Accidental drug-induced deaths due to opioids in Australia, 2013

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Background

- This bulletin provides interpretation of final data on accidental opioid induced deaths in Australia in 2013, and estimated data for 2014 and 2015.
- The majority of opioid overdose deaths in Australia are accidental (defined as being a death where there is no information to suggest the decedent intentionally took their own life). Accordingly, the focus of this bulletin is on deaths that are due to accidental overdose.
- In this bulletin deaths refer to accidental deaths in which opioids were determined to be the underlying cause of death - that is, that they were the primary factor responsible for the person's death. They are coded according to the World Health Organization's (WHO) International Statistical Classification of Diseases and Related Problems, 10th revision (ICD-10) [1].
- To provide context, we also present data on the total number of opioid deaths (including deaths that were not accidental).
- The data for 2014 and 2015 are not final. We have estimated figures for 2014 and 2015 based on changes that occurred in the 2012 and 2013 revisions. We have not interpreted these figures in any detail. This will be the subject of later bulletins.
- Opioid overdose deaths include deaths due to heroin and pharmaceutical opioids such as morphine and oxycodone.

Key findings for 2013

RATES

- There were a total of 597 accidental opioid overdose deaths in 2013 (564 in 2012) among those aged 15 to 54 years, and 668 deaths across all ages (639 in 2012).
- In 2013, the rate of accidental overdose deaths due to opioids in Australia was 46.7 per million persons aged 15 to 54 years, compared to 44.7 per million persons in 2012. Among all ages the rate of accidental opioid deaths in 2013 was 28.9 per million persons (28.1 in 2012).
- In 2013, 189 (32%) of the 597 accidental opioid deaths among Australians aged 15 to 54 were due to heroin (30% in 2012 were due to heroin) (Table 1). Among all ages, 198 (30%) of the 668 deaths were due to heroin (data not shown).
- In 2013, 408 (68%) of the 597 accidental opioid deaths among Australians aged 15 to 54 were due to pharmaceutical opioids (70% in 2012 were due to pharmaceutical opioids) (Table 1). Among all ages, 470 (70%) of the 668 deaths were due to pharmaceutical opioids (data not shown).
- In 2013 among Australians aged 15 to 54, approximately one-third (32%) of the accidental opioid deaths occurred in New South Wales (NSW) (n=190), 28% in Victoria (VIC) (n=166) and 19% in Queensland (QLD) (n=114). NSW and VIC recorded an increase in accidental opioid deaths in 2013, with QLD, SA and WA recording a decline (Table 2). In the smaller jurisdictions (Tasmania (TAS), the Northern Territory (NT) and the Australian Capital Territory (ACT), deaths are small in number.
- Projected estimates for 2014 (n=684) and 2015 (n=689) suggest that accidental opioid deaths are trending upwards among those aged 15 to 54 years. These figures should be interpreted with caution as they are estimates and may change.

[1] See Appendix for details of codes used.

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GENDER

- Males comprised over two-thirds (72%) of the accidental opioid deaths among the 15 to 54 year age group and 70% among all age groups in 2013.

AGE

Current

- Australians aged 15-54 (n=597) shows the largest proportion of deaths occurring among the 35-44 year age group (40% n=240), followed by the 25-34 year age group (27% n=162), 45-54 (27% n=161) and 15-24 year age groups (6% n=34).
- When deaths for all ages are included in the analysis (n=668), Australians aged 55 years and over account for 9% of all accidental opioid deaths in 2013.

Trends

- In 2001, accidental opioid deaths across most age groups (with the exception of the 45-54 year olds) decreased (from 211 to 78 among 15 to 24 year olds, from 372 to154 among 25 to 34 year olds, and from 289 to 113 among 35 to 44 year olds) following relatively high mortality rates between 1997 and 2000 (Figure 1, Table 5).
- Trends in accidental opioid deaths among Australians aged 15-54 show the mortality rate among the youngest age group (15-24 years) remained low between 2004 and 2013.
- Rates among the 25-34 year age group have declined since 2011 (Figure 1).
- Accidental opioid mortality rates among the 35-44 year age group have increased since 2007 from 34.3 per million persons to 74.7 per million in 2013 (Figure 1).
- Mortality rates among the 45-54 year olds have continued to increase since 2001, and rates are higher (at 52.3 per million persons in 2013) than those recorded prior to 2001 (25.4 per million in 2000).
- Mortality rates among Australians aged 55 to 74 years have remained relatively low and stable over the past four years (Figure 1).

