and Australian populations were dispensed medications in 2017-18 (72% and 71%, respectively) (Supplementary table S1).

Of all medications dispensed to contemporary ex-serving members in 2017-18, DVA cardholders were dispensed more than half (54%), general beneficiaries were dispensed a third (33%) and concession cardholders just over one in ten (12%) (Figure 3).

Figure 3: Contemporary ex-serving ADF members with a PBS/RPBS dispensing in 2017-18



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

DVA cardholders had an average of 27 dispensings per person, with 20 per person for concession cardholders and 9 for general beneficiaries. The rate of dispensings for DVA Gold Cardholders was an average of 43 per person (Table 1). This reflects the perceived greater need for DVA and concession cardholders and Gold cardholders in particular. This may also reflect a greater access to services DVA cards aim to facilitate. For example, recent [DVA policies](#) aim to provide greater access for eligible ex-serving members to treatment for certain conditions such as cancer and mental health.

Table 1: Contemporary ex-serving members use of PBS/RPBS in 2017-18

	No. members	No. members dispensed medications	No. dispensings	% of total dispensings	Avg dispensings per person ^(a)
DVA Gold Cardholder	7,372	6,977	298,657	27.8	43
DVA White Cardholder	19,074	14,885	285,201	26.6	19
Sub-total: All DVA Cardholders	26,446	21,862	583,858	54.0	27
Concession cardholder	7,110	6,401	129,097	12.0	20
General beneficiary	73,721	40,833	358,098	33.4	9
Total in 2017-18	107,358	69,177	1,072,731	100.0	16

(a) This is the average number of medications dispensed to contemporary ex-serving members with a dispensing in 2017-18. That is, 'No. of dispensings' divided by 'No. members dispensed medications' in the table above.

Notes:

1. Contemporary ex-serving member includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time and before 1 July 2017. The 69,177 members who received at least 1 dispensing in 2017-18 represented 64% of the total contemporary ex-serving population.
2. For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort.
3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.

Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

DVA cardholders and the RPBS and PBS

While an ex-serving members' DVA card provides them with access to the RPBS, they may also have some medications dispensed under the PBS.

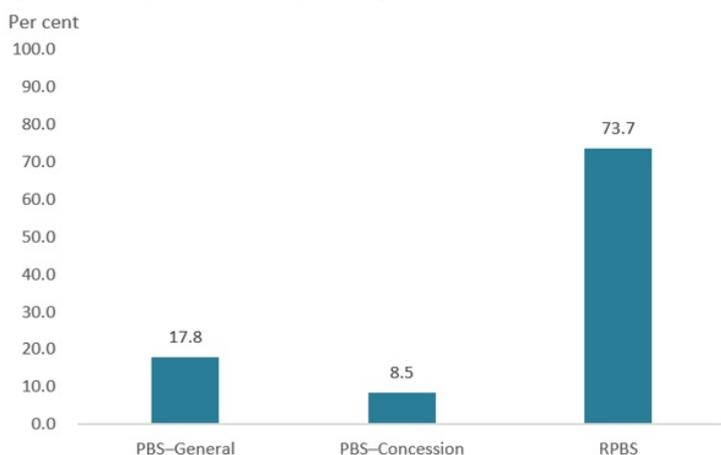
For DVA White cardholders, any prescribed medications not associated with their approved condition will be dispensed under the PBS. Therefore, dispensings presented for DVA cardholders may be for medications dispensed under the RPBS or PBS.

Although DVA Gold cardholders have full access to the RPBS under their cards, there are a small number of Gold cardholders that access the PBS, and this can happen for a number of reasons. In some cases, they may not present their Gold card and accept paying the general rate. Or, they may also have access to the PBS through another concession card, or they may have received their gold card part way through 2017-18 (note, 13% of gold card holders received their card part way through 2017-18).

The results below present information on the number of medications dispensed under the PBS to the DVA cardholder cohort.

The majority (74%) of all dispensings for DVA cardholders in 2017-18 were dispensed under the RPBS (Figure 4) and just over one quarter (26%) were dispensed under the PBS.

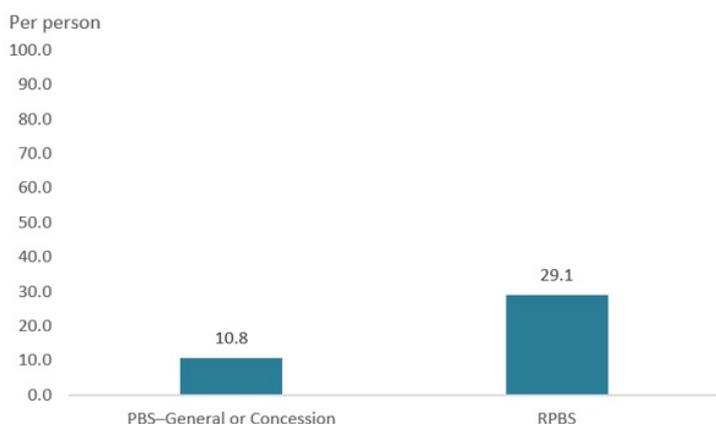
Figure 4: Proportion of dispensings for contemporary DVA cardholders dispensed under the RPBS and PBS, 2017-18



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

Nearly two-thirds (65%) of DVA cardholders who were dispensed at least one medication in 2017-18 were dispensed medications under the PBS in 2017-18 at an average of 11 dispensings per person. Just over two-thirds (68%) of DVA cardholders were dispensed medications under the RPBS at 29 per person (Figure 5 and Supplementary table S2).

Figure 5: Average number of medications dispensed to contemporary ex-serving DVA cardholders^(a) in 2017-18



(a) Average for contemporary ex-serving DVA cardholders with at least 1 dispensing in 2017-18.

Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

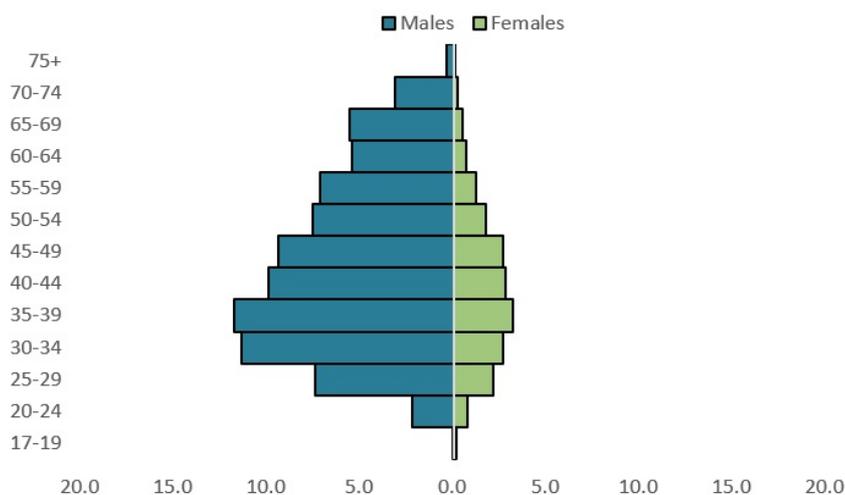
Age and sex of contemporary ex-serving members dispensed a medication in 2017-18

The contemporary ex-serving population is mostly men (85%) and the majority of contemporary ex-serving members dispensed at least 1 medication in 2017-18 were also men (82%). Similarly, the majority of all dispensings for ex-serving members were for men (86%) (Supplementary table S3).

Over half (57%) of the contemporary ex-serving population are aged between 30 and 49 and, therefore, over half (54%) of contemporary ex-serving members dispensed at least 1 medication in 2017-18 were aged 30 to 49 (Figure 6). These patterns were similar in the Australian population (Supplementary table S3).

Contemporary ex-serving members in the older age-groups were dispensed more medications than younger age groups, with almost half (47%) of all medications dispensed to members aged 50 to 69, and a further 39% to members aged between 30 to 49 (Supplementary table S3), which is consistent with the development of disease with increasing age (ABS 2018). These patterns were similar in the Australian population (Supplementary table S4).

Figure 6: Contemporary ex-serving members dispensed at least 1 medication in 2017-18, by age and sex (per cent)



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

Consistent with the increased likelihood of developing chronic diseases with age (ABS 2018), the rate of dispensings per person increased with age (Supplementary table S3). For example, the rate of dispensings per member aged 70 and over was 35 dispensings per person, nearly twice as high as the rate for members aged 50 to 69 (19 per person) and almost ten times the rate for members aged 17 to 30 years (3 per person).

