National Illicit Drug Indicators Project

METHODS FOR "Trends in Overdose and Other Drug-Induced Deaths in Australia, 2004-2023"

Agata Chrzanowska[1], Nicola Man[1], Rachel Sutherland[1], Louisa Degenhardt[1] and Amy Peacock[1,2]

[1] National Drug and Alcohol Research Centre, University of New South Wales

[2] School of Psychology, University of Tasmania

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Please note that as with all statistical reports, there is the potential for minor revisions to data in this report. Please refer to the online version at Drug Trends.

Please contact the Drug Trends team with any queries regarding this publication: drugtrends@unsw.edu.au.

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Data source

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Acknowledgements

We wish to acknowledge Lauren Moran and the team at the Australian Bureau of Statistics for their assistance with the data and ICD-10 coding practices to ensure rigorous, comprehensive, and consistent reporting on drug-induced deaths in Australia.

We acknowledge the traditional custodians of the land on which the work for this report was undertaken. We pay respect to Elders past, present, and emerging.

Related Links

- For interactive data visualisations accompanying this report, go to: https://drugtrends.shinyapps.io/deaths_2023
- For full details of the methods underpinning this report, go to: www.unsw.edu.au/research/ndarc/resources/trends-drug-induced-deaths-australia-2004-2023
- For other Drug Trends publications on drug-related hospitalisations and drug-induced deaths in Australia, go to: National Illicit Drug Indicators Project (NIDIP)
- For more information on NDARC research, go to: National Drug & Alcohol Research Centre, UNSW Sydney
- For more information about the ABS, go to: http://www.abs.gov.au
- For more information on ICD coding go to: http://www.who.int/classifications/icd/en/
- For more information on the Remoteness Areas Structure within the Australian Statistical Geography Standard (ASGS), go to: https://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.005
- For more research from the Drug Trends program and to subscribe to our newsletter, go to: Drug trends
- For details on the collection, organisation and interpretation of NCIS data, go to: https://www.ncis.org.au/about-the-data/explanatory-notes/
- For statistics about case closure statistics in NCIS, go to: https://www.ncis.org.au/about-the-data/operational-statistics/

Data Source

This report contains statistics on drug related causes of death in Australia from 2004 to 2023 while the corresponding online interactive visualisation includes data between 1997 and 2023. The data from the Australian Bureau of Statistics (ABS) were accessed from the Cause of Death Unit Record File (COD URF) datasets through the Australian Bureau of Statistics (ABS) before 2006 (1997 to 2005 dataset) and from the Queensland Registry of Births, Deaths and Marriages as the Australian Coordinating Registry (ACR) from 2006 onwards (2006 to 2023 dataset). The COD URF is a compilation of death records from each of the State and Territory Registries of Births, Deaths and Marriages (RBDMs) and from State and Chief Coroners through the National Coronial Information System (NCIS). Changes in data coding and collection have occurred over the time period reported.

Data Revision

To account for the length of time that it can take for the coronial process to be finalised and the coroner case closed, the ABS undertake a revision process for coroner-certified deaths over a 3-year period commencing with the 2006 reference year. Accordingly, Causes of Death data for 2022 are preliminary and subject to two further revisions; data for 2021 are revised and subject to another revision; data for 2020 and earlier years are final. Data for 2004 and 2005 have not undergone revision and may be subject to underreporting, particularly in relation to intent classification. Caution should be exercised when interpreting trends beginning in 2004, as figures for the years 2004 and 2005 are likely to be underestimated. All figures should be viewed in conjunction with the ABS Causes of Death Methodology document. For information on the proportion of closed cases each year see NCIS Operation Statistics. In 2020, 2,812 additional Victorian deaths registered in 2017, 2018 and 2019 were reported to the ABS. These registrations needed to be allocated to the appropriate reference years. Our data have been adjusted in line with the ABS Technical note and this could have some impact on the earlier trends in drug-induced deaths.

In addition to the revision process, the ABS undertook further processing improvements from 2008 onwards. For both open and closed cases, the ABS increasingly use additional information from the NCIS (e.g., autopsy, police and toxicology reports) where available to apply more specific cause of death codes. These processing improvements are likely to have an impact on the number of drug-induced deaths reported from 2008 onwards. It should also be noted that availability of additional information within the NCIS varies by jurisdiction; improvements to data collection are likely to be applied differentially across jurisdictions.

As indicated in the ABS Causes of Death Methodology document and the NCIS Operation Statistics, deaths that are referred to coroner for investigation take time to be closed. Drug-induced deaths are one of the causes of death with the highest proportion of coroners referred cases. On average, 97% of drug-induced deaths are certified by a coroner.

2023 Preliminary Revision

Because of the time delay in coroner-certification of deaths, the ABS undertake a revision process for coroner-certified deaths over a 3-year period. Data available after the first data collection cycle are preliminary (and are titled accordingly). These data then go through a two-stage revision cycle. After the first revision, the data are titled 'revised' and after the second and final revision the data become final.

Table 1 outlines changes in the number of drug-induced deaths with each data revision undertaken by the ABS. When data undergo the first revision process, the change between the preliminary and revised number is greater than when data changes from revised to final.

