WA Drug Strategy
Occasional Paper Number 7

The Criminal Careers of Drug Offenders in Western Australia:

A study of the recidivism and criminal history of those arrested for a drug offence in Western Australia between 1989 and 1999

crime
RESEARCH
centre

G M Valuri
D Indermaur
A M Ferrante

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Crime Research Centre
University of WA

and

Drug and Alcohol Office
Department of Health

University of Western Australia

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Executive Summary

This research is designed to explore and document the offending patterns of drug offenders in Western Australia. It is based on an analysis of all persons arrested for drug offences in Western Australia for the period 1989 to 1999.

The study includes both an analysis of the arrest history of such offenders and estimates of the likelihood of being arrested again. Estimates of the likelihood of re-arrest (recidivism) are based on the known re-arrest rates of the identified offenders. One aim of the current project was to establish a database that would assist in investigations concerned with the recidivism and rehabilitation of drug offenders. This data can be used as a baseline against which special groups of offenders could be matched and assessed, for example referrals to drug courts, those cautioned and persons dealt with by way of expiation for minor drug offences.

To achieve the aims of the research a special drug offender database was created. This database was created from the Crime Research Centre's (CRC) longitudinal apprehension database which contains records of all persons charged by the police in Western Australia from 1984. For this research, a 'drug offender' was defined as any offender who was arrested for at least one drug offence during the period 1989 to 1999, where this offence was one of the three most serious offences for any type of offence recorded.

There were a total of 216,810 offenders in the apprehension database for the period 1989 to 1999, and of these 52,501 offenders met the criteria as a 'drug offender'. There were 10,116 offenders whose prior arrest occurred before 1984 and thus the nature of the charge was not apparent. These offenders were excluded from our analysis as it was not possible to be sure of the nature of their prior offence history.

The current research was primarily interested in determining whether there are meaningful distinctions between the different types of drug arrestees in terms of the chances of subsequent re-arrest in the period 1989 to 1999. The investigation involved the grouping drug offenders into three mutually exclusive groups based on their prior arrest records, as follows:

- Group 1 (ie the least criminal) contained all those arrestees who had no prior arrests for any offence;
- Group 2 contained those arrestees who had prior arrests for only drug offences; and
- Group 3 (ie the most criminal) had a prior arrest for at least one other non-drug offence.

There were a total of 42,385 individuals arrested for one or more drug offences in Western Australia between 1989 and 1999. Of these, 20,821 (49.1%) had no prior arrest history (Group 1), 678 (1.6%) had prior arrests for drug only offences (Group 2) and 20,886 (49.3%) had arrests for at least one non drug offence (Group 3). Most of the drug offenders were male, with Aborigines making up a relatively small number of the overall group (5.9%). Offenders in Group 3 were generally older than those in the other drug groups – 76.2% were aged 21 years old or older at their first arrest compared with 44.1% of those in Group 1.

Using a mathematical technique known as "survival analysis" the probability of re-arrest (p) for each of the three groups was estimated. These estimates are the likelihood that members of a certain group will ever be re-arrested. The results show that the probability of re-arrest was 50% for Group 1, 63% for Group 2 and 77% for Group 3.

This means that these results suggest that drug offenders with no prior record represent the least risk in terms of re-offending and those drug offenders with prior non drug offences represent the greatest risk.

The report contains detail on more specific types of drug offences. For example, the chances of a 'cannabis user offence' re-offending are almost half that of the general group of drug offenders. For cannabis user offences the chances of re-offending to any other type of drug offence is 0.20 compared to 0.37 for all drug offenders taken together.

The recidivism rates of the three drug offender groups can be compared to the risks of re-offending of the general population. The re-arrest estimate for offenders with no prior records in the general population is 0.49 and for arrestees with prior records is 0.84. The figures for drug offenders are very similar. From this study of drug offenders, the probability of re-arrest for arrestees with no prior records is 0.47 and for arrestees with prior records it is 0.76.

Recidivism estimates can also be calculated for shorter and more defined periods which are usually those needed and preferred by policy-makers and practitioners. Estimates were calculated for re-arrest at 1, 2 and 5 years after the first drug arrest for the three drug offender groups.

Drug offenders with no priors had re-arrest estimates of 0.21 at 1 year, 0.30 at 2 years and 0.41 at 5 years. For drug offenders with at least one non-drug prior offence the estimates are 0.45 at 1 year, 0.57 at 2 years and 0.70 at 5 years.

It is clear from the results that the three qualitatively distinct groups are meaningful categories and provide a neat continuum in terms of the probability of re-arrest. These results support the view that drug offenders with a prior history for a non drug offence represent a more serious group of drug offenders. Treatment and sentencing services should consider this in their approaches to drug offenders.

The analysis shows much lower risks of re-offending of certain groups, particularly cannabis user offences and therefore suggests that drug offenders should not be considered as a homogeneous group, but defined in terms of their chances of re-offending. This may mean, for instance, that intervention resources could be conserved by focusing on those groups where there are indications that recidivism can be reduced.

1 Introduction

This research is designed to explore and document the offending patterns of drug offenders in Western Australia. It is based on an analysis of all persons arrested for drug offences in Western Australia for the period 1989 to 1999. The study includes both an analysis of the arrest history of such offenders and estimates of future offending (recidivism)[1]. This endeavour to uncover what we know about drug offenders' criminal "careers" was pursued with an interest in both policing practice and drug offender behaviour. Information on the expected recidivism of drug offenders also has implications for the courts and evaluations of criminal justice interventions.

Offenders arrested for drug offences between 1989 and 1999 were grouped into the following three mutually exclusive groups based on their prior arrest record:

- no prior arrests for any offence (group 1);
- prior arrests for only drug offences (group 2); and
- prior arrests for mixed offence types (group 3).

The current research is primarily interested in determining whether there are meaningful distinctions between the different types of drug arrestees in terms of the chances of subsequent re-arrest. It is possible that drug arrestees are most meaningfully viewed simply as a subset of the offending population. One reason for suspecting this is the well documented widespread use of drugs in the offending population. The assumption that there is a group of offenders that can be meaningfully labelled "drug offenders" rather than just "offenders" thus needs to be critically examined and forms part of this study.

By examining what, on the available records, may be our best "estimate" of three qualitatively distinct groups of drug offenders, we may see what degree of variation or difference exists in the recidivism pattern of these three groups and how they differ from general offenders. If no significant differences are found, this may suggest that indeed, judging by recidivism patterns, there is no difference between the groups. Further investigation of the demographic differences between the groups may help support this view. The question would then be clearly with those arguing for a functional difference to explain how, and in what ways, these groups are different, apart from their actual pattern of charges.

The study thus focused around four key research questions:

1. Having formed three mutually exclusive groups on the basis of prior arrest records, will these groups exhibit significantly different estimates of the probability of re-arrest? Those with no prior records are expected to be associated with the lowest rates of recidivism and the group with prior arrests for mixed offences should have the highest likelihood of re-arrest.
2. What proportion in each group are subsequently arrested? Further, what is the nature of the subsequent arrest? What proportion will be arrested for drug offences (only) and what proportion will be arrested for a variety of offences?

[1] Recidivism refers generally to re-offending and is frequently measured by one of the following proxy measures of offending: arrest, conviction or imprisonment. Although most actual offending will not result in any of these outcomes, in terms of numbers, the number of offenders arrested will come closer to the "true" figure and thus provides a more accurate measure of re-offending.

3. How does the estimated probability of re-arrest for a subsequent drug offence differ according to the nature of the drug associated with the first drug charge? For example, are those offenders arrested for heroin use more likely to be re-arrested for more drug offences than those initially arrested for cannabis use?

4. Is there a group of drug offenders for whom there is a pattern of increasing seriousness of subsequent charges? In particular, is any particular group more likely to graduate from "usage" offences to "trafficking" offences or from a "soft" drug like cannabis to a "hard" drug like heroin?

1.1 Limitations

There were some important limitations to this study:

1. In terms of the "official" criminal history of offenders, the research had access only to Western Australian data. This factor is not nearly as significant as the fact that offending history is itself only an imprecise indicator of past criminal activity, as most criminal activity will not come to the attention of the authorities. Nevertheless it remains possible that an offender with a substantial criminal record in another state will be recorded as having "no priors" if they had not also been previously arrested in Western Australia.

2. The database of police apprehensions has good detail as far back as 1984. Prior to 1984 we only know that an offender had been arrested but the nature of the offence is unknown. The absence of any details of the nature of the arrest prior to 1984 means that it is not possible to determine whether the offender falls into our group 2 or 3. To overcome this, in all analysis which considers prior arrest history, these cases are excluded.

3. Previous interrogation of the drug arrests in Western Australia has found that during the mid - 1990s the proportion of drug charges where the type of drug is listed as "unspecified" increased from 2-3% in 1990 to 15-20% in 1997. This may have some effect on that part of the analysis that concerns examining differential patterns of drug arrests – that is, it will not effect examination of whether offenders have been rearrested, the rate of re-arrest or even the type of drug charge (trafficking or using) but it will affect (slightly) the type of drug associated with the arrest.

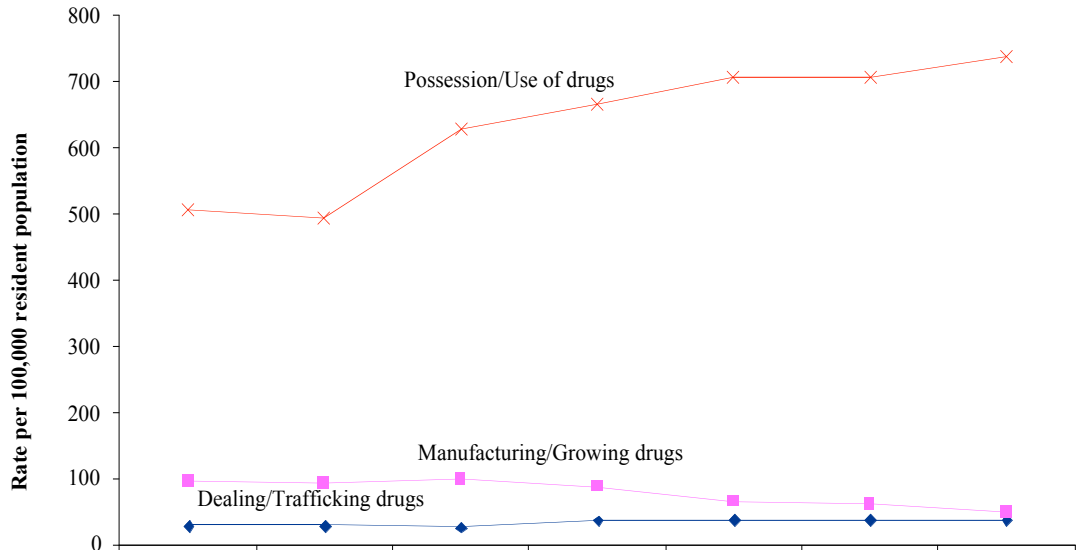
4. Charges relating to the importation of drugs are not described in any detail, as these are charges laid by customs, immigration and other Federal agencies, rather than by the WA Police Service. However, as the number of such charges laid each year is small, the impact of their omission on our analysis is considered to be negligible.

2 Background

2.1 Drug offences and drug offenders in Western Australia

Since 1994, the number of drug offences recorded by the WA Police Service has varied as shown in Figure 2.1. The largest category of drug offence shown in this figure ("possession/use") is the only category that shows an increase (primarily between 1995 and 1998). This category combines those offences associated with the use and consumption of drugs including possession of an implement for the use of a drug. While some younger offenders are cautioned for the less serious drug offences, the majority of offenders are charged by the police and must appear before the courts. In 2000, 15,581 drug offences were recorded by the WA police. These offences consisted of possession/use of drugs (89.2%), manufacture/grow drugs (6.1%) and deal/trafficking drugs (4.6%).

Figure 2.1 Rate[2] of drug offences (per 100,000 resident population) in Western Australia 1994- 2000[3]



	1994	1995	1996	1997	1998	1999	2000
Deal/traffic	31.0	30.2	28.6	38.3	39.5	39.0	38.3
Make/grow	97.9	93.7	99.7	89.0	67.2	62.7	50.6
Possess/use	507.3	495.3	629.3	667.7	708.5	707.6	738.2

Years

[2] The Australian Bureau of Statistics Estimated Resident Population figures for WA were used to calculate the rates in this report.

[3] Data sourced from the WAPS Offence Information System and subject to caveats described in Appendix A. Drug offences were first recorded in this system in 1994. Prior to 1994, information about drug offences could only be obtained from the WAPS P18 Apprehension System, which records details of all charges laid by the police whether by arrest or via summons.

As shown in Figure 2.1, a major distinction lies between the voluminous "use" offences and the much less common "dealing/trafficking" and "manufacture/growing drugs" groups. The latter offence groups will simply be referred to under the generic title of "trafficking". Earlier research conducted by Indermaur and Ferrante (1998), which reported on drug crime in Western Australia between 1990 to 1997, pointed out the distinction between using and "trafficking"[4] as well as the second major distinction that dominates the landscape of drug crime, namely the type of drug. The drug involved in over 90% of all charges was cannabis. Cannabis use offences were found to account for about three in four drug charges. There is little doubt then that when we are looking at a database of drug charges, we are mostly looking at charges for the simple possession or use of cannabis.

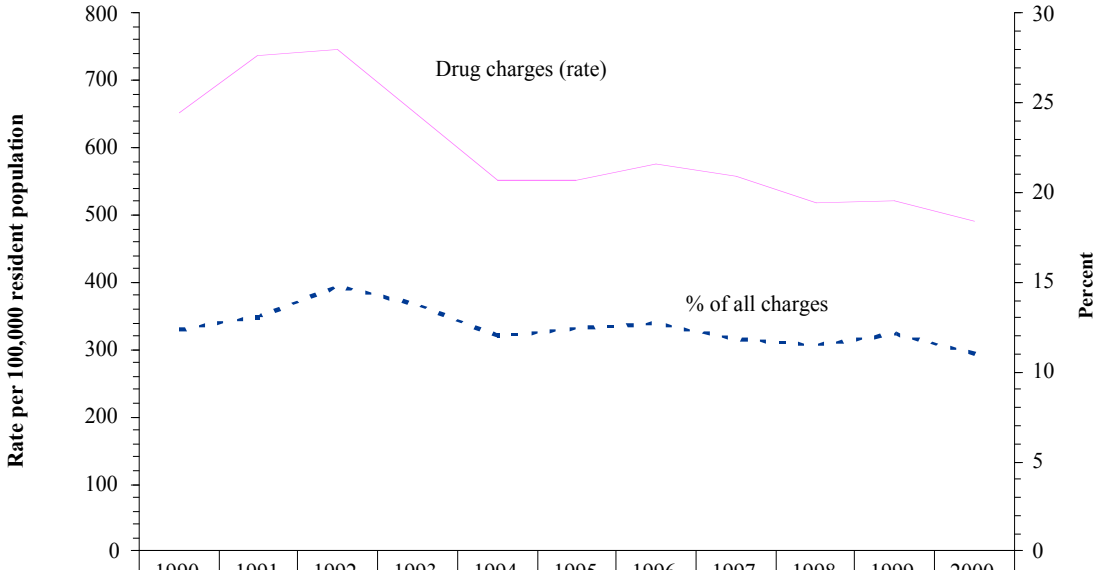
Figures 2.2 and 2.3 illustrate trends in drug charges from 1990 to 2000. An important difference between these figures and Figure 2.1 is that Figure 2.1 is calculated on drug offences. Figures 2.2 and 2.3 suggest that as a proportion of all charges, drug offences comprised 11% in 2000 and this proportion has not varied much since 1990.

