



Are users' most recent drug purchases representative?☆



Brittany Bond^a, Jonathan P. Caulkins^{b,*}, Nick Scott^c, Beau Kilmer^d, Paul Dietze^c

^a U.S. Department of Commerce, Office of the Chief Economist, Washington, DC, United States

^b Carnegie Mellon University Heinz College, 5000 Forbes Avenue, Pittsburgh, PA 15213, United States

^c Centre for Population Health, Burnet Institute, 85 Commercial Rd, Melbourne, Victoria 3004, Australia

^d RAND Drug Policy Research Center, RAND Corporation, 1776 Main Street, Santa Monica, CA 90407, United States

ARTICLE INFO

Article history:

Received 14 April 2014

Received in revised form 3 June 2014

Accepted 7 June 2014

Available online 23 June 2014

Keywords:

Drug markets

Drug purchases

Survey methods

Marijuana

Cannabis

Injection drug use

ABSTRACT

Background: Various surveys now ask respondents to describe their most recent purchase of illicit drugs, as one mechanism through which market size can be estimated. This raises the question of whether issues surrounding the timing of survey administration might make a sample of most recent purchases differ from a random sample of all purchases. We investigate these issues through a series of questions which ask about the three most recent purchases, and about drug use.

Methods: Data were drawn from 688 respondents in the Melbourne Injecting Drug User Cohort Study across the period 2008–2013 and 2782 respondents to the Washington Cannabis Consumption Study in 2013. Responses to questions about the most recent purchases were compared to larger subsets of all recent purchases.

Results: For heroin, methamphetamine and cannabis no differences were found between the amount spent by participants on their most recent purchase and the average amount spent on three or more recent purchases. There were also no differences concerning the locations and types of deals, and the duration between consecutive cannabis purchases was the same for first and second most recent, and second and third most recent.

Conclusions: Asking about the most recent purchase appears to be an economical way to learn about purchases more generally, with little evidence of substantial variation between the most recent purchase and other recent purchases reported by participants. In spite of consistent findings across our two surveys, further replication of the work reported in this paper involving other populations of users is warranted.

© 2014 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

The harms associated with illicit drugs include those created by their distribution and sale (UNODC, 2013), so understanding the size and character of illegal markets is important (Kilmer and Pacula, 2009).

Illicit drug markets have been studied in various ways, including analyses of court documents (e.g., Mason and Bjerk, 2011; Bright et al., 2012), ethnography (e.g., Fuentes and Kelly, 1999; Johnson, 2003), analysis of seizures and undercover buys (e.g., Reuter and Caulkins, 2004; Coomber, 2006; Burgdorf et al., 2011), analysis of surveillance videos (e.g., Moeller, 2012), and surveys of drug users. Surveys can ask users how much they spent; what they bought, from whom, when, and where; how easy it was to locate a dealer

and whether law enforcement complicated that search, among other topics. Market-oriented questions have been analyzed in surveys of users in the household population (e.g., Caulkins and Pacula, 2006), street users (e.g., Hando et al., 1998), arrestees (e.g., ONDCP, 2012), web-survey respondents (e.g., van Laar et al., 2013), and high-school students (e.g., Johnston et al., 2012).

Estimating the markets' size, in terms of revenue, is of particular interest since users' spending drives economic-compulsive crime, systemic crime, impoverishment of some users, and incentives for corruption. Kilmer et al. (2011) describe four strategies for estimating markets' size; the most direct multiplies prevalence of use by population and average spending per user, meaning that accurate estimates of average spending are needed.

Some analyses (e.g., ONDCP, 2012) estimate monthly spending by multiplying the size of most recent purchase by the number of purchases made in the past-month. This raises the question of whether the most recent purchase is representative and so whether extrapolating from descriptions of most recent purchases gives an accurate understanding of purchases overall and, hence, of markets. After all, even when surveys sample users at random, they

☆ Supplementary material can be found by accessing the online version of this paper. Please see Appendix A for more information.

* Corresponding author. Tel.: +1 412 268 9590.

E-mail address: caulkins@andrew.cmu.edu (J.P. Caulkins).

do not sample purchases randomly. If because of the vagaries of sampling the most recent purchases tended to be larger than average, then the multiplication just described would over-estimate user' spending and, hence, the size of the markets. This possibility is illustrated by the following hypothetical example from ONDCP (2014):

Suppose there were a population of users who consume one gram of cannabis each day (so 30 grams per month). Suppose further that they buy an ounce once each month, and also make two additional purchases of one gram each, perhaps because they shop around before making their main purchase. An ounce is roughly 28 grams, so these three purchases add up to $1 + 1 + 28 = 30$ grams per month. If this population were surveyed about their most recent purchase and each respondent's survey date was random there would be one chance in thirty that the survey would be administered in the 24 hours following the first one-gram purchase, one chance in thirty it would be administered after the second one-gram purchase, and 28 chances in 30 that it would be administered after the one-ounce purchase and before those 28 grams run out, occasioning a new purchase. At the population level, 2 out of every 30 survey respondents would report their most recent purchase as one gram, and 28 out of 30 would report their most recent purchase as 28 grams. So the average size of the most recent purchase reported would be $(2/30) * 1 + (28/30) * 28 = 26.2$ grams. Since all respondents report making 3 purchases per month, the naïve estimate of $26.2 * 3 = 78.6$ grams purchased per person per month would be two-and-a-half times the true value of 30 grams per person per month. This phenomenon of most recent purchases being larger than typical purchases if big purchases are followed by long inter-purchase times is known as random incidence (Larson and Odoni, 1981).

