The impact of the prohibition of benzylpiperazine (BZP) ‘legal highs’ on the availability, price and potency of BZP in New Zealand

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Abstract

Background: Benzylpiperazine (BZP) was the active ingredient in a range of ‘legal highs’ sold worldwide. BZP was prohibited in New Zealand in April 2008.

Aim: To examine the impact of the prohibition of BZP legal highs had on the availability, price and potency of BZP.

Method: Annual surveys of frequent drug users were conducted from 2007 to 2010. Participants were asked about aspects of the BZP, methamphetamine, ecstasy and cannabis markets.

Results: The proportion of frequent drug users who considered the current availability of BZP to be ‘very easy’ declined from 98% in 2007 to 15% in 2008, and then increased to 44% in 2009 and 42% in 2010. There was no change in the availability of ecstasy or methamphetamine over the same years. The nominal retail price of BZP per pill increased from $8.96 in 2007 to $15.83 in 2010. The real price of ecstasy and cannabis declined from 2007 to 2010. The potency of BZP and ecstasy declined from 2007 to 2010.

Conclusions: The prohibition of BZP initially greatly reduced its availability. The availability of illegal BZP recovered in subsequent years, but not to the pre-prohibition level. The price of BZP increased slowly over a number of years following its prohibition, and this may have been because users were able to stockpile heavily discounted legal BZP, the demand for BZP was declining, there was only modest enforcement of the prohibition, and illegal BZP could be sold as more expensive fraudulent ecstasy.
Introduction

Legal highs containing previously obscure psychoactive compounds have become an increasing concern in recent years in many countries around the world (European Monitoring Centre for Drugs and Drug Addiction, 2011a; Griffiths et al., 2010; United Nations Office on Drugs and Crime, 2011a, 2011b; Winstock et al., 2010). A common policy response has been to prohibit these new substances under existing drug control legislation (European Monitoring Centre for Drugs and Drug Addiction, 2011a). Some commentators have questioned whether prohibitions of legal highs are likely to reduce their availability as the legal trade will simply be replaced by a black trade and they will remain available from international websites (Birdwell et al., 2011; Winstock, 2010).

To date the only published research of the impact of prohibition on the availability and price of legal highs has been a small number of studies which have discussed the preliminary impacts of the prohibition of mephedrone in the United Kingdom (McElrath & O'Neill, 2011; Measham et al., 2010; Winstock, 2010). A qualitative study of mephedrone users in Belfast reported the price of mephedrone had increased from £15 per gram while it was legal to £30 per gram following its prohibition (McElrath & O'Neill, 2011). An on-line survey of people associated with the dance music scene who had used mephedrone in the United Kingdom found the price of mephedrone increased from an £10 per gram when it was legal to £16 per gram after its prohibition (Winstock, 2010). The EMCDDA reported the price of mephedrone increased in many EU countries from between £10-£12 pre-prohibition to £20-£25 post-prohibition (European Monitoring Centre for Drugs and Drug Addiction, 2011a) (EMCDDA, 2011).

A number of drug researchers have developed a general economic theory of illegal drug markets to explain the consequences of making the manufacture and sale of a drug illegal (Caulkins, 2007; Caulkins & Reuter, 1998; Caulkins & Reuter, 2010; Kleiman, 1992; Moore, 1977; Reuter, 1983). They argue illegal drug markets tend to produce lower levels of availability, higher prices, lower potency and more frequent smaller quantity purchases compared to a legal market for a drug. The availability of a prohibited drug is reduced as prohibition removes the ability of sellers to advertise the drug and sell it from fixed public premises (Reuter, 1983). The price of a
prohibited drug increases as manufacturers must operate small scale clandestine manufacture and transportation operations (Reuter, 1983). Those involved in the illegal trade also demand additional monetary compensation for the risk of arrest and victimisation by rivals and these costs are passed on to the consumer as higher prices (Reuter & Kleiman, 1986). The potency of an illegal drug is often reduced as, in the absence of government enforced product standards, sellers are able to dilute the potency of a drug to earn additional profit and sellers can respond to supply shortages by diluting existing stocks. Illegal drug markets can encourage more frequent small quantity purchases as users seek to avoid the higher legal penalties imposed for being found in possession of large quantities of a prohibited drug.

