

WA STRATEGY AGAINST DRUG ABUSE

Statistical Bulletin Number 8, May 2000

ACCIDENTAL HEROIN RELATED DEATHS IN WESTERN AUSTRALIA, 1997-1998

Introduction

Heroin has long been recognised as a serious problem because of attendant health, social and criminal consequences associated with its use. The documented increase in heroin prevalence over the past decade throughout Australia, including Western Australia (WA), has occurred in conjunction with substantial increases in world opium production and caused considerable community concern.

Since the mid 1990s there has been a marked rise in the number of deaths attributable to heroin toxicity. A range of innovative preventive campaigns and an expansion of treatment options have been devel-

oped over recent years to meet this challenge. A range of strategies including peer based educational and outreach initiatives have been undertaken specifically to reduce the risk of fatal overdose of those actively using heroin. Examples of peer based educational postcards which contain preventive messages are presented at page 8.

Coroners in this State by law are required to investigate all sudden and unexpected deaths. In relation to drug related deaths Coroners obtain and consider a large range of toxicology and forensic data. Since 1995 the WA Drug Abuse Strategy Office (WADASO) has established the Coronial Database in collaboration with the Chemistry Centre of WA and the Coroner's Court. Previous reports have summarised some of this information for the years 1995 (*Statistical Bulletin No. 2*) and 1996 (*Statistical Bulletin No. 4*).

Methods

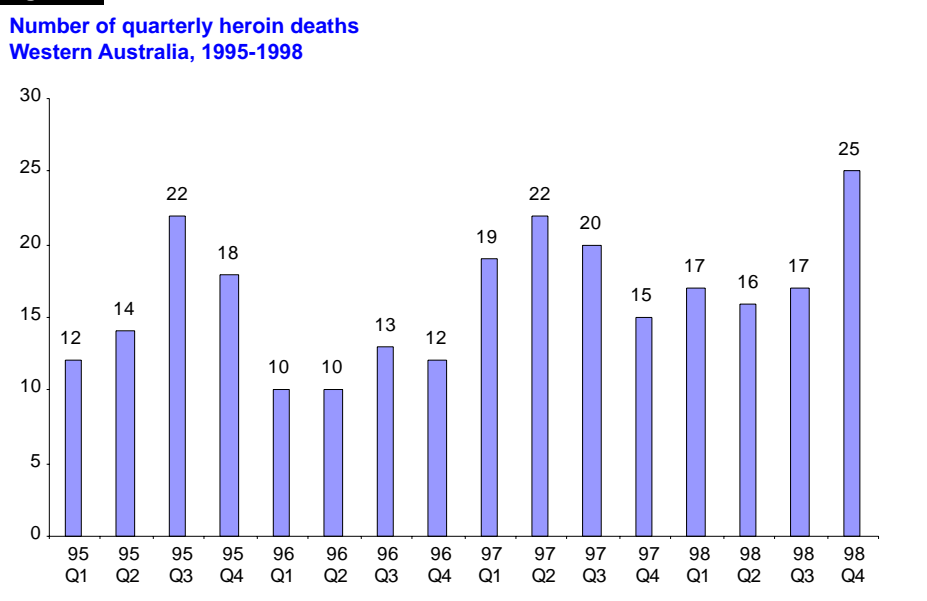
This bulletin is based on a detailed examination of all cases in the Coronial Database involving heroin related deaths (HRDs) that occurred in WA in 1997 and 1998 and were subject to coronial investigation. Coronial determinations were available for all cases to enable the selection of only cases where death was found to have not been intentionally caused (ie not due to suicide or homicide).

This method of case selection used for this report, based on coronial finding, produces a more accurate set of accidental heroin deaths compared to the identification of cases by the use of ICD9 codes.

Table 1

Year	Quarter				Total
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	
1995	12	14	22	18	66
1996	10	10	13	12	45
1997	19	22	20	15	76
1998	17	16	17	25	75

Figure 1



A limitation of ICD9 codes in identifying HRDs is that they provide an incomplete set of cases, as they do not accurately differentiate heroin and other morphine derived opiates. Another shortcoming is that coding is based on a limited amount of information supplied to the Australian Bureau of Statistics contained in the Coroner's findings and not on the complete set of reports and associated forensic data contained in the records held by the Coroner.

