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## **Estimating the Size of the Australian Heroin Market: A New Method**

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**Paper presented to the Social Change in the  
21<sup>st</sup> Century Conference**

**Centre for Social Change Research  
Queensland University of Technology  
27<sup>th</sup> October 2006**

# Estimating the Size of the Australian Heroin Market: A New Method

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## **Abstract**

Measuring the success of drug law enforcement by the quantity of drugs seized can be deceptive, simply because the amount seized may increase because the size of the drug market has also increased, rather than because of any increased success of drug law enforcement. Consequently, the best method of assessing the success of drug law enforcement is to determine the percentage of the market seized.

The application of this method of analyzing heroin seizures in the years before the heroin shortage in Australia in 2001 reveals that drug law enforcement was an unlikely cause of the 2001 heroin shortage. The most likely explanation for the heroin shortage was a severe disjunction between the rapidly growing demand for heroin in Australia coupled with the significant decline in heroin production in Southeast Asia due to the drought in Burma and a general move away from heroin production towards methamphetamine production.

**Key words:** Australian heroin market; 2001 heroin shortage; methamphetamine plague.

## **Introduction:**

Beginning in January 2001, there were many reports that a profound shortage of heroin had developed in Australia. The causes of this Australian heroin shortage have been the subject of considerable academic debate. The Australian Federal Police [AFP], along with the Australian Customs Service [ACS], were quick to claim credit for causing the drought and their claims have been supported by several papers in the academic literature [Weatherburn, 2003], [Smitherson, 2005], [Degenhardt, 2005]. However, these analyses naively assumed that because the amount of heroin seized went up, it meant drug law enforcement had succeeded and thus caused the drought. However, over the past three decades the amount of heroin seized in Australia had always increased without causing shortages. This was because the size of the heroin market increased in proportion. Although the police seized more drugs each year, each year there were more drugs on the street.

## **The role of the seizure figures in modeling the Australian heroin market**

The amount of heroin seized by customs and police is an important indicator of the size of the heroin market and various ways of estimating the size of the heroin market using the seizure figures have developed. Of these, the earliest (and least accurate) is the seizure method. Because the police often estimate they seize 10 percent of the market, the seizure method takes the amount seized by police and multiplies this by ten to estimate the market size. However, the 10 percent figure is only an average. In reality, the seizure figures vary widely, causing estimates of market size by the seizure method to vary widely also. This wide variation in the seizure figures makes their analytical use difficult because they go up and down, depending on how lucky police and customs were in intercepting large heroin shipments that year.

More accurate models of the heroin market can be calculated by consumption models which use nation-wide polls to estimate the size of the market from the estimated number of heroin users. The model presented in this paper uses a combination of consumption estimates and seizures estimates. A historic model of the Australian heroin market was estimated from the number of heroin users in Australia (derived from the recent use of heroin figures from the National Drug Strategy Household Survey polls), and then this model was checked against the seizure figures by estimating the percentage of the market seized. If the model falls in the right ballpark, we would expect the percentage-seized figure should vary around 10 percent, generally falling in the range between 5 and 15 percent. This method is also useful in measuring drought-causing seizures which are indicated by seizure levels well above the 5-15 percent range.

## **The Australian heroin boom of 1993-2001**

The various indicators of the Australian heroin market in the 1990s suggest this decade was a period of explosive growth in heroin use. The 1995 National Drug Strategy (NDS) Household Survey indicated that recent heroin use in Australia doubled between 1993 and 1995; and the 1998 NDS poll showed that recent heroin use doubled again between 1995 and 1998. This picture of a runaway heroin market that was doubling every three years was supported by the figures on opioid overdoses (in 15-54 age group) which rose from 250 at the start of the decade to over 1000 by 1999. Table 1

uses these indicators, along with the estimate that the size of the heroin market in 1998 was 6 tonnes, to model the Australian heroin from 1993 to 2001.

**Table 1:**

Indicators of size of Australian heroin market 1993-2001 measured by: % of population reporting recent use of heroin; opioid overdose deaths among those aged 15-54; estimated size in tonnes of heroin;

Year	recent use <sup>(a)</sup> (% of pop.)	opioid overdose deaths in pop. aged 15-54 <sup>(b)</sup>	est. market size <sup>(c)</sup>
1993	0.2	374	1.5 tonne
1994	n.a	425	2.25tonne
1995	0.4	582	3.0 tonne
1996	n.a	557	4.0 tonne
1997	n.a	713	5.0 tonne
1998	0.8	927	6.0 tonne
1999	n.a	1116	6.5 tonne
2000	n.a	938	6.0 tonne
2001	0.2	386	2.0 tonne

(a) The National Drug Strategy conducted 4 polls in this era in 1993, 1995, 1998 and 2001;

(b) Australian Bureau of Statistics, Degenhardt and Barker 2003;

(c) Based on an estimated size of the heroin market at 6 tonnes in 1998.

