



**Australian Government**

**Australian Institute of  
Health and Welfare**

# **National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update**

PHE 222

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From 2001 to 2017, there were 419 suicides in serving, reserve and ex-serving Australian Defence Force (ADF) personnel who have served since 2001. Compared with Australian men, the age-adjusted rate of suicide over this period was 48% lower for men serving and in the reserves, and 18% higher for ex-serving men. Over the same period, the age-adjusted rate of suicide among ex-serving women was higher than that of Australian women.

## **Latest findings**

- In 2001–2017 there were 419 suicides in serving, reserve & ex-serving ADF personnel who have served since 2001
- In 2002–2017 the age-adjusted rate of suicide in serving and reserve men was 48% lower than in Australian men
- In 2002–2017 the age-adjusted rate of suicide in ex-serving women was higher than in Australian women
- In 2002–2017 the age-adjusted rate of suicide in ex-serving men was 18% higher than in Australian men

## Summary

There is ongoing concern within the Australian Defence Force (ADF) and the wider Australian community about suicide in serving and ex-serving ADF personnel. In particular, ex-serving ADF personnel may face [increased risk of suicide](#).

Recent government inquiries have highlighted the need to improve the integration of service responses to meet the health and wellbeing needs of serving and ex-serving ADF personnel (JSCFADT 2015). The need to invest in prevention and early intervention strategies to improve health and wellbeing outcomes for these groups has also been highlighted. The Government has introduced further suicide prevention and mental health support services for serving and ex-serving ADF personnel and their families (AG 2017).

In response to concerns about suicide amongst serving and ex-serving ADF personnel, the AIHW is commissioned by the Department of Veterans' Affairs (DVA) to report the number and rate of suicide deaths in three ADF service status groups—personnel serving full time, personnel serving in the reserves, and ex-serving personnel (see Box 1).

We acknowledge and pay our respects to those who have passed away, or been affected, by suicide. We are committed to ensuring our work continues to inform improvements in mental health, suicide awareness and prevention.

### What is in this report?

This online report *National suicide monitoring of serving and ex-serving Australian Defence Force personnel* provides annual updates to information on the level of suicide among serving and ex-serving ADF personnel with at least 1 day of ADF service since 2001 across three service status groups (Box 1).

#### Box 1: ADF service status groups

**Serving full time:** ADF personnel serving in a regular capacity in the Royal Australian Navy (Navy), Australian Army (Army) or the Royal Australian Air Force (Air Force) on or after 1 January 2001, on continuous full-time service, or participating in a gap year program.

**Reserve:** ADF personnel in the active or inactive reserve forces for the Navy, Army or the Air Force on or after 1 January 2001. Most personnel leaving full-time service transition to the inactive reserve forces, unless prevented by medical or other grounds.

**Ex-serving:** ADF personnel in the serving or reserve population on or after 1 January 2001, who were subsequently discharged.

This information is presented in two formats:

- **numbers** of suicides among the three ADF service status groups, in tables, for both men and women
- **comparisons of rates** of suicide across the three ADF service status groups and with the Australian population, in interactive graphs.

A brief summary of the latest information and analysis of results over time is provided for each of the service status groups. These different measures are provided to account for differences in the study population (Box 2).

## Box 2: Notes on the study population

While the size of the serving and reserve populations has remained relatively stable over the study period, the ex-serving population in this study started at zero (0) on 1 January 2001 and increases each year as more personnel are discharged. Changes in numbers of suicides over time need to be interpreted in the context of changes in the size of these populations.

The information in this report is based on fact of death information from the National Death Index (NDI), cause of death information from the National Mortality Database (NMD) and Defence Suicide Database (DSD), as well as information on the three ADF service status groups from Department of Defence personnel systems. For more detail, see Data sources.

The study includes ADF personnel with service on or after 1 January 2001, based on when the Department of Defence personnel system was introduced. Numbers of suicides are reported from 2001 onwards, based on the latest available cause of death data. Rates of suicide are reported from 2002 onwards, based on available population data for the three ADF service status groups. While some numbers of suicides can be reported on a yearly basis, 3-year rolling aggregations are used to report the more detailed information. Rates of suicide are reported in 3-year aggregations for 2007 onwards as changes to the Australian Bureau of Statistics (ABS) coding guidelines were applied for deaths registered from 1 January 2007 and comparable rates for prior years cannot be calculated.

This report is the second annual update to the ongoing monitoring of suicides in serving and ex-serving ADF personnel. The first detailed report, [Incidence of suicide in serving and ex-serving Australian Defence Force personnel: detailed analysis 2001-2015](#), was released in January 2018. The report examined the incidence of suicide among serving and ex-serving personnel and further identified characteristics that may be associated with suicide risk.

Each annual release will update previously published numbers of suicides to incorporate any updates to the source data. The 2019 online report updates numbers and measures of suicide published in the 2018 online report. These updates add more recently

National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update identified suicides, leading to small increases in some suicide rates. The main reasons for changes to previously published results are:

- a lag in cause of death information for the most recent year of data, where a death is registered in the following year
- revisions to cause of death data by the ABS
- improvements in information available to the study.

More detail on these reasons for changes to previously published information is provided in the Technical Notes.

## **National suicide monitoring of serving and ex-serving ADF personnel: measures**

The following measures are to be reported on annually:

### ***For the period from 1 January 2001 to the most recent year of available cause of death data:***

- The total annual numbers of suicides for men and women across the three ADF service status groups (combined).
- The total annual numbers of suicides for men and women in the serving and reserve populations (combined).
- The total annual numbers of suicides for men and women (combined) in the ex-serving population.

### ***For 3-year periods, from 2001–2003 to the most recent 3-year period:***

- Numbers of suicide deaths for:
  - all ADF personnel (for men and women across the three ADF service status groups combined)
  - ADF personnel by ADF service status group (for men and women combined)
  - all ADF women (for the three ADF service status groups combined)
  - all ADF personnel under 30 years of age (for men and women across the three ADF service status groups combined)
  - ex-serving personnel under 30 years of age (for men and women combined).

### ***For the period from 2002 to the most recent year of available cause of death data:***

- Standardised Mortality Ratios (SMRs) comparing rates of suicide for men in each of the three ADF service status groups with rates for men in the Australian population, adjusted for age.

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- An SMR comparing rates of suicide for ex-serving women with rates for women in the Australian population, adjusted for age.

***For 3-year periods, from 2007–2009 to the most recent 3-year period:***

- Suicide rates for the three ADF service status groups (men only), with comparison to rates for all Australian men of the same age.
- SMRs comparing rates of suicide for men in each of the three ADF service status groups with rates for men in the Australian population, adjusted for age.
- Age-specific suicide rates for ex-serving men aged under 30 and those aged 30 years and over, with comparisons to the rates for Australian men of the same age.

Important factors to consider when reading this report are outlined in Box 3.

### **Box 3: Factors to consider when reading this report**

The reported suicide data are calculated from certified deaths information only; that is, official cause of death information recorded by the Registrars of Births, Deaths and Marriages in each state and territory and the National Coronial Information System.

Within Australia, cause of death information is coded by the ABS. Practices and guidelines for coding intentional self-harm (suicide) have changed over time. These changes have improved the data quality for suicides recorded in Australia. For these reasons, the key measures in this report are presented from 2007 onwards. See the Technical Notes for further details of these changes.

This study may exclude an unknown number of deaths suspected to be suicides and attributed to another cause after a coroner's investigation.

Deaths data included in this report, or previously published, may be based on preliminary or revised data and as such are subject to further revision. See the Technical Notes for further information on ABS cause of death revisions.

This report uses data from the NDI to identify fact of death, supplemented with cause of death information from the NMD. Analysis of the NMD for all Australian deaths shows a lag in the reporting of cause of death information for a small percentage of all deaths for the most recent year of published data. As such the most recent year of published data in this report is subjected to additional revision in the following year. These revisions may identify additional suicide deaths.

Differences between the results of this study and other publicly reported estimates may be due to the study scope and/or the source of cause of death information.

The data presented here cannot be used to estimate the number of suicides among people who left the ADF before 1 January 2001 and cannot be extrapolated to the broader ex-serving population. As only certain administrative information about individuals was available in the Defence Personnel Management Key Solution (PMKeyS) data used in this study, it was not possible to account for the wide range of social, demographic and psychological factors that may contribute to suicide risk.

Some results are based on low numbers. Rates produced using low numbers can be sensitive to small changes in numbers of deaths over time.

Confidence intervals are presented in this report to reflect uncertainty in the suicide rates calculated for the three ADF service status groups and the Australian population. Confidence intervals provide one way to assess the randomness that may occur in suicides over time and are presented for each time point (3-year rolling aggregations). As time passes and more data become available, greater confidence can be attached to any differences in outcomes between the ADF population and the comparable Australian population.

See the Technical Notes for more information.

**If you need help or support, please contact:**

Open Arms - Veterans and Families Counselling **1800 011 046**, or <[www.openarms.gov.au](http://www.openarms.gov.au)>

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

Operation Life Online <<http://at-ease.dva.gov.au/suicideprevention>>

Lifeline **13 11 14**, or <[www.lifeline.org.au](http://www.lifeline.org.au)>

Suicide Call Back Service **1300 659 467**, or <<https://www.suicidecallbackservice.org.au>>

Beyondblue Support Service **1300 22 4636**, or <[www.beyondblue.org.au](http://www.beyondblue.org.au)>

**For information on support provided by DVA see:**

<<https://www.dva.gov.au/health-and-wellbeing/mental-health>>

<<https://www.dva.gov.au/factsheet-hsv99-mental-health-support>>

## References

- JSCFADT (Joint Standing Committee on Foreign Affairs Defence and Trade) 2015. Review of the Defence Annual Report 2013-14. Canberra: Joint Standing Committee on Foreign Affairs, Defence and Trade.
- AG (Australian Government) 2017. Australian Government response to the Foreign Affairs, Defence and Trade Committee Report: The constant battle: suicide by Veterans. Tabled by the Minister for Veterans' Affairs.

## **Numbers of suicides 2001 to 2017**

Each annual release of this report will update previously published numbers of suicides, where updates have been made to the source data. Updates to these numbers may have an impact on the rates and ratios used for comparison to the broader Australian population, which are calculated using counts of suicide.

For information on interpreting these results, including updates to previously published data, see Box 3 and the Technical Notes.

### **Numbers of suicides by year (men and women)**

From 2001 to 2017 there were 419 certified suicide deaths among men and women with at least 1 day of Australian Defence Force (ADF) service since 1 January 2001. Of these, 229 (55%) occurred among ex-serving personnel (Table 1).

From 2001 to 2017, the ex-serving population increased each year as more discharged personnel were added to that population. Changes in numbers of suicides over time need to be interpreted in the context of changes in the size of the population (particularly the increases in the size of the ex-serving group over the analysis period).

**Table 1. Number of suicide deaths, ADF service status groups, male and female, 2001 to 2017**

<b>Year</b>	<b>Serving and Reserve<sup>(a)</sup></b>	<b>Ex-serving<sup>(b)</sup></b>	<b>Total<sup>(c)</sup></b>
2001	n.p.	n.p.	19
2002	n.p.	n.p.	15
2003	8	10	18
2004	n.p.	n.p.	15
2005	n.p.	n.p.	9
2006 <sup>(d)</sup>	7	6	13
2007 <sup>(e)</sup>	11	9	20
2008	9	11	20
2009	13	13	26
2010	13	14	27
2011	11	13	24
2012	7	17	24
2013	12	22	34
2014	12	20	32
2015	9	32	41
2016	15	25	40
2017	15	27	42

n.p. Not published because of small numbers or confidentiality.

(a) Consists of suicide deaths in men and women for serving and reserve ADF personnel.

(b) Consists of suicide deaths in men and women for ex-serving ADF personnel.

(c) Consists of suicide deaths in men and women, for all ADF status groups combined (serving, reserve and ex-serving personnel).