Taken together these trends suggest that the peak in 1992 in the rates of drug charges is explained partly by a slight escalation in the rate of drug charges over and above the generally higher rate in recorded charges for all criminal offences in 1992. As shown in Figure 2.3 possession/use type offences have made up about 80% of all charges from 1990 with little variation from year to year and the 1992 peak is observed for both possession and trafficking charges.

One possible reason why drug use offences may be increasing whilst drug charges are remaining stable is the introduction of police cautioning of minor cannabis charges which make up the majority of drug charges. Future research may be able to test this hypothesis by directly comparing drug charges with the record of drug offences.

[4] That paper pointed out that "use" offences accounted for about 80% of all charges (and all recorded offences)

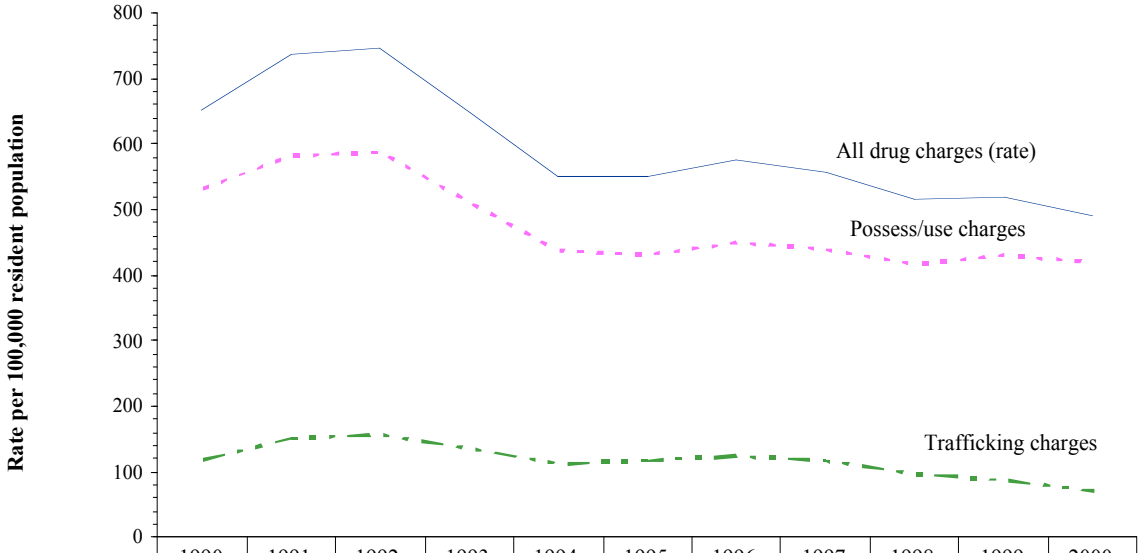
Figure 2.2 Trend in drug charges in WA, as rates per 100,000 resident population and as percentage of all charges laid, 1990 to 2000.



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Drug charges (rate)	653.0	736.0	747.4	648.5	552.0	550.8	576.3	558.5	516.8	519.9	492.2
% af all charges	12.4	13.1	14.8	13.8	12.0	12.5	12.7	11.9	11.5	12.2	11.0

Year

Figure 2.3 Trend in drug charges in WA by broad offence category, 1990 to 2000.

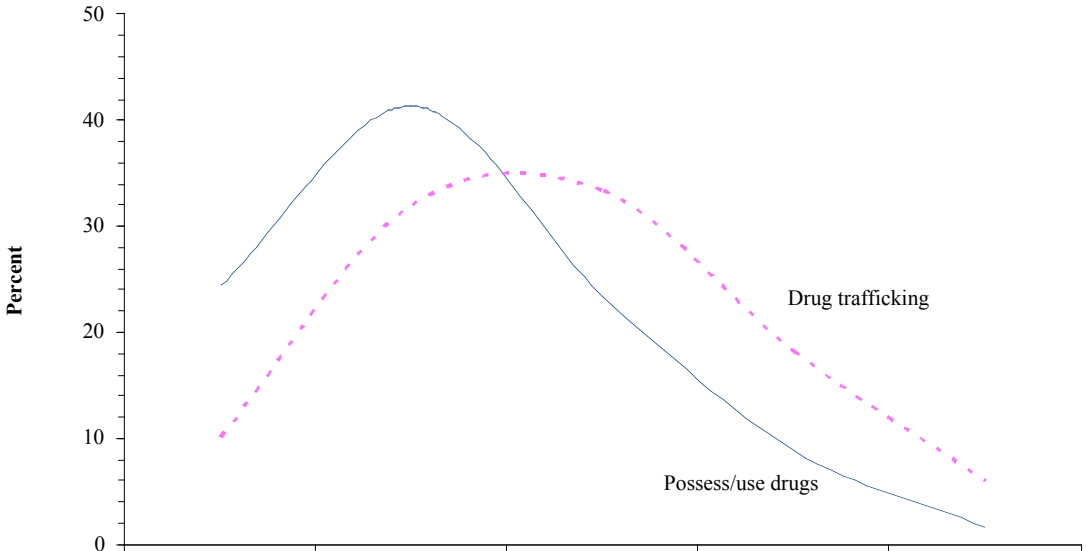


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
All drug charges	653.0	736.0	747.4	648.5	552.0	550.8	576.3	558.5	516.8	519.9	492.2
Possess/use charges	533.4	583.6	588.8	512.3	438.6	432.2	451.2	440.7	418.6	431.7	420.4
Trafficking charges	119.5	152.4	158.6	136.2	113.4	118.6	125.1	117.8	98.1	88.2	71.8

Year

Indermaur and Ferrante (1998) found that about 85% of drug offences are committed by males. Most (62%) offenders are under the age of 24 (87% under 34) and about a quarter under the age of 18. The youth effect is evident in Figure 2.4 which illustrates the age specific rates in terms of the two major types of drug arrest. This figure illustrates the slightly less pronounced and later peak age of arrest for trafficking offences. A similar analysis of more recent data (from 1999) reveals similar age distribution patterns for drug trafficking and using offenders.

Figure 2.4 Proportion of drug offenders in each age-group by type of drug offence, 1995.



	<18	18-24	25-34	35-44	45+
Possess/use drugs	24.5	41.4	23.5	8.9	1.7
Drug trafficking	10.2	32.1	33.4	18.2	6.0

Age group

Indermaur and Ferrante (1998) also found that offenders without a prior record appear to have consistently accounted for about one quarter to a third of both users and traffickers. Although it might be thought that traffickers are much more likely to have a criminal record than users, this is not borne out by this indicator. However, it may be that the 70% of traffickers with a criminal record have a more serious and/or a more extensive criminal record than the 70% of users that have a criminal record.

3 Other research on the recidivism of drug offenders

Discussions of the recidivism of drug offenders are usually contained in the literature on attempts to evaluate the success of one form of treatment or disposition in the sentencing. The second body of literature that provides explanations of drug offenders' recidivism is the more prosaic investigation of the criminal careers of drug offenders. The current research clearly falls into the latter category but with direct implications for the former.

3.1 Explorations of recidivism as part of evaluation efforts

An example of the investigation of the recidivism of drug offenders that was undertaken as part of an attempt to evaluate the efficacy of treatment interventions is the study of Benda, Toombs and Whiteside (1996). This study examined the recidivism of 792 boot camp graduates in Arkansas. Recidivism was operationalized with two measures taken after 6 and 12 months from graduation. The two measures were: (a) the number of months in the community after graduation from boot camp, and (b) return to the Department of Corrections after graduation from the boot camp (yes versus no). Several demographic predictors were examined with ordinary least squares regression and logistic regression. The primary predictors of recidivism were the type of offence(s) and the number of infractions at the boot camp at twelve months. None of the predictors, however, accounted for much variance in the fairly crude measures of recidivism that were employed.

Another example is provided by Kim, Benson, Rasmussen, and Zuehlke (1993) who explored the determinants of recidivism among drug offenders in Florida. Kim et al (1993) found that that drug offenders appeared to respond to the incentives and constraints created by the criminal justice system. However, since drug offenders who commit other crimes are more likely to re-offend than other drug offenders, the study also implies that it may be appropriate to consider drug offenders who are not committing other crimes separately in empirical modes of criminal justice decision-making.

Spohn, Piper, Martin and Frenzel (2001) used 12 separate indicators of recidivism in an elaborate statistical analysis of recidivism rates of drug court graduates compared to a matched control group. They found mixed results. Drug court participants had substantially lower levels of recidivism compared to general offenders but somewhat higher levels of recidivism than other offenders assigned to the diversion program. This pattern of results was found with almost all their recidivism measures. Differences between drug court and diversion program participants disappeared when the offender's assessed level of risk (LSI score) was controlled, but that the differences between drug court participants and traditionally adjudicated drug offenders remained when only offenders with no prior felony convictions were considered. In their conclusion the authors note the short follow-up period (offenders were only tracked for twelve months) - a factor that considerably restricts this type of analysis.

In their evaluation of drug courts, Peters and Murrin (2000) used a measure of recidivism that plotted the rearrest of drug court graduates and a comparison group over a 30 month period. The statistic used for comparison was the average number of arrests per 100 offenders at 12 months and 30 months following the program start date. Peters and Murrin also calculated the average arrest rates in terms of different types of offence and then used a chi-square test to compare between the treatment group and the comparison group. Although this measure

provides some indication of outcome, 30 months may still be considered a limited follow up time and a superior evaluation could be achieved with a survival analysis that allows a longer and variable follow-up period. Peters and Murrin also compared the curves created by the re-arrests of the two groups over time. This method involves using a plot of the survival rate – obtained by plotting the proportion not arrested over a 30 month period. Peters and Murrin compared the shape of the curves between the treatment and comparison groups using a Wilcoxin Gehan statistic to show that program graduates were significantly less likely to be arrested.

The assessment of recidivism is part of the growing field of risk assessment. In a recent article Silver, Smith and Banks (2000) assess various recidivism prediction mechanisms and provide an indication of how the measures vary in terms of the expected recidivism. This group of researchers were attempting to test the utility of an iterative classification procedure for constructing risk screening devices. These authors found that the iterative procedure performed very well and along with a range of associated literature (e.g. Taylor, 1999) point to the value of the emerging field of risk assessment.

Hepburn and Albonetti (1994) conducted one of the most sophisticated analyses of the recidivism of drug offenders. Hepburn and Albonetti found that the method of intervention with drug offenders made little difference on measures of recidivism. The most powerful predictors of recidivism were the well known socio-demographic factors of ethnicity, age and prior arrest record. Their investigation was aimed at assessing the relative value of the sort of intervention that is invoked by drug courts as an alternative to the incarceration. This intervention involves either probation or bail with the condition of drug treatment and robust monitoring of drug use. Hepburn and Albonetti wanted to test the long term deterrent effect of such an intervention. For their study the researchers collected data on 718 probationers in Birmingham, Alabama. Most of the offenders were male African Americans and the average age was 27 and most had a prior arrest (as would be expected of probationers). For their analysis Hepburn and Albonetti used a non-parametric life table analysis followed by regression equations.

Hepburn and Albonetti's findings indicate that compared to large demographic factors such as race, age and sex, the effect that could be attributed to treatment interventions account for very little of the variance in re-offending rates. What this means is that drug re-offending continues to follow its natural course along the lines determined by the major demographic groups. However, more research is needed to understand the effectiveness of drug court interventions within these large groups. For example, are drug court interventions relatively more effective with Whites than Blacks? If this is the case then alternative or more intensive interventions may be required for specific socio-demographic groups. Such recidivism studies thus can be valuable in pointing out the necessity for programs tailored to specific groups. It should also be remembered that in terms of testing the effectiveness of interventions such as those associated with the drug courts, the recidivism rates need to be compared to the major alternative intervention: imprisonment.

While Hepburn and Albonetti's findings raise questions about the efficacy of drug court interventions, there have been many studies which find positive effects from drug court interventions. For example, Belenko's (1998) review of drug courts noted that eight of the nine studies reported lower recidivism rates for drug court clients. However Belenko was critical of the quality of many studies noting that most of the studies did not contain comparison groups and did not contain adequate follow up periods. These two limitations are

the most common limitations of studies attempting to evaluate the relative effectiveness of criminal justice interventions. Although it is not within the brief of the current research to examine these studies in any detail, it is relevant to note that apart from the often minimal treatment provided in many jurisdictions as part of the drug court intervention, many of the measures of recidivism are also limited by small numbers, skewed samples and/or limited observation periods. These limitations mean that less than ideal mathematical models of recidivism are introduced. To enable more meaningful evaluations a broad measure of drug offender recidivism is needed.

In Australia the most extensive evaluation of the drug courts has been undertaken by the New South Wales Bureau of Crime Statistics and Research (e.g. Freeman et al, 2000, Lind et al, 2002). Part of the review of the effectiveness of drug courts in that state involved an analysis of the cost-effectiveness of drug courts compared to other forms of intervention with drug offenders. The analysis involved a comparison of two groups of offenders. The first group was subject to the drug court intervention and a matched group to more conventional treatment. Lind and colleagues (2002) compared 309 offenders who had been through the drug court to the matched control group. Measures taken included time to "fail" (failure being re-appearance at court on another drug charge) and the frequency of offending. The researchers found that drug court attendees did better than the alternative group both in terms of the frequency of offending and in terms of time to "fail". However the analysis was limited to a one year follow up and also the analysis was limited to a comparison of non violent offenders because those charged with violent offences (including robbery) were not eligible for the drug court program.

Lind and colleagues (2002) also conducted a cost benefit analysis that demonstrated the cost savings of the drug court option. One of the critical conclusions of Lind et al that is relevant to the present study is that to maximise the benefits of the drug court programs staff should closely and clearly identify those offenders likely to benefit from the program and terminate those unsuitable for the program at an earlier stage. It is clear that the implementation of the drug court should be guided by intelligence on where the benefits of the intervention can be best achieved. In this endeavour information on expected recidivism rates of groups of drug offenders is essential.

To sum up, the investigations looking at recidivism in the context of evaluating criminal justice system interventions for drug offenders have been limited by short follow up times, inadequate grouping and the lack of controls for the most important determinants of recidivism: socio-demographic status and criminal justice history. Many studies are limited by inadequate access to longitudinal data sets and to sophisticated mathematical techniques for calculating recidivism.

3.2 Explorations of the criminal careers of drug offenders

Although debate and investigation continues into the ways that drug use and offending relate to other criminal offending, there is now wide acceptance of the view that drug abuse is a regular and routine part of the lifestyles of most offenders, and certainly persistent offenders[5]. This "lifestyle" approach to understanding the link between drugs and crime suggests that

[5] See Dobinson and Ward (1985), Wexler et al (1990), Little et al (1993) Hanlon et al (1990) Hough (1996) Inciardi, McBride and Rivers (1996), Johnson et al (1993).

although some casual drug users who are not regular offenders may occasionally be snared by the police, most drug arrests will be made of those who regularly come into contact with the police. If this understanding is true then there should be two quite distinct groups in the records of drug arrests: a small group of drug users/not offenders and a larger group of drug users/offenders.

