



## Patterns of amphetamine use in New Zealand: findings from the 2001 National Drug Survey

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### Abstract

**Aims** To measure the level of heavy amphetamine use, poly drug use, and intravenous drug use by amphetamine users in New Zealand.

**Methods** Using a Computer Assisted Telephone Interview (CATI) system, a national sample of approximately 5500 people (aged 15–45 years) were interviewed about their recreational drug use.

**Results** Five percent of the sample (4.3–5.7) had used stimulants (uppers, speed, amphetamine, methamphetamine) in the last year. Eighty-one percent of these users used stimulants once-a-month or less frequently. Twenty-two percent used half a gram of stimulants or more on a typical occasion. Stimulant users used an average of 6.4 drug types in the last year (range 1–17, standard deviation [SD] 2.8) and 4.2 drug types in the last month (range 0–13, SD 2.1). Three percent of last-year stimulant users (0.7–4.6) had used a needle to inject drugs in the previous year.

**Conclusions** About one in five amphetamine users used quantities of amphetamine in a single session that have been identified in previous research as being hazardous levels. High levels of poly drug use among amphetamine users indicate users may be at risk of problems from a range of drug types and combinations of drug types, and not just from amphetamine alone. Ongoing monitoring is required to identify if increased amphetamine use is a source of increased intravenous drug use.

New Zealand has recently experienced a rapid rise in the use and manufacture of powerful amphetamines, such as methamphetamine.<sup>1–3</sup> Anecdotally, the rise in amphetamine use in New Zealand has been implicated in increases in hospital admissions for drug-induced psychosis,<sup>4</sup> increases in street robbery and car conversion,<sup>5</sup> and increases in violent crime.<sup>5</sup> While these consequences are consistent with the experience of increased amphetamine use elsewhere,<sup>6,7</sup> statistics on criminal offending and hospital admissions in New Zealand do not routinely record the drug type involved in an incident and so it has been impossible to precisely measure the impact of increased amphetamine use. Understanding the implications of growing amphetamine use is further complicated by the time lag of 12 to 18 months, which is commonly experienced by users between initial use and progression to problematic use.<sup>8,9</sup>

Overseas, clinical research on amphetamines,<sup>9,10</sup> and studies of amphetamine users,<sup>11–14</sup> have identified the central role that the route and pattern of amphetamine-use plays in the risk of users experiencing serious problems. Hall and Hando found that amphetamine users reporting intravenous administration,<sup>11</sup> using twice-a-week or more, and using more than half a street gram in a single session were more likely to experience adverse psychological effects, dependency, and report violent offences. Other studies have noted a link between the increased use of amphetamines by young

people, and rises in intravenous drug use by these age groups, suggesting this is a response by some amphetamine users to growing tolerance.<sup>15–18</sup> Studies elsewhere have also found amphetamine users to be extensive poly drug users.<sup>11,14,16,19,20</sup> Other stimulant type drugs, such as cocaine, were commonly used in combination with amphetamines, while opioids and tranquillisers were used to self medicate against adverse side effects. This poly drug use increased the likelihood of users experiencing problems.<sup>19,21,22</sup>

This paper presents findings from the 2001 National Drug Survey on the patterns of amphetamine use in New Zealand. Data is presented on the frequency and amount of amphetamine used, and the extent of poly drug use and intravenous drug use by amphetamine users.

## Methods

In 2001, using a Computer Assisted Telephone Interview (CATI) system, a national sample of approximately 5500 people aged 15–45 were interviewed about their recreational drug use. Telephone numbers were selected using a stratified random digit dialling method so that each household (of a particular stratum) nationwide had an equal chance of being called. In order to represent the different socioeconomic characteristics of the population, the country was divided into 33 strata. A proportionate sample from each stratum was then taken. Within each household, one person was randomly selected for an interview. The sample was weighted to adjust for household size. Interviewers received intensive training at the beginning of the survey, and a supervisor was present at each shift to monitor the quality and consistency of interviewing and to handle any problems. Each telephone was tried at least 10 times in an effort to reach those persons seldom at home. An 80% response rate was achieved. Further details of the methodology can be found in Wilkins et al.<sup>23</sup>

Respondents were asked about their use of alcohol, tobacco, cannabis—and 22 other drug types, such as cocaine, crack, heroin, and LSD. The amphetamine drugs were referred to by the broad term ‘stimulants’, which the interviewer described as meaning ‘uppers, speed, amphetamine, and methamphetamine’. Respondents were asked about use of other stimulant-type drugs, such as cocaine, crack cocaine, and ice (ie, crystal methamphetamine), in separate questions of the interview.

