HealthStats NSW

Drug deaths

WHY COLLECT DATA ON DRUG DEATHS IN NSW?

Deaths from harmful drug use are an important public health issue. This analysis aims to explain the full impact of illicit drug deaths in NSW. Some of the key questions the data on HealthStats NSW can be used to answer are:

- What are the trends over time in total drug deaths in NSW?
- How many of these deaths were directly caused by drugs?
- How many deaths occurred where drugs contributed to, but were not the direct reason for, the death?
- What were the primary causes of the deaths where drugs played a direct or indirect role?
- How many drug deaths were associated with certain drugs or classes of drugs?
- Are the drugs involved in the death being consumed alone or in combination with other drugs or classes of drugs?
- How many drug deaths involved alcohol as well?

HOW IS DATA COLLECTED?

Data on drug deaths is collected as part of routine administrative death data. All death records have the medical reasons for death included. A death record will often have multiple medical reasons listed. One of these will be considered the ultimate reason someone died and will be recorded as the 'underlying cause of death'. Any additional medical reasons listed indicate that they contributed to the death but were not considered the primary cause of death.

A standardised list of medical conditions is used to record medical information. This is the International Classification of Diseases version 10 (ICD-10), which is published by the World Health Organization. The ICD-10 includes codes for diseases, medical conditions and test or examination findings. When considering drugs this means that drugs could be included as a diagnosis (e.g. *X42 Accidental poisoning by and exposure to narcotics and psychodysleptics, not elsewhere classified*) or as findings on a blood test (e.g. *R78.1 Finding of opiate drug in blood*).

The different codes and how they are used can give us useful information on the types of drugs involved and how they contributed to the death. Tables 1-5 list the ICD-10 codes used to define the drug death indicators published on HealthStats NSW.

WHAT SORTS OF DRUGS ARE INCLUDED?

This analysis includes all drug deaths with an underlying or associated cause of death code listed in Table 1. Drugs are considered by their class (e.g. opiate, psychostimulant, hallucinogen) and individual drug type (e.g. heroin, opium, methamphetamine). These individual drug types are called drug sub-classes in this analysis. Drug identification can be challenging and some drugs are easier to identify than others. This relates to the biology of how drugs are tested for and processed by the body. Often drug tests look for the metabolites, or the break-down products, of the body processing the drug. Drugs from the same class will often break down into the same metabolites; this means that a test may be able to tell the class of drug taken but not the individual drug. Drugs break down at different rates so it may also be harder to find evidence of a particular drug if it is cleared quickly by the body. However, circumstantial evidence may help determine the cause of the death.

The drug classes and drug sub-classes of some well-known individual drugs reported in the HealthStats NSW indicators are shown in Table 6. This table does not show every drug that is classified. For those deaths where there is not enough information to allocate it to a specific drug class, they are classified as an unspecified drug class and grouped by cause of death. For example, a death with an X41 code (*Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified*) will be classified as belonging to the *Psychotropic* drug class and/or the *Sedative-hypnotics, antiepileptics and antiparkinson* drug class based on the subsequent medical information on the death record (Table 2). However, if there are no additional codes to determine the specific drug class, the death record is categorised as *Unspecified* drug class of *Accidental* cause. Analysis by drug type is therefore limited by the ICD-10 classification framework.

WHAT SORTS OF DEATHS ARE INCLUDED?

There are many indicators included on HealthStats NSW and each one tells a unique part of the story. Together, they describe an overall picture of drug deaths in NSW and can help guide policy, programs and clinical care.

Data is presented on when drugs directly cause a death (drug-induced), such as an overdose, as well as when they contribute to a death (drug-related), such as drowning while under the influence. A person may take one or many drugs at the same time with or without alcohol. Therefore, a death can be counted in multiple indicators and categories, and for some categories these may add up to more than the total number of deaths. For example, if Person A died of an overdose after taking methadone (an opioid), a barbituate and alcohol then their death will be counted as part of the total deaths (drug-induced), and then contribute to the total count of opioid deaths, and of barbituate deaths and methadone deaths (see Figure 1). It is worth noting that alcohol-induced or alcohol-related deaths in the absence of other drugs are not included in this analysis.