Empirically demonstrating the consequences of prohibiting a drug is fairly challenging as the main recreational illegal drugs have been prohibited for many decades and consequently there is only limited historical data from when they were legally sold (Musto, 1987; Thornton, 1998). Data on the price, availability, potency and purchase of illegal drugs also remains limited in many countries (European Monitoring Centre for Drugs and Drug Addiction, 2011b). Consequently, discussions of the real world impact of prohibition are often restricted to broad analogies between the available measures of illegal drug markets and economic statistics on legal drugs such as alcohol and tobacco, or comparable semi-refined agricultural products, such as flour, tea and coffee. For example, Kleiman et al. (2011) illustrates the higher prices paid for illegal cannabis by pointing out that ‘high potency cannabis sells for $300-$450 per ounce compared to high quality tea which sells for $300 per pound’ (p.46, italics in original).

The prohibition of benzylpiperazine (BZP) legal highs in New Zealand in 2008 provides a rare opportunity to examine the impact of prohibition on the price, availability and potency of a formerly widely used, legal recreational drug. BZP is a piperazine-based central nervous system stimulant with approximately 10% the potency of dexamphetamine (Baumann et al., 2004; Baumann et al., 2005; Bye et al., 1973; Campbell et al., 1973). BZP legal highs were legally sold and widely used in New Zealand during from the early to mid-2000s (Sheridan et al., 2007; Wilkins et al., 2007). A national household survey of BZP use conducted in 2006 found 15% of the New Zealand population aged 13-45 years old had used a BZP legal high in the previous year, including 40% of males aged 18-24 years (Wilkins et al., 2007). A leading manufacturer of
BZP legal highs claimed that by 2004 as many as 200,000 BZP pills (i.e. 50,000 four pill packs) were being sold each month in New Zealand, generating retail sales of $24 million per year ($NZ) (Cohen & Butler, 2011; Dawkins, 2008; Gee & Fountain, 2007; Sheridan et al., 2007). BZP legal highs were sold from a wide range of retail outlets including convenience stores, liquor stores and clothing outlets (Sheridan et al., 2007). The manufacture and sale of BZP was prohibited in New Zealand in April 2008, with BZP classified as a Class C restricted drug (i.e. the same as cannabis), following the findings of a number of studies which found use of BZP legal highs to be associated with health risks (see Gee et al., 2005; Sheridan et al., 2007; Wilkins et al., 2008). A moratorium allowing possession of up to 100 BZP pills for ‘personal use’ was extended until October 2008.

The aim of this paper is to examine the impact the prohibition of BZP had on the availability, price and potency of BZP, and the frequency of purchase and quantity of BZP purchased, over a number of years.

**Methodology**

An annual survey of frequent illegal drug users, known as the Illicit Drug Monitoring System (IDMS), has been conducted in New Zealand for the past five years to provide information on trends in drug use and drug markets (see Wilkins et al., 2011a; Wilkins et al., 2011b). Frequent illegal drug users are considered to be particularly knowledgeable about illegal drug markets as they are frequent drug users themselves, often use a range of drug types and are often actively involved in the purchase and selling of drugs. The IDMS interviews three types of frequent drug user (i.e. methamphetamine users, ecstasy users and injecting drug users) from the three largest cities of New Zealand (i.e. Auckland, Wellington and Christchurch). These three groups of frequent drug users represent the three main types of serious drug users found in New Zealand. The IDMS interviews a total of 300-400 frequent drug users each year, comprising equal numbers from each of the three frequent drug using groups. An individual can only be interviewed for one of the frequent drug users groups each wave (i.e. the groups are mutually exclusive). The number of interviews and type of drug users interviewed in each of the three locations is determined by site targets and the final sample is weighted by location and drug type
to ensure consistent yearly comparisons. The frequent drug users are recruited using the same street level promotion and ‘snowballing’ procedures each year, and complete a structured face-to-face interview at a public venue of their choosing. To be eligible an individual must be aged 16 years or older, have used the drug type of interest monthly or more often in the past six months, and have resided in the site location for the past 12 months. Those respondents who indicated they have knowledge of the price, purity and availability of a specific drug type are asked about current availability, change in availability in the previous six months, current strength, change in strength in the previous six months, and change in the price in the previous six months. Those respondents who have purchased a drug type in the past six months are asked how often they purchased it, how long it would take them to purchase it if they wanted some, how much they would spend on the drug on a typical occasion and how much of the drug they would receive for that dollar expenditure. Questions about trends in BZP were included in the IDMS from 2007-2010. Data on the trends in methamphetamine, ecstasy and cannabis markets are presented for the same years as a quasi-control comparison group.