There were more open coroner cases at the time of preliminary coding of 2021 and 2022 data than there were in prior years (67.2% in 2021 and 65.2% in 2022 versus a 5-year average of 56.2% for 2015-2019) (see Cause of Death 2022 methodology for details). This prompted the ABS to begin conducting additional revisions of these data going forward (Cause of Death

2023 methodology). The ABS focused on deaths coded to ill-defined causes of death in this preliminary revision. This publication reports on findings from the most recently revised datasets (as of 15/05/2025), namely:

- 2004-2021 final data,
- 2022 revised data, and
- 2023 preliminary revised data.

Table M1. The proportion of closed coroner cases at the time of coding the cause of deaths unit record files.

	Preliminary	Preliminary revised	Revised		Final		
Registration year	N		N	% change from prelim.	N	% change from revised	% change from prelim.
2016	n/a		1,858	n/a	**1,869**	0.59%	n/a
2017	1,795		1,991	11%	**2,003**	0.60%	12%
2018	1,817		1,948	7.2%	**1,980**	1.64%	9.0%
2019	1,865		1,966	5.4%	**1,978**	0.61%	6.1%
2020	1,842		1,946	5.6%	**1,967**	1.08%	6.8%
2021		1,788*	1,830	2.3%*	**1,858**	1.53%	3.9%*
2022		1,819*	**1,874**	3.0%*	-	-	-
2023		**1,762***					

Note: The numbers used in this report are highlighted. Data for 2004-2015 are final but are not displayed in the table. 'n/a' indicates that historical data is not available from previous reporting; '-' indicates that data is not available yet and will be completed in future reports when it becomes available. *indicates number or change related to preliminary revised data: due to low proportion of closed cases when the preliminary data were collected (see Technical note).

Classification

Causes of death are coded according to the International Classification of Diseases and Related Health Problems, 10th Revision (hereafter 'ICD-10'). In 2014, the ABS implemented Iris, an automatic system for coding multiple causes of death and selecting the underlying cause of death, and the Causes of Death data from 2013 onwards were coded using the new system. This enabled ABS to carry through changes in coding practices associated with substance use dependence syndromes as an underlying cause of death and other ICD-10 updates introduced by the World Health Organization. Impacts on the data from 2013 onwards are described in more detail in the ABS Technical Note 1, Causes of Death Australia 2013. At the time of publication of this document, latest statistics on causes of death for Australia, including drug-induced deaths, are presented in the annual ABS 3303.0 Causes of Death Publication. For further information relating to ICD-10 codes, refer to the World Health Organization website.

Presentation of Results

Following the ABS guidelines for presenting annual time series, this year's report presents the cause of death data based on registration year. Previously, the data was presented by the reference year. This change has been applied to all years in the data series to ensure consistency and enable comparable analysis over time and will not necessarily match the previously reported numbers. Table 2 shows the differences in numbers over the monitoring period. For more details and the rationale behind this change, please refer to the ABS Cause of Death methodology. Death registration date is the official date when the death is recorded in the civil registry. It may not always coincide with the actual date of death due to procedural requirements, such as waiting for the burial or cremation to be completed and may also differ from the reference year because of delays in the ABS receiving this information.

Table M2. Number of drug-induced deaths by reference, registration and death year, Australia, 2004 to 2023

	Reference year	Registration year	Difference between registration and reference year	Year of death
2004	965	965	0	955
2005	1,008	1,008	0	994
2006	944	944	0	952
2007	1,102	1,101	-1	1,155
2008	1,282	1,288	6	1,307
2009	1,450	1,456	6	1,463
2010	1,406	1,397	-9	1,393
2011	1,439	1,437	-2	1,494
2012	1,463	1,462	-1	1,449
2013	1,464	1,464	0	1,497
2014	1,736	1,736	0	1,715
2015	1,811	1,811	0	1,826
2016	1,869	1,869	0	1,887
2017	2,003	2,003	0	1,992
2018	1,980	1,980	0	2,006
2019	1,978	1,978	0	1,984
2020	1,967	1,967	0	1,941
2021	1,858	1,858	0	1,834
2022	1,874	1,874	0	1,863
2023	1,762	1,762	0	1,548

In the report, we present number of deaths, percentage and age-standardised death rate per 100,000 population. The exception is where we report by age group (e.g., 10-year age groups); in these instances, we present age-specific rates calculated as population crude rates in the given age group. Our online data visualisation includes the three estimates where available: number of deaths, crude death rate and age-standardised death rate. Numbers and crude rates from small numbers of deaths less than or equal to five are not presented in the report or in the visualisation to protect the confidentiality of individuals. Zero values are still shown in the visualisation.

Age-standardised death rates enable the comparison of death rates over time and between populations of different age-structures and were calculated using the direct method and the Australian ERP as at 30 June 2011 from the 2011 Census as the standard population. Rates may not be comparable to other sources where a different standard population may have been applied. In accordance with recommendations to ensure stability of age-standardised rates from sparse data, age-standardised rates were not calculated if the number of total deaths was ≤10. In this case, reader should refer to other measures such as number of deaths or crude rate of deaths.

In the report, we present the profile (percentage and number) of age, sex, intent, remoteness area, psychosocial risk factors, place of occurrence and drug involvement in 2023, description of change in the profile over time, trend in population rates over time for the final estimates (2004-2021), and description of difference in estimated rates between the two most recent years of data (2022 compared to 2023).