INTENTIONAL DEATHS AND DEATHS OF UNDETERMINED INTENT

- Although this bulletin focuses on opioid deaths that were accidental, additional data provided by the Australian Bureau of Statistics shows that in 2013, among Australians aged 15 to 54, there were 94 deaths that were recorded as being intentional overdoses, and 53 deaths where the intent was undetermined (Table 1).
- Among Australians aged 15 to 54, the 35 to 44, and 45 to 54 year age groups accounted for the largest proportions (40% and 32% respectively) of intentional opioid overdose deaths. Australians aged 55 years and over accounted for 37% of intentional overdose deaths among all ages (data not shown).

Notes on findings

- The Australian Bureau of Statistics (ABS) collates and manages the national causes of death database, utilising information from the National Coronial Information System (NCIS). Prior to 2003, ABS staff visited coronial offices to manually update information about the cause of death for records that had not yet been loaded onto the NCIS. Since 2003 the ABS has progressively ceased visiting jurisdictional coronial offices, therefore ceasing manual updates of deaths that were not already included on the NCIS.
- For the first time in 2006, the ABS relied solely on the data contained on NCIS at the time the ABS ceased processing the deaths data.
- Since 2007, the causes of death data have been subject to a revisions process. The preliminary data is released by the ABS, then two successive revisions are released 12 months apart from the date of the release of preliminary data.

- The 2006 data presented in this bulletin are based on data released prior to the revisions process being applied to 2006 cause of death data. These data are therefore likely to be incomplete. This is likely to result in an underestimate of the number of accidental opioid deaths recorded in 2006. We have attempted to offset this underestimate by analyzing the changes between preliminary and final findings for both 2007 and 2008. We have averaged the changes across both years, and applied it to the 2006 figures. This data should be interpreted with caution.
- Data for the years 2007 through 2013 in this bulletin represent the 2nd and final revision of each dataset, and are therefore methodologically comparable.
- Data for 2014 and 2015 are projected estimates, based on the changes that occurred in 2012 and 2013 data. These data should be interpreted with caution as figures are likely to change.
- The revisions process results in a longer time from the reporting of a death to finalization by the coroner. These revisions will lead to an increase in the number of deaths. This is particularly true for deaths that are drug-related, as coronial investigations can be complex and lengthy in nature.
- In addition to the revisions process, the ABS undertook two further processing improvements from 2008 onwards; 1) For both open (where a coroner has not yet handed down a finding on cause of death) and closed (where a coroner's decision has been made) cases on the NCIS, the ABS now spend more time investigating the Medical Certificate of Cause of Death to more consistently apply the appropriate ICD10 code for cause of death; 2) For both open and closed cases, the ABS also increasingly use additional information on 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 accidental opioid deaths reported from 2008 onwards.
- In 2014, the ABS implemented IRIS, an automatic system for coding multiple causes of death and selecting the underlying cause of death. Impacts on the data from 2013 onwards are described in more detail in the ABS Technical Note 1, Causes of Death Australia 2013 available on the ABS website:

  http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/3303.0Technical%20Note12013?opendocument&tabname=Notes&prodno=3303.0&issue=2013&num=&view=#CHAPTER%2019
- It should also be noted that availability of additional information on the NCIS varies by jurisdiction and means that improvements are likely to be applied differentially across jurisdictions.
- These findings should be interpreted in conjunction with the ABS Technical Note 2 Causes of Death Revisions, 2013 Final data available on the ABS website:

  http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/3303.0Technical%20Note22015?opendocument&tabname=Notes&prodno=3303.0&issue=2015&num=&view

Conclusions

- The number of accidental opioid overdose deaths in 2013 increased from 2012 figures. Consistent with previous years' findings, the majority (70%) of accidental opioid overdose deaths in 2013 were due to opioids other than heroin.
- There were different trends across different age groups. Deaths among 15 to 24 year olds remain low, while deaths among 25 to 34 year olds have declined since 2011. Increases have been recorded among Australians aged 35 to 44 years, and 45 to 54 years. Deaths among 45 to 54 year olds remain higher than those recorded prior to 2001.
- Projected estimates for 2014 and 2015 suggest a continued upward trend in accidental opioid overdose deaths in Australia. These figures should be interpreted with caution as they are likely to change.
- Intentional opioid overdose deaths in 2013 accounted for a minority (10%) of all opioid overdose deaths in Australia.
- Just over half (57%) of the intentional opioid overdose deaths occurred among Australians aged 45 years and over. These figures need to be interpreted with caution as coding practices have changed over time.

