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Analysis of New South Wales patterns
July 1997 to June 1999

NDARC Technical Report No. 94

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EXECUTIVE SUMMARY

There has been a substantial increase in the number and rate of opioid overdose deaths in Australia over the past three decades. Non-fatal opioid overdoses are even more common among heroin users. Non-fatal overdoses are instances in which a person loses consciousness, breathing is depressed, but death does not occur. Evidence suggests that perhaps half of these overdoses may result in an ambulance being called. Overdoses attended by ambulance officers may therefore provide an important source of information about trends in heroin use in NSW and other states.

The aims of the current report were: 1) to examine the number of ambulance call-outs over the period; 2) to explore of the quality of the data on these calls; 3) to examine the temporal and geographic trends in heroin use; and 4) to compare data on ambulance attendances with data on fatal heroin overdose deaths in NSW. The current report examined data on New South Wales ambulance calls over a two-year period, July 1997 to June 1999.

Data were provided by the NSW Ambulance Service on the occasions when an ambulance attended a person with whom the poisonings protocol was used, and to whom naloxone was administered. Age and gender were coded for some cases, and the postcode of the area to which the ambulance was called was recorded. Analyses of the geographic distribution of ambulance attendances were carried out using approximates of the Australian Bureau of Statistics (ABS) Statistical Local Area (SLA) Statistical Subdivision (SSD). Estimates of social disadvantage for each area were correlated with the rate of ambulance attendances for each region. The number of callouts per month was plotted, and the distribution of callouts by time of day and day of week was calculated.

A total of 10,324 callouts were made during the study period. The majority of cases in which age was recorded were in the age range of 15-44 years (89%), and almost all cases (95%) were in the age range 15-54 years. Around one third (31%) of cases for whom gender was recorded were female. This suggests that overdoses attended by ambulances may be more representative of the gender distribution in the heroin using population than are overdose fatalities. Unfortunately, age or gender was not recorded for around half of cases, so caution must be taken in interpreting these figures.

The two most common SLAs to which ambulances were called out to attend an overdose were South Sydney (n = 2,034) and Liverpool (n = 1,794). Outside Sydney, the areas with higher callout rates tended to be the larger towns – Newcastle, Orange, and Kiama. The SSDs of Inner Sydney (1114) and Fairfield-Liverpool (708) had the highest average annual rates per 100,000 population aged 15-44 years, with Newcastle-Hunter, Gosford and Wollongong recording the highest rates outside Sydney. In Sydney, higher rates of callouts occurred in areas of greater disadvantage, while areas outside Sydney with higher callout rates had greater social advantage. Comparison with the geographic distribution of fatal and non-fatal overdoses revealed a strong correlation between the two data sources on overdose.

In the 1997-1998 period, there were a total of 4,335 recorded ambulance attendances in which the poisonings protocol was used and naloxone was administered, compared to 5,989 in 1998-1999. This was an average of 361 calls per month in 1997-1998, and a monthly average of 499 in 1998-1999. Over half of calls (54%) were made between 12pm and 9pm.

These findings suggest data on rates of ambulance attendance at suspected overdose cases are a promising indicator for monitoring trends in heroin use and in non-fatal overdoses. In the future, this could allow identification of problematic areas, as well as give an indication of areas in which heroin use becomes a more widespread problem. Data over a larger time period would also allow more formal analysis of time-related trends.

1 INTRODUCTION

There has been a substantial increase in both the number and the rate of opiate overdose deaths in Australia over the past three decades. In 1964, there were 6 deaths due to opiates among those aged 15-44 years, compared to 600 in 1997. The pattern was similar when rates of death were examined, with an increase from 1.3 per 100 000 persons in 1964 to 71.5 in 1997 (Hall, Degenhardt, & Lynskey, 1999). Approximately half of these deaths occurred in NSW (Lynskey & Hall, 1998). Research suggests that 1-3% of heroin users will die from a heroin-related overdose each year (Darke & Zador, 1996).

Non-fatal opiate overdoses are even more common among heroin users. Non-fatal overdoses may be defined as instances where loss of consciousness and depression of respiration occurs but is not fatal, due either to medical intervention or the good health of the person. Approximately two thirds (68%) of a sample of 300 long-term Sydney heroin users reported a non-fatal overdose at some point in their lives. Just under half of these (43%) reported an overdose within the past year, and 80% had witnessed the overdose of another person (Darke, Ross, & Hall, 1996a). Around half (56%) of one sample reported that an ambulance had been called for the most recent overdose they had witnessed (Darke, Ross, & Hall, 1996b).

