Evaluating explanations of the Australian 'heroin shortage'

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ABSTRACT

Aims In this paper we outline and evaluate competing explanations for a heroin shortage that occurred in Australia during 2001 with an abrupt onset at the beginning of 2001.

Methods We evaluated each of the explanations offered for the shortage against evidence from a variety of sources: government reports, police and drug law enforcement documents and briefings, key informant (KI) interviews, indicator data and research data.

Results No similar shortage occurred at the same time in other markets (e.g. Vancouver, Canada or Hong Kong) whose heroin originated in the same countries as Australia's. The shortage was due most probably to a combination of factors that operated synergistically and sequentially. The heroin market had grown rapidly in the late 1990s, perhaps helped by a decline in drug law enforcement (DLE) in Australia in the early 1990s that facilitated high-level heroin suppliers in Asia to establish large-scale importation heroin networks into Australia. This led to an increase in the availability of heroin, increasingly visible street-based drug markets, increased purity and decreased price of heroin around the country. The Australian heroin market was well established by the late 1990s, but it had a low profit margin with high heroin purity, and a lower price than ever before. The surge in heroin problems led to increased funding of the Australian Federal Police and Customs as part of the National Illicit Drug Strategy in 1998–99, with the result that a number of key individuals and large seizures occurred during 1999–2000, probably increasing the risks of large-scale importation. The combination of low profits and increased success of law enforcement may have reduced the dependability of key suppliers of heroin to Australia at a time when seized heroin was becoming more difficult to replace because of reduced supplies in the Golden Triangle. These factors may have reduced the attractiveness of Australia as a destination for heroin trafficking.

Conclusions The Australian heroin shortage in 2001 was due probably to a combination of factors that included increased effectiveness of law enforcement efforts to disrupt networks bringing large shipments of heroin from traditional source countries, and decreased capacity or willingness of major traffickers to continue large scale shipments to Australia.

KEYWORDS Drug policy, drug supply, heroin, law enforcement, supply reduction.

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INTRODUCTION

Heroin problems in Australia rose substantially in the 1990s [1]. In the largest Australian heroin market, New South Wales (NSW), the price per gram of heroin was at a historic low between 1993 and 1999, purity at 'street' level reached 60%, and heroin was the drug most commonly injected by injecting drug users (IDU) [2–4]. Substantial rises occurred in the number of people treated for heroin dependence, heroin-related overdose deaths, heroin arrests and hepatitis C infections [5–7].

A range of factors probably generated this increase. First, heroin availability increased when there was a large population of susceptible youth with limited exposure to heroin, because the preceding wave of initiation to heroin use had occurred a decade before [1]. Secondly, there was a high level of corruption in NSW drug law enforcement in the 1980s and early 1990s [8]. Previous work has suggested that in such instances, corrupt police may choose to restrict the supply of heroin, so as to maintain profits and/or avoid public concern about heroin use [9]; in NSW, there was good evidence to suggest that corrupt specialized drug squads protected existing drug distribution networks and restricted drug supply in NSW [10]. Following the Wood Royal Commission (1994–97), less experienced specialized squads, although willing to investigate such networks, probably lacked the resources (including informants) and expertise to do so [8]. This may have led to increased opportunities for new or expanded organized crime groups to become involved in large-scale heroin importation and/or distribution.

Thirdly, there were changes in the criminal syndicates that imported and distributed heroin in Australia. Southeast (SE) Asian heroin trafficking groups are thought to have targeted the Australian market from 1994 to attain significant market share [8], aided by links with increasingly influential Asian–Australian crime gangs, particularly in key areas in Sydney, namely Haymarket and Cabramatta [11]. This followed the displacement of SE Asian heroin from the US market by Colombian and Mexican sources [12,13]. There also appeared to be a shift in the mode of importation of heroin with increased use of 'middle men', or facilitators, based in SE Asia, who connected producers/financiers in SE Asia with importers/distributors in Australia.

Fourthly, there was limited funding for national and international drug law enforcement (DLE) efforts in the early 1990s, in particular for the border and international operations of the Australian Customs Service (ACS) and the Australian Federal Police (AFP) [8]. An increase in supply without a comparable increase in enforcement may have led to 'enforcement swamping' [14].

The 2001 heroin shortage

In early 2001, there were reports of a dramatic decline in the availability of heroin in Sydney that marked the abrupt onset of what proved to be a sustained reduction in the availability of heroin, known as the Australian 'heroin shortage' or 'heroin drought' [12,15–17]. The Illicit Drug Reporting System (IDRS)—Australia's strategic early warning system—revealed a similar pattern across Australia, with an overall reduction in the availability and purity of heroin and an increase in heroin price for all major heroin markets (see Fig. 1 for NSW data) [2]; heroin use dropped sharply among IDU, despite continued demand for the drug.