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Figures and Tables

Table 1: Number of opioid overdose deaths by intent and opioid type among 15 to 54 year olds, 2010 to 2013

Year	Accidental			Intentional			Undetermined Intent			TOTAL		
	Heroin	PO*	Total	Heroin	PO*	Total	Heroin	PO*	Total	Heroin	PO*	Total
2010	203	410	**613**^	24	79	103	32	51	83	259	540	799
2011	201	416	**617**^	46	73	119	40	63	103	287	552	839
2012	170	394	**564**^	47	108	155	56	75	131	273	577	850
2013	189	408	**597**^	5	89	94	5	48	53	216	671	887

* PO – Pharmaceutical opioid.
^ These deaths are the focus of this bulletin.
NB: Declines in heroin deaths coded as intentional or of undetermined intent between 2012 and 2013 may be due to the complexities of coding heroin-related deaths. Given that heroin is metabolised rapidly into morphine, some heroin deaths may be coded as pharmaceutical opioid deaths. Although there were changes in 2007 in the way intent is coded, there have been no recent changes that would explain the decrease in intentional and undetermined intent deaths between 2012 and 2013 (personal communication with ABS data coders).

Table 2. Number of accidental deaths due to opioids among those aged 15-54 years by jurisdiction, 1988–2013

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUST
1988	204	99	16	12	18	0	0	2	**351**
1989	158	99	19	8	18	1	2	2	**307**
1990	196	79	8	19	14	5	0	0	**321**
1991	146	64	9	13	13	3	0	2	**250**
1992	182	79	18	30	22	0	1	4	**336**
1993	188	86	23	41	24	5	2	5	**374**
1994	209	97	37	32	38	4	5	3	**425**
1995	273	140	42	38	70	6	0	13	**582**
1996	260	145	32	32	64	5	2	17	**557**
1997	333	203	36	52	76	2	2	9	**713**
1998	452	243	64	53	78	10	13	14	**927**
1999	481	376	79	64	92	5	8	11	**1116**
2000	349	323	124	50	72	8	2	10	**938**
2001	177	73	58	18	35	8	5	12	**386**
2002	158	93	40	21	28	9	6	8	**364#**
2003	143	129	32	14	16	4	2	17	**357**
2004	144	126	34	25	19	6	1	2	**357**
2005	133	104	42	37	36	14	np*	np*	**374**
2006	138	118	42	20	38	15	np*	np*	**381**
2007	115	103	52	34	27	15	np*	np*	**360**
2008	137	170	62	43	64	11	np*	np*	**500**
2009	174	143	103	47	71	10	np*	np*	**563**
2010	150	169	142	41	87	9	np*	np*	**613**
2011	176	175	134	24	88	7	np*	np*	**617**
2012	157	126	128	42	90	13	np*	np*	**564**
2013	190	166	114	28	81	np*	np*	11	**597**

* np means that the data in these jurisdictions were not published in order to protect confidentiality.
# One death did not have a jurisdiction noted.
See Appendix (Table A1) for deaths across all age groups.

Accidental drug-induced deaths due to opioids in Australia, 2013

Table 3. Number of accidental deaths due to opioids among those aged 15–54 years by gender and jurisdiction, 2013

Jurisdiction	Males 15-54	Females 15-54
NSW	134	56
VIC	122	44
QLD	82	32
SA	25	3
WA	59	22
TAS	np*	np*
NT	np*	np*
ACT	6	5
Missing	-	-
Australia	**432**	**165**

* np means that the data in these jurisdictions were not published in order to protect confidentiality
Note: Figures may not match those reported in Table 1 as a result of the ABS confidentialisation process.
See Appendix Table A2 for deaths across all age groups.

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Table 4. Rate of accidental opioid deaths per million persons among 15–54 year olds by jurisdiction, 1988–2013