The research in Australia into the associations between crime and drug use stem back to the mid 1980s and the pioneering work of Ian Dobinson (e.g. Dobinson and Ward, 1985). In Western Australia, Indermaur and Upton (1988) provided a profile of the drug using behaviour of prisoners in metropolitan prisons in 1987. There are many studies in the US examining the criminal careers of drug users. For example, Ball, Rosen, Flueck and Nurco (1982) traced the criminal histories of a sample of heroin addicts over an 11-year period. Ball et al found that these addicts had committed more than 473,000 crimes. As measured by crime days per year at risk, the average addict committed over 178 offences per year and almost 2,000 offences during his/her post-onset lifetime. Although the predominant offence committed by the sample was theft, these addicts also were involved in a wide range of other crimes, including drug sales, robbery, forgery, pimping, assault, and murder. While few of the addicts had been hospitalised for their drug abuse during the years from onset of abuse to time of interview, most had spent considerable time in prison. The probability of arrest for the sample was low, as less than 1 percent of their crime days were marked by arrest, although arrest rates were highest among those addicts with the greatest number of crime days per year at risk. On the basis of these results, it was estimated that the 450,000 heroin addicts in the United States commit more than 50,000,000 crimes per year and that their lifetime criminality exceeds 819,000,000 offences.

In Australia, one of the biggest attempts to gauge the nature of the socio-demographics associated with drug offenders was a project launched by the Australian Institute of Criminology in the late 1980s. This project known as the ACT Drug Indicators Project was a three year program of research funded by the National Campaign Against Drug (NCADA). The project aimed to develop and refine methodologies for estimating the incidence, prevalence and character of illegal drug use, monitor changes over a period of time, and to assess how best to integrate information from different agencies and sources. The proceedings of the second National Drug Indicators conference held in Canberra in March 1990 as part of the indicators project contained three papers from Western Australia (Somerford and Smith, 1991; Hayward, 1991; Saunders et al, 1991). Hayward (1991) noted that in Western Australia drug arrests in the three year period from 1984/85 to 1987/88 rose from 3,600 to 5,376 (representing a 50% increase in this period). Almost all of these arrests were for cannabis – the number of charges for cannabis offences increased in line with arrests from 3,381 to 5,033.[6] The number of distinct persons [7] convicted of possession or use of cannabis in the Courts of Petty Sessions doubled over the three year period.

[6] With drug crime there is a close association between offences, arrests and charges because of the nature of the way these crimes are processed. This close relationship does not exist with most other types of offences, particularly where crimes are reported, offences are recorded but no offender is arrested.

[7] The term "distinct persons" is a standard term in the field of criminal justice statistics to refer to the number of separate individuals appearing in a certain way in the criminal justice system within a defined period. This terminology is necessary as within a period of, say, a year a certain individual may appear a number of times in arrest records, before the courts and so forth. If we are interested in the number of separate individuals that appear in these records in that year we need to talk not about appearances but about "distinct' (separate) persons.

A longer term analysis was provided in the paper by Somerford and Smith (1991) which discussed the trends in the number of offenders and offences heard in the courts in Western Australia from 1977 to 1985[8]. Somerford and Smith managed to examine the recidivism of drug offenders and the effect of penalty type and severity upon the measure of recidivism that they employed. The researchers obtained court records for the three levels of courts (Supreme, Petty and Children's)[9] and tabulated the number of charges and distinct persons appearing before these three courts from 1977 to 1985. They examined recidivism by simply examining each offence in each court and dividing the population of distinct persons into those that subsequently re-offended. For those that did re-offend they also examined the differences between those that had a prior record before the particular offence in question. Somerford and Smith were primarily interested in the effect of penalty severity on recidivism and calculated the proportions re-offending by type of drug, type of court and type of penalty. They concluded that there was little difference in the recidivism of offenders given different penalties.

Although Somerford and Smith noted that more offenders given prison sentences re-offended, this may well have been a function of the offender's greater criminal involvement which could explain both the prison sentence and the re-offending. Somerford and Smith also noted a higher recidivism amongst those offenders charged with opioid offences compared to those charged with "cannabinol" offences. However this analysis was limited by the length of the follow up time, which naturally varied between individuals. An individual processed toward the beginning of the time period (1977) would have had eight years in which to re-offend and show up again in the records whereas someone processed towards the end of the period (in 1985) may have had no opportunity to re-offend again. Despite these shortcomings Somerford and Smith's work provides an important pioneering effort to track the recidivism of drug offenders in Western Australia.

Another major effort in understanding the recidivism of drug offenders in Western Australia came about through the work in the mid 1990s. In a study of cannabis offenders in Western Australia, Lenton, Ferrante and Loh (1996) found that 40% of those charged with cannabis use as their most serious offence in an arrest incident had never been arrested for any prior offence. This means that for almost half of those charged with a cannabis offence, the charge represents their first entry into the criminal justice system. Lenton et al (1996) also found that about half of those arrested for cannabis offences had not been re-arrested up to 10 years later. The most common offences for which cannabis users were re-arrested were driving under the influence and other drug charges.

The next effort in understanding the recidivism of drug offenders in Western Australia came with the Crime Research Centre submission to the Western Australian Parliament Select

[8] A more detailed paper on the same project is provided by Smith, Somerford and Harrison-Stewart (1988).

[9] Although Somerford and Smith refer in their paper to the three courts (Supreme, Petty and Children's) our analysis of the figures they provide suggest that their classification "Supreme" actually captures cases in both the Supreme and District Courts. In our regular reporting of the activities of these courts we usually group together the activities of the Supreme and District courts and describe them as the activities of the "Higher Courts". We have assumed, therefore, that Somerford and Smith are referring to the "Higher Courts" when they make reference to the Supreme Court. The numbers in the District Court are much higher than the numbers appearing in the Supreme Courts, but both courts combined are dwarfed by the numbers in the Court of Petty Sessions. About 3 in every 4 charges in Western Australia are heard by the Court of Petty Sessions.

Committee on the Misuse of Drugs Act 1981 (CRC, 1997). Amongst other matters the submission raised the question of functional distinctions between different drug arrestees. For example, between the major two types of drug charges – using versus trafficking. The CRC submission included some simple analyses on the relationship between drug using and drug trafficking. It showed, for example, that of the trafficking charges in 1996, 62.6% were laid in conjunction with possession/use offences against the same offender. The extent to which users 'deal' and dealers 'use' has not been properly investigated and requires a much deeper analysis of offenders and the careers of drug offenders than that attempted in the CRC submission. This would require a functional distinction between types of drug offenders and an examination of the re-offending rates of different types of drug offenders.

A valuable and more recent study into the criminal careers and other characteristics of drug offenders was undertaken by a consortium of the Victorian Department of Justice and the Department of Criminology at the University of Melbourne (Canty, Dalton, Dussuyer, James, and Sutton, 2001; Dalton and Canty, 2001). The research sought to chart recent trends in drug offences and drug offender characteristics in Victoria and to explore the criminal careers of those charged with drug offences in order to clarify relationships between drug offending and other forms of crime.

The Victorian study investigated trends in drug offender and drug offence characteristics in Victoria over a three–year period (mid 1996 to mid 1998). All incidents recorded by Victoria Police in this period which involved at least one illicit drug charge were identified. From these, all charges laid at these incidents—including both drug and non–drug charges—were selected for analysis. Across the three years there were 36,038 incidents recorded comprising 110,909 charges, 76,878 of which were charges for drug offences.

The second phase of the Victorian research which describes the criminal careers of drug offenders most closely resembles the present study. A 'drug offender' was defined as an individual who had had at least one drug charge Three samples of 1,000 individuals were created by selecting the first 1,000 individuals processed in each of the three years where their charges included at least one drug charge. The complete criminal history was then obtained for each individual (from 1993/94 to 1998/99). While initially the research intended to utilise the existing Victorian Illicit Drugs Database (IDDB)[10] to perform the analyses, several factors lead to the creation of two specialised data extracts from Victoria Police. Additional data not currently available through the IDDB was accessed to track individual drug offenders throughout their criminal careers and to provide information on 'non–drug' criminal incidents in which these offenders were involved.

The results of the Victorian study were not available at the time of finalisation of this report. However, they do indicate a new level of sophistication developing in agencies associated with the criminal justice system to analyse the nature of offending population and provide substantial bases for the calculation of recidivism rates.

[10] The IDDB was developed by Portfolio Planning at the Department of Justice with funding from the Turning the Tide program of the Victorian Government. This database receives inputs from the Victoria Police, Victoria's Magistrates' Courts, the Office of Corrections, the Coroner and the Victorian Forensic Science Centre. It is intended to include additional data from Victoria's higher courts, the Children's Court the Department of Human Services, and other agencies concerned with illicit drugs.

3.3 Lessons from the literature relevant to the current study

A major limitation of most of the evaluations of criminal justice interventions is that they rely on information for a limited period of usually less than three years. Failure rate analysis using the Weibull distribution, allow for an estimate of the chances of eventual recidivism. The present study seeks to substantially improve on the basic estimates of drug offender recidivism by firstly relying on a much broader base of all drug offenders. Second, by using a Weibull mixture model and Kaplan Meier estimates to account for varying follow up times, a more robust and practical estimate of the chances of re-offending is provided.

In terms of the study of drug offender recidivism the present study provides a good starting point. The information on the recidivism of drug offenders is necessary not only for the evaluation of criminal justice interventions but also to understand the likely impact of various law reform particularly with simple cannabis users who contribute the bulk of charges to the drug offenders database.

4 Methodology

The methodology of this study involved the establishment of a longitudinal drug offender database and subsequent analysis of that data. Data analysis included both descriptive statistics and the fitting of mathematical models to estimate the rates of re-offending.

As explained in the introduction, offenders arrested for drug offences between 1989 and 1999 were categorized into the following three mutually exclusive groups, forming a starting point for analysis:

- no prior arrests for any offence, ie "no priors";
- prior arrests for only drug offences, ie "drug only priors"; and
- prior arrests for mixed offence types, ie "mixed priors".

There were four principal questions that guided our investigation as outlined in the introduction.

Question 1
Are there significant differences between the three distinct groups in terms of prior recidivism only?

Question 2
What proportion in each group are subsequently arrested for only drug offences and what proportion are subsequently arrested for other offences?

Question 3
What is the estimated probability of re-arrest on the basis of the type of initial drug charge?

Question 4
What are the relative probabilities for the three groups that the subsequent arrests will be more serious?

4.1 Creation of a drug offender database

The drug offender database was created from the Crime Research Centre's longitudinal apprehension database. The Crime Research Centre (CRC) maintains a specialized database of all persons apprehended in Western Australia. It currently comprises 306,331 distinct persons and 930,968 arrests over a period of time from 1984 to 2000[11]. From this, researchers can calculate, for each individual, the likelihood of re-arrest for any offence or for a specific type of offence. As previously noted, details on arrests prior to 1984 are not available, although if an offender had been arrested in Western Australia prior to 1984 their record is flagged to indicate this.

Because the CRC apprehension database contains records of all offenders arrested in Western Australia, problems with sampling and selection that typically affect recidivism studies are minimised. The database allows us to construct sub-databases of certain specifications of offenders and charges to estimate the likelihood of re-arrest according to those parameters.

[11] The Crime Research Centre Apprehension database is updated annually with records provided by the Western Australia Police Service. This data is subject to caveats which are fully described in Appendix A.

The existing database has provided researchers with baseline measures of the probabilities of re-arrest for any offender arrested in Western Australia.

For this research, a drug offender was defined as any offender who was arrested for at least one drug offence[12] during the period 1989 to 1999, where this offence was one of the three most serious offences recorded for the arrest term. There were 216,810 offenders in the CRC apprehension database for the period 1989 to 1999, and of these 52,501 offenders met the above criteria (See Figure 4.1).

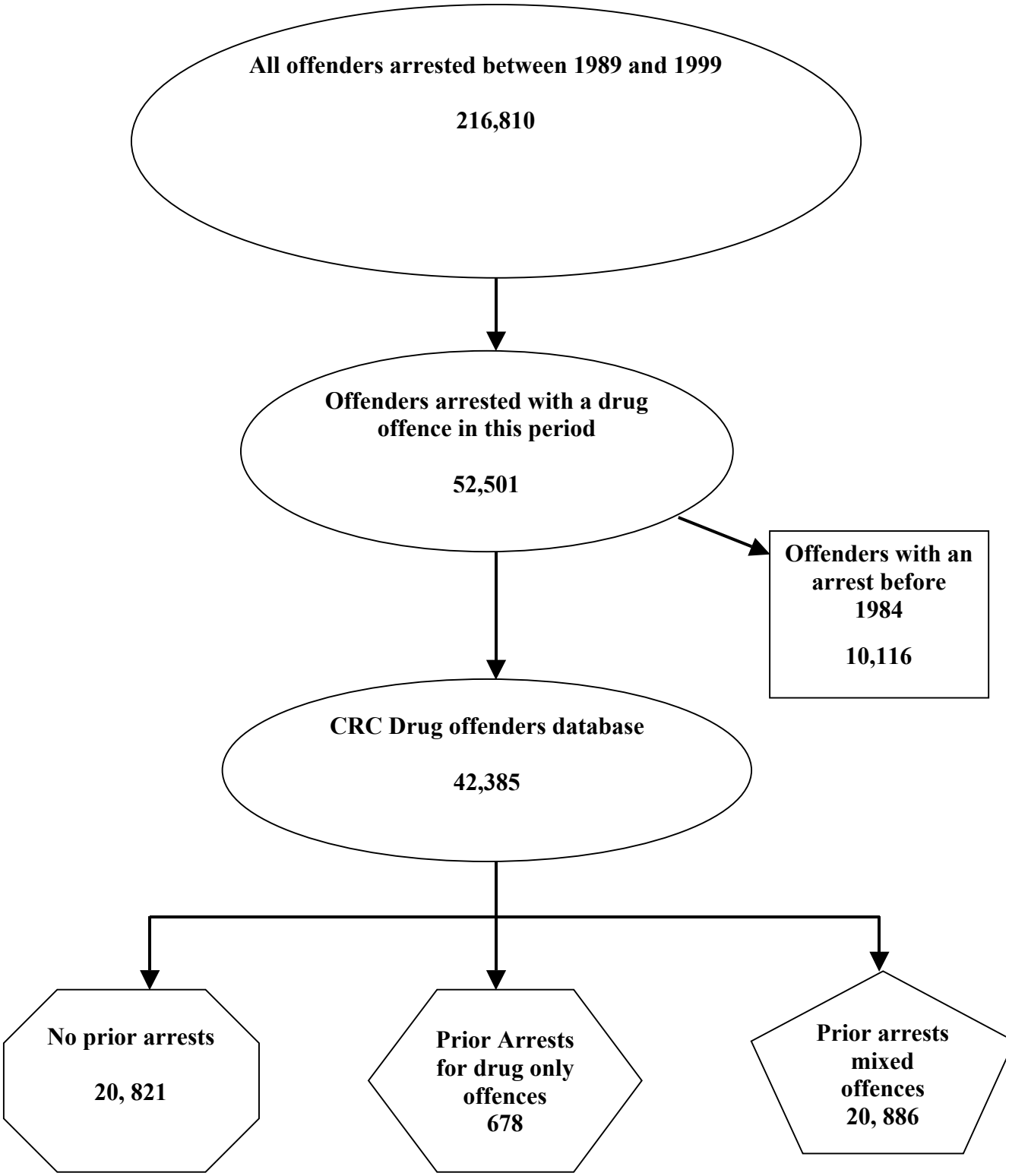
There were 10,116 offenders in the data set whose prior arrest occurred before 1984 and thus the nature of the charge was not apparent. This group, labelled the 'pre-84 priors' group, represents 19.3% of the total number of 52,501 offenders in the original data set. Subsequent analysis of the recidivism of this group found results resembling those of Group 3. This is not surprising, given that group 2 makes up only 3% of the total of Groups 2 and 3 combined and the 10,116 pre-84 priors group could only belong to either Group 2 or Group 3.