The reduction in availability probably began in January 2001, with peak severity from January–April 2001 [16–18]. IDU reported a median increase of 80 minutes in the time to obtain heroin during January–February 2001 compared to December 2000 [17]. In April 2001, 71% of IDU interviewed still regarded heroin as more difficult to obtain than December 2000 [19]. Monitoring systems such as the IDRS have indicated that heroin availability, price and purity have not returned to pre-shortage levels, and as of late 2003, indicators of heroin-related harms remained at much lower levels than before the shortage [20]. Greater detail on the shortage is provided elsewhere [18].

For a number of reasons, it is difficult to make definitive statements about the causes of the shortage. First and foremost, heroin markets are illicit. Even people who are integrally involved lack a detailed or comprehensive picture of the commodity with which they deal [21]. Secondly, illicit drug markets are affected by a multitude of factors that most broadly include supply and demand. Demand can sometimes increase sharply, as during the early phase of an epidemic of use, or it may shift downwards, through increases/improvements in treatment [22]. Downward shifts are less sharp, because dependent users dominate consumption levels, and their use is long-lasting and slow to change.

The heroin shortage, however, was clearly an instance of reduced supply, not of reduced demand: users still identified heroin as their primary drug of choice even if they were not using it as often [2,23], and heroin prices rose, which is inconsistent with a fall in demand. It is supply-side factors that we examine in detail in this paper:

- source country conditions: natural conditions; the availability of stable markets for other crops; government action against opium farmers; and traffickers' changes due to perceived profit changes;
- the intensity and competence of government actions against: drug producers, including precursor control and seizures; source country traffickers; and smugglers;