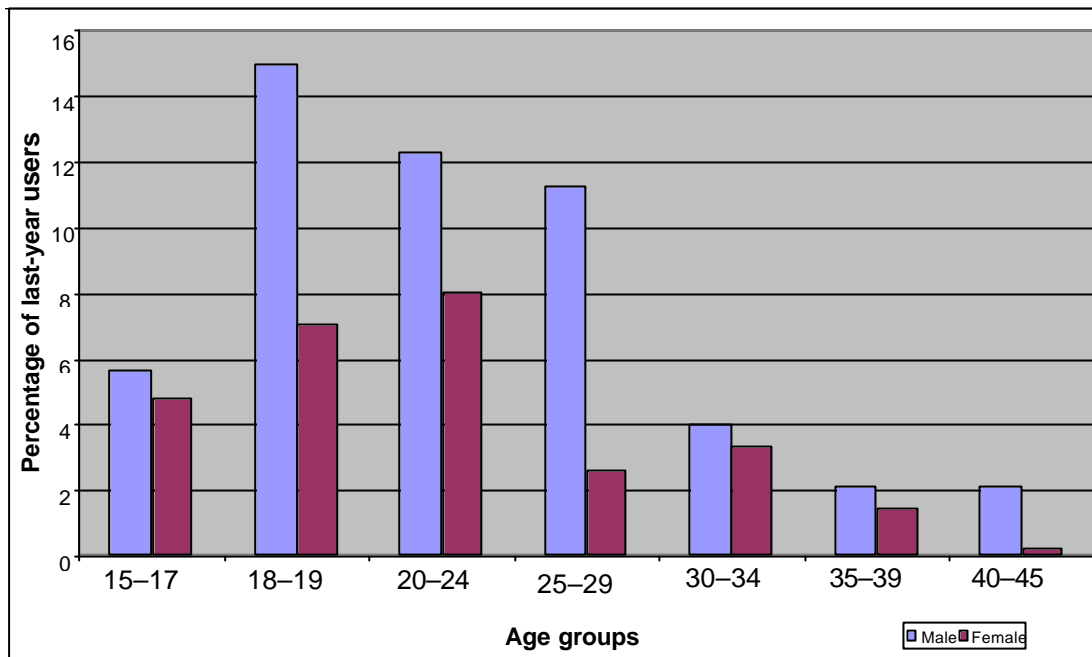
Those persons who had used stimulants in the last year were asked a range of additional questions about their patterns of use, including how many times they had used stimulants in the last year, and the quantity of stimulant they used on a ‘typical occasion’. Anecdotally, the quantities of amphetamine most commonly used in New Zealand were lines, points (approximately 0.1 gram) and grams of powder. The quantity question included coded amounts from 0.1 gram up to 28 grams. The equivalent amount in lines and points was included in brackets next to the appropriate quantity to facilitate the identification of the amount typically used. Respondents could also indicate if they only used ‘pills/tablets’ or ‘liquid’ amphetamine.

In a separate section of the interview, respondents were asked if they had ever used a needle to inject drugs for recreational purposes and how many times they had done so in the last year. Respondents were not asked directly what drug types they had injected. However, the drug types used by a respondent could be identified from other parts of the interview, and the injectable drugs are essentially limited to the opioids and amphetamines. What is reported is intravenous drug use by amphetamine users rather than intravenous amphetamine use. The confidence levels reported are at the 95% level.