To enable a more detailed analysis in terms of the three mutually exclusive groups, the pre-84 priors group was excluded from the analysis. Drug offenders without a prior record in this period account for 40% of all those charged with a drug offence. However the removal of the 10,116 'pre-84 prior' offenders increases the size of this proportion to 49%. There is no reason to suspect that the integrity of the current analysis is damaged by the removal of this group and its removal is necessary to allow for accurate estimates for the three qualitatively distinct groups.

The steps and numbers involved in the derivation of the CRC Drug offenders database is outlined in Figure 4.1.

[12] The Australian National Classification of Offences (ANCO), developed by the ABS, was used to classify offences. See Appendix B for a description of the ANCO codes used to define a drug offender for this study.

Figure 4.1 Derivation of the CRC drug offender database



4.2 Statistical techniques

For this study, probabilities of re-arrest have been estimated from a parametric statistical model fitted to the observed (actual) failure or follow-up times of the specific offender group(s) under review. The data under analysis are said to be censored, that is, for some cases insufficient time has elapsed between arrest and the chances of re-arrest. For example, a person who was arrested for their first drug offence in mid 1999 would have much less opportunity to be re-arrested by the end of 1999 (the study end date) than a person who was arrested in 1989. Ordinarily, such cases would seriously bias estimates of re-arrest or re-offending.

A statistical method, known as failure or survival rate analysis, is utilised to account for such bias and permits accurate estimates of the probability of re-arrest to be calculated. In previous work by CRC researchers on the probabilities of re-offending in Western Australia, a Weibull mixture model was fitted, with good results, to the observed failure or follow-up times of offenders arrested by police (Broadhurst and Loh, 1995).

The Weibull mixture model is described by various parameters including θ, a parameter representing the probability of ultimate or long-term failure, λ (lambda) which is related to the rate of failure, and α (alpha) which describes the "shape" of the Weibull curve. A 95% confidence interval associated with estimated θ value is also described, as is the median time to fail (related to λ) which summarises the 'middle' time taken for observing failure. For a more detailed description of the Weibull model and its application to research into recidivism, see Broadhurst and Loh (1995).

The Kaplan Meier estimator was also used in the failure rate analysis. Kaplan Meier is a non-parametric estimate of the cumulative distribution of time to failure. It was used to obtain estimates of re-offending at any time, for example, obtaining estimates of the probability of an offender re-offending after 2 years or 5 years.

The Weibull model used here also incorporates covariates so that differences between sub-groups of the population under analysis can be tested. "Covariates" are variables associated with each individual that contain additional information of interest, such as offence type, sex, race, prior record, etc. This method of modelling covariates was developed by local researchers (see Maller, 1993 and also Broadhurst and Maller, 1992, for more information).

5 Results

Results are presented in two parts. First a description of the socio-demographic characteristics of the three drug offender groups including how they compare to the general arrest population. The second part deals with the arrest history of the three groups and an analysis of their likelihood of re-offending, using survival techniques.

5.1 Socio-demographic characteristics of the groups

The results rest upon an initial database of all persons arrested for one or more drug offences in Western Australia between 1989 and 1999. As explained earlier, there were 42,385 such individuals after the removal of 10,116 with insufficiently detailed pre-1984 arrest records. Table 5.1 shows that 49.1% of drug offenders had no prior arrest history, 1.6% had prior arrests for drug only offences and 49.3% for mixed offences.

Table 5.1 Numbers and percentages for the three qualitatively distinct groups

Group	Description	Number	Percentage of total
1	No prior arrest for any offence	20, 821	49.1
2	Prior arrests for only drug offences	678	1.6
3	Prior arrest for mixed offences	20, 886	49.3
	Total	42, 385	100

Table 5.2 provides a summary of the socio-demographic details of the three drug offender groups, with more detailed tables appearing in Appendix A. Not surprisingly, these results reveal that most drug offenders are male, with Aborigines making up a relatively small number of the overall group (5.9%). The table also shows that offenders with mixed priors were generally older than those in the other drug groups – 76.2% were aged 21 years old or older compared with 44.1% of those with no priors.

Table 5.2 Socio demographic details of the three drug offender groups

Characteristic	No priors	Drug only priors	Mixed priors
Total	**20,821**	**678**	**20,886**
Sex			
Female	4,803	158	3,108
Male	15,977	519	17,762
Unknown	41	1	16
% Male	*76.7*	*76.5*	*85.0*
Indigenous status			
Aboriginal	463	3	2,042
Non-Aboriginal	20,188	675	18,812
Unknown	170	0	32
% Aboriginal	*2.2*	*0.4*	*9.8*
Age at first arrest			
< 21 years	9,178	357	15,905
≥ 21 years	11,643	321	4,981
% < 21 years	*44.1*	*52.7*	*76.2*

5.2 Arrest histories of the groups

The three groups also differed in terms of the average number of arrests as shown in Table 5.3. The no priors group had the lowest average of 2.1 arrests per person, compared with the mixed priors group who had an average of 8.4 arrests per offender.

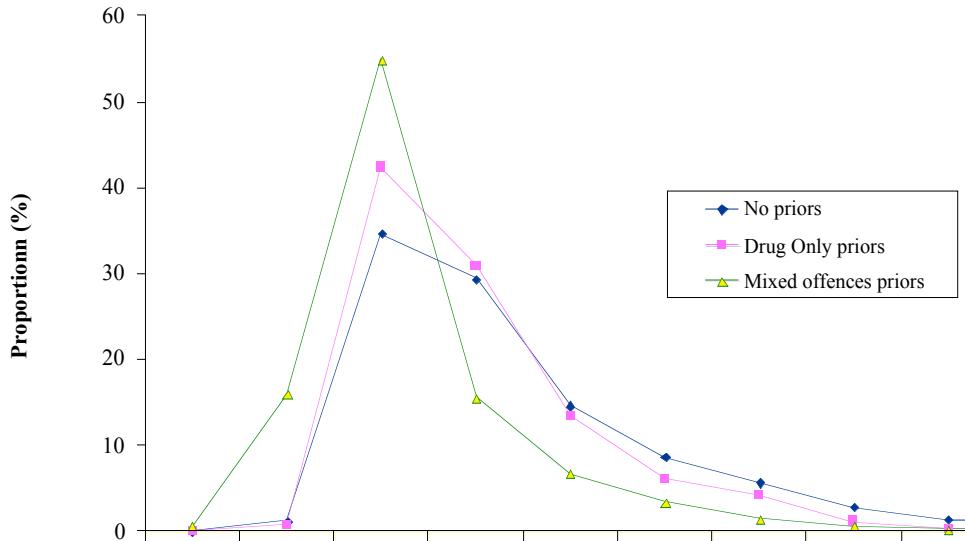
Table 5.3 Average number of arrests and average age at first arrest of the three groups

	Average number of arrests	Average age at first arrest
No priors	2.1	24
Drug only priors	3.5	22
Mixed priors	8.4	19

The average age at first arrest also follows the same pattern of increasing seriousness of the three groups (see Figure 5.1). That is, in terms of criminal careers, a more pronounced and serious career is signalled by arrest at a relatively younger age.

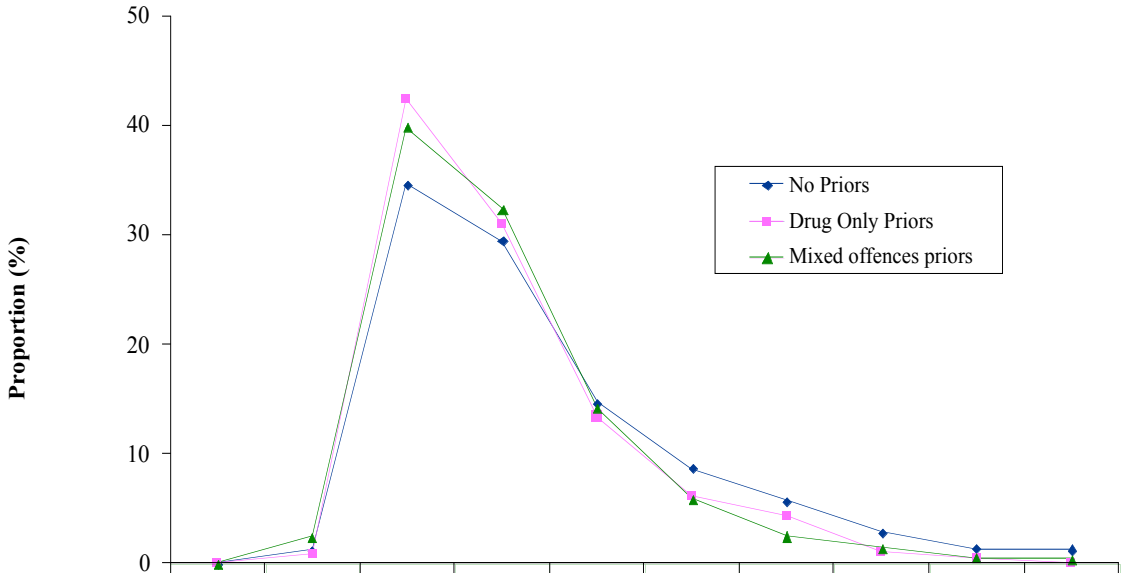
The age at first arrest and age at first drug arrest for the three drug offender groups are presented in Figures 5.1 and 5.2. As the figures show, peak age of first arrest for all groups was in the 15-19 age range, as was the peak age of first drug arrest.

Figure 5.1 Age at first arrest for the three drug offender groups by age groups



	> 10	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50+
No priors	0.0	1.3	34.6	29.5	14.7	8.7	5.7	2.9	1.4	1.3
Drug Only priors	0.0	0.9	42.5	31.0	13.4	6.2	4.3	1.2	0.4	0.1
Mixed offences priors	0.6	16.0	54.9	15.6	6.7	3.4	1.5	0.7	0.3	0.2

Figure 5.2 Age at first *drug* arrest for the three drug offender groups by age groups



	> 10	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50+
No Priors	0.0	1.3	34.6	29.5	14.7	8.7	5.7	2.9	1.4	1.3
Drug Only Priors	0.0	0.9	42.5	31.0	13.4	6.2	4.3	1.2	0.4	0.1
Mixed offences priors	0.0	2.5	39.9	32.4	14.2	6.0	2.6	1.5	0.6	0.4

5.3 Seriousness of subsequent arrests

Another important aspect of examining arrest and re-arrest patterns is the relative seriousness of subsequent arrests. To examine the seriousness of drug offenders' subsequent arrest after their first drug-related arrest, transition matrices were produced for all drug offenders who re-offended and for each of the three groups. These are presented in Table 5.4 and Appendix D.

Offenders who commit similar offences at both arrest points appear on the diagonal elements of the tables (the darker grey shading). Offenders committing the same or more serious offences at their next arrest are highlighted by the grey areas of the tables (left hand bottom corner of the tables).

Table 5.4 shows that of all drug offenders who re-offended, 27.8% (6,218) committed the same type of offence at their next arrest, 42.6% (9,534) committed a more serious type of offence and 29.6% (6,620) a less serious type of offence.

Table 5.4 Most serious offence committed at "nth" and "n+1th" arrest for all drug offenders that re-offended

Most Serious Offence of nth arrest	Most Serious Offence of n+1 arrest: Against person	Robbery	Break/ enter/ theft	Property damage	Against govt security	Drugs	Driving/ traffic	Other offences	Total
Against person	45	3	39	16	58	48	56	1	266
Robbery	4	1	10	3	3	4	4	0	29
Break/enter/theft	153	25	869	75	370	334	306	18	2,150
Property damage	14	1	29	15	34	17	20	3	133
Against govt security	92	11	288	36	276	162	220	12	1,097
Drugs	1,230	90	3,578	577	2,938	4,793	4,607	193	18,006
Driving/traffic	35	1	63	15	93	108	215	4	534
Other offences	20	2	35	5	27	27	37	4	157
Total	1,593	134	4,911	742	3,799	5,493	5,465	235	22,372

Legend:
- Same or similar offences at both arrest points
- More serious type of offence committed at the next arrest (left hand bottom corner)
- Less serious type of offence committed at the next arrest (right hand top corner)

Table 5.5 summarises the offence seriousness committed by offenders in the three groups at their next arrest ("n+1"). The specific transition matrices for each of the three groups are included in Appendix D. As Table 5.5 shows, The 'drug only priors' group were more likely to commit the same type of offence at next arrest (compare 44.6% for this group with 31.2% for the 'no priors' group and 25.4% for the 'mixed priors' group), while the 'mixed prior' group were more likely to move to more serious offence types than any other drug offender group (compare 45.7% with 37.7% and 30.7%).

Table 5.5 Proportion of offence seriousness committed at "n+1" arrest for the three drug offender groups

	Same type of offence (%)	More serious type of offence (%)	Less serious type of offence (%)
No priors	31.2	37.7	31.0
Drug only priors	44.6	30.7	24.7
Mixed priors	25.4	45.7	28.9
All drug offenders	23.8	42.6	29.6

5.4 Recidivism of the groups

Using survival analysis techniques, the probability of re-arrest (p) for each of the three groups were estimated. These are shown in Table 5.6. The table shows that the probability of re-arrest following an initial drug charge varied from a low of 0.5, for the 'no priors' group, to a high of 0.77, for the 'mixed priors' group. In other words, about half of all drug offenders with no prior arrest for any offence are likely to be re-arrested, while more than three-quarters of drug offenders with prior arrests for mixed offences are likely to re-offend.

In terms of the time taken to be re-arrested, offenders without priors are likely to be re-arrested in 1.4 years, while for offenders with drug-only priors, the median time taken to re-offend is much greater at 2.1 years. Offenders with priors for mixed offences not only had the highest probability of re-offending (0.77) but also had the shortest time for this to occur (0.7 years).

Table 5.6 Estimated probability of re-arrest and median time to fail for the three drug offender groups.

Group	Description	p	Median time to fail
1	No prior arrest for any offence	0.50	1.4
2	Prior arrests for only drug offences	0.63	2.1
3	Prior arrest for mixed offences	0.77	0.7

Recidivism estimates for the three drug offender groups, broken down into specific sub-populations of offenders are presented in Table 5.7[13]. The table shows that, generally, the 'no priors' group has a lower probability of re-offending when compared to the other two groups (compare p=0.5 with p=0.63 and p=0.77).