This pattern is similar in age-matched rates within the Australian population. The rate of dispensings for Australians aged 70 and over was 44 dispensings per person, just over twice as high as the rate of Australians aged 50 to 69 (20 per person) and over 10 times the rate for Australians aged 17 to 30 years (3 per person) (Supplementary table S3).

After accounting for age and sex differences, similar proportions of contemporary ex-serving men and women accessed the PBS/RPBS compared with the broader Australian population.

- 79% of ex-serving women and 76% of Australian women were dispensed at least 1 medication in 2017-18.
- 64% of ex-serving men and 64% of Australian men were dispensed at least 1 medication in 2017-18. (Supplementary table S1).

Similarly, after accounting for age and sex, the rate of dispensings per person was the same in the contemporary ex-serving and Australian populations (13 per person, respectively) (Figure 7).

Figure 7: Rate of dispensings per person, contemporary ex-serving and Australian populations (age and sex-standardised), 2017-18



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

References

ABS (Australian Bureau of Statistics) 2018. [Chronic Conditions: National Health Survey: First Results, 2017-18](#). ABS cat. no. 4364.0.55.001. Canberra: ABS. Viewed 27 September 2019.

Medications dispensed to contemporary ex-serving members, by medication class

On this page:

- [Introduction](#)
- [Nervous system medications](#)
- [Cardiovascular system medications](#)
- [Anti-infectives for systemic use](#)
- [Musculo-skeletal system medications](#)

This section presents key results from the analysis of medications dispensed by the first and third levels of the Anatomical Therapeutic Chemical (ATC) classification, see below. Results include numbers of the medications most frequently dispensed, the proportions of individuals who were dispensed medications as well as average numbers of dispensings per person within ATC classes.

Anatomical Therapeutic Chemical (ATC) classification

This report uses the Anatomical Therapeutic Chemical (ATC) classification system, as maintained by the World Health Organization (WHO) to classify medications. This system classifies medications into five hierarchical levels, from the bodily system or organ the medication targets at the highest level, to the specific chemical substance at the lowest level (WHOCC 2018). This allows analysis at varying levels of granularity.

Table 2 below provides an example of the complete classification for Rosuvastatin.

Table 2: Example ATC classification: Rosuvastatin

ATC level	Classification	ATC code
1st level, anatomical main group	Cardiovascular System	C
2nd level, therapeutic subgroup	Lipid Modifying Agents	C10
3rd level, pharmacological subgroup	Lipid Modifying Agents, Plain	C10A
4th level, chemical subgroup	HMG CoA reductase inhibitors	C10AA
5th level, chemical substance	Rosuvastatin	C10AA07

Note: Medicines are given an ATC classification in the Schedule of Pharmaceutical Benefits according to their main therapeutic use in Australia as registered with TGA and listed on the PBS.

Source: World Health Organization.

At the first ATC level, the most common medications dispensed to contemporary ex-serving members in the study period were those relating to the nervous system, which accounted for 33% of all medications dispensed (Supplementary table S5). This category includes medications such as antidepressants, anticonvulsants and analgesics. This was followed by medications relating to the cardiovascular system, which accounted for 26% of all medications dispensed. Together these two categories accounted for 59% of all dispensed medications.

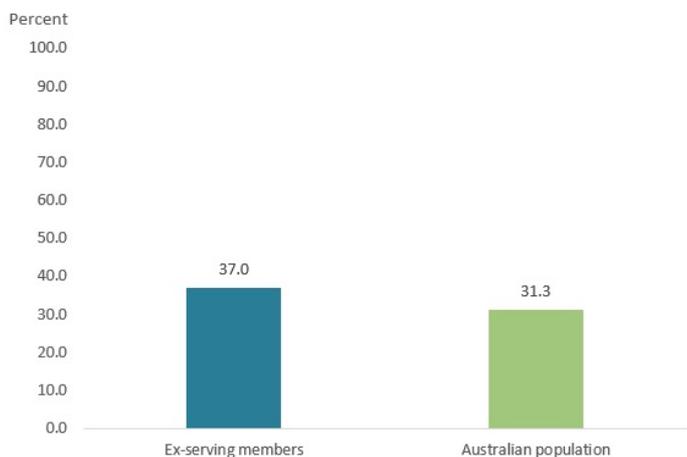
Nervous system medications

The nervous system includes the brain and all the nerves in the body that make consciousness, cognition, feeling and movement possible. Medications in this class include anaesthetics, stimulants, antiepileptics, sedatives, antidepressants and antipsychotic medications.

One third (33%) of all contemporary ex-serving ADF members were dispensed at least one nervous system medication. Overall 55% of DVA cardholders and 54% of concession cardholders were dispensed at least one nervous system medication (Supplementary table S6). Among general beneficiaries this proportion was 23%.

After adjusting for age and sex, more contemporary ex-serving ADF members (37%) were dispensed at least one nervous system medication compared with the Australian population (31%) (Figure 8 and Supplementary table S4).

Figure 8: Comparison of nervous system medications dispensed to contemporary ex-serving members and Australian population (age and sex-standardised), 2017-18



Note: Standardised to the Australian 2001 population, see [Methods](#) for more information.

Sources: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18 (Contemporary ex-serving population); AIHW analysis of Department of Health PBS and RPBS data, 2017-18 (Australian population).

The most commonly dispensed medications at the third ATC level across all cohorts were antidepressants, which accounted for 15% of all medications dispensed to contemporary ex-serving ADF members (Table 3). Antidepressants were dispensed at least once to 33% of all DVA cardholders, which was more than any other class of medication. That percentage was 30% for concession cardholders and 10% among general beneficiaries. After adjusting for age and sex, more contemporary ex-serving ADF members were dispensed antidepressants (20%) compared with the Australian population (15%) (Supplementary table S6).

It should be noted that policies regarding mental health treatment for ex-serving personnel have undergone change in recent years to facilitate early access to mental health treatment, and the full effect of these changes may not be reflected in this study population. For example, DVA's policy relating to non-liability health care for mental health conditions was expanded in 2016 to cover all current and former ADF members for post-traumatic stress disorder (PTSD), anxiety, depression, alcohol and substance use disorders. This was expanded again on 1 July 2017 to include all mental health conditions.

Within nervous system medications, the second most commonly dispensed medicines were opioids, which accounted for 8% of all dispensings among the study population (Table 3). Opioids were dispensed to 29% of DVA cardholders, 25% of concession cardholders and 11% of general beneficiaries. After adjusting for age and sex, similar proportions of contemporary ex-serving members were dispensed opioids when compared with the Australian population (17% and 15%, respectively) (Supplementary table S6).

DVA cardholders who were dispensed an opioid received an average of 7 opioid dispensings per year. This was 6 per person among concession cardholders and 2 per person among general beneficiaries (Supplementary table S6).

If you need help or support, please contact:

Open Arms - Veterans and Families Counselling **1800 011 046**, or openarms.gov.au

ADF All-hours Support Line **1800 628 036**

Operation Life Online

Lifeline **13 11 14**, or lifeline.org.au

Suicide Call Back Service **1300 659 467**, or suicidecallbackservice.org.au

Beyond Blue Support Service **1300 22 4636**, or beyondblue.org.au

For information on support provided by DVA see: [DVA website](#)

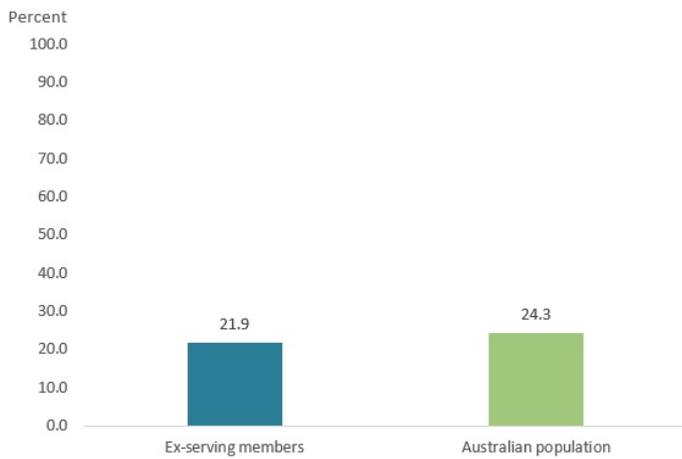
Cardiovascular system medications

The cardiovascular system includes the heart and blood vessels that distribute blood carrying oxygen and nutrients to cells in the body to support physiological functions. Medications in this class are prescribed to treat conditions like hypertension, high cholesterol and angina (ischaemic heart disease).