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUST
1988	62.5	39.9	10.1	14.9	19.7	0	0	11.4	**36.6**
1989	47.5	39.3	11.6	9.8	19.2	6.4	19.2	11.4	**31.4**
1990	58.2	30.8	4.7	23.1	14.6	19.1	0	0	**32.3**
1991	42.8	24.7	5.2	15.7	13.4	11.4	0	10.8	**24.8**
1992	52.9	30.3	10.1	35.9	22.4	0	9.2	21.1	**32.9**
1993	54.3	33.0	12.6	48.9	24.1	18.8	18.3	25.9	**36.3**
1994	59.9	37.1	19.7	38.1	37.7	15.0	45.5	15.4	**40.9**
1995	76.9	53.4	21.8	45.1	68.1	22.5	0	66.2	**55.3**
1996	72.7	54.8	16.2	37.9	61.2	18.7	17.7	85.6	**52.2**
1997	92.2	76.1	18.1	61.8	71.3	7.5	16.5	45.8	**66.3**
1998	124.1	90.4	31.7	62.7	72.1	37.8	106.1	71.3	**85.4**
1999	130.9	138.8	38.7	75.5	84.1	19.0	64.4	55.9	**101.9**
2000	94.1	118.1	60.1	58.9	65.2	30.6	15.9	50.5	**84.9**
2001	47.2	26.4	27.8	21.2	31.3	30.8	39.6	60.2	**34.6**
2002	41.9	33.2	18.8	24.7	24.8	34.9	47.8	40.1	**32.3**
2003	37.8	45.9	14.7	16.5	14.1	15.4	15.9	85.3	**31.5**
2004	38.0	44.6	15.4	29.5	16.6	23.0	8.0	10.1	**31.3**
2005	35.0	36.5	18.7	43.7	31.0	53.7	np*	np*	**32.5**
2006	36.1	41.0	18.3	23.5	32.2	57.4	np*	np*	**32.8**
2007	29.8	34.8	22.1	39.2	22.4	57.2	np*	np*	**30.4**
2008	35.1	56.5	25.7	49.2	51.5	42.0	np*	np*	**41.5**
2009	44.2	49.7	42.0	53.4	54.8	37.7	np*	np*	**45.9**
2010	37.8	54.5	57.2	46.3	65.9	33.8	np*	np*	**49.5**
2011	44.3	56.0	53.6	27.1	65.1	26.3	np*	np*	**49.5**
2012	39.29	39.86	50.46	47.26	64.38	49.44	np*	np*	**44.7**
2013	47.15	51.81	44.34	31.46	55.98	np*	np*	48.35	**46.71**

* np means that the data in these jurisdictions were not published in order to protect confidentiality.

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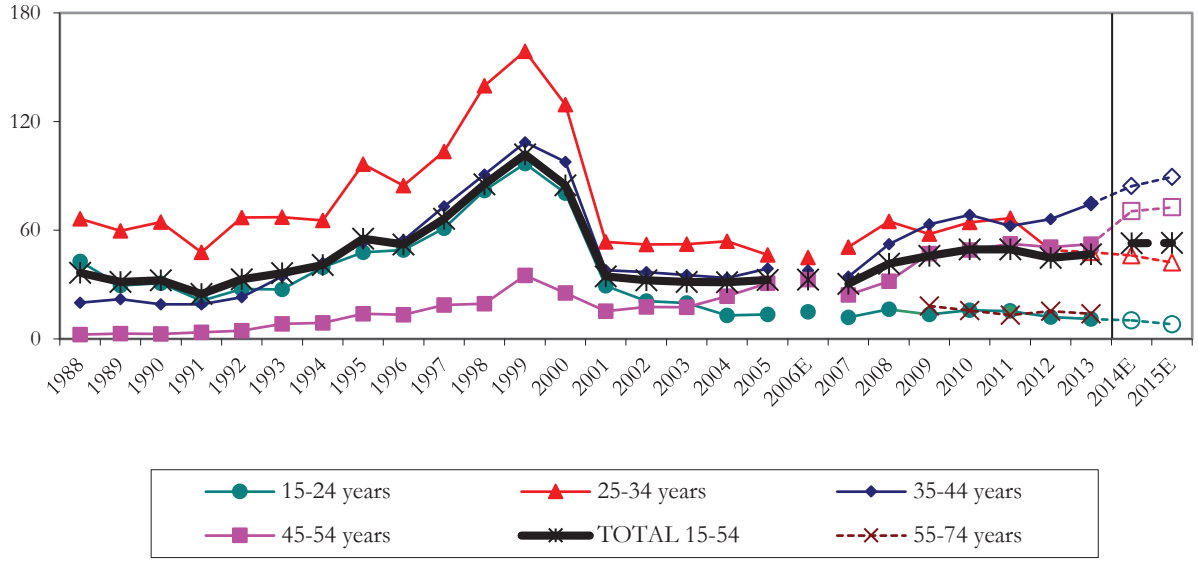
Table 5: Rate of accidental deaths due to opioids per million persons by age group, 1988-2013