Also, the probability an offender going from a cannabis user offence to any type of offence is the same as the probability of re-offending for any offence after being arrested for a drug related offence. Therefore, indicating that most of the first drug-related arrests were most likely for cannabis use.

The full set of re-arrest probabilities are provided in Appendix E. Separations in terms of Aboriginality and gender are also included.

[13] See Appendix B for a description of the terminology used to specify sub groups of offenders.

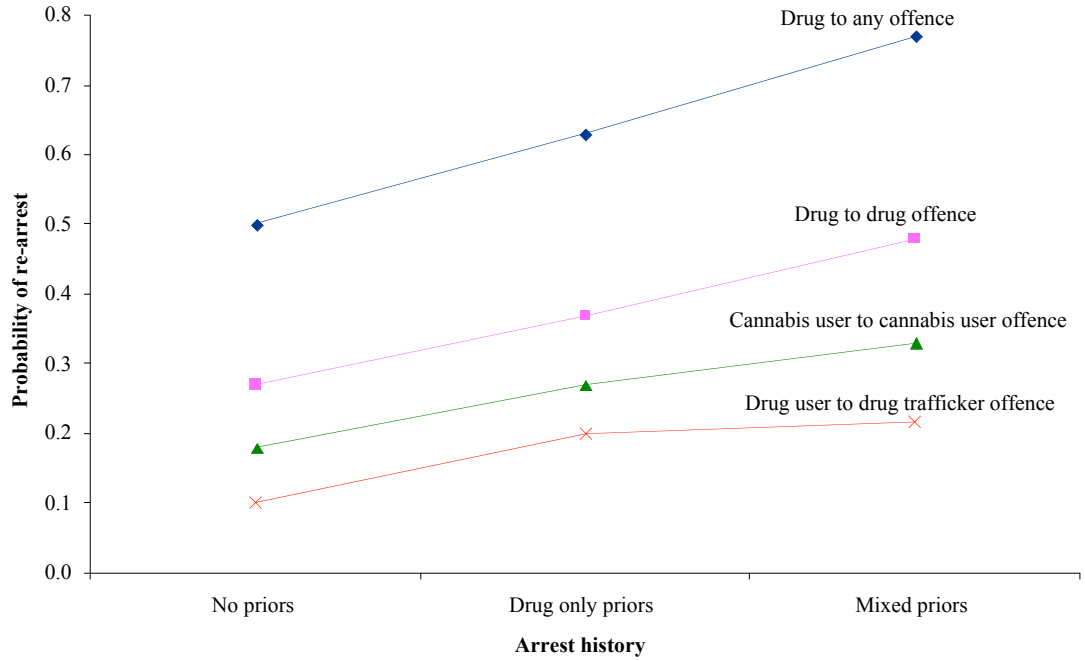
Table 5.7 The probability of recidivism of the three drug offender groups considering specific sub groups of offenders and re-arrest types

	No priors			Drug only priors			Mixed priors		
		95% CI	Median time to fail		95% CI	Median time to fail		95% CI	Median time to fail
Drug to any offence	0.50	(0.49, 0.51)	1.4	0.63	(0.56, 0.70)	2.1	0.77	(0.76, 0.78)	0.7
Drug to drug offence	0.27	(0.26, 0.28)	2.1	0.37	(0.33, 0.42)	2.1	0.48	(0.46, 0.49)	2.1
Cannabis user to any offence	0.50	(0.49, 0.51)	1.4	0.63	(0.55, 0.70)	1.9	0.77	(0.76, 0.77)	0.8
Cannabis user to cannabis user offence	0.18	(0.17, 0.19)	2.2	0.27	(0.22, 0.31)	2.2	0.33	(0.33, 0.32)	2.2
Drug user to drug trafficker	0.10	(0.09, 0.17)	4.6	0.20	(0.16, 0.25)	4.6	0.22	(0.19, 0.24)	4.6

These results suggest that the three groups fall on a continuum in terms of risks of recidivism and the median time to fail. As illustrated in Figure 5.3 and Table 5.7, drug offenders with no prior record represent the least risk in terms of re-offending and those drug offenders with mixed prior offences represent the greatest risk. Drug offenders with prior arrests for drug offences (only) fall closer to the "no-prior" group than the "mixed prior" group in terms of risk of re-offending to any offence and the length of time to re-offend.

In terms of re-offending to *another drug offence*, the "drug only prior" group actually falls half way between the "mixed prior" group and the "no prior" group. The same finding emerges if we look more specifically at, say, the probability of a cannabis offender being re-arrested for another cannabis offence (see also Table 5.7).

Figure 5.3 The relationship between arrest history and the probability of recidivism



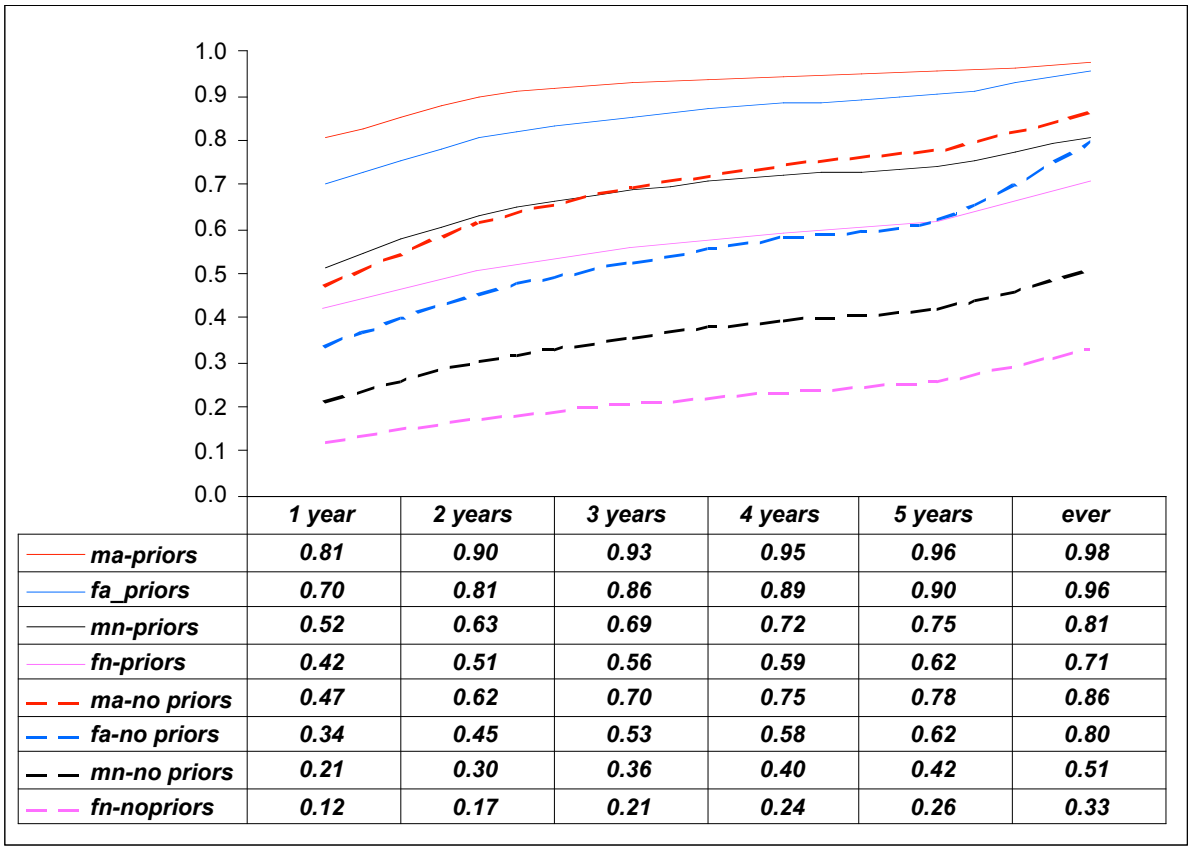
The chances of a cannabis user re-offending are almost half that of the general group of drug offenders. For cannabis users the chances of re-offending to any other type of drug offence is 0.20 compared to 0.37 for all drug offenders taken together. The chances of a drug user being later arrested for a drug trafficking offence are even less (.16). This is still more than three times the probability of a cannabis user being subsequently arrested for an opiate offence which is only 5%. However, the chances of a cannabis user being subsequently arrested for a cannabis user related offence is one in four (.26).

The recidivism rates of the three drug offender groups can be compared to the risks of re-offending of the general population. Statistics on these general risks are provided in Appendix F and summarised in Figure 5.4.

Figure 5.4 shows Kaplan Meier group estimates of failure for the two major demographic groups (males/females, Aboriginal/non-Aboriginal), and for two groups based on prior arrest record. As shown in Figure 5.4 the probability of recidivism increases slightly each year following the first arrest event and the probability of rearrest increases across eight groups defined by Aboriginality, gender and arrest history. The group most likely to be re-arrested is that comprising male Aborigines with prior arrest. This group is estimated to have a 96% probability of being re-arrested within 5 years, while the group least likely to be re-arrested consists of female non Aborigines with no priors. This group is estimated to have only a 33% probability of being arrested within 5 years. The other groups are distributed between these two extremes.

If we suspend our consideration of Aboriginality and gender and consider the probability of re-arrest for those with or without priors, we can see the Kaplan Meier estimates of re-arrest for offenders with prior records is 0.84 and for arrestees without prior records is 0.49. The figures for drug offenders are very similar. From our data set of drug offenders, the probability of re-arrest for arrestees with prior records is 0.76 and for arrestees without prior records it is 0.47.

Figure 5.4 Baseline estimates of the probability of re-arrest in Western Australia



	1 year	2 years	3 years	4 years	5 years	ever
ma-priors	0.81	0.90	0.93	0.95	0.96	0.98
fa_priors	0.70	0.81	0.86	0.89	0.90	0.96
mn-priors	0.52	0.63	0.69	0.72	0.75	0.81
fn-priors	0.42	0.51	0.56	0.59	0.62	0.71
ma-no priors	0.47	0.62	0.70	0.75	0.78	0.86
fa-no priors	0.34	0.45	0.53	0.58	0.62	0.80
mn-no priors	0.21	0.30	0.36	0.40	0.42	0.51
fn-nopriors	0.12	0.17	0.21	0.24	0.26	0.33

where: fa = female Aboriginals,
ma = male Aboriginals,
fn = female non Aboriginals,
mn = male non Aboriginals; and
priors = prior arrests in Western Australia

5.5 Estimates of re-arrest at shorter follow-up periods

The re-arrest estimates for drug offender that we have so far calculated have been *ultimate* probabilities of re-offending, in other words, they are estimates of the likelihood that an offender will *ever* be re-arrested. However, recidivism estimates at shorter and more defined periods are usually those needed and preferred by policy-makers and practitioners. In Table 5.8, we present re-arrest estimates, using the Kaplan Meier estimator, for the three drug offender groups, for specific sub-groups of offenders[14], at one, two and five years after first drug arrest. A full set of re-arrest estimates are provided in Appendix G.

Table 5.8 Re-arrest estimates (Kaplan Meier) at 1, 2 and 5 years for the three drug offender groups for specific sub-groups of offenders

		Rearrest probabilities (kme) at:		
		1 year	2 years	5 years
Drug to any offence	No priors	0.21	0.30	0.41
	Drug only priors	0.21	0.31	0.46
	Mixed priors	0.45	0.57	0.70
Drug to drug offence	No priors	0.09	0.14	0.20
	Drug only priors	0.11	0.18	0.28
	Mixed priors	0.15	0.23	0.36
Cannabis user to any offence	No priors	0.21	0.30	0.41
	Drug only priors	0.23	0.33	0.48
	Mixed priors	0.45	0.57	0.70
Cannabis user to cannabis user offence	No priors	0.06	0.09	0.14
	Drug only priors	0.08	0.13	0.20
	Mixed priors	0.10	0.15	0.25
Cannabis user to other drug user offence (excl. cannabis user)	No priors	0.02	0.03	0.05
	Drug only priors	0.02	0.03	0.06
	Mixed priors	0.03	0.05	0.10
Drug user to drug trafficker	No priors	0.02	0.03	0.06
	Drug only priors	0.02	0.05	0.10
	Mixed priors	0.03	0.06	0.11

The results in Table 5.8 can be compared with the estimate of re-arrest for the general arrest population (see Appendix E). For the general arrest population with no priors, the probability of re-arrest at 5 years is 0.40 (see Appendix E). This compares favourably with the estimate for the group of drug offenders with no priors (0.41). For all arrestees with prior arrests, the estimated probability of re-arrest at 5 years is 0.79, while, for drug arrestees with prior arrests, the probability of re-arrest within 5 years is 0.69.

[14] See Appendix B for a description of the terminology used to specify sub groups of offenders.

6 Conclusions

The current research was designed to provide indications of the relevance of drug arrest records on the likelihood of re-offending. It is clear from the results that the three qualitatively distinct groups are meaningful categories and provide a neat continuum in terms of the probability of re-arrest. Those with no prior records have the least likelihood of rearrest while those with non-drug offences in their prior arrest record have the highest chance of being re-arrested. These results support the view that drug offenders with a prior history for a non drug offence represent a more serious group of drug offenders. Treatment and sentencing services should perhaps consider this in their approaches to drug offenders. In both planning programs and in sentencing and parole, the prior offending history and the nature of that history should be reviewed.

The analysis that shows the much lower risks of re-offending of certain groups, particularly cannabis users, suggests that drug offenders should not be considered as a homogeneous group but defined in terms of the chances of re-offending. This may mean, amongst other things, that intervention resources should be conserved and focused on those groups where there are indications that recidivism can be reduced.

An underlying aim of the current project was to establish a database that would allow not only the specific questions that led to the research but that would serve in the future to allow the exploration of a range of questions regarding the recidivism of drug offenders. The data provided here can be used as a baseline against which special groups of offenders, for example drug court clients, could be matched and assessed.

The current research provokes questions in regard to qualitatively distinct groups of drug offenders. Future research should explore how the nature of the prior record as well as the type of drug and the type of offence ("using" or "trafficking") could all be factored in to produce a typology of drug offenders. Such a classification could form the basis of a decision-making system, where the first three way split could be formed on the basis of prior history. A second three way split (producing 9 groups) could be based on the type of drug (cannabis, opiate and other) and a third split could be based on the distinction between users and traffickers. Such a decision tree could be linked to risk assessment instruments that, in turn, could be used to evaluate the success (or otherwise) of interventions such as the drug court.

The availability of the drug arrestees database provides for an effective method of estimating the effectiveness of interventions in Western Australia.

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Appendix A

CAVEATS ON POLICE DATA

The following caveats have been placed upon the release and use of police data:

1. The Data are supplied courtesy of the Western Australia Police Service.

2. The Data are sourced from the Western Australia Police Service's:
   Offence Information System,
   Name Indexing System (P18s) – Criminal Record Reference System,
   Juvenile (Cautioning) System, and
   Lockup Admission System.

3. The Data are provisional and may be subject to revision.

4. Processed Persons data refer to persons who have been 'processed', that is, arrested, summonsed, formally cautioned or referred to a Juvenile Justice Team program. They do not represent total clearances as clearance figures include offenders subject to statute bar, diplomatic immunity and other related processes. The processed persons data do not necessarily provide a count of offences, as more than one offender could be processed for a single offence or one offender could be processed for a number of offences. Accordingly, the data cannot be used to calculate reported offence numbers or clearance rates. Care should be exercised in their application.

