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Pharmaceutical Drug Misuse, Industry of Employment and Occupation

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Abstract: We contribute to the existing literature on drug consumption by analysing the misuse of pharmaceutical drugs, which has attracted scant attention in the economics literature. Specifically, using individual level data, we explore the determinants of pharmaceutical drug misuse and focus on potential industry and occupation effects, which have been associated with the consumption of other (licit and illicit) drugs. In order to place the misuse of pharmaceutical drugs into context, we also consider other illicit drugs: namely cannabis, speed, and ecstasy. We find a positive association between the consumption of pharmaceutical drugs and employment in the hospitality industry, which contrasts with an inverse relationship in the case of the retail, and finance and insurance industries. In addition, our findings suggest that individuals employed in managerial, professional, sales and clerical/administration occupations are less likely to consume pharmaceuticals relative to labourers, indicating a clear disparity across white collar and blue collar occupations.

Key Words: Industry; Labour Market Participation; Occupation; Pharmaceutical drugs

JEL: C5, D1, I1, J00

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Pharmaceutical Drug Misuse:
Industry and Occupation Effects

1. Introduction and Background

Given the considerable individual and social costs associated with the consumption of illegal drugs (including increased crime, health issues and difficulties at work and school), it is not surprising that an extensive body of research exists exploring issues related to the consumption of drugs. Empirical studies have played an important role in helping to identify the socioeconomic and demographic factors associated with the consumption of illicit drugs such as marijuana and cocaine (Grossman and Chaloupka 1998, Farrelly *et al.* 1999, Ramful and Zhao 2009) as well as legal addictive goods such as alcohol and cigarettes (Chaloupka and Pacula 1999, Cameron and Williams 2001, Farrelly *et al.* 2001). One area which has attracted less attention in the academic literature, which may reflect a lack of suitable data, relates to the misuse of pharmaceutical drugs. Indeed, according to the Office for National Statistics, over 800 people died from fatal overdose of prescription drugs such as painkillers and tranquilizers in the UK in 2012, compared with around 700 who fell victim to heroin and cocaine abuse. The use of pharmaceutical drugs for non-medical purposes has been on a constant rise in the US in recent years with the latest National Survey on Drug Use and Health (NSDUH) indicating 6.8 million Americans (or 2.6% of the population aged 12 or older) having reported using psychotherapeutic prescription drugs non-medically in 2012 (NSDUH 2012). In Australia, the latest National Drug Strategy Household Survey (NDSHS) shows that 4.2% of Australians aged 12 and above engaged in such behaviour in 2010 (AIHW 2011).

As pharmaceutical drug misuse becomes more prevalent, it becomes increasingly important that we understand the factors determining their consumption. As with other licit and illicit drugs, pharmaceutical drug abuse is mostly concentrated in young adults. The 2010 NDSHS, for example, indicates that the use of pain-killers/analgesics and tranquilisers/sleeping pills was highest in adults aged between 18-29 years (AIHW 2011). The rise in the abuse of non-medical pharmaceutical drugs has been related to the increased and easy availability of these drugs, growing social acceptance, and more importantly, the perception that they are safe (Friedman 2006, McCarthy 2007, Twombly and Holtz 2008). Furthermore, pharmaceutical drug misuse is particularly difficult to monitor and control given the availability of many drugs both over-the-counter and online (Nielsen and Barratt 2009). The increasing availability of online pharmacies has developed a new and rapidly expanding market place for pharmaceuticals that may help to explain the increased rates of use reported in recent survey data (Compton and Volkow 2006).

To date, there has been a paucity of research into the consumption and effects of pharmaceutical misuse, especially in the economics literature. Those existing studies have tended to focus on particular groups within the population rather than representative samples. For example, Degenhardt *et al.* (2006) examined the trends in prescriptions and illicit morphine use among regular injecting drug users in Australia. The paper reported an 89% increase in the rate of morphine prescriptions in the period 1995 to 2003. The 46% of the sample that reported recent morphine injection were significantly more likely to be male, unemployed, no longer receiving treatment and homeless. There is reason to believe that the increase in the use of pharmaceutical drugs (particularly morphine) is linked to the observed heroin declines that have been examined extensively in the existing literature (see, for example, Day *et al.* 2006). Fischer and Rehm (2007) proposed that the perception of heroin use as the core of street drug use in North America, Australia and Europe has ended, or at least been substantially lessened. Instead, the illicit use of a variety of prescription opioids may have progressed to surpass heroin as the dominant drug in street drug problems. McCabe *et al.* (2005), on the other hand, examined non-medical use of prescription stimulants among US college students. The study found that prescription stimulant was highest among white students, young men, members of sororities and fraternities and those with low levels of academic achievement. There also existed considerable variation in results across different colleges and universities.

From an economic perspective, both licit and illicit drug consumption has been shown to have significant impacts on the labour market and vice versa. However, to the best of the authors' knowledge, evidence linking prescription drugs to the labour market is non-existent. High rates of drug use in the workforce are of particular concern as prior empirical works have found strong links between drug use, and decreased wages and productivity (see, for example, Register and Williams 1992, Zarkin *et al.* 1998, MacDonald and Shields 2000, MacDonald and Pudney 2000, DeSimone 2002, Lye and Hirschberg 2010).

The labour market factors that drive drug consumption have equally received significant attention in the literature (Ames and Grube 1999, Ames *et al.* 2000, Bacharach *et al.* 2002, Zhang and Snizek 2003). Managerial control, workplace culture, stress levels and the enforcement of policies were seen as factors influencing the consumption of alcohol in workforces in Bacharach *et al.* (2002). Workplace culture was seen as a determining factor as workers develop assumptions about what constitutes appropriate drinking behaviour from their peers. These assumptions can often transform into social expectations that lead to pressure on workers to conform (Bacharach *et al.* 2002). This study echoed the statement of Boye and Jones (1997, p.175) that "many studies have shown that the norms of the work group can influence the level of counterproductive behaviour engaged in by employees". In terms of job characteristics, steady employment or job security were found to be correlated with alcohol and drug use (Zhang and Snizek 2003).

Workplace factors that lead to drug use may also be industry and occupation specific, posing issues for productivity. For instance, Conway *et al.* (1981) found high occupational stress to be positively associated with the consumption of cigarette and coffee but negatively associated with alcohol consumption. The differing cultural norms and attitudes of employees within an industry may allow a greater level of drug use in employees than is present in other industries (Larsen 1994). Some studies have explored such industry and occupation differential effects on drug use.

In terms of industry differences, hospitality workers have been identified as a high risk group with regard to drug use at the workplace (Eade 1993, Pidd *et al.* 2011). Studies have also identified construction workers and those employed in the arts and recreational industry as other high risk groups for drugs (see, for example, Banwell *et al.* 2006, Berry *et al.* 2007, Du Plessis and Corney 2011, Biggs and Williamson 2012). Du Plessis and Corney (2011) identified peer pressure as a significant factor in the increased drug use witnessed in the construction industry. As many people participate in after work socialising with colleagues - which may include drinking and other activities - it is possible that drug use could be affected by peer pressure exerted by work colleagues. In other words, socialising with people from the workplace which has a high rate of drug consumption could make an individual more likely to participate in drug consumption.

The positive relationships identified in the construction industry pose a particular concern given the effect that drug use can have on decision making abilities both during and after use (Vaidya *et al.* 2012). According to Biggs and Williamson (2012), a potential source of the increased drug use in the construction industry is the employee's inability to cope with the lifestyle that comes about as a result of project-to-project, transient work. The stop-start nature of the construction industry provides many workers with large periods of free time at some stages and long working hours at other stages. There are concerns that these free periods coincide with the use of both licit and illicit drugs (Biggs and Williamson 2013). Additionally, the construction industry is very masculine in culture, requires hard physical labour and can be a stressful environment; all factors that have been associated with high drug use (Banwell *et al.* 2006).