Cardiovascular medications were dispensed to 18% of all contemporary ex-serving ADF members. The proportion of DVA cardholders who received at least one cardiovascular system medication was 35%. Eleven percent of general beneficiaries and 30% of concession cardholders received cardiovascular medicines (Supplementary table S5).

After accounting for age and sex differences, the proportion of contemporary ex-serving ADF members dispensed a cardiovascular system medication was 22% compared with 24% in the Australian population (Figure 9 and Supplementary table S4).

Figure 9: Comparison of cardiovascular system medications dispensed to contemporary ex-serving ADF members and Australian population (age and sex-standardised), 2017-18



Note: Standardised to the Australian 2001 population, see [Methods](#) for more information.

Sources: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18 (Contemporary ex-serving population); AIHW analysis of Department of Health PBS and RPBS data, 2017-18 (Australian population).

For those dispensed a cardiovascular medication the average number of cardiovascular dispensings was 14 per person. Within the Australian population it is 17 per person. The average number of dispensings per person indicates that individuals who were dispensed cardiovascular medications tended to receive them regularly over the course of the year, or received multiple types of medication within this category, consistent with expected use for persons with heart disease. Within this group, at the ATC fifth-level, individuals were dispensed an average of 2 different types of cardiovascular medication over the study period.

Within this category the most commonly dispensed medications were lipid modifying agents, which accounted for 9% of all medications dispensed to contemporary ex-serving members (Table 3). After adjusting for age and sex, the proportion of contemporary ex-serving members dispensed lipid modifying agents was 11% and for the Australian population was 13%

Anti-infectives for systemic use

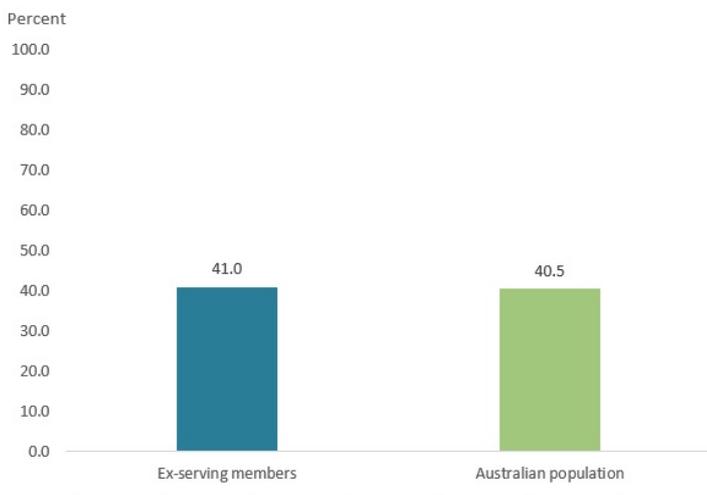
These medications are used to treat or prevent infections caused by microorganisms, and include antibacterials, antivirals and vaccines.

In terms of the number of individuals being dispensed medications, anti-infectives for systemic use were dispensed to the most people, with more than one third (34%) of all contemporary ex-serving ADF members being dispensed at least one. This is consistent with Australian use with 41% of both the contemporary ex-serving population and the Australian population receiving at least one anti-infective medication after accounting for age and sex differences (Figure 10 and Supplementary table S4).

Among concession cardholders 49% received an anti-infective, as did 41% of DVA cardholders and 30% of general beneficiaries. Among general beneficiaries who were dispensed anti-infectives, the average number of dispensings over the study period was 2 per person (Table 3). Among DVA cardholders and concession cardholders there was an average of 3 per person. Consistent with recommended use, the results suggest anti-infectives were used short term.

The most commonly dispensed anti-infectives were ‘beta-lactam antibacterials, penicillins’, which were dispensed to 20% of all contemporary ex-serving ADF members, which is consistent with national patterns of anti-infective use (Supplementary table S6).

Figure 10: Comparison of anti-infectives for systemic use dispensed to contemporary ex-serving ADF members and the Australian population (age and sex-standardised), 2017-18



Note: Standardised to the Australian 2001 population, see [Methods](#) for more information.

Sources: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18 (Contemporary ex-serving population); AIHW analysis of Department of Health PBS and RPBS data, 2017-18 (Australian population).

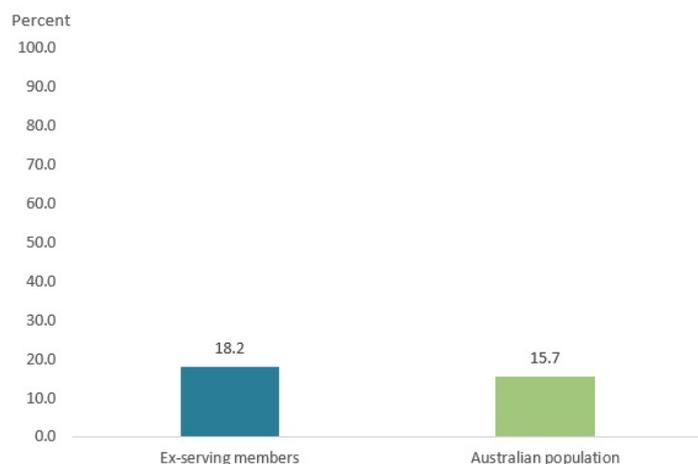
Musculo-skeletal medications

These medications are prescribed to treat conditions related to the muscles and skeleton including bones, joints and tendons. Medications in this class include anti-inflammatories and muscle relaxants.

Musculo-skeletal system medications were dispensed to 15% of all contemporary ex-serving members. After accounting for age and sex differences, the proportion of contemporary ex-serving ADF members dispensed a musculo-skeletal system medication was 18% compared with 16% in the Australian population (Figure 11 and Supplementary table S4).

The average number of dispensings for these medications was 3 dispensings per person for the contemporary ex-serving population, consistent with expected short term use of for acute conditions. As some medications used for musculo-skeletal conditions are available over-the-counter - for example, non-steroidal anti-inflammatory drugs (NSAIDs) - these numbers may underestimate the total use of medications in this category for both populations.

Figure 11: Comparison of musculo-skeletal system medications dispensed to contemporary ex-serving members and the Australian population (age and sex-standardised), 2017-18



Note: Standardised to the Australian 2001 population, see [Methods](#) for more information.

Sources: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18 (Contemporary ex-serving population); AIHW analysis of Department of Health PBS and RPBS data, 2017-18 (Australian population).

Overall 28% of contemporary DVA cardholders were dispensed at least one musculo-skeletal medication, 21% of concession cardholders and 10% of general beneficiaries. The most common medications in this category were non-steroidal anti-inflammatory drugs NSAIDs (ATC third level M01A), which were dispensed at least once to 24% of contemporary DVA cardholders, 17% of contemporary concession cardholders and 9% of contemporary general beneficiaries. After adjusting for age and sex, the proportion of the population dispensed NSAIDs was 15% for contemporary ex-serving ADF members and 12% for the Australian population.

Most frequently dispensed medication classes

The top ten most frequently dispensed medication classes to all contemporary ex-serving ADF members at ATC third level are presented in Table 3.

Table 3: Top ten medication classes most frequently dispensed to contemporary ex-serving ADF members in 2017-18 at third ATC level

	No. of medications dispensed	Avg no. per person	% of population dispensed at least 1	% of ex-serving population dispensed at least 1 (age-sex-standardised ^(a))	% of Aust. population dispensed at least 1 (age-sex-standardised ^(a))
Antidepressants (N06A)	163,195	9	16.7	19.7	14.6
Lipid modifying agents, plain (C10A)	93,313	9	9.4	10.8	12.8
Opioids (N02A)	83,614	5	16.4	17.2	15.2
Drugs for peptic ulcer and GORD (A02B)	76,654	6	11.4	15.0	14.8
Angiotensin II receptor blockers, plain (C09C)	36,999	9	4.0	4.8	6.1

Beta-lactam antibacterials, penicillin (J01C)	36,850	2	20.3	22.6	23.9
Non-steroidal anti-inflammatory drugs (NSAIDs) (M01A)	36,777	3	13.5	15.4	12.1
ACE inhibitors, plain (C09A)	36,688	8	4.1	5.0	5.3
Blood glucose lowering drugs (ex. insulin) (A10B)	35,674	10	3.2	3.3	5.3
Angiotensin II receptor blockers, combination (C09D)	27,968	10	2.7	3.2	4.2
Total dispensed 2017-18	1,072,731	16	64.4

(a) Standardised to 2001 Australian population.