Drug use can have consequences outside of the individual consuming drugs. Data collection systems are not able to capture all of these situations. For example, if Person F dies after being in a car accident caused by Person E, who is under the influence of drugs, the drug use of Person E will not be recorded as part of the death record for Person F. Person F will not be included in Total Drug Deaths (see Figure 1). This means that the data will not truly capture all deaths where substance misuse may have played a role.

HOW DOES THIS COMPARE TO DRUG DEATH REPORTING FOR THE REST OF AUSTRALIA?

The Australian Bureau of Statistics (ABS), the Australian Institute of Health and Welfare (AIHW) and the National Drug and Alcohol Research Centre (NDARC) also produce reports on drug deaths in Australia. The ABS and the AIHW report information on drug-induced deaths nationwide. The definitions used to select deaths and the methods used for classifying drug classes and sub-classes are slightly different between the ABS/AIHW and NSW Health. Those that are comparable give similar numbers and trends. These differences are largely due to how we intend to use this information. In NSW the information is used for public health policy and planning. Therefore, the HealthStats NSW indicators use a broader definition to measure burden related to drug use where the underlying cause may be directly or indirectly associated with drug use. One further difference is that specific codes related to medical error or adverse events are not included in the HealthStats NSW indicators.

The National Illicit Drug Indicators Project reports published by NDARC include deaths of fewer and selected drug classes and drug sub-classes in Australia. The conditional definitions for allocating deaths to these drug classes and drug sub-classes is more restrictive than for HealthStats NSW. As such, some statistics are higher on HealthStats NSW than in the NDARC reports.

Figure 1. Case studies and how the data counts people

Case A – dies of an overdose with methadone (opioid), a barbituate and alcohol.

Case B – dies of a heart attack after taking methamphetamine (psychostimulant).

Case C – dies of an accidental overdose of heroin (opioid), morphine (opioid), and tramadol (opioid).

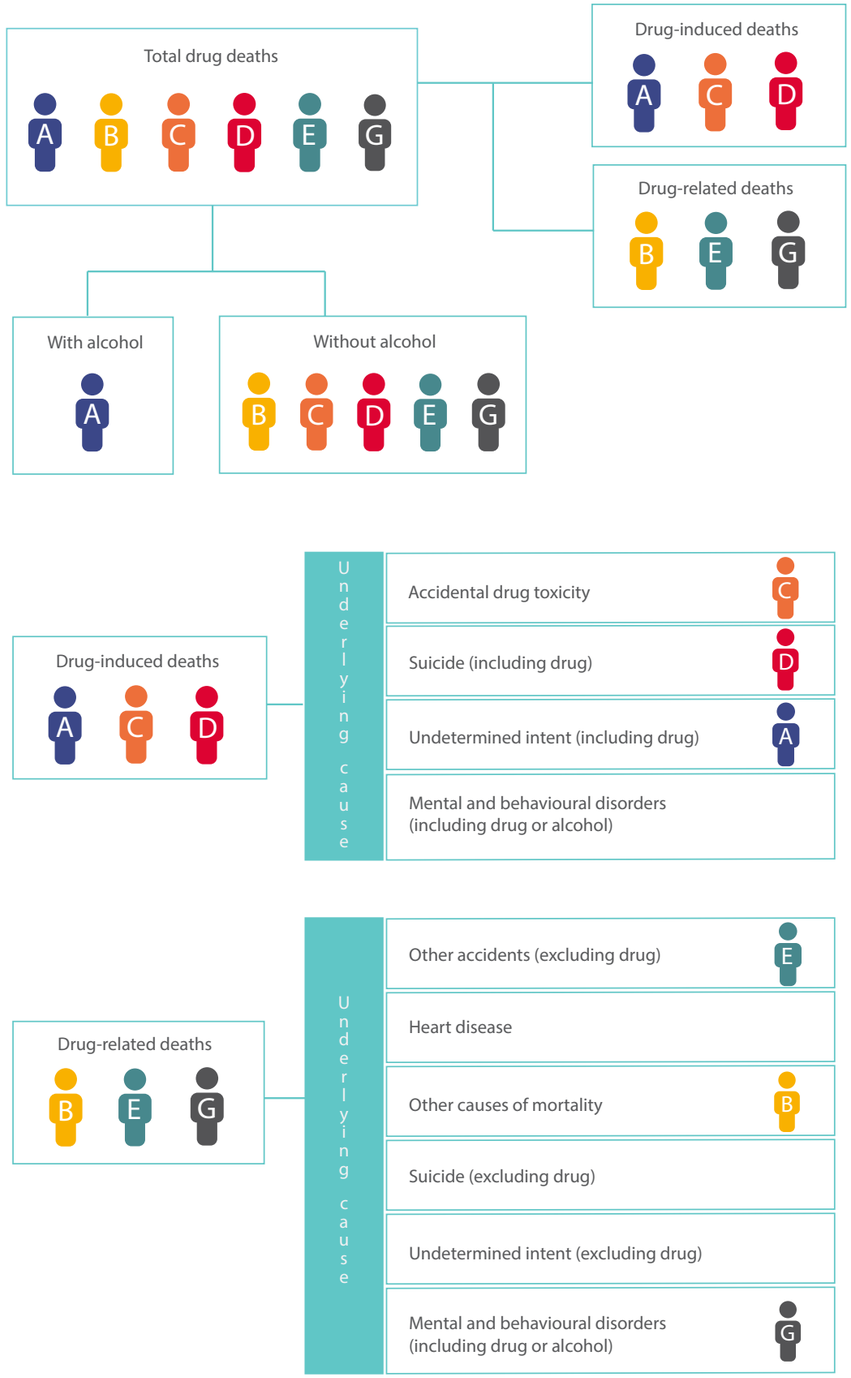
Case D – dies of an intentional overdose of a benzodiazepine.