**Analysis**

To calculate the mean price for each drug type we divided the dollar amount a respondent reported spending on a drug on a typical occasion by amount they reported receiving for that dollar expenditure. Price discounts based on the quantity purchased are common in illegal drug markets (see Wilkins et al., 2005) so the mean price for retail quantities of each drug was calculated. The quantity sold at retail was calculated as the quantity that approximately 80% of the respondents had purchased on a typical occasion (e.g. 80% of those who purchased methamphetamine had purchased 0.3 grams or less). The real (i.e. inflation adjusted) mean price for each drug was also calculated based on 2010 dollars. We also report the nominal prices as these are the price comparisons which frequent drug users reflect on when they are asked if the price is increasing, stable or decreasing. To ensure consistent comparisons between years we applied fixed weights to the four annual IDMS samples based on the average distribution of the total sample by location and average distribution of the total sample by the three frequent drug user groups for 2006-2008. Logistic regression was used to test for differences in the proportion of frequent drug users reporting a category of a measure over the four years (e.g. those reporting
the availability of a drug was ‘very easy’ from 2007 to 2010). Regression was used to test for differences in drug prices reported by frequent drug users from 2007 to 2010. Spending on drugs on a typical occasion and quantity of drugs purchased on a typical occasion were log-transformed to achieve approximately normal distributions. All analysis was run using SAS software.

**Results**

*Current availability*

The proportion of frequent drug users who considered the current availability of BZP to be ‘very easy’ decreased from 98% in 2007 to 15% in 2008 (p<0.0001) and then increased from 15% in 2008 to 44% in 2009 (p=0.0032) (Table 1 & Figure 1). Overall, a lower proportion considered the current availability of BZP to be ‘very easy’ in 2010 compared to 2007 (42% vs. 98%, p<0.0001). There was no change in the proportion of frequent drug users who considered methamphetamine or ecstasy to be ‘very easy’ to obtain from 2007 to 2010. The proportion of frequent drug users who considered the availability of cannabis to be ‘very easy’ increased from 64% in 2007 to 82% in 2008 (p<0.0001) and then decreased from 82% in 2008 to 73% in 2009 (p=0.0205).

**Figure 1**: Proportion of frequent drug users who considered a drug type to be ‘very easy’ to obtain, 2007-2010
Table 1: Characteristics of the BZP market as report by frequent drug users, 2007-2010

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<td><strong>Quantity purchased</strong></td>
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<td>10.2 pills</td>
<td>5.7 pills</td>
<td>5.1 pills</td>
<td>0.41 grams</td>
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<td>0.30 grams</td>
<td>0.38 grams</td>
<td>2.4</td>
<td>2.5</td>
<td>4.5</td>
<td>1.9</td>
<td>12.2</td>
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<tr>
<td><strong>Average price (NZ$) (All)</strong></td>
<td>9.09 per pill</td>
<td>8.57 per pill</td>
<td>9.98 per pill</td>
<td>14.52 per pill</td>
<td>849.58 per gram</td>
<td>884.95 per gram</td>
<td>942.25 per gram</td>
<td>952.06 per gram</td>
<td>54.87 per pill</td>
<td>55.65 per pill</td>
<td>53.51 per pill</td>
<td>46.32 per pill</td>
<td>12.7 per gram</td>
<td>13.1 per gram</td>
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<td><strong>Nominal average retail price (NZ$)</strong></td>
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<td>15.83 per pill</td>
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Statistical test comparing current year with previous year = *p<0.05%  **p<0.01%  ***p<0.001

Statistical test comparing 2010 to 2007 = #p<0.05%  ##p<0.01%  ###p<0.001
Change in availability

The proportion of frequent drug users who considered BZP to be ‘more difficult’ to obtain increased from 5% in 2007 to 65% in 2008 (p<0.0001) and then declined from 65% in 2008 to 38% in 2009 (p=0.0124) (Figure 2 & Table 1). A lower proportion considered BZP to be ‘more difficult’ to obtain from 2009 to 2010 (38% vs. 19%) and this difference was close to being statistically significant (p=0.0547). There was no change in the proportion of frequent drug users who considered methamphetamine, ecstasy, or cannabis to be ‘more difficult’ to obtain from 2007 to 2010.

