

Accidental drug-induced deaths due to opioids in Australia, 2011

Recommended citation: Roxburgh, A. and Burns, L. (2015). Accidental drug-induced deaths due to opioids in Australia, 2011. Sydney: National Drug and Alcohol Research Centre.

- This bulletin provides interpretation of final data on accidental opioid induced deaths in Australia in 2011, and estimated data for 2012 and 2013.
- NB: The data for 2012 and 2013 are not final and are likely to change. We have estimated figures for 2012 and 2013 based on changes that occurred in the 2010 and 2011 revisions. We have not interpreted these figures in any detail. This will be the subject of later bulletins.
- Opioid deaths include those due to heroin, but may also include overdoses due to other opioids such as morphine and oxycodone.
- 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.

Key Findings for 2011

Rates

- There were a total of 617 accidental overdose deaths attributed to opioids in 2011 (compared to 613 in 2010) among those aged 15 to 54 years, and 683 deaths across all ages (compared to 687 in 2010).
- In 2011, the rate of accidental overdose deaths due to opioids in Australia was 49.5 per million persons aged 15 to 54 years, and remains unchanged from 2010. Among all ages the rate of accidental opioid deaths in 2011 was 30.5 per million persons (compared to 31.1 per million persons in 2010).
- In 2011, 201 (33%) of the accidental opioid deaths among Australians aged 15 to 54 were due to heroin, and among all ages 208 (30%) were due to heroin.
- In 2011 among Australians aged 15 to 54, just over one-quarter (28%) of the accidental opioid deaths occurred in New South Wales (NSW) (n=176), and 28% in Victoria (VIC) (n=175). Both jurisdictions recorded slight increases in accidental opioid deaths (from 150 and 169 respectively in 2010) in 2011. Queensland (QLD) recorded a decrease in accidental opioid deaths (from 142 in 2010 to 134) in 2011, as did South Australia. Accidental opioid deaths in Tasmania (TAS) and Western Australia (WA) remained stable in 2011².

¹ See Appendix for details of codes used

² Numbers were not provided for the NT and the ACT in order to protect confidentiality of the decedents,

- Projected estimates for 2012 (n=596) and 2013 (n=632) suggest that accidental opioid deaths will remain stable, however these figures should be interpreted with caution as they may change.

Gender

- Males comprised three quarters (76%) of the accidental opioid deaths among the 15 to 54 year age group and 74% among all age groups in 2011.

Age

Current

- Age analysis of accidental opioid deaths among Australians aged 15-54 (n=617) shows the largest proportion of deaths occurring among the 25-34 year age group (34%), followed by the 35-44 year age group (32%), 45-54 (26%) and 15-24 year age groups (8%).
- When deaths for all ages are included in the analysis (n=683), Australians aged 55 years and over account for 10% of all accidental opioid deaths in 2011.

Trends

- In 2001, accidental opioid deaths across most age groups (with the exception of the 45-54 year olds) decreased significantly following relatively high mortality rates between 1997 and 2000 (Figure 1, Table 4).
- Trends in accidental opioid deaths among Australians aged 15-54 show the mortality rate among the youngest age group (15-24 years) remained low and relatively stable between 2004 and 2011.
- Although increases have been recorded in opioid mortality rates among the 25-34 year age group, they remain at lower levels than rates recorded prior to 2001.
- There were sharp increases in accidental opioid mortality rates among the 35-44 year age group between 2007 and 2010, however these stabilised in 2011 (Figure 1).
- Mortality rates among the oldest age group (45-54 years) have increased since 2001, and rates are higher than those recorded prior to the 2001 heroin shortage.

Intentional deaths and deaths of undetermined intent

- Although this bulletin covers opioid deaths that were accidental, additional data provided by the Australian Bureau of Statistics shows that in 2010 there were 162 opioid deaths (compared to 141 in 2010) across all ages that were intentional overdoses (representing 17% of all opioid deaths) and 114 deaths (compared to 90 in 2010) where the coroner was unable to determine intent (12% of all opioid deaths).
- Approximately equal proportions of intentional opioid overdoses occurred among 35 to 44 year olds (27%), Australians aged 55 years and over (26%) and 45 to 54 year olds (25%).