5. The number of reported offences for a period comprises all offences reported during that period and may include offences committed during earlier periods. Therefore the reporting of historical offences may inflate the number of reported offences for a period.

6. Offence classifications may alter between periods due to changes in legislation or administrative recording practices. Accordingly, time series may be broken.

7. Aboriginality/Ethnicity is derived from the Western Australia Police Service Identity Code field for Ethnic Appearance. The field is completed on the basis of the attending police officer's subjective assessment of the person's appearance and is recorded for operational purposes only. Care should be exercised in the interpretation of these statistics, as a subjective assessment means it is possible that a person attributed to a particular group does not belong to that group.

8. Time series data may be affected by changes in legislation, coding practices and locality boundaries.

9. Any information relating to juvenile offenders' personal information (that is, anything that could identify the person) unless the person consents in writing, or, the divulgence is for the purposes of investigation of any suspected offence, or the conduct of proceedings against any person for an offence, contravenes an offence under Section 17 of the Young Offenders Act 1995 and Section 36 of the Children's Court of Western Australia Act 1988.

10. Any information likely to identify the complainant in a sexual offence or the complainant's school, if applicable, may contravene an offence under Section 36C of the Evidence Act 1906.

Appendix B

DEFINITION OF DRUG OFFENCES AND DRUG OFFENDERS

B.1 Definition of Drug Offences

The Australian National Classification of Offences (ANCO) system was used to classify offences in this study. ANCO is a standardised classification of criminal offences developed by the Australian Bureau of Statistics (ABS) and used by criminal justice organisations to categorise offences.

Table B.1 shows the general offence groups available in the ANCO system.

Table B. 1 ABS Australian National Classification of Offences (ANCO) Summary of Divisions

Division	Title
1	Offences against the person including acts endangering life generally
2	Robbery and extortion
3	Breaking and entering, burglary, and unlawful entry; fraud, forgery and false pretences; and other offences involving theft
4	Property damage and environmental offences
5	Offences against good order
6	Drug offences (excluding theft of drugs)
7	Driving, motor vehicle, traffic and related offences
8	Other offences
9	Child welfare matters

Table B.2 shows a more detailed breakdown of the drug related ANCO codes used to identify a drug offence and create the drug offender database.

Table B.2 Drug related ANCO codes

Division	Sub-Division	Group	Title
6			Drug offences (excluding theft of drugs)
	61		Possession and / or use of drugs
		613	Possess and / or use opium and its derivatives
		614	Possess and / or use cocaine and its derivatives
		615	Possess and / or use other narcotics, specified
		616	Possess and / or use narcotics, unspecified
		617	Possess and / or use cannabis, all forms
		618	Possess and / or use other drugs, specified
		619	Possess and / or use drugs, unspecified
	64		Importing and exporting of drugs
		643	Import/export opium and its derivatives
		644	Import/export cocaine and its derivatives
		645	Import/export other narcotics, specified
		646	Import/export narcotics, unspecified
		647	Import/export cannabis, all forms
		648	Import/export other drugs, specified
		649	Import/export drugs, unspecified
	65		Dealing and trafficking in drugs
		653	Deal and traffic in opium and its derivatives
		654	Deal and traffic in cocaine and its derivatives
		655	Deal and traffic in other narcotics, specified
		656	Deal and traffic in narcotics, unspecified
		657	Deal and traffic in cannabis, all forms
		658	Deal and traffic in other drugs, specified
		659	Deal and traffic in drugs, unspecified
	66		Manufacturing and growing drugs
		663	Manufacture/grow opium and its derivatives
		664	Manufacture/grow cocaine and its derivatives
		665	Manufacture/grow other narcotics, specified
		666	Manufacture/grow narcotics, unspecified
		667	Manufacture/grow cannabis, all forms
		668	Manufacture/grow other drugs, specified
		669	Manufacture/grow drugs, unspecified
	69		Other drug offences
		699	Other drug offences

Notes:

1. ANCO does classify prohibited drugs such as cannabis (ANCO 617) and heroin (ANCO 613) but stimulants, such as amphetamine and ecstasy, do not have separate codes. Stimulates are given an ANCO of 618. Previous analysis has shown that this code mainly contains offences involving stimulants.
2. ANCO 699 mainly contains offences related to possession of smoking implements. In the drug offender database, 96.6% of the offences classified as ANCO 699 were for possession of smoking implements. Therefore, this code has been included in the drug user group.

B.2 Definition of Drug Terms used in this Report

The following provides a description of terms used in this report to classify specific groups of drug offenders and drug offences.

Any Offence	any offence with an ANCO between 111 and 911.
Cannabis deal/trafficker offence	any offence with an ANCO of 647 or 657.
Cannabis related offence	any offence with an ANCO of 617, 647, 657, 667.
Cannabis user offence	any offence with an ANCO of 617.
Drug deal/trafficker offence	any offence with an ANCO between 643 and 669.
Drug offence	any offence with an ANCO between 613 and 699.
Drug Offender	an offender arrested for at least one drug offence (ANCO between 613 and 699) between 1989 and 1999.
"Drug only priors" offender	a drug offender with prior arrests (prior 1989) for drug offences only.
Drug user offence	any offence with an ANCO between 613 and 619, and 699.
"Mixed offences priors" offender	a drug offender with prior arrests (prior 1989) for any type of offence including at least one drug offence.
"No priors" offender	a drug offender with no prior arrests (prior 1989).
Opiate user offence	is any offence with an ANCO of 613.

Appendix C

SOCIO-DEMOGRAPHIC DETAILS

Table C.1 Drug offenders arrested during 1989 to 1999, by sex

	No priors		Drug only priors		Non-drug priors		Total	
	N	%	N	%	N	%	N	%
Female	4,803	23.1	158	23.3	3,108	14.9	8,069	19.0
Male	15,977	76.7	519	76.5	17,762	85.0	34,258	80.8
Unknown	41	0.2	1	0.1	16	0.1	58	0.1
Total	20,821	100	678	100	20,886	100	42,385	100

Table C.2 Drug offenders arrested during 1989 to 1999, by race

	No priors		Drug only priors		Non-drug priors		Total	
	N	%	N	%	N	%	N	%
Aboriginal	463	2.2	3	0.4	2,042	9.8	2,508	5.9
Non-Aboriginal	20,188	97.0	675	99.6	18,812	90.1	39,675	93.6
Unknown	170	0.8	0	0.0	32	0.2	202	0.5
Total	20,821	100	678	100	20,886	100	42,385	100

Table C.3 Age at first arrest for offenders arrested during 1989 to 1999

	Drug Offenders							
	No priors		Drug only priors		Mixed priors		Total	
Age	N	%	N	%	N	%	N	%
> 10	0	0.0	0	0.0	134	0.6	134	0.3
10 - 14	262	1.3	6	0.9	3,332	16.0	3,600	8.5
15 - 19	7,213	34.6	288	42.5	11,476	54.9	18,977	44.8
20 - 24	6,134	29.5	210	31.0	3,263	15.6	9,607	22.7
25 - 29	3,056	14.7	91	13.4	1,400	6.7	4,547	10.7
30 - 34	1,805	8.7	42	6.2	720	3.4	2,567	6.1
35 - 39	1,190	5.7	29	4.3	321	1.5	1,540	3.6
40 - 44	600	2.9	8	1.2	143	0.7	751	1.8
45 - 49	287	1.4	3	0.4	58	0.3	348	0.8
50+	273	1.3	1	0.1	39	0.2	313	0.7
Unknown	1	0.0	0	0.0	0	0.0	1	0.0
Total	**20,821**	**100**	**678**	**100**	**20,886**	**100**	**42,385**	**100**

Table C.4 Age at first arrest for offenders arrested during 1989 to 1999

	Drug Offenders							
	No priors		Drug only priors		Mixed drug priors		Total	
Age	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
> 10	0	0.0	0	0.0	1	0.0	1	0.0
10 – 14	262	1.3	6	0.9	520	2.5	788	1.9
15 – 19	7,213	34.6	288	42.5	8,332	39.9	15,833	37.4
20 – 24	6,134	29.5	210	31.0	6,773	32.4	13,117	30.9
25 – 29	3,056	14.7	91	13.4	2,973	14.2	6,120	14.4
30 – 34	1,805	8.7	42	6.2	1,245	6.0	3,092	7.3
35 – 39	1,190	5.7	29	4.3	533	2.6	1,752	4.1
40 – 44	600	2.9	8	1.2	307	1.5	915	2.2
45 – 49	287	1.4	3	0.4	118	0.6	408	1.0
50+	273	1.3	1	0.1	83	0.4	357	0.8
Unknown	1	0.0	0	0.0	1	0.0	2	0.0
Total	**20,821**	**100**	**678**	**100**	**20,886**	**100**	**42,385**	**100**

Appendix D

RE-ARREST TRANSITION MATRICES

Table D.1 Most serious offence committed at "nth" and "n+1th" arrest for all drug offenders with no prior arrest history that re-offended

Most serious offence of nth arrest	Against person	Robbery	Break/ enter/ theft	Property damage	Against govt security	Drugs	Driving/ traffic	Other offences	Total
Against person	13	1	4	6	7	17	11		59
Robbery	2	1	1	2		1	1		8
Break/enter/theft	31	4	197	18	81	113	101	7	552
Property damage	2	1	7	4	8	9	7	1	39
Against govt security	19	1	65	14	55	63	61	3	281
Drugs	374	29	1,174	185	958	2,170	1,897	87	6,874
Driving/traffic	11		23	4	31	56	84	2	211
Other offences	8	1	10	1	8	13	17	2	60
Total	460	38	1,481	234	1,148	2,442	2,179	102	8,084

Legend:
- Same or similar offences at both arrest points
- More serious type of offence committed at the next arrest (left hand bottom corner)
- Less serious type of offence committed at the next arrest (right hand top corner)

Table D.2 Most serious offence committed at "nth" and "n+1th" arrest for all drug offenders with drug only prior arrests that re-offended

Most Serious Offence of n+1 arrest

Most serious offence of nth arrest	Against person	Robbery	Break/ enter/ theft	Property damage	Against govt security	Drugs	Driving/ traffic	Other offences	Total
Against person	0	0	0	0	2	1	1	0	4
Robbery	0	0	0	0	0	0	0	0	0
Break/enter/theft	0	0	5	0	1	5	2	0	13
Property damage	0	0	1	0	0	0	0	0	1
Against govt security	0	0	0	0	3	2	6	0	11
Drugs	18	1	39	7	31	134	62	1	293
Driving/traffic	0	0	2	1	1	0	8	0	12
Other offences	0	0	0	0	1	0	1	0	2
Total	18	1	47	8	39	142	80	1	336

Legend:
- Same or similar offences at both arrest points
- More serious type of offence committed at the next arrest (left hand bottom corner)
- Less serious type of offence committed at the next arrest (right hand top corner)

Table D.3 Most serious offence committed at "nth" and "n+1th" arrest for all drug offenders with mixed offence prior arrests that re-offended

Most Serious Offence of nth arrest	Most Serious Offence of n+1 arrest: Against person	Robbery	Break/ enter/ theft	Property damage	Against govt security	Drugs	Driving/ traffic	Other offences	Total
Against person	32	2	35	10	49	30	44	1	203
Robbery	2	0	9	1	3	3	3	0	21
Break/enter/theft	122	21	667	57	288	216	203	11	1,585
Property damage	12	0	21	11	26	8	13	2	93
Against govt security	73	10	223	22	218	97	153	9	805
Drugs	838	60	2,365	385	1,949	2,489	2,648	105	10,839
Driving/traffic	24	1	38	10	61	52	123	2	311
Other offences	12	1	25	4	18	14	19	2	95
Total	1,115	95	3,383	500	2,612	2,909	3,206	132	13,952

Legend:
- Same or similar offences at both arrest points
- More serious type of offence committed at the next arrest (left hand bottom corner)
- Less serious type of offence committed at the next arrest (right hand top corner)

Appendix E

ESTIMATED RE-ARREST PROBABILITIES

Table E.1 Estimated probability of ultimate re-arrest (_), rate of failure (_), median time to fail and Kaplan Meier estimates (kme) for specific sub groups of offenders and re-arrest types.

Group			CI			n	no. fails	% Fails	Median time to fail (yrs)	-2logL	Kme-max
Drug to Any offence											
Total dataset		0.63	(0.6212, 0.6345)	0.62	0.68	42385	22372	52.8	0.9	104697.03	0.62
Prior Categories	No Priors	0.50	(0.4905, 0.5128)	0.42	0.69	20821	8084	38.8	1.4	100713.60	0.47
	Drug only Priors	0.63	(0.5599, 0.6974)	0.28	0.69	678	336	49.6	2.1		0.55
	Mixed Priors	0.77	(0.7576, 0.7732)	0.79	0.69	20886	13952	66.8	0.7		0.77
Sex	Males	0.65	(0.6471, 0.6614)	0.64	0.68	34258	18982	55.4	0.9	104007.26	0.64
	Females	0.52	(0.5023, 0.5337)	0.50	0.68	8069	3367	41.7	1.2		0.50
Race	Aboriginal	0.88	(0.8639, 0.8978)	1.32	0.69	2508	1950	77.8	0.4	103111.83	0.90
	Non-Aboriginal	0.62	(0.6094, 0.6235)	0.58	0.69	39675	20401	51.4	1.0		0.60
Age Group	< 21	0.75	(0.7459, 0.7619)	0.80	0.69	18757	12488	66.6	0.7	101810.23	0.75
	>= 21	0.53	(0.5214, 0.5416)	0.46	0.69	23628	9884	41.8	1.3		0.51
Drug to Drug offence											
Total Dataset		0.37	(0.3635, 0.3819)	0.30	0.78	42385	11372	26.8	2.1	81492.47	0.34
Prior Categories	No Priors	0.27	(0.2616, 0.2797)	0.30	0.79	20821	4058	19.5	2.1	80288.41	0.25
	Drug only Priors	0.37	(0.3334, 0.4176)	0.30	0.79	678	210	31.0	2.1		0.35
	Mixed Priors	0.48	(0.4625, 0.4877)	0.30	0.79	20886	7104	34.0	2.1		0.44
Sex	Males	0.39	(0.3803, 0.4000)	0.30	0.79	34258	9655	28.2	2.1	81240.35	0.36
	Females	0.30	(0.2832, 0.3103)	0.30	0.79	8069	1706	21.1	2.1		0.28
Race	Aboriginal	0.52	(0.4558, 0.5812)	0.21	0.78	2508	715	28.5	3.0	81320.30	0.44
	Non-Aboriginal	0.37	(0.3590, 0.3773)	0.31	0.78	39675	10652	26.8	2.0		0.34
Age Group	< 21	0.48	(0.4651, 0.4901)	0.31	0.80	18757	6614	35.3	2.0	80328.98	0.44
	>= 21	0.28	(0.2721, 0.2896)	0.31	0.77	23628	4758	20.1	2.0		0.27
Cannabis User to Any Offence											
Total dataset		0.63	(0.6226, 0.6386)	0.62	0.69	26760	14556	54.4	0.9	68488.63	0.62