Rate ratio (crude or age-standardised; RR) was calculated to compare the rate for the year 2023 ($rate_{2023}$) with the corresponding rate for the year 2022 ($rate_{2022}$) as follows:

$$RR = \frac{rate_{2023}}{rate_{2022}}$$

The 95% confidence interval of the rate ratio is calculated using the -ir- command in Stata version 17.0 which uses the exact binomial method described by Rothman (1986). The weights used for age-standardisation of the rates were used in the ir command to obtain the 95% confidence interval of the age-standardised rate ratio.

Percent change and its corresponding 95% confidence interval are then calculated as:

$$Percent\ change = (RR - 1) \times 100\%$$

The percent change is considered statistically significant when 0 lies outside of the 95% confidence interval of the percent change.

The Joinpoint software was used to analyse trend in rates expressed as annual percentage change (APC) and average annual percent change (AAPC), change points and statistical significance of the change from 2004 (or from 2009 for remoteness area data) to 2021. Joinpoint regression model with the dependent variable log-transformed and autocorrelated errors was fitted allowing for maximum of three (or two for remoteness area data) joinpoints and a minimum two observations between two joinpoints. Weighted BIC method was used to determine best model from models fitted with 0 to the maximum number of joinpoints. Estimated AAPC in rates was determined for each trend as a weighted average of the annual percentage changes (APC) from the fitted model.

Terminology

Registration year is determined by the date on which the death was officially recorded with the state and territory registry.

Underlying cause of death (UCOD) is the disease or condition which initiated the sequence of events resulting in death. There can be only one underlying cause of death.

Associated causes of death (ACOD) are any other diseases or conditions that contributed to the death but were not the underlying cause and are listed on the death certificate.

Multiple causes of death (MCOD) include all causes (both underlying and associated causes), diseases and conditions reported on the death certificate. For deaths where the underlying cause was identified as an external cause (for example, injury or poisoning, etc.), multiple causes include circumstances of injury and the nature of injury as well as any other conditions reported on the death certificate.

Deaths are considered **'drug-induced deaths'** if they are directly attributable to drug use (e.g., drug toxicity/overdose is the underlying cause of death). They are considered **'drug-related deaths'** where drugs played a contributory role (i.e., listed as an associated cause of death) and the death was attributable to another cause (e.g., motor vehicle accident); these deaths are not reported here.

Drug overdose death involving selected drug is where poisoning by the drug of interest (e.g., benzodiazepines) was indicated in the UCOD or MCOD, noting that there may be other drugs coded to these fields. For example, a 'drug overdose death involving benzodiazepines' could comprise an opioid as UCOD and a benzodiazepine and alcohol as MCOD.

All-cause mortality comprises all deaths of any causes certified by a doctor and/or a coroner.

External cause mortality comprises deaths due to causes external to the body (for example intentional self-harm, transport accidents, falls, poisoning, overdose and other drug-induced death, etc.)

Potentially avoidable mortality refers to deaths of persons under 75 years of age that arise from conditions that may be avoided through individualised care, or treated through primary care or hospitalisation. Conditions causing potentially avoidable deaths include natural diseases (e.g., specific types of cancer, ischaemic heart disease, diabetes, and infectious diseases) and external causes of death (e.g., accidents, suicides, and assaults).

Excess mortality is typically defined as the difference between the total number of deaths in a specified period and the expected numbers of deaths in that same period.

Registration year refers to the calendar year in which the death was officially registered with a state or territory Registry of Births, Deaths and Marriages. There can be a delay between the actual date of death and its registration, especially in cases involving coronial investigations.