Case E – dies from crashing their car. They took heroin prior to the accident.

Case F* – dies as a passenger in Case E's car accident. No drugs were taken.

Case G – dies from heart failure where their drug addiction was a contributory factor to their death.

*Case F does not appear in any of the indicators in this figure. See 'What sorts of deaths are included?' for more details.



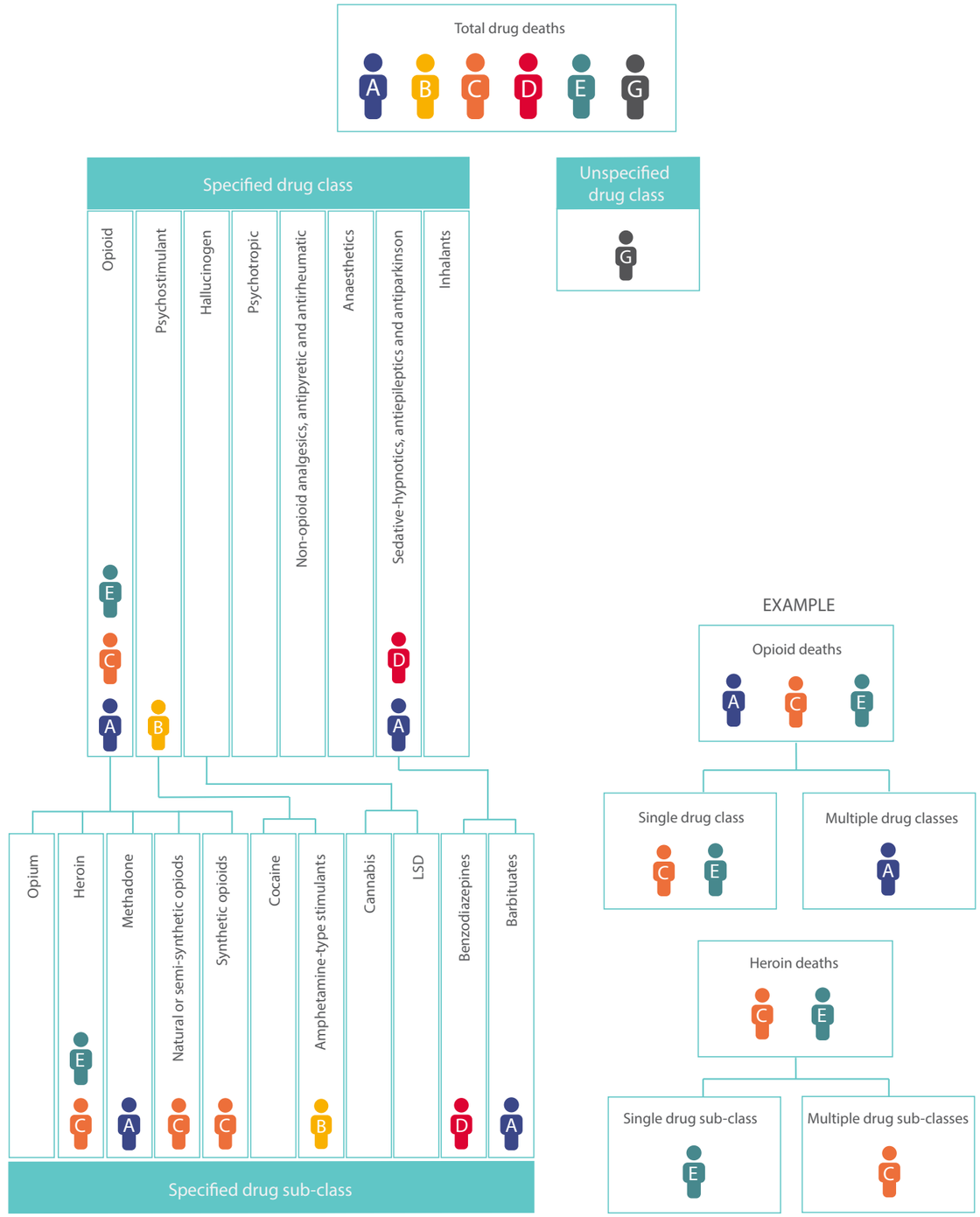


Table 1. ICD-10 codes used to identify total drug deaths[1] (drug-induced[2] and drug-related[3] deaths)

ICD-10 code(s)	Description
(F11-F19)	Mental and behavioural disorders due to use of:
F11	opioids
F12	cannabinoids
F13	sedatives or hypnotics
F14	cocaine
F15	other stimulants, including caffeine
F16	hallucinogens
F18	volatile solvents
F19	other psychoactive substances
F55	Harmful use of non-dependence producing substances
(R78.1-R78.6)	In blood, finding of:
R78.1	opiate drug
R78.2	cocaine
R78.3	hallucinogen
R78.4	other drugs of addictive potential
R78.5	psychotropic drug
R78.6	steroid agent
(T39-T43)	Poisoning by:
T39	nonopioid analgesics, antipyretics and antirheumatics
T40	narcotics and psychodysleptics [hallucinogens]
T41	anesthetics and therapeutic gases
T42	antiepileptic, sedative-hypnotic and antiparkinsonism drugs
T43	psychotropic drugs, not elsewhere classified
T52	Toxic effect of organic solvents
(X40-X44, X46)	Accidental poisoining by and exposure to:
X40	non-opioid analgesics, antipyretic and antirheumatics
X41	antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
X42	narcotics and psychodysleptics (hallucinogens), not elsewhere classified
X43	other drugs acting on the autonomic nervous system