Figure 2: Proportion of frequent drug users who considered a drug type to have been ‘more difficult’ to obtain in the previous six months, 2007-2010

Time to purchase

The proportion of frequent drug users who could purchase BZP in one hour or less declined from 97% in 2007 to 32% in 2008 (p<0.0001) and then increased from 32% in 2008 to 68% in 2009
Overall, a lower proportion were able to purchase BZP in one hour or less in 2010 compared to 2007 (63% vs. 97%, p=0.0047). The proportion of frequent drug users who could purchase methamphetamine in one hour or less declined from 67% in 2007 to 53% in 2008 (p=0.0229), increased from 53% in 2008 to 67% in 2009 (p=0.0190) and then declined again from 67% in 2009 to 48% in 2010 (p=0.0029). There was no change in the proportion of frequent drug users who could purchase ecstasy in one hour or less from 2007 to 2010. The proportion of frequent drug users who could purchase cannabis in one hour or less increased from 73% in 2007 to 81% in 2008 (p=0.0300) and then declined from 82% in 2009 to 74% in 2010 (p=0.0317).

Figure 3: Proportion of frequent drug users who could purchase a drug type in one hour or less, 2007-2010

![Proportion of frequent drug users who could purchase a drug type in one hour or less, 2007-2010](image)

Frequency of purchase

The proportion of frequent drug users who purchased BZP weekly or more often increased from 19% in 2008 to 41% in 2009 (p=0.0396) and was higher in 2010 compared to 2007 (44% vs. 15%, p=0.0200). The proportion of frequent drug users who had purchased ecstasy weekly or
more often increased from 15% in 2009 to 28% in 2010 (p=0.0045) and was higher in 2010 compared to 2007 (28% vs. 16%, p=0.0122).

Nominal and real retail price

The nominal retail price for a pill of BZP increased from $8.96 in 2007 to $15.83 in 2010 (p=0.0059). The nominal retail price of a gram of methamphetamine at retail level increased from $922 in 2007 to $1,033 in 2010 (p=0.0030). The nominal retail price for a pill of ecstasy declined from $56 in 2009 to $48 in 2010 (p<0.0001) and was lower in 2010 compared to 2007 ($48 vs. $56, p<0.0001).

The overall test of whether the real retail price of a pill of BZP was different between the four years was close to being statistically significant (p=0.0787). The single test of the difference in the real price of BZP between 2010 and 2007 was statistically significant ($15.83 vs. $9.86, p=0.0174). The fairly low numbers of frequent drug users reporting BZP prices may have been a factor in the outcome of the overall test of the real price differences. The real retail price of ecstasy declined in a similar way to the nominal price from 2007 to 2010. The adjustment for inflation meant there was no change in the real retail price of methamphetamine from 2007 to 2010. When the price of cannabis was adjusted for inflation, the real price declined from $15 per gram in 2007 to $13 per gram in 2010 (p<0.0001).

Figure 3 presents the percentage change in the real price of each drug by year compared to the 2007 baseline price. Figure 3 shows by 2010 the real price of BZP had increased by 61%, the real price of methamphetamine had increased by 2%, the real price of cannabis had declined by 10% and the real price of ecstasy had declined by 22% compared to 2007 prices.
The proportion of frequent drug users who considered the price of BZP to be ‘increasing’ increased from 3% in 2007 to 54% in 2008 (p=0.0008), declined from 54% in 2008 to 18% in 2009 (p=0.0008), and then increased again from 18% in 2009 to 47% in 2010 (p=0.0071) (Figure 4 & Table 1). Overall, a higher proportion believed the price of BZP was increasing in 2010 compared to 2007 (47% vs. 3%, p=0.0022). A higher proportion of frequent drug users considered the price of methamphetamine to be increasing in 2010 compared to 2009 (25% vs. 12%, p=0.0033) and in 2010 compared to 2007 (25% vs. 13%, p=0.0070).
Figure 5: Proportion of frequent drug users who reported the price of a drug had ‘increased’ in the previous six months, 2007-2010

Current strength

A lower proportion of frequent drug users considered the current strength of cannabis to be high in 2010 compared to 2009 (37% vs. 52%, p=0.0008). There were no other changes in perceptions of the current strength of any of the other drugs from 2007 to 2010.

Change in strength

The proportion of frequent drug users who considered the strength of BZP to be ‘decreasing’ increased from 2% in 2007 to 24% in 2010 (p=0.0112). The proportion of frequent drug users who considered the strength of ecstasy to be ‘decreasing’ also increased from 15% in 2007 to 28% in 2010 (p=0.0047).
Typical dollar amount spent

The frequent drug users spent a higher nominal dollar amount on ecstasy on a typical occasion in 2010 compared to 2007 ($195 vs. $129, p=0.0082). There was no change in the mean dollar amount spent on BZP, cannabis or methamphetamine on a typical occasion from 2007 to 2010.