(d) From 2006 onwards, the ABS implemented a revisions process for coroner-certified deaths (such as suicides). This improved data quality by enabling additional suicide deaths to be identified beyond initial processing (ABS 2018). For detailed information see Technical Notes.

(e) New ABS coding guidelines were applied for deaths registered from 1 January 2007. The new guidelines improve data quality by enabling deaths to be coded to suicide by ABS mortality coders if evidence indicates the death was from intentional self-harm (ABS 2018). For detailed information see Technical Notes.

*Note:* The ex-serving population increased each year in the study period (2001–2017), as more personnel were discharged from the ADF.

*Source:* AIHW analysis of linked PMKeyS-NDI data 2001–2017.



## **Number of suicides by service status: 3-year aggregation (men and women)**

For confidentiality reasons relating to small numbers, total numbers of suicides are reported in 3-year rolling aggregations from 2001. Aggregation allows for reporting of a greater level of detail than is possible when reporting in single years (Table 2).

From 2001 to 2017, the ex-serving population increased each year as more discharged personnel were added to that population. Changes in numbers of suicides over time need to be interpreted in the context of changes in the size of the population (particularly the increases in the size of the ex-serving group over the analysis period). Suicide deaths recorded in any year will contribute to multiple rows in Table 2. As such, the sum of any column will be greater than the total number of suicide deaths recorded for that service group over the study period 2001 to 2017.

**Table 2. Number of suicide deaths, ADF service status groups, male and female by 3-year aggregations, 2001–2003 to 2015–2017**

Years	Serving <sup>(a)</sup>	Reserve <sup>(a)</sup>	Ex-serving <sup>(a)</sup>	Women	Under 30: All service groups	Under 30: Ex-serving	Total <sup>(a)</sup>
2001-03	27	13	12	n.p.	31	8	52
2002-04	22	12	14	n.p.	24	8	48
2003-05	16	8	18	n.p.	25	12	42
2004-06 <sup>(b)</sup>	13	10	14	n.p.	17	7	37
2005-07 <sup>(b)(c)</sup>	10	12	20	n.p.	22	11	42
2006-08 <sup>(b)(c)</sup>	12	15	26	n.p.	23	10	53
2007-09 <sup>(c)</sup>	15	18	33	n.p.	26	11	66
2008-10	17	18	38	n.p.	25	13	73
2009-11	22	15	40	5	28	14	77
2010-12	18	13	44	n.p.	25	14	75
2011-13	16	14	52	9	28	17	82
2012-14	13	18	59	8	31	20	90
2013-15	18	15	74	10	35	24	107
2014-16	21	15	77	10	36	20	113
2015-17	27	12	84	11	33	17	123

n.p. Not published because of small numbers or confidentiality.

(a) From 2006 onwards, the ABS implemented a revisions process for coroner-certified deaths (such as suicides). This improved data quality by enabling additional suicide deaths to be identified beyond initial processing (ABS 2018). For detailed information see [Technical Notes](#).

(b) New ABS coding guidelines were applied for deaths registered from 1 January 2007. The new guidelines improve data quality by enabling deaths to be coded to suicide by ABS mortality coders if evidence indicates the death was from intentional self-harm (ABS 2018). For detailed information see [Technical Notes](#).

*Notes*

1. For privacy reasons, numbers of suicides for individual service status groups by year are not published. This table presents suicide deaths by 3-year aggregation, so suicide deaths recorded in any year will contribute to multiple rows in the table. As such, the sum of any column will be greater than the total number of suicide deaths recorded for that service group over the study period 2001 to 2017.
2. The ex-serving population increased each year in the study period (2001–2017), as personnel discharged from the ADF.

Source: AIHW analysis of linked PMKeyS—NDI data 2001–2017.

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**For information on support provided by DVA see:**

<<https://www.dva.gov.au/health-and-wellbeing/mental-health>>

<<https://www.dva.gov.au/factsheet-hsv99-mental-health-support>>

## References

- ABS (Australian Bureau of Statistics) 2018. Causes of death, Australia, 2017. Explanatory notes. ABS cat. no. 3303.0. Canberra: ABS. Viewed 11 June 2019, <<https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Explanatory%20Notes12017?OpenDocument>>.

## Comparing suicide rates 2002 to 2017

There are differences between the demographic profiles of the three Australian Defence Force (ADF) service status groups and the Australian population (Box 4). Because of these differences, comparisons of numbers of suicides between the ADF service status groups and the Australian population are not straightforward. To assist in making comparisons, this report presents rates of suicide and Standardised Mortality Ratios (SMRs).

### Box 4: Differences between the ADF and Australian populations

The age and sex profiles of the ADF service status groups and the Australian population differ. The comparative Australian population is older on average and around 50% male, while the ADF service status groups are younger and around 85% male. These age and sex differences need to be accounted for when examining differences in suicide levels between these populations.

Further, the annual population size for each of the service status groups differs. While the serving and reserve populations are relatively stable over time, the ex-serving population in this study started at zero (0) on 1 January 2001 and increases each year as personnel discharge. Unlike the serving and reserve populations, the ex-serving population is also ageing over time.

Suicide rates complement information on the number of suicide deaths by taking into account the size of the underlying population, to provide information on how often suicide death occurs in that population.

This report uses SMRs to control for the difference in age structures between the three ADF service status groups and its equivalent comparison (Australian) population. SMRs are presented as comparisons of age-adjusted rates.

Distinct comparison populations were used for each ADF service status group. Lower and upper ages were defined by ages observed within each ADF service status group.

Data for 2001 are not included in the calculation of rates in this report, as data for the serving and reserve populations were not available before 2002 due to a change in Defence personnel management systems at that time. Analysis of ex-serving personnel was restricted to data from 2002 onwards, in line with reporting for serving and reserve groups. For information on interpreting these results, including changes to previously published data, see Box 3 and the Technical Notes.

### Analysis 2002 to 2017

Suicide rates were calculated for the period 2002 to 2017 for each service group. These rates can be validly compared with each other and can be compared with rates for the Australian population. Due to the small number of suicide deaths among women across

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the ADF service status groups it was only possible to present the suicide rate for ex-serving women. The suicide rates for 2002-2017 are shown in Table 3.

**Table 3. Suicide rates for 2002-2017, ADF service groups, men and women**

Service Group	Suicide Rate for Men (per 100,000 population)	Suicide Rate for Women (per 100,000 population)
Serving	12	n.p.
Reserve	12	n.p.
Ex-serving	27	15

n.p. Not published because of small numbers, confidentiality or other concerns about the quality of the data. *Source:* AIHW analysis of linked PMKeyS—NDI data 2001–2017.

SMRs were also calculated for the period 2002-2017 to control for differences in age distributions between the ADF and Australian populations. For more information about SMRs see **Age-adjusted suicide measures (standardised mortality ratios) by service status (men)**.

The age-adjusted rate of suicide, when compared to the Australian population was:

- 48% lower for serving men, SMR = 0.52 (95% CI = 0.42-0.64)
- 48% lower for men in the reserves, SMR = 0.52 (95% CI = 0.41-0.66)
- 18% higher for ex-serving men, SMR = 1.18 (95% CI = 1.02-1.35)
- 115% (or 2.15 times) higher for ex-serving women, SMR = 2.15 (95% CI = 1.33-3.29).

These differences were all found to be statistically significant.

Unlike suicide rates, these SMRs cannot be used to compare suicide rates between service groups or across time.

## Suicide rate for females

While the number of women in the ADF is increasing, it has historically been low. The size of the contemporary female ex-serving cohort is increasing each year, with the number reaching 16,366 in 2017. Each year of data adds to the confidence in the results for female ex-serving ADF personnel. For this reason, suicide information for ex-serving females is reported for the first time in this report.

In the period 2001-2017, there were 21 suicide deaths among ex-serving females.

The suicide rate for ex-serving females in 2002-2017 was 15 per 100,000 compared with 27 per 100,000 for males as shown in Table 3.

The age-adjusted rate of suicide for ex-serving females, when compared to the Australian population was 115% (or 2.15 times) higher for ex-serving women, SMR = 2.15 (95% CI = 1.33-3.29).

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This difference was statistically significant. Confidence intervals (CI) provide one way to assess the randomness that may occur in the number of suicides over time. The wider confidence interval for the female ex-serving SMR reflects the higher degree of potential variability compared to the male results. More information on confidence intervals is provided in the Technical Notes section.

For privacy and statistical reasons relating to the small number of women in the study, suicide rates and SMRs for serving and reserve women and SMRs for ex-serving women by 3-year periods are not reported.

## **Analysis by period 2007 to 2017**

### **Rate of suicide by service status (men)**

Observed rates for the three ADF service status groups are presented in this section. They can be validly compared with each other and over time, and can be compared with rates for the Australian population.

*Description:* This section reports the observed suicide rates for men in the three ADF service status groups, for 3-year rolling aggregations from 2007 to 2017. Comparisons are made between rates for men in each of the service status groups and to rates for Australian men in the same age range.

While the proportion of women in the ADF is increasing, the number of women serving in the ADF has historically been low, and for privacy and statistical reasons, only limited rates for ADF women have been reported. For further information on interpreting this measure, see Technical Notes.

Results based on cause of death information that is not final are subject to greater change than those based on final cause of death information. However, estimates for all periods are subject to change as improvements to the underlying data are incorporated.

For the 3 year rolling aggregations from 2007 to 2017, the rate of suicide among:

- serving men was between 8 and 18 per 100,000 population
- men in the reserves was between 10 and 15 per 100,000 population
- ex-serving men was between 25 and 33 per 100,000 population.

Significance testing using confidence intervals (CIs) has been used to examine the differences between groups. See Technical Notes and Data tables for more detail.

Over the study period, the suicide rate among serving men was consistently lower than the rate for Australian men in the same age range. This difference was found to be statistically significant for each 3-year period up to and including 2014–2016.

For men in the reserves, the suicide rate was consistently lower than the rate for Australian men over the study period. This difference was found to be statistically significant for the most recent 3-year periods from 2013–2015 to 2015–2017.

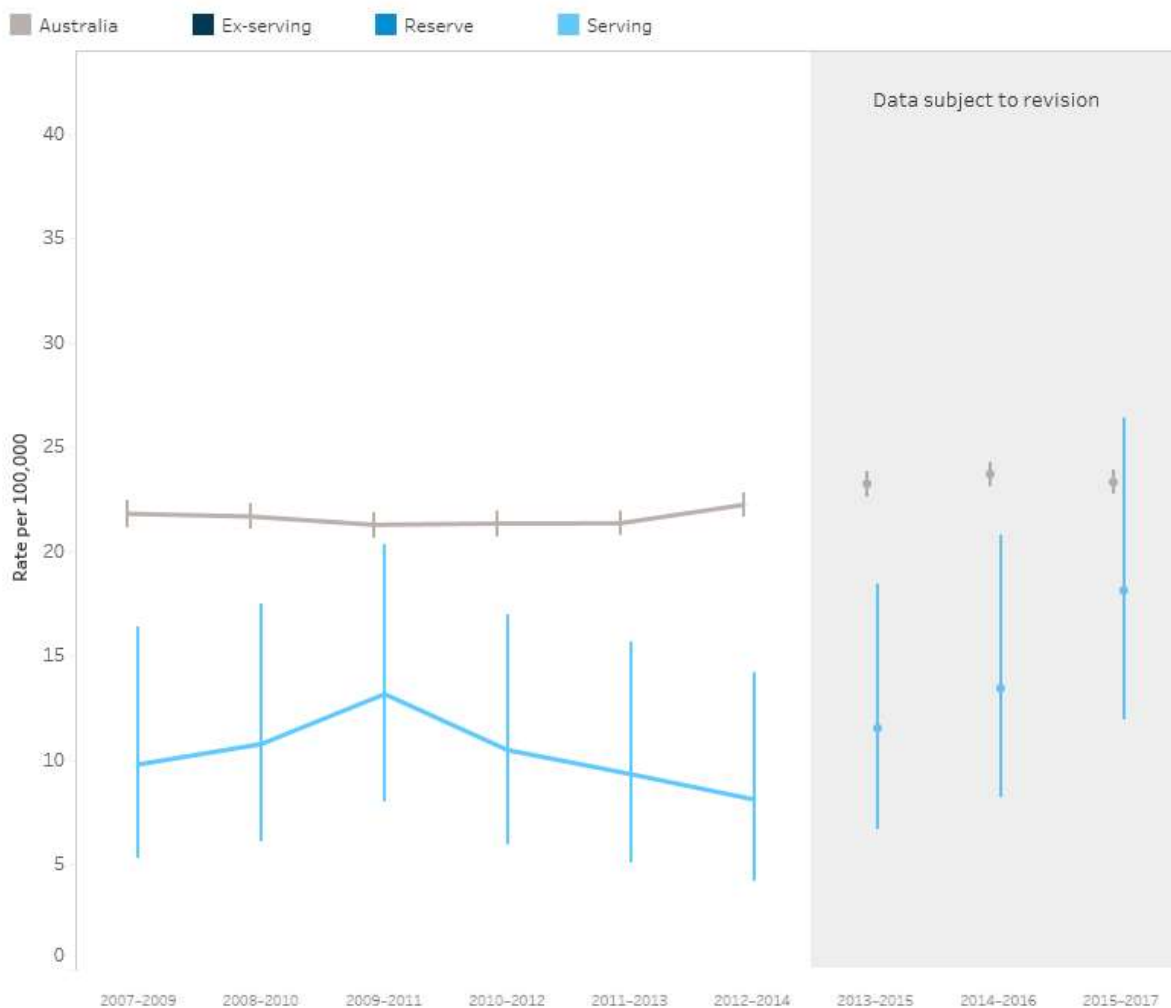
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For ex-serving men, the suicide rate was consistently higher than that for men in the Australian population. This difference was found to be significantly higher for the 3-year period 2013–2015 and the subsequent 3-year period 2014–2016.