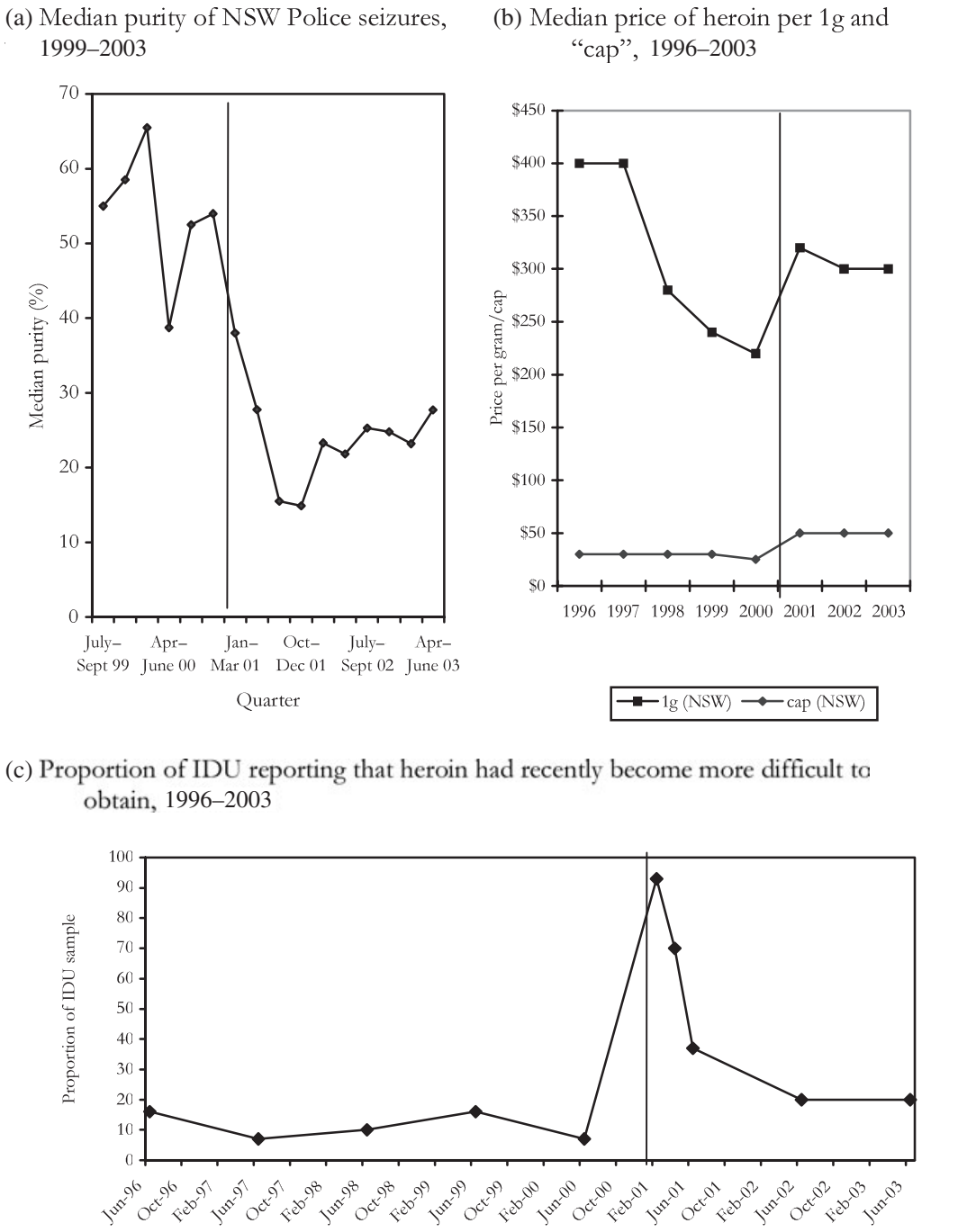

Figure 1 Estimates of heroin price, purity and availability in NSW, 1996–2003. (a) Median purity of NSW Police seizures, 1999–2003 (source: Australian Crime Commission). (b) Median price of heroin per 1 g and 'cap', 1996–2003 (source: NSW Illicit Drug Reporting System: IDRS). (c) Proportion of IDU reporting that heroin had recently become more difficult to obtain (source: June estimates IDRS, February 2001 estimate from Day *et al.* [18], April 2001 estimate from Weatherburn *et al.* [19])

- changes resulting from law enforcement corruption investigations;
- personnel changes, such as the removal of key figures in drug production or trafficking.

It is likely that a combination of factors combined to give rise to the reduction in supply of heroin. This paper aims to explore these factors, and reveals the most likely combination of factors that affected the supply of heroin in Australia.

METHOD

Our method was historical and forensic using a modified method of exclusion (Doyle 1892/1983): '. . . when you

have excluded the impossible, whatever remains, however, improbable, must be the truth' (p. 154) [24]. We listed all hypotheses that had been advanced by researchers, law enforcement officials, drug users, drug policy analysts and the media. These hypotheses were evaluated by their consistency with the information available and their coherence with each other, with the aim of using the available information to exclude the least plausible explanations. As will become clear, because the available information could rarely be used to exclude hypotheses, we compared the plausibility of competing explanations. Our information sources included: government reports, classified police and drug law enforcement documents and briefings, classified briefing documents by Australian agencies, key informant (KI) interviews, examination of indicator data and the use of research data where relevant.

Key informants were chosen strategically, for their knowledge of operations and events prior to 2001, and for their expertise within their organization. All those who were approached agreed to be interviewed for the study. Key informant interviews were conducted at an international level with representatives of the Royal Thai Police (RTP); the Thailand Office of the Narcotics Control Board (ONCB); and Australian Federal Police (AFP) in Thailand. Interviews were conducted in Australia with representatives of the AFP, ACS and NSW Police.

Briefings and discussion documents were also provided by the following Australian law enforcement agencies: the ACS, the AFP, the Office of Strategic Crime Analysis (OSCA) and the Australian Crime Commission (ACC: formerly the National Crime Authority). Security protected documents from NSW Police were also examined, including intelligence reports and reports of the outcome of NSW Police operations.

RESULTS

We have classified explanations into factors that may have operated at the level of cultivation/production, international trafficking and Australian distribution. In Fig. 2, the supply chain reads from right to left; changes at any one of these levels can affect supply further along the chain. The movement of key people into and out of the illicit drug trade (at all levels) is motivated by profit margins and influenced by perceived risk ('interventions'), commodity price ('outcomes') and competing markets that potentially provide better profit margins (either because of higher mark-ups or lower risk).

The following example is provided to help illustrate where an effect might be felt, given changes at a particular level. Cultivation levels (far right column) are based on the expectation that a specific portion of crops will not reach maturity; if eradication destroys a larger share of crops than farmers anticipate, a shortage might result. This would continue until traffickers either found new sources of supply or opium farmers adapted by increasing