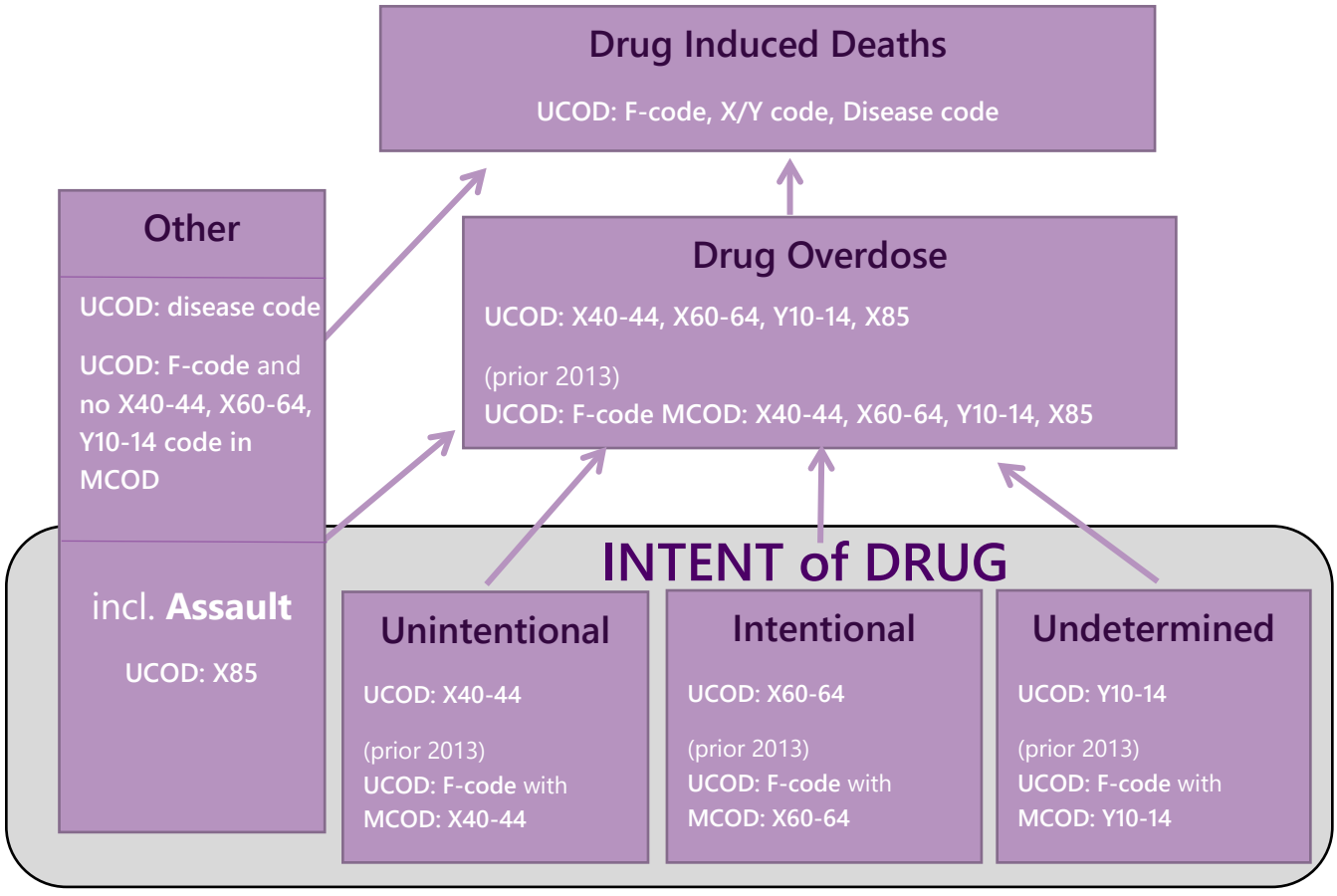
Reference year is used by the ABS to group deaths for statistical reporting. It is based on the registration year and the date the record was received by the ABS.

A Tabulation list of ICD-codes to identify causes of death attributable to drug-induced mortality was developed by the ABS based on a drug-induced death tabulation created by the United States Centre for Disease Control and Prevention (CDC). We have adopted these codes for our definition of all drug-induced deaths. This list excluded causes of deaths attributed to tobacco or alcohol (see below).

Underlying Cause of Death

'Drug overdose deaths' are all deaths where the acute toxic effect of a drug was determined by the coroner, forensic pathologist or forensic toxicologist to be the UCOD (i.e., accidental poisoning X40-X44, intentional poisoning X60-X64, undetermined intent of poisoning Y10-Y14 and assault by drugs X85). The remaining drug-induced deaths are those where the UCOD was related to mental and behavioural disorders due to psychoactive substance use or drug-induced diseases.

Intent



As part of the coronial investigation of drug-related deaths, the coroner assigns the manner or intent to these deaths where there is sufficient information. The ICD-10 coding incorporates codes for the following categories of intent:

1. **Unintentional**, where the coroner determines the manner/intent of the injury or poisoning which led to death was accidental (X40, X41, X42, X43, X44);
2. **Intentional**, where the coroner determines that the manner/intent of the injury or poisoning which led to death was purposeful (X60, X61, X62, X63, X64);
3. **Undetermined**, where there was insufficient information for the coroner to make a determination on the intent (Y10, Y11, Y12, Y13, Y14); and
4. **Assault**, where the coroner determines that the manner/intent of the injury or poisoning that led to death was purposeful assault (X85). Numbers in this category are too small to be presented. On the visualisation they are included in the "other" category for drug-induced deaths for all ages only (see the diagram below).

Coding of Deaths

Drug-Induced Deaths

The following list of codes for UCOD defines drug-induced deaths in our reporting. This list of ICD-10 codes to identify causes of death attributable to drug-induced mortality was developed by the ABS based on a drug-induced death tabulation created by United States Centre for Disease Control and Prevention (CDC). In accordance with ABS reporting, causes of drug-induced death presented in this report exclude accidents, homicides, and other causes indirectly related to drug use. We have also excluded newborn deaths associated with mother's drug use, and deaths related to tobacco (e.g., F17) or alcohol (e.g., F10).