Notes:

1. Contemporary ex-serving member does not refer to the entire ex-serving ADF population. It includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and discharged before 1 July 2017.
2. For 81 contemporary ex-serving members with a prescription in 2017-18, there were 1,678 prescriptions with insufficient information to assign them to an ex-serving cohort.
3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.
4. Average number per person is the number of dispensings for a particular medication class, divided by the number of individuals with a dispensing for the same medication class.

Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

References

WHOC (World Health Organization) Collaborating Centre) 2018. [ATC - Structure and principles](#). Oslo: WHO Collaborating Centre of Drug Statistics Methodology, Norwegian Institute of Public Health. Viewed 1 July 2019.

Costs for medications dispensed to contemporary ex-serving members

On this page:

- [Introduction](#)
- [Total costs](#)
- [Government costs](#)
- [DVA cardholders and the RPBS and PBS](#)
- [Safety nets in the PBS and RPBS](#)

This section provides information on the costs associated with medications dispensed to contemporary ex-serving members in 2017-18.

- **Total costs** are the sum of government and patient co-payment costs for dispensed medications.
- **Government costs** relate to the difference between the relevant patient co-payment amount and the total dispensed cost. Also referred to as the benefit amount.

Averages presented in this section are for members who were dispensed at least one medication in 2017-18. Averages for different medication classes are calculated only for members who were dispensed a medication in that medicine class. Averages presented for age and sex adjusted rates are the rate per person within each population. Costs include costs associated with either the PBS and/or RPBS.

PBS and RPBS costs in 2017-18

Data in this report include all valid medications dispensed under the PBS/RPBS (including medications dispensed that are under the co-payment amount, known as 'Under co-payment data'. PBS/RPBS co-payments and Safety Net Thresholds are updated on 1 January each year. Co-payment and Safety Net Thresholds for 1 January 2018 are as follows (for full details on fees, patient contributions and thresholds for both 2017 and 2018, see the [PBS website](#)):

- General co-payment = \$39.50, Safety Net Threshold = \$1,521.80, co-payment once safety net reached = \$6.40.
- Concessional co-payment = \$6.40, Safety Net Threshold = \$384.00, co-payment once safety net reached = \$0.
- Government contributions and co-payment amounts for DVA cardholders under the RPBS are the same as the concessional rates under the PBS, with eligibility depending on the type of DVA card and the entitlements available under that card, see this [fact sheet](#) for more information.

The following are some important notes to consider when interpreting information on costs in this report:

Given the different co-payment amounts for concessional (DVA cardholders and concession cardholders) and general beneficiaries, it is expected that a much higher proportion of general beneficiaries will be dispensed medications that are under the co-payment threshold.

As well as government contributions provided through either the PBS or RPBS, ex-serving ADF members also have access to a range of other programs through DVA. These programs provide further reimbursement of medication costs, thereby increasing the government costs. As information on these is not available, they are not included in this report.

Two programs worth noting in the context of this report are the [Medical Expenses Privately Incurred \(MEPI\)](#) and [Veterans Pharmaceutical Reimbursement Scheme \(VPRS\)](#).

Results presented in this report on costs for medications under the co-payment amount are an estimate of the price of that medication, see [Technical notes](#) for more details.

Discounts applied to medications within pharmacies are not included in these results, including any discretionary discounts of the patient co-payment by the pharmacy. Therefore, costs for under co-payment medications are most likely an over estimate—noting this will affect results for total costs only.

Some medications will incur a Brand or Therapeutic Premium, which is a cost incurred by the individual. These premiums are also not included in these results.

Total costs for medications dispensed to contemporary ex-serving members

In 2017-18, total costs for the 1 million medications dispensed to contemporary ex-members came to just over \$50 million, which was an average of \$728 per person and \$47 per dispensing (Table 4).

Accounting for age and sex differences, total costs for contemporary ex-serving members were \$586 per person in 2017-18 and \$666 per person in the Australian population (Supplementary table S1).

Half of all total costs for contemporary ex-serving members were for DVA cardholders (53%), followed by general beneficiaries (34%) and concession cardholders (13%). Reflecting the frequency of dispensings, the average total costs per person was highest for DVA cardholders (\$1,223 per person) and in particular for Gold cardholders, (\$2,006 per person).

Table 4: Total costs for PBS/RPBS medications dispensed to contemporary ex-serving ADF members in 2017-18

	Total costs (\$)	% total costs	Average Total \$ per person ^(a)	Average \$ per dispensing
DVA Gold cardholder	13,997,429	27.8	2,006	47
DVA White cardholder	12,737,162	25.3	856	45
Sub-total: All DVA cardholders	26,734,591	53.1	1,223	46
Concession cardholder	6,505,263	12.9	1,016	50
General beneficiary	17,081,663	33.9	418	48
All contemporary ex-serving members	50,376,759	100.0	728	47

(a) This is the average total cost per person. Total cost = government costs + patient costs.

Notes

1. Contemporary ex-serving member does not refer to the entire ex-serving ADF population. It includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time. The 69,177 members who received at least 1 dispensing in 2017-18 represented 64% of the total contemporary ex-serving population.
2. For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort.
3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.
4. Average cost per dispensing is the average cost of medications dispensed to contemporary ex-serving members in 2017-18.
5. Average cost per person is the average of contemporary ex-serving members who were dispensed a medication in 2017-18.

Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

Total costs for different medications classes

Due to the very high prices of certain medications relating to the treatment of cancer, highest total costs for medications dispensed to members in 2017-18 were for 'antineoplastics and immunomodulating agents'. Medications within this class accounted for 32% of total PBS/RPBS costs, but represented only 1.4% of all dispensings for contemporary ex-serving members in 2017-18 (Supplementary table S5) This pattern is consistent with age-matched results in the Australian population, with these drugs accounting for 27% of total PBS/RPBS costs, but representing only 1.5% of all dispensings.

Nervous system and cardiovascular system medications, which accounted for the largest proportion of dispensings for contemporary ex-serving members, accounted for 20% and 11% of total costs, respectively.

- Average total nervous system medication costs were \$294 per person for members dispensed a nervous system medication, and for cardiovascular system medications was \$290 per person for members dispensed a cardiovascular system medication.
- Antidepressants and opioids accounted for the two highest proportions of dispensings for Nervous System Medications. Total costs for these medication classes were \$170 per person and \$139 per person, respectively.
- Lipid modifying agents accounted for the highest proportion of dispensings for Cardiovascular system medications. Average total costs were \$185 per person.

After accounting for age and sex differences, average total costs for nervous system medications were \$99 per person in the contemporary ex-serving population and \$87 per person in the Australian population (Supplementary table S4), which is consistent with the rates of dispensing of nervous system medicines.

For cardiovascular system medications, total costs for the contemporary ex-serving population were \$67 per person in the contemporary ex-serving population and \$78 per person in the Australian population, adjusted for age and sex differences, which also reflects the rates of dispensing for these medication classes.

Government costs for medications dispensed to contemporary ex-serving members

In 2017-18, the costs met by Government for medications dispensed to contemporary ex-serving members under the PBS/RPBS was just over \$38 million. This was just over three-quarters (76%) of the total costs for all contemporary ex-serving members, and equated to an average of \$550 per person for the year (Supplementary table S9).

After accounting for age and sex differences, Government costs for the contemporary ex-serving population were \$447 per person for the contemporary ex-serving population and \$533 per person for the Australian population (Supplementary table S4).

Government costs for different medications classes

As with total costs, government costs were highest for 'Antineoplastics and immunomodulating agents', accounting for 41% of all government contributions to medications dispensed to ex-serving members in 2017-18.

Nervous system and cardiovascular system medications accounted for 17% and 7% of government contributions, respectively.

- Average government costs were \$190 per person dispensed a nervous system medication, and \$128 per person dispensed a cardiovascular system medication.
- Opioids and antidepressants had the highest volume of dispensing for nervous system medications. Average government costs for people dispensed these medications were \$94 per person and \$77 per person, respectively.
- Lipid modifying agents had the highest volume of dispensing for cardiovascular system medications. Average government costs were \$78 per person dispensed these medications (Supplementary table S8).