A high likelihood of drug use among sections of the agriculture industry has previously been identified in studies (see, for example, Evans *et al.* 2005). This was partly attributed to self-esteem issues which stemmed from a feeling of being undervalued as the industry lacks appropriate career paths and adequate training (Evans *et al.* 2005).

With regard to occupation, it has been found that use of drugs with stimulant properties is common among truck drivers in particular, in order to maintain energy throughout long-haul trips (Couper *et al.* 2002, Silva *et al.* 2003). Sustained periods of driving exert considerable mental strain on the driver and the job is therefore likely to be fatiguing (Krueger 1989). Research has shown that vigilant tasks such as driving become more taxing on the individual in the early hours of the morning when many transport employees complete long distance drives (see, for example, Folkard and Monk 1979, Monk and Folkard 1985). Some studies have reported drug and alcohol use in the workplace to be more common in blue collar jobs than in white collar occupations (Gleason *et al.* 1991, Zhang and Snizek 2003).

In summary, in contrast to the academic interest in other drugs, there is a distinct lack of existing literature on the misuse of pharmaceutical drugs, which implies limited understanding of the determinants of consumption of such drugs for individuals that are not predisposed to use due to dependence following a previous medical condition. Hence, we explore the determinants of pharmaceutical drug misuse and focus on potential industry and occupation effects, which have been associated with the consumption of other (licit and illicit) drugs. Due to the difficulty in controlling misuse of legal, *i.e.* pharmaceutical, drugs further knowledge of these determinants will potentially have an important impact on providing necessary and effective policy initiatives.

3. Data

Data based on large-scale representative random samples of the general population are rare. However, the NDSHS does, indeed, yield such data. It provides information on drug use patterns, attitudes and behaviour of a nationally representative sample of the non-institutionalised Australian population aged 12 and over. A random sampling of households geographically is ensured through the use of a multi-stage, stratified area sample design (AIHW 2011). There have been seven surveys completed since 1985 and the data have been used in several previous studies on licit and illicit drug consumption (see, for example, Cameron and Williams 2001, Harris and Zhao 2007, Ramful and Zhao 2009, Srivastava 2010).[1] In this paper, the four most recent surveys (2001, 2004, 2007 and 2010) have been pooled together given their consistency (NDSHS 2010). We restrict the analysis to individuals who are of working age and thus limit our observations to 20 to 65 years old (the retirement age in Australia is 65). After omitting missing values the sample consists of 66,430 observations. We firstly analyse drug use amongst all individuals regardless of their labour market status in order to explore labour market participation effects. We then focus on a sample of employed individuals in order to explore industry and occupation effects.

The focus on Australia is particularly pertinent: medical professionals in Australia have expressed growing concern over the increased prevalence of prescriptions for opioid analgesics such as morphine and oxycodone in recent years (Roxburgh *et al.* 2011). Australia ranks in the top five countries globally for the per capita consumption of both morphine and oxycodone (Roxburgh *et al.* 2011). While opioid analgesics are a legitimate and important means of pain management for the treatment of chronic pain associated with diseases such as cancer, overarching guidelines for their use in other situations are non-existent. One of the major concerns held in regard to the increased prescription numbers is the increased potential for the non-medical use and diversion (selling or passing on) of such drugs. Roxburgh *et al.* (2011) highlight that the non-medical use and diversion of pharmaceuticals are both complex behaviours that may occur across different and broad groups of individuals. Further understanding of the characteristics of these groups will allow for a greater volume of avenues for the control of such behaviours.

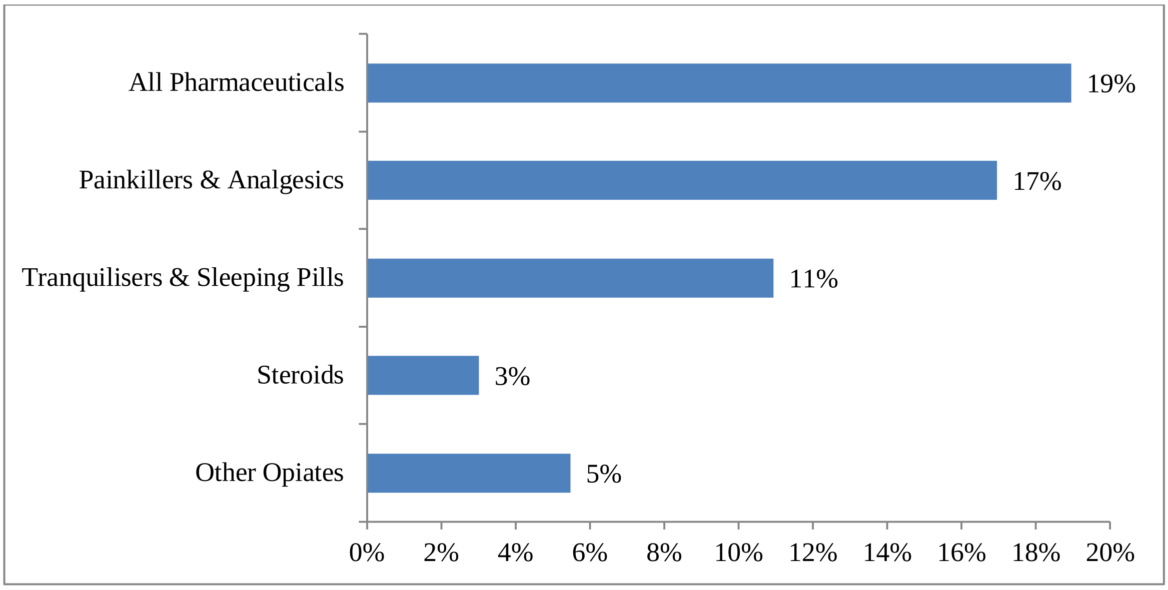
In order to place the illicit use of prescription or over-the-counter pharmaceutical drugs into context, we also consider other illicit drugs commonly used in Australia as well as in other developed countries. Specifically, we have chosen cannabis, speed, and ecstasy as they have

[1] Activities that are associated with perceived social stigma or legal consequences, such as drug use, may be subject to some misreporting. A few studies have attempted to model such misreporting behaviour (see, for example, Brown *et al.* 2013). Addressing this issue in the current paper would add another significant layer of complexity. Besides, this is not the focus here and it would be near impossible to identify the model with the current data.

the highest prevalence of use in Australia and compare well with pharmaceuticals, which as a combined group, are ranked just below cannabis in terms of prevalence.

The NDSHS does not record information on the volume or monetary cost of the consumption of each of these drugs. Information on drug consumption comes in terms of lifetime or recent (past 12 months) use and also the frequency of recent use. The data that will be utilised here is recent drug use and comes in the form of a binary variable, indicating whether the respondent has taken the drug in question in the previous 12 months. In particular, the questions of interest are: *Have you used (this particular) pharmaceutical drug for non-medical purpose in the past 12 months*? *Have you used marijuana (or cannabis) in the last 12 months*? *Have you used amphetamines/speed in the past 12 months*? and *have you used ecstasy in the past 12 months*? The pharmaceutical drug category is a combination of the responses to questions regarding painkillers or analgesics, steroids, tranquilisers or sleeping pills and other opiates. Individuals are included as illicit pharmaceutical drug users if they have taken all or any of the above drugs for non-medical purposes. These drugs are combined into one broader category as they are all pharmaceuticals available either over the counter or by prescription and the participation rates in some individual categories are relatively low. As shown in Figure 1, users of painkillers and analgesics accounted for the largest portion of non-medical use of pharmaceutical drugs followed by users of tranquilisers and sleeping pills.

Figure 1: Pharmaceutical Drugs, by Sub-Groups



Source: NDSHS (2010).