## Results

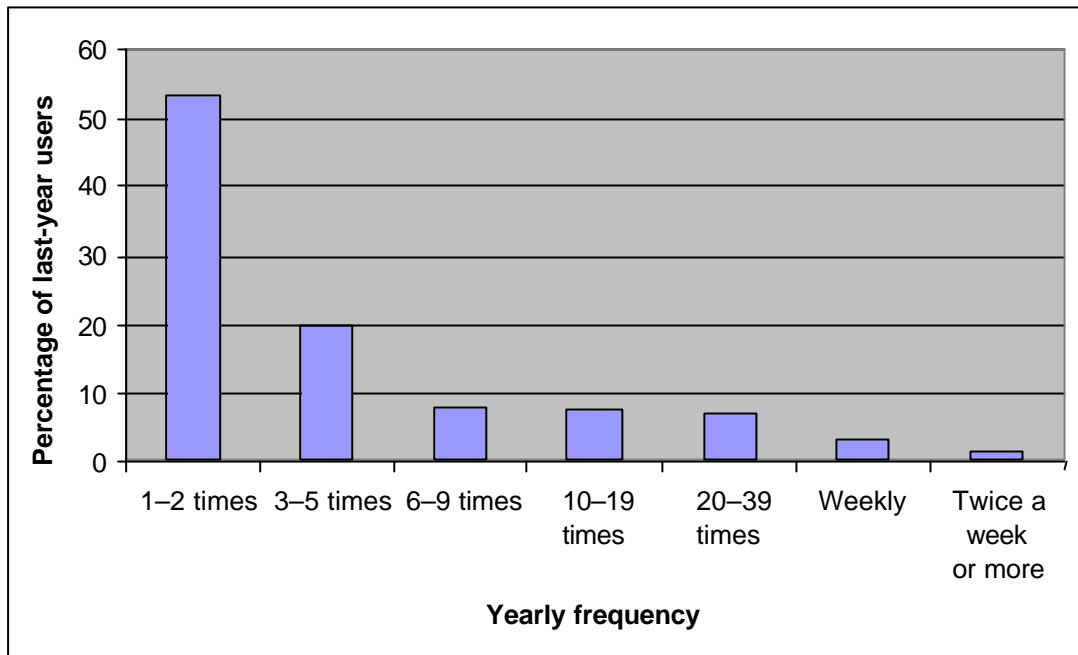
**Prevalence** Overall, 5.0% (4.3–5.7) of the sample had used stimulants (uppers, speed, amphetamine, methamphetamine) in the last year (n = 275). Users were overwhelming male (70%) and in the 18–29 year old age groups (Figure 1). For males, 5.7% (2.4–9.0) aged 15–17 years, 15.0% (8.7–21.2) aged 18–19 years, 12.3% (8.8–15.9) aged 20–24 years, and 11.3% (7.8–14.7) aged 25–29 years had used stimulants in the last year.

**Figure 1. Last-year use of stimulants (by gender and age group) 2001**



**Frequency of use** Fifty-three percent of last-year stimulant users had used these drugs 1-2 times in the last year (Figure 2). A further 20.1% had used them 3-5 times in the last year. The other frequencies of use reported in the last year were 7.7% using 10-19 times (about once every month), 3.1% using 50-59 times (about once-a-week), and 1.0% using 100-109 times (about twice-a-week). Only 0.2% of last-year users said they used stimulants 350-359 times in the last year (about daily).