Because overdoses attended by ambulance officers are a more common occurrence than fatal overdoses, they provide an important source of information about heroin use. First, data on the number of ambulance calls to suspected drug overdoses provides an indication of trends in rates of heroin use in the community. Second, the location of ambulance attendances provides information about areas in which the use of heroin may be more common.

The current report examined data on ambulance calls in New South Wales over a two-year period, July 1997 to June 1999. There are several elements of interest in the current report. First, we examined the number of these events that occurred over the period. Second, we explored of the quality of the data on these calls. Third, we examined the information that ambulance attendances provided on temporal and geographic trends in heroin use. Finally, we compared geographic data on ambulance attendances with data on fatal heroin overdose deaths in NSW.

2 METHOD

2.1 AMBULANCE SERVICE OF NSW PROTOCOLS AND PROCEDURES

The primary function of the Ambulance Service of NSW is to provide an emergency clinical service to patients. The Ambulance Service's Protocols, Procedures and Pharmacologies, which are the foundation upon which the patient care role is provided, mandate all aspects of ambulance clinical practice. As such, the Protocols authorise ambulance officers to undertake clinical interventions and to administer medications for specific conditions.

The Ambulance Service provides a tiered service, with ambulance officers trained to different levels, and able to undertake different clinical interventions. All ambulance officers can provide basic life support. Officers with higher levels of education and training can also provide advanced life support.

Of specific relevance to the discussion about the treatment of heroin overdose, while all ambulance officers will provide basic respiratory support, only level 4 and paramedic officers can administer naloxone. While the Service will try to dispatch a higher level officer to cases where naloxone may be needed, this does not always occur: as the emphasis is shortening the time to provision of care, the nearest ambulance is sent to a case, irrespective of the level of officer. In addition, sufficient information may not be forthcoming from the caller about the nature of the case. Officers can request backup from higher-level officers if they require this.

2.2 DATA USED IN THE CURRENT STUDY

The data used in this analysis are from case reports completed by ambulance officers for all patients treated in the period from 1st July 1997 to 30th June 1999. The figures are derived values, with possible limitations due to the factors below:

a) the data are based on the number of cases where ambulance officers have used the Ambulance Service protocol for drug overdose and poisoning and where naloxone was administered, so those cases in which naloxone was not needed for persons who had overdose on heroin will not be included;

b) because not all ambulance officer are authorised to administer naloxone, not all heroin overdose cases may have naloxone administered;

c) the drug overdose protocol includes *all* drug overdoses and does not distinguish between the drugs used by the patient;

d) naloxone can be administered for other reasons, for example to unconscious patients who have not responded to other treatment;

e) identification of drug overdoses is based on the ambulance officers' assessment of the patient at the time of treatment/transport.

2.3   DATA ANALYSIS

For some cases, the gender and age of the attendee was recorded. These were used to calculate estimates of the sex and age distribution of all suspected cases of overdose attended by ambulances. Cases who were aged between 15-44 years were used in the current analyses to estimate rates of ambulance callouts according to Statistical SubDivision (SSD) area (see below). If no age was recorded, cases were also included in this group. Previous research has suggested that by far the majority of opiate overdoses occur within this age group (Darke & Hall, 1998; English et al., 1995).

The postcode of the area to which the ambulance was called was recorded for each attendance. Analyses of the geographic distribution of ambulance attendances were carried out. Postcodes were matched to the postal area to which they corresponded to by using the Telstra White Pages internet directory. Subsequently, postal areas were approximated to the Australian Bureau of Statistics (ABS) Statistical Local Area (SLA), and ABS Statistical Subdivision (SSD), to which they belonged. These geographical areas have been developed by the ABS and are used in the Australian census. There are 43 SSDs in New South Wales, and 168 SLAs.

To be consistent with previous analyses of the geographic location of fatal heroin overdoses in NSW (Darke, Hall, Degenhardt, & Ross, in preparation), some SSDs outside the Sydney area were aggregated. These areas were those in which fatal heroin overdoses were very uncommon. This led to the creation of the following areas: Newcastle-Hunter (which included the Newcastle and Hunter SSDs), New England (Northern Slopes, Northern Tablelands), Mid West NSW (North Central Plain, Central Macquarie, Bathurst-Orange, Central Tablelands, Lachlan), Southern NSW (Queanbeyan, Snowy, Central Murrumbidgee, Lower Murrumbidgee, Albury, Upper Murray), Far West NSW (Macquarie-Barwon, Upper Darling, Central Murray, Murray-Darling, Far West), South Coast (Lower South Coast, Illawarra), and Mid-North Coast (Clarence, Hastings). This meant that 23 areas were used in approximating SSD areas.

