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Research paper

Do drug seizures predict drug-related emergency department presentations or arrests for drug use and possession?

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ABSTRACT

Background: Direct evidence of the effect of drug seizures on drug use and drug-related harm is fairly sparse. The aim of this study was to see whether seizures of heroin, cocaine and ATS predict the number of people arrested for use and possession of these drugs and the number overdosing on them.
Method: We examined the effect of seizure frequency and seizure weight on arrests for drug use and possession and on the frequency of drug overdose with autoregressive distributed lag (ARDL) models. Granger causality tests were used to test for simultaneity.
Results: Over the short term (i.e. up to 4 months), increases in the intensity of high-level drug law enforcement (as measured by seizure weight and frequency) directed at ATS, cocaine and heroin did not appear to have any suppression effect on emergency department (ED) presentations relating to ATS, cocaine and heroin, or on arrests for use and/or possession of these drugs. A significant negative contemporaneous relationship was found between the heroin seizure weight and arrests for use and/or possession of heroin. However no evidence emerged of a contemporaneous or lagged relationship between heroin seizures and heroin ED presentations.
Conclusion: The balance of evidence suggests that, in the Australian context, increases in the monthly seizure frequency and quantity of ATS, cocaine and heroin are signals of increased rather than reduced supply.

Introduction

Like many other countries, Australia, spends a large proportion of its illicit drug budget trying to stem the flow of illicit drugs (Ritter, McLeod, & Shanahan, 2013). There has been considerable debate over many years about whether this expenditure is warranted and whether more should be spent on demand or harm reduction (e.g. Crane, Rivolo, & Comfort, 1997; Rydell & Everingham, 1994; Wodak & Owens, 1996). The effectiveness of supply control measures in reducing the harm associated with illicit drugs is therefore a matter of critical importance to policy. Police and drug law enforcement agencies often present large drug seizures as evidence of their success in reducing the quantities of illicit drugs reaching the street. Without information on the total quantity of drugs being produced, however, it is impossible to tell whether a jump in the frequency or quantity of illegal drugs seized signals an increase in drug supply or a reduction.

There are two main ways in which illicit drug seizures might influence illicit drug consumption and the harm associated with it. Conventional economic theory would lead one to expect that large seizures would reduce supply relative to demand, thereby creating a scarcity of the drug and/or pushing up drug prices to the point where consumption falls. Since many of the harms associated with illicit drug use (e.g. overdose) are functions of aggregate consumption (MacCoun & Reuter, 2001), this should result in a reduction in drug-related harm. An alternative possibility; put forward by Reuter and Kleiman (1986), is known as Risks and Prices Theory (RPT). Drug importers and traffickers face very severe penalties if convicted. According to RPT, drug traffickers compensate themselves for these risks by demanding higher premiums. The higher premiums are then passed onto drug consumers in the form of higher retail drug prices, which (for reasons already given) should in turn suppress consumption and drug-related harm.

Both these models of the effect of seizures on drug related harm assume that demand for illicit drugs falls when the price of illicit

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drugs increases. Note, however, that according to the RPT model, law enforcement does not need to create a shortage or scarcity of illegal drugs. It simply has to make drug trafficking very risky. We return to this point in the discussion. For now it suffices to note that the theory has strong but indirect empirical support. In his meta-analysis Gallet (2013) found price-elasticities of demand of around −0.5 to −0.6 for heroin and cocaine and −0.2 to −0.3 for cannabis. Dave (2005) found the price elasticities associated with cocaine and heroin emergency department (ED) episodes were −0.27 and −0.10, respectively. He estimated that a 10 per cent increase in prices would prevent about 11,000 hospital visits, with savings of between $21–47 million. The evidence presented here counts against one of the two commonly advanced pillars on which supply control policy rests but it does not count against the other.

Direct evidence of the effect of seizures on drug use and drug-related harm, however, is fairly sparse. In their review, Mazerolle, Soule, & Rombouts (2007) identified four studies which examined the specific impact of supply control initiatives on drug use and drug related harm (Rumbold & Fry, 1999; Smithson, McFadden, Mwesigye, & Casey, 2004; Weatherburn & Lind, 1997; Wood et al., 2003). Three of these studies (Rumbold & Fry, 1999; Weatherburn & Lind, 1997; Wood et al., 2003) found no effect of drug seizures on drug use patterns, drug-related deaths or overdoses, treatment enrolment or rates of crime and arrest. Only one, Smithson et al. (2004) found substantial effects from seizures. Smithson et al. (2004) observed that the decline in heroin supply in the Australian Capital Territory from July 1996 to April 2002 reduced non-fatal overdoses and crime, and increased entry into methadone treatment. The period over which their study was conducted straddled the Australian heroin shortage. This was an exceptional event. To date, therefore, the evidence to suggest that larger or more frequent seizures reduce drug consumption and drug related harm is fairly limited.