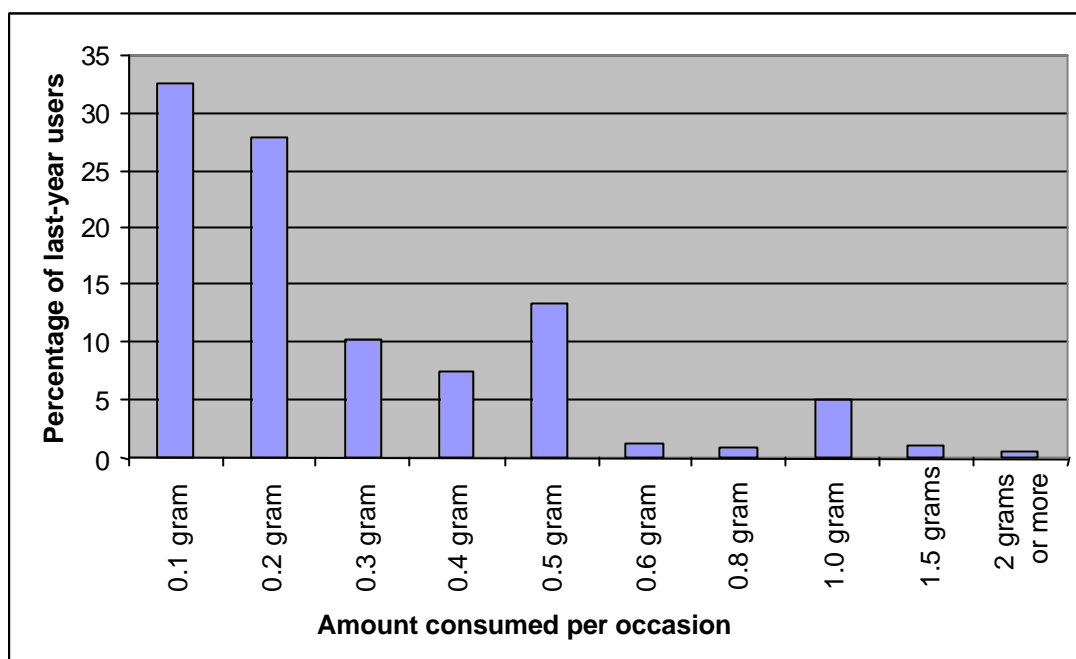
**Figure 2. Frequency of use of stimulants in the last 12 months, 2001**



**Quantity used** About 7% (6.8%) of last-year stimulant users indicated they only used pills/tablets of amphetamine. No respondents reported only using liquid amphetamine.

Of those users who used powder amphetamine (93.2% of all users), the most popular amount used on a typical occasion was one line (0.1 gram) [32.3%], followed by two lines (0.2 gram) [27.7%], and five lines (0.5 gram) [13.3%], respectively (Figure 3). Five percent of last-year users used 1 gram of stimulants on a typical occasion.

**Figure 3. Amount\* of stimulant used on a typical occasion, 2001**



\*For those users who did not consume pills or liquid

**Poly drug use** The other drug types most commonly used in the last year by stimulant users were alcohol (92.5%), cannabis (85.7%), tobacco (72.6%), skunkweed [hydroponic cannabis] (65.8%), LSD (44.7%), ecstasy (43.4%), magic mushrooms (26.5%), ice [crystal methamphetamine] (15.0%), rush [amyl nitrate, butyl nitrate] (14.3%), kava (12.8%), GHB [gamma-hydroxybuterate] (10.6%), cocaine (9.3%), and ketamine (9.1%); see Table 1. Last-year stimulant users had tried an average of 8.5 drug types ever (range 1–20, SD 3.3), used an average of 6.4 drug types in the last year (range 1–17, SD 2.8), and used an average of 4.2 drug types in the last 30 days (range 0–13, SD 2.1).

