

Accidental opioid-induced deaths in Australia 2010



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Background

- This bulletin provides interpretation of final data on accidental opioid induced deaths in Australia in 2010, and estimated data for 2011 and 2012.
- NB: The data for 2011 and 2012 are not final and are likely to change. We have estimated figures for 2011 and 2012 based on changes that occurred in the 2009 and 2010 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 2010

RATES

- There were a total of 613 accidental overdose deaths attributed to opioids in 2010 (compared to 563 in 2009) among those aged 15 to 54 years, and 687 deaths across all ages (compared to 645 in 2009).
- The rate of accidental overdose deaths due to opioids in Australia was 49.5 per million persons aged 15 to 54 years, an increase from 2009 (where the rate was 45.9 per million persons). Among all ages the rate of accidental opioid deaths in 2010 was 31.1 per million persons (compared to 29.6 per million persons in 2009).
- In 2010, 203 (33%) of the accidental opioid deaths among Australians aged 15 to 54 were due to heroin, and among all ages 213 (31%) were due to heroin.
- In 2010 among Australians aged 15 to 54, just over one-quarter (28%) of the accidental opioid deaths occurred in Victoria (VIC) (n=160), and one-quarter (25%) occurred in New South Wales (NSW) (n=150). Queensland (QLD) recorded a noticeable increase in accidental opioid deaths (from 103 in 2009 to 142) in 2010, while VIC and Western Australia (WA) recorded smaller increases (from 143 in 2009 to 169 in VIC; 71 in 2009 to 87 in WA). Accidental opioid deaths in Tasmania (TAS) remained stable in 2010 while they declined in NSW ².
- Projected estimates for 2011 (n=631) and 2012 (n=649) suggest that the trend in accidental opioid deaths is beginning to stabilise, however these figures should be interpreted with caution.

GENDER

- Males comprised three quarters (75%) of the accidental opioid deaths among the 15 to 54 year age group and 73% among all age groups in 2010.

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.

Key findings for 2010 continued...

AGE

Current

- Age analysis of accidental opioid deaths among Australians aged 15–54 (n=613) shows the largest proportion of deaths occurring among the 35–44 year age group (35%), followed by the 25–34 year age group (33%), 45–54 (24%) and 15–24 year age groups (8%).
- When deaths for all ages are included in the analysis (n=687), Australians aged 55 years and over account for 10% of all accidental opioid deaths in 2010.

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 2010.
- 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 have been sharp increases in accidental opioid mortality rates among the 35–44 year age group over the past 3 years (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 141 opioid deaths (compared to 136 in 2009) across all ages that were intentional overdoses (representing 15% of all opioid deaths) and 90 deaths (compared to 98 in 2009) where the coroner was unable to determine intent (10% of all opioid deaths).
- Approximately one-quarter (27%) of intentional opioid overdoses occurred among older Australians aged 55 years and over, and just under one-third (30%) occurred among 45 to 54 year olds.

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, 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 2010 in this bulletin represent the 2nd and final revision of each dataset, and are therefore methodologically comparable.
- Data for 2011 and 2012 are projected estimates, based on the changes that occurred in 2009 and 2010 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

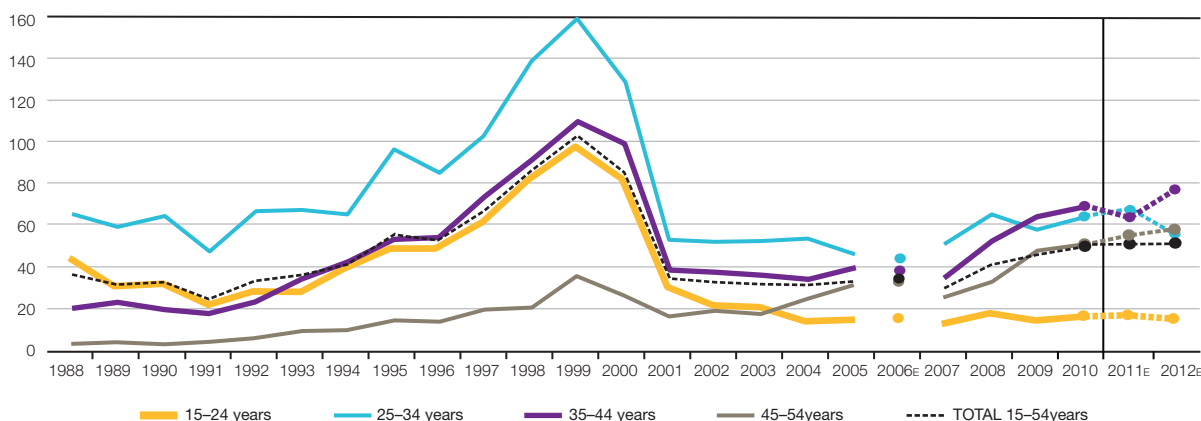
- Both the number and the rate of accidental opioid overdose deaths in Australia in 2010 remain lower than figures recorded in the late 1990s, when heroin use and harms were increasing.
- There has been an upward trend in the number of accidental opioid deaths over the past three years to 2010. This upward trend is likely partly due to processing changes implemented by the ABS, with increased effort being made to correctly code opioid deaths.
- In 2010 the majority (69%) of accidental opioid deaths were due to opioids other than heroin.
- Projected estimates for 2011 and 2012 suggest the trend in accidental opioid deaths in Australia may stabilise at a higher level, however these figures should be interpreted with caution.