The interactive graph below presents the suicide rates for men in each of the three ADF service status groups and the rates for the comparative population of Australian men, for all 3-year periods from 2007-2009 to 2015-2017.

*Please note: The graph below is an image of an interactive graph available in the online version of this report. See Appendix for other data selections available for rates of suicide.*

### Serving and Australia suicide rate by 3 year aggregate



Source: AIHW analysis of linked PMKeyS-NDI data 2001–2017; NMD 2007–2017.

Data underlying this graph are available in Supplementary tables S1.1 to S1.3. See Data for a link to the tables. Please note, data are subject to change: see Technical Notes for further detail.

## **Age-adjusted suicide measures (standardised mortality ratios) by service status (men)**

This report uses SMRs to control for the difference in age structures between the three ADF service status groups and their equivalent comparison (Australian) population. SMRs for men are presented by service status, for 3-year periods from 2007 to 2017.

*Description:* SMRs provide a comparison of suicide rates between two populations, while controlling for differences in age distributions. SMRs greater than 1.0 indicate age and sex-specific rates are higher in the ADF population than those in the Australian population; and SMRs less than 1.0 indicate lower rates in the ADF population. SMRs are presented as comparisons of age-adjusted rates.

SMRs cannot be compared with each other, because different weighting is used to generate each result.

While the proportion of women in the ADF is increasing, the number of women serving in the ADF has historically been low, and for privacy and statistical reasons, only the suicide rate and SMR for ex-serving women for the period 2002–2017 has been reported.

For further information on interpreting this measure, see Technical Notes. Results based on cause of death information that is not final are subject to greater change than those based on final cause of death information. However, estimates for all periods are subject to change as improvements to the underlying data are incorporated.

The age-adjusted suicide rate among ex-serving men was consistently higher than in men in the Australian population over the whole study period. A significant difference was observed in the 3-year period 2013–2015 (see Data tables for more detail). When compared with the rate for Australian men, the age-adjusted rate for ex-serving men was between 14% higher (SMR = 1.14) in 2009–2011 and 36% higher (SMR = 1.36) in 2013–2015.

After adjusting for age, the suicide rate for men in the reserves was consistently lower than the Australian population. When tested, this difference was found to be statistically significant in each 3-year period from 2009–2011 to 2015–2017. When compared with rates for Australian men, the age-adjusted suicide rate among men in the reserves ranged from 32% lower (SMR=0.68) in 2007–2009 to 55% lower (SMR=0.45) in 2013–2015 and 2015–2017.

After adjusting for age, the suicide rate for serving men was consistently lower when compared with rates for Australian men in each 3-year period between 2007–2009 and 2015–2017. The age-adjusted suicide rate for serving men was found to be significantly lower than rates for Australian men in each 3-year period from 2007–2009 to 2014–2016. When compared to rates for Australian men, the age-adjusted suicide rate for serving men ranged between 63% lower (SMR=0.37) in 2012–2014 and 24% lower (SMR=0.76) in 2015–2017.

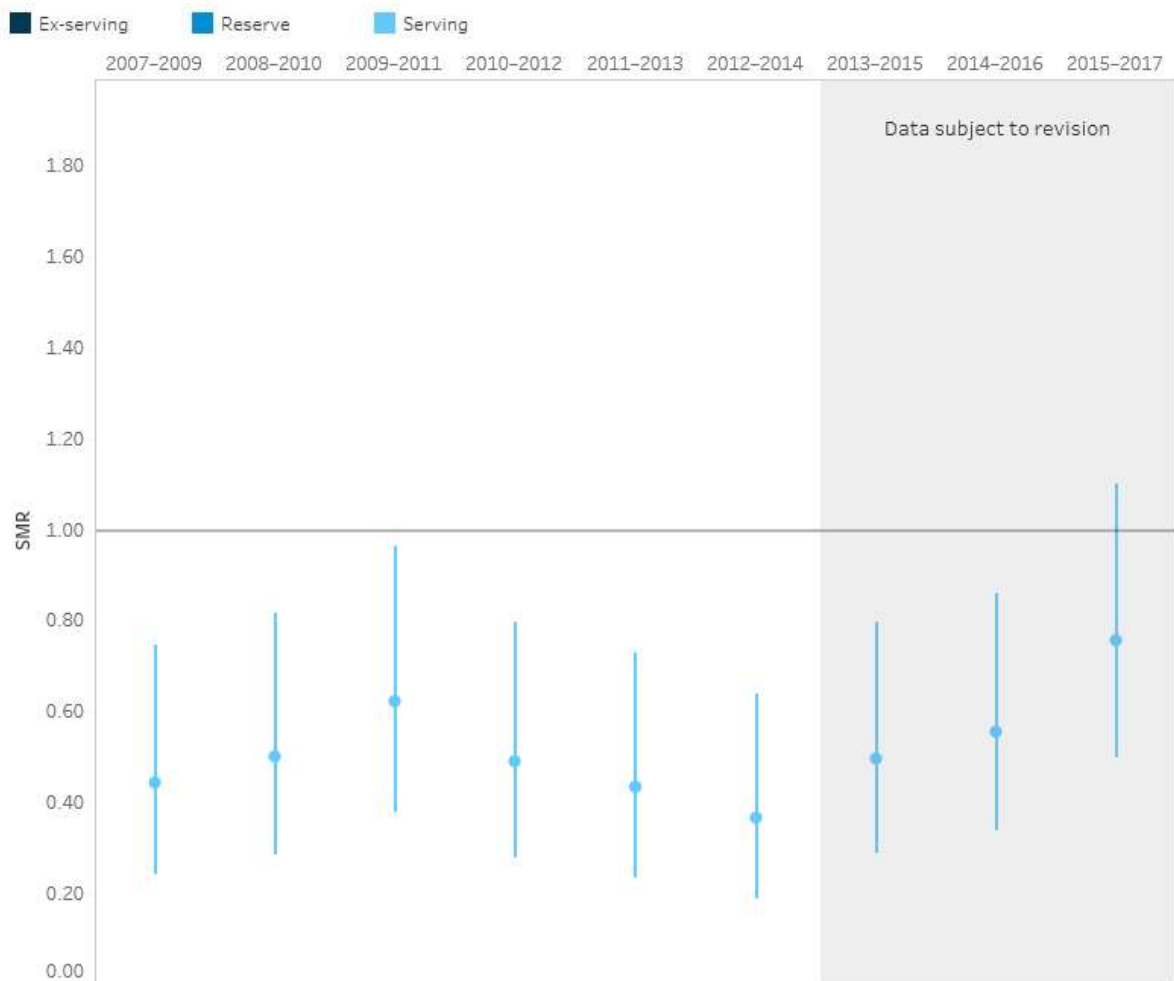


National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update

The SMRs for men in each ADF service status group between 2007–2009 and 2015–2017 are presented in the interactive graph below. Select an ADF service group from the menu to display its SMR.

*Please note: The graph below is an image of an interactive graph available in the online version of this report. See Appendix for other data selections available for rates of suicide.*

### Standardised mortality ratio by 3 year aggregate, Serving (men)



Source: AIHW analysis of linked PMKeyS-NDI data 2001–2017; NMD 2007–2017.

Data underlying this graph are available in Supplementary tables S2.2 to S2.4. See Data for a link to the tables.

Please note, data are subject to change: see Technical Notes for further detail.

## **Suicide rates by age (ex-serving men, aged under 30 and aged 30 years and over)**

*Description:* This section presents suicide rates per 100,000 population for ex-serving men aged under 30 and those aged 30 years and over, for 3-year periods from 2007 to 2017. Comparisons are made to rates for men in the same age range in the Australian population.

While the proportion of women in the ADF is increasing, the number of women serving in the ADF has historically been low, and for privacy and statistical reasons, suicide rates for ADF women are not reported. For further information on interpreting this measure, see Technical Notes.

Results based on cause of death information that is not final are subject to greater change than those based on final cause of death information. However, estimates for all periods are subject to change as improvements to the underlying data are incorporated.

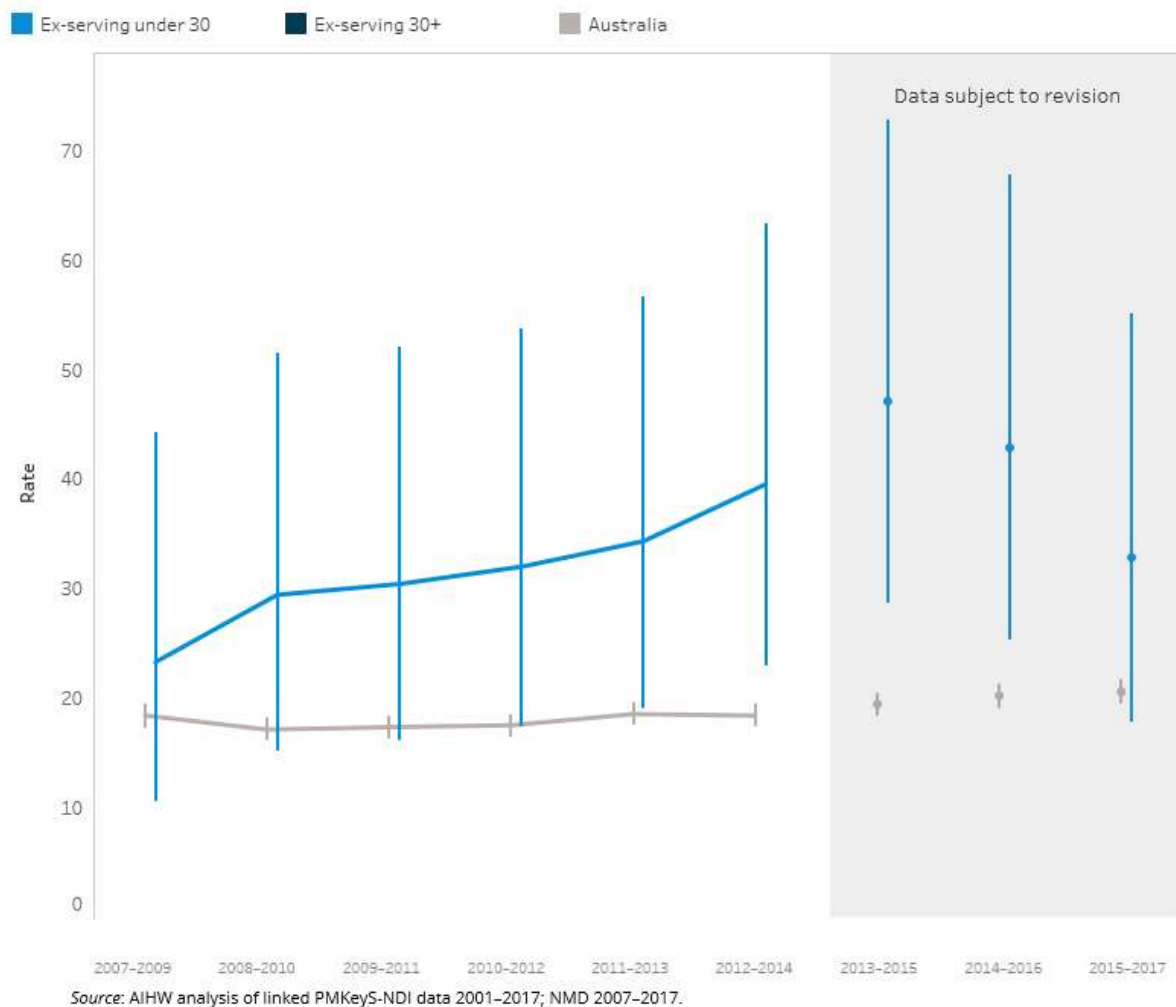
From 2007–2009 to 2015–2017 the suicide rate for ex-serving men aged under 30 was consistently higher than that for men in the same age range in the Australian population. When tested, the difference was significant from 2012–2014 to 2014–2016. The suicide rate for ex-serving men aged under 30 was 23 per 100,000 at the start of the study period and 47 per 100,000 in 2013–2015. The rate for all Australian men under 30 was between 17 and 21 per 100,000 over the study period.