Underlying Cause of Death (UCOD):

- D52.1 – Drug-induced folate deficiency anaemia;
- D59.0 – Drug-induced haemolytic anaemia;
- D59.2 – Drug-induced nonautoimmune haemolytic anaemia;
- D61.1 – Drug-induced aplastic anaemia;
- D64.2 – Secondary sideroblastic anaemia due to drugs and toxins;
- E06.4 – Drug-induced thyroiditis;
- E16.0 – Drug-induced hypoglycaemia without coma;
- E23.1 – Drug-induced hypopituitarism;
- E24.2 – Drug-induced Cushing's syndrome;
- E27.3 – Drug-induced adrenocortical insufficiency;
- E66.1 – Drug-induced obesity;
- F11.0-F11.5 – Use of opioids causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F11.7-F11.9 – Use of opioid causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F12.0-F12.5 – Use of cannabis causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F12.7-F12.9 – Use of cannabis causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F13.0-F13.5 – Use of sedative or hypnotics causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F13.7-F13.9 – Use of sedative or hypnotics causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F14.0-F14.5 – Use of cocaine causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F14.7-F14.9 – Use of cocaine causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.

- F15.0-F15.5 – Use of amphetamine-related substances causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F15.7-F15.9 – Use of amphetamine-related substances causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F16.0-F16.5 – Use of hallucinogens causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F16.7-F16.9 – Use of hallucinogens causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F18.0-F18.5 – Use of volatile solvents causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F18.7-F18.9 – Use of volatile solvents causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- F19.0-F19.5 – Use of multiple drugs and other psychoactive substances causing intoxication, harmful use (abuse), dependence, withdrawal or psychosis
- F19.7-F19.9 – Use of multiple drugs and other psychoactive substances causing late onset psychosis, other mental and behavioural disorders and unspecified behavioural disorders.
- G21.1 – Other drug-induced secondary Parkinsonism;
- G24.0 – Drug-induced dystonia;
- G25.1 – Drug-induced tremor;
- G25.4 – Drug-induced chorea;
- G25.6 – Drug-induced tics and other tics of organic origin;
- G44.4 – Drug-induced headache, not elsewhere classified;
- G62.0 – Drug-induced polyneuropathy;
- G72.0 – Drug-induced myopathy;
- I95.2 – Hypotension due to drugs;
- J70.2 – Acute drug-induced interstitial lung disorders;
- J70.3 – Chronic drug-induced interstitial lung disorders;
- J70.4 – Drug-induced interstitial lung disorder, unspecified;
- L10.5 – Drug-induced pemphigus;
- L27.0 – Generalized skin eruption due to drugs and medicaments;
- L27.1 – Localized skin eruption due to drugs and medicaments;
- M10.2 – Drug-induced gout;
- M32.0 – Drug-induced systemic lupus erythematosus;
- M80.4 – Drug-induced osteoporosis with pathological fracture;
- M81.4 – Drug-induced osteoporosis;
- M83.5 – Other drug-induced osteomalacia in adults;
- M87.1 – Osteonecrosis due to drugs;
- R78.1 – Finding of opiate drug in blood;
- R78.2 – Finding of cocaine in blood;
- R78.3 – Finding of hallucinogen in blood;
- R78.4 – Finding of other drugs of addictive potential in blood;
- R78.5 – Finding of psychotropic drug in blood;
- X40-X44 – Accidental poisoning by and exposure to drugs, medicaments and biological substances;
- X60-X64 – Intentional self-poisoning (suicide) by and exposure to drugs, medicaments and biological substances;
- X85 – Assault (homicide) by drugs, medicaments and biological substances; and
- Y10-Y14 – Poisoning by and exposure to drugs, medicaments and biological substances, undetermined intent.

Alcohol-Induced Deaths

Causes of death attributable to alcohol-induced mortality include ICD-10 codes:

- E24.4, Alcohol-induced pseudo-Cushing's syndrome;
- F10, Mental and behavioural disorders due to alcohol use;
- G31.2, Degeneration of nervous system due to alcohol;

- G62.1, Alcoholic polyneuropathy;
- G72.1, Alcoholic myopathy;
- I42.6, Alcoholic cardiomyopathy;
- K29.2, Alcoholic gastritis;
- K70, Alcoholic liver disease;
- K85.2 Alcohol-induced acute pancreatitis;
- K86.0, Alcohol-induced chronic pancreatitis;
- R78.0, Finding of alcohol in blood;
- X45, Accidental poisoning by and exposure to alcohol;
- X65, Intentional self-poisoning by and exposure to alcohol; and
- Y15, Poisoning by and exposure to alcohol, undetermined intent.

Alcohol-induced causes exclude accidents, homicides, and other causes indirectly related to alcohol use. This category also excludes newborn deaths associated with maternal alcohol use.

Drug Overdose Deaths by Drug Class and Drug Type

Vast majority of drug-induced deaths are due to drug overdose. If a specific drug is identified in toxicology reports as being present in the person's system and deemed to be contributory to that death, then this case will be identified as drug overdose death. This report includes a particular focus on deaths involving opioids, amphetamine and cocaine.

The following ICD-10 codes were used to identify any drug overdose death where each drug type listed in the first column was considered a contributory cause of death (e.g., drug overdose death involving benzodiazepines, drug overdose death involving antidepressants). Note here that in some cases we have looked at the broader drug class (e.g., drug overdose deaths involving opioids) and then the specific types of substances within that class (e.g., drug overdose deaths involving methadone, drug overdose deaths involving heroin). Numbers do not add up to the total number of drug overdose deaths as there could be more than one drug class involved in a death.

Table M3. Classification of drug types by ICD-10 codes: examples, underlying cause of death (UCOD), and multiple mause of meath (MCOD).