**Table 1. Percentage of last-year users of stimulants who used other drugs in the last 12 months, 2001**

	Ever used				Used in the last 12 months				Used in the last 30 days			
	Last-year stimulant users		Whole sample		Last-year stimulant users		Whole sample		Last-year stimulant users		Whole sample	
Stimulants (amphetamine/methamphetamine)	100.0		11.0	(10.1–11.9)	100.0		5.0	(4.3–5.7)	32.4	(25.8–39.1)	1.6	(1.2–2.0)
Alcohol	93.0	(89.1–96.9)	86.5	(85.5–87.6)	92.5	(88.6–96.4)	85.4	(84.3–86.5)	88.0	(83.3–92.8)	77.3	(76.0–78.6)
Tobacco	91.4	(87.4–95.4)	64.1	(62.7–65.5)	72.6	(66.1–79.1)	34.6	(33.1–36.0)	65.9	(59.1–72.6)	28.1	(26.8–29.5)
Ice (crystal methamphetamine)	18.2	(12.6–23.7)	1.3	(1.0–1.7)	15.0	(9.7–20.2)	0.9	(0.6–1.2)	3.8	(1.1–6.4)	0.2	(0.1–0.4)
Cannabis	97.9	(96.1–99.8)	52.1	(50.6–53.6)	85.7	(81.2–90.2)	20.3	(19.1–21.5)	65.1	(58.7–71.5)	10.5	(9.6–11.5)
Ecstasy	49.2	(42.3–56.1)	5.4	(4.7–6.0)	43.4	(36.6–50.2)	3.4	(2.8–4.0)	15.2	(10.3–20.2)	0.9	(0.6–1.2)
Cocaine	19.0	(13.8–24.2)	3.2	(2.7–3.7)	9.3	(5.5–13.1)	0.6	(0.4–0.9)	0.7	(0.0–1.7)	0.0	(0.0–0.1)
Crack cocaine	3.8	(1.3–6.3)	0.3	(0.1–0.4)	1.5	(0.0–3.3)	0.1	(0.0–0.2)	0.2	(0.0–0.5)	0.0	(0.0–0.0)
Heroin	3.2	(1.3–5.1)	0.7	(0.5–1.0)	0.5	(0.0–1.2)	0.1	(0.0–0.1)	0.0		0.0	(0.0–0.0)
Ketamine	11.5	(7.1–15.8)	0.7	(0.5–1.0)	9.1	(5.1–13.1)	0.5	(0.3–0.7)	2.0	(0.0–4.1)	0.1	(0.0–0.2)
LSD	69.7	(63.3–76.1)	9.6	(8.8–10.5)	44.7	(37.8–51.6)	3.2	(2.6–3.7)	8.2	(4.2–12.2)	0.5	(0.3–0.7)
Mushrooms	51.2	(44.4–58.1)	8.9	(8.1–9.8)	26.5	(19.9–33.1)	2.4	(1.8–2.9)	7.3	(3.3–11.3)	0.6	(0.4–0.9)
Tranquillisers	18.6	(13.6–23.7)	2.6	(2.2–3.1)	6.9	(3.7–10.1)	0.4	(0.3–0.6)	3.1	(1.0–5.2)	0.2	(0.1–0.3)
Needle	5.9	(2.4–9.3)	0.8	(0.5–1.0)	2.6	(0.7–4.6)	0.2	(0.1–0.3)	0.8	(0.0–1.7)	0.1	(0.0–0.2)
GHB (gamma-hydroxybuterate)	14.9	(10.2–19.7)	1.1	(0.8–1.5)	10.6	(6.5–14.6)	0.8	(0.5–1.0)	1.7	(0.1–3.2)	0.1	(0.0–0.2)
Homebake heroin	11.1	(6.9–15.4)	1.5	(1.1–1.8)	6.8	(3.1–10.4)	0.5	(0.3–0.8)	2.2	(0.0–4.5)	0.2	(0.0–0.3)
Morphine	7.3	(4.1–10.4)	1.0	(0.7–1.3)	3.1	(1.0–5.2)	0.2	(0.1–0.4)	0.7	(0.0–1.5)	0.1	(0.0–0.1)
Poppies	14.5	(9.5–19.4)	2.4	(1.9–2.9)	3.5	(1.0–6.0)	0.3	(0.2–0.5)	1.0	(0.0–2.2)	0.1	(0.0–0.2)
Rush (amyl nitrate–butyl nitrate)	34.9	(28.2–41.6)	4.7	(4.1–5.3)	14.3	(9.5–19.2)	0.9	(0.6–1.2)	4.2	(1.6–6.8)	0.3	(0.1–0.4)