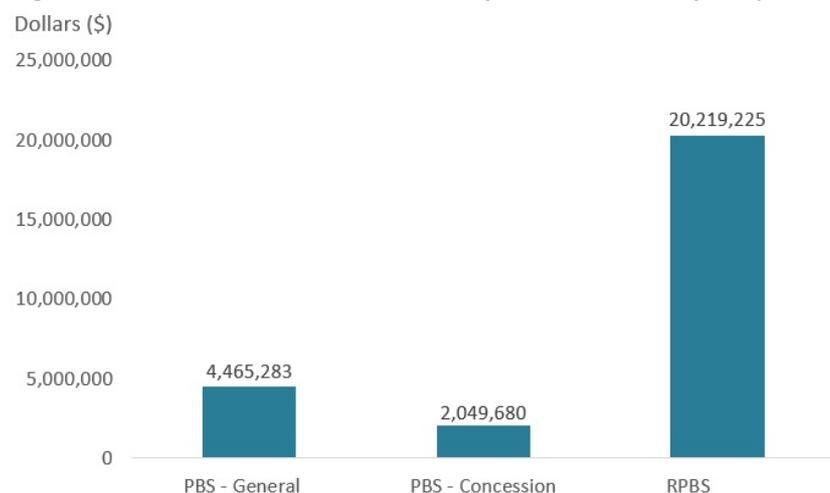
As with total costs, government costs for nervous system and cardiovascular system medications reflect the rate of dispensing for these medications in the contemporary ex-serving and Australian populations. After accounting for age and sex differences, average government costs for the contemporary ex-serving population were \$61 per person for nervous system medications and \$30 per person for the Australian population (Supplementary table S4). Government costs per person for cardiovascular system medications were \$33 per person in the ex-serving population and \$37 per person in the Australian population.

DVA cardholders and the RPBS and PBS

As mentioned [above](#), it is expected that DVA cardholders will have some dispensings provided under the PBS, rather than the RPBS. Government costs for dispensed medications come from both the RPBS (funded by the [Australian Department of Veterans' Affairs](#)) and the PBS (funded by the [Australian Department of Health](#)).

The majority of costs for contemporary ex-serving members were dispensed under the RPBS (see Figure 12 below).

Figure 12: Total costs for medications dispensed to contemporary DVA cardholders in 2017-18



Source: AIHW analysis of linked PMKeyS-PBS/RPBS data 2017-18.

Safety nets in the PBS and RPBS

Another form of government available under the PBS and RPBS is safety nets for patients and families who reach certain cost thresholds within a given year. Once an individual, or family reaches the safety net threshold in the year, their medication costs are further reduced.

For concession cardholders and general beneficiaries using the PBS, these thresholds are based on cost. For concession cardholders, the safety net threshold on 1 January 2018 was \$384. Once this threshold is reached, there are no further co-payment costs for concession cardholders. For general beneficiaries, the safety net threshold was \$1,521.80. Once this threshold is reached, the co-payment cost per medication is \$6.40 for general beneficiaries.

For RPBS users, safety net and co-payment thresholds were the same as for concession cardholders in the PBS.

In 2017-18, very small proportions of contemporary ex-serving members reached the safety net in 2017-18, less than 10% for each cohort, and less than 1% for general beneficiaries.

References

AIHW (Australian Institute of Health and Welfare) 2017. Medicines for cardiovascular disease. Canberra: AIHW.

DVA (Department of Veterans' Affairs) 2018. [Non-Liability Health Care](#). Canberra: DVA. Viewed 1 July 2019.





Interactive data - drug use, medication class and total costs



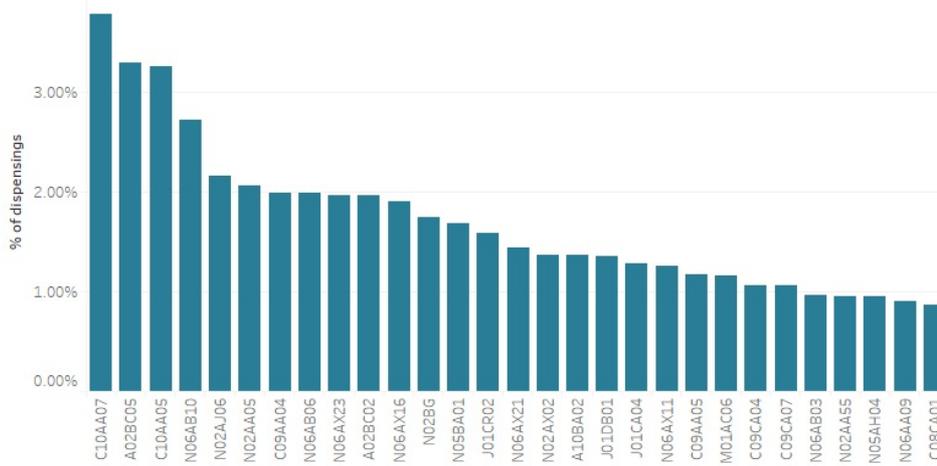
Interactive data - drug use, medication class and total costs

This data visualisation presents information about the frequency of dispensings for contemporary ex-serving ADF members in 2017-18. The columns of the graph show the percent of all dispensings, broken down by medications at the fifth ATC level (chemical substance). The percentage of all dispensings contributed by each medication class is shown when the cursor is placed over each column, along with the chemical substance name and other additional information. The graph can be adjusted to show results for subsets within the data by adjusting the filters located above the graph.

Drug Utilisation

ATC First Level: All | Ex-Serving Cohort: All | Gender: Persons | Age Group: All

Drug Utilisation for all ex-serving members of all ages for 2017-18



ATC Fifth Level (Top 20)	% of Total Scripts	Cumulative %	Script Count
A02BC05	3.29%	7.07%	35,285
N06AX23	1.97%	26.11%	21,110
N06AX21	1.44%	36.43%	15,415
N06AX16	1.91%	29.98%	20,448
N06AB10	2.72%	15.95%	29,130
N06AB06	1.98%	24.14%	21,262
N05BA01	1.68%	33.41%	17,996
N02BG	1.75%	31.73%	18,754

1. Contemporary ex-serving member includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time and before 1 July 2017. The 69,177 members who received at least 1 dispensing in 2017-18 represented 64% of the total contemporary ex-serving population.

2. For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort.

3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.

4. 31,271 pharmaceutical items were dispensed under the RPBS that are not listed on the PBS schedule. Detailed coding information is not available for these items and therefore are not included in breakdowns by medication class.

5. Coding information at the ATC 5 level for 'N02GB' is unavailable. However, medicines available within Australia that fall under this category are Pregabalin and Gabapentin, these drugs are listed for neuropathic pain within the PBS/RPBS.

Source: AIHW analysis of linked PMKeyS—PBS/RPBS data 2017-18
<http://www.aihw.gov.au>

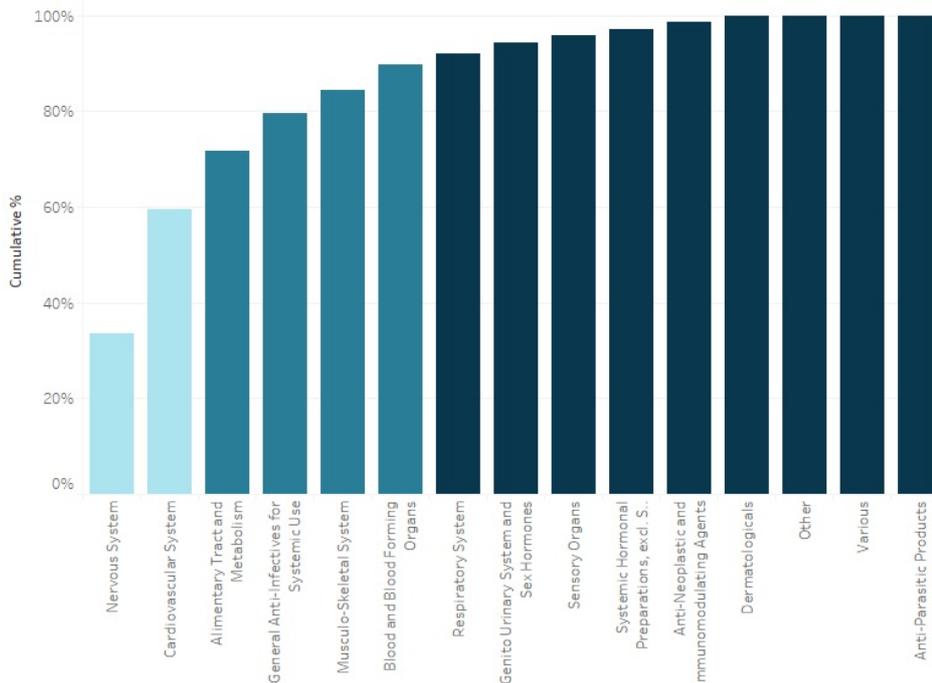
Interactive data - drug use, medication class and total costs

These data visualisations present cumulative percentages of all dispensings in 2017-2018 at the first ATC Level (anatomical level) and third ATC Level (pharmacological subgroup). Columns are coloured differently to highlight 0%-66% (A), 67%-89% (B) or 90%-100% (C) of all dispensings. The percentage of all dispensings contributed by each medication class is shown when the cursor is placed over each column, along with other additional information. The graph can be adjusted to show results for subsets within the data by adjusting the filters located above the graph. See [Glossary](#) for definitions of ATC1 and ATC3 codes.