Drug class and type	Examples of drugs commonly assigned to ICD-10 category	UCOD	MCOD
Antiepileptic, sedative-hypnotic and antiparkinsonism drugs		Drug-induced deaths*	T42.0-T42.8
Barbiturates	Pentobarbital, phenobarbital	Drug-induced deaths*	T42.3
Benzodiazepines	Alprazolam, diazepam, oxazepam, clonazepam, clozapine, temazepam, oxazepam	Drug-induced deaths*	T42.4
Antiepileptic and sedative-hypnotic drugs, unspecified	Pregabalin	Drug-induced deaths*	T42.7
Opioids		Drug-induced deaths*	T40.0-T40.4, T40.6
Heroin		Drug-induced deaths*	T40.1
Natural and semi-synthetic opioids	Oxycodone, morphine, codeine	Drug-induced deaths*	T40.2
Methadone		Drug-induced deaths*	T40.3
Synthetic opioids	Fentanyl, tramadol, pethidine	Drug-induced deaths*	T40.4
Amphetamine-type stimulants	Amphetamine, methamphetamine, 3,4-methylenedioxy-methamphetamine (MDMA)	Drug-induced deaths*	T43.6
Antidepressants		Drug-induced deaths*	T43.0-T43.2

Tricyclic and tetracyclic antidepressants	Imipramine, amitriptyline, mianserin	Drug-induced deaths*	T43.0
Other and unspecified antidepressants	Sertraline, citalopram, venlafaxine, fluoxetine, mirtazepine, fluvoxamine, paroxetine, duloxetine	Drug-induced deaths*	T43.2
Antipsychotics and neuroleptics		Drug-induced deaths*	T43.3-T43.5
Other and unspecified antipsychotics	Quetiapine, olanzapine, risperidone	Drug-induced deaths*	T43.5
Non-opioid analgesics, antipyretics and antirheumatics		Drug-induced deaths*	T39.0-T39.9
4-Aminophenol derivatives	Paracetamol	Drug-induced deaths*	T39.1
Other nonsteroidal anti-inflammatory drugs	Ibuprofen, aspirin	Drug-induced deaths*	T39.3
Alcohol		Drug-induced deaths*	T51.0-T51.9
Cannabis derivatives		Drug-induced deaths*	T40.7
Cocaine		Drug-induced deaths*	T40.5

*Tabulation list in Causes of Death, Australia methodology, Australia, 2023 (cat. no. 3303.0). Deaths related to tobacco (ICD-10 – F17) or alcohol (ICD-10 – F10) have been excluded from the analysis.

Opioid-overdose deaths – exclusive involvement

Table M4. Classification of exclusive involvement in opioid-overdose deaths by ICD-10 codes

Cause of death	MCOD
Opioid-overdose deaths involving heroin only	T40.1 and no T40.0, T40.2-T40.4, T40.6
Opioid-overdose deaths involving other opioids (excluding heroin, opium and unspecified opioids)	T40.2-T40.4 and no T40.0, T40.1, T40.6
Opioid-induced deaths involving heroin and other opioids	T40.1 and (T40.2, T40.3 or T40.4)
Opioid-induced deaths involving opium and unspecified opioids	T40.0 or T40.6

Age and sex

Age at death is provided by the ABS in the COD URF. In the report and in the online data visualisation we report on findings for Australians of all ages and by 10-year age groups (15-24 to 74-84 and 85+), where data allows for such disaggregation. Where numbers are too small and data cannot be shown, age groups can be suppressed to protect confidentiality. Sex is reported as male and female, as provided by the ABS in the COD URF, or as people for data related to total population (both sexes combined). Unfortunately, this means we were unable to report on gender identity or sexual orientation. We acknowledge the importance of inclusive data and the need for improved data collection in these areas.

Jurisdiction and Remoteness Area of Usual Residence

Data on state and territory is defined by the place of usual residence of the deceased person regardless of where in Australia the death occurred. Deaths occurring outside of Australia (even where usual residence is within Australia) are generally excluded. Deaths registered in Australia of persons usually residing overseas have been classified according to the state or territory in which the death was registered. Proportion of closed cases and document types attached to each death record can vary between jurisdictions. For more information jurisdictional differences see NCIS Operational Statistics and Explanatory Notes.

In the COD URF from 2011 onwards, data on the geographic location of usual residence of a deceased person is available at the Statistical Area 2 (SA2) level from the Australian Statistical Geography Standard (ASGS) (cat. no. 1270.0.55.001). Data from 2009 and 2010 were originally coded using the Australian Standard Geographic Classification (ASGC) (cat no 1216.0), while data from 2011 to 2015 were coded using ASGS 2011, from 2016 to 2020 using ASGS 2016 and from 2021 to 2023 using ASGS 2021. Correspondence was applied to the 2009 and 2010 ASGC codes by ABS to obtain corresponding ASGS 2011 codes, which could have introduced some inaccuracies and should be considered when interpreting the data.