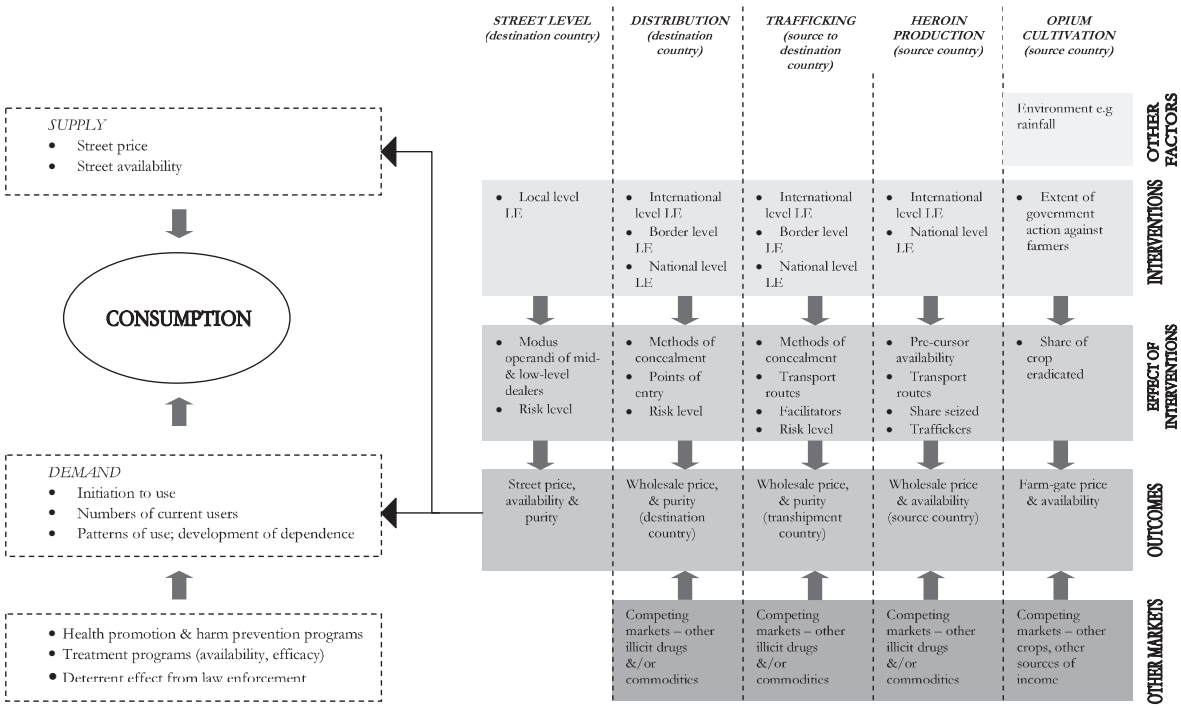

Figure 2 Schematic diagram of the factors influencing the trade of illicit drugs

the total land area cultivated or scattered their plants in smaller, less accessible fields. In the interim, prices might rise across the levels of producer, trafficker and distributor, with users competing for a diminished supply (i.e. all columns to the left of the cultivation column would experience the decreased availability and possibly increased price).

Changes in source country conditions

A popular hypothesis in the media was that the Australian shortage was caused by political changes and weather conditions in the countries in which opium was produced (Fig. 2, cultivation level). This is the least plausible explanation, because these factors would be expected to have affected heroin supply in other countries that receive heroin from the same source, yet Australia was the only country receiving heroin from the Golden Triangle (in contrast to China and Canada) to experience a heroin shortage [8]. Heroin seizures in Canada remained at a similar level in 2001 as they had been in 2000 (personal communication, Coordinator, Drug Unit, Vancouver Police Department, Canada), and there were continued increases in the number of estimated heroin users in China between 2000 and 2001 [12,15]. This suggests that factors specific to Australia must have played the key role in the heroin shortage. Specific forms of the source country hypothesis suffer from additional implausibilities that are considered below.

The Taliban's 2001 ban on opium production

The Taliban ban on opium cultivation in July 2000 reduced Afghanistan's opium production by 94% and world opium production in 2001 by two-thirds [25]. This is an unlikely explanation of the Australian heroin shortage because heroin in Australia is almost exclusively from Myanmar. Myanmar produces around 90% of opium in the SE Asian 'Golden Triangle' region [8]. Markets known to be supplied primarily by Afghanistan did not experience a similar reduction in heroin supply at this time. The reasons for this are unclear, although inventory was clearly important, and not the subject of this study [12].

Reduced opium production in Myanmar

Opium cultivation and production in Myanmar declined between 1996 and 1999, due primarily to increased eradication and control efforts on the part of the government and local authorities, and a severe drought [8]. This reduction is unlikely to be the primary explanation of the Australian heroin shortage. For producers in a source country, the export price of heroin does not depend on where it is destined; they are paid the same regardless of where the heroin will be trafficked. Any price increase (such as that seen in Myanmar in the late 1990s [8]) would therefore be passed on by heroin producers in a source country to heroin purchasers and hence to all those down the supply line (i.e. to the left of the production chain in Fig. 1).It is unclear why this would not affect other countries being supplied by Myanmar.

Surrender of a key heroin producer in Myanmar

Khun Sa, a significant player in the production of heroin in the Golden Triangle, surrendered to the Burmese authorities in 1996 [26]. After his surrender the organization he led, the Mong Tai Army (MTA), became less cohesive and rapidly reduced its levels of heroin production [27]. The United Wa State Army subsequently increased their involvement in heroin production, and shifted it to a Wa Army-controlled area adjacent to the Myanmar Chinese border; there was a short-lived increase in price in 1996 [26], but no decrease in production.