Empirical studies of illicit drug consumption have traditionally relied on the use of a range of personal and demographic characteristics as explanatory variables (see, for example, Cameron and Williams 2001, Ramful and Zhao 2009, Brown *et al.* 2013). The NDSHS provides a variety of information that can be included in the set of explanatory variables for use in the econometric modelling undertaken in this paper; and moreover a set that closely follows the related previous literature. The variables utilised include: gender; age in natural logarithm; whether the individual is of Aboriginal or Torres Strait Islander descent; whether the individual resides in a capital city; the individual is married or cohabiting; comes from a single parent household; and a dummy variable for whether there are preschool aged children in the household. We also control for educational attainment distinguishing between four categories of highest educational attainment: a tertiary degree; a non-tertiary diploma or trade certificate; year 12 education; and less than year 12 education, which is the omitted category. With regard to the individual's economic situation, we control for the natural logarithm of real personal annual income before tax measured in Australian Dollars (Lnhldinc) and the individual's main labour market status.

It is commonly known that price information on illicit drugs is not easily obtained. Thus, the availability and inclusion of price data into the empirical analysis is an important feature of our study. The price data are merged in from a variety of sources. Importantly, pharmaceutical prices are adapted from the Australian Statistics on Medicines (ASM) reports. The ASM provides prescription numbers and total cost to both patient and government for all drugs listed as part of the Pharmaceutical Benefits Scheme (PBS). This information provides a proxy for price for several drugs in the painkiller/analgesics, tranquilisers/sleeping pill, steroids or other opiate categories that are included into the broad pharmaceuticals class to be examined. The pharmaceutical price is then determined via a (logged) weighted average of the price of the two most commonly used drugs in each class (LnPharmPr).

State level prices for cannabis and speed are obtained from the Illicit Drug Reporting System (IDRS). The IDRS reports on the price of cannabis, methamphetamine (including speed), cocaine and heroin through interviews with injecting drug users (IDU), interviews with key informants who have regular contact with users and the examination of extant data. The price of cannabis is measured in (log) dollars per ounce (LnCanPr) and the price of speed in (log) dollars per gram (LnSpdPr). The IDRS reports for 2001, 2004, 2007 and 2010 have prices for all states for both cannabis and speed. The price of ecstasy is obtained from the Ecstasy and Related Drugs Reporting System (EDRS) which is administered in very much the same way as the IDRS. Ecstasy price is measured in (log) dollars per pill (LnEcsPr) and is available for all states for all years. While these prices are unlikely to be precise, they provide a close approximation of actual street price. All price series are deflated using the all-items consumer price index (CPI) for the respective states (ABS 2014).

Lastly, for our analysis of the sample of employed individuals, information on industry and occupation is obtained from the following survey questions: *What kind of industry, business or service is carried out by your main employer (or employer when you last worked)*? And *what kind of work do you do (or did you do when you last worked)*? This information is then classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC) and the Australian and New Zealand Standard Classification of Occupations (ANZSCO).[2]

Currently ANZSIC has 19 industry classifications but, in order to ensure consistency for the whole of the dataset, the industry variables were classified into 17 categories that could be easily identified in all four surveys, namely: agriculture, forestry or fishing; mining and related industries; manufacturing; utilities, (electricity, gas and water supply or waste collection, treatment and disposal services); construction; wholesale trade; retail trade; hospitality; transport, courier or warehouse and storage services; communication or telecommunication services; finance or insurance services; property (rental and hiring services, property operators and real estate services); public administration, defence and public order or safety and regulatory services; education or training; arts and recreation; health and/or social services; and other services.

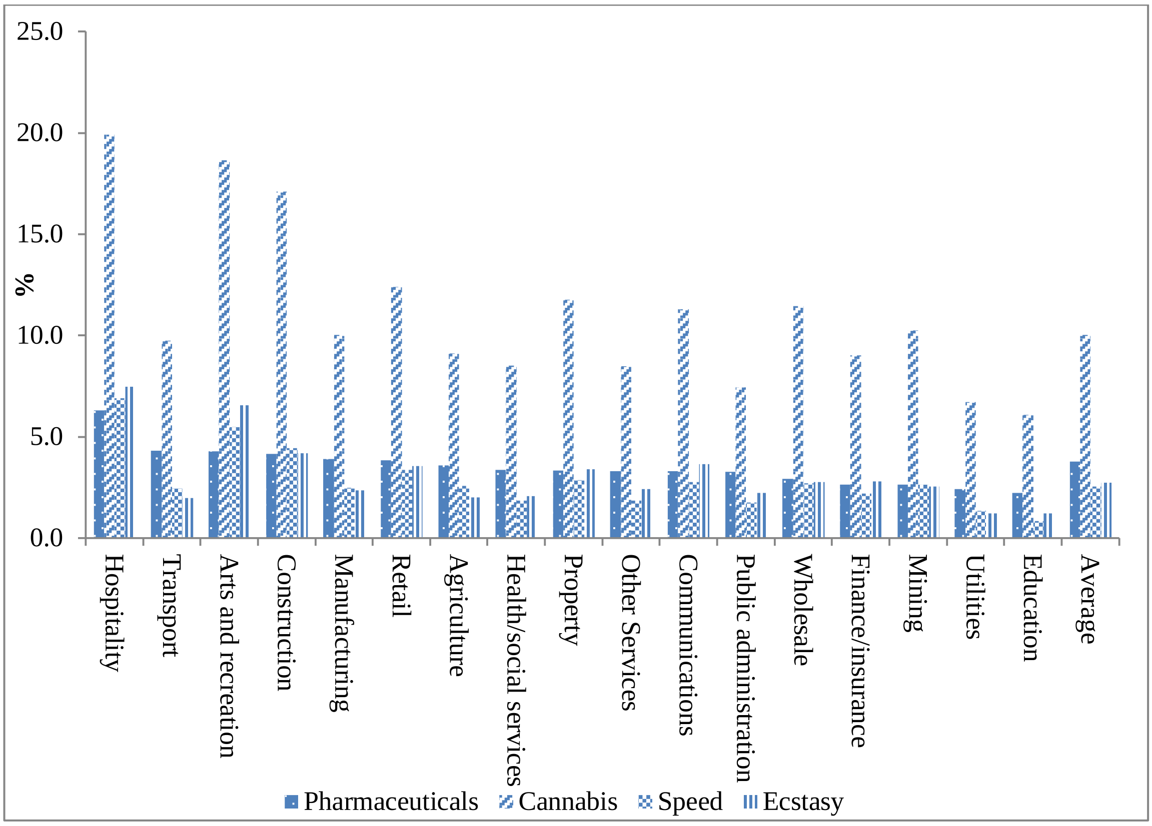
ANZSCO's first edition was not introduced until 2006 and was then replaced by the second edition in 2009. The system classifies occupations into eight categories, all containing several sub categories. As the system was fundamentally not different from the preceding Australian Standard Classification of Occupations (ASCO), the 2009 classifications were used for all surveys. The eight occupational categories are as follows: manager; professional; technician or trade worker; clerical or administrative worker; community or personal service worker; sales worker; driver or machine operator; and labourer.

[2] Both classification guidelines were developed by the Australian Bureau of Statistics (ABS) and Statistics New Zealand (Stats NZ) to allow for easier examination of industry statistics between the two countries and other countries around the world. Released in 2006, the current version of the ANZSIC replaced the original 1993 edition prior to which Australia and New Zealand had separate classifications.

Table 1 in the appendix presents summary statistics for all variables used in the empirical analysis. Considering the entire sample of individuals in the 20-65 age group, 43% are male and 66% are married. In terms of educational attainment, 28% have a degree, 36% have a diploma or trade certificate, 13% have a Year 12 as highest qualifications, and 23% have lower than Year 12 qualifications. Around 64% of the sample are employed, 4% are unemployed, 4% are students while the rest (28%) are engaged in other activities such as home duties.