	15-24 years	25-34 years	35-44 years	45-54 years
1988	42.8	66.3	20.0	2.4
1989	29.5	59.7	21.9	2.9
1990	30.8	64.6	19.1	2.8
1991	21.0	47.8	19.1	3.7
1992	27.6	67.1	23	4.6
1993	27.3	67.3	34.5	8.3
1994	39.5	65.5	41.9	8.9
1995	47.9	96.5	53.3	13.9
1996	49.0	84.6	54.4	13.4
1997	61.1	103.5	73.1	18.8
1998	82.0	139.7	90.8	19.4
1999	96.8	158.9	108.6	35.0
2000	80.6	129.3	97.8	25.4
2001	29.4	53.6	38.0	15.4
2002	20.9	52.1	36.9	17.6
2003	19.8	52.4	35.2	17.5
2004	13.0	53.9	33.6	23.6
2005	13.5	46.4	38.9	30.8
2006	15.0	44.9	37.8	32.7
2007	12.0	50.7	34.3	24.4
2008	16.3	65.0	52.3	31.8
2009	13.5	57.9	63.3	47.2
2010	15.9	64.3	68.4	48.5
2011	15.3	66.7	62.4	52.5
2012	12.0	49.0	66.1	50.7
2013	10.9	47.9	74.7	52.3

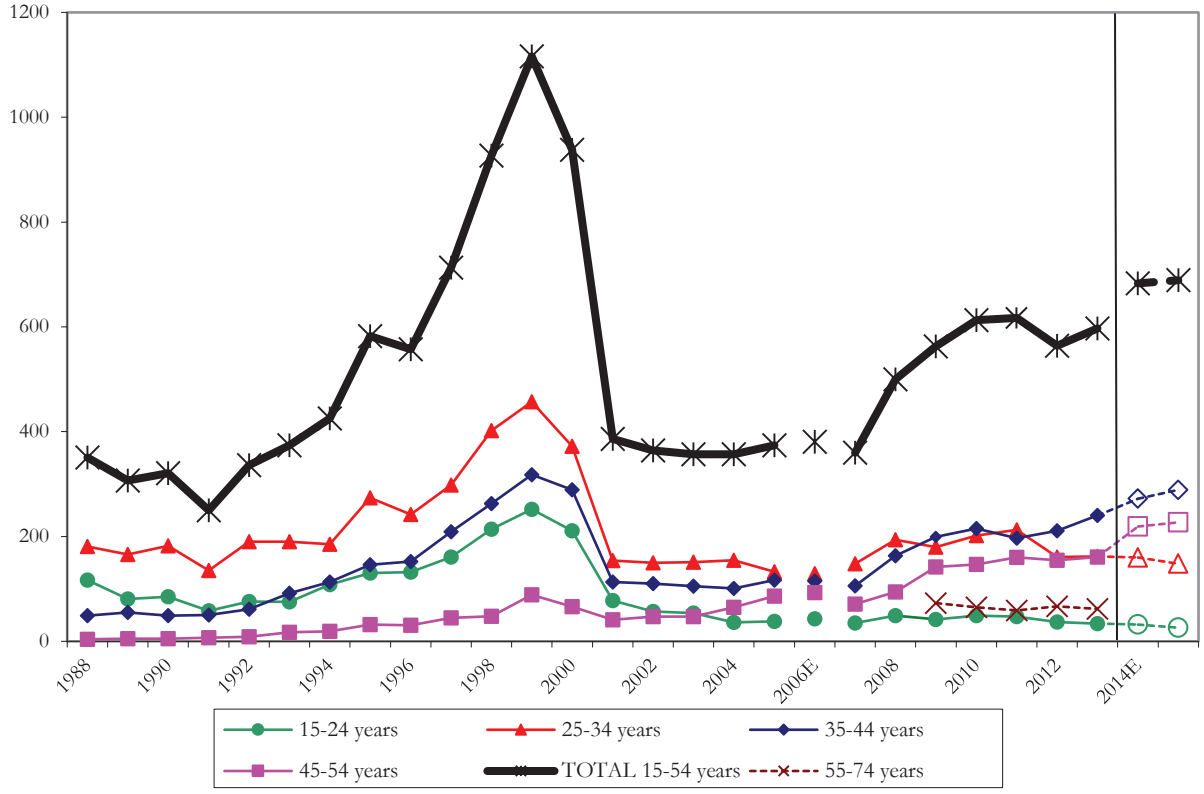
Accidental drug-induced deaths due to opioids in Australia, 2013

Figure 1: Rate of accidental deaths due to opioids per million persons by 10 year age group, Australia 1988-2013



N.B. There is a break in the series in 2006.These data were not revised and are therefore likely to be an underestimate. We have estimated these data points using original data, then using an average of change across the 2007 and 2008 revisions. The 2014 and 2015 figures are estimated using changes that occurred across revisions in 2012 and 2013. These figures are not yet final. 2006E, 2014E and 2015E=Estimated.