Changes in heroin producers' strategies

A popular theory among both heroin users and law enforcement officials was that the shortage was the result of a strategic decision by SE Asian heroin producers to switch from heroin to methamphetamine production. Methamphetamine was argued to be a more attractive and reliable illicit drug, as it did not depend on cultivation [28] (Fig. 2, heroin production level).

This hypothesis has a number of strengths. First, KI reported that methamphetamine production shifted in 1999 from 'small-time' operators in Bangkok, Thailand (who were not involved in heroin production) to large-scale groups who were involved in heroin production and had the necessary connections, trafficking routes, money and power (key informant from Thailand ONCB). Production peaked in Thailand in 2000, as measured by arrests and seizures, despite being subject to less policing and interdiction than heroin (key informants from RTP, Thailand ONCB, AFP Thailand). Secondly, there was a shift from heroin to methamphetamine among SE Asian organized criminals at mid-level distribution in Australia in 2001 [29,30]. Thirdly, it assumes a highly centralized SE Asian heroin trade that fits with previous analyses of Australia's heroin markets (key informants from NSW Police, ACC). Fourthly, the trend of heroin production in the Golden Triangle over the past 15 years has been downwards [8].

The hypothesis has the following weaknesses. First, most methamphetamine imported into Australia is thought to originate from China [31]. Secondly, heroin is

produced for only about 1 month after the opium harvest, leaving plenty of time for the laboratories to be used for methamphetamine production. Around 50% of the chemicals used in heroin production are also used in methamphetamine production (key informants from Thailand ONCB). One seizure of methamphetamine by Thai law enforcement had the same seals as heroin packaging, and some samples of methamphetamine showed traces of heroin, suggesting that heroin and methamphetamine wee produced by the same people and/or in the same laboratories (key informants from RTP). In short, opium producers in SE Asia appear to have diversified into methamphetamine production as well as heroin, rather than substituting methamphetamine for heroin.

Changes in heroin traffickers' strategies

Diversion of heroin to an expanding Chinese market

Since the mid-1990s, traffickers have increasingly transported heroin through Southern China where heroin use has also increased [32,33]. The number of opioid-dependent people registered in China—80% of whom are heroin-dependent—increased almost 10-fold [34] and heroin seizures have increased relatively consistently since 1996 [15,35]. It has been suggested that heroin traffickers decided to concentrate their efforts on the larger market of China, reducing heroin supply in Australia (Fig. 2, trafficking level).

This explanation does not seem to be a major contributing factor to the Australian shortage. First, in the absence of other motivating factors, the hypothesis fails to explain why only Australia (and not Canada or Hong Kong), experienced a shortage. Secondly, it is unclear why traffickers importing heroin into other countries would replace a lucrative (although smaller scale) Australian market with a market such as China, in the absence of other motivating factors. In 2000, available price data indicated that 700 g of heroin could be bought in Hong Kong for around US$12 000 (AU$20 000 [8]). The same amount of heroin would sell for AU$100 000 in NSW. A profit of 500% would seem attractive to most investors if we assume no other factors were affecting risk and therefore the expected profit margin.

Market manipulation

The expansion of Australia's heroin markets during the late 1990s [8] was considered by numerous sources to have been the result of a strategy of large-scale SE Asian heroin traffickers to increase the scale of the heroin market in Australia (law enforcement sources). On this hypothesis, the importers tolerated the increased street purity and reduced price [2,36] in order to establish a large and profitable heroin market (key informant from the ACC). The heroin shortage was argued by some to be a deliberate cartel-like action intended to increase substantially the price of heroin and reduced heroin purity to the previous street level [2].

This hypothesis has the following implausibilities. First, it attributes considerable strategic foresight, long-term planning and coordination of effort to heroin importers, despite the high risks they face of imprisonment and violent death, which encourage short-term profit maximization. Secondly, as with all cartel-like behaviour, it presupposes considerable discipline among the traffickers to ensure that none broke ranks by selling more than the agreed amount of heroin at a slightly lower price in the face of continued high demand from consumers. Thirdly, the abrupt reduction in heroin supply to Australia would have meant substantially reduced income from sales of heroin to Australia (in the absence of other income generating activities). This explanation would be have been more plausible had there been a steady reduction in heroin supply over a period of time.

A shift from heroin to methamphetamine trafficking

One alternative source of income for heroin importers may have been methamphetamine trafficking. There has been a significant increase in methamphetamine trafficking to Australia since 1996 [12,37], in some cases by those involved previously in heroin trafficking to Australia (key informants from the Royal Thai Police, and the Thailand Office of the Narcotics Control Board). The financiers of the drugs imported from SE Asia were different, but the facilitators were the same individuals (law enforcement source).