Before we conduct any formal econometric analysis of industry and occupation effects on (pharmaceutical) drug use, it is useful to explore participation rates across the industries and occupations for the sub-sample of employed individuals. There is evidence from the literature that drug use is particularly prevalent within the hospitality, construction and financial industries and among unskilled workers (such as labourers or salespersons), trades and food preparation occupations (see, for example, Frone 2006, Pidd *et al.* 2006, Gates *et al.* 2009). The first bar in Figure 2 demonstrates the prevalence of pharmaceutical drugs across various industries.

Figure 2: Drug Participation Rates by Industry of Employment

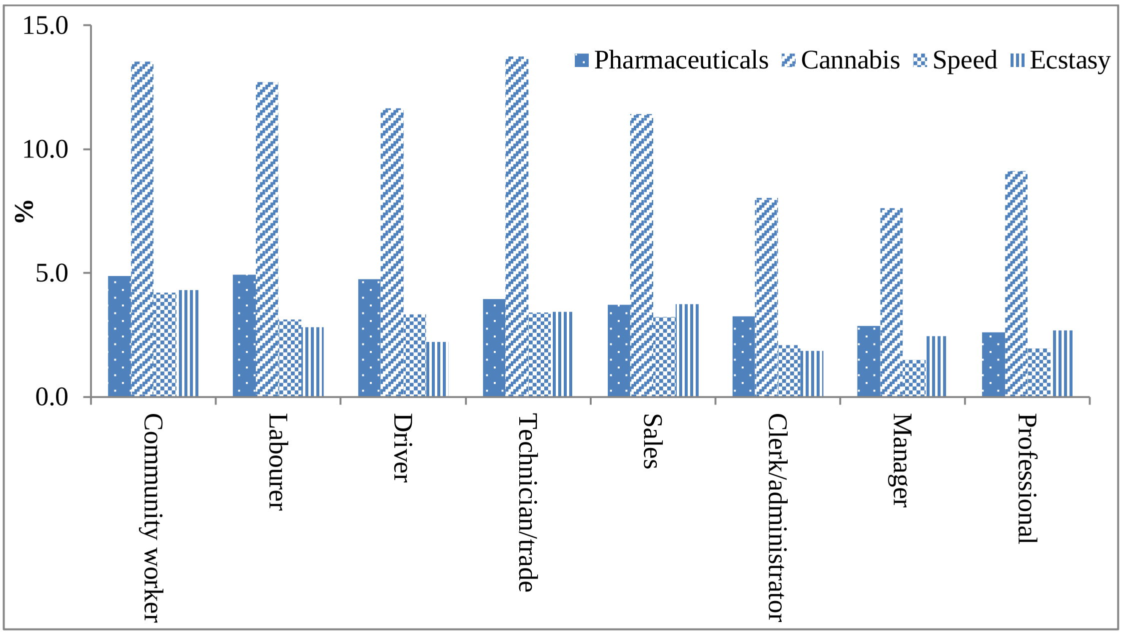


Source: NDSHS (2010).

The highest proportions belong to hospitality (6.3%), transport (4.3%), arts and recreation (4.3%), and construction (4.2%) while participation rates are the lowest in utilities (2.4%) and education and training industries (2.2%). Comparing with the other illicit drugs, we find that participation rates in cannabis, speed and ecstasy in general mirror rates of pharmaceutical drug use. However, the former dominates across all industries. Interestingly, we can see that pharmaceutical participation rates do appear to be (noticeably) higher in hospitality, but also relatively high in arts and recreation, construction, retail, manufacturing, transport and agriculture. We can also see that overall (i.e mean across all industries shown in the last set of bars), participation rates in pharmaceuticals are significantly higher than those in either speed or ecstasy.[3]

Figure 3 illustrates participation rates of illicit drugs across occupations. The highest participation rates in pharmaceutical drugs (illustrated in the first bar) are observed in community service workers (4.9%) and low skilled occupations such as labourers (4.9%) and machine operators and drivers (4.8%). On the other hand high skilled occupations such as professional and managers showed the lowest prevalence rates (2.6% and 2.9% respectively). In comparison, cannabis, speed and ecstasy were found to be most prevalent among traders, community service workers, labourers and sales workers.

Figure 3: Drug Participation Rates by Occupation



[3] A t-test was conducted to test the hypothesis that the mean participation rate of pharmaceuticals is higher than the mean participation rates of speed and ecstasy. The test statistics of t=3.78 (p-value=0.001) for speed and t=1.91 (p-value=0.037) for ecstasy reject the null and indicate that the mean participation rate for pharmaceuticals is statistically higher.

It is apparent from Figures 2 and 3 that some interesting, and statistically significant, variations exist with respect to drug participation rates across both industries and occupations, which we further explore in our econometric analysis detailed in the following sections.

4. Methodology

A standard probit approach is used to estimate the demand for pharmaceutical drugs. For the sake of comparison, we also estimate the demand for cannabis, speed and ecstasy. Specifically, as is standard in the literature, the unobserved latent propensity for drug *d* consumption is linearly related to a set of observed characteristics *X* such that

$$Y_d^* = X\beta + u \quad (1)$$

where β is a vector of parameters to be estimated, and ε is a standard normally distributed error term, giving rise to a standard Probit specification for the observed binary stochastic variable Y_d .

We initially estimate the above model for all individuals regardless of labour force status, but then focus on the sample of employees in order to capture workplace effects on pharmaceutical drug consumption.[4] We include a series of dummy variables related to the industry and occupation in which an individual is employed. In order to avoid potential sample selection bias, we use a sample selection ('Heckit') model, specifically involving two equations: the drug participation one and also the selection equation that determines whether an individual is employed. Specifically, again as standard in the literature, the propensity to work is a linear function of observed characteristics *Z* thus

$$Y_s^* = Z\gamma + v \quad (2)$$

with unknown weights γ and a normally distributed error term *v*. This results in a standard Probit specification for another observed binary stochastic variable Y_s that indicates whether the individual is employed or not. As both of the endogenous equations of interest here are binary, this set-up differs from the usual Heckit in that the system of two equations is estimated simultaneously via two correlated Probit equations. A priori one would expect that the disturbance terms in the two equations are correlated via unobserved factors (Johnson and

[4] Note that here, and elsewhere, the term 'pharmaceutical or prescription drug consumption' specifically relates to the abuse and/or non-medical use of such.

Creech 1983). For example, a person's appetite for risk may decrease their propensity to be employed and increase their propensity to participate in drug consumption simultaneously. Thus the model is estimated by Maximum Likelihood Estimation (MLE) techniques with the following likelihood function

$$\prod_{i=1}^{N_1} \Phi_2(\beta X, \gamma Z; \rho) \cdot \prod_{i=N_1+1}^{N} \Phi_2(-\beta X, \gamma Z; \rho) \cdot \prod_{i=N+1}^{M} \Phi(-\gamma Z) \quad (3)$$

where the disturbance terms, u and v are bivariate normally distributed with correlation ρ, and Φ_2 and Φ denote the cumulative bivariate normal distribution and the cumulative standard normal distribution function, respectively. The first N_1 observations are those who are both employees and drug participants ($Y_s = Y_d = 1$), the second portion of $N - N_1$ observations are employees who are not drug participants ($Y_s = 1, Y_d = 0$) and the last portion are those who are not employed ($Y_s = 0$).

The presence of any endogenous sample selection can be determined by a test for the significance of the estimated ρ, which essentially indicates whether the two equations are correlated or not. A high degree of correlation suggests the presence of endogenous sample selection and hence highlights the importance of controlling for such.

