



## Examination of heroin and amphetamine purity in Victoria

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### Rationale

One key parameter of the heroin market available for DPMP is the purity of illicit drug seizures made by the Victoria Police and analysed by the Victorian Forensic Sciences Centre. To date the information derived from this purity data has not been systematically examined in Victoria. The aim of this component of the research was to examine the purity series available for heroin and amphetamines in detail, with a view to determining the nature of heroin seizure purity changes in the context of the change in heroin supply known as the heroin 'drought' and whether they are sensitive to assumed changes across the chain of drug supply. During the period immediately around the drought we consider the changes in purity at both the wholesale and retail levels and how the markets recovered in the period after the drought. Through comparisons with the supply in the market of methamphetamine we consider the impacts on this market and evidence for one of the possible substitution effects that may have occurred.

### Approach

All seizures of heroin and methamphetamine by Victoria Police have been analyzed and collated by the Victorian Forensic Sciences Centre since 1998. Following analysis, the characteristics of the seizures are entered onto a database managed by the VFSC. We used data collected across the period January 1st 1998 – August 24th 2003. Each item on the database of seizures contains information on the type of drug, purity of the sample, number of packages within which the drugs were contained, total mass and an assessment of the "form" of the seizure e.g. powder (amorphous) or powder (compressed).

We compared trends separately for "retail" and "wholesale" quantities. There are no standardised transaction sizes for illicit drugs – we have chosen less than 1g; 1-10g and greater than 10g as the units for analysis.

Purity of illicit drugs is often highly variable (Reuter and Caulkins, 2005). Victorian heroin and methamphetamine are no different in this regard, so plotting the purity of every individual observation over time gives a noisy time series. Plotting a measure of the central tendency is more informative, and medians are preferred to averages since they are less sensitive to outliers. The method of smoothing that we used was to create a series of rolling medians.

### Key findings

Figure 1 shows the 2-week rolling median purity for seizures of heroin <1g over the period 1998-2002. Purity was stable in 1998 at 70-75%. Purity declined fairly steadily from ~75% to ~40% during 1999 and 2000. Purity fell precipitously at the onset of the heroin drought in the beginning of 2001, then fluctuated during 2001 before stabilising in 2002 at around 20%, or roughly half the pre-drought level.

Neither before nor after the drought was there any indication that purity was lower for smaller seizures than for larger seizures. This is demonstrated in Figure 2, a plot of the 2-week rolling medians for seizures of <1 gram and for 10-100 grams, as well as individual plotting points for seizures of >100 grams. Purity for larger seizures follows broadly the same pattern of decline and slight recovery as those observations of <1g.

It is perfectly clear from the preceding data that something (the drought) abruptly reduced heroin purity around the end of 2000 and beginning of 2001. It is also perfectly clear that 2002 purity levels remained well below those in 2000. The period of the drought at the beginning of 2001 shows a marked decline in the purity of heroin in our data set. In looking at the period from 2001



onwards, the purity of heroin remains lower than might be expected. There is a question as to whether this is a true impact of the drought or whether it is purely an effect of the downward trend of purity observed in the preceding years.

Figure 3 shows a fitted trend line extrapolated from the period before the drought (October 2000) through the following years against the actual median values over that period. Whilst there is a clear depression during 2001, by March 2002 the purity levels are what would be expected if the overall decline had continued.

In looking at the methamphetamine market, there was no dramatic change associated with the period around the heroin drought. Again however, it is worth considering whether this is a "real" impact of the heroin drought or whether this is a continuation of the trend of increasing purity in the market. Figure 4 shows the 8 week rolling median and the trend line extrapolated from September 2000 over the following years, whilst 2001 shows values.

### Implications

The findings of this study highlight the changes in heroin and methamphetamine seizure purity evident in Victoria over the period 1999-2002. Clearly, the data source used in the study, a high-frequency series of all seizures made by Victoria Police can provide important insight into one key parameter of the illicit market for the drugs considered, heroin and methamphetamine. The key conclusion from the study is that heroin seizure purity changed dramatically around the time of the onset of the heroin drought and this change appears to have been sustained in the longer term with a more volatile market evident in Victoria in terms of heroin purity. There were few corresponding changes in the purity of methamphetamine seizure purity evident in the data that could be reasonably attributed to the heroin drought with the magnitude of changes reflecting changes occurring at other points in the time series. Finally, the analysis suggests that there is little adulteration or 'cutting' of heroin once

it enters Victoria with little difference recorded in purity across different seizure sizes.

### Research team

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Figure 1: Two week rolling median <1g heroin with 25th and 75th percentiles 1998 – 2002