Estimates of the rate per 100 000 population in each area were made using ABS estimates of the population in these areas which were provided from the 1996 census (Australian Bureau of Statistics, 1998). Standardised Rate Ratios (SRR), including their 95% confidence intervals (95%CI), were calculated for each of these areas, using the whole State as the reference.

Estimates of relative social disadvantage for each area were obtained from the ABS estimates produced from the 1996 census. These estimates were correlated with the rate of ambulance attendances for each region.

An examination of the number of calls to suspected overdoses over time was completed. Unfortunately, due to the limited period over which data was available, a formal time series analysis could not be attempted. The number of ambulance attendances per month was plotted, and the distribution of callouts by time of day was calculated.

3 RESULTS

A total of 10,324 calls in which the ambulance poisoning protocol was used and naloxone administered occurred over the period July 1997 to June 1999. Table 1 shows the distribution of cases by age and gender. By far the majority of cases were in the age range of 15-44 years (89%). Almost all cases (95%) were in the age range 15-54 years. This is consistent with literature on fatal heroin overdoses in Australia (Darke & Hall, 1998; English et al., 1995).

Around one third (31%) of cases for whom gender was recorded were female. This is higher than the proportion of females who die of opiate related overdoses (around 20%)(Darke & Zador, 1996). It is more similar to the proportion of females in methadone maintenance treatment (MMT) (Conroy & Copeland, 1998; Drug and Alcohol Directorate, 1996), in IDU samples (McKetin, Darke, & Godycka-Cwirko, 1999) and in those attending needle and syringe programs (NSP) (MacDonald et al., 2000). This suggests that overdoses attended by ambulances may be more representative of the heroin using population than are overdose fatalities.

Unfortunately, these estimates must be considered approximate due to the fact that for 56.6% of cases, the age was not recorded, and for 51.2% of cases, gender was not recorded. Hence, caution must be taken in interpreting these figures.

Table 1: Distribution of cases by age and gender (% of cases for whom an entry was recorded)

	Valid percent	(N)
Male	68.9	(3471)
Female	30.5	(1534)
Unknown	0.6	(32)
Not recorded		(5287)
Under 15 years	0.9	(41)
15-24 years	26.7	(1195)
25-34 years	38.9	(1742)
35-44 years	23.0	(1032)
45-54 years	6.3	(282)
55 +	4.2	(190)
Not recorded		(5842)
Total	**10,324**	

3.1 GEOGRAPHIC DISTRIBUTION OF AMBULANCE CALLS TO DRUG OVERDOSES

The two statistical local areas (SLAs) with the highest numbers of ambulance callouts to overdoses were South Sydney (n = 2,034) and Liverpool (n = 1,794; see Appendix A). Together, these SLAs accounted for over one third of all such calls in NSW (19.7% for South Sydney, 17.4% for Liverpool).

Outside Sydney, the areas with higher rates of ambulance attendances tended to be the larger towns – Newcastle had an average annual rate of 169 per 100,000 total population, Orange had a rate of 161, and Kiama had a rate of 199. Many of the SLAs outside Sydney did not record any ambulance attendances for suspected overdoses (Appendix A).

Table 2 shows the rate of ambulance attendances per 100,000 population aged 15 to 44 years by statistical subdivision. Inner Sydney (1114) and Fairfield Liverpool (708) had the highest average annual rates, with Newcastle-Hunter (124), Gosford (130), and Wollongong (171) recording the highest rates outside Sydney.

Table 2: Number of ambulance calls 1997-1999, average rate per annum among 15-44 year olds, and standardised rate ratios (SRR) by statistical subdivisions