X44	other and unspecified drugs, medicaments and biological substances
X46	organic solvents and halogenated hydrocarbons and their vapours
(X60-X64, X66)	Intentional self-poisoning by and exposure to:
X60	non-opioid analgesics, antipyretics and antirheumatics
X61	antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified
X62	narcotics and psychodysleptics (hallucinogens), not elsewhere classified
X63	other drugs acting on the autonomic nervous system
X64	other and unspecified drugs, medicaments and biological substances
X66	organic solvents and halogenated hydrocarbons and their vapours
X85	Assault by drugs, medicaments and biological substances
(Y10-Y14, Y16)	Poisoning by and exposure to:
Y10	non-opioid analgesics, antipyretics and antirheumatics, undetermined intent
Y11	antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified, undetermined intent
Y12	narcotics and psychodysleptics (hallucinogens), not elsewhere classified, undetermined intent
Y13	other drugs acting on the autonomic nervous system, undetermined intent
Y14	other and unspecified drugs. medicaments and biological substances, undetermined intent
Y16	organic solvents and halogenated hydrocarbons and their vapours, undetermined intent

[1] Total drug deaths include any death with a cause (underlying or associated) containing at least one ICD-10 code listed in Table 1.
[2] Drug-induced deaths are those deaths with an underlying cause listed in Table 1.
[3] Drug-related deaths are those deaths with a non-underlying cause containing at least one ICD-10 code listed in Table 1 and an underlying cause that is not listed in Table 1 (i.e. the death is not already classified as drug-induced).