The suicide rate for ex-serving men aged 30 years and over ranged between 23 and 29 per 100,000 population over the study period. During this time, there was no evidence of a difference in suicide rates between ex-serving men aged 30 and over and men in the same age range in the Australian population.

The suicide rate for ex-serving men, by age, is compared with the rate for Australian men in the same age range in the interactive graph below. Select an age group from the menu to display the comparison.

*Please note: The graph below is an image of an interactive graph available in the online version of this report. See Appendix for other data selections available for rates of suicide.*

## Suicide rates by age and 3 year aggregate, Under 30 Ex-serving and Australia (men)



Data underlying this graph are available in Supplementary tables S3.1 and S3.2. See Data for a link to the tables.

Please note, data are subject to change: see Technical Notes for further detail.

### If you need help or support, please contact:

Open Arms - Veterans and Families Counselling **1800 011 046**, or <[www.openarms.gov.au](http://www.openarms.gov.au)>

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

Operation Life Online <<http://at-ease.dva.gov.au/suicideprevention>>

Lifeline **13 11 14**, or <[www.lifeline.org.au](http://www.lifeline.org.au)>

Suicide Call Back Service **1300 659 467**, or <<https://www.suicidecallbackservice.org.au>>

Beyondblue Support Service **1300 22 4636**, or <[www.beyondblue.org.au](http://www.beyondblue.org.au)>

**For information on support provided by DVA see:**

<<https://www.dva.gov.au/health-and-wellbeing/mental-health>>

<<https://www.dva.gov.au/factsheet-hsv99-mental-health-support>>

## Technical Notes

### **Australian Bureau of Statistics (ABS) changes to mortality coding over the study period**

The following information on mortality coding is sourced from the ABS. For further information, see the ABS Causes of death, Australia report.

Substantial changes to ABS cause of death coding were undertaken in 2006, improving data quality by enabling the revision of cause of death for open coroner's cases over time. Deaths that are referred to a coroner (including deaths due to suicide) can take time to be fully investigated. To account for this, all coroner-certified deaths registered after 1 January 2006 are subject to a revisions process. This allows cause of death for open coroner's cases to be included at a later stage where the case is closed during the revision period. Cause of death data are deemed preliminary when first published, with revised and final versions of the data being historically published 12 and 24 months after initial processing. Prior to 2006, revisions did not take place and as such it is recognised by the ABS that suicide deaths may have been understated during this period (ABS 2018).

As well as the above changes, new coding guidelines were applied to deaths registered from 1 January 2007. The new guidelines improve data quality by enabling deaths to be coded as suicide by ABS mortality coders if evidence from police reports, toxicology reports, autopsy reports and coroners' findings indicates the death was due to suicide. Previously, coding rules required a coroner to determine a death as due to suicide for it to be coded as suicide.

The combined result of both changes has been the more complete capture of suicide deaths, and a reduced number of deaths coded as 'undetermined intent', within Australian mortality data.

Detailed information on coding guidelines for intentional self-harm, and administrative and system changes that can have an impact on the mortality data set, can be found in Explanatory Notes 91-100 of Causes of death, Australia report (ABS 2018).

### **Changes to previously published suicide information**

As well as the addition of a new year of cause of death data, there are three main reasons for changes to previously published suicide results, as described below.

#### **Lag in cause of death information for the most recent year of data, where a death is registered in the following year**

Analysis in this study is based on year of occurrence of death. The National Death Index (NDI) is the source of information on fact of death in this study. Fact of death information from the NDI is supplemented with cause of death information from the National Mortality Database (NMD). Results published in the report *National suicide*

National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update  
*monitoring of serving and ex-serving Australian Defence Force personnel: 2018 update* for deaths that occurred in 2016 were based on preliminary cause of death information from the NMD. This was the most recent version of cause of death information at the time of reporting.

Analysis of the NMD for all Australian deaths shows that between 4% and 7% of deaths are not registered until the next year (ABS 2018). These deaths are not captured in cause of death information, until data for the next year become available. This means that while fact of death information was complete for 2016 at the time of publishing the *National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2018 update*, cause of death information was missing for around 7.5% of the deaths included in the analysis at that time. Additional suicides that occurred in 2016 but that were not registered until 2017 have now been identified with the inclusion of preliminary 2017 cause of death information in the current results.

### **Cause of death data revisions (ABS)**

Cause of death information for the *National suicide monitoring of serving and ex-serving ADF personnel: 2019 update* release is based on final cause of death information for the years 2001 to 2014. Revised data are used for 2015 and preliminary data for 2016 and 2017. Cause of death for a small number of records linked to the 2015 (revised), 2016 (preliminary) and 2017 (preliminary) cause of death data may change where a death is being investigated by a Coroner and more up to date information becomes available as a result of the ABS revisions process. This may have a small effect on the number of deaths attributed to suicide in these years, as some deaths currently coded as 'undetermined intent' could later be identified as 'intentional self-harm'.

### **Improvements in information available to the study**

Changes to previously published results may also occur as additional information becomes available to the study.

For example, changes affecting recording of deaths in jurisdictional systems (including administrative and system changes, certification practices, classification updates or coding rule changes) can impact on the data sets underlying this study. Data users should note the potential impact of these changes when making comparisons between reference periods. While such changes will not explain all differences between years, they are a factor that may influence the magnitude of any changes in suicide numbers as revisions are applied (ABS 2018)

### **Rates based on small numbers**

Rates based on small numbers of events can fluctuate from year to year for reasons other than a true change in the underlying frequency of the event.

In this report, rates are not reported when there are fewer than 5 events, as rates produced using small numbers can be sensitive to small changes in counts of deaths over time.

## **Suicide rates**

When reporting how often suicide occurs, suicide rates account for the size of the underlying population. Whilst this measure does not account for differences in the age structures of the populations being compared, rates can be validly compared over time, across groups and to the corresponding Australian population.

Here, rates report how often suicides occur in the three ADF service status groups, and Australia, expressed as a number per 100,000 people.

## **Standardised mortality ratios**

The standardised mortality ratio (SMR) is a widely recognised measure used to account for differences in age structures when comparing death rates between populations. This method of standardisation can be used when analysing relatively rare events (i.e. where number of deaths is less than 25 for the analysed time period) (Curtin and Klein, 1995). The SMR is used to control for the fact that the three ADF service status groups have a younger age profile than the Australian population, and rates of suicide vary by age in both the study populations and the Australian population. The SMRs control for these differences, enabling comparisons of suicide counts between the three service status groups and Australia without the confounding effect of differences in age.

The SMR is calculated as the observed number of events (suicide deaths) in the study population divided by the number of events that would be expected if the study population had the same age and sex specific rates as the comparison population.

SMRs greater than 1.0 indicate a greater number of suicides in the ADF population than expected; and SMRs less than 1.0 indicate a lower number of suicides than expected in the ADF population.

## **Using confidence intervals to test for statistical significance**

Statistical significance is a measure that indicates how likely the observed difference is due to chance alone.

In this study, 95% confidence intervals (CIs) are provided for each standardised mortality ratio (SMR) and suicide rates to indicate the level of uncertainty around these estimates. Estimates produced using low numbers can be sensitive to small changes in numbers of deaths over time and will therefore have wide CIs. 95% CIs are provided within this report as they may account for the variation in absolute numbers of suicide deaths over time (related to the small sample size).

Use of CIs is the simplest way to test for significant differences. For the purpose of this report, differences are deemed to be statistically significant if CIs do not overlap with each other (when comparing suicide rates) or 1.0 (in the case of an SMR).

National suicide monitoring of serving and ex-serving Australian Defence Force personnel: 2019 update

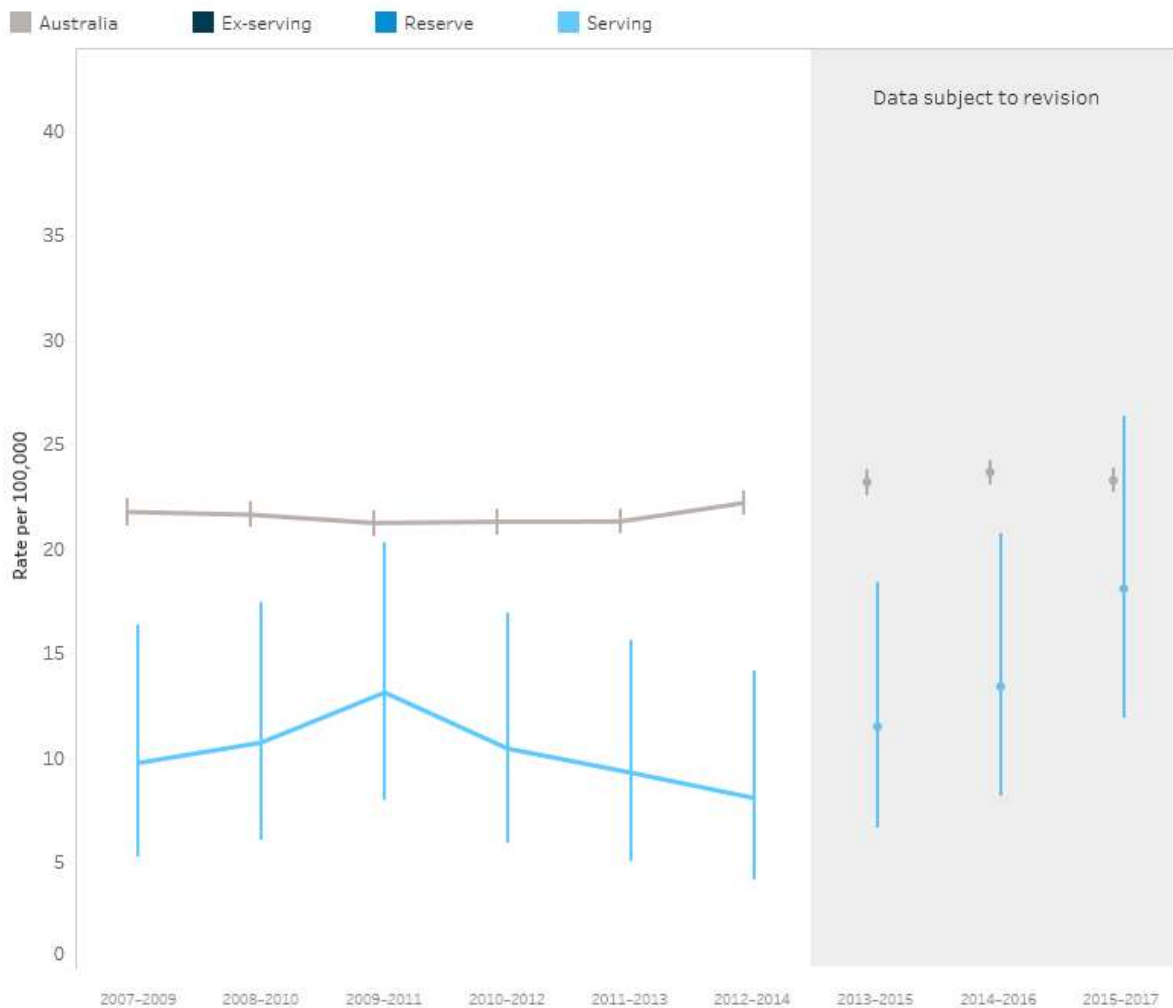
Where the CIs are wide, for example in the case of the SMR for ex-serving females, sensitivity analysis was conducted. This analysis found that slight changes to the numbers of suicides did not significantly alter the result.