Skunkweed cannabis	77.5	(72.0–82.9)	14.1	(13.0–15.1)	65.8	(59.5–72.1)	9.4	(8.5–10.3)	45.6	(38.7–52.6)	5.1	(4.4–5.8)
Solvents	11.4	(6.8–16.1)	2.2	(1.7–2.6)	1.1	(0.0–2.4)	0.2	(0.1–0.4)	0.9	(0.0–2.2)	0.1	(0.0–0.2)
Other opiates	7.9	(4.6–11.2)	1.0	(0.7–1.3)	4.6	(2.0–7.2)	0.3	(0.2–0.5)	1.2	(0.0–2.4)	0.1	(0.0–0.2)
Kava	29.5	(23.1–35.9)	9.6	(8.7–10.5)	12.8	(8.1–17.5)	3.2	(2.6–3.7)	1.9	(0.2–3.5)	0.4	(0.2–0.5)
Other hallucinogenic	84.6	(80.1–89.1)	15.0	(14.0–16.1)	67.9	(61.7–74.1)	6.1	(5.3–6.8)	23.1	(17.1–29.2)	1.6	(1.2–2.0)
<b>Average number of other drugs ever used:</b>				<b>8.4</b>								
<b>Average number of other drugs used in the last year:</b>				<b>6.4</b>								
<b>Average number of other drugs used in the last 30 days:</b>				<b>4.2</b>								

**Last-year needle use** A total of 0.2% (0.1– 0.3) of the whole sample (11 people in the weighted survey but 13 respondents) had used a needle to inject a drug in the last year. Seventy-seven percent of these last-year needle users also used one of the opioid drugs in the last year (ie, heroin, homebake, morphine, poppies, other opiates). Sixty-eight percent of last-year needle users also used stimulants.

## Discussion

Due to the difficulties of surveying illicit drug users,<sup>24</sup> particularly heavy drug users,<sup>25</sup> the National Drug Survey is likely to under estimate the true number of users. However, well designed CATI surveys with high response rates have been found to produce similar results to other population survey methodologies.<sup>26</sup> The findings presented here are best thought of as providing reliable but conservative estimates of illicit drug use in New Zealand.

The National Drug Survey provides a broad representative picture of the amphetamine using population in New Zealand, including experimental and occasional users. However, the household sample frame may mean that some heavy problematic users who are living on the streets or living particularly erratic lifestyles are missed. This limitation is likely to be particularly relevant with respect to reaching intravenous drug users who are often heavy drug users.

Amphetamine drugs come in varying levels of potency and purity and the strength of amphetamine plays an important role in the risk of experiencing problems. At present the understanding of the strength of the amphetamines being used in New Zealand is largely anecdotal. Seizures of amphetamine in New Zealand are not routinely tested by the authorities for purity levels as this information is not generally central to achieving a prosecution. Approximating the strength of the amphetamines used is made difficult by the different slang names which are developed to identify different types of amphetamine, such as the term 'pure' in New Zealand, the loose way these street terms are used by drug dealers and drug users, and the varying ability of users to accurately assess the potency of the drugs they are using depending on their level of knowledge and experience.

Drawing on existing sources, including social histories of amphetamine use,<sup>27</sup> recent analysis of the amphetamine situation in Australia<sup>28</sup> and reports of amphetamine seizures in New Zealand,<sup>1-2,29</sup> it is possible to identify four broad types of amphetamine being used in New Zealand: amphetamine sulphate; methamphetamine powder; 'pure' methamphetamine; and ice or crystal methamphetamine. Amphetamine sulphates include diet pills and common prescription medicines, which may have been illegally obtained from legitimate dispensing sources. Methamphetamine is a particularly powerful type of amphetamine.<sup>28</sup> In the powder form, it is usually heavily cut with adulterants. The New Zealand Customs Service reports the normal purity of methamphetamine powder at street level in New Zealand is between 5%–15%.<sup>29</sup> Methamphetamine powder is purchased by the gram or ounce and is consumed in lines of powder. 'Pure' is high-potency uncut methamphetamine and is sold by the point (0.1 gram). A point of 'pure' is sufficient for a number of doses. Ice or crystal methamphetamine is high-potency crystallised methamphetamine and is generally manufactured and imported from Asia. It is not entirely clear (at present) how different the New Zealand manufactured 'pure' is from the Asian crystal methamphetamine.

Several limitations with the National Drug Survey data from the perspective of estimating the level of heavy amphetamine use in New Zealand must be acknowledged. The questions in the National Drug Survey about the quantity of stimulants used referred to use on a 'typical occasion' only. This may not fully capture amphetamine consumption patterns that can sometimes include binge use, where a user consumes large amounts of the drug over several hours or days.<sup>10</sup> This type of use greatly increases the risk of problems such as psychosis.