SSD	Number 1997-99	Rate pa	Expected No.	SRR	95%CI	
Inner Sydney	3280	1113.9	535	6.1	5.9	6.3
Fairfield Liverpool	2075	707.7	532	3.9	3.7	4.1
Wollongong	376	171.4	398	0.9	0.9	1.0
Outer SW Sydney	313	157.1	361	0.9	0.8	1.0
Outer W Sydney	365	132.2	501	0.7	0.7	0.8
Gosford Wyong	268	129.7	375	0.7	0.6	0.8
Inner W Sydney	173	126.1	249	0.7	0.6	0.8
Newcastle Hunter	571	124.0	837	0.7	0.6	0.7
Mid west NSW	259	110.3	427	0.6	0.5	0.7
Far north Coast	166	104.2	289	0.6	0.5	0.7
Canterbury Bankstown	264	101.6	472	0.6	0.5	0.6
Eastern suburbs	224	95.5	426	0.5	0.5	0.6
Southern highlands	47	92.6	92	0.5	0.4	0.7
New England	105	88.7	217	0.5	0.4	0.6
St George Sutherland	284	81.7	631	0.5	0.4	0.5
Central W Sydney	198	77.8	462	0.4	0.4	0.5
Northern Beaches	140	74.9	339	0.4	0.3	0.5
Mid north Coast	132	68.3	351	0.4	0.3	0.4
LN Sydney	146	56.8	467	0.3	0.3	0.4
Southern NSW	109	43.3	457	0.2	0.2	0.3
Blacktown-Baulkham Hills	116	35.5	594	0.2	0.2	0.2
Hornsby Kuringai	64	33.2	351	0.2	0.1	0.2
South Coast	40	31.8	228	0.2	0.1	0.2
Far west NSW	21	26.3	145	0.1	0.1	0.2
TOTAL (STATE)	**9737**	**181.6**	**9737**	**1.0**		

The correlation between social disadvantage and the ambulance attendance rate was

calculated. Over the whole state, the correlation was r = - 0.21, indicating that higher rates occurred in more disadvantaged areas. However, this overall rate concealed differences between Sydney and the rest of the state. In Sydney, this relationship was even stronger, with the r = - 0.46. However, outside Sydney, the correlation was + 0.19, indicating that there was a modest trend for areas with higher rates of ambulance attendances to be more advantaged (and perhaps more urbanised) areas.

3.2 COMPARISON OF FATAL HEROIN OVERDOSE AND AMBULANCE CALL RATES

Table 3 compares the average rate per 100,000 15 to 44 year olds per year, of ambulance attendances, and of fatal heroin overdose deaths. This comparison revealed that the areas in which the rate of ambulance attendances was highest were also the areas in which rates of heroin overdose deaths were highest. Inner Sydney recorded the highest rate per annum of overdose deaths (37.0) and ambulance attendances (1113.9), with Fairfield-Liverpool recording the next highest rates (17.8 for fatal overdoses; 707.7 for ambulance attendances). Outside Sydney, Wollongong had one of the highest rates of heroin overdoses (7.7) and the highest ambulance attendance rate (171.4).

Table 3: Average rate per annum per 100 000 population aged 15 to 44 years of fatal overdoses and ambulance attendances per annum

Area	Fatal overdose death rate (PA)	Ambulance overdose attendance rate (PA)
Inner Sydney	37.0	1113.9
Fairfield Liverpool	17.8	707.7
Wollongong	7.7	171.4
Outer SW Sydney	6.6	157.1
Outer W Sydney	2.8	132.2
Gosford Wyong	3.4	129.7
Inner W Sydney	8.9	126.1
Newcastle hunter	3.0	124.0
Mid west NSW	2.7	110.3
Far north coast	6.0	104.2
Canterbury Bankstown	5.7	101.6
Eastern suburbs	13.2	95.5
Southern highlands	13.1	92.6
New England	1.6	88.7
St George Sutherland	3.8	81.7
Central W Sydney	6.4	77.8
Northern beaches	6.6	74.9
Mid north coast	1.0	68.3
LN Sydney	3.4	56.8
Southern NSW	1.0	43.3
Blacktown Baulkham hills	1.2	35.5
Hornsby Kuringai	1.7	33.2
South coast	2.9	31.8
Far west NSW	1.4	26.3
TOTAL (STATE)	**6.8**	**181.6**

The relationship between rates of fatal heroin overdose and ambulance attendances was strong, with a correlation of + 0.91. The relationship was stronger for Sydney areas, with a correlation of + 0.94, than it was for other areas in the state where the correlation was r = +0.43. This may reflect the greater variability and the smaller number of deaths occurring in areas with small populations outside Sydney.

These relationships, while strong, must be interpreted with caution, as the period over which heroin overdoses were recorded was 1992-1996, compared to the 1997-1999 period of ambulance attendances. Information on ambulance attendances over the same period would be required for greater interpretation of the patterns suggested here. Nonetheless, there was a strong relationship between the geographic distribution of fatal and non-fatal opiate overdoses.