ABC Analysis at ATC 1 Level

Ex-Serving Cohort: All
Gender: Persons
Age Group: All
ABC category:
A: 0-66%
B: 67-89%
C: 90-100%

ABC analysis of all ex-serving members of all ages in 2017-18



1. Contemporary ex-serving member includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time and before 1 July 2017. The 69,177 members who received at least 1 dispensing in 2017-18 represented 64% of the total contemporary ex-serving population.

2. For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort

3. Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.

4. 31,271 pharmaceutical items were dispensed under the RPBS that are not listed on the PBS schedule. Detailed coding information is not available for these items and therefore are not included in breakdowns by medication class.

Source: AIHW analysis of linked PMKeyS—PBS/RPBS data 2017-18

<http://www.aihw.gov.au>

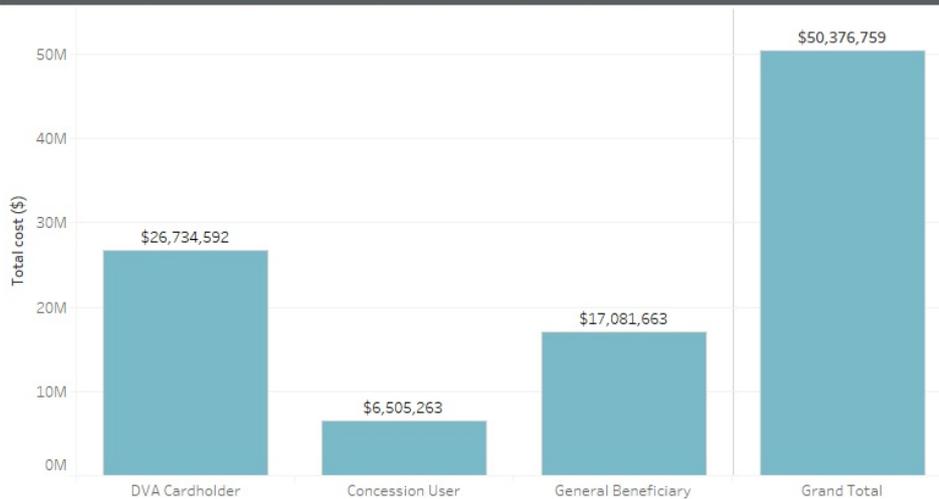
Interactive data - drug use, medication class and total costs

This data visualisation shows the total costs of pharmaceutical use in contemporary ex-serving members in 2017-18. Costs have been broken down into ex-serving cohorts and can be further broken down by ATC first level, gender and age group using the filters above the graph.

Total Costs of Ex-Serving Members Pharmaceutical Use in 2017-18

ATC First Level: All Gender: Persons Age Group: All

Medication total costs for all ex-serving members of all ages in 2017-18



Ex-Serving Cohort	Total Cost (\$)	Percentage of Total Cost
DVA Cardholder	\$26,734,592	53.07%
Concession User	\$6,505,263	12.91%
General Beneficiary	\$17,081,663	33.91%
Grand Total	\$50,376,759	100.00%

Notes:

- Contemporary ex-serving member includes only ex-serving ADF members with at least one day of full-time or reserve service on or after 1 January 2001, and were discharged after this time and before 1 July 2017. The 69,177 members who received at least 1 dispensing in 2017-18 represented 64% of the total contemporary ex-serving population.
- For 81 contemporary ex-serving members with a dispensing in 2017-18, there were 1,678 dispensings with insufficient information to assign them to an ex-serving cohort.
- Dispensings for DVA card holders may be for either the PBS or RPBS, this is particularly relevant for DVA White card holders.

Source: AIHW analysis of linked PMKeyS—PBS/RPBS data 2017-18
<http://www.aihw.gov.au>

Technical notes

- The scope of the study is restricted to ex-serving members with at least 1 day of service since 1 January 2001, who were discharged after 1 January 2001 and before 1 July 2017.
- The results for this report are restricted to PBS/RPBS dispensings between the period 1 July 2017 and 30 June 2018 (2017-18).
- A dispensing, or dispensed medication in this report refers to a pharmaceutical benefit dispensed under the PBS or RPBS.
 - DVA cardholders (White Cardholders especially), may have medications dispensed under both the RPBS and the PBS.
- For this report, information available on costs for dispensings under the co-payment threshold are derived on a theoretical value as listed in the Schedule. These are likely overestimates as any discounts to the costs of medications dispensed have not been applied within these data.
- Averages reported for government costs include dispensings that were under the co-payment threshold. Any dispensing that is under the co-payment threshold will have no associated government costs.
- The cohort for this study is contemporary ex-serving members with at least 1 day of service after 1 January 2001. DVA Orange Cardholders are out of scope for this study. Orange Cards are only available for World War 1 and World War 2 veterans, aged 70 and over who have been Australian residents for a minimum of 10 years.
- PBS/RPBS claims and under co-payment data excludes some programs subject to alternative arrangements (Section 100) where patient level details are not available, for example, direct supply of medications to [Remote Aboriginal Health Services](#)). Section 100 programs are established where distribution arrangements are considered appropriate. More details can be found on the [PBS website](#).
- The PBS/RPBS do not cover medicines supplied to public hospital in-patients, over-the-counter medicines or private dispensings.
- Due to the potential for differences in the types of medication used as a result of an individual's age and sex, caution should be used when making comparisons between different population groups, for example, between ex-serving cohorts, and between contemporary ex-serving members and the Australian population.
 - Results presented in this report for the Australian population have been age-sex standardised to account for these differences, see [Methods](#) for more information on how standardised rates have been calculated.
 - Similarly, results available in the accompanying interactive data visualisations and in the supplementary tables are stratified by age and sex to help understand any differences occurring at this level.
- PBS/RPBS data contain administrative information on medications dispensed according to medication type and name. The data do not contain information on clinical diagnoses.
- The PBS/RPBS does not capture data on prescriptions written by an authorised health professional that are not filled by the patient.
- The total number of dispensings includes repeats that have been supplied to the patient.
- As PBS/RPBS data refer to dispensed medications, it is not possible to determine how much of these pharmaceuticals were used. A person may use some, or all of their dispensed pharmaceuticals, or none at all.
- Some of the results are based on small numbers (fewer than 100 people), and caution should be taken when interpreting these findings, as results based on small numbers can be sensitive to small changes in numbers over time.
- Rates of pharmaceutical use for contemporary ex-serving members are calculated using the total number of ex-serving ADF members with at least one day of service since 2001 in the population as at 30 June 2017 who were alive and discharged from the ADF at this time.
 - Cohort specific rates calculated for DVA cardholders, other concession cardholders and general beneficiaries are based on estimates of the underlying populations for each of these groups, see [Methods](#) for more information.



Technical notes

PMKeyS data

The PMKeyS is a Department of Defence administrative database that contains demographic and service information on all people with ADF service on or after 1 January 2001 (when the system was introduced). The Department of Defence provided the AIHW with an extract from the PMKeyS containing 118,800 records of all ADF members who have had at least 1 day of service on or after 1 January 2001 and who were discharged after 1 January 2001.

PBS/RPBS data

The PBS and RPBS are national government-funded schemes designed to subsidise the cost of pharmaceutical medicines. The PBS is available to all Australian residents and overseas visitors covered by a reciprocal health-care agreement. The RPBS and its subsidies are available to DVA Gold or White card holders.

The linked PBS/RPBS dataset contained recorded medication dispensing to the PMKeyS cohort from April 2012 to December 2018, with dispensing below the co-payment threshold captured from April 2012. The data is recorded at the point of dispensing. Details such as the drug supplied, the conditions of supply and limited details on the patient, pharmacy and prescriber were provided in the dataset. The datasets were linked using an associated set of identifiers, the Medicare Enrolment File (MEF), which was only available for the PBS.