The COD URF includes remoteness area data from 2018 reference year onward. To enable analysis of remoteness for earlier years, we applied geographic correspondences to reassign data from the ASGS to Remoteness Areas (RA). Specifically, SA2 2011 to RA 2016 correspondences were used for data from 2009 to 2015, and SA2 2016 to RA 2016 correspondences were used for data from 2016 to 2017. Five classes of remoteness area are defined nationally for Australia – Major cities, Inner regional, Outer regional, Remote and Very remote. We have disaggregated by Major cities versus Regional and Remote for reporting by jurisdiction for New South Wales, Victoria, Queensland, South Australia and Western Australia. There are no Major cities in Tasmania and Northern Territory, and numbers in Regional and Remote areas are too small for reporting in Australian Capital Territory.

Please refer to the Australian Statistical Geography Standard (ASGS): Remoteness Structure, 2021 for further information on remoteness areas including details of the nature of the changes between the ASGS 2011, ASGS 2016 and ASGS 2021.

Socio-Economic Advantage and Disadvantage

Socio-Economic Indexes for Areas (SEIFA) is a product developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage. SEIFA index used in this report is based on the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) which summarises information about the economic and social conditions of people and households within an area, including both relative advantage and disadvantage measures. For this report, SEIFA deciles provided in the COD URF were grouped into SEIFA quintiles ranging from 1 to 5 where:

- A **lower** score indicates relatively greater disadvantage and a lack of advantage in general. For example, an area could have a low score if there are:
    - many households with low incomes, or many people in unskilled occupations, AND
    - few households with high incomes, or few people in skilled occupations.
- A **higher** score indicates a relative lack of disadvantage and greater advantage in general. For example, an area may have a high score if there are:
    - many households with high incomes, or many people in skilled occupations, AND
    - few households with low incomes, or few people in unskilled occupations.

Table M5. Classification of SEIFA quintiles

SEIFA deciles	SEIFA quintiles
1 (most relatively disadvantaged and least relatively advantaged decile)	**1**
2	
3	**2**
4	
5	**3**
6	
7	**4**
8	
9	**5**
10 (least relatively disadvantaged and most relatively advantaged decile)	

Access to SEIFA index data within the Cause of Deaths Unit Record File has been available since 2018. Consequently, the estimates presented here are confined to the timeframe from 2018 to 2023.

Psychosocial Risk Factors

In 2020, a pilot study was undertaken by the ABS coding team to capture information on psychosocial risk factors for deaths referred to a coroner (i.e., including all drug-induced deaths) in the 2017 reference year to extend the utility of the national mortality dataset by presenting information on risk factors in a nationally consistent way. Psychosocial risk factors identified in coronial, police and pathology reports were coded to the International Classification of Diseases 10th (ICD-10) and added to the 2017 Causes of Death data. Psychosocial factors were defined as "social processes and social structures which can have an interaction with individual thought or behaviour and health outcomes" and captured only those factors which were identified to have a negative effect on the death. Protective factors were not in the scope of this study. Building on the pilot study, psychosocial factors were further identified and incorporated into the 2018 dataset and all subsequent years. An updated list of psychosocial codes from the International Classification of Disease 10th Revision (ICD-10) have been used as the framework to identify and apply psychosocial risk factors to mortality coding. It is important to note that there is no national standard for the collection of data on psychosocial factors and that information relating to coroner-certified deaths can differ by jurisdiction. In particular, there might be under-reporting of psychosocial factors that were not recorded during the course of investigation. Further, coronial investigations are an iterative process undertaken by a multitude of agencies and coding of risk factors is thus an ongoing process. More on the pilot study can be found in the ABS research paper and recent article.

In this report, we present data on the psychosocial risk factors as a percentage of the total drug-induced deaths in a selected intent, sex and age group, noting that all drug-induced deaths are referred to a coroner in Australia, and thus would have been recorded in NCIS and reviewed for psychosocial risk factors in 2017-2020.

A comprehensive listing of psychosocial risk factors and their ICD-10 codes that may be reported on the Medical Certificate of Cause of Death for deaths certified by a doctor is available on the ABS website. ICD-10 Z-codes for the most common psychosocial risk factors identified in the drug-induced deaths are presented in the table below:

Table M6. Listing of selected psychosocial risk factor ICD-10 codes with inclusions and exclusions

Z-code	Description	Inclusion and exclusion terms (as applied by ABS)
Z55-Z65	Persons with potential health hazards related to socioeconomic and psychosocial circumstances	
Z80-Z99	Persons with potential health hazards related to family and personal history and certain conditions influencing health status	
Z56.0	Unemployment, unspecified	Incl: • Unemployment payment with no further specification Excl: • Unemployment of family member (Z59.8)
Z56.2	Threat of job loss	Incl: • Job loss • Firing • Redundancy • Threat (real or perceived) of job loss • Medical discharge • Made redundant due to ill health
Z56.6	Other physical and mental strain related to work	Incl: • Physical pain when performing work duties • Workplace injuries • Work stress • Unable to relax/wind down post-work • Unhappy at work Excl: • Workplace bullying (Z56.4, Z60.8)
Z59.0	Homelessness	Incl: • Primary homelessness • Sleeping rough • Rooflessness Excl: • Secondary homelessness (Z59.1)
Z59.8	Other problems related to housing and economic circumstances	Incl: • Foreclosure on loan • Problems with creditors • Financial issues • Bankruptcy • Unemployment of family member • Other specified economic circumstances not classified under Z59.0-Z59.7
Z61.4	Problems related to alleged sexual abuse of child by person within primary support group	Primary support group includes family, friends, and highly influential social groups involved in the exchange of love, caring, concern, animosity, support, and those who share close, personal, enduring relationships.
Z63.0	Problems in relationship with spouse or partner	Incl: • Intimate partner violence • Relationship issues