3.3   TIME TRENDS IN AMBULANCE CALLS

In the 1997-1998 period, there were a total of 4,335 ambulance attendances recorded in which the poisonings protocol was used and naloxone was administered. In the same period in 1998-1999, there were 5,989 attendances, a 38.2% increase in the number of calls compared to the previous year. In the 1997/1998 financial year, an average of 361 calls per month were made to suspected overdoses; in comparison, the average in 1998/1999 was 499.

The primary reason for this large difference was the marked increase occurring in July 1998 (see Figure 1). Between July and October 1998, the number of calls in all cases was at least around 600, and reached 706 in September 1998. In contrast, there were no months in the 1997/1998 financial year in which the number of calls exceeded 500. The number of calls appeared to drop after October 1998, although it did not appear to return to the original levels, with higher numbers than in the beginning of the study period. Since formal analysis of this data was not possible due to the limited time over which data were available, these findings must be interpreted cautiously.

Figure 1: Number of ambulance attendances by month, 1997 to 1999
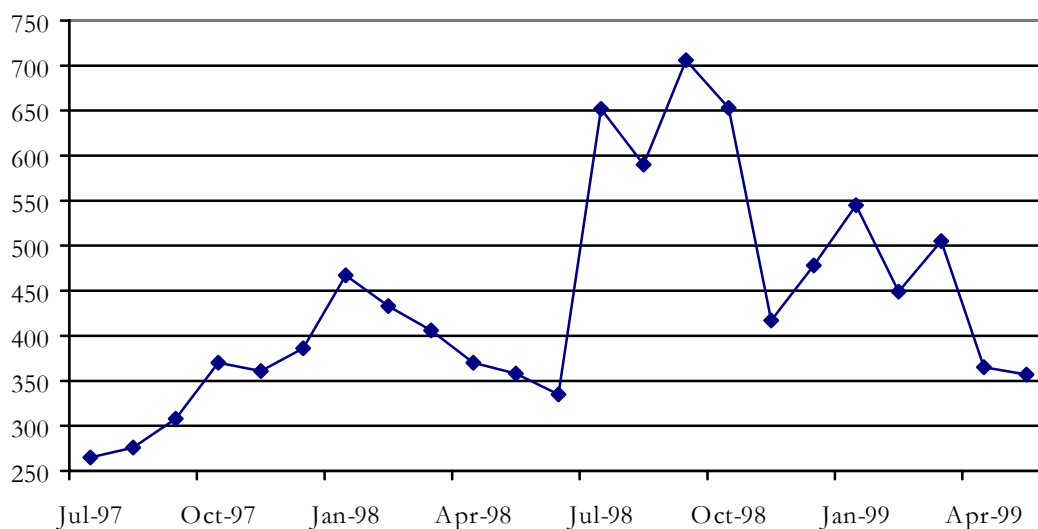
3.4 TIME OF DAY OF AMBULANCE CALLOUTS

The time of day at which ambulances were called out to suspected overdoses was grouped in three-hour blocks; the distribution is displayed in Figure 2. The majority of calls (54%) were made between 12pm and 9pm. Calls were least likely to be made between 12am and 9am (19.2%).

Figure 2: Distribution of ambulance callouts by time of day
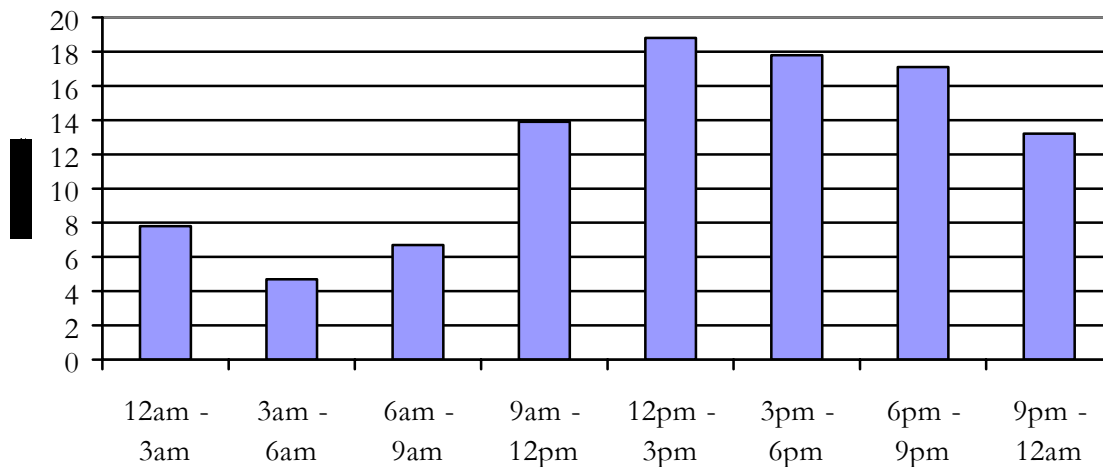
4 DISCUSSION