There are other potential sources of bias when using only most-recent purchase data. For example, if weekend purchases tend to be larger and survey staff work Monday to Friday, then the survey may under-estimate the average purchase size. Likewise if data are collected around mid-day and drug users purchase both small "wake-up" doses and larger amounts in the evening, then most recent purchases may be smaller than average purchases. There might even be Hawthorne effects if payments made to compensate respondents for participating in the survey are large enough to influence purchasing decisions (Landsberger, 1958).

In short, assuming that the most recent purchase is representative amounts to making a strong untested assumption, yet this is a feature of some studies of drug markets. We investigate the assumption by asking respondents in two different surveys to describe a larger number of past purchases, and then comparing the most recent purchases nominated to that larger set with respect to price paid, location, and time between purchases. If biases of the sort just described are commonplace, then we would expect to observe significant differences.

Estimates of market size combine estimates of purchase size with estimates of purchase frequency. We also investigate whether the intervals between the two most recent purchases are similar to gaps between the 2nd and 3rd most recent purchase and, more generally, whether asking about multiple recent purchases offers greater insight into purchase frequency than does simply asking directly how many purchases were made within a specified period of time.

2. Methods

Data were drawn from two surveys of drug consumers in two countries.

2.1. Melbourne injecting drug user cohort study (MIX)

Since 2008, the Melbourne Injecting Drug User Cohort Study (MIX) has followed 688 people who inject drugs (PWID) longitudinally through direct interviews at roughly one-year intervals (for further details, see Horyniak et al., 2013).

Each interview asks respondents to describe their three most-recent purchases of heroin, methamphetamine, benzodiazepines and other pharmaceutical opioids. As of August 2013, more than half ($N = 351$) of the respondents had undertaken three or more follow-up interviews, although some purchase data may be missing if participants had not been using a particular drug in the month preceding the interview. As heroin is the drug of choice for the majority of respondents, the heroin purchase data are rich – for example, there are 45 instances in which a sequence of 12 heroin purchases are reported by a single individual (baseline plus three follow-up interviews times three per interview), and more generally there are 1239 instances in which a person describes the three purchases of a particular drug immediately preceding an interview (943 for heroin, 142 methamphetamine).

Key questions of interest for each purchase include expenditure in Australian Dollars and purchase location (categorized as on the street, in a house, or drop off/rendezvous with dealers' car). To enable a fair longitudinal comparison, only data from the 351 respondents with four interviews is used, and due to low reporting of consecutive benzodiazepine and pharmaceutical opioid purchases only heroin and methamphetamine purchases are considered in this paper.

2.2. Washington cannabis consumption survey (WCCS)

To help estimate of the size of the cannabis market for the Washington State Liquor Control Board, RAND created a web-based survey that included detailed questions about cannabis consumption and purchases (Kilmer et al., 2013). The survey was taken 3488 times during the ten days it was available (June 24th through July 3rd, 2013), including by 2782 respondents who reported being from Washington State, of whom 1687 reported past-month cannabis use.

As one would expect, the respondents are *not* representative of all Washington State cannabis users (Kilmer et al., 2013). For example, growers and frequent users were over-represented. This is not surprising; people with only passing involvement with cannabis may be less likely to complete the survey.

Drug reform organizations publicized the existence of the survey. This raises concerns that some respondents may have answered strategically, in hopes of influencing Liquor Control Board regulations. Kilmer et al. (2013) expended considerable effort trying to detect such individuals. They applied a range of psychometric techniques to 32 separate "risk flags" that may be suggestive of illogical, erratic, or otherwise problematic responses (see Kilmer et al., 2013, Appendix A, pp. 4–5, for further details). Relatively few respondents who answered all the purchase questions raised many flags; most of the suspicious respondents appeared to lose interest in the survey before reaching those questions. However, using an expansive definition, the analysis flagged 297 Washington respondents as potentially problematic. The analyses herein were run both with and without these 297 respondents. Results reported here are based on all respondents since inclusion of flagged respondents had no material effect on the results.

WCCS respondents were asked for several different measurements of the size of their past three cannabis purchases, including the amount spent, amount of their own money spent, weight and days' supply (466 respondents reported both the total and their own amount of money spent on their past three purchases, 330 reported the weight of their past three purchases, and 484 reported days' supply). For each purchase they were also asked the date and from whom they purchased. Additional questions of relevance include the number of purchases made in the last 30 days, an estimate of total expenditure on cannabis in the last 30 days and an assessment of the potency of the most recent purchase. The question asks "Now think back to all of the marijuana you purchased in the past 30 days. How much did you spend in total, in dollars?" It was asked late in the survey, in the explicit hope that having thought concretely about the three most recent purchases might improve the accuracy of responses to it. 322 respondents reported the date for all three past purchases as well as the estimated number of purchases made in the past month, 580 reported from whom their past three purchases were made, 447 reported both their estimated total past month expenditure and the amount spent on each of past three purchases, and 494 reported how typical the potency was of their most recent purchase.

Respondents nominated who they purchased cannabis from as either friend or family member, dealer, dispensary or other, and gave categorical responses to the number of purchases in the last 30 days of 1–3 times, 4–6 times, 7–10 times, more than 10 times or 'did not purchase'. Expenditures were all reported in US Dollars and potency was reported as either less than typical, about the same or more than typical.

2.3. Analysis strategy

2.3.1. Purchase sizes. The mean and standard error of the mean for the size of the most recent heroin, methamphetamine and cannabis purchases are compared to those of the average sizes of several recent purchases by the same individuals as follows.

Download English Version:

<https://daneshyari.com/en/article/7505924>

Download Persian Version:

<https://daneshyari.com/article/7505924>

[Daneshyari.com](https://daneshyari.com)