Quantity purchased

The mean quantity of cannabis purchased on a typical occasion declined from 12.2 grams in 2007 to 6.1 grams in 2008 (p=0.0036) and was lower in 2010 compared to 2007 (6.2 vs. 12.2 grams, p=0.0252). There were no other changes in the quantity of other drugs purchased on a typical occasion from 2007 to 2010.

Discussion

The prohibition of BZP legal highs initially resulted in a substantial decline in the availability of BZP. The availability of BZP improved in subsequent years via a new illegal market, but still remained below its former level of legal availability. Our findings are thus consistent with the understanding that prohibition reduces the availability of a drug relative to a legal market. This appears to remain the case even with the possibility of supply via international based websites. A number of factors may have discouraged users from ordering BZP from international websites following its prohibition, including the fact that consignments of illegal BZP would still be required to travel across the border, must include the recipient’s postal address, and had to be ordered from an unfamiliar website. The sensitivity of legal high availability to the local retail environment is consistent with alcohol and tobacco studies which have found use of these substances to be related to the density of retail outlets and hours of retail selling (Huckle et al., 2008; Kleiman et al., 2011).

The availability of illegal BZP did recover to some extent in subsequent years and this improved level of illegal availability was sustained. These findings suggest that an illegal market which develops following a prohibition can improve availability over time and recover some of the loss of availability which initially follows the imposition of the prohibition and the removal of legal
supply. In recent years it has become more widely recognised that illegal drug markets can often adapt and relocate in response to enforcement campaigns (United Nations Office on Drugs and Crime, 2009). This dynamic adaption has been rigorously demonstrated with respect to methamphetamine precursor control where restrictions on precursors have caused proximate disruptions of methamphetamine markets until drug manufacturers find alternative production locations, precursors or manufacturing methods (Cunningham et al., 2011; Cunningham & Liu, 2005; Cunningham et al., 2009). However, in spite of the ability of illegal market to improve the availability of BZP over time it was not able to match the level of availability achieved by the former legal market.

In contrast to the immediate and substantial decline in the availability of BZP following its prohibition, we initially found only a modest increase in the retail price of BZP per pill (i.e. +19% in real terms from 2007 to 2008) with the largest increase in price occurring some two years after the prohibition was enforced (i.e. +32% in real terms from 2009 to 2010). These reported increases in the dollar price paid for a pill of BZP over the years were consistent with the frequent drug users’ perceptions of the years when the price of BZP increased. The overall increase in the retail price of BZP was fairly substantial over the entire period (i.e. +61% in real terms from 2007 to 2010) and was consistent with the percentage increases reported for the price of mephedrone following its prohibition (i.e. 60%-100%) (European Monitoring Centre for Drugs and Drug Addiction, 2011a; McElrath & O’Neill, 2011; Winstock, 2010).

Yet while the real price rise for BZP is impressive over the three years of the prohibition, particularly in the context of the decline in the real price of ecstasy and cannabis over the same years, it raises the question of why this increase occurred over a number of years rather than immediately following the imposition of the prohibition. A number of factors may explain the lagged increase in the BZP price following its prohibition. Firstly, the government announced its intention to prohibit BZP over six months before the prohibition of sale was eventually enacted into law and this gave users ample time to stockpile legal BZP. Legal BZP retailers reported an up-surge in BZP sales just before the BZP ban came into force with some retailers offering heavy price discounts to sell off remaining stock (Stuff, 2007). Six percent of the frequent drug users who purchased BZP in 2008 reported purchasing 50 or more pills and this was the only
year that such large purchases were reported. Pre-ban stockpiling has also been reported with the recent prohibition of mephedrone in the United Kingdom (Measham et al., 2010). The price of BZP may as a consequence have only increased after users’ personal stockpiles of cheap, legally manufactured BZP pills were consumed and they were then forced to buy from the new illegal market.