As an interim measure, because of the time delays in coronial determination, cases identified by police as suspected HRDs are used to provide an early indication of trends in fatal overdoses. This information is used to describe the situation at any given time and to make comparisons between current levels and previous years.

The data contained in this report provides a finalised count of the number of HRDs that have occurred in WA in 1997 and 1998.

Trends: 1995 - 1998

Over the four year period there was an increase of 13.6% in the number of confirmed HRDs in this State, from 66 deaths in 1995 to 75 deaths in 1998 (Table 1, page 1). There was a drop of 31.8% from 66 deaths in 1995 to 45 deaths in 1996 and then an increase to 76 and 75 deaths per year in 1997 and 1998 respectively.

There were marked short term fluctuations in the number of HRDs, with the number of deaths per quarter increasing from 12 in the March quarter 1995 to 22 in the September quarter 1995 (Figure 1, page 1). This was followed by a drop of more than half, to 10 deaths by the March quarter 1996. After remaining at 10 deaths per quarter for the first two quarters of 1996, the number of HRDs steadily increased over the next 12 months, reaching 22 deaths in the March quarter 1997.

After remaining relatively static with about 20 deaths per quarter over the first nine months of 1997, the number of HRDs dropped to about 16 deaths per quarter from the December quarter 1997 to the September quarter 1998. In the December quarter 1998 deaths increased to 25, the highest quarterly number of HRDs over the period 1995 to 1998.

AGE

The mean age of HRDs fluctuated at about 31 years of age over the four year period (Table 2). In 1997 the mean age of females dropped to about 25 years of age compared to 1995, 1996 and 1998. For males the mean age remained at 30 years and older throughout the four year period.

Except for 1997, the age profile of all deaths was similar with about one in five deaths involving the less than 25 age group. In 1997 just over one in three HRDs involved persons aged 25 years and under (Table 3).

PURITY

Over recent years there has been a documented change in the composition of heroin powders seized by the WA Police analysed by the Chemistry Centre.

Table 2
Mean age of heroin deaths by sex
Western Australia, 1995-1998

Year	Males	Females	Persons
1995	31.7	31.9	31.7
1996	31.2	33.5	31.7
1997	30.1	24.8	28.9
1998	31.5	30.2	31.4

Table 3
Number of heroin deaths by age group and sex
Western Australia, 1995-1998

Year	Age group								Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+	
1995	2	12	13	17	13	7	2	0	66
1996	1	8	10	10	9	6	0	1	45
1997	9	17	18	12	9	9	2	-	76
1998	2	13	18	17	14	6	2	3	75

Table 4
Heroin purity statistics
Western Australia, 1995/1996-1997/1998

	1995/1996	1996/1997	1997/1998
	(n=90)	(n=188)	(n=265)
Minimum purity (%)	0.2	0.4	0.4
Maximum purity (%)	78.0	83.0	88.0
Median purity (%)	46.5	47.0	60.0
Mean purity (%)	41.5	46.2	59.3

The mean concentration of seized heroin has increased from 41.5% in 1995/1996 to 59.3% in 1997/1998 (Table 4, page 2). It is to be noted that a broader range of samples have been analysed, with a nearly three fold increase in the number of samples analysed in 1997/1998 than in 1995/1996.

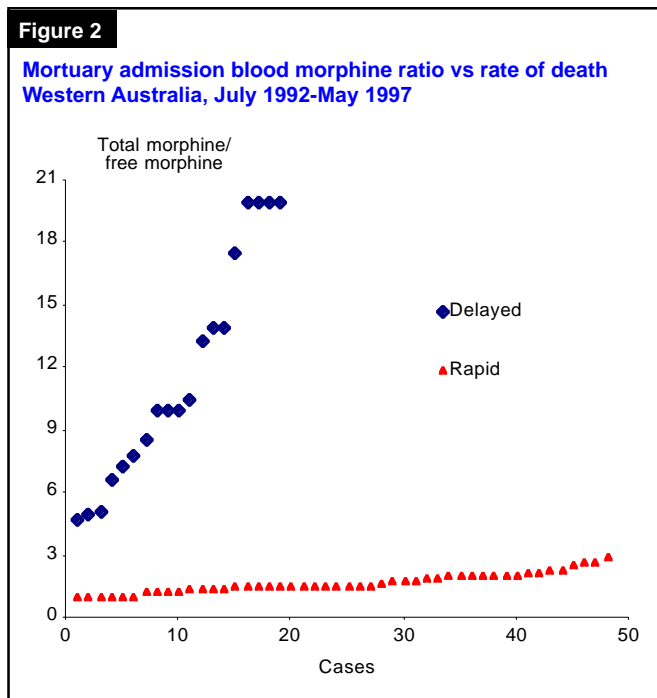
An unpublished study undertaken by the Chemistry Centre examined the correlation between blood opiate concentrations and the estimated time of death based on available data for the period July 1992 to May 1997. In the study it was concluded that this