Implications continued...

- In 2010 intentional opioid overdose deaths accounted for a minority (15%) of all opioid overdose deaths in Australia. A greater proportion (57%) of intentional deaths occurred among Australians aged 45 years and over. These figures remain unchanged from 2009.
- In 2010, accidental opioid deaths among the youngest age group (15 to 24 years) remained relatively stable, while deaths have increased 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 have stabilised among Australians aged 10 to 29 years, while presentations among Australians aged 30 to 59 years have continued to increase since the mid 1990's (Roxburgh and Burns, 2014).
- 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 1988–2010



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 2011 and 2012 final figures might be given the changes that occurred across revisions in 2009 and 2010. These figures are not yet final. 2006E, 2011E and 2012E=Estimated



Implications continued...

Table 1. Number of accidental deaths due to opioids among those aged 15-54 years by jurisdiction, 1988–2010

	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

[#] One death did not have a jurisdiction noted.

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

Implications continued...

Table 2. Number of accidental deaths due to opioids among those aged 15–54 years by gender and jurisdiction, 2009

Jurisdiction	Males	Females
NSW	110	40
VIC	126	43
QLD	118	24
SA	25	16
WA	64	23
TAS	np*	np*
NT	np*	np*
ACT	np*	np*
Missing	-	-
Australia	461	152

* 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, 1988–2010

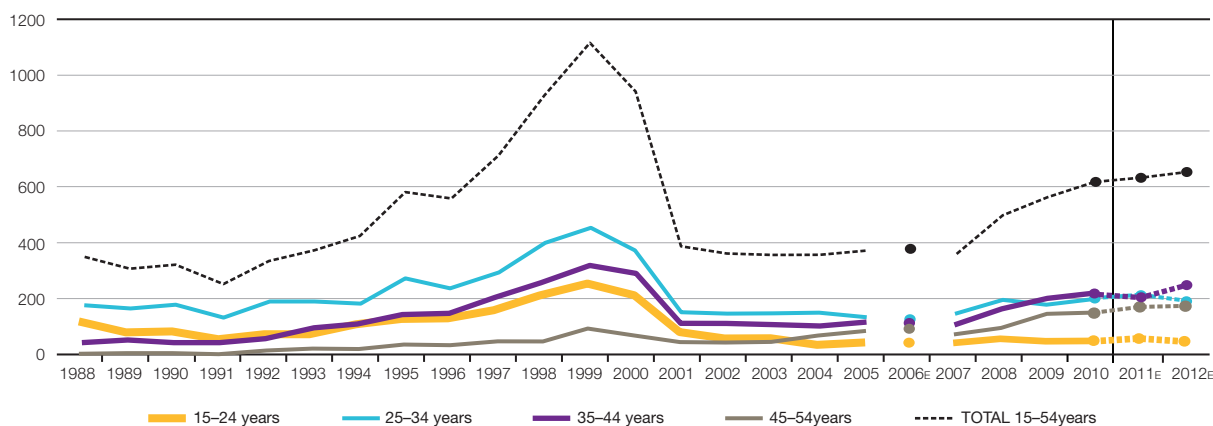
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUST
1988	62.5	39.9	10.1	14.9	19.7	0	0	11.4	36.6
1989	47.5	39.3	11.6	9.8	19.2	6.4	19.2	11.4	31.4
1990	58.2	30.8	4.7	23.1	14.6	19.1	0	0	32.3
1991	42.8	24.7	5.2	15.7	13.4	11.4	0	10.8	24.8
1992	52.9	30.3	10.1	35.9	22.4	0	9.2	21.1	32.9
1993	54.3	33.0	12.6	48.9	24.1	18.8	18.3	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

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



Implications continued...

Figure 2. Number of accidental deaths due to opioids among those aged 15–54 years, Australia 1988–2010



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 2011 and 2012 final figures might be given the changes that occurred across revisions in 2009 and 2010. These figures are not yet final. 2006E, 2011E and 2012E=Estimated

Table 4. Rate of accidental deaths due to opioids per million persons by age group, 1988–2010

	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

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/



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References

Darke, S., Kaye, S., and Duflou, J. (2006). Systemic disease among cases of fatal opioid toxicity. *Addiction*, 101(9), 1299–1305.

Degenhardt, L., Day, C., Conroy, E., Gilmour, S., and Hall, W. (2005). Age differentials in the impacts of reduced heroin supply: Effects of a “heroin shortage” in NSW, Australia. *Drug and Alcohol Dependence*, 79(3), 397–404.

Roxburgh, A., Bruno, R., Larance, B. and Burns, L. (2011). Prescription of opioid analgesics and related harms in Australia. *Medical Journal of Australia*, 195, 280–284.

Roxburgh, A., Burns, L., Drummer, O.H., Pilgrim, J., Farrell, M. and Degenhart, L. (2013). Trends in fentanyl prescriptions and fentanyl-related mortality in Australia. *Drug and Alcohol Review*, 32 (3), 269–275.

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