Secondly, a large component of the price of an illegal drug at retail level is a risk premium paid to compensate sellers for the risk of arrest and victimisation. Examination of the enforcement statistics for BZP in New Zealand suggests the legal risk of the illicit BZP trade may have been fairly low. The New Zealand authorities seized a total of 45,671 BZP pills in 2008, 64,710 BZP pills in 2009 and 14,698 pills in 2010 (NDIB, personal correspondence, 2011). However, the number of BZP seizure incidents (i.e. 51=2008, 59=2009 and 45=2010) is low relative to the number of seizures for methamphetamine (i.e. 666=2008, 763=2009 and 833=2010) (NDIB, personal correspondence, 2011). The number of people arrested for possession of BZP was low (i.e. 2=2008, 16=2009, 9=2010) and the number arrested for supply of BZP was even lower (i.e. 6=2008, 4=2009, and 2=2010). In contrast, over 8,000 people were arrested for cannabis use offences and over 1,000 arrested for methamphetamine use offences in New Zealand in 2008 (Department of the Prime Minister and Cabinet, 2011; Wilkins, 2009). The risk of arrest for selling BZP during the period of the moratorium is likely to have been particularly low as long as sellers restricted the amount in their possession to under the 100 pills specified in the prohibition legislation. The very low number of arrests for BZP offences may have exacerbated the difficulties participants in illegal markets had in correctly assessing the risk and penalties related to a trade in an illegal drug and hence their ability to credibly demand higher prices for involvement in BZP selling (see Bright & Ritter, 2010). The substantial price increases reported for BZP in the context of only modest enforcement of the prohibition supports the understanding that many of the benefits of prohibition are achieved by forcing the manufacture, marketing and sale of the good to occur within a fragmented and inefficient illegal market, rather than through intensive enforcement and severe penalties (Caulkins & Reuter, 2010).

Thirdly, both national household surveys and frequent drug user surveys have found large decreases in the recent use of BZP around the years that the prohibition was imposed. There is
evidence that the imposition of the prohibition contributed to a decline in BZP use, but putting aside the issue of the reasons for the decline for a moment, the mere fact that there was a substantial decline in BZP use in the late 2000s is likely to have resulted in a decrease in the demand for BZP which in turn would have dampened any price rise following prohibition.

Fourthly, there is evidence in recent years that the ecstasy sold in New Zealand increasingly contains BZP and other piperazines rather than the traditional 3,4-methylenedioxymethamphetamine (MDMA) (NDIB, 2009). Ecstasy (MDMA) traditionally commands a high price in New Zealand ($50-$60 per pill $NZ) (Wilkins et al., 2011b) and so there is a superior financial reward from selling BZP fraudulently as ecstasy rather than illegal BZP. This may have undermined the development of an illegal market for higher priced BZP in New Zealand. It is unclear the extent to which the BZP prohibition was specifically responsible for this phenomena as the adulteration of ecstasy with piperazines has been reported in other parts of the world and has been linked to a disruption of key ecstasy precursors (European Monitoring Centre for Drugs and Drug Addiction, 2010).

We acknowledge a number of limitations with this paper. Firstly, the natural experiment research design of our study does not allow us to control for all alternative explanatory factors for changes in the availability and price of BZP and hence the precise causal influence of the prohibition may remain a matter of contention (Babor et al., 2010). However, prohibiting a drug imposes fundamental changes to the way the drug is manufactured, distributed and sold (Kilmer et al., 2010) and consequently it is easier to accept a causal connection between the imposition of prohibition and subsequent changes in prices and availability. Our study also tracked the availability and price of three other drugs over the same years as a quasi-control group, and the fact that there were no similar substantial changes for these drugs suggests the prohibition of BZP was a major cause in the subsequent changes in the price and availability of BZP, rather than other general trend on the wider illegal drug market in New Zealand. Secondly, some of our price and availability measures involved fairly small numbers of respondents. While low numbers are a cause of concern with respect to reliability they also mean differences in a measure between years must be larger to achieve statistical significance. As discussed, the low number of frequent drug users providing prices for BZP was probably the reason why the real
price increases found did not achieve statistically significance. Thirdly, the frequent drug user sample is not representative of frequent drug use in New Zealand. The annual sample of frequent drug users recruited for the IDMS has been recruited using the same street level recruitment procedures each year and the stable demographic profile of the three frequent drug user groups over the five years of the survey suggests we broadly interviewed the same group of frequent drug users each year (Wilkins et al., 2011a). The IDMS survey interviews frequent drug users because they have extensive experience in drug use and drug markets and hence are likely to have the best appreciation of current drug market trends. A representative survey of frequent drug users would be prohibitively costly and time consuming and hence not practical as a means to track trends in drug use and drug markets.

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