“data clearly indicates that where the ratio of total morphine to free morphine is less than 3, then the death has been rapid (ie less than 20 minutes).”

This means that compared to previous years of much lower purity levels, by 1997/1998 very small quantities of heroin posed a greater risk because they had on average much higher purity levels.

In relation to the 69 cases studied, it was found that 50 (72.5%) involved deaths with a total morphine to free morphine ratio of less than 3. (Total morphine is defined as the sum of both the inactive protein bound morphine and the free unbound morphine.)

This analysis supports the belief that increasing purity of heroin has been one of the key factors for the increased number of HRDs in this State, as indicated by the data in this study (Figure 2).



Trends: 1997 - 1998

AGE

The following section provides a more detailed analysis of aggregate data for two year period 1997 and 1998. A comparison of the age profile of males and females indicates that nearly four out of 10 males were aged between 25 and 34 years, whereas nearly six out of 10 females were aged between 20 and 29 years (Table 5; Figure 3).

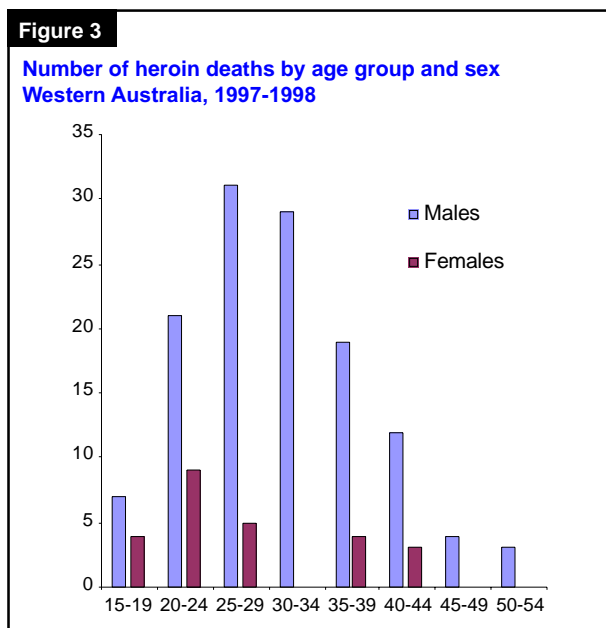


Table 5
Number of heroin deaths by age group and sex Western Australia, 1997-1998

Age	Females		Males		Total	
	n	%	n	%	n	%
15-19	4	16.0	7	5.6	11	7.3
20-24	9	36.0	21	16.7	30	19.9
25-29	5	20.0	31	24.6	36	23.8
30-34	-	-	29	23.0	29	19.2
35-39	4	16.0	19	15.1	23	15.2
40-44	3	12.0	12	9.5	15	9.9
45-49	-	-	4	3.2	4	2.6
50-54	-	-	3	2.4	3	2.0
All ages	25	100.0	126	100.0	151	100.0

INCIDENT DAY

It was found that just over two thirds, 103 (68.2%) of all HRDs in the two year period occurred between Wednesday and Saturday (Table 6; Figure 4). There was a notable clustering of deaths on Friday and Saturday, with total of 10 (40%) female deaths and a total of 46 (36.5%) male deaths occurring on these two days.

It is possible the number of deaths on Sundays could be higher than reported, as whilst some of the 'Monday deaths' may have apparently occurred in the early hours of Monday morning, this could have been the culmination of drug use on the Sunday evening.