The present analyses revealed that there were a large number of calls by the NSW Ambulance Service to suspected overdose cases between July 1997 and June 1999. There were over 4,300 in 1997-8, and almost 6,000 in 1998-9, averages of 361 and 499 per month, respectively. This monthly average is considerably higher than that estimated from a similar analysis of ambulance calls in Victoria, where there was an average of 129 per month between November 1997-January 1998 (Dietze, Cvetkovski, Rumbold, & Miller, 2000). Clearly, there are a substantial number of calls made for assistance by medically trained officers in situations of suspected overdose in young adults.

Some clear trends were observed in the data. First, in cases where gender was recorded, two thirds of cases were male. This figure is similar to the proportion of males in MMT (Conroy & Copeland, 1998) and attending NSPs (MacDonald et al., 2000). The proportion of males is lower than that observed for fatal heroin overdoses, where males typically form around 80% of cases (Darke & Zador, 1996).

Second, the age distribution of cases was similar to that observed for fatal opioid overdose deaths, with the vast majority of deaths occurring among those aged 15-44 years, and most being in the 25-34 year age group. As noted previously, caution must be taken in interpreting the age and gender distributions due to the large number of cases with missing data.

Third, analysis of the geographic distribution of ambulance attendances revealed that by far the majority of calls to the Ambulance Service occurred in larger cities, with Sydney accounting for the majority of calls. The two most common areas in Sydney were Liverpool and South Sydney, the areas in which the largest NSW heroin markets are concentrated (Maher, Dixon, Lynskey, & Hall, 1998). Outside the Sydney metropolitan area, Newcastle and Kiama recorded the highest call rates. Many areas outside Sydney recorded no calls for ambulance assistance to suspected drug overdoses. A comparison between fatal heroin overdose deaths and ambulance call data revealed strikingly similar geographic distributions, particularly in the Sydney area.

Fourth, the distribution of time of day that ambulances were called to suspected overdoses is similar to that observed for heroin fatalities in NSW (Darke & Ross, 1998; Darke, Zador, & Sunjic, 1997). In an analysis of heroin fatalities in South Western Sydney between 1992 and 1996, 37% of deaths were estimated to have occurred between midday and 6pm, the most common time period in which such deaths occurred (Darke & Ross, 1998). Exactly the same proportion (37%) of ambulance calls were made within this period. This pattern is similar to those found in similar analyses of ambulance callouts in Victoria (Dietze et al., 2000) and the ACT (Bammer, Ostini, & Sengoz, 1995), as well as in Germany (Schulz-Schaeffer, Peters, & Pueschel, 1993).

There are, however, two limitations of the data. First, the data on the age and gender of the persons treated was not recorded for all persons. Only half of cases had the person's gender (48.8%) or age (43%) recorded. This means that although the patterns observed here are consistent with what is known about the characteristics of heroin users, this cannot be said for the large number of persons for whom this information is absent. Hence, conclusions based on these data must be tentative.

Second, the data here are based on *incidents* rather than *persons*, which means that the same person may have accounted more than one ambulance call. Hence, the call rates and estimates presented here may be affected by multiple entries for the same persons over the period of a year.

Nevertheless, the consistency of these data with other sources of data on the characteristics of heroin users is impressive. The age distribution of cases here is strikingly similar to that for persons in MMT (Drug and Alcohol Directorate, 1996), to samples of IDU (McKetin et al., 1999) and to cases of fatal overdose (Darke & Zador, 1996). The gender distribution is also similar to other sources, namely NSPs (MacDonald et al., 2000), samples of IDU (McKetin et al., 1999) and clients of MMT (Conroy & Copeland, 1998).

Furthermore, the geographic patterns observed here are strongly correlated with the patterns of fatal heroin overdoses. The areas in which fatal overdose rates were highest in NSW were also those where non-fatal overdose rates were highest. The agreement is all the more impressive given the smaller numbers of overdose deaths, and the likelihood that patterns observed for fatal overdoses may be more subject to random fluctuations. The larger number of non-fatal overdoses allowed more detailed geographical analyses to be carried out, which showed that the areas in which rates were highest were those known to be areas with the greatest heroin use and heroin-related problems in the state, namely South Sydney and Liverpool.