The model is highly non-linear which facilitates identification. To further assist with identification we also use exclusion restrictions, that is, valid instruments are included in the selection equation but not the participation equation (see, for example, Wooldridge, 2010). It is often difficult to find such plausible variables and, as a result, selection models are frequently estimated with the same set of explanatory variables in both stages (Jones 2007), where identification relies solely on functional form. Here, the state-level job vacancy rate is used as the restriction to be included in the selection equation. Naturally, the local availability of jobs greatly influences an individual's propensity to work (Howe and Connor 1982). It is unlikely that the job vacancy rate has any direct effect on an individual's drug participation decision. To increase the explanatory power of the model, we also include the price of drug as an instrument in the respective participation equations. Price provides a logical exclusion restriction as it is likely to influence an individual's decision to consume but has no direct effect on their propensity to be employed.

5. Results

5.1 Socioeconomic and Demographic Determinants of Pharmaceutical Drug Misuse

We start by estimating the demand for pharmaceutical drugs for a sample of all individuals regardless of their labour market status. For the sake of comparison we also estimate and report participation equations for cannabis, speed and ecstasy. Due to space constraints we choose to report only partial effects (Table 2). Standard errors of all estimates are presented in parentheses.

Before turning to the key industry and occupational effects of interest, we first briefly discuss the broad drivers of drug participation. Starting from the effect of age which we enter in logarithmic form for flexibility, we find that individuals are less likely to consume prescription drugs and the other three illicit drugs as they grow older. In terms of gender, males are more likely to consume all four drugs although the effect on pharmaceutical drugs is only significant at the 10% level. For instance, males are 0.3 percentage points (pp) more likely to consume pharmaceuticals, 5.3pp more likely to consume marijuana, 1.2pp more likely to consume speed and 1.3pp more likely to participate in ecstasy consumption. These results are not uncommon in the drug literature and reflect risk-taking behaviour typically observed in males (see, for example, Borghans *et al.* 2009). The smaller gender effect for pharmaceuticals relative to the illegal drugs is not unexpected; the use of prescription drugs is relatively less stigmatised, and the drugs are more easily available and involving less risks, possibly making them an attractive alternative equally for males and females.

Married individuals are less likely to take prescription drugs and less likely to consume the other three illicit drugs. The partial effects show that married individuals are 1.1pp less likely to use pharmaceutical drugs, and are 4.8pp, 1.8pp and 2.1pp less likely to consume cannabis, speed and ecstasy, respectively. Those from single parent households have a higher likelihood to take cannabis and speed but not ecstasy and prescription drugs. Those with preschool children in the household are less likely to take pharmaceutical drugs but also less likely to take all of the other three illicit drugs.

Aboriginal status is associated with higher use of pharmaceuticals. We see a similar association with cannabis use but not the other drugs. Living in a capital city is also positively associated with drug use of all four types. The main language spoken at home appears to be a good predictor of drug use for cannabis, speed and ecstasy but not for prescription drugs.

In line with several studies in the literature (see, for example, Farrelly *et al.* 1999, Zhao and Harris 2004), household income is negatively related to drug use except for ecstasy consumption. If household income acts as a proxy for socioeconomic class then it is not surprising that we see a negative relationship(s) here. In terms of education effects, higher academic achievements are generally associated with a lower probability of drug use. For example, relative to those with less than year 12 qualifications, degree holders are 1.7pp less likely, those with diploma and trade certificate are 0.6pp less likely and those with year 12 qualifications are 1.2pp less likely to take prescription drugs. Similar results are obtained for cannabis and speed while the education effects for ecstasy are statistically insignificant.

We find varying results with regard to labour market status across the drugs. Relative to the reference group of those who are engaged in other activities, we find that the unemployed are more likely to use all four drugs but those who are studying are less likely to take pharmaceuticals and speed. We also find that those who are currently employed are more likely to take prescription drugs, cannabis and ecstasy but we do not find any significant effect of employment on the use of speed. The effect of employment on prescription drugs is however small (0.4pp) and significant only at the 10% level.

Finally, we look at the effect of price on drug consumption. Except for cannabis, we find a negative effect of drug price on consumption for all other drugs. However, the effect is statistically insignificant for speed. While the positive effect of cannabis price on consumption contradicts the standard convention of a downward sloping demand curve, note that here the price of marijuana is strongly associated with quality (see, for example, Cameron and Williams, 2001, and Williams, 2004) and because we are unable to control for the price variation due to quality, a positive price effect could well be picking up the drug quality effect on participation.

5.2 Industry and Occupation Effects of Pharmaceutical Drug Misuse

We next examine the effects of industry of employment and occupation on pharmaceutical drug consumption via use of Heckit-type selection models to take into account the endogenously determined selected sample of working individuals. We explore three specifications: firstly we augment the model in Table 2 with controls for industrial affiliation; secondly, we replace the industry controls for occupation; finally, we control for both industry and occupation. Once again, we estimate such effects for cannabis, speed and ecstasy consumption for comparison purposes. However, for the sake of illustration and due to space constraints we only report coefficients for pharmaceutical drug (Table 3), but focus our discussion on partial effects.[5] For each drug, partial effects are reported for the selection equation and the drug participation equation conditional on selection. As a result the marginal effect of the independent variables on the drug participation equation consists of two components. First, there is the direct effect of the independent variable on the dependent variable. Second, there is an indirect effect if the independent variable also appears in the selection equation. This is because a change in some x not only changes the dependent variable (drug participation), but also the probability that an observation is actually in the sample (employment status).

We start by examining the effects of industry on drug consumption (Tables 4a and 4b). The results of the selection equation in Table 4a are broadly in accordance with previous empirical studies on the determinants of labour force participation (see, for example, Gray and Hunter 2002, Cai and Kalb 2006). All demographic and socioeconomic variables are found to have statistically significant effects on an individual's employment status, with positive effects for being a male, being married, coming from a single parent household, living in a capital city, speaking mainly English at home and for being more educated (Table 4a). Negative effects are found for those with preschool children at home, and those of Aboriginal status. Lastly, the effect of the state job vacancy rate, which we use as an instrument to identify the selection equation, is found to have a significant positive effect on employment. It is expected that a high rate of job vacancies in the state will have a positive influence on the probability of employment. The strong statistical significance endorses our choice of instrument.

Next, we discuss the drug participation equation(s) for those who are employed, with a focus on the industry indicators (Table 4b). Previous studies have shown that the drug consumption patterns of workers vary significantly across industries (Pidd *et al.* 2011). Our results indeed show some significant relationships of industry types with cannabis, speed and ecstasy consumption. However, the industry effects were mostly statistically insignificant for the consumption of pharmaceuticals except for a positive and significant association with the hospitality industry, which we also observe for the other three illicit drugs. We also find some evidence of a negative association with the retail industry and the finance and insurance industry for the consumption of pharmaceuticals. In contrast, we find statistically significant

[5] Full model estimation results are available from the authors on request.

and positive associations of cannabis, speed and ecstasy consumption with the construction, communications, and arts and recreational industries; positive associations of the manufacturing and property industries with cannabis consumption and negative associations of the education industry with cannabis, speed and ecstasy consumption. Clearly, the industry effects are more pronounced for the consumption of cannabis, speed and ecstasy and less pronounced for pharmaceutical drugs. With regard to the effects of the demographic, socioeconomic and price variables, they are not qualitatively different from our earlier estimates when we estimated the drug participation equations on the entire sample of individuals.

In terms of marginal effects, hospitality workers have a 1pp higher chance to consume pharmaceuticals than the reference group of "Other" industry workers, and even higher marginal effects of 2.1pp, 2.6pp and 6.2pp for speed, ecstasy and cannabis (Table 4b).