Note that the opioid overdose deaths were not used to estimate the size of the market. They are included as another independent measure of the dynamics of heroin use in Australia from 1993-2001.

Using Customs Minister Amanda Vanstone's method of estimating the "street value" of heroin (in a 1998 press release quoted below, Vanstone assumed a kilo of heroin was worth \$800,000 street value) the street value of this market peaked at approximately \$5 billion in the period 1998-2000.

In terms of drug law enforcement, this suggests a picture of abject failure, not success: Despite hundreds of millions spend on drug law enforcement and tens of thousands of heroin arrests, heroin use increased markedly, creating a \$5 billion black market, with over 6000 opioid overdose deaths in 8 years.

## The seizure evidence

Yet this picture of drug law enforcement failure could be interpreted to indicate success. Because the size of the market increased markedly, the amount of heroin seized by police rose in proportion. A series of studies have used the increase in the amount of heroin seized in the 1990s to argue that the AFP and ACS were successful in causing the heroin shortage. [Weatherburn, 2003], [Degenhardt 2005], [Smitherson, 2005].

Table 2 below records the quantity of heroin seized at the borders by the Australian Federal Police and Customs Service (AFP/ACS) and presents it as percentage of the market seized by Customs and Federal police; it also uses (where this is known) the total amount of heroin seized in Australia by the eight state police services as well as the AFP/ACS.

**Table 2:**

Weight of heroin seized at the border by the Australian Customs Service (ACS) and Australian Federal Police (AFP), estimated size of the Australian heroin market; percentage seized by ACS/AFP at border; heroin seized by all police, where known

Year	Heroin seized <sup>(a)</sup> by AFP/ACS	market size	% seized by AFP/ACS	Heroin seized by all police	% seized all police
1993/94	50kg	1.5 tonne	3%	?	?
1994/95	300kg	2.25 tonne	13.33%	?	?
1995/96	57kg	3.0 tonne	2%	?	?
1996/97	168kg	4.0 tonne	4.2%	237kg <sup>1</sup>	5.9%
1997/98	138kg(?)	5.0 tonne	2.8%	299kg <sup>1</sup>	6.0%
1998/99	509kg	6.0 tonne	8.4%	1000kg <sup>2??</sup>	16.6%
1999/2000	269kg	6.0 tonne	4.5%	734kg <sup>3</sup>	12.2%
2000/2001	218kg	4.0 tonne	5.5%	?	?

(a) Figures on heroin seized by the AFP/ACS are from successive issues of the *Australian Illicit Drug Report*. Table 2 is unfortunately incomplete because the *Australian Illicit Drug Report* was more concerned with the Australian Federal Police and rarely gave the law enforcement efforts of state police much attention. Consequently, I found figures for "Heroin seized by all police" in only two issues of the *Australian Illicit Drug Report* and have been forced to find sources for the other years. The varying sources for the figures in this column were:

(1) based on figures from Australian Illicit Drug Report 1997, 1998

(2) based on [Degenhardt, 2005]; the double question mark is because no source was quoted.

(3) Australian Bureau of Criminal Intelligence 2001; quoted in [Weatherburn, 2001].

Although the amount of heroin seized by police and customs varied widely from year to year, it seems that there was an increase in the amount seized by AFP/ACS throughout the 1990s. However, the percentage seized remained relatively stable. Police often estimate that they seize 10% of the market and (as an average) the percentage-seized support this. Although we do not have complete figures on the heroin seized by all Australian police forces, those that we have show the amount seized by the various Australian police services in the 1990s varied between 5.9%-16.6%, which is consistent with the expected 5%-15% range.

If we were to use the seizure method for estimating the size of the heroin market from the total amount seized by police in the years for which we have a complete record (market size = amount seized X 10), we would estimate the size of the Australian heroin market was 2.4 tonnes in 1996/97, 3 tonnes in 1997/98, 10 tonnes in 1998/99 and 7.3 tonnes in 1999/2000, a very wide variation. However, the average of these results would be much closer to our other estimates. This suggests the predictions of the seizure method could be improved by averaging adjacent years (the year before, the current year, and the year after), rather than relying on the amount seized in any individual year. This modified seizure method would predict the size of the market in 1997/1998 as 5.1 tonnes and in 1998/99 at 6.8 tonnes, which is much closer to our user-population based estimates.