Figure 2: Number of accidental deaths due to opioids among those aged 15-54 years, Australia 1988-2013



N.B. There is a break in the series in 2006, as these data were not revised, and are therefore likely to be an underestimate. We have estimated these data points using original data, then using an average of change across the 2007 and 2008 revisions. The 2014 and 2015 figures are estimated using changes that occurred across revisions in 2012 and 2013. These figures are not yet final. 2006E, 2014E and 2015E=Estimated.

Appendix: ABS data on accidental deaths due to opioids in Australia

The Australian Bureau of Statistics (ABS) is responsible for collecting data every year on persons who have died across Australia. Data on accidental deaths are collected from the Medical Certificates of Cause of Death submitted to each State or Territory's Registrar of Births, Deaths and Marriages and from the National Coroners Information System.

Death certificates typically state the sequence of events that led to a person's death. The ABS then uses its coding rules to establish the underlying cause of death, that is, "the disease or injury that initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury". The ABS also lists the diseases, injuries and health-related factors that contributed to the death but which were not the main cause of death.

The ABS uses an international classification system for classifying deaths, developed by the World Health Organization (WHO). This is called the International Statistical Classification of Diseases and Related Problems (ICD). The ICD edition currently used is the 10th edition (ICD-10). This edition of the classification system has been used since 1997 and provides more detailed information on accidental drug-induced deaths than previous versions. It is important to note that the introduction of ICD-10 has resulted in a break in time series. Prior to 1997, the COD data were coded according to ICD-9, and opioid deaths were based on the following codes: 3040 (opioid dependence), 3070 (opioid dependence in combination with another drug), E8500 (accidental poisoning by heroin) and E8501 (accidental poisoning by methadone).

All data on accidental opioid deaths used in this report refer to deaths in which opioids were considered to be the underlying cause of death. This means that the deaths recorded here only include those in which it was considered that opioids such as heroin, morphine, pethidine, methadone and codeine were primarily responsible for the person's death. There are more deaths each year in which opioids are considered to have contributed to a person's death (e.g. general medical conditions, suicides, other accidental deaths), however these deaths are not presented.

In this report, the following ICD-10 codes have been used:

- F11 — Accidental deaths due to opioid use disorder (including opioid dependence);
- F19 with F11 — Accidental deaths due to multiple drug use disorder which included an opioid use disorder;
- X42 with T40.0-T40.4, T40.6 — Accidental deaths due to poisoning which included opioid poisoning;
- X44 with T40.0-T40.4, T40.6 — Accidental deaths due to multiple drug poisoning which included opioid poisoning; and
- F19 with T40.0-T40.4, T40.6 — Accidental deaths due to multiple drug use disorder which included opioid poisoning.

RELATED LINKS:

For more information on NDARC research, go to:	http://ndarc.med.unsw.edu.au/
For more information about the ABS, go to:	www.abs.gov.au
For more information on ICD-10, go to:	www.who.int/whosis/icd10/
For more research from the Drug Trends program go to:	http://www.drugtrends.org.au/

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Table A1: Number of accidental deaths due to opioids among all age groups by jurisdiction, 2007-2013

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUST
2007	134	109	61	38	28	20	np*	np*	**398**
2008	150	181	71	47	75	14	np*	np*	**551**
2009	198	151	124	58	83	14	np*	np*	**645**
2010	172	180	165	45	98	11	np*	np*	**687**
2011	194	182	159	28	98	8	np*	np*	**683**
2012	173	136	148	54	104	14	np*	np*	**639**
2013	225	177	126	32	88	np*	np*	13	**668**

* np means that the data in these jurisdictions were not published in order to protect confidentiality.

Table A2: Number of accidental deaths due to opioids among all age groups by gender and jurisdiction, 2013

Jurisdiction	Males all ages	Females all ages
NSW	154	71
VIC	130	47
QLD	86	40
SA	26	6
WA	62	26
TAS	np*	np*
NT	np*	np*
ACT	6	7
Missing	-	-
Australia	**468**	**200**

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