TIME OF DEATH

It was found that over the two year period one third, 51 (33.1%) of all HRDs occurred between the times of 8 am and 2 pm (Figure 5).

Over the 24 hour period deaths were clustered in two periods, in late morning and mid evening. Peaks occurred from 10 am to midday when there were 20 (13.2%) deaths and from 8 pm to 10 pm when there were 17 (11.2%) deaths .

The lowest frequency of deaths occurred in the eight hour period from midnight to 8 am, with least number recorded between 4 am and 6 am, when 7 deaths occurred.

Table 6
Number of heroin deaths by day of incident and sex Western Australia, 1997-1998

Day	Females		Males		Total	
	n	%	n	%	n	%
Monday	3	12.0	14	11.1	17	11.3
Tuesday	2	8.0	14	11.1	16	10.6
Wednesday	4	16.0	24	19.0	28	18.5
Thursday	3	12.0	16	12.7	19	12.6
Friday	4	16.0	24	19.0	28	18.5
Saturday	6	24.0	22	17.5	28	18.5
Sunday	3	12.0	12	9.5	15	9.9
All days	25	100.0	126	100.0	151	100.0

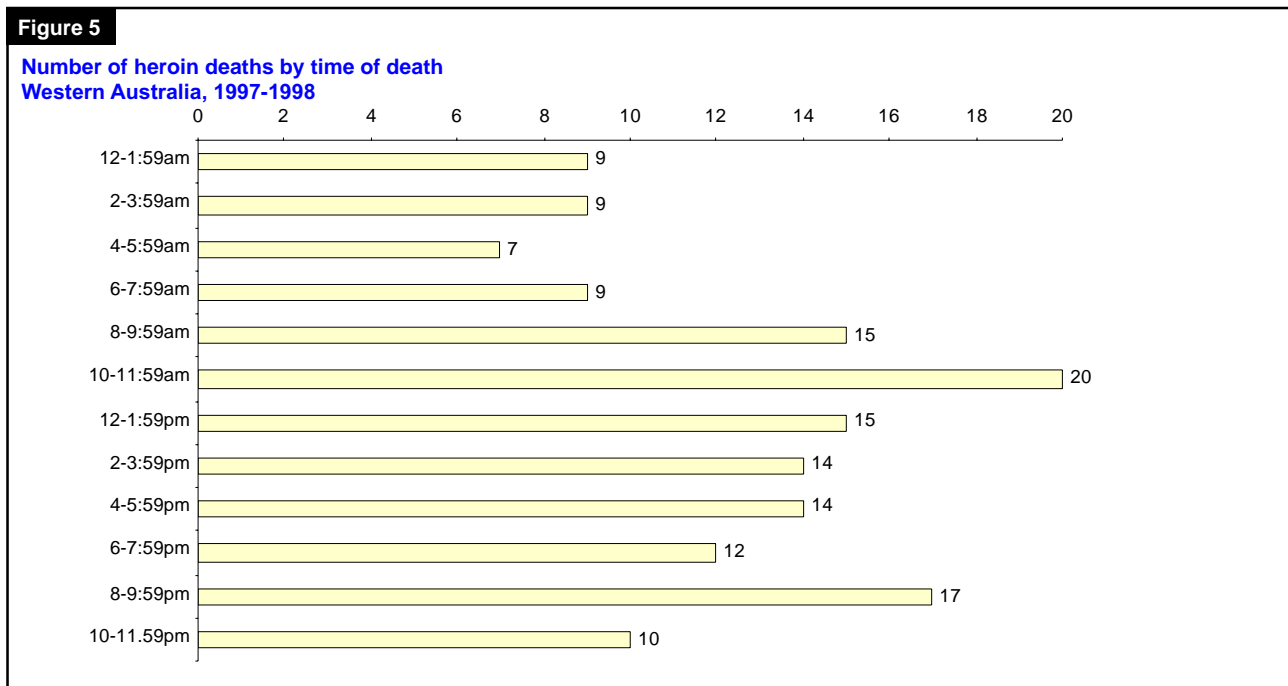
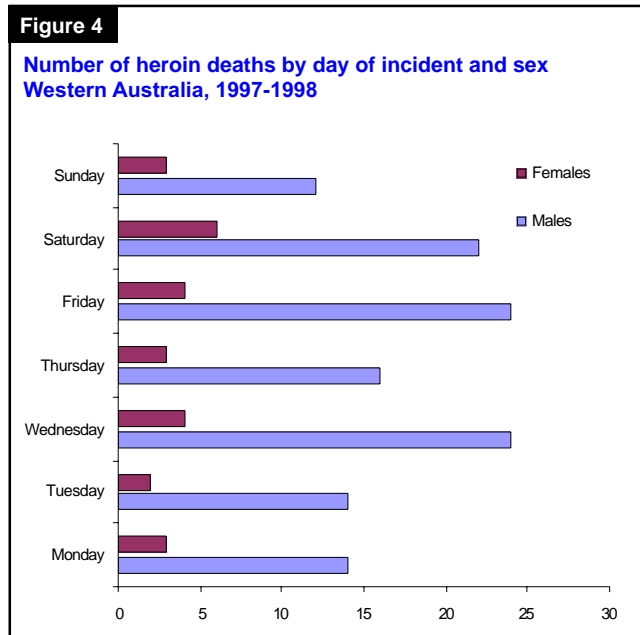