Despite the yearly fluctuations, the amount of heroin seized was well below the range needed to cause a drought. Rather than collapsing because of successful drug law enforcement, the picture Table 2 suggests is of a rampant market that simply grew far too rapidly for its growth to be sustainable, and which fell victim in 2001 to its own runaway success.

If police seizures caused the heroin shortage of 2001, then a very large section of the market had to be seized; so we would expect to find a series of large heroin seizures in the year before 2001 which precipitated the heroin shortage. To be large enough to cause a drought, these seizures would have to be record-breaking, the biggest

seizures of all time (because no other series of seizures has caused a comparable drought). However, although the heroin shortage began around January 2001, the seizure figures for the calendar year 2000 were small in comparison to previous years. As Table 2 shows, the amount of heroin seized at the border by AFP/ACS in the financial year 2000/2001 was only the fourth highest in the eight years between 1993 and 2001. Rather than being record-breaking, this was an average result.

### **The record seizure of 1998**

The largest seizure of heroin in Australian history was 390 kilos seized in October 1998 at a beach south of Port Macquarie, which was celebrated at the time with justifiable gloating by the Minister for Justice and Customs, Senator Amanda Vanstone.

In her media release of October 14 1998, Senator Vanstone stated that this massive heroin bust had 'a street value of over \$300 million' (valued at \$800,000 per kilo) and 'represents something in the order of 8 million "hits".' In a table accompanying the media release, the three largest heroin hauls of the past year were recorded both in weight and as an equivalent number of hits. According to the minister's estimates, these three busts amounted to over half a tonne of heroin or more than ten million heroin hits removed from the market.[Vanstone, 1998a]

In her next media release 'Heroin Busts Will Lower Supply', the minister thundered at critics who dared suggest that this record heroin seizure would have only a minimal impact on Australia's heroin market. 'It is almost laughable to suggest a haul of this magnitude will have only a limited impact on the quantity of heroin on our streets', Senator Vanstone declared. [Vanstone, 1998b]

Yet the critics were right. Even though Senator Vanstone and the AFP and the ACS teams calculated that they took ten million hits off the market, they had no effect on heroin supply. For the years following this massive heroin haul coincided with the peak of the heroin boom, with purity high, and the number of opiate overdoses (a good indicator of heroin usage) at record levels: there were 927 overdose deaths in 1998; 1116 overdose deaths in 1999; and 936 overdose deaths in 2000. Likewise, the price of heroin per gram in Sydney fell from \$280 in 1998, to \$240 in 1999, to \$220 per gram in 2000. [Breen et al, 2004]

The heroin market model indicates that as large as this 390 kilo shipment was, it was not a drought-causing event and represented only 6% of the 6 tonne Australian market in 1998. In the period between 1993 and 2001 there were NO seizure large enough to cause a drought, not even this one, which was the largest ever.

### **The yaa-ba plague and the decline of heroin production in Southeast Asia**

While demand for heroin in Australia quadrupled in the eight years before January 2001, production of heroin from the Golden Triangle, the major source of heroin for Australia, declined significantly, partly because of a long drought. The *Australian Illicit Drug Report 2000-2001* described the shortage of opium in Myanmar (Burma) in 2000 due to the poor 1999 growing season:

Severe drought in Myanmar's poppy growing areas – principally northern and southern Shan state - caused production and cultivation to decline significantly in 1999; the third year in a row ... Myanmar's estimated gum opium potential

was almost 38% lower than in 1998 and almost half the average annual potential area for 1991 to 1999 ...

A more spectacular decline in opium production occurred in Afghanistan: from an estimated 89,172 hectares in 2000 to an estimated 7606 hectares in 2001; a reduction of 91%. Afghanistan produced an estimated 79% of the world's illicit opium in 1999, but this dropped to 70% in 2000, following a decree issued by the Taliban authorities in September 1999, requiring all opium-growers to reduce output by one-third. A second decree, issued in July 2000, required farmers to completely stop opium cultivation. [Australian Bureau of Criminal Intelligence, 2002]

While these environmental and political factors had a detrimental effect on heroin production in Southeast Asia, other changes in the Southeast Asian drug trade in the 1990s also contributed to a decrease in heroin production in Southeast Asia. In China and Thailand, which are the major markets for producers in the Golden Triangle, heroin was displaced as drug of choice in the 1990s by "yaa-ba", an amphetamine-type-stimulant.