Prior Categories	No Priors	0.50	(0.4872, 0.5140)	0.43	0.69	12825	5150	40.2	1.4	66004.95	0.47
	Drug only Priors	0.63	(0.5542, 0.7011)	0.31	0.69	485	248	51.1	1.9		0.56
	Mixed Priors	0.77	(0.7556, 0.7744)	0.78	0.69	13450	9158	68.1	0.8		0.76
Sex	Males	0.66	(0.6510, 0.6681)	0.68	0.69	21967	12590	57.3	0.9	67964.11	0.65
	Females	0.50	(0.4804, 0.5202)	0.48	0.69	4763	1953	41.0	1.2		0.48
Race	Aboriginal	0.90	(0.8729, 0.9148)	1.28	0.69	1416	1144	80.8	0.5	67573.45	0.91
	Non-Aboriginal	0.62	(0.6109, 0.6278)	0.59	0.69	25244	13400	53.1	1.0		0.61
Age Group	< 21	0.75	(0.7437, 0.7631)	0.81	0.70	11525	7885	68.4	0.7	66725.17	0.75
	>= 21	0.54	(0.5283, 0.5526)	0.47	0.70	15235	6671	43.8	1.3		0.52

cont…

	Group		CI			n	no. fails	% Fails	Median time to fail (yrs)	-2logL	Kme-max
Cannabis User to Cannabis User Offence											
Total dataset		0.26	(0.2473, 0.2666)	0.29	0.82	26760	5064	18.9	2.2	41247.73	0.24
Prior Categories	No Priors	0.18	(0.1714, 0.1903)	0.29	0.82	12825	1711	13.3	2.2	40706.91	0.16
	Drug only Priors	0.27	(0.2243, 0.3139)	0.29	0.82	485	107	22.1	2.2		0.24
	Mixed Priors	0.33	(0.3301, 0.3167)	0.29	0.82	13450	3246	24.1	2.2		0.31
Sex	Males	0.27	(0.2604, 0.2813)	0.29	0.82	21967	4397	20.0	2.2	41117.95	0.25
	Females	0.19	(0.1768, 0.2057)	0.29	0.82	4763	664	13.9	2.2		0.19
Race	Aboriginal	0.26	(0.2478, 0.2672)	0.29	0.16	1416	257	18.1	0.3	41189.21	0.28
	Non-Aboriginal	0.26	(0.2478, 0.2672)	0.29	0.16	25244	4805	19.0	0.3		0.24
Age Group	< 21	0.33	(0.3180, 0.3450)	0.30	0.82	11525	2895	25.1	2.1	40790.46	0.31
	>= 21	0.19	(0.1852, 0.2037)	0.30	0.82	15235	2169	14.2	2.1		0.19
Cannabis User to Other Drug User Offence (excl. cannabis user)											
Total dataset		0.20	(0.1558, 0.2475)	0.08	0.83	26760	2204	8.2	7.8	22939.13	0.12
Prior Categories	No Priors					12825	691	5.4			0.07
	Drug only Priors					485	36	7.4			0.11
	Mixed Priors					13450	1477	11.0			0.16
Sex	Males	0.20	(0.1552, 0.2445)	0.08	0.83	21967	1843	8.4	7.7	22913.54	0.12
	Females	0.20	(0.1552, 0.2445)	0.08	0.83	4763	359	7.5	7.7		0.10
Race	Aboriginal	0.19	(0.1547, 0.2411)	0.09	0.83	1416	130	9.2	7.5	22914.30	0.17
	Non-Aboriginal	0.19	(0.1547, 0.2411)	0.09	0.83	25244	2073	8.2	7.5		0.12
Age Group	< 21	0.24	(0.1953, 0.2867)	0.10	0.90	11525	1306	11.3	6.6	22697.53	0.16
	>= 21	0.13	(0.1061, 0.1500)	0.10	0.77	15235	898	5.9	6.1		0.09
Cannabis User to Cannabis Deal/Trafficker Offence											
Total dataset		0.04	(0.0351, 0.0537)	0.15	0.85	26760	663	2.5	4.3	8456.59	0.03
Prior Categories	No Priors	0.03	(0.0210, 0.0341)	0.15	0.85	12825	196	1.5	4.3	8361.20	0.02
	Drug only Priors	0.06	(0.0361, 0.0939)	0.15	0.85	485	19	3.9	4.3		0.05
	Mixed Priors	0.06	(0.0471, 0.0730)	0.15	0.85	13450	448	3.3	4.3		0.05
Sex	Males	0.04	(0.0353, 0.0551)	0.15	0.84	21967	566	2.6	4.4	8463.09	0.04
	Females	0.04	(0.0353, 0.0551)	0.15	0.84	4763	97	2.0	4.4		0.03

Race	Aboriginal	0.04	(0.0354, 0.0553)	0.15	0.84	1416	35	2.5	4.4	8460.42	0.05
	Non-Aboriginal	0.04	(0.0354, 0.0553)	0.15	0.84	25244	628	2.5	4.4		0.03
Age Group	< 21	0.04	(0.0351, 0.0537)	0.15	0.85	11525	314	2.7	4.3	8456.59	0.04
	>= 21	0.04	(0.0351, 0.0537)	0.15	0.85	15235	349	2.3	4.3		0.03

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Group			CI			n	no. fails	% Fails	Median time to fail (yrs)	-2logL	Kme-max
Cannabis User to Other Drug Offence (excl. cannabis user)											
Total dataset		0.32	(0.3096, 0.3346)	0.25	0.82	26760	6070	22.7	2.6	47628.61	0.29
Prior Categories	No Priors	0.23	(0.2161, 0.2392)	0.25	0.82	12825	2056	16.0	2.6	46962.31	0.20
	Drug only Priors	0.32	(0.2699, 0.3680)	0.25	0.82	485	122	25.2	2.6		0.29
	Mixed Priors	0.41	(0.3959, 0.4301)	0.25	0.82	13450	3892	28.9	2.6		0.38
Sex	Males	0.33	(0.3215, 0.3480)	0.25	0.82	21967	5196	23.7	2.5	47524.98	0.30
	Females	0.26	(0.2444, 0.2797)	0.25	0.82	4763	870	18.3	2.5		0.24
Race	Aboriginal	0.52	(0.3797, 0.6517)	0.13	0.82	1416	336	23.7	5.1	47547.63	0.40
	Non-Aboriginal	0.32	(0.3047, 0.3289)	0.26	0.82	25244	5732	22.7	2.5		0.29
Age Group	< 21	0.41	(0.3902, 0.4231)	0.26	0.82	11525	3418	29.7	2.5	47133.37	0.37
	>= 21	0.25	(0.2371, 0.2600)	0.26	0.82	15235	2652	17.4	2.5		0.23
Cannabis User to Opiate User offence											
Total dataset		0.05	(0.0009, 0.7894)	0.02	0.89	26760	192	0.7	35.8	2975.28	0.01
Prior Categories	No Priors					12825	44	0.3			0.01
	Drug only Priors					485	7	1.4			0.02
	Mixed Priors					13450	141	1.0			0.02
Cannabis Related offence to Any Offence											
Total dataset		0.62	(0.6152, 0.6305)	0.59	0.69	31544	16822	53.3	1.0	80901.20	0.61
Prior Categories	No Priors	0.48	(0.4668, 0.4909)	0.45	0.74	15306	5997	39.2	1.4	77937.69	0.46
	Drug only Priors	0.61	(0.5269, 0.6839)	0.32	0.72	585	291	49.7	1.9		0.55
	Mixed Priors	0.77	(0.7561, 0.7750)	0.73	0.67	15653	10534	67.3	0.8		0.76
Sex	Males	0.65	(0.6444, 0.6606)	0.62	0.69	25727	14505	56.4	0.9	80223.13	0.64
	Females	0.50	(0.4764, 0.5147)	0.44	0.69	5772	2300	39.8	1.3		0.47
Race	Aboriginal	0.88	(0.8578, 0.8996)	1.21	0.69	1643	1296	78.9	0.5	79894.61	0.90
	Non-Aboriginal	0.61	(0.6044, 0.6204)	0.56	0.69	29778	15512	52.1	1.1		0.60
Age Group	< 21	0.76	(0.7464, 0.7646)	0.79	0.70	13063	8942	68.5	0.7	78618.36	0.75
	>= 21	0.53	(0.5216, 0.5446)	0.44	0.70	18481	7880	42.6	1.4		0.51
Cannabis Related offence to Cannabis Related Offence											
Total dataset		0.29	(0.2784, 0.2972)	0.29	0.82	31544	6692	21.2	2.2	52751.62	0.27

Prior Categories	No Priors	0.20	(0.1943, 0.2126)	0.29	0.82	15306	2300	15.0	2.2	52021.41	0.18
	Drug only Priors	0.31	(0.2702, 0.3562)	0.29	0.82	585	151	25.8	2.2		0.29
	Mixed Priors	0.37	(0.3571, 0.3834)	0.29	0.82	15653	4241	27.1	2.2		0.35
Sex	Males	0.30	(0.2931, 0.3134)	0.29	0.82	25727	5771	22.4	2.2	52571.46	0.28
	Females	0.22	(0.2031, 0.2308)	0.29	0.82	5772	916	15.9	2.2		0.22
Race	Aboriginal	0.39	(0.3125, 0.4777)	0.17	0.82	1643	336	20.5	3.8	52667.36	0.32
	Non-Aboriginal	0.29	(0.2761, 0.2946)	0.30	0.82	29778	6353	21.3	2.1		0.27
Age Group	< 21	0.37	(0.3573, 0.3837)	0.30	0.82	13063	3662	28.0	2.1	52189.61	0.34
	>= 21	0.22	(0.2144, 0.2324)	0.30	0.82	18481	3030	16.4	2.1		0.21

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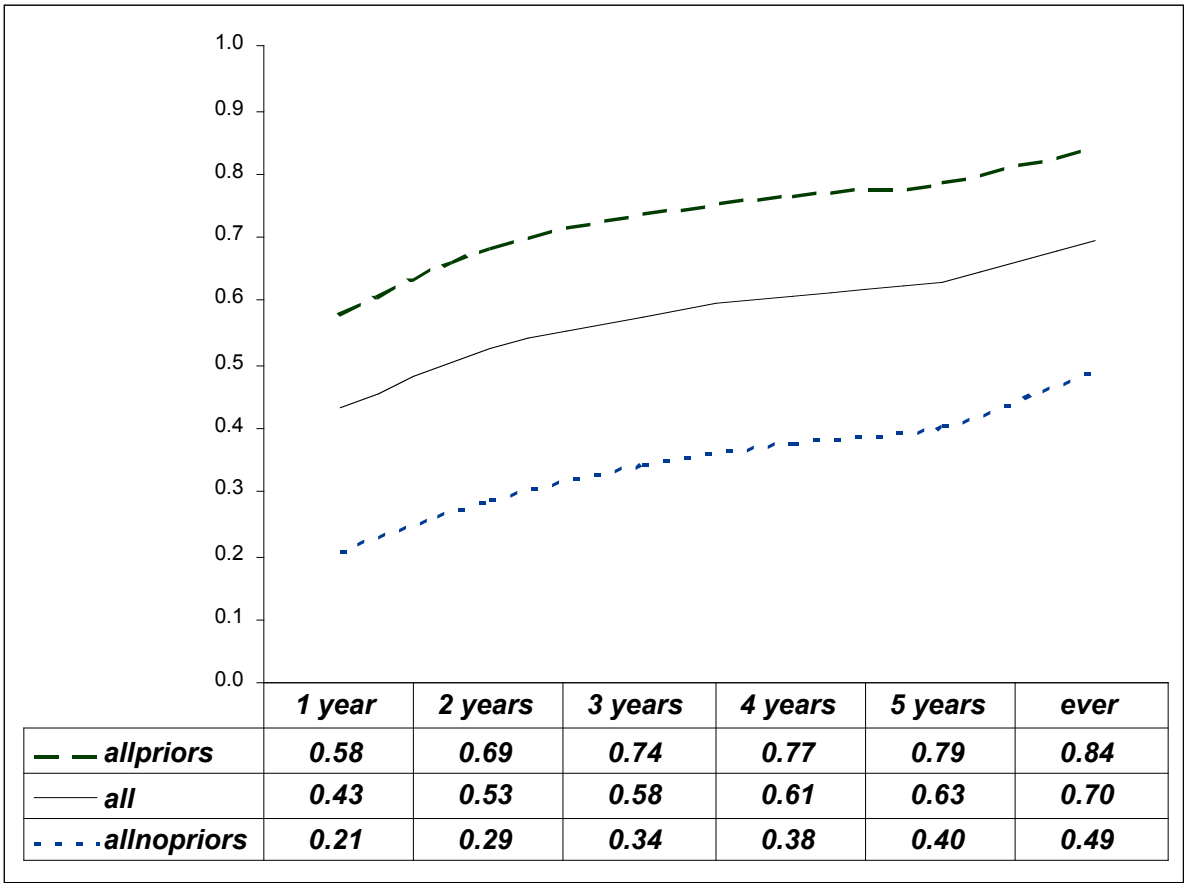
Group		CI				n	no. fails	% Fails	Median time to fail (yrs)	-2logL	Kme-max
Cannabis Related offence to Other Drug Offence (excl. cannabis related)											
Total dataset		0.28	(0.2699, 0.2957)	0.22	0.81	31544	5994	19.0	2.9	49767.92	0.25
Prior Categories	No Priors	0.20	(0.1871, 0.2095)	0.22	0.81	15306	2038	13.3	2.9	49084.70	0.17
	Drug only Priors	0.23	(0.1923, 0.2746)	0.22	0.81	585	103	17.6	2.9		0.21
	Mixed Priors	0.37	(0.3498, 0.3850)	0.22	0.81	15653	3853	24.6	2.9		0.33
Sex	Males	0.30	(0.2817, 0.3090)	0.22	0.81	25727	5127	19.9	2.9	49640.55	0.26
	Females	0.22	(0.2078, 0.2404)	0.22	0.81	5772	862	14.9	2.9		0.20
Race	Aboriginal	0.49	(0.3491, 0.6358)	0.11	0.81	1643	348	21.2	5.7	49678.95	0.36
	Non-Aboriginal	0.28	(0.2645, 0.2893)	0.23	0.81	29778	5644	19.0	2.8		0.24
Age Group	< 21	0.38	(0.3618, 0.3965)	0.23	0.81	13063	3463	26.5	2.8	49031.57	0.33
	>= 21	0.20	(0.1931, 0.2143)	0.23	0.81	18481	2531	13.7	2.8		0.18
Drug User to Any Offence											
Total dataset		0.64	(0.6293, 0.6429)	0.65	0.69	38299	20589	53.8	0.9	94324.50	0.63
Prior Categories	No Priors	0.49	(0.4827, 0.5042)	0.48	0.75	18546	7361	39.7	1.3	90665.04	0.48
	Drug only Priors	0.59	(0.5280, 0.6449)	0.37	0.80	598	301	50.3	1.7		0.55
	Mixed Priors	0.78	(0.7676, 0.7841)	0.81	0.67	19155	12927	67.5	0.7		0.77
Sex	Males	0.66	(0.6541, 0.6687)	0.67	0.69	31112	17497	56.2	0.9	93756.59	0.65
	Females	0.53	(0.5121, 0.5442)	0.54	0.69	7139	3072	43.0	1.1		0.51
Race	Aboriginal	0.89	(0.8737, 0.9073)	1.39	0.69	2305	1822	79.0	0.4	92848.64	0.91
	Non-Aboriginal	0.62	(0.6169,0.6313)	0.60	0.69	35828	18749	52.3	1.0		0.61
Age Group	< 21	0.75	(0.7457, 0.7620)	0.82	0.69	17534	11720	66.8	0.7	91873.61	0.75
	>= 21	0.54	(0.5288, 0.5497)	0.48	0.69	20765	8869	42.7	1.2		0.52
Drug User to Drug Deal/Trafficker Offence											
Total dataset		0.16	(0.1457, 0.1790)	0.14	0.88	38299	3248	8.5	4.7	32987.38	0.13