We then re-estimate the model replacing the industry dummy variables with the set of occupation indicators. For brevity we only report the partial effects of the occupation variables (Table 5). The effects of the socioeconomic, demographic and price variables mostly remained unchanged. Relative to the reference group of "labourers", we find some significant effects of occupation types on the consumption of pharmaceuticals and the other three drugs. Specifically, we find that managers, professionals and sales workers are less likely to consume pharmaceuticals; the partial effects indicate 0.7pp, 1pp and 0.7pp lower participation of managers, professionals and sales workers, respectively, compared to labourers. The effect of managers is however significant only at the 10% level. Interestingly, we do not find these three occupations to have any significant effect on the consumption of the other drugs. We also find evidence of a negative relationship of pharmaceutical drug consumption with clerical/administration occupation which we also find for ecstasy consumption. In contrast, we find a positive and significant effect of "technician and trade workers" on cannabis and speed consumption, a negative and significant relationship of ecstasy participation with those employed as clerks/administrative workers, and a positive and significant relationship of machine operators/drivers with speed participation. However, we do not find any (statistically) significant difference in pharmaceutical drug consumption in other blue collar jobs such as technician and trade workers, drivers and community workers relative to labourers.

Finally, we estimate the model with both industry and occupation indicators (Table 6). Once again the effects of the socioeconomic, demographic and price variables do not change significantly from our earlier estimates. We still find a positive and significant association of the hospitality industry with pharmaceuticals consumption but no other industry partial effects are significant this time. The industry effects for the other three drugs remain essentially unchanged. In contrast, most of the occupation effects are found to be statistically insignificant for all four drugs. However, the negative association of professionals with pharmaceutical drugs consumption and that of clerks/administrative workers with pharmaceutical and ecstasy participation remain significant.

Note that hospitality workers have been identified by previous studies as a high risk group with regard to alcohol and other drug use at the workplace (Eade 1993, Pidd *et al.* 2011). It is very likely that the easy availability and exposure to drugs in this industry influence individuals' decisions to consume. As noted earlier, social and physical availability have been found to be important determinants of alcohol consumption at the workplace (see, for example, Smart 1980, Louis 1981, Stonnenstuhl and Trice 1987, Ames and Grube 1999). According to the 2010 NDSHS, a high proportion of drug users, particularly ecstasy (55%) and speed (40%) users consume drugs in public establishments such as pubs or clubs and restaurants or cafes (AIHW 2011). As hospitality employees are exposed to greater rates of use by both fellow employees and customers, it is likely that obtaining illicit drugs is relatively easy and therefore the employee in this sector is more likely to consume.

The consumption of alcohol among managers and professionals is well documented in the literature (see, for example, Davidson and Cooper 1984, Corsun and Young 1998). It is often associated with the drinking culture as well as stressful job environment. In contrast, our findings indicate a lower probability of prescription drug consumption in such professions including other white collar occupations such as clerical and sales. This is consistent with our findings and with earlier studies that link pharmaceuticals drug use with low educational attainments (see, for example, McCabe *et al.* 2005) and blue collar jobs (Gleason *et al.* 1991). Gleason *et al.* (1991) who explored patterns of consumption of illicit drugs, including prescription drugs, in the US found that craftworkers, operatives and labourers reported a higher rate of illicit drug use. It is quite likely that pharmaceutical drugs are common in blue collar workers given that they are relatively less expensive. Also, the abuse of prescription medicine often relates to reasons other than getting high, including to relieve pain or anxiety, to sleep better and to help with concentration, or to increase alertness (see, for example, Boyd *et al.* 2006). It is very likely that such characteristics of psychopharmaceutical drugs are appealing to low skilled professions that are often more labour intensive.

Finally, the presence of endogenous sample selection is evaluated by a test of the significance of the estimated value of ρ, which essentially indicates whether the selection and participation equations are correlated (see Table 3). High, and statistically significant, extents of correlation were found in all specifications, validating the empirical approach followed in this paper.

6. Robustness Checks

As noted earlier we have used exclusion restrictions to provide additional explanatory power to our model. To test the robustness of the results to these, we estimate the following model specifications: 1) we exclude price of drug from the drug participation equation and; 2) we estimate the model without the vacancy rate variable in the selection equation. In both cases we find that the estimated parameters are robust to the specification changes (both in magnitude and significance). For example, when we drop the price of pharmaceutical drug from the participation equation, the coefficient on the hospitality variable changes from 0.132 to 0.125 and the standard errors remain unchanged at 0.058.

Further robustness checks were undertaken in terms of model specifications. Specifically, we firstly estimate the model with and without year dummies to take into account any trend or policy effects. Secondly, to allow for any potential clustering at the state level, we also estimate the model with and without state dummies. In all cases, once again our results are essentially invariant to these changes in model specification.[6] As a final test of robustness, the model was estimated with and without robust standard errors. This had only a negligible effect on significance levels.

7. Conclusion

High rates of illicit drug use in the Australian workforce are of particular concern to policymakers, as is also the case in many developed countries. Figures from the 2010 NDSHS reported that 15.8% of the Australian workforce had consumed some form of illicit drug in the 12 months prior to the survey. The most recent estimate of drug abuse-related loss of productive capacity in the paid Australian workforce was deemed at around $A11 billion

[6] Due to space constraints these results are not presented here but they are available from the authors on request.

in 2004/05, of which illicit drugs contributed around 15% (Collins and Lapsley 2008). Deaths and illnesses causing premature retirement, absenteeism from sickness or injury, and reduced on-the-job productivity were identified as the three principal ways in which drug abuse impacts on productivity.

As pharmaceutical drugs are (more) readily available, law enforcement measures are unlikely to be effective. Instead, the most effective strategy to curb the use of these drugs appears to be demand reduction. Considering that over 90% of Australian households have some form of internet connection, it is easy to see that a broader market exists that facilitates easy access to pharmaceuticals (ABS 2011). As it is difficult to control the availability and distribution of pharmaceutical drugs, other methods, such as education programs, may provide a more effective method of control. It is thus crucial to build up scientific evidence on the characteristics of the users of such drugs. Hence, the first objective of this paper was to examine the demand for non-medical pharmaceuticals. The second objective was to examine the use of such drugs in the workforce to explore any further industry and occupational differences.

We find a positive association between the consumption of pharmaceutical drugs (and the other three drugs) and employment in the hospitality industry, which contrasts with an inverse relationship in the case of the retail and finance and insurance industries. It is very likely that the easy availability and exposure to drugs in the hospitality industry influence individuals' decisions to consume.

In addition, our findings suggest that individuals employed in managerial, professional, sales and clerical/administration occupations are less likely to consume pharmaceuticals relative to labourers, indicating a clear disparity across white collar and blue collar occupations. This could be a consequence of the relatively cheaper cost of pharmaceuticals and of the nature of the physiological or psychological effects or function (such as relief from pain or anxiety, improved sleep and concentration, increased alertness) of pharmaceuticals relative to other drugs. Such characteristics of psychopharmaceutical drugs might appeal more to those individuals employed in labour intensive low skilled professions.

Our empirical analysis contributes to the small, yet growing literature in this area and will hopefully serve to stimulate further interest in this under-researched area. But arguably more importantly understanding the demographics of such drug users will hopefully contribute to policy developments for addressing misuse of pharmaceutical drugs.