DVA client data

The DVA client database is an administrative database that contains demographic and service information on DVA clients. The extract received by the AIHW Data Linkage Unit, consisting of DVA veteran clients born on or after 1 January 1925 with at least one day of ADF service on or after 1 January 2001, contained 292,804 records. Only those who also had a record in the PMKeyS were included in the contemporary ADF population.

Technical notes

Contemporary ex-serving ADF population and cohorts

The contemporary ex-serving ADF population has been identified via linkage between the Defence held Personnel Management Key Solution (PMKeyS) data and Department of Veterans' Affairs (DVA) Clients data, see [Data linkage methodology and outcome](#) for details on linkage methods.

Imputation of underlying population for concession card holders

It is not possible to determine whether a person has a concession card under the PBS within the dataset used for this report. Therefore, a concession cardholder has been identified using an individual's dispensing information as a proxy. That is, if a person had any concessionary dispensings in the reporting year they were identified as a concession cardholder. However, this cannot be done for those contemporary ex-serving members who were not dispensed a medication in 2017-18. For these individuals, their information from 2016-17 has been used to impute the number of concession cardholders. Specifically, if a member had any concessionary dispensings in 2016-17, then in 2017-18 it is assumed they are still a concession cardholder and not a general beneficiary. Because these imputed records are for individuals with no dispensings in 2017-18, this imputation only applied to counts of underlying populations for concession card holders and general beneficiaries, **and as such, these counts are estimates** and a certain level of error based on this method is expected.

Rates calculations

In this report, rates have been calculated for both the contemporary ex-serving population and the Australian population. Both crude and age-sex standardised rates are calculated for the contemporary ex-serving population, and age-sex standardised rates are calculated for the Australian population.

Rates calculated for the contemporary ex-serving *members* in 2017-18 uses the contemporary ex-serving *population* as the denominator. That is, those members identified within the linked PMKeyS (Defence personnel data) and DVA client datasets who were discharged on or after 1 January 2001 and before 1 July 2017.

Rates calculated for the Australian population have use the December 2017 Australian estimated resident population (ERP) as the denominator (ABS 2018).

Age-standardised, and age-sex standardised rates have been calculated using the 2001 Australian standard populations (ABS 2018) as the weighting population. The December 2017 Australian ERP has been age-matched to the lower and upper age limits of the contemporary ex-serving population for standardised rates to make populations more comparable.

References

ABS (Australian Bureau of Statistics) 2018. [Australian Demographic Statistics, December 2017](#). ABS cat. no. 3101.0. Canberra: ABS. Viewed 27 September 2019.

Technical notes

Data linkage, also known as data integration, is a process that brings together information relating to an individual from more than one source. This web report utilised probabilistic linkage between three datasets: Defence-held Personnel Management Key System (PMKeyS) data, Department of Veterans' Affairs (DVA) Clients data set and the Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) - including Repatriation Pharmaceutical benefits Scheme (RPBS) data.

After undergoing data checking and cleaning, the PMKeyS and DVA client data set were linked using a probabilistic data linkage. They were matched by name, sex and date of birth. The linkage procedure involved creating record pairs - one from each data set - by running a series of passes that allow for variation in full name information and demographic data. A manual clerical review was conducted to manually examine the linkage data for proposed match pairs and decided whether to accept or reject the match. There were 47,685 links found in the PMKeyS-DVA linkage, representing 46,927 distinct PMKeyS cohort members (DVA clients), the difference were duplicate records in both datasets. Some links were missed due to postcodes and changed last names. Additional links were identified and verified by inspection which produced a total yield of 47,023 distinct PMKeyS cohort members linked to DVA data.

After linking to the Medicare Enrolments File and applying exclusionary criteria used in previous VHWU analysis, the final PMKeyS dataset had 117,801 ex-serving individuals with one day of service since 2001. The raw PBS/RPBS dataset contained 8,789,463 rows and linked to the PMKeyS cohort with any records no longer linked deleted from the data. The termination date from all PMKeyS individuals was also linked to the PBS/RPBS. The final PBS/RPBS dataset contained 7,027,860 dispensing records from 101,695 distinct individuals.

All data linking was carried out by the Data Linkage Unit at the AIHW - one of only three accredited Commonwealth Integrating Authorities. This accreditation requires the AIHW to adhere to stringent criteria and abide by the National Statistical Service High level principles for data integration involving Commonwealth data for statistical and research purposes and best practice guidelines. As well as operating within these guidelines, data linkage at the AIHW is carried out under the protections of the *Privacy Act 1988*, and the *Australian Institute of Health and Welfare Act 1987* (which carries additional privacy protections for companies and deceased people).

Strict separation of identifiable information and content data is maintained within the Data Linkage Unit in accordance with the AIHW linkage protocols, so that no one person will ever have access to both. Summary results from the linked data set are presented in aggregate format. Personal identifying information is not released and no individual can be identified in any reporting. The linked data set created for this study will be stored securely on site at the AIHW for 7 years.

Technical notes

The scope of the analysis dataset is ex-serving members with at least one day of service on or after 1 January 2001 (who were discharged after that time) who accessed the PBS/RPBS and received a dispensing of medication between 1 July 2017 and 30 June 2018.

Scoping of ex-serving population in the PMKeyS

The Department of Defence provided the AIHW with an extract from the PMKeyS containing 118,800 records of all ADF members who have had at least 1 day of service on or after 1 January 2001 and who were discharged after 1 January 2001.

This resulting augmented cohort with 154,052 records produced 121,969 links to the MEF, representing 118,540 linked PMKeyS cohort records, of a possible 118,880. Further duplicate processing yielded a person-level PMKeyS data set of 118,505 records. There, 704 records removed due to exclusionary criteria used in previous VHWU analysis. The final PMKeyS dataset had 117,801 ex-serving individuals with operational experience and one day of service since 2001.

Scoping of analysis population in the PBS

The raw PBS/RPBS dataset contained 8,789,463 rows and linked to the PMKeyS cohort with any records no longer linked deleted from the data. The termination date from all PMKeyS individuals was also linked to the PBS/RPBS. All records with a date of supply before the individual's termination date were deleted from the data set. The final PBS/RPBS dataset contained 7,027,860 dispensing records from 101,695 distinct individuals.

Technical notes

Data provided and created for this study are stored in accordance with AIHW information security protocols. No third parties (including DVA) have access to any identified linked data. Any data provided to DVA by the AIHW are in aggregated and de-identified form and stored in accordance with DVA's security processes and procedures.

Data stored and analysed at the AIHW are protected under the *Privacy Act 1988* and the *Australian Institute of Health and Welfare Act 1987*. The AIHW is subject to the *Public Service Act 1999* and the APS Code of Conduct. As well, it has issued formal Guidelines for the Custody of Institute Data as a further measure to ensure data protection.

The AIHW performs data linkage projects on a separate secure private network to which only Data Integration Services Centre (DISC) staff and the Systems Manager have access. Dedicated DISC infrastructure capabilities replicate the hardware already used with success on other large data integration projects across the AIHW. This environment is separate from any other AIHW systems. The AIHW connects, through the Intra Government Communications Network, to an Internet gateway provider accredited by the Australian Signals Directorate. The AIHW's Internet gateway is certified to the PROTECTED level. DISC projects are undertaken on a separate secure network not connected to the Internet.

The AIHW uses best practice technology, procedures and policies to protect its information and communication technology assets. A layered system of security is in place, with different technologies and techniques used at different levels. In line with the Australian Government Protective Security Policy Framework:

- passwords are changed regularly
- accounts are locked out after 3 failed attempts
- Operating System patching of desktops, networking equipment and servers is done in line with Australian Signals Directorate guidelines
- application software updates are tested and applied as soon as practical after release
- access to the data centre is controlled by swipe card
- the network has a state-of-the art firewall to protect against external intrusion, beyond which the accredited gateway has its firewalls
- anti-virus software is constantly updated
- regular backups are taken, including rotation to a secure off-site storage facility
- desktops have been hardened to prevent users from installing software or tampering with the system.

These security measures are backed up by an auditing regime, based around tightly controlled separate information domains (staging, linking, and consolidation domains) that exist for each stage of creating the project data. Each project in each information domain is in a separate storage location, with access limited by user (different users in different information domains for separation requirements).