		• Acute events as well as ongoing/reoccurring • Arguments which have happened proximate to death • Domestic violence • Violence orders (code with Z65.3) Excl: • Separation and divorce (Z63.5) • Domestic violence where children and other specified parties except spouse or partner were affected (Z61.8 or Z63.8)
Z63.3	Absence of family member	Incl: • Inability to see family members (including children) • Estrangement from family members (including children) Excl: • Disappearance and death of family member (Z63.4)
Z63.4	Disappearance and death of a person in the primary support group	Incl: • Death of pet • Assumed death of family member or friend • Suicide of family member or friend (code with Z81.8)
Z63.5	Disruption of family by separation and divorce	Incl: • Relationship breakdown • Separation • Divorce • Children affected by separation or divorce if breakup still having a current effect Excl: • Relationship issues (Z63.0)
Z63.8	Other specified problems related to primary support group	Incl: • Family fights • Problems with pets • Friendship fights • Unrequited love (not in a relationship) • Any other specified problems related to primary support group not classified under Z63.0-Z63.7
Z65.0	Conviction in civil and criminal proceedings without imprisonment	Incl: • Any mention of a conviction • Charged with an offence • Criminal history Excl: • Problems related to release from prison (Z65.2) • If charged with an offence but out on bail, or court pending (Z65.3)
Z65.2	Problems related to release from prison	Incl: • Recent release from prison • Any mention where the deceased has been imprisoned
Z65.3	Problems related to other legal circumstances	Incl: • Domestic Violence Orders • Child custody or support proceedings • Litigation • Restraining Orders • Potential or impending legal circumstances or court appearances • Charges have been laid, awaiting commencement of court proceedings • Circumstances where death occurs in relation to illegal activities, where it is not captured elsewhere
Z73.6	Limitation of activities due to disability or chronic health condition	Incl:

		• All types of disabilities as well as health conditions which reduce an individual's abilities (e.g. chronic conditions in the elderly, "declining health", terminal illness) • Perceived limitation of ability due to newly diagnosed illness
Z74.8	Other problems related to care-provider dependency	Incl: • Anxiety surrounding perceived or actual "burden" on primary support group • Worry/fear/anxiety/avoidance surrounding move to nursing home
Z81.8	Family history of other mental and behavioural disorders (ABS code description: Family history of suicide)	Incl: • Suicide of family member or person in primary support group
Z87.8	Personal history of other specified conditions	Incl: • Conditions classifiable to S00-T98 • History of MVA or other physical trauma without specific injury mentioned Excl: • Personal history of self harm (Z91.5)
Z91.1	Personal history of noncompliance with medical treatment and regimen	Incl: • Non-compliance with medication or other treatment (e.g. dialysis, poorly controlled diabetes) • Misuse of medication • Both current and past misuse and noncompliance with medical regime
Z91.5	Personal history of self-harm	Incl: • Deliberate self-injury • Causing self-inflicted pain • Suicidal and non-suicidal self-injury Excl: • Suicide ideation (R45.8)

Place of Occurrence

Place of occurrence refers to a physical location where the event leading to death (External Cause of Death), such as injury, poisoning or adverse effect, occurred (JAG-#4040295-v10-Guide_-_COD_URF_Client_User_Guide). For data from 2007 to 2012, Place of Occurrence of External Cause of Death was derived from the 4th digit of the ICD-10 code assigned to deaths due to external causes, for matched coroner records. For 2013 data onwards, Place of Occurrence of External Cause of Death was coded directly from comments in the reports relating to the coroners' investigation.

For this report, place of occurrence was categorised into following categories:

Table M7. Classification of place of occurance

Place of occurrence	Code in COD URF
Home	0
Residential Institution	1
School, other institution and public administrative area	2
Street and highway	4
Trade and services	5

Other specified places (including sports and athletics area, industrial and construction area, farm)	3, 6, 7, 8
Unspecified place	9

Comprehensive explanatory notes and technical information relating to Causes of Death data can be found in the Causes of Death, Australia (cat. no 3303.0) on the ABS website.

Report limitations

To support transparency and interpretability of the findings, we present a summary of data completeness across key disaggregation characteristics in 2023. While all cases of drug-induced deaths were included in the overall counts and analyses, some records lacked complete information or were assigned to undefined categories such as *Other* or *Unknown* for one or more variables. The table below outlines the extent of missingness for each characteristic. This information is important for understanding potential biases in subgroup analyses and for interpreting patterns where data completeness may vary.

Table M8. Summary of data completeness for key disaggregation characteristics in drug-induced deaths, 2023

Characteristic	Missing n (%)	Other/Unknown n (%)
Age	0	0
Sex	0	0
State	0	0
Intent	0	62 (3.8)
Remoteness	0	0
Place of occurrence	61 (3.5)	0
SEIFA	0	38 (2.2)