Table 7

**Number of heroin deaths by place of incident and sex
Western Australia, 1997-1998**

Place	Females		Males		Total	
	n	%	n	%	n	%
Carpark/street	3	12.0	9	7.1	12	7.9
Dwelling	19	76.0	93	73.8	112	74.2
Hotel/motel/hostel	1	4.0	12	9.5	13	8.6
Other	1	4.0	3	2.4	4	2.6
Prison	-	-	2	1.6	2	1.3
Public toilet	1	4.0	7	5.6	8	5.3
All places	25	100.0	126	100.0	151	100.0

PLACE OF INCIDENT

This study illustrates that the majority of deaths occurred at homes, with just under three quarters of all HRDs occurred at a private dwellings (Table 7).

A total of 13 (8.6%) deaths were recorded as occurring at a hotel, motel or hostel, 12 (7.9%) deaths in a carpark or street and 8 (5.3%) in a public toilet, in various locations in the inner city and outer metropolitan areas. There were two deaths in State prisons.

Table 8

**Number of heroin deaths by place of incident and age group
Western Australia, 1997-1998**

Age group	Place of incident						Total
	Carpark/ street	Dwelling	Hotel/motel /hostel	Other	Prison	Public toilet	
15-19	-	8	1	1	1	-	11
20-24	2	25	1	2	-	-	30
25-29	2	28	4	1	-	1	36
30-34	3	23	1	-	-	2	29
35-39	2	15	3	-	-	3	23
40-44	2	8	2	-	1	2	15
45-49	-	3	1	-	-	-	4
50-54	1	2	-	-	-	-	3
All ages	12	112	13	4	2	8	151

A total of 8 (72.7%) of deaths involving the 15-19 age group occurred in a private dwelling.

For older age groups a greater proportion of deaths occurred at places other than private dwellings, with a total of 15 (65.2%) HRDs of the 35-39 age group and 8 (53.3%) HRDs of the 40-44 age group at private dwellings (Table 8).

Table 9

**Number of heroin deaths by drug group and sex
Western Australia, 1997-1998**

Drug group	Males (n = 126)		Females (n = 25)		Total (n = 151)	
	n	%	n	%	n	%
Other opioids Eg Methadone, Oxycodone, Propoxyphene	14	11.1	-	-	14	9.3
Cannabis	56	44.4	12	48.0	68	45.0
Benzodiazepines Eg Clonazepam, Diazepam, Flunitrazepam, Nitrazepam, Oxazepam, Temazepam	46	36.5	15	60.0	61	40.4
Alcohol	40	31.7	4	16.0	44	29.1
Tranquillisers Eg Chlorpromazine, Thioridazine	8	6.3	4	16.0	12	7.9
Antidepressants Eg Dothiepin, Fluoxetine, Moclobemide, Paroxetine, Sertraline	14	11.1	6	24.0	20	13.2
Amphetamines	15	11.9	3	12.0	18	11.9
Other drugs Eg Cocaine, Haloperidol, Methylamphetamine, Naltrexone, Paracetamol	30	23.8	8	32.0	38	25.2

TOXICOLOGICAL FINDINGS

The presence of heroin was confirmed by the presence of one or more of its metabolites (ie monoacetylmorphine, morphine and/or acetylcodeine) identified by the Chemistry Centre as having originated from heroin (ie diacetylmorphine).