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

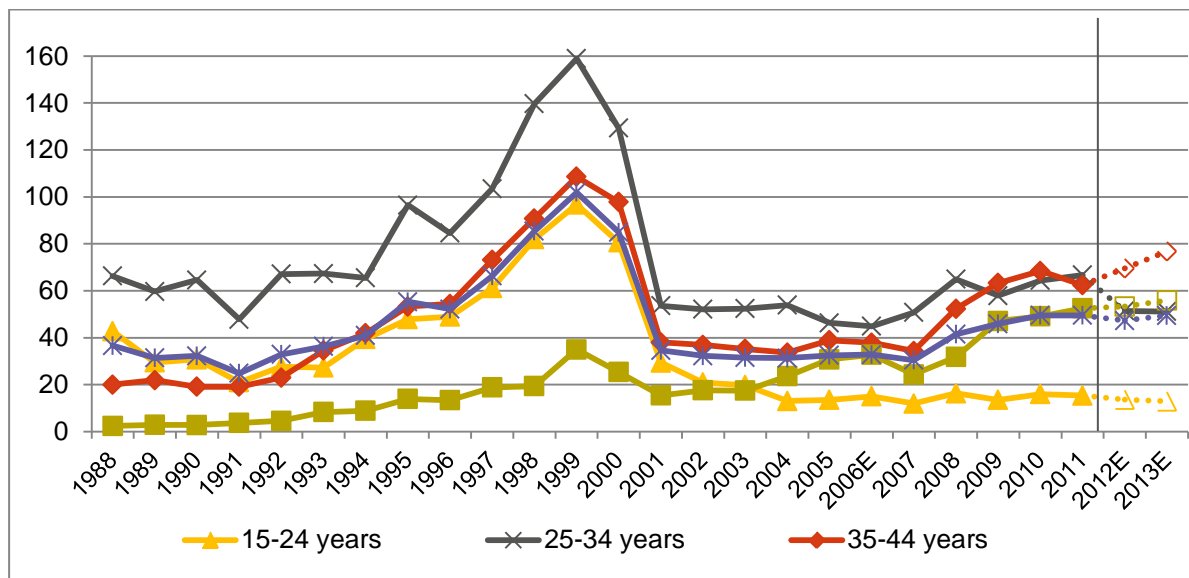
to 2003, ABS staff visited coronial offices to manually update information about the cause of death for records that had not yet been loaded onto the NCIS. Since 2003 the ABS has progressively ceased visiting jurisdictional coronial offices, therefore ceasing manual updates of deaths that were not already included on the NCIS.

- For the first time in 2006, the ABS relied solely on the data contained on the 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, 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 opioid deaths recorded in 2006. We have tried 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 2011 in this bulletin represent the 2nd and final revision of each dataset, and are therefore methodologically comparable.
- Data for 2012 and 2013 are projected estimates, based on the changes that occurred in 2010 and 2011 data. Again these data should be interpreted with caution as figures are likely to change.
- The result of the revisions process is 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 uses additional information on the NCIS (e.g. autopsy, police and toxicology reports), where available, to apply more specific cause of death codes.
- Both of these processing improvements are likely to have an impact on the number of opioid deaths reported from 2008 onwards.
- It should also be noted that availability of additional information on the NCIS varies by jurisdiction, which 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 2010, available on the ABS website:
<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/3303.0Technical+Note12012>

Implications

- Both the number and the rate of accidental opioid overdose deaths in Australia in 2011 remain lower than figures recorded in the late 1990s, when heroin use and harms were increasing.
- For the first time in the past five years, opioid overdose deaths appear to be stabilising in 2011.
- In 2011 the majority (70%) of accidental opioid deaths were due to opioids other than heroin.
- Projected estimates for 2012 and 2013 suggest the trend in accidental opioid deaths in Australia may stabilise at a higher level, however these figures should be interpreted with caution.
- In 2011 intentional opioid overdose deaths accounted for a minority (17%) of all opioid overdose deaths in Australia. Just over half (51%) of the intentional deaths occurred among Australians aged 45 years and over. These figures remain relatively unchanged from 2010.
- In 2011, accidental opioid deaths among the youngest age group (15 to 24 years) remained relatively stable at a lower level, while deaths have continued to increase among the oldest age group (45 to 54 years) to rates higher than those recorded prior to 2001. This trend is consistent with research suggesting a differential impact of the heroin shortage according to age, with heroin use and related harms declining among younger Australians in 2001, while there was little change in heroin-related harms among older age groups at this time (Degenhardt, Day, Conroy, Gilmour, & Hall, 2005).
- Age trends are consistent with the direction of other indicators such as hospital presentations for opioid related conditions. Opioid-related hospital presentations among Australians aged 30 to 59 years have steadily increased over the past five years (Roxburgh and Burns, 2015).
- National analysis of coronial cases investigating oxycodone (Roxburgh, Bruno, Larance and Burns, 2011) and fentanyl related mortality (Roxburgh et al, 2013) has shown that the median age of death was between 39 years of age (for fentanyl) and 42 years of age (for oxycodone).
- Many opioid deaths are due to multiple drug toxicity, which increases the risk of fatal overdose. Continued education about the risks of multiple drug consumption, and the additional risk that systemic disease such as reduced liver or respiratory function may pose for drug toxicity, is required.
- The Australian population is ageing and older Australians are increasingly likely to be prescribed opioid analgesics. It is therefore critical that treatment programs for opioid dependence include dependence on prescription opioids. This group are likely to have developed dependence through different trajectories and require different strategies for engagement, treatment and retention.