This hypothesis could explain why the heroin shortage was unique to Australia. It is supported by the fact that law enforcement officials reported a shift from heroin to methamphetamine trafficking among SE Asian organized criminals supplying Australia prior to the onset of the heroin shortage in Australia [29,30]. It also assumes centralization of the SE Asian heroin trade that fits with previous analyses (key informant from the ACC).

The major implausibility of this hypothesis is that it assumes that traffickers have a limited capacity to import drugs (in that an increase in methamphetamine trafficking entails a decrease in heroin trafficking). While the same methods of concealment are used for heroin and methamphetamine (key informants from the Australian Cusroms Service) [36] there appears to be a global trend towards multiple drug importation [30,36,38], and involvement of multiple criminal groups [39], with criminal syndicates diversifying increasingly, and ethnic boundaries between groups breaking down. There is no

direct evidence to suggest that traffickers were constrained by a limited trafficking capacity. At high levels of drug trafficking, any shift to methamphetamine trafficking was more likely an addition to, rather than a substitute for, heroin trafficking.

In summary, there may have been a change in the drugs imported into Australia, but the financiers of these shipments may have been different. Some major financiers may no longer have imported heroin to Australia, while others imported methamphetamine into Australia instead of, or in addition to, heroin. This hypothesis does not explain why some financiers no longer financed heroin imports to Australia. This is considered in the next section.

Individual trafficker decisions to cease or reduce heroin trafficking to Australia

One popular explanation of the heroin shortage among law enforcement officials was that major heroin traffickers decided to reduce heroin importations to Australia. Interviews suggested that in the late 1990s, heroin trafficking to Australia was highly centralized, with six major suppliers (law enforcement sources; key informants from the AFP, Royal Thai Police, the Thailand ONCB and NSW Police). Three of these were 'large-scale', two were 'medium-scale' and one was 'small-scale'. A decision by some of these suppliers to reduce/stop trafficking could explain a marked reduction in supply (Fig. 2, trafficking level). A retirement removes a large quantity of human capital specific to this market; any successor will face higher costs, consistent with a model of 'learning by doing' [40].

This hypothesis would explain why Australia, and no other country, experienced a sizeable reduction in the availability of heroin in 2001. Multiple heroin seizures totalling 1 tonne in 1998–99 (about one-sixth of estimated annual consumption), reportedly resulted in the three small/medium operators ceasing heroin supply to Australia (law enforcement source; key informants from the Royal Thai Police and the AFP). Further seizures in 1999–2000 of a similar volume (Operation Logrunner) reportedly prompted the three remaining (large-scale) suppliers of heroin to Australia (key informants from the Royal Thai Police and the Thailand ONCB) to supply heroin to other countries but 'pull back' from supplying Australia (key informants from the ACC, Royal Thai Police, AFP Thailand). In 2003, Australian law enforcement agents in Thailand reported that these former major importers were now predominantly involved in money-laundering (key informant from the AFP Thailand). This change may therefore be attributable at least in part to successful international and/or border level law enforcement. A range of briefings suggested that, by the end of 2000, high-level Australian heroin distributors were organizing alternative sources of heroin in SE Asia, possibly because the major importers were no longer supplying them.

Changes in drug law enforcement

Drug law enforcement (DLE) may have contributed to the reduction in supply of heroin in Australia. This could have occurred at one or more trafficking levels (Fig. 2, 'interventions' row). It is difficult to decide which level of law enforcement may have been responsible because of the collaboration among different agencies. For the purposes of clarity, however, we discuss international, border-level and Australian law enforcement.

International

Federal DLE in Australia was poorly funded in the 1990s, making effective policing of drug importation at high levels difficult. Increases in funding in 1998 as a result of the National Illicit Drugs Strategy, and the shift towards a more international focus of the AFP and ACS [38], led one international-level KI to state that Australia had become the most successful of the many countries with which he had worked (key informant from the Royal Thai Police). He attributed this to good strategic intelligence; strong ACS enforcement; strengthened law enforcement capacity; and the movement into the AFP of ACS officers. These changes relative to the previous level of drug law enforcement may have improved the ability of the AFP and ACS to interdict large shipments of illicit drugs and to disrupt the activities of organized criminal networks involved in high-level drug importation. Cooperation between governments and law enforcement agencies also increased in the 1990s across countries in the Asian Pacific region. There was a number of large seizures in 2000, along with arrests of those with key roles in facilitating large shipments of heroin to Australia. Some intelligence agencies hypothesized that trafficking networks operating for years were disrupted and perhaps dismantled [36].