Yaa-ba was originally known in Thailand as "yaa-ma" (literally, horse medicine) but in 1996 Thai Health minister Sanoh Thienthong substituted the name "yaa-ba" (madness drug) in order to disenchant the public with a product whose consumption levels had already reached alarming proportions. Not surprisingly, as yaa-ba the drug became even more popular. The thriving trade in yaa-ba stimulated methamphetamine production in Burma and Thailand and attracted players from heroin production. According to Chouvy and Meissonnier [2004], methamphetamine production was easier, more flexible and cheaper than heroin production, and it did not need vast areas devoted to its production. This made methamphetamine manufacture more attractive to many big players in the heroin market, and these authors suggest that the very public retirement of Khun Sa and his United Wa State Army from the heroin industry in 1996 masked a move into methamphetamine production.

Since Australia's heroin drought was accompanied by a methamphetamine plague, the Australian heroin drought may have been a deliberate conspiracy by Southeast Asian gangs to withhold heroin from the Australian market to stimulate methamphetamine sales. More probably though, Australia's 2001 heroin shortage/methamphetamine plague simply reflected the new reality of market forces in Southeast Asia and the decline in heroin production.

## **The new heroin world order**

According to the *2006 World Drug Report*, published by the UN Office on Drugs and Crime, the decline of heroin production in SE Asia has continued from 2001. Following the overthrow of the Taliban, Afghanistan has risen to an unprecedented global dominance of the world's heroin market. In this new heroin world order, the traditional source for heroin for Australia, the countries of SE Asia, have continued to decline in importance. The report states:

The proportion of opiate seizures, expressed in heroin equivalents, along the Afghanistan–Europe trafficking route increased from 78 per cent to 85 per cent between 2002 and 2004, reflecting rising levels of opium production in Afghanistan and rising levels of opiate trafficking from that country. The volume of opiate seizures along the other two main routes showed a downward trend (from 7 per cent to 4 per cent in the Americas, and from 15 to 11 per cent for the South-East Asia/Oceania route.