This architecture determines who can access what data at any time, and access is therefore predetermined and logged. Work logs of basic user and time/date information are generated when code is run against these data and are stored as part of the audit trail.

In summary, access is provided to individuals for each stage of a project. This allows the AIHW to determine and log all access rights to the data throughout the process. At the completion of the project, and in line with the data retention date, the AIHW uses Delete (Microsoft) to remove all files relating to a project from the hard disk. In line with DISC data retention/backup cycle procedures, data are overwritten on a 4-weekly cycle. Data are encrypted as part of the archival process using Commvault.

Technical notes

This study is conducted under strict privacy guidelines and the oversight of organisational ethics committees.

Privacy principles

The *Privacy Act 1988* sets out 13 Australian Privacy Principles that govern agencies of the Australian Government in their collection, storage, use, disclosure and management of data containing personal information. The Privacy Act permits the handling of health information for health and medical research purposes in certain circumstances, where researchers are unable to seek individuals' consent. This recognises the need to protect health information from unexpected uses beyond individual health care as well as the important role of health and medical research in advancing public health.

The Privacy Commissioner has approved 2 sets of legally binding guidelines, issued by the [National Health and Medical Research Council](#). Researchers must follow these guidelines when handling health information for research purposes without individuals' consent. The guidelines also assist Human Research Ethics Committees (HRECs) in deciding whether to approve research applications. The guidelines are produced under sections 95 and 95A of the Privacy Act, detailing procedures that HRECs and researchers must follow when personal information is disclosed from an Australian Government agency for medical research purposes, and providing a framework for HRECs to assess proposals to handle health information for health and medical research (without individuals' consent). They ensure that the public interest in the research activities substantially outweighs the public interest in the protection of privacy.

Ethics approval

This study is conducted under strict privacy guidelines and the oversight of organisational ethics committees. This study was approved by the Departments of Defence and Veterans' Affairs Human Research Ethics Committee (DDVA HREC) on 28 March 2018 (042-18). It was approved by the AIHW Ethics Committee on 8 May 2018 (EO2017/5/411).

Glossary

Anatomical Therapeutic Classification (ATC)

The classification system, as maintained by the World Health Organisation (WHO) that classifies medications into five hierarchical levels, from the bodily system or organ the medication targets at the highest level, to the specific chemical substance at the lowest level. This allows analysis at varying levels of granularity.

The following definitions for groups in the 1st level were sourced and paraphrased from the WHOCC (2018), online Cambridge University dictionary (2019) and AIHW (2017).

A - Alimentary tract and metabolism - the structures and functions of the body that enable nutrition, digestion and excretion. Medications can include antacids, laxatives, anti-diabetic or anti-obesity drugs.

B - Blood and blood forming organs - includes the bone marrow and the spleen. Medications can treat diseases like anaemia by assisting in red blood cell formation, or haemorrhage with coagulation agents and blood substitution products.

C - Cardiovascular system - includes the heart and blood vessels that distribute blood carrying oxygen and nutrients to cells in the body to support physiological functions. Medications in this class are prescribed to treat conditions like hypertension, high cholesterol and angina (ischaemic heart disease).

D - Dermatologicals - medications to treat or prevent diseases that affect the skin, nails and hair, such as acne or allergic reactions.

G - Genito-urinary system and sex hormones - diseases and dysfunction of the sexual organs and urinary system. Medications can include hormonal contraception, fertility agents, hormonal replacement and agents to improve bladder control.

H - Systemic hormonal preparations, excluding sex hormones and insulins - medications relating to the hormones produced by the endocrine system which regulate metabolism, growth and development. Medications can include thyroid and pancreatic hormones.

J - Antiinfective for systemic use - medications to treat or prevent infections caused by microorganisms, and include antibacterials, antivirals and vaccines.

L - Antineoplastic and immunomodulating agents - these medications are used to treat malignant tumours and other cancers such as leukaemia and lymphoma. This includes chemotherapy and immunotherapy regimes.

M - Musculo-skeletal system - The musculoskeletal system provides form, support, stability and movement. Medications related to treating diseases of the muscles, skeleton and connective tissue include muscle relaxants and drugs to treat bone disease.

N - Nervous system - includes the brain and all the nerves in the body that make consciousness, cognition, feeling and movement possible. Medications in this class include anaesthetics, stimulants, antiepileptics, sedatives, antidepressants and antipsychotic medications.

P - Antiparasitic products, insecticides and repellents - medications which are used to treat or prevent infections from organisms that feed and live on or in humans.

R - Respiratory system - relating to the lungs and airways which enable the absorption of oxygen and the discharge of carbon dioxide. Medications that treat diseases of the respiratory system like asthma and emphysema include bronchodilators, steroids and decongestants.

S - Sensory organs - relating to the eyes and ears. Most of these medication are topical medications to treat infective and inflammatory conditions.

V - Various - medications can include allergens, diagnostic agents and surgical dressings.

After categorisation at the first level, medications are divided into their therapeutic subgroup at the 2nd level, and then into their pharmacological and chemical subgroup at 3rd and 4th level, respectively. At the 5th level they are categorised into their chemical substance. The following definitions are for 3rd level medications mentioned in this report.

Antidepressants – medication used relieve symptoms of depression and anxiety, and other conditions such as sleep disorders.

Lipid modifying agents, plain – medication used in the treatment of high levels of fats such as cholesterol in the blood.

Opioids – medication that acts on the nervous system primarily for pain relief.

Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD) – medication that reduces the amount of stomach acid that leaks into the oesophagus allowing ulcers to heal and preventing heartburn or gastrointestinal pain.

Angiotensin II receptor blockers, plain and combination – medication used to treat high blood pressure (hypertension) by dilating veins and arteries, and reducing the work of the heart.

Anti-inflammatory and antirheumatic products, non-steroids – medicines to treat arthritis and rheumatic conditions by reducing inflammation, joint swelling and stiffness.

Antibacterials, penicillins – antibiotic medications used to treat bacterial infections.

Ace inhibitors, plain – medications used to treat high blood pressure (hypertension), heart failure and other conditions by relaxing the blood vessels and reducing the work of the heart.

Blood glucose lowering drugs – medications used to treat diabetes by lowering the glucose level in the blood.

Immunosuppressants – medications used to suppress a person's immune response. They are used to prevent rejection of a transplanted organ and to treat autoimmune diseases such as rheumatoid arthritis.

Other antineoplastic agents – medications to prevent, inhibit or halt the development of a malignant tumour.

Concession Cardholder

Any contemporary ex-serving ADF member with at least one day of service since 2001, with a PBS dispensing recorded as 'Concession' in 2017-18, who has not held a DVA Gold Card or White Card since being discharged. It is not possible to determine the type of concession card an individual holds from the available data, however, concession cards available with the Australian population include:

- Pension Concession Cards
- Commonwealth Seniors Health Card
- Health Care Card.

Given the inability to identify directly if an individual has a concession card, individuals in the underlying population who had no dispensings in 2017-18 were identified via dispensing information for 2016-17. That is, if these individuals received a concessional dispensing in 2016-17, it is assumed they were still concession cardholders in 2017-18, see more detail in the methods section below.

Contemporary ex-serving ADF population

The contemporary ex-serving ADF population is defined as all ADF members who have had at least one day of full-time or reserve service on or after 1 January 2001, and discharged after this time.

Contemporary ex-serving cohort

Any of the three ex-serving member population groups created for analysis in this report:

- DVA Cardholder
- Concession Cardholder
- General Beneficiary.

Contemporary ex-serving member

For this report, a contemporary ex-serving member is an ex-serving ADF member who has had at least one day of full-time or reserve service on or after 1 January 2001, and discharged after this time, and who was dispensed a medication in 2017-18.

Dispensing/Medication dispensed

A dispensing for this report refers to the supply of a pharmaceutical benefit under the PBS or RPBS.

DVA Cardholder

Any contemporary ex-serving ADF member with at least one day of service since 2001, who has held a DVA Gold Card or White Card since being discharged.

General Beneficiary

Any contemporary ex-serving ADF member with at least one day of service since 2001, who received a 'General Beneficiary' dispensing in 2017-18 and who has not held a DVA Gold Card or White Card since being discharged, and not received a concessional dispensing in 2017-18.

Reporting period

The reporting period for the current study is the financial year between 1 July 2017 and 30 June 2018 (2017-18).



Data





Related material

Links & other information

- [PBS](#)
- [RPBS](#)
- [Veterans MATES](#)

Related topics

- [Medicines](#)
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