## Appendix: Images of supplementary suicide rate interactive graphs

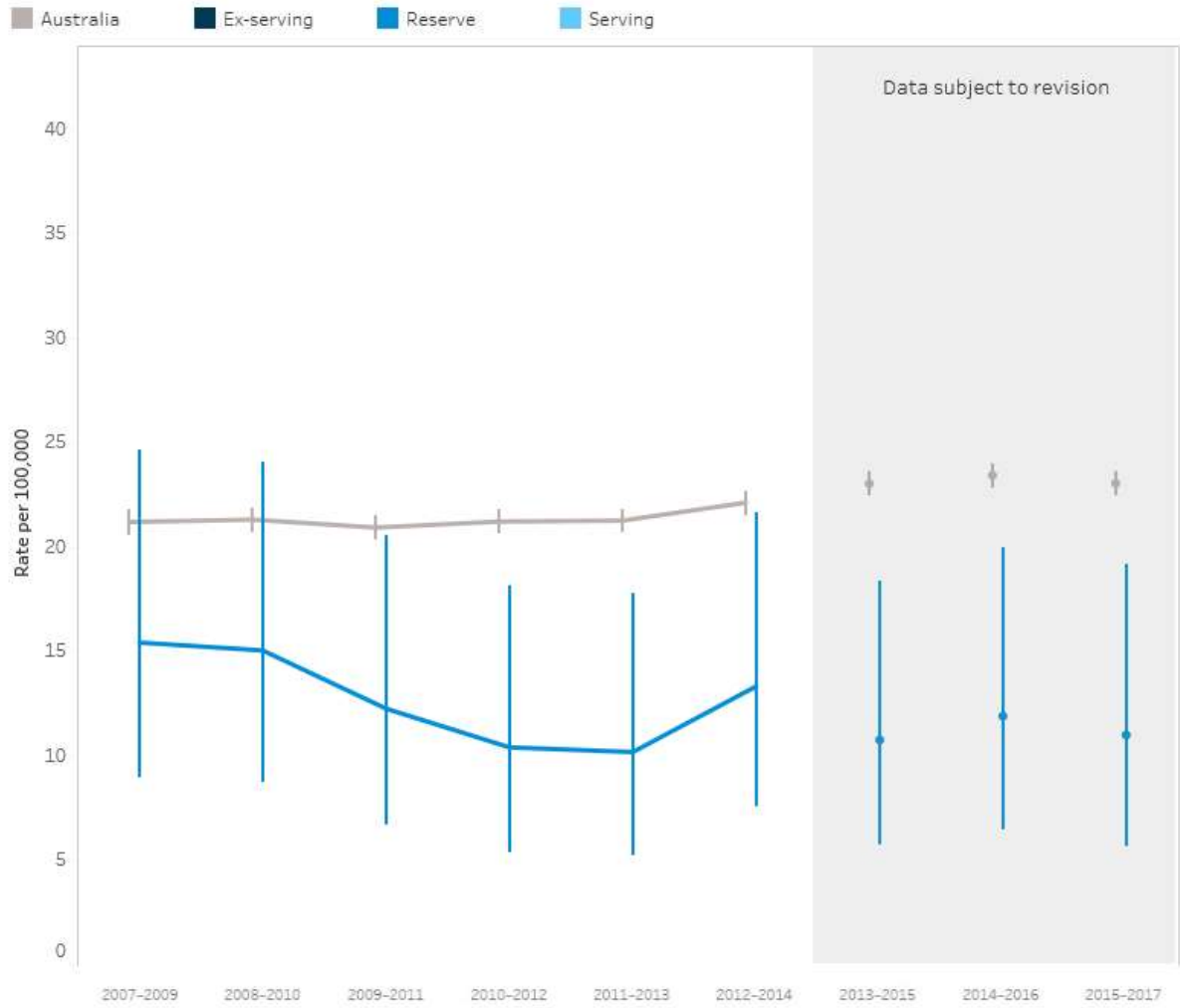
### Rate of suicide by service status (men)

#### Serving and Australia suicide rate by 3 year aggregate



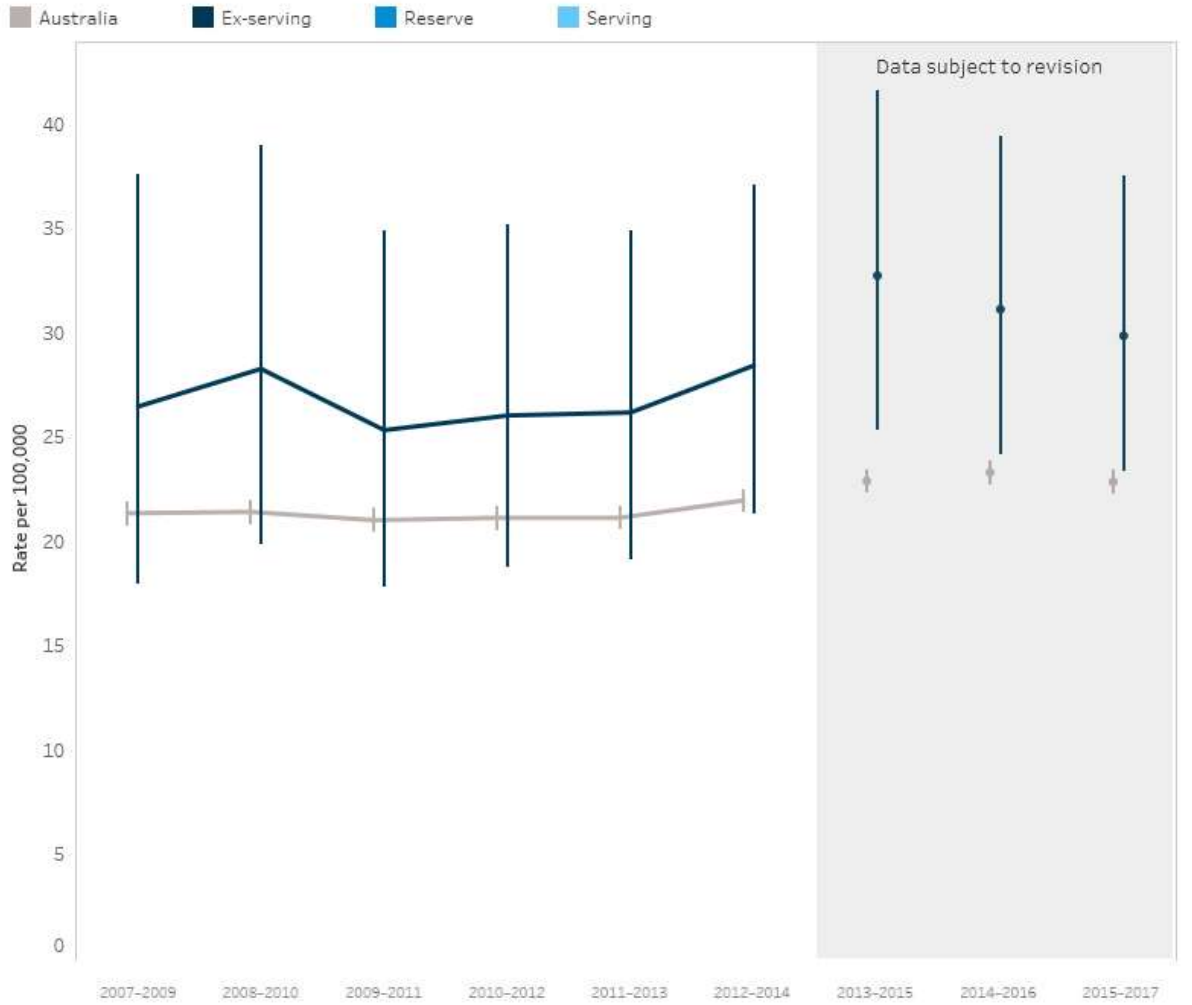
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Reserve and Australia suicide rate by 3 year aggregate



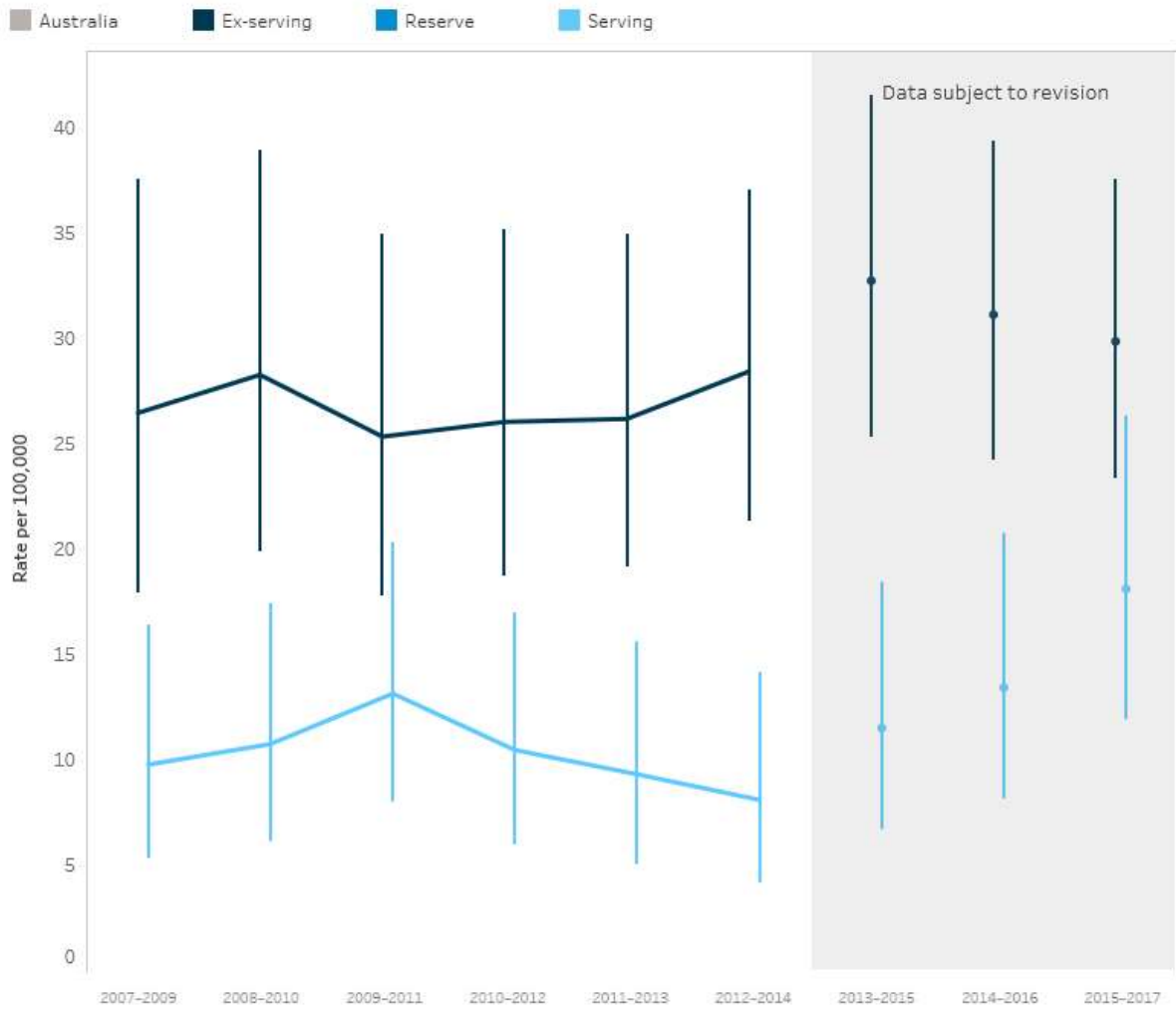
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Ex-serving and Australia suicide rate by 3 year aggregate