Appendix

Table 1: Summary Statistics, Sample Size, 66,430; sample = all individuals aged 20-65[7]

Variable	Mean	Std. Dev.	Min	Max
Lnage	3.7099	0.3154	2.9957	4.2800
Male	0.4295	0.4950	0	1
Married	0.6621	0.4730	0	1
Single Parent	0.0680	0.2518	0	1
Preschool child	0.1492	0.3563	0	1
Aboriginal	0.0159	0.1250	0	1
Capital city	0.6433	0.4790	0	1
English speaking	0.9453	0.2273	0	1
Lnhldinc	10.5624	0.7322	6.6448	11.5984
Degree	0.2841	0.4510	0	1
Diploma	0.3552	0.4786	0	1
Year 12	0.1272	0.3332	0	1
Less than Year 12	0.2335	0.4231	0	1
Unemployed	0.0377	0.1904	0	1
Student	0.0432	0.2034	0	1
Employed	0.6428	0.4792	0	1
Other activities	0.2763	0.4472	0	1
LnPharmPr	2.8893	0.0576	2.8193	2.9916
LnCanPr	5.8056	0.1698	5.4160	6.1428
LnSpdPr	5.2252	0.5457	4.1068	6.1046
LnEcsPr	3.7104	0.3379	3.1711	4.4554
Job vacancy rate	1.2791	0.4130	0.5200	3.0200
Agriculture	0.0205	0.1418	0	1
Mining	0.0130	0.1135	0	1
Manufacturing	0.0780	0.2682	0	1
Utilities	0.0083	0.0909	0	1
Construction	0.0620	0.2411	0	1
Wholesale	0.0178	0.1323	0	1
Retail	0.0820	0.2744	0	1
Hospitality	0.0339	0.1809	0	1
Transport	0.0448	0.2070	0	1
Communications	0.0188	0.1358	0	1
Finance/insurance	0.0317	0.1752	0	1
Property	0.0852	0.2791	0	1
Pub administration	0.0711	0.2569	0	1
Education	0.0764	0.2656	0	1
Health/social services	0.1076	0.3099	0	1
Arts and recreation	0.0159	0.1253	0	1
Other Services	0.0918	0.2887	0	1
Manager	0.0898	0.2858	0	1
Professional	0.3071	0.4613	0	1
Technician/trade	0.1071	0.3092	0	1
Clerk/administrator	0.1203	0.3253	0	1
Community worker	0.0767	0.2661	0	1
Sales	0.0798	0.2710	0	1
Driver	0.0524	0.2229	0	1
Labourer	0.0559	0.2298	0	1

[7] Summary statistics of the industry and occupation indicators relate to a sample of employed individuals (sample =42,701).

Table 2: Illicit Drug Consumption: Partial Effects

	Pharmaceuticals	Cannabis	Speed	Ecstasy
Lnage	-0.030***	-0.220***	-0.080***	-0.087***
	[0.002]	[0.004]	[0.002]	[0.002]
Male	0.003*	0.053***	0.012***	0.013***
	[0.001]	[0.002]	[0.001]	[0.001]
Married	-0.011***	-0.048***	-0.018***	-0.021***
	[0.002]	[0.003]	[0.001]	[0.001]
Single parent	-0.004	0.027***	0.005**	0.001
	[0.003]	[0.004]	[0.002]	[0.002]
Preschool child	-0.010***	-0.011***	-0.006***	-0.012***
	[0.002]	[0.003]	[0.002]	[0.002]
Aboriginal	0.018***	0.026***	-0.001	-0.004
	[0.005]	[0.008]	[0.004]	[0.005]
Capital city	0.004**	0.006***	0.009***	0.011***
	[0.001]	[0.002]	[0.001]	[0.001]
English speaking	0.003	0.130***	0.039***	0.037***
	[0.003]	[0.007]	[0.004]	[0.004]
Lnhldinc	-0.005***	-0.014***	-0.000	0.006***
	[0.001]	[0.002]	[0.001]	[0.001]
Degree	-0.017***	-0.010***	-0.014***	0.002
	[0.002]	[0.003]	[0.002]	[0.002]
Diploma	-0.006***	0.001	-0.002	0.002
	[0.002]	[0.003]	[0.002]	[0.002]
Year 12	-0.012***	-0.016***	-0.011***	-0.001
	[0.002]	[0.004]	[0.002]	[0.002]
Unemployed	0.010**	0.068***	0.010***	0.016***
	[0.004]	[0.006]	[0.003]	[0.004]
Student	-0.009**	-0.003	-0.010***	0.001
	[0.004]	[0.006]	[0.003]	[0.003]
Employed	-0.004*	0.026***	0.001	0.009***
	[0.002]	[0.003]	[0.002]	[0.002]
LnPharmPr	-0.022*			
	[0.012]			
LnCanPr		0.011*		
		[0.006]		
LnSpdPr			-0.0001	
			[0.001]	
LnEcsPr				-0.007***
				[0.002]

Notes: Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Pharmaceutical Drugs: Estimated Coefficients

	Participation		Employed	
Constant	0.615	[0.709]	1.168***	[0.073]
Lnage	-0.284***	[0.074]	-0.613***	[0.018]
Male	-0.086	[0.053]	0.558***	[0.011]
Married	-0.218***	[0.037]	0.352***	[0.012]
Single parent	-0.079	[0.052]	0.084***	[0.022]
Preschool child	-0.052	[0.055]	-0.428***	[0.016]
Aboriginal	0.363***	[0.084]	-0.290***	[0.041]
Capital city	0.068**	[0.026]	0.063***	[0.011]
English speaking	-0.033	[0.129]	0.589***	[0.023]
Degree	-0.363***	[0.061]	0.664***	[0.015]
Diploma	-0.204***	[0.046]	0.401***	[0.014]
Year 12	-0.246***	[0.045]	0.176***	[0.018]
Job vacancy rate			0.117***	[0.013]
Lnhldinc	-0.000	[0.023]		
LnPharmPr	-0.284	[0.216]		
Agriculture	-0.109	[0.091]		
Mining	-0.119	[0.113]		
Manufacturing	-0.037	[0.049]		
Utilities	-0.235	[0.154]		
Construction	-0.052	[0.053]		
Wholesale	-0.145	[0.097]		
Retail	-0.091*	[0.048]		
Hospitality	0.132**	[0.059]		
Transport	0.075	[0.056]		
Communications	0.043	[0.083]		
Finance/insurance	-0.131*	[0.075]		
Property	-0.044	[0.048]		
Public administration	-0.054	[0.051]		
Health/social services	-0.010	[0.044]		
ρ	-0.301**	[0.144]		

Notes: Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 4a: Illicit Drug Consumption and Industry of Employment: Partial Effects of Socio-Economic and Demographic Factors

	Pharmaceuticals		Cannabis		Speed		Ecstasy	
	Part'n	Empl'd	Part'n	Empl'd	Part'n	Empl'd	Part'n	Empl'd
Lnage	-0.029***	-0.204***	-0.234***	-0.206***	-0.089***	-0.205***	-0.103***	-0.205***
	[0.003]	[0.006]	[0.005]	[0.006]	[0.003]	[0.006]	[0.003]	[0.006]
Male	0.001	0.186***	0.053***	0.184***	0.011***	0.185***	0.013***	0.186***
	[0.002]	[0.003]	[0.003]	[0.003]	[0.002]	[0.003]	[0.002]	[0.003]
Married	-0.012***	0.117***	-0.063***	0.117***	-0.022***	0.117***	-0.027***	0.117***
	[0.002]	[0.004]	[0.004]	[0.004]	[0.002]	[0.004]	[0.002]	[0.004]
Single parent	-0.005	0.028***	0.010	0.025***	0.004	0.027***	0.003	0.026***
	[0.004]	[0.007]	[0.006]	[0.007]	[0.003]	[0.007]	[0.003]	[0.007]
Preschool child	-0.009***	-0.143***	-0.028***	-0.143***	-0.010***	-0.142***	-0.016***	-0.143***
	[0.003]	[0.005]	[0.004]	[0.005]	[0.002]	[0.005]	[0.002]	[0.005]
Aboriginal	0.024***	-0.097***	0.029**	-0.094***	-0.002	-0.096***	-0.005	-0.095***
	[0.006]	[0.014]	[0.012]	[0.014]	[0.006]	[0.014]	[0.007]	[0.014]
Capital city	0.006***	0.021***	0.007**	0.021***	0.009***	0.021***	0.012***	0.021***
	[0.002]	[0.004]	[0.003]	[0.004]	[0.002]	[0.004]	[0.002]	[0.004]
English speaking	0.008*	0.196***	0.117***	0.202***	0.040***	0.195***	0.039***	0.197***
	[0.004]	[0.007]	[0.006]	[0.007]	[0.005]	[0.007]	[0.004]	[0.007]
Degree	-0.019***	0.221***	-0.013***	0.223***	-0.016***	0.221***	-0.005*	0.222***
	[0.003]	[0.005]	[0.005]	[0.005]	[0.003]	[0.005]	[0.003]	[0.005]
Diploma	-0.010***	0.134***	-0.007*	0.134***	-0.006***	0.134***	-0.006**	0.134***
	[0.002]	[0.004]	[0.004]	[0.004]	[0.002]	[0.004]	[0.002]	[0.004]
Year 12	-0.016***	0.059***	-0.011**	0.060***	-0.009***	0.059***	-0.003	0.060***
	[0.003]	[0.006]	[0.005]	[0.006]	[0.003]	[0.006]	[0.003]	[0.006]
Job vacancy rate	0.002*	0.039***	0.014***	0.025***	0.006***	0.033***	0.007***	0.029***
	[0.001]	[0.004]	[0.002]	[0.004]	[0.001]	[0.004]	[0.001]	[0.004]
Lnhldinc	-0.000		-0.011***		0.003*		0.011***	
	[0.002]		[0.003]		[0.001]		[0.002]	
LnPharmPr	-0.021							
	[0.016]							
LnCanPr			0.003					
			[0.009]					
LnSpdPr					-0.001			
					[0.001]			
LnEcsPr							-0.012***	
							[0.002]	