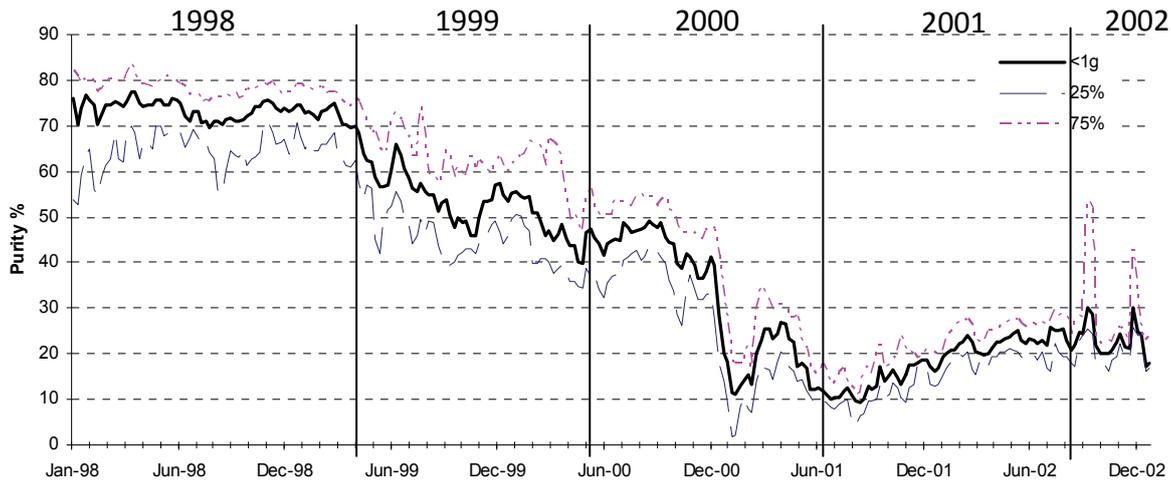


Figure 2: <1g and >10g 2 week rolling median for purity 1998 – 2002

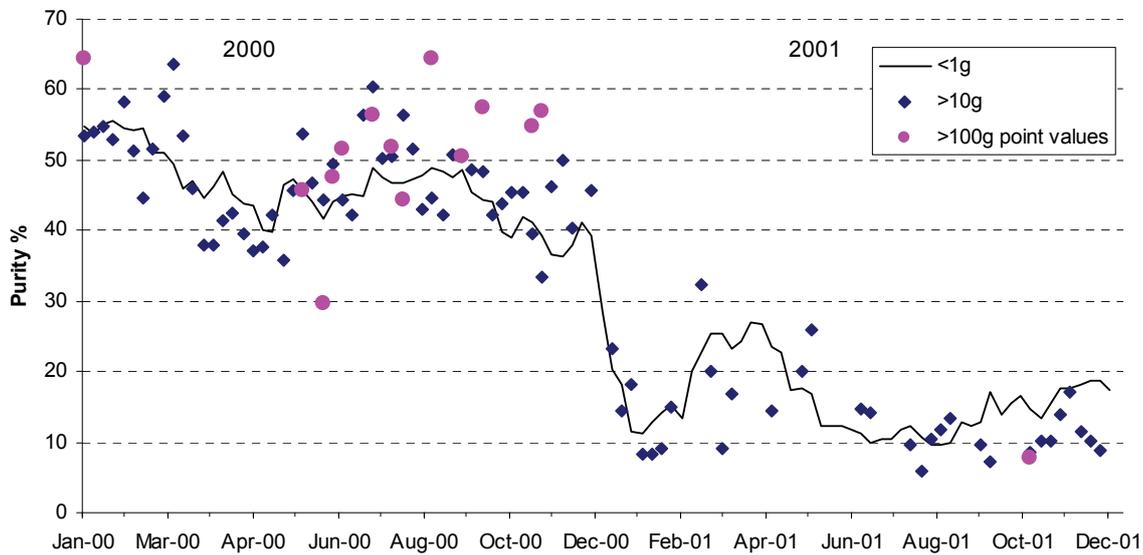




Figure 3: Two week rolling median <1g heroin 1999-2002 with fitted trend line

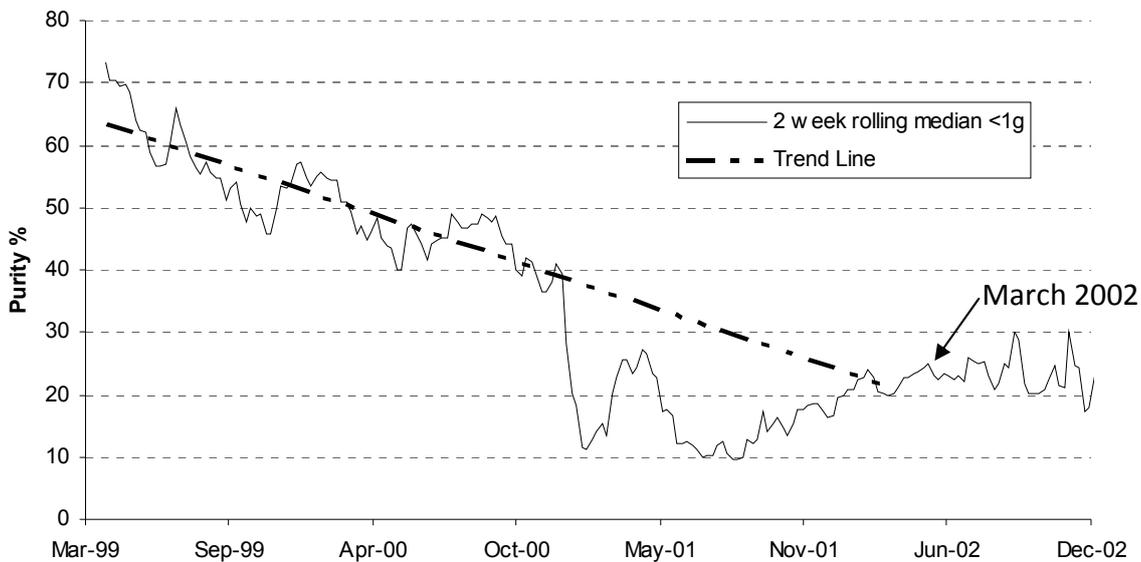


Figure 4: Eight week rolling median methamphetamine <1g 2000-2001