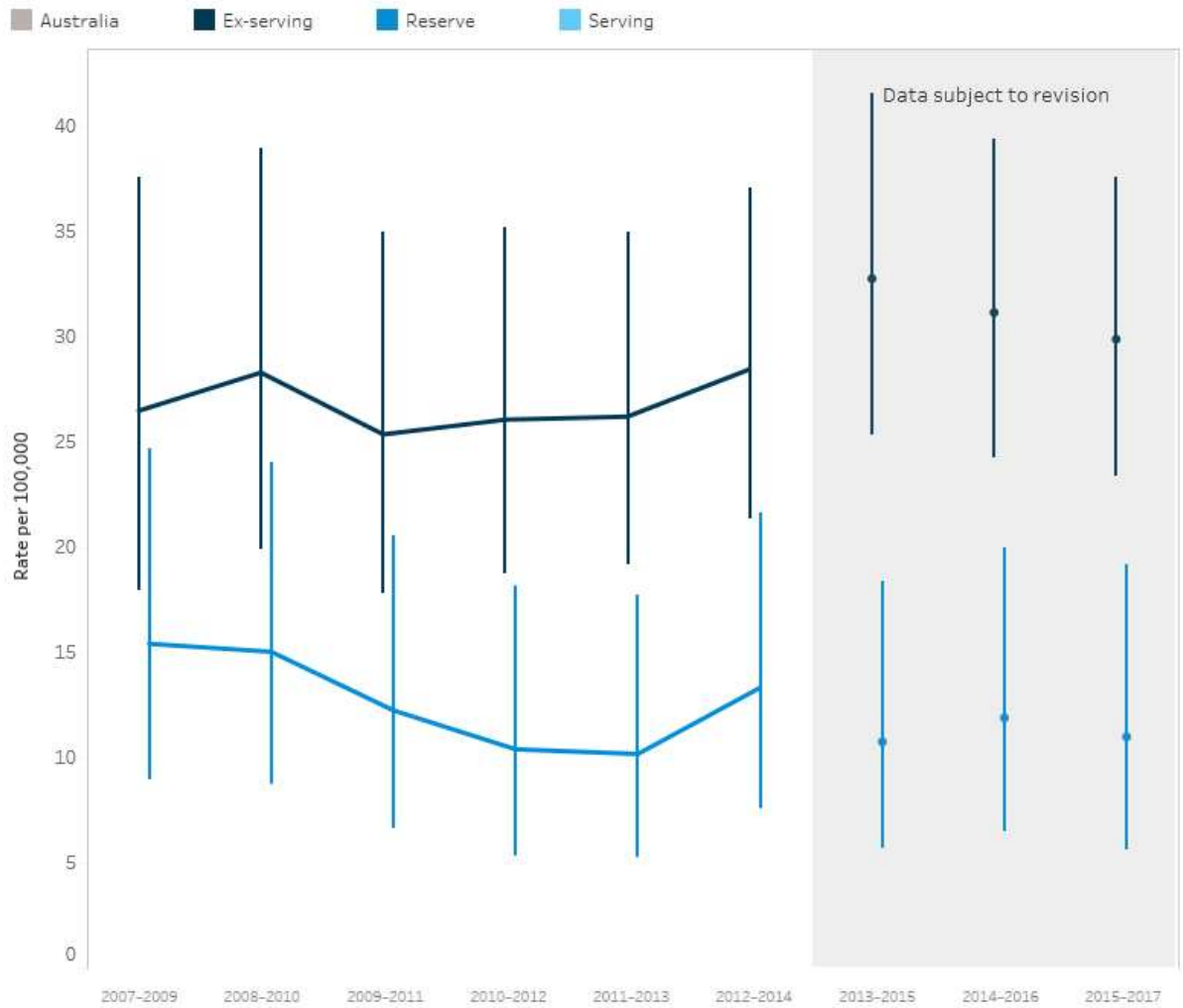
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Ex-serving and Serving suicide rate by 3 year aggregate



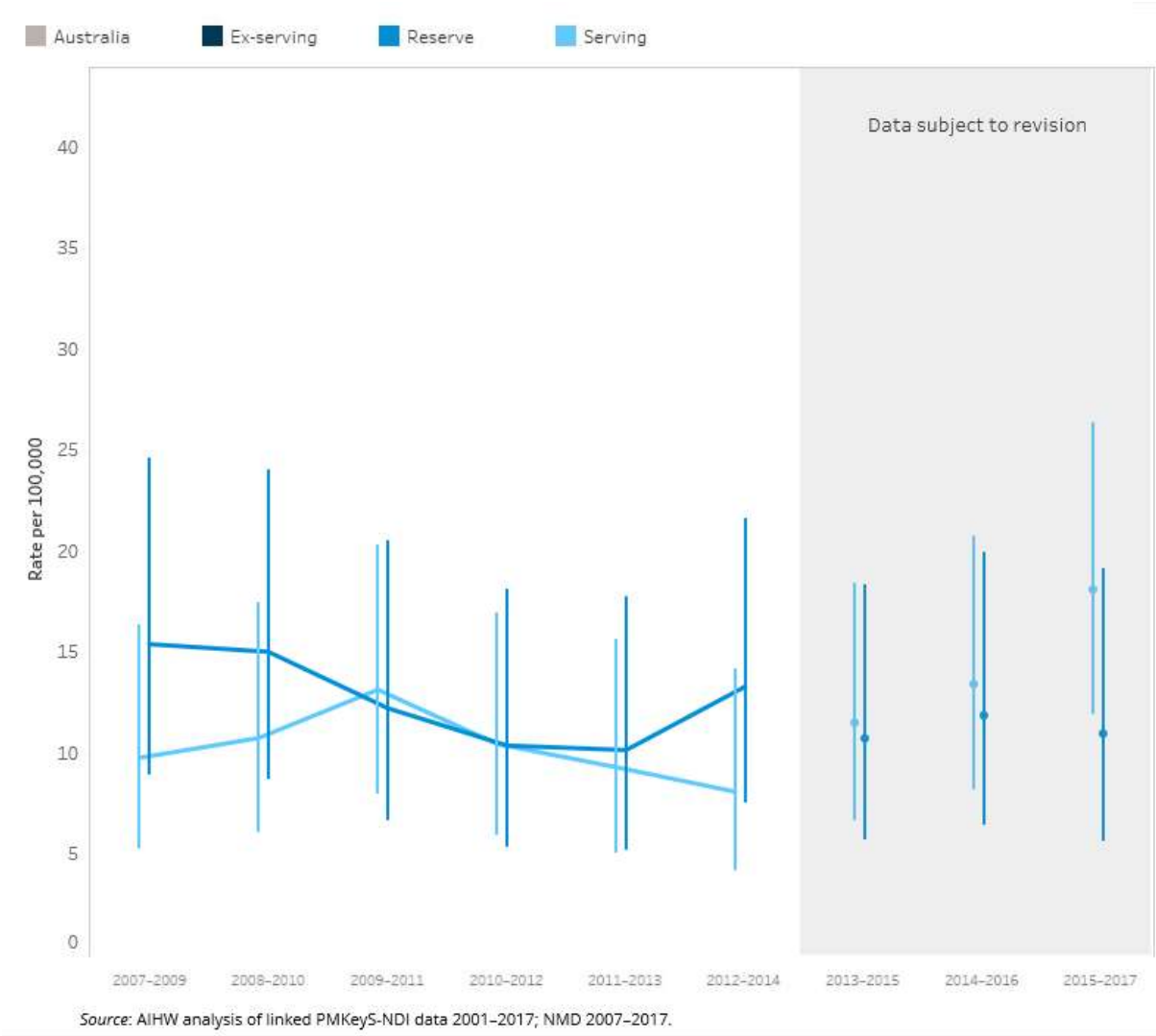
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Ex-serving and Reserve suicide rate by 3 year aggregate



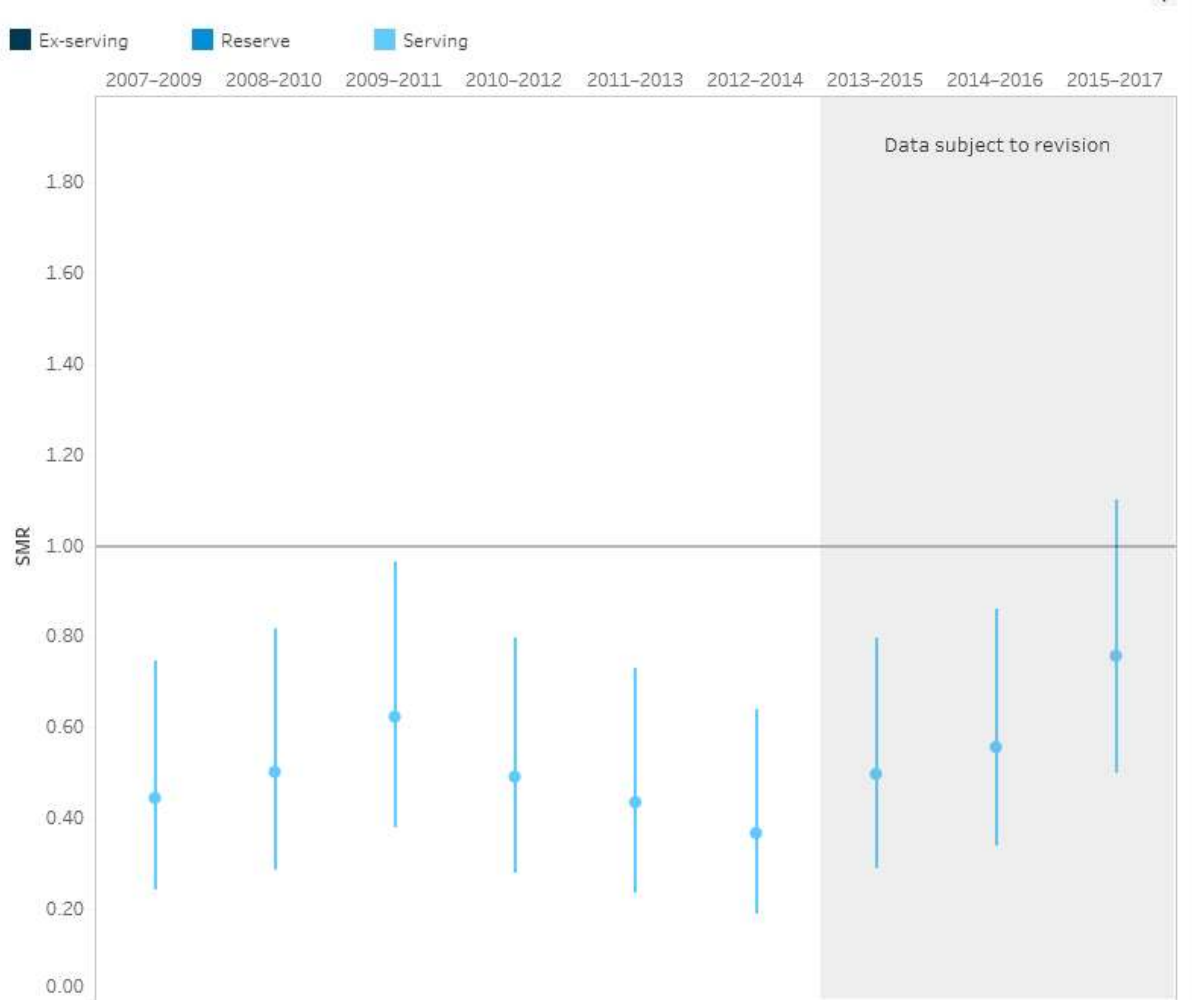
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