Second, stimulant users in the National Drug Survey were not asked directly whether they used a needle to inject stimulants and this would have provided a clearer picture concerning the level of intravenous amphetamine use as opposed to merely amphetamine use by intravenous drug users. However, the fact that an amphetamine user is also using a needle to inject other drugs suggests that the injection of amphetamine, if not already occurring, may be a future option as tolerance develops.

With these limitations in mind, several key points about patterns of amphetamine use in New Zealand can be drawn from the data. Over 10% of New Zealand men aged 18–29, the highest using group, had used amphetamines in the previous year in 2001. Many last-year users used amphetamines fairly infrequently—ie, 73% used them five times or less in the previous year. However, while many users also used fairly low doses, 22% used 0.5 gram (or more) of amphetamine on a typical occasion. Poly drug use was common within the amphetamine-using population with the use of a range of illicit drug types at levels many times higher than that of the general population. Of particular concern were the relatively high levels of the use of LSD, ecstasy, cocaine, homebake heroin and intravenous drug use among amphetamine users compared to the general population.

Most of the needle-using amphetamine users also used opioids. It may be the case they are primarily opioid users. Australian research has found that opioid users will switch to other illicit drug types such as cocaine and amphetamines when heroin is in short supply.<sup>30</sup> Opioid users in New Zealand may be simply responding to the recent greater availability of high potency amphetamine relative to the traditional supply of opioids. The small number of intravenous drug users in the National Drug Survey sample makes further analysis problematic. Close monitoring of intravenous drug use within the amphetamine-using population is required in New Zealand to ensure increased amphetamine use is not fuelling increases in intravenous drug use. Other research methodologies than the household population approach used in the National Drug Survey may be more suited to achieving this task.

The infrequency of amphetamine use in New Zealand could be explained by several factors—including the cultural context of its use (ie, it is still being limited to infrequent large dance party events), the 'newness' of the drug, the immaturity of domestic production and supply networks, and/or the effectiveness of police enforcement. Exploring these reasons is beyond the scope of this present paper. However, it is interesting to note that the price of amphetamine in New Zealand is higher than in Australia with 1 gram selling for \$100–\$180 in New Zealand compared to \$59–\$118 in Australia (based on prices reported in the Illicit Drug Reporting System of \$50–\$100,<sup>20</sup> and a 'New Zealand dollar to Australian dollar' exchange rate of 0.85).<sup>31</sup> Unfortunately, the price in New Zealand is believed to have fallen dramatically since the establishment of large-scale domestic manufacture in the late 1990s (from \$250–\$300 per gram in mid-1999 to \$100–\$180 after that time).<sup>31</sup>

Ongoing competition between domestic producers may cause this trend to continue (with implications for frequency of use).

It is also important not to overstate the role that the route of administration and the pattern of amphetamine-use play in users experiencing adverse effects. As with all drugs, effects and harms are also dependent on the user's physical condition, psychological state of mind, context of use (eg, at home, at a club, while driving, etc), and whether the drug was used in combination with other substances.<sup>32</sup> In the case of psycho-stimulants, heavy long-term use has been associated with increased sensitivity to dosage.<sup>9</sup> Users who have experienced methamphetamine-induced psychosis have been found to experience relapses of psychosis after only a small subsequent dose of the drug, or even after exposure to a stressful situation.<sup>33,34</sup>

In conclusion, the findings from the 2001 National Drug Survey indicate there is a substantial minority of amphetamine users in New Zealand who use quantities of amphetamine in a single session that have been identified in research elsewhere as hazardous.<sup>11</sup> This is of great concern as high dosage has been described in the literature as the 'first stage' to other hazardous using patterns, such as intravenous administration and high frequency use.<sup>35</sup> High levels of poly drug use by amphetamine users indicates users may be at risk of problems from other drug types or drug types used in combination with amphetamines, and not solely from amphetamines alone. Ongoing monitoring is required to identify if increased amphetamine use is a source of increased intravenous drug use.

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