Three additional groups of psychoactive drugs were most frequently detected in the 151 HRDs, these were (Table 9, page 5):

- 68 (45.0%) cases were cannabis positive (detected by its major metabolite carboxytetrahydrocannabinol (THCA));
- 61 (40.4%) cases were benzodiazepine positive; and
- 44 (29.1%) cases were alcohol positive.

This data indicates that a combination of benzodiazepines and alcohol is likely to increase the risk of fatal overdose. Similar levels of use of these two drugs have also been reported by the Victorian Institute of Forensic Medicine in the study, *Heroin deaths in Victoria 1997-1998*, published in March 1999.

There were 20 (13.2%) cases where anti depressants were detected, 18 (11.9%) cases where amphetamines were detected, 14 (9.3%) cases where other opioids were detected and 12 (7.9%) cases where major tranquillisers were detected.

A variety of other drugs were detected in 38 (25.2%) cases, such as cocaine, chlorpromazine, ephedrine, haloperidol, methlyamphetamine, paracetamol, promethazine and thioridazine.

Naltrexone was detected in one case and the anti nausea and anti vomiting drug metoclopramide was detected in two cases.

Table 11
Number of heroin deaths by country locality of incident
Western Australia, 1997-1998

Locality	Locality	Locality	Locality
Albany	2	Mandurah	4
Bridgetown	1	Pannawonnica	1
Busselton	1	Port Hedland	2
Geraldton	3	Wundowie	1
Harvey	1	Yerrecoin	1
Kalgoorlie	3	Total	21
Kununurra	1		

Table 10
Number of heroin deaths by Perth metropolitan locality of incident
Western Australia, 1997-1998

Locality	Locality	Locality	Locality	Locality	
Armadale	2	Glendalough	1	Nollamara	1
Ashfield	1	Gosnells	1	Noranda	1
Attadale	1	Hamersley	1	Northbridge	5
Atwell	1	Helena Valley	1	Ocean Reef	1
Balcatta	2	Highgate	1	Osborne Park	3
Balga	2	Iluka	1	Padbury	1
Bassendean	3	Innaloo	1	Perth	8
Beckenham	1	Kardinya	1	Prison	2
Belmont	2	Karrinyup	1	Queens Park	2
Bentley	3	Kenwick	1	Rivervale	1
Bicton	1	Kingsley	1	Scarborough	6
Bullcreek	1	Ledge Point	1	South Perth	1
Cannington	1	Leederville	2	Stirling	1
City Beach	1	Lockridge	1	Subiaco	1
Cloverdale	2	Maddington	1	Tuart Hill	4
Coolbellup	1	Manning	1	Victoria Park	1
Doubleview	1	Marangaroo	1	Wanneroo	1
Duncraig	1	Maylands	2	Waterford	1
East Fremantle	2	Midland	2	Wembley	2
East Perth	2	Midvale	3	Wembley Downs	1
East Victoria Park	3	Mosman Park	1	West Leederville	1
Edgewater	1	Mount Claremont	1	West Perth	1
Forrestfield	3	Mount Lawley	2	Willetton	1
Fremantle	8	Mundaring	2	Woodlands	2
Girrawheen	3	Nedlands	1	Total	130

Heroin alone was detected in 54 (36.4%) cases. Heroin and only benzodiazepines were detected in 23 (15.2%) cases. Heroin and only alcohol were detected in 24 (15.9%) case. Heroin and only other opioids were detected in 13 (8.6%) cases. Heroin and only amphetamines were detected in 15 (9.9%) cases. Heroin and only other drugs were detected in 9 (6.0%) cases. Heroin and only anti depressants were detected in 5 (3.3%) cases.