Table 2. ICD-10 codes used to identify drug classes

Drug class	ICD-10 codes
Opioid	F11, R78.1, T40.0, T40.1, T40.2, T40.3, T40.4, T40.6
Psychostimulants	F14, F15, R78.2, T40.5, T43.6
Hallucinogens	F12, F16, R78.3, T40.7, T40.8, T40.9
Psychotropic	R78.5, T43.0, T43.1, T43.2, T43.3, T43.4, T43.5, T43.8, T43.9
Non-opioid analgesic and antirheumatic	T39.0, T39.1, T39.2, T39.3, T39.4, T39.5, T39.6, T39.7, T39.8, T39.9, X40, X60, Y10
Anaesthetics	T41.0, T41.2, T41.3, T41.4, T41.5
Inhalants	T52.0, T52.1, T52.2, T52.3, T52.4, T52.8, T52.9, F18
Sedative-hypnotics, antiepileptics and antiparkinsonism	T41.1, T42.0, T42.1, T42.2, T42.3, T42.4, T42,5, T42.6, T42.7, T42.8, F13

Table 3. ICD-10 codes used to identify drug sub-classes

Drug sub-class	ICD-10 codes
Opium	T40.0
Heroin	T40.1
Methadone	T40.3
Natural or semi-synthetic opioids	T40.2
Synthetic opioids	T40.4
Cocaine	T40.5, R78.2, F14
Amphetamine-type stimulants	T43.6, F15
Cannabis	T40.7
LSD	T40.8
Benzodiazepines	T42.4
Barbituates	T41.1, T42.3

Table 4. ICD-10 codes used to identify underlying cause of death groupings

Drug class	ICD-10 codes
Accidental drug toxicity	X40, X41, X42, X43, X44, X46
Other accidents	V00-X39, X45, X47-X59, Y85.0, Y85.9, Y86
Heart disease	I00-I99
Suicide (including drug)	X60-X64, X66
Suicide (excluding drug)	X65, X67-X84, Y87.0
Undetermined intent (including drug)	Y10-Y14, Y16
Undetermined intent (excluding drug)	Y00-Y09, Y15, Y17-Y34
Mental and behavioural disorders (including drug)	F11-F19, F55
Other causes of mortality	ICD-10 codes not included elsewhere in Table 4

Table 5. ICD-10 codes used to identify drug deaths involving alcohol*

ICD-10 code	Description
F10	Mental and behavioural disorders due to use of alcohol
R78.0	Finding of alcohol in blood
T51.0	Toxic effect of alcohol, ethanol
T51.9	Toxic effect of alcohol, unspecified

* Note: This is not a complete set of ICD-10 codes for alcohol use and associated health outcomes. These codes are used to identify scenarios where alcohol and drug use were both present at the time of death.

Table 6. Example drugs included in drug classes and drug sub-classes

Drug class	Drug or drug sub-class	Individual drugs within a drug sub-class
Opioid	Opium	
	Heroin	
	Natural or semi-synthetic opioids	Codeine, Morphine
	Synthetic opioids	Pethidine, Fentanyl, Tramadol
	Methadone	
Psychostimulant	Cocaine	
	Amphetamine-type stimulants	Amphetamine, Methamphetamine, MDMA/ Ecstasy, Caffeine
Hallucinogen	Cannabinoids	Cannabis
	Ketamine	
	LSD	
	Mescaline	
	Psilocin	
	Psilocybine	
Psychotropic	Antidepressants	Sertraline, Citalopram, Venlafaxine, Fluoxetine, Mirtazepine, Fluvoxamine, Paroxetine, Duloxetine, Bupropion
	Other and unspecified antipsychotics and neuroleptics	Quetiapine, Olanzapine, Antipsychotic, Risperidone
Non-opioid analgesics, antipyretics and anti-rheumatics	Salicylates	Aspirin
	4-Aminophenol derivatives	Paracetamol
Anaesthetics	GHB	
	Ketamine	
Sedative-hypnotic, antiepileptic and antiparkinson	GHB	
	Carbamazepine	
	Barbituates	
	Benzodiazepines	Alprazolam, Diazepam, Oxazepam, Clonazepam, Clozapine, Temazepam, Oxazepam
Inhalants	Petroleum	
	Benzene	
	Organic solvents	
	Ketones	