Prior Categories	No Priors	0.10	(0.0925, 0.1161)	0.14	0.89	18546	1012	5.5	4.6	32546.32	0.08
	Drug only Priors	0.20	(0.1594, 0.2497)	0.14	0.89	598	78	13.0	4.6		0.16
	Mixed Priors	0.22	(0.1940, 0.2390)	0.14	0.89	19155	2158	11.3	4.6		0.17
Sex	Males	0.17	(0.1517, 0.1865)	0.14	0.88	31112	2763	8.9	4.7	32930.05	0.13
	Females	0.13	(0.1150, 0.1490)	0.14	0.88	7139	483	6.8	4.7		0.11
Race	Aboriginal	0.16	(0.1466, 0.1804)	0.14	0.88	2305	137	5.9	4.7	32969.59	0.11
	Non-Aboriginal	0.16	(0.1466, 0.1804)	0.14	0.88	35828	3111	8.7	4.7		0.13
Age Group	< 21	0.18	(0.1641, 0.2020)	0.14	0.89	17534	1734	9.9	4.6	32924.92	0.14
	>= 21	0.14	(0.1263, 0.1565)	0.14	0.89	20765	1514	7.3	4.6		0.11

Appendix F

ESTIMATED RISKS OF RE-OFFENDING FOR THE GENERAL ARREST POPULATION

Figure F.1 Kaplan Meier group estimates of failure for sex/race populations

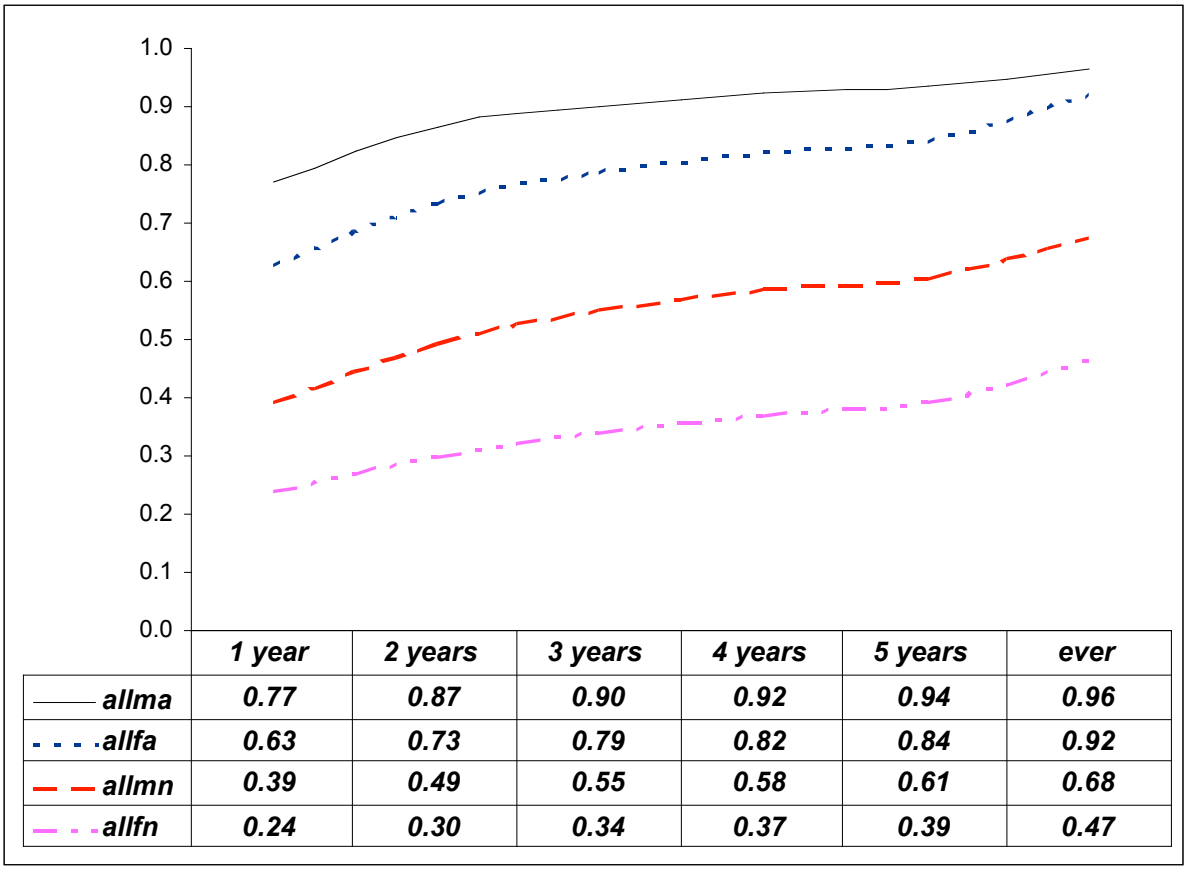


	1 year	2 years	3 years	4 years	5 years	ever
allpriors	0.58	0.69	0.74	0.77	0.79	0.84
all	0.43	0.53	0.58	0.61	0.63	0.70
allnopriors	0.21	0.29	0.34	0.38	0.40	0.49

where all = all arrest events between 1984 and 1997
allnopriors = all FIRST arrest events between 1984 and 1997
allpriors = all 2nd and subsequent arrest events between 1984 and 1997

Group Sizes	n	fails
all	493,157	300,503
allnopriors	192,805	78,761
allpriors	300,353	221,750

Figure F.2 Kaplan Meier group estimates of failure for sex/race populations

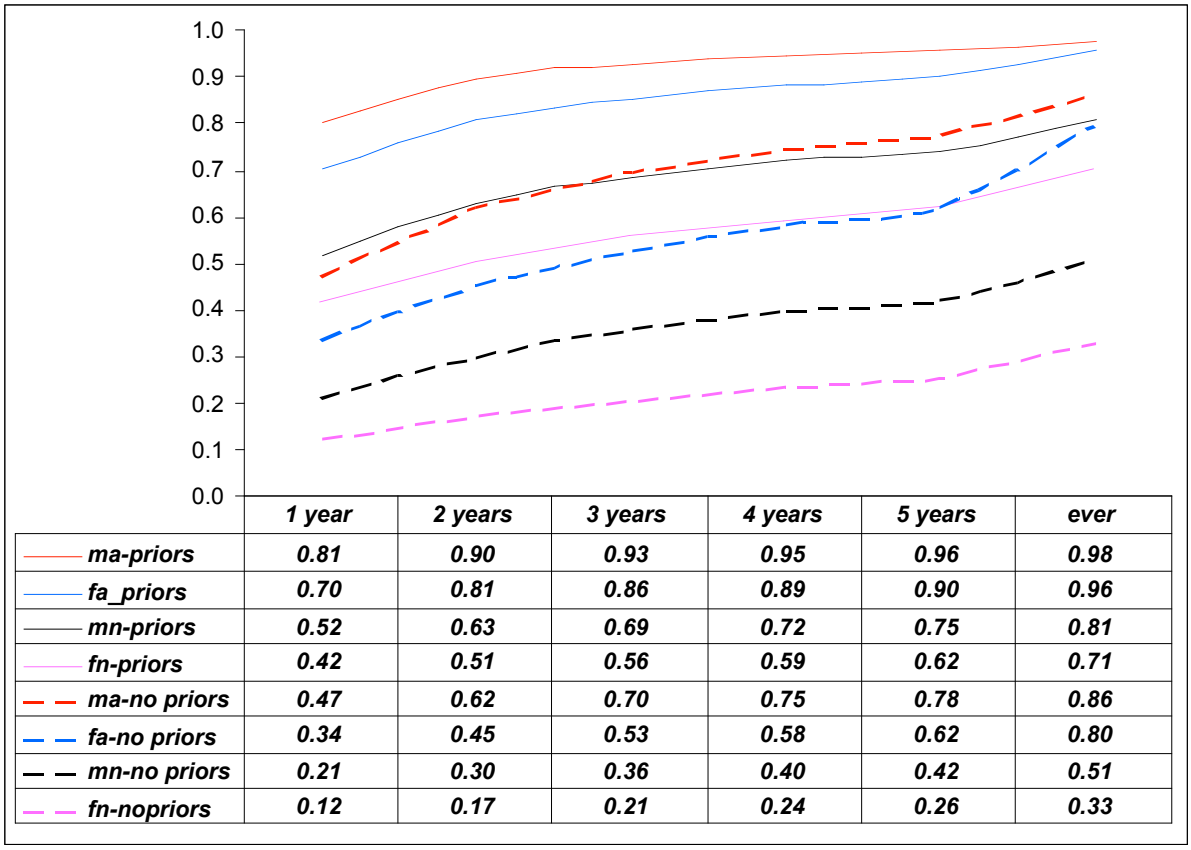


	1 year	2 years	3 years	4 years	5 years	ever
allma	0.77	0.87	0.90	0.92	0.94	0.96
allfa	0.63	0.73	0.79	0.82	0.84	0.92
allmn	0.39	0.49	0.55	0.58	0.61	0.68
allfn	0.24	0.30	0.34	0.37	0.39	0.47

where: allma = all arrest events between 1984 and 1997 for Male Aboriginals
allfa = all arrest events between 1984 and 1997 for Female Aboriginals
allmn = all arrest events between 1984 and 1997 for Male Non Aboriginals
allfn = all arrest events between 1984 and 1997 for Female NonAboriginals

Group Sizes	n	fails
allma	69,932	62,024
allmn	326,116	190,498
allfa	25,491	20,288
allfn	71,621	27,701

Figure F.3 Kaplan Meier group estimates of failure for sex/race groups, with and without prior arrests



	1 year	2 years	3 years	4 years	5 years	ever
ma-priors	0.81	0.90	0.93	0.95	0.96	0.98
fa_priors	0.70	0.81	0.86	0.89	0.90	0.96
mn-priors	0.52	0.63	0.69	0.72	0.75	0.81
fn-priors	0.42	0.51	0.56	0.59	0.62	0.71
ma-no priors	0.47	0.62	0.70	0.75	0.78	0.86
fa-no priors	0.34	0.45	0.53	0.58	0.62	0.80
mn-no priors	0.21	0.30	0.36	0.40	0.42	0.51
fn-nopriors	0.12	0.17	0.21	0.24	0.26	0.33

where:
ma-no priors = all MA FIRST arrest events between 1984 and 1997
ma-priors = all MA 2nd and subsequent arrest events between 1984 and 1997
mn-no priors = all MN FIRST arrest events between 1984 and 1997
mn-priors = all MN 2nd and subsequent arrest events between 1984 and 1997
fa-no priors = all FA FIRST arrest events between 1984 and 1997
fa_priors = all FA 2nd and subsequent arrest events between 1984 and 1997
fn-nopriors = all FN FIRST arrest events between 1984 and 1997
fn-priors = all FN 2nd and subsequent arrest events between 1984 and 1997

Group Sizes	n	fails
ma-no priors	7,993	6,089
ma-priors	61,940	55,935
mn-no priors	135,666	57,753
mn-priors	190,451	132,745
fa-no priors	5,222	3,312
fa_priors	20,270	16,976
fn-nopriors	43,927	11,607
fn-priors	27695	16094

Appendix G

RE-ARREST ESTIMATES AT 1, 2 AND 5 YEARS

Table G.1 Re-arrest estimates (Kaplan Meier) at 1, 2, 5 and maximum years for the three drug offender groups for specific sub-groups of offenders.

		1 year	2 years	5 years	Max Kme (11 years)
Drug to any offence	No priors	0.2110	0.2976	0.4066	0.4688
	Drug only priors	0.2073	0.3107	0.4606	0.5457
	Mixed priors	0.4485	0.5689	0.7013	0.7652
Drug to drug offence	No priors	0.0883	0.1354	0.2037	0.2485
	Drug only priors	0.1088	0.1816	0.2760	0.3544
	Mixed priors	0.1533	0.2338	0.3564	0.4406
Cannabis user to any offence	No priors	0.2133	0.2996	0.4082	0.4711
	Drug only priors	0.2271	0.3265	0.4754	0.5606
	Mixed priors	0.4453	0.5667	0.7001	0.7635
Cannabis user to cannabis user offence	No priors	0.0557	0.0883	0.1354	0.1646
	Drug only priors	0.0790	0.1275	0.1976	0.2435
	Mixed priors	0.1003	0.1539	0.2453	0.3115
Cannabis user to drug user offence (excl. cannabis user)	No priors	0.0166	0.0276	0.0496	0.0748
	Drug only priors	0.0208	0.0272	0.0591	0.1103
	Mixed priors	0.0307	0.0531	0.0989	0.1608
Cannabis user to cannabis deal/trafficker offence	No priors	0.0048	0.0096	0.0146	0.0206
	Drug only priors	0.0083	0.0231	0.0346	0.0453
	Mixed priors	0.0100	0.0164	0.0325	0.0480
Cannabis user to other drug offence (excl. cannabis user)	No priors	0.0646	0.1024	0.1609	0.1993
	Drug only priors	0.0688	0.1300	0.2090	0.2908
	Mixed priors	0.1138	0.1766	0.2878	0.3795
Cannabis user to opiate user offence	No priors	0.0009	0.0015	0.0025	0.0053
	Drug only priors	0.0042	0.0084	0.0084	0.0164
	Mixed priors	0.0018	0.0043	0.0086	0.0183
Cannabis related offence to any offence	No priors	0.2051	0.2896	0.3983	0.4605
	Drug only priors	0.2172	0.3152	0.4574	0.5459
	Mixed priors	0.4325	0.5566	0.6913	0.7579
Cannabis related offence to Cannabis related offence	No priors	0.0617	0.0983	0.1529	0.1848
	Drug only priors	0.0878	0.1490	0.2234	0.2874
	Mixed priors	0.1119	0.1742	0.2759	0.3477
Cannabis related offence to other Drug offence (excl. cannabis related)	No priors	0.0532	0.0828	0.1312	0.1688
	Drug only priors	0.0482	0.0884	0.1464	0.2102
	Mixed priors	0.0927	0.1477	0.2413	0.3252

cont…

		1 year	2 years	5 years	Max Kme (11 years)
Drug user to any offence	No Priors	0.2186	0.3077	0.4169	0.4792
	Drug only Priors	0.2152	0.3207	0.4751	0.5547
	Mixed Priors	0.4597	0.5788	0.7111	0.7709
Drug user to drug deal/trafficker offence	No Priors	0.0165	0.0307	0.0560	0.0766
	Drug only Priors	0.0237	0.0530	0.1032	0.1560
	Mixed Priors	0.0334	0.0586	0.1141	0.1725