Four factors might therefore be partly responsible: improved methods of law enforcement, through (a) the development since 1998 of a capacity to work offshore with other law enforcement agencies, and (b) the identification of many of the importation methods used by Asian heroin syndicates; and improved outcomes of this law enforcement, as evidenced by (c) increased weight of heroin seizures and (d) the disruption of major heroin trafficking syndicates in mid 2000 by an Australian-led international task force.

A large proportion of the heroin supply to Australia was thought to rely on a centralized network based

around a small number of key wholesale suppliers relying on sea cargo shipments (key informant from the ACC). An increased risk of detection as a result of the coordinated action of Australian law enforcement [37] may have prompted those responsible for financing heroin imports to Australia to withdraw (law enforcement sources; key informants from the Royal Thai Police, the AFP and the Australian Customs Service).

This hypothesis is consistent with an increase in smaller-sized importations of heroin interdicted since 2001 [20]. Recent evidence suggests that these traffickers are still bringing heroin into Australia, but are using smaller-scale methods such as bodypacking [41–43]. There is also evidence of smaller, uncoordinated, entrepreneurial importations by less experienced groups who were not involved previously in importation.

It is doubtful whether even large seizures of illicit drugs are sufficient to reduce supply in a drug market [44,45]. It may be, however, that such seizures accompanied by the arrests of key facilitators between SE Asian financiers and Australian importers (law enforcement sources) may have reduced heroin supply in either or both of two ways by (a) disrupting the ability of criminal networks to import large amounts of heroin into Australia; and/or (b) deterring groups in SE Asia/source countries from bringing large shipments of heroin into Australia.

Australian border-level law enforcement

If increased success of border level law enforcement had an impact on heroin supply, then we might expect higher seizures and an increase in the difference between the export and import prices. Supporting this, border-level heroin seizures did increase substantially in the years prior to the onset of heroin shortage (509 kg in 1999, 269 kg in 2000, compared to an average of 54 kg per year in 1996–98 [46]). Profits from heroin trafficking to Australia were probably declining as a result of seizures, high-street level purity and decreasing wholesale heroin price in NSW. It is difficult to separate the effects of border-level law enforcement from international cooperation between law enforcement officials.

Local-level law enforcement

If local-level (market-based) law enforcement had had some involvement in the disruption to the heroin market, we might expect to see differential impacts across different drug markets in Sydney and elsewhere in Australia. It has been suggested that the Anti Drug Strategy in Cabramatta, Sydney had a significant impact on the supply of heroin (Cabramatta is the main distribution point for heroin supply in NSW). However, this strategy was only introduced after the reduction in heroin supply had occurred (July 2001) and the reduction in the number of heroin-related arrests was similar across the different Sydney drug markets. Nevertheless, KI reported that the disruptions caused to the Cabramatta heroin market by NSW Police might have been important in extending the effects of the heroin shortage in this area.

Summary of plausible explanations

Although the putative explanations of the heroin shortage have been evaluated separately in the preceding discussion, it is likely that the shortage was due to some combination of these factors that operated synergistically. We think that the following combination of factors is the most plausible explanation of the heroin shortage.

The heroin market in Australia was well established by the late 1990s but it had a low profit margin, with high heroin purity, an unprecedented low retail price and a large number of seizures that had increased traffickers' risks and costs. The increased funding and effectiveness of the AFP and ACS probably made the risks of importation greater. The combination of low profits and increased success of interdiction probably reduced the dependability of key suppliers of heroin to Australia. This occurred at a time when seized heroin was becoming more difficult to replace because of reduced supplies in the Golden Triangle. These factors probably reduced the attractiveness of Australia as a destination for heroin trafficking from the Golden Triangle.

It is possible that heroin was sent to other countries instead of Australia, such as Canada or China, but there was no evidence of an increased supply in Canada. The small scale of the Australian market relative to the Chinese market makes it difficult to detect any change there. Nevertheless, it seems that major importers significantly reduced or ceased making large-scale importations of heroin to Australia, reducing heroin availability and purity and increasing retail price. The heroin market is clearly still being supplied, but with smaller, less consistent levels of supply, more like the decades prior to the early 1990s.

DISCUSSION

It is important to understand the market conditions that preceded the heroin shortage—the heroin market in the late 1990s had increased rapidly in size. In the early 1990s, DLE in Australia received little funding (there was also limited funding for drug treatment, harm reduction and demand reduction strategies). This probably made it easier for high-level heroin suppliers in Asia (who may

have needed to offload heroin displaced from the US East coast markets by the sudden emergence of Colombian heroin production) to establish large-scale importation networks into the country. The result was an increase in street-based drug markets around the country; increased purity of heroin; and decreased price of the drug.