Absence of evidence is not the same thing as evidence of absence. Research on the effects of drug seizures is not so voluminous as to put those effects beyond doubt. The aim of the current study was to examine the impact of seizures on two measures of use/harm: (i) arrests for drug use and possession, and (ii) drug-related emergency department presentations. We focus on three drugs: heroin, cocaine and amphetamine type substances (ATS). These drugs were selected because seizures of them are sufficiently frequent and variable to permit an examination of their effects. Our study improves on past research in two ways. Firstly, rather than infer changes in consumption and harm from changes in drug price, purity and availability, we measure consumption and harm through ED presentations for drug overdose, drug use and possession arrests. Arrests for drug use and possession (UP arrests) have been shown in past research to be strongly correlated with ED presentations for heroin, ATS and cocaine use (Moffatt, Wan, & Weatherburn, 2012; Nordt & Stohler, 2010; Rosenfeld & Decker, 1999). In their analysis of the first differenced monthly time series relationship between ED admissions and UP arrests for narcotics, cocaine and ATS over the 10 year period between January 1999 and December 2009, for example, Moffatt et al. (2012) found significant positive correlations for all series at lag zero. UP arrests have the advantage (particularly in the case of cocaine and ATS) of being more frequent than ED presentations. Secondly, two of the four previous studies of the effect of drug seizures on drug markets have restricted their attention to one seizure (Rumbold & Fry, 1999; Wood et al., 2003). In this study we examine all significant seizures of heroin, cocaine and ATS in New South Wales (NSW) over a 10 year period (from July 2001 to June 2011). NSW is Australia's largest state, with a population of 7.2 million. In 2013/14 NSW accounted for 43.7% (by weight) of heroin seized, 68.9% of all cocaine seized and 51.3% of all ATS seized (Australian Crime Commission, 2014). The Australian Crime Commission refers to arrests for use and/or possession as 'consumer' arrests. In the 2013/2014, NSW accounted for 24% of all ATS consumer arrests, 42% of all heroin/opioid arrests and 58% of all cocaine consumer arrests (Australian Crime Commission, 2014).

One of the challenges in evaluating the effect of drug seizures is that we have no reliable information on the total quantities of heroin, cocaine and ATS being imported or produced. This makes it difficult to gauge how large any given drug seizure is, relative to the flow of heroin, cocaine and ATS into the market. Matters are made more complicated by the fact that a string of moderate-sized seizures (especially if accompanied by significant arrests) may be more disruptive to a drug distribution network than one very large seizure. It is possible, then, that the number of seizures (above a given threshold) exerts more effect on the availability or price of an illicit drug at street level than the quantity of drugs seized. Our approach in the current study is to examine both the number and quantities of heroin, cocaine and ATS seized and to base our analysis of quantity on what the law regards as a 'commercial' seizure. In what follows we explain our approach in more detail.

Method

Data

The dependent variables in this study are the monthly number of emergency department (ED) presentations for heroin, cocaine and ATS and the monthly number of arrests involving narcotics, cocaine and ATS use and possession. For each of the three drugs of interest (heroin, cocaine, ATS) we examine the direction and strength of the relationship between two independent variables (the number and weight of drug seizures) and two dependent variables (the monthly number of ED presentations and the monthly number of UP arrests). The question we seek to address is whether there is an inverse (contemporaneous or lagged) relationship between the monthly number and monthly total weight of a drug seized and either (a) the monthly number of arrests for possession and use of the drug and/or (b) the monthly number of ED presentations associated with the drug.

Data on monthly drug seizures were obtained from the National Illicit Drug Reporting Format (NIDRF) system maintained by the Australian Crime Commission. Data on monthly UP arrests were sourced from the NSW crime and operational policing system (COPS) database. Data on heroin, cocaine and ATS ED presentations were obtained from the NSW Department of Health. The ED data is based on diagnosis codes recorded in the "Presenting problem" and "Final problem" fields. These are entered by the Emergency Department clinician (typically the responsible medical officer) following their assessment. Their diagnosis is based on all available information, including history, examination, and laboratory testing where this was available.

Treatment of seizure data

There is no standard threshold which defines a seizure large enough to affect the market for a particular drug. If we set the threshold too low we risk including seizures that are far too small to have affected the availability of drugs. If we set it too high we risks missing seizures large enough to have impacted the market. We defined a seizure for the purpose of this study as a quantity of heroin, cocaine or ATS that lay in the top 20% of the distribution of heroin, cocaine or ATS seizures by weight. The mean weight of seizures at or above these thresholds in each of the three drug type categories examined (along with the standard deviations) was:

- Heroin 173.46 g (s.d. = 2129.48 g)
- Cocaine 267.13 g (s.d = 1825.71 g)
- ATS 326.69 g (s.d. = 4146.59 g)