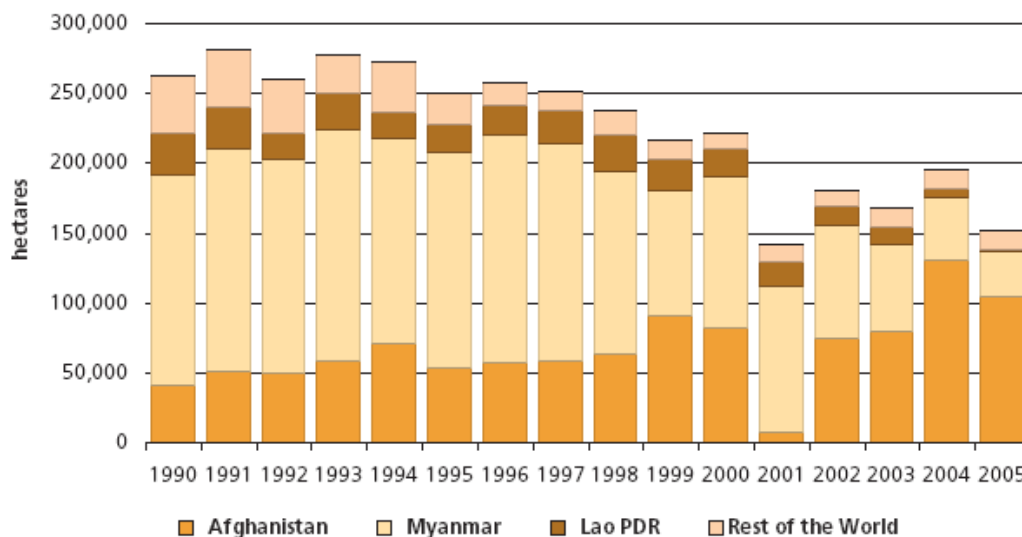
**Table 3. Global Illicit Cultivation of Opium Poppy and Production of Opium 1990-2005**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>CULTIVATION<sup>(a)</sup> IN HECTARES</b>																
<b>SOUTH-WEST ASIA</b>																
Afghanistan	41,300	50,800	49,300	58,300	71,470	53,759	56,824	58,416	63,674	90,583	82,171	7,606	74,100	80,000	131,000	104,000
Pakistan	7,488	7,962	9,493	7,329	5,759	5,091	873	874	950	284	260	213	622	2,500	3,100	2,400
<b>Subtotal</b>	<b>48,788</b>	<b>58,762</b>	<b>58,793</b>	<b>65,629</b>	<b>77,229</b>	<b>58,850</b>	<b>57,697</b>	<b>59,290</b>	<b>64,624</b>	<b>90,867</b>	<b>82,431</b>	<b>7,819</b>	<b>74,722</b>	<b>82,500</b>	<b>134,100</b>	<b>106,400</b>
<b>SOUTH-EAST ASIA</b>																
Lao PDR	30,580	29,625	19,190	26,040	18,520	19,650	21,601	24,082	26,837	22,543	19,052	17,255	14,000	12,000	6,600	1,800
Myanmar	150,100	160,000	153,700	165,800	146,600	154,070	163,000	155,150	130,300	89,500	108,700	105,000	81,400	62,200	44,200	32,800
Thailand <sup>(b)</sup>	1,782	3,727	3,016	998	478	168	368	352	716	702	890	820	750			
Viet Nam <sup>(b)</sup>	18,000	17,000	12,199	4,268	3,066	1,880	1,743	340	442	442						
<b>Subtotal</b>	<b>200,462</b>	<b>210,352</b>	<b>188,105</b>	<b>197,106</b>	<b>168,664</b>	<b>175,768</b>	<b>186,712</b>	<b>179,924</b>	<b>158,295</b>	<b>113,187</b>	<b>128,642</b>	<b>123,075</b>	<b>96,150</b>	<b>74,200</b>	<b>50,800</b>	<b>34,600</b>
<b>LATIN AMERICA</b>																
Colombia <sup>(c)</sup>		1,160	6,578	5,008	15,091	5,226	4,916	6,584	7,350	6,500	6,500	4,300	4,100	4,100	3,950	2,000
Mexico <sup>(d)</sup>	5,450	3,765	3,310	3,960	5,795	5,050	5,100	4,000	5,500	3,600	1,900	4,400	2,700	4,800	3,500	3,300
<b>Subtotal</b>	<b>5,450</b>	<b>4,925</b>	<b>9,888</b>	<b>8,968</b>	<b>20,886</b>	<b>10,276</b>	<b>10,016</b>	<b>10,584</b>	<b>12,850</b>	<b>10,100</b>	<b>8,400</b>	<b>8,700</b>	<b>6,800</b>	<b>8,900</b>	<b>7,450</b>	<b>5,300</b>
<b>OTHER</b>																
Combined <sup>(e)</sup>	8,054	7,521	2,900	5,704	5,700	5,025	3,190	2,050	2,050	2,050	2,479	2,500	2,500	3,000	3,590	5,200
<b>GRAND TOTAL</b>	<b>262,754</b>	<b>281,560</b>	<b>259,686</b>	<b>277,407</b>	<b>272,479</b>	<b>249,919</b>	<b>257,615</b>	<b>251,848</b>	<b>237,819</b>	<b>216,204</b>	<b>221,952</b>	<b>142,094</b>	<b>180,172</b>	<b>168,600</b>	<b>195,940</b>	<b>151,900</b>

The decline in South East Asian heroin production is shown in Table 3 (above) from the 2006 World Drug Report.

Graph 1, Global heroin production (1990-2005) (from the 2006 World Drug Report) shows the underproduction of heroin in 2001. Given this level of global underproduction, Australia's 2001 heroin shortage should be no great surprise.

**Global heroin production (1990-2005)**



Supporting this conclusion, a similar heroin shortage also occurred in British Columbia in Canada in 2001 [Wood et al, 2006]. Like Australia, British Columbia largely derives its heroin from Southeast Asia, so British Columbia's 2001 heroin shortage suggests that the heroin shortages in both British Columbia and Australia in 2001 were due to global heroin underproduction; particularly the decline in heroin production in Southeast Asia.

## **Conclusion**

Although the causes of the heroin drought in Australia in January 2001 remain a matter of dispute, this analysis of the heroin seizures by the Australian police and customs suggests that it had little to do with any increased success by Australian law enforcement (Table 2). The most likely explanation for the heroin shortage was a severe disjunction between the rapidly growing demand for heroin in Australia, coupled with the significant decline in heroin production in Southeast Asia due to the drought in Burma and a general move away from heroin production towards methamphetamine production. It seems that the rapidly increasing demand for heroin from Australia, combined with the falling availability of heroin from Southeast Asia, resulted in a shortage of heroin in Australia in 2001. The similar heroin shortage in British Columbia in 2001 described by Wood et al reinforces the conclusion that the shortage was due to international supply factors, rather than domestic drug law enforcement causes.

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