In the late 1990s, there were considerable relative improvements in the ability of DLE to police high-level heroin importation networks. This led to arrests of key people in drug supply networks and to significant seizures of heroin. These probably affected the risk of importing large heroin shipments to Australia enough to influence either or both (a) the decision to import heroin into Australia, or (b) a decision to use different methods of importing heroin in smaller amounts that reduced the quantity of heroin that was imported into Australia. While the risk of interdiction remains high, it is unlikely that large shipments will return.

Limitations

We relied necessarily on information collected by law enforcement on illicit drug trafficking and distribution, in particular that which we were permitted to view. However, we talked to a wide range of key informants; we were granted good access to information within NSW Police and federal agencies, and we consulted a range of law enforcement and publicly available documents on illicit drug markets. The information from all these sources was consistent and it was possible to demonstrate the implausibility of a number of widely touted but ill-fitting hypotheses.

Implications for Australian drug policy

A number of inferences might be made about Australian drug policy if our analysis of the causes of the increase in heroin supply during the early 1990s is correct. First, against a background of increased heroin importation by a small number of well-organized criminal syndicates, increased funding for DLE may be effective in reducing supply when there is collaboration between law enforcement officials in source and trans-shipment countries. These efforts may have reduced the competitive advantage enjoyed by some criminal syndicates importing large quantities of heroin during the early 1990s. Secondly, in the face of continuing demand for heroin by dependent users, and proximity to source countries, one may expect to see a resurgence of the smaller entrepreneurial suppliers who met the demand for heroin in the 1980s. This was the experience in Colombia following the break-up of the Medellin and Cali cartels in the early 1990s; cocaine trafficking now involves many small smuggling organizations. From an enforcement point of view, however, there is a lack of 'high-value' targets.

Thirdly, the Australian experience with heroin has limited relevance to DLE efforts to reduce the supply of illicit drugs within Australian borders. Heroin is sourced solely from other countries, as is cocaine, but this is not true of cannabis or psychostimulants. We cannot assume, therefore, that the methods that have reduced heroin supply will reduce the availability of other illicit drugs on the domestic market. This is borne out by the dramatic increase in recent years in the domestic manufacture of illicit methamphetamine and MDMA, by people sourcing precursor chemicals locally and internationally through legitimate channels [37].

Fourthly, the scale of heroin use will depend upon the availability of new cohorts of potential users willing to use heroin when it is available. The dramatic increase in heroin availability in the early 1990s, coming a decade after the preceding epidemic of heroin use in Australia, probably fuelled the Australian heroin epidemic of the mid-1990s. It suggests a need for early warning systems to detect emerging trends [47]. Data from such early warning systems, if linked to policy processes, may shift DLE resources towards reducing the availability of the most harmful types of illicit drugs.

Fifthly, achieving a relative reduction in heroin supply is not a sufficient policy response. The heroin shortage did not affect all heroin users in the same way [48–50]. More disadvantaged dependent heroin users shifted to riskier patterns of injecting drug use, experiencing substantial harm. Alternative interventions (both demand and harm reduction measures) are required.

Sixthly, it is uncertain how long the reduction in heroin supply can be sustained, and what its long-term effects may be. One plausible hypothesis is that a 1–2-year gap in the initiation of new heroin users may have a cumulative effect in reducing heroin uptake. Conversely, the proliferation of smaller-scale heroin trafficking may make it more difficult for law enforcement to monitor and disrupt heroin supply. There also appears to be a global trend towards multiple drug importation and an increase in flexible entrepreneurial networks, which means that law enforcement will need to adapt to these changes.

Implications for drug control policy in other countries

An event such as the Australian heroin shortage is *prima facie* more relevant to countries in which heroin is a problem. Even in the case of heroin markets, there are reasons for being cautious about its relevance. First, some of the reduction in heroin supply was possibly a fortunate coincidence of events (as the preceding excess of supply was an unfortunate occurrence). It is unclear to what extent such conditions might be repeated in other contexts.

Secondly, this is most relevant to illicit drugs sourced primarily from other countries. Australia is unusual because is surrounded by a natural barrier (water). This is not the case for most countries, and may aid attempts at comprehensive border monitoring that are less feasible (if not impossible) for countries with common borders [51]. Countries with domestically sourced illicit drugs could not draw many policy lessons conclusions from this event.

Thirdly, the shortage is not likely to last forever. Current evidence suggests that the scale of the heroin market in Australia is certainly smaller than prior to the reduction in supply (lower street level purity, higher price and maintenance of more covert drug distribution rather than overt street level drug markets) [20,49], but this may not remain the case in the future. While there is a demand for drugs, criminal syndicates will probably adapt to DLE successes in interrupting supply by looking to different markets, different importation methods, different illicit drugs and other commodities. DLE will in turn adapt to these changes and make some gains. Efforts to reduce supply need to be accompanied by efforts to reduce demand. As long as both continue, harm reduction efforts must continue.

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