LOCALITY OF INCIDENT

The majority of the 151 deaths occurred in the Perth metropolitan area, with the remaining 21 (13.9%) HRDs recorded in 12 non metropolitan localities, including 4 in Mandurah (Table 11, page 6). As Mandurah is immediately south of the Perth metropolitan area it is possible some of these deaths could be indicative of drug use originating in the metropolitan area.

In the Perth metropolitan area there were a total of 130 HRDs which occurred in 74 different localities (Table 10, page 6). The most frequent localities were in Fremantle and in the Perth central business district (CBD), with 8 deaths recorded in each place. A further 5 deaths occurred in Northbridge, a major late night entertainment locality immediately adjacent to the CBD.

Outside the Perth CBD/Northbridge area, the next greatest number of deaths, 6 cases, occurred in Scarborough. Most of the remaining localities except for Tuart Hill (4 deaths), East Victoria Park, Bassendean, Midvale, Bentley and Osborne Park (3 deaths in each) involved only single deaths.

WA Heroin Overdose Prevention Strategy

The *WA Heroin Overdose Prevention Strategy* was established in 1997 to develop and implement initiatives to prevent heroin related overdose deaths in this State.

The strategy has been developed, implemented and evaluated by the Opiate Overdose Strategy Group. This is an open forum convened by the WA Drug Abuse Strategy Office and includes ambulance and hospital emergency medical services, the Health Department, alcohol and drug agencies, the WA Substance Users' Association (WASUA), the WA AIDS Council (WAAC), the WA Police Service, the Phar-

macy Guild and the National Drug Research Institute.

The key elements of the strategy include:

- Police and ambulance practices to encourage users to call an ambulance.
- Use of Narcan by ambulance services.
- Information for users regarding critical risk factors provided through posters and postcards at appropriate sites, warnings on fitpacks and publications.
- Outreach and peer education for users to educate other users regarding risk factors and simple resuscitation methods.
- Emergency department follow up of overdose cases.
- Expansion of the availability of methadone treatment.
- Monitoring trends through the Coroner's Office and ambulance services.
- Research with users to explore various strategies.

Commissioned research has included investigation of risk factors by young injecting drug users (IDUs), the overdose risk factors and harm reduction opportunities evident from coronial investigation, and the feasibility of the provision of Narcan to drug users. These studies have been conducted by the National Drug Research Institute.

The key peer based education and emergency department follow up project, *OOPS ED*, has been provided by Next Step - Specialist Drug and Alcohol Services, working collaboratively with the needle and syringe programs and outreach services provided by WASUA and the WAAC.

Education materials for IDUs have focused on the following critical risk factors and simple emergency responses.

Dosage

Variations in the purity of heroin mean unpredictable doses.

Tolerance

Tolerance drops rapidly after even a brief period of abstinence.

Polydrug use

The use of alcohol and benzodiazepines (valium, rohypnol etc) increases the risk of overdose considerably.

Using alone or in an isolated place

If others are not present this may mean there is no one to assist or call an ambulance.

Overdose deaths often do not occur immediately

It may take anything from a few minutes to a few hours for an overdose to occur - snoring is a strong indicator of risk.

Always call an ambulance

Ambulances should always be called to an overdose.

Simple resuscitation techniques work

Simple resuscitation methods, such as EAR (expired air resuscitation), can assist in overdoses.

A set of eight postcards focusing on these factors were released in March 1999 through needle and syringe programs, outreach and treatment services.

Each postcard contains a unique graphic representational design dealing with a specific issue, accompanied by text. The material has been designed with drug users for people involved with the heroin using sub culture.

The artwork and text from two postcards are reproduced to illustrate how issues are addressed in a manner which is designed to reach those involved in heroin use.



Call

If someone drops call an ambulance. The best way to avoid legal hassles is to make sure the person stays alive. The police don't attend ODs unless they are fatal, or unless the ambos are afraid for their safety. When you phone 000 don't give the operator any grief. This way the police won't show.

Strength & tolerance

Think about the things that may increase your chances of going over. Like the strength of the heroin and your level of tolerance. Have you had a break? Been in prison or on naltrexone? Your tolerance is reduced within two days. What other drugs are on board? Alcohol and benzos make a huge contribution in heroin deaths.



Web Only Document

This publication is available online only at <http://www.wa.gov.au/drugwestaus/>

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