These findings suggest that data on rates of ambulance attendance at suspected overdose cases are a promising indicator for monitoring trends in heroin use and in non-fatal overdoses. The data would allow identification of areas in which greater overdose rates may indicate geographic concentrations of heroin use, as well as give some indication of the NSW areas in which heroin use becomes a more widespread problem. Data over a larger time period would also allow more formal analysis of time-related trends and seasonal factors in ambulance attendances to suspected drug overdoses.

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APPENDIX A: NUMBER OF AMBULANCE ATTENDANCES 1997-1999, POPULATION SIZE, AVERAGE RATE PER ANNUM RATE PER 100 000 POPULATION (ALL AGES) OF AMBULANCE ATTENDANCES, AND STANDARDISED RATE RATIOS, BY STATISTICAL LOCAL AREA

Statistical Local Area*	Number 1997-99	Population	Rate pa	SRR	95% CI	
Sydney - inner	185	3732	2478.6	30.0	25.9	34.7
South Sydney	2034	79460	1279.9	15.5	14.8	16.2
Botany	586	35938	815.3	9.9	9.1	10.7
Liverpool	1794	124292	721.7	8.7	8.3	9.2
Sydney – remainder	81	10114	400.4	4.9	3.9	6.0
Marrickville	341	79876	213.5	2.6	2.3	2.9
Kiama	73	18374	198.7	2.4	1.9	3.0
Newcastle inner	461	137265	168.7	2.0	1.9	2.2
Orange	112	34828	160.8	1.9	1.6	2.3
Wollondilly	106	34583	153.3	1.6	1.4	1.9
Inverell	14	4622	151.4	1.6	1.4	3.1
Baranald	8	2934	136.3	1.7	0.7	3.3
Auburn	144	53266	135.2	1.6	1.4	1.9
Goulburn	53	21490	123.3	1.5	1.1	2.0
Bathurst	63	29146	108.1	1.3	1.0	1.7
Leichhardt	130	60749	107.0	1.3	1.1	1.5
Penrith	319	167868	95.0	1.2	1.0	1.3
Tamworth	65	35580	91.3	1.1	0.9	1.4
Manly	68	37703	90.2	1.1	0.8	1.4
Greater Lithgow	35	19994	87.5	1.1	0.7	1.5
Tweed	68	39148	86.8	1.1	0.8	1.3
Strathfield	47	27170	86.5	1.0	0.8	1.4
Wollongong	314	183497	85.6	1.0	0.9	1.2
Lismore	73	43551	83.8	1.0	0.8	1.3
Fairfield	310	189108	82.0	1.0	0.9	1.1
Armidale	35	21370	81.9	1.0	0.7	1.4
Ashfield	67	41578	80.6	1.0	0.8	1.2
Gosford	231	150220	76.9	0.9	0.8	1.0
Campbelltown	215	148218	72.5	0.9	0.8	1.0
Dubbo	50	36533	68.4	0.8	0.6	1.1
Wellington	12	8905	67.4	0.8	0.4	1.4
Queanbeyan	37	28155	65.7	0.8	0.6	1.1
Waverley	70	65137	53.7	0.7	0.5	0.8
Rockdale	95	88944	53.4	0.6	0.5	0.8
Kempsey	28	26468	52.9	0.6	0.4	0.9
Hunter's Hill	13	12622	51.5	0.6	0.3	1.1
Canterbury	143	138715	51.5	0.6	0.5	0.7
Kogarah	51	49938	51.1	0.6	0.5	0.8
Ryde	98	96429	50.8	0.6	0.5	0.8
Randwick	118	123466	47.8	0.6	0.5	0.7
Woollahra	51	53443	47.7	0.6	0.4	0.8
Blue Mountains	68	74880	45.4	0.6	0.4	0.7
Concord	22	24506	44.9	0.5	0.3	0.8
Wagga Wagga	50	56080	44.6	0.5	0.4	0.7
Byron	23	26620	43.2	0.5	0.3	0.8
Coffs Harbour	49	57283	42.8	0.5	0.4	0.7
Burwood	25	29699	42.1	0.5	0.3	0.8
Bankstown	137	164382	41.7	0.5	0.4	0.6