Notes: Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 4b: Illicit Drug Consumption and Industry of Employment: Partial Effects of Industry Indicators

	Pharmaceuticals	Cannabis	Speed	Ecstasy
Agriculture	-0.008	-0.003	0.006	0.007
	[0.007]	[0.011]	[0.005]	[0.006]
Mining	-0.009	-0.005	-0.002	-0.003
	[0.008]	[0.014]	[0.007]	[0.007]
Manufacturing	-0.003	0.015**	0.003	-0.000
	[0.004]	[0.006]	[0.003]	[0.003]
Utilities	-0.018	-0.025	-0.016	-0.023**
	[0.012]	[0.017]	[0.010]	[0.011]
Construction	-0.004	0.054***	0.015***	0.011***
	[0.004]	[0.007]	[0.003]	[0.003]
Wholesale	-0.011	0.019*	0.006	0.004
	[0.007]	[0.011]	[0.006]	[0.006]
Retail	-0.007*	0.007	-0.002	-0.003
	[0.004]	[0.006]	[0.003]	[0.003]
Hospitality	0.010**	0.062***	0.021***	0.026***
	[0.004]	[0.008]	[0.004]	[0.004]
Transport	0.006	0.011	0.007*	0.004
	[0.004]	[0.008]	[0.004]	[0.004]
Communications	0.003	0.044***	0.008	0.014***
	[0.006]	[0.011]	[0.005]	[0.005]
Finance/insurance	-0.010*	0.007	0.000	0.003
	[0.006]	[0.009]	[0.004]	[0.004]
Property	-0.003	0.016***	-0.001	0.002
	[0.004]	[0.006]	[0.003]	[0.003]
Public administration	-0.004	-0.013*	-0.003	-0.002
	[0.004]	[0.007]	[0.003]	[0.003]
Education	-0.007	-0.012*	-0.014***	-0.010**
	[0.004]	[0.007]	[0.004]	[0.004]
Health/social services	-0.001	0.005	0.001	0.002
	[0.003]	[0.006]	[0.003]	[0.003]
Arts and recreation	0.001	0.066***	0.015***	0.021***
	[0.007]	[0.011]	[0.005]	[0.005]

Notes: Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Illicit Drug Consumption and Occupation Types: Partial Effects of Occupation Indicators

	Pharmaceuticals	Cannabis	Speed	Ecstasy
Manager	-0.007*	-0.004	0.000	0.004
	[0.004]	[0.006]	[0.003]	[0.003]
Professional	-0.011***	-0.002	-0.000	-0.002
	[0.003]	[0.005]	[0.003]	[0.003]
Technician/trade	-0.004	0.017***	0.005*	0.002
	[0.003]	[0.006]	[0.003]	[0.003]
Clerk/administrator	-0.007**	-0.004	-0.002	-0.009***
	[0.003]	[0.006]	[0.003]	[0.003]
Community worker	0.004	-0.003	0.006*	0.004
	[0.003]	[0.006]	[0.003]	[0.003]
Sales	-0.007**	-0.008	-0.001	0.000
	[0.004]	[0.006]	[0.003]	[0.003]
Driver	0.005	0.007	0.007**	-0.004
	[0.004]	[0.007]	[0.004]	[0.004]

Notes: Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1 .

Table 6: Illicit Drug Consumption, Industry of Employment and Occupation Types: Partial Effects of Industry and Occupation Indicators

	Pharmaceuticals	Cannabis	Speed	Ecstasy
Agriculture	-0.008	-0.003	0.006	0.006
	[0.007]	[0.011]	[0.006]	[0.006]
Mining	-0.010	-0.007	-0.003	-0.003
	[0.009]	[0.014]	[0.007]	[0.007]
Manufacturing	-0.003	0.013**	0.002	-0.000
	[0.004]	[0.006]	[0.003]	[0.003]
Utilities	-0.016	-0.026	-0.016	-0.022*
	[0.012]	[0.017]	[0.010]	[0.011]
Construction	-0.004	0.051***	0.014***	0.011***
	[0.004]	[0.007]	[0.003]	[0.003]
Wholesale	-0.010	0.020*	0.005	0.004
	[0.007]	[0.011]	[0.006]	[0.006]
Retail	-0.005	0.008	-0.002	-0.004
	[0.004]	[0.006]	[0.003]	[0.003]
Hospitality	0.010**	0.063***	0.021***	0.025***
	[0.005]	[0.008]	[0.004]	[0.004]
Transport	0.003	0.008	0.005	0.005
	[0.005]	[0.008]	[0.004]	[0.004]
Communications	0.005	0.044***	0.008	0.015***
	[0.006]	[0.011]	[0.005]	[0.005]
Finance/insurance	-0.007	0.008	0.001	0.004
	[0.006]	[0.009]	[0.004]	[0.004]
Property	-0.000	0.016***	-0.001	0.003
	[0.004]	[0.006]	[0.003]	[0.003]
Public admin.	-0.002	-0.013*	-0.003	-0.001
	[0.004]	[0.007]	[0.004]	[0.003]
Education	-0.004	-0.011	-0.015***	-0.010**
	[0.004]	[0.007]	[0.005]	[0.004]
Health/social serv.	0.000	0.006	-0.000	0.001
	[0.003]	[0.006]	[0.003]	[0.003]
Arts and recreation	0.003	0.066***	0.014***	0.021***
	[0.007]	[0.011]	[0.005]	[0.005]
Manager	-0.006	-0.007	-0.000	0.003
	[0.004]	[0.006]	[0.003]	[0.003]
Professional	-0.011***	-0.002	0.001	-0.002
	[0.003]	[0.005]	[0.003]	[0.003]
Technician/trade	-0.003	0.006	0.003	-0.000
	[0.003]	[0.006]	[0.003]	[0.003]
Clerk/administration	-0.006*	-0.004	-0.001	-0.010***
	[0.003]	[0.006]	[0.003]	[0.003]
Community worker	0.002	-0.008	0.003	0.000
	[0.004]	[0.007]	[0.003]	[0.003]
Sales	-0.006	-0.008	0.001	0.002
	[0.004]	[0.007]	[0.003]	[0.003]
Driver	0.005	0.009	0.007*	-0.004
	[0.004]	[0.008]	[0.004]	[0.004]

Standard errors are given in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

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