Figure 1: Rate of deaths due to opioids per million persons by 10 year age group, Australia 1988-2011.



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.

We estimated what the 2012 and 2013 final figures might be given the changes that occurred across revisions in 2010 and 2011. These figures are not yet final. 2006E, 2012E and 2013E=Estimated

Table 1: Number of accidental deaths due to opioids among those aged 15-54 years by jurisdiction, 1988-2011.

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUSTRALIA
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

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

One death did not have a jurisdiction noted

Table 2: Number of accidental deaths due to opioids among those aged 15-54 years by gender and jurisdiction, 2011.

Jurisdiction	Males	Females
NSW	130	46
VIC	140	35
QLD	96	38
SA	np	np
WA	68	20
TAS	np	np
NT	np	np
ACT	np	np
Missing	np	np
Australia	469	148

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

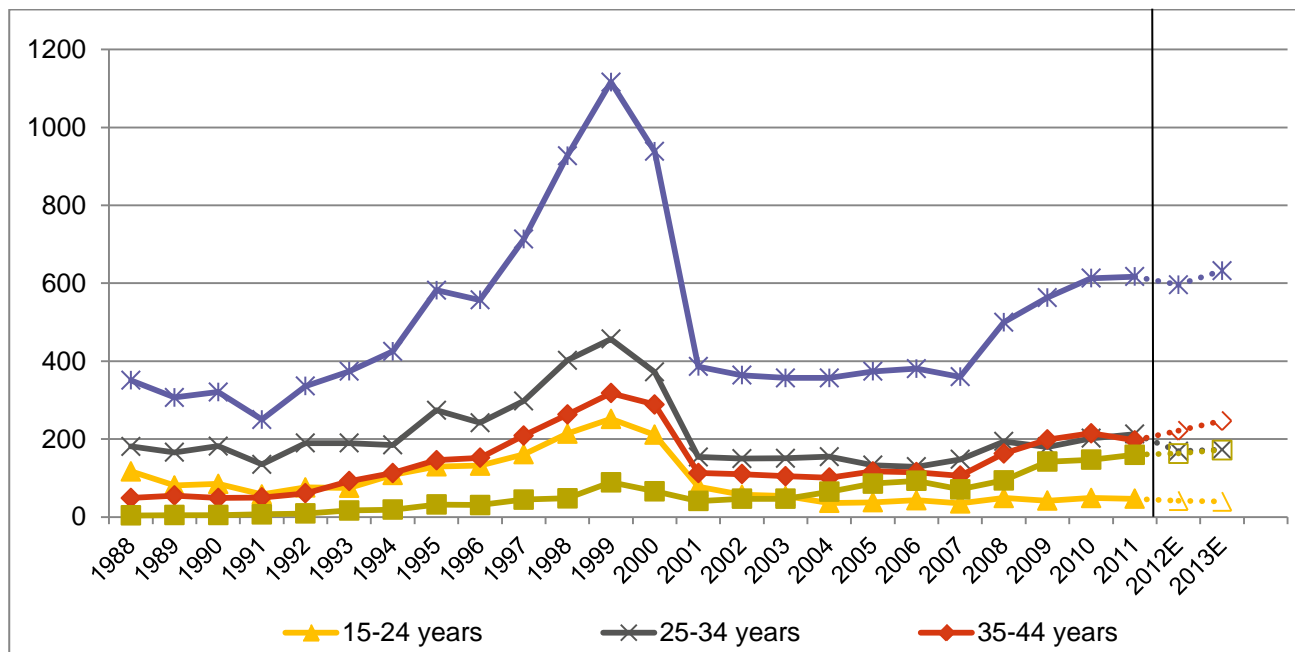
Note: Figures may not match those reported in Table 1 as a result of the ABS confidentialisation process.

Table 3: Rate of accidental opioid deaths per million persons among 15-54 year olds by jurisdiction, 1988-2011.

	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

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

Figure 2: Number of accidental deaths due to opioids among those aged 15-54 years, Australia 1988-2011.



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.

We estimated what the 2012 and 2013 final figures might be given the changes that occurred across revisions in 2010 and 2011. These figures are not yet final. 2006E, 2012E and 2013E=Estimated

Table 4: Rate of accidental deaths due to opioids per million persons by age group, 1988-2011.

	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

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/

Acknowledgements: Thanks to Lipan Rahman and Dimity Stephens of the ABS for their assistance with the data provided for this bulletin. Thanks to Louisa Degenhardt for advice and assistance in calculating estimated data points.

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ISSN: 1445 9833

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