Statistical Local Area*	Number 1997-99	Population	Rate pa	SRR	95% CI	
Casino	9	10943	41.1	0.5	0.2	0.9
Hurstville	56	68538	40.9	0.5	0.4	0.6
Lane cove	25	31327	39.9	0.5	0.3	0.7
Baulkham Hills	99	125598	39.4	0.5	0.4	0.6
Muswellbrook	12	15659	38.3	0.5	0.2	0.8
Broken Hill	16	21950	36.4	0.4	0.3	0.7
Bellingen	9	12485	36.0	0.4	0.2	0.8
Nambucca	12	17639	34.0	0.4	0.2	0.7
Greater Taree	28	43546	32.1	0.4	0.3	0.6
Snowy River	4	6272	31.9	0.4	0.1	1.0
Drummoyne	20	31968	31.3	0.4	0.2	0.6
Mosman	15	27452	27.3	0.3	0.2	0.5
Sutherland Shire	110	203573	27.0	0.3	0.3	0.4
Parkes	8	15292	26.2	0.3	0.1	0.6
Hastings	29	57228	25.3	0.3	0.2	0.4
Bourke	2	3974	25.2	0.3	0.0	1.1
Cessnock	22	45695	24.1	0.3	0.2	0.4
Warringah	62	131109	23.6	0.3	0.2	0.4
Bingara	1	2130	23.5	0.3	0.0	1.6
Pittwater	25	54648	22.9	0.3	0.2	0.4
Grafton	8	17507	22.8	0.3	0.1	0.5
Kuringai	48	105392	22.8	0.3	0.2	0.4
Parramatta	65	143021	22.7	0.3	0.2	0.4
Wyong	54	120185	22.5	0.3	0.2	0.4
Albury	19	42322	22.4	0.3	0.2	0.4
Maitland	23	51397	22.4	0.3	0.2	0.4
Murrurundi	1	2256	22.2	0.3	0.0	1.5
Blayney part a	2	4597	21.8	0.3	0.0	1.0
Ballina	15	34650	21.6	0.3	0.1	0.4
Hume	3	7037	21.3	0.3	0.0	0.8
Richmond River	4	9807	20.4	0.2	0.1	0.6
Gloucester	2	4962	20.2	0.2	0.0	0.9
Mudgee	7	17461	20.0	0.2	0.1	0.5
Shoalhaven	31	79068	19.6	0.2	0.2	0.3
Lake Macquarie	65	176750	18.4	0.2	0.2	0.3
Bega Valley	10	28268	17.7	0.2	0.1	0.4
North Sydney	19	56319	16.9	0.2	0.1	0.3
Camden	11	33076	16.6	0.2	0.1	0.4
Kyogle	3	9919	15.1	0.2	0.0	0.5
Manilla	1	3325	15.0	0.2	0.0	1.0
Singleton	6	20208	14.8	0.2	0.1	0.4
Gundagai	1	3798	13.2	0.2	0.0	0.9
Weddin	1	3903	12.8	0.2	0.0	0.9
Hornsby	31	143486	10.8	0.1	0.1	0.2
Port Stephens	11	52281	10.5	0.1	0.1	0.2
Narrabri	3	14328	10.5	0.1	0.0	0.4
Scone	2	9734	10.3	0.1	0.0	0.5
Gilgandra	1	4897	10.2	0.1	0.0	0.7
Shellharbour	11	53873	10.2	0.1	0.1	0.2
Young	2	11384	8.8	0.1	0.0	0.4
Tumut	2	11398	8.8	0.1	0.0	0.4
Leeton	2	11428	8.8	0.1	0.0	0.4

Statistical Local Area*	Number 1997-99	Population	Rate pa	SRR	95% CI	
Junee	1	5970	8.4	0.1	0.0	0.6
Temora	1	6131	8.2	0.1	0.0	0.6
Naraandera	1	7165	7.0	0.1	0.0	0.5
Maclean	2	15305	6.5	0.1	0.0	0.3
Cootamundra	1	7782	6.4	0.1	0.0	0.4
Blacktown	27	239818	5.6	0.1	0.0	0.1
Yass	1	9370	5.3	0.1	0.0	0.4
Wingecarribee	4	38048	5.3	0.1	0.0	0.2
Cooma Monaro	1	9721	5.1	0.1	0.0	0.4
Moree Plains	1	15364	3.3	0.0	0.0	0.2
Griffith	1	22161	2.3	0.0	0.0	0.2
Great Lakes	1	28722	1.7	0.0	0.0	0.1
TOTAL (STATE)	**10324**	**6295368**	**82.6**	**1.0**		

* The Statistical Local Areas not reported in this table did not have any ambulance attendances recorded