**Serving and Reserve suicide rate by 3 year aggregate**



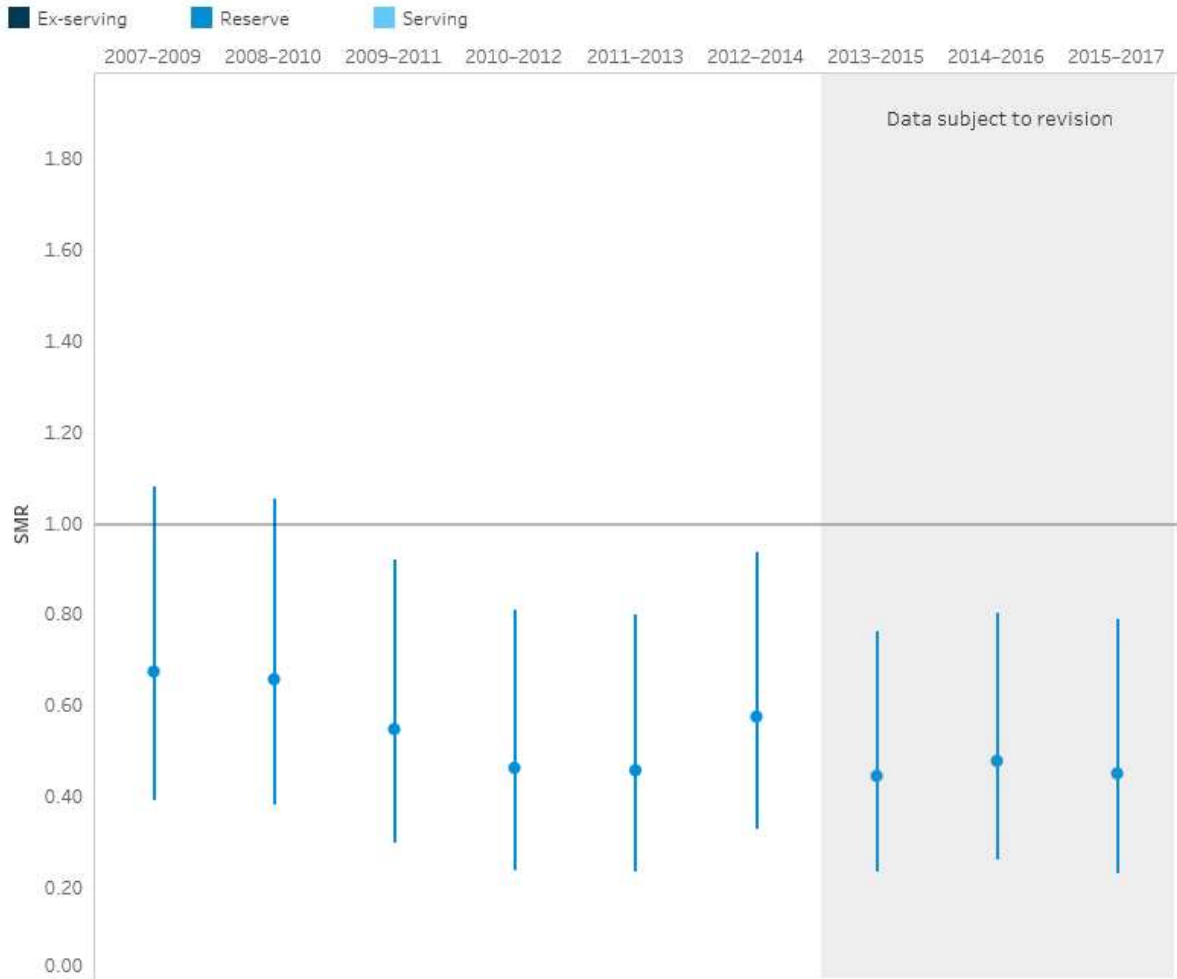
# Age-adjusted suicide rates (standardised mortality ratios) by service status (men)

## Standardised mortality ratio by 3 year aggregate, Serving (men)



Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

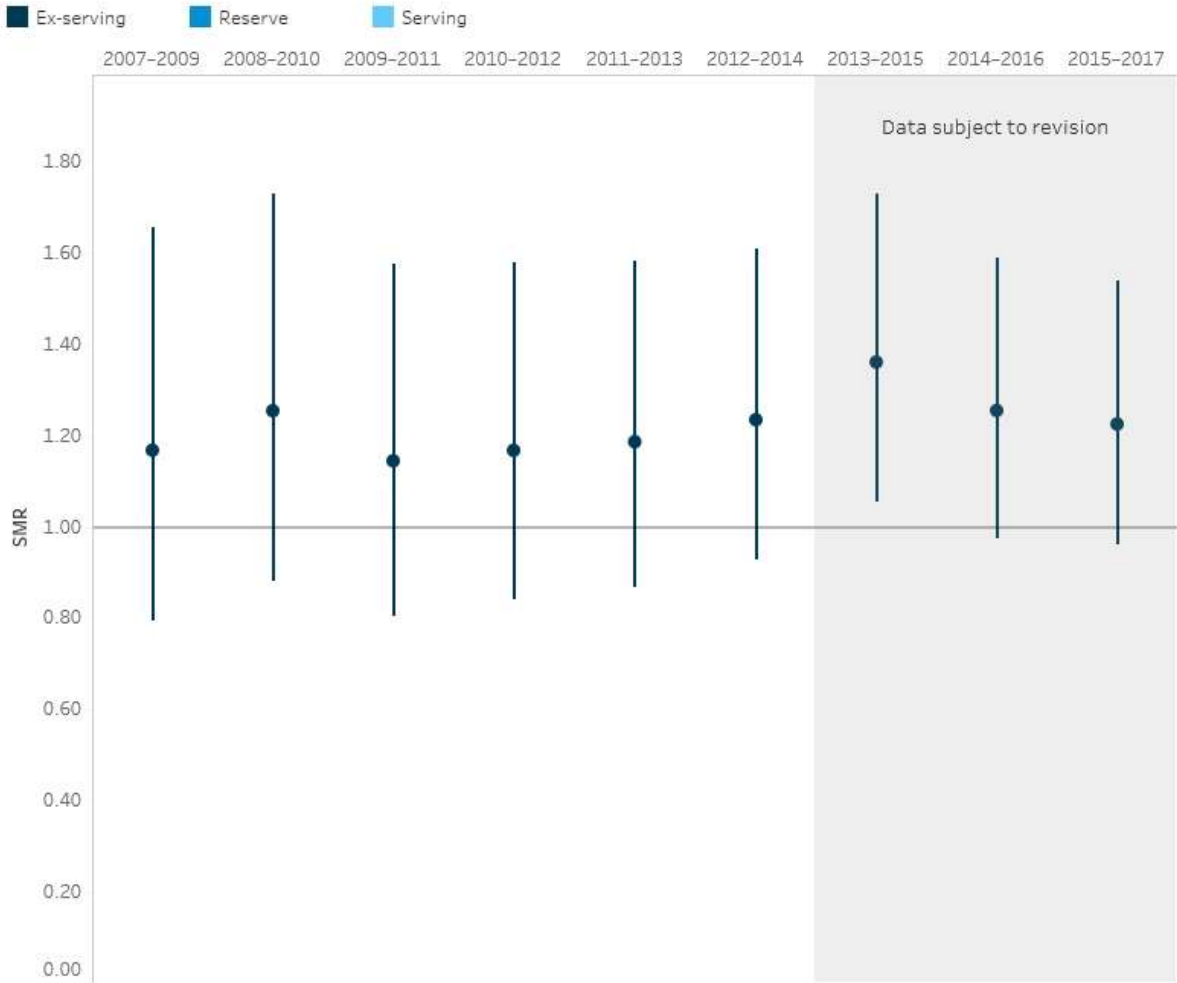
### Standardised mortality ratio by 3 year aggregate, Reserve (men)



Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.



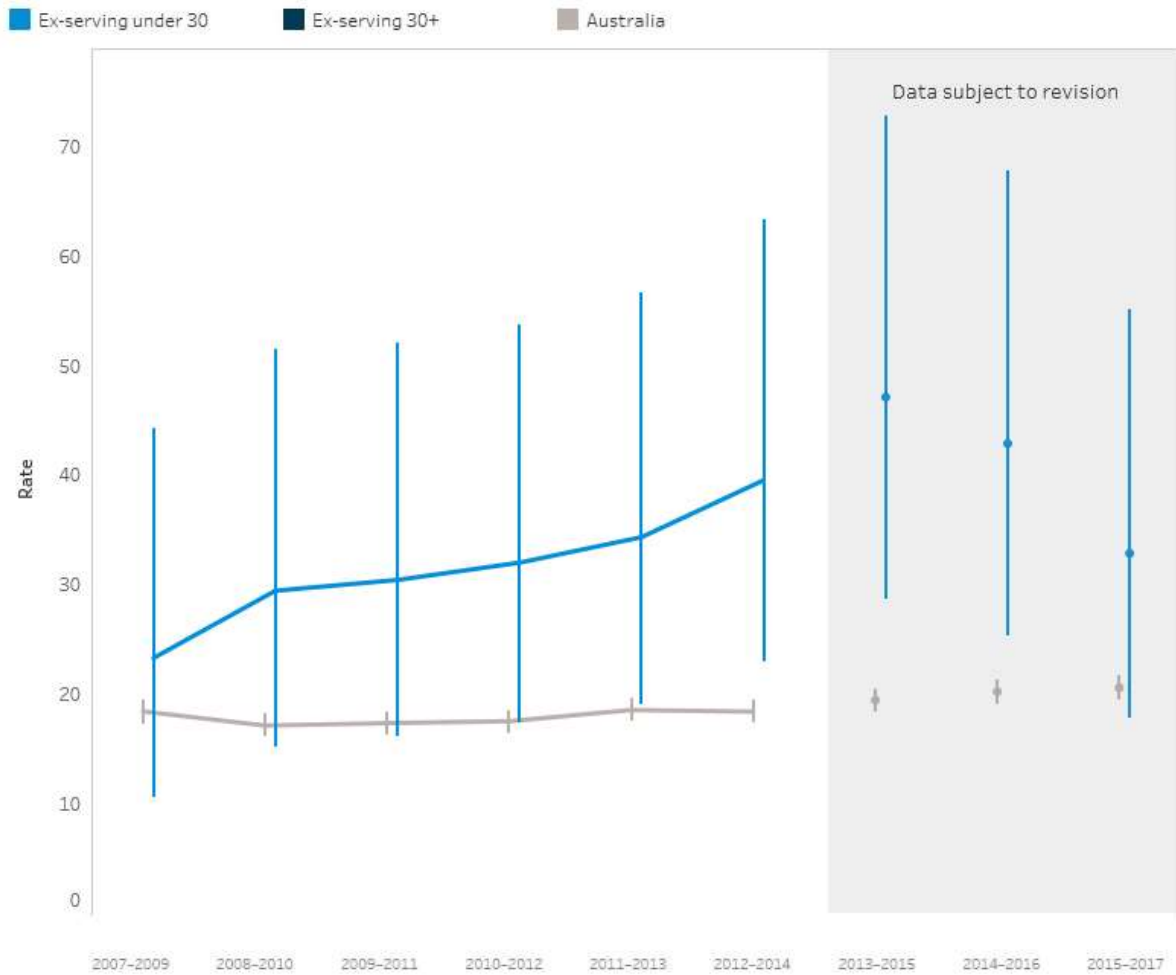
**Standardised mortality ratio by 3 year aggregate, Ex-serving (men)**



Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

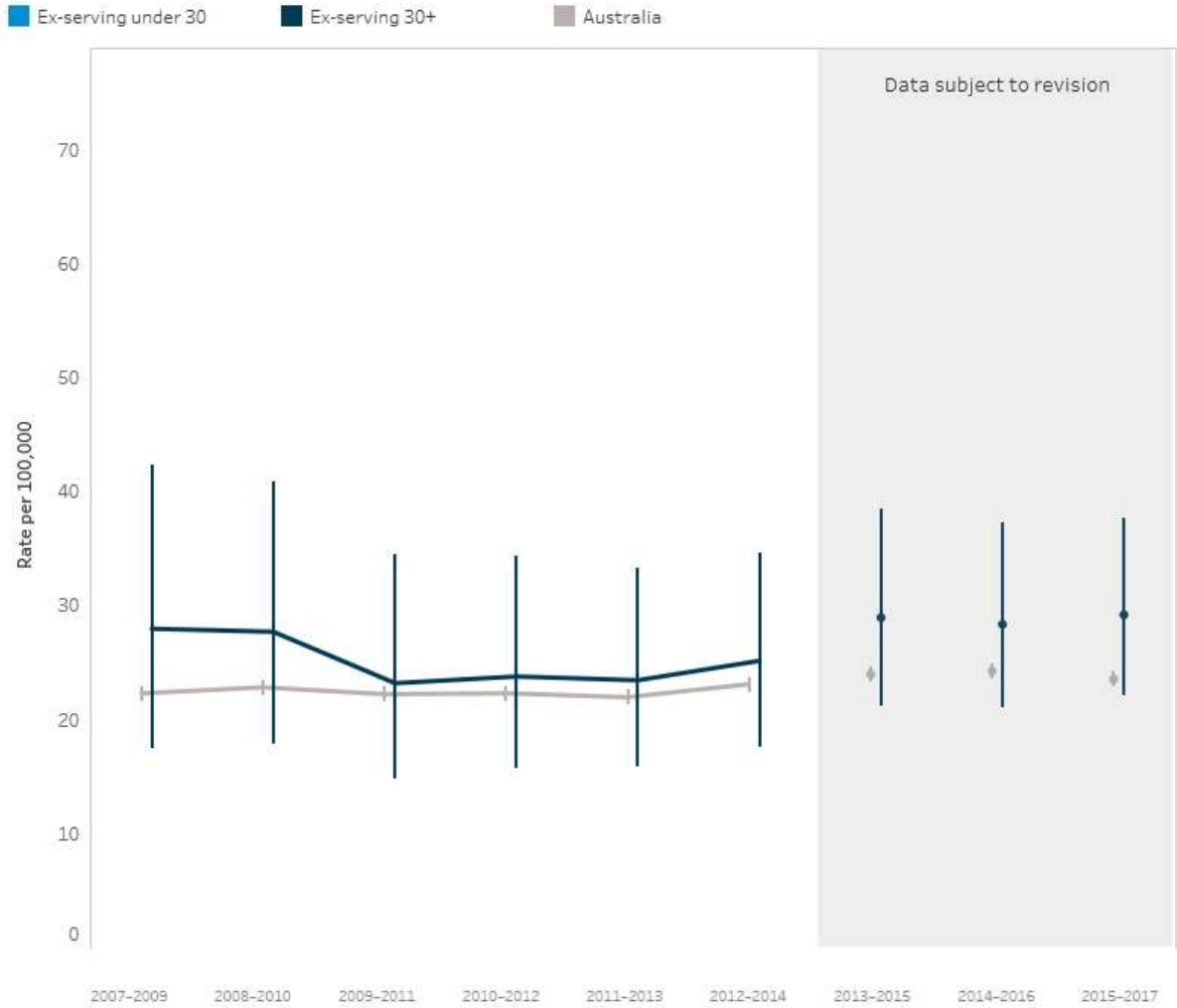
## Suicide rates by age (ex-serving men, aged under 30 and aged 30 years and over)

### Suicide rates by age and 3 year aggregate, Under 30 Ex-serving and Australia (men)



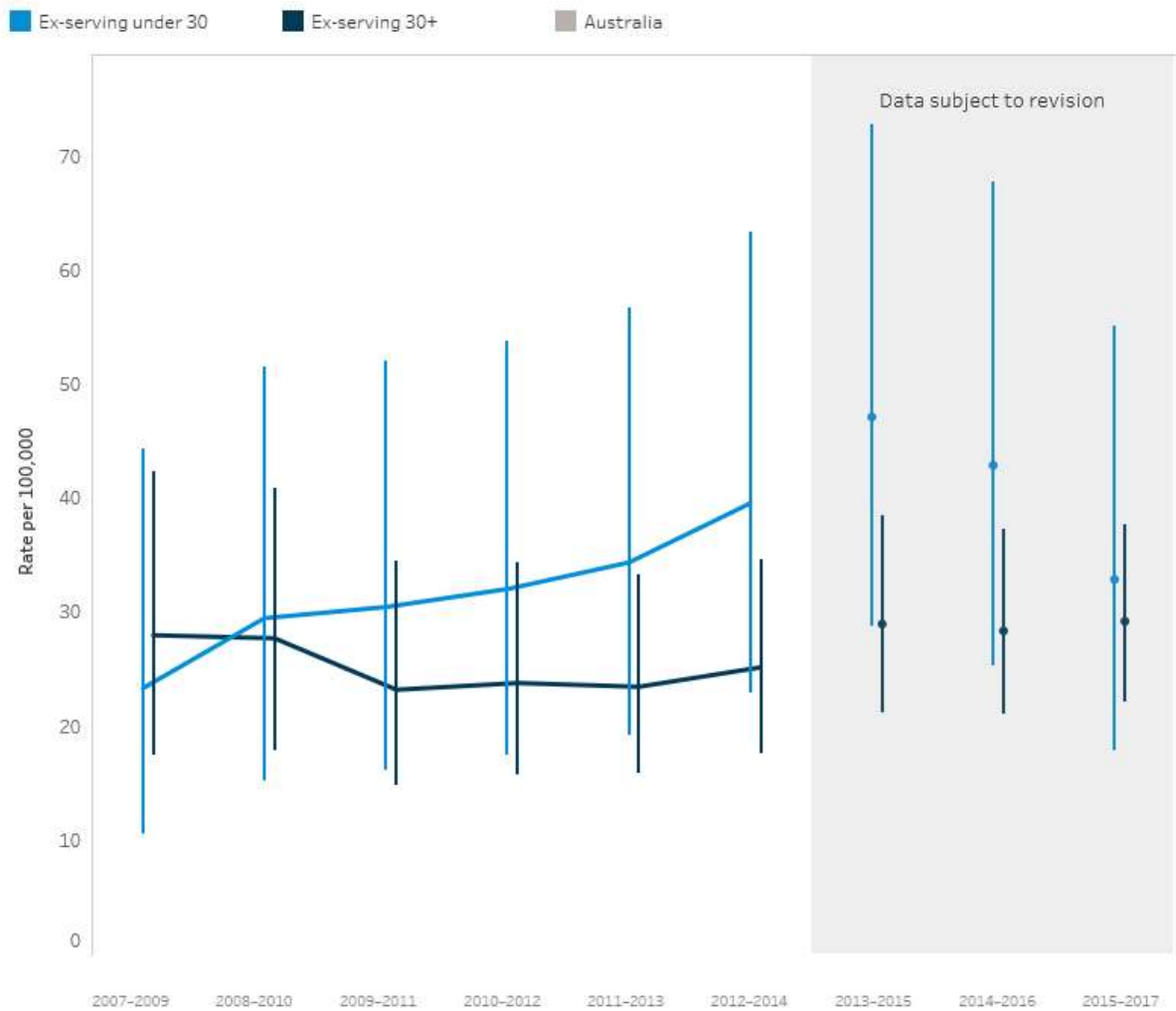
Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Suicide rates by age and 3 year aggregate, 30+ Ex-serving and Australia (men)



Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

### Suicide rates by age and 3 year aggregate, Under 30 and 30+ Ex-serving (men)



Source: AIHW analysis of linked PMKeyS-NDI data 2001-2017; NMD 2007-2017.

## Acronyms

ADF	Australian Defence Force
AIHW	Australian Institute of Health and Welfare
CI	confidence interval
DSD	Defence Suicide Database
DVA	Department of Veterans' Affairs
NDI	National Death Index
NMD	National Mortality Database
PMKeyS	Personnel Management Key Solution
SMR	Standardised mortality ratio

## Notes

### Data quality statement

The data quality statement underpinning the NDI can be found at: [National Death Index \(NDI\), Data Quality Statement](#)

The data quality statements underpinning the AIHW National Mortality Database can be found in the following Australian Bureau of Statistics (ABS) publications:

- ABS quality declaration summary for [Deaths, Australia \(ABS cat. no. 3302.0\)](#)
- ABS quality declaration summary for [Causes of death, Australia \(ABS cat. no. 3303.0\)](#)
- For more information on the AIHW National Mortality Database see [Deaths data at AIHW](#) and the [National Mortality Database](#).

### Data sources

The sources used here are as follows:

- **National Mortality Database (NMD).** Cause of Death Unit Record File data are provided to the AIHW by the Registries of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the Australian Bureau of Statistics (ABS). The data are maintained by the AIHW in the NMD.

Analysis in this report is based on year of occurrence of death. Year of death is an underestimate for the last year of data (2017), as some deaths are not registered until later years. Historical analysis of the NMD shows between 4% and 7% of deaths are not registered until the following year or later (ABS 2018). At the time of analysis, the causes of death data were final for 2014, revised for 2015 and preliminary for 2016 and 2017. Cause of death for a small number of deaths occurring in 2015, 2016 and 2017 are subject to further revision by the Australian Bureau of Statistics (ABS).

In this study, the NMD is used in the calculation of Australian crude rates and SMRs, and is the same source of information on cause of death as used in the NDI.

- **National Death Index (NDI).** The NDI is managed by the AIHW and contains person-level records of all deaths in Australia since 1980 obtained from the Registrars of Births, Deaths and Marriage in each state and territory. Its use is confined to data linkage studies approved by the AIHW Ethics Committee for health and medical research. NDI records are supplemented with cause of death information from the NMD (AIHW 2018).

In this study, the NDI is used in linkage with the Personnel Management Key Solution (PMKeyS) and Defence Suicide Database (DSD) to create the linked PMKeyS–NDI data set used in analysis of suicide in the ADF population.

- **Personnel Management Key Solution (PMKeyS).** PMKeyS is a Defence staff and payroll management system that contains information on all people with Australian Defence Force (ADF) service on or after 1 January 2001 (when the system was introduced). This database contains demographic and service information at a given point in time and is linked to the NDI to identify deaths, including suicides, in the three ADF service status groups.
- **Defence Suicide Database (DSD).** The DSD is maintained by Defence and contains information on suspected and confirmed deaths due to suicide of personnel serving full time since 1 January 2000. Suspected and confirmed suicides are included in the database only on the advice of the ADF Investigative Service. Cases are confirmed by receipt of a coronial finding of suicide. This database is linked to the PMKeyS and NDI and records with a status of 'confirmed' are used to supplement cause of death information from the NDI for numbers of suicides only.

## References

- ABS (Australian Bureau of Statistics) 2018. Causes of death, Australia, 2017. Explanatory notes. ABS cat. no. 3303.0. Canberra: ABS. Viewed 11 June 2019, <<https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Explanatory%20Notes12017?OpenDocument>>.
- AIHW (Australian Institute of Health and Welfare) 2018. Canberra: AIHW. Viewed 18 June 2019. [About National Death Index](#).
- Curtin, L. R., & Klein, R. J. (1995). *Direct standardization (age-adjusted death rates)* (No. 6). Hyattsville, MD: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics.