

Characteristics of prolific offenders in NSW

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Aim: To examine the frequency of contacts (police cautions, youth justice conferences, or finalised court appearances at which one or more offences were proven) with the criminal justice system by offenders in New South Wales; and, to identify prolific offenders and non-prolific offenders (NPO), compare their characteristics, and model their risk of recidivism.

Method: Demographic, criminal history and recidivism data for the cohort of offenders with one or more contacts during 2011 were extracted from BOCSAR's Re-offending Database. Logistic regression was used to model prolific offending and violent recidivism, Cox regression was used to model time to offence, and negative binomial regression was used to model recidivism rate.

Results: Most offenders in this 2011 cohort had no contacts in the 2 years prior to their index contact. Prolific offenders (defined as offenders with at least four contacts in the past 2 years) comprised 1.7 per cent of the cohort but accounted for 16.8 per cent of the cohort's contacts in the past 2 years. Males, offenders aged under 18, Indigenous offenders, and offenders who were in prison/detention at their index contact were significantly more likely to be prolific offenders (compared with females, older offenders, non-Indigenous offenders and offenders who were not in prison). The strongest correlates of prolific offending were younger age and CJS contacts in the 8 years prior to the period used to define prolific offending. Prolific offending had a significant but modest impact on all three recidivism outcomes, along with several other factors.

Conclusion: Prolific offenders were found to make a disproportionate contribution to the total volume of offending and recidivism. This is consistent with prior research and suggests that this group warrants intensive intervention. However, much of the variance in recidivism was explained by risk factors other than prolific offending and modifiable risk factors such as drug use were not examined by this study.

Keywords: prolific offending, offence rate, profiling, recidivism, characteristics.

Introduction

Most crime can be attributed to a small fraction of the population (Farrington, 2003; Wolfgang, Figlio, & Sellin, 1972). In Victoria, 14 per cent of offenders (3% of persons) born in 1984 accounted for 36 per cent of that cohort's arrests by age 24 (Drugs Crime Prevention Committee, 2009). In New South Wales (NSW), just 2 per cent of offenders born in 1984 contributed 15 per cent of that cohort's court appearances between 1994 and 2005 (Hua, Baker, & Poynton, 2006). In Queensland, 5 per cent of offenders born in 1990 accounted for 41 per cent of that cohort's total criminal justice costs (Allard, Stewart, Smith, Dennison, Chrzanowski, & Thompson, 2014). Prolific offenders can noticeably affect local crime rates, perceptions of public safety and resource availability (Dawson & Cuppleditch, 2007) and accrue millions in individual lifetime costs (Cohen & Piquero, 2009; Vaughn et al., 2011).

As one would expect, rates of recidivism among prolific offenders are high. In one large study from the United Kingdom study, 3 in 4 prolific offenders reoffended within 1 year and prolific offenders recorded an average of five new offences in that time, accounting for a much greater share of total offences than other offenders (Home Office, 2010). Numerous analyses show that prolific offending also predicts more prevalent and frequent recidivism, independent of other risk factors (e.g., Evans, Huang, & Hser, 2011; Smith & Jones, 2008a). Given that the NSW state priorities (NSW Government, 2015) include reducing adult re-offending by 5 per cent by 2019, this study provides an analysis of prolific offending in NSW. More specifically, the study has four aims:

1. To describe the frequency of contacts over the past 2 years and the volume of contacts accounted for by prolific offenders and non-prolific offenders (NPO);

2. To compare demographic, geographic and offence correlates of prolific offenders and NPO;
3. To measure the time to new offence, frequency of new contacts, prevalence of violent recidivism, and the proportion of each of these outcomes accounted for by prolific offenders and NPO;
4. To identify the risk of each recidivism outcome for prolific offenders, adjusting for demographic characteristics and criminal histories.

Definitions and characteristics of prolific offending

There is no consensus in the literature on how prolific offending should be defined (Blokland & Nieuwebeerta, 2007). The term implies an unusually high volume and/or rate of offending, however the unit that is counted (e.g., offence or arrest), the frequency that is classified as “prolific”, and the duration over which offending is observed vary widely across studies. In part, this reflects the general challenge in dichotomising continuous data such as offending frequency. Definitions of prolific offending have included: more than five records of offending in the past year (Dawson & Cuppleditch, 2007); more than five police contacts by age 25 (Drugs Crime Prevention Committee, 2009); and more than 100 offences (Boorman & Hopkins, 2012).

Individual offence frequencies vary over time and criminal careers can be intermittent (Blumstein, 1986). However, three broad patterns of prolific offending can be identified. Long-term low rate offenders can be prolific given enough time, and may be characterised by violent crime, but are rare (Piquero, Sullivan, & Farrington, 2010). Long-term high rate (“life-course persistent”) offenders typically commit a diverse array of offences (Moffitt, 2003; Piquero et al., 2010) and present the greatest lifetime burden to society (Vaughn et al., 2011), but also are relatively uncommon. By contrast, short-term high rate offenders tend to be characterised by property crime and crime limited largely to adolescence (Moffitt, 2003; Piquero et al., 2010) and are far more numerous.

Notwithstanding the range of definitions, a number of characteristics associated with prolific offending have been repeatedly identified. These include being male, being younger, Indigenous status, socioeconomic disadvantage, drug use (Kinlock, O’Grady, & Hanlon, 2003; Makkai, Ratcliffe, Veraar, & Collins, 2004) and property offending (Allard, Chrzanowski, & Stewart, 2014; Brame, Mazerolle, & Piquero, 2010; Dawson & Cuppleditch, 2007; Drugs Crime Prevention Committee, 2009). These are common risk factors for offending and recidivism (Smith, 2010; Smith & Jones, 2008a, 2008b). Prolific offenders are usually characterised by property crime but also tend to commit a variety of offences. Several studies have found a strong link between prolific property crime and violence (Kinlock et al., 2003; Makkai et al., 2004; Tollenaar & van der Laan, 2013) and, at least among adult prolific offenders, even the most specialised property offenders alternate between offence types (Tollenaar & van der Laan, 2013).

The next section describes the methods used to address the four aims listed in the introduction.

Method

Sample

The sample included all 102,446 offenders with one or more proven criminal justice system contacts (CJS; defined as police cautions, youth justice conferences, or finalised court appearances at which one or more offences were proven) during 2011. The first of these contacts was defined as the “index” contact. All data reported here were extracted from the NSW Bureau of Crime Statistics and Research Re-offending Database (ROD; Hua & Fitzgerald, 2006). ROD contains all finalised criminal court appearances from 1994 to the present and all cautions and conferences from 1998 the present, and so may be incomplete for persons born prior to 1988.

Independent variables

The selection of independent variables was informed by the empirical studies described in the introduction.

DEMOGRAPHICS

Sex: whether the offender was male or female.

Age: age in years at the time of the index contact.

Indigenous status: whether the offender identified as Aboriginal or Torres Strait Islander at the index contact or any contact since 1994 (no/missing or yes). Missing data were treated as “non-Indigenous” in multivariate analyses (per Jones, 2009).

Location: defined by the Area of Remoteness Index (ARIA; Australian Bureau of Statistics, 2011a) for the offender’s residential postcode at the index contact (major city, regional, or remote). Offenders who were in prison/detention at the index contact were labelled as such.

Disadvantage: the Socio-Economic Indexes for Areas (SEIFA; Australian Bureau of Statistics, 2011b) relative disadvantage quintile for the offender’s residential postcode, ranging from 1 (most disadvantage) to 5 (least disadvantage).

Statistical area: the statistical area (SA4) of the offender’s residential postcode.

INDEX CONTACT

Bail refused: whether bail was refused or the offender was in custody for a prior offence at the time of the index contact (no, or yes). For offenders with caution or conference as their index contact, this was coded “no”.

Concurrent charges: the number of proven charges at the index contact, excluding the principal offence (0, 1, or 2 or more).

Legal representation: whether the offender was legally represented (no/unknown, or yes). For offenders with a caution or conference as their index contact, this was coded “no”.

Principal offence: the offence that attracted the most severe penalty according to the Bureau’s penalty ranking system (see NSW Bureau of Crime Statistics and Research, 2015, p. 163),

categorised by the Australian and New Zealand Standard Offence Classification (ANZSOC; Australian Bureau of Statistics, 2011c) divisions (violent, divisions 01-06; property, divisions 07-09; drug, division 10; traffic, division 14; justice, division 15; and other, divisions 11-13 or 16).

PRIOR OFFENDING

Type of first offence: the principal offence at an offender’s first known proven contact (violent, ANZSOC divisions 01-06; property, ANZSOC divisions 07-09; or other, ANZSOC divisions 10-16).

Prior juvenile court: any finalised proven juvenile court appearances prior to the index contact.

Prior prison: the number of court appearances that resulted in a full-time prison penalty or juvenile detention prior to the index contact.

Prior violent offence: any contacts in the 10 years prior to the index contact for a proven violent offence (ANZSOC divisions 01 to 06).

Prior property offence: any contacts in the 10 years prior to the index contact for a proven property offence (ANZSOC divisions 07 to 09).

Contacts 3-10 years prior: the number of contacts 3 to 10 years prior to the index contact (i.e., in the 8 years prior to the period used to define prolific offending).

Time in custody: the number of days the offender was in custody in the 2 years prior to their index contact.

Dependent variables

Time to reoffend: the number of days from the index contact or date of release from custody (for offenders in custody at the time of their index contact), until the first new proven offence occurring before 1 April 2014 and finalised by 1 October 2014. Offenders were censored at the first occurrence of a new custodial episode, finalisation for an offence committed prior to their index contact, death, or 1 April 2014.

Recidivism rate: number of new proven offences occurring within 2 years of the index contact, adjusted for time spent in custody.

Violent recidivism: a new violent offence (ANZSOC divisions 01 to 06) occurring within 2 years of the index contact (irrespective of time spent in custody) and finalised by 1 October 2014.

Statistical analysis

Time to offence was modelled using Cox proportional hazards regression with associations quantified as hazard ratios (HR). Recidivism rate was modelled using negative binomial regression with associations quantified as incidence

rate ratios (IRR). Time spent in custody was accounted for by an exposure term defined as 731 days (i.e., 2 years) minus total days in custody in the 2 years after the index contact. Violent recidivism was modelled using logistic regression with associations quantified as odds ratios (OR).

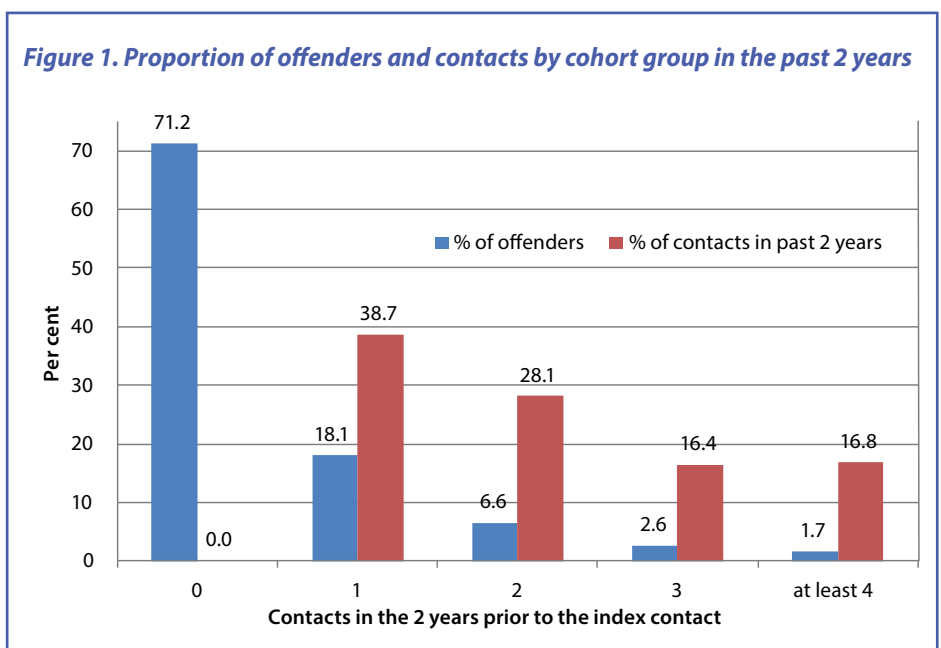
In the first stage of the analysis, bivariate regression models measured the associations of cohort group with each independent variable to the recidivism outcome of interest. Variables associated with the outcome at $p < .10$ at the bivariate level were then included in a multivariate model along with cohort group. Independent variables were then removed from the model sequentially in ascending order of significance and retained in the model if associated at $p < .05$. A similar approach using logistic regression was employed to develop a multivariate model of prolific offending.

Previous recidivism research with these administrative data suggests that predictive models of time to offence and recidivism rate are often highly similar but may show substantive differences (e.g., Jones, 2009). The correlates of both outcomes are explored in the current study because we do not assume (a priori) that they are the same for prolific offenders.

Results

Defining prolific offending

Figure 1 presents the number of CJS contacts in the 2 years prior to the index contact (“the past 2 years”) for all offenders included in the cohort. Also shown is the proportion of CJS contacts within the past 2 years accounted for by each of the relevant groups. As seen here, most (71.2%) offenders in the cohort had no CJS contacts in the past 2 years, while a very small proportion (1.7%) had at least four contacts during that period. Overall, the cohort accumulated a total of 47,805 contacts in the past 2 years and offenders with at least four contacts during that period accounted for 1 in 6 (16.8%) of these prior contacts. This equates to a rate of 2.34 contacts



per person per year (pp/py), which is 12 times the rate of persons with fewer than four contacts in the past 2 years. We define this group (offenders with at least four contacts in the past 2 years) as prolific.¹ This definition ensures a group that is sufficiently numerous to examine in multivariate analyses, but not so large that an intensive CJS response to this group would necessarily require an enormous investment. This definition is also consistent with the focus of prolific offending programs elsewhere (e.g., Home Office, 2010). Finally we dichotomise offence frequency for our analysis but do not infer that prolific offending is a qualitatively distinct phenomenon.

Geographic distribution

Prolific offenders were unevenly distributed across NSW. At their index contact, 1 in 11 (8.8%) prolific offenders were in prison/detention and, along with the small minority of offenders with missing/interstate postcode data, could not be included in a geographic analysis. Figure 1 presents the percentage of offenders who are prolific by total offenders, disaggregated by SA4 statistical area.² These percentages, and the rates of total and prolific offending per 100,000 population are detailed in Table A1.

The areas with the highest percentages of prolific offenders were City/Inner South (3.4%), Newcastle/Lake Macquarie (2.3%), and Far West/Orana (2.1%); the lowest rates were in Ryde (0.6%) and Richmond/Tweed (0.8%) and Baulkham Hills/Hawkesbury (0.8%). The highest rates of prolific offenders were in Far West/Orana (n = 65; 54.7 per 100,000 population) and Murray (n = 52; 45.7 per 100,000 population); the lowest rates were in Ryde (n = 3; 1.8 per 100,000 population) and North Sydney/Hornsby (n = 20; 5.0 per 100,000 population).

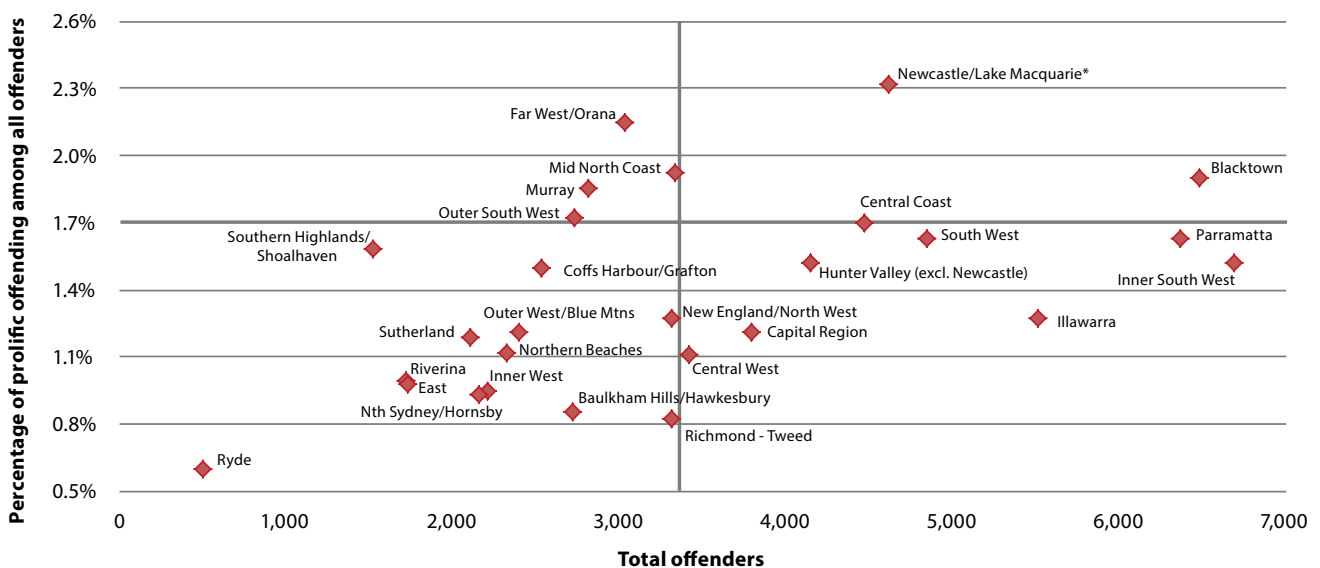
Demographic and offending characteristics

Table 1 presents the proportion of prolific offenders by demographic subgroup. Males were significantly more likely to be prolific offenders than females (1.8% vs. 1.1%). On other demographic variables the greatest proportional differences in prolific offending were between offenders aged under 18 (4.3% vs. offenders aged 21 or above, 0.9%); Indigenous offenders (5.1% vs. non-Indigenous offenders, 1.3%; however, almost all offenders without Indigenous status were non-prolific offenders); offenders in prison/detention at their index contact (8.8% vs. offenders in regional locations, 1.3-1.5%); and offenders from the least disadvantaged areas (1.0% versus offenders in other locations, 1.7-1.8%).

Prolific offending was also much more common among offenders with certain criminal history characteristics (Table 2). For example, the proportion of offenders with multiple concurrent charges at their index contact (3.8%) was double that of offenders with a single concurrent charge (1.9%) and higher still than offenders with no concurrent charges (1.1%). Prolific offending was also much more common among offenders who had been refused bail, those who were not legally represented, and offenders with a principal violent, property or justice offence at their index contact. Prolific offending was much more common among offenders with a principal property offence at their index contact and offenders who had ever received a prison sentence, had a juvenile court record, had a proven violent or property offence in the past 10 years, or had at least 3 contacts between 3 and 10 years prior to their index contact.

Offenders with one or more proven violent offences in the past 2 years were much more likely to be prolific offenders

Figure 2. Percentage of known offenders who are prolific by total known offenders for statistical area



Note. Bold line on horizontal axis indicates total prevalence of prolific offending in cohort. Bold line on vertical axis indicates the average number of offenders in all geographic areas except City/Inner South. Values for City/Inner South, prison/detention, and missing/interstate not shown. Totals for Newcastle/Lake Macquarie may be inflated by a higher than average transient population.

Table 1. Demographic characteristics of the cohort and proportion of prolific offenders

DEMOGRAPHICS	Total (n=102,446)	Prolific offenders % (n=1,716)
Sex		
Female	21,487	1.1
Male	79,073	1.8
Missing	170	0.0
Age		
Under 18	11,860	4.3
18-20	21,244	2.4
21 or older	64,208	0.9
Missing	418	0.0
Indigenous status		
Non-Indigenous	69,403	1.3
Indigenous	14,661	5.1
Missing	16,666	0.01
Location^a		
Major city	56,321	1.7
Inner regional	17,650	1.5
Outer regional	18,221	1.3
Remote	1,916	1.7
Very remote	1,079	2.1
Prison/detention	1,571	8.8
Interstate/no postcode	4,536	0.6
Disadvantage quintile		
1 (most disadvantaged)	20,964	1.7
2	18,512	1.7
3	23,644	1.7
4	17,698	1.8
5 (least disadvantaged)	14,113	1.0
Missing	5,799	2.9

Note. All differences significant at $p < .001$

^a The proportion of prolific offenders in all regional/remote areas was 1.5 per cent.

than offenders with no proven violent offences in the past 2 years (10.4% vs. 0.7%; Table A2). A similar pattern was observed for property, drug, traffic, justice and other offences. These measures could not be included in multivariate analyses, however, as they are inherently related to the measure of prolific offending (i.e., their total contacts during that period).

Multivariate model of prolific offending

A multivariate model of prolific offending (Table 3) was developed using a subset of the bivariate correlates above. Correlates that overlapped with the definition of prolific offending (including recent criminal history) or were strongly correlated with age (e.g., index traffic offending) were not considered in this model. The multivariate correlates of prolific offending were being male, younger age, Indigenous status, major city versus regional/remote location, bail refusal and concurrent offences at the index contact, and proven contacts 3 to 10 years before the index contact.³ With the exception of

Table 2. Criminal history of the cohort and proportion of prolific offenders

CRIMINAL HISTORY	Total (n=102,446)	Prolific offenders % (n=1,716)
INDEX CONTACT		
Concurrent charges		
None	67,272	1.1
1	17,486	1.9
2 or more	15,972	3.8
Bail refused		
No	95,782	1.3
Yes	6,664	7.6
Legally represented		
No	59,448	2.0
Yes	33,299	0.9
Missing	9,699	2.3
Principal offence^a		
Violent	22,463	3.2
Property	12,582	2.9
Drug	8,604	1.6
Traffic	37,554	0.4
Justice	8,799	4.5
Other	12,438	2.2
PRIOR OFFENDING		
Principal proven offence at first contact		
Violent	21,314	1.5
Property	20,180	3.1
Other	60,952	1.3
Prison (any time prior)		
No	89,082	1.0
Yes	13,364	6.1
Juvenile court (any time prior)		
No	81,929	0.6
Yes	20,517	6.0
Violence offence (past 10 years)		
No	73,750	0.5
Yes	28,696	4.8
Property offence (past 10 years)		
No	79,144	0.3
Yes	23,302	6.2
Contacts (3-10 years prior)		
None	54,670	0.7
1-2	25,304	1.5
3 or more	22,472	4.4

Note. All differences significant at $p < .001$.

^a Missing data not reported: $n=6$.

sex, these correlates were associated with a roughly two-fold or greater risk of prolific offending.⁴ Odds of prolific offending were highest for offenders aged under 18 (11 times those of offenders aged 21 or older: OR = 11.36) and for offenders with at least 3 proven contacts more than 2 years prior to their index contact (several times greater than those of offenders with no concurrent charges: OR = 7.68). Socioeconomic disadvantage, type of first proven offence, and legal representation were not significant in this model.

Table 3. Multivariate model of prolific offending

EXPLANATORY VARIABLES	Odds Ratio (95% CI) (n = 97,386)
Male vs. female	1.36 (1.18, 1.57)
Age	
18-20 vs. 21 or older	3.12 (2.77, 3.51)
Under 18 vs. 21 or older	11.36 (9.85, 13.09)
Indigenous vs. non-Indigenous	2.02 (1.80, 2.26)
Location	
Regional/remote vs. major city	0.56 (0.50, 0.63)
Prison/detention vs. major city	1.06 (0.86, 1.32) ^a
Bail refused at index contact vs. other	2.49 (2.17, 2.86)
Concurrent charges at index contact	
1 vs. 0	1.28 (1.12, 1.47)
2 or more vs. 0	1.69 (1.50, 1.91)
Contacts, 3 to 10 years before index contact	
1-2 vs. 0	3.10 (2.65, 3.62)
3 or more vs. 0	7.68 (6.59, 8.95)
Pseudo R²	.184

Note. All contrasts significant at $p < .001$ unless otherwise noted. CI = confidence interval. Offenders who were missing data on one or more explanatory variables were excluded from the model.

^a $p = .588$

Table 4. Offending and criminal justice system involvement after index contact

OUTCOME	Prolific	Non-prolific
Time in custody within 2 years	64.9%	14.9%
Mean days if spent time in custody (standard deviation)	137 (88)	88 (171)
New contact within 2 years	74.5%	29.1%
Mean contacts (standard deviation)	1.9 (1.9)	0.5 (1.0)
Incidence Rate Ratio (95% CI) prolific offenders vs. NPO ^a	5.33 (4.90, 5.81), $p < .001$	
Days for 25% of each group to reoffend	67	595
Hazard Ratio (95% CI) prolific offenders vs. NPO	4.42 (4.14, 4.72), $p < .001$	
New violent offence within 2 years	39.7%	11.6%
Odds Ratio (95% CI) prolific offenders vs. NPO	5.03 (4.55, 5.55), $p < .001$	
New property offence within 2 years	41.2%	8.3%
Odds Ratio (95% CI) prolific offenders vs. NPO	7.74 (7.01, 8.54), $p < .001$	

Note. CI = confidence interval.

^a Adjusted for time spent in custody within 2 years of the index contact.

Recidivism

Descriptive and bivariate results

Table 4 presents descriptive statistics for offending and CJS involvement after the index contact, and the results of bivariate regression models for the major recidivism outcomes and for property recidivism. Within 2 years of the index contact, nearly two thirds (64.9%) of prolific offenders spent time in custody (4.5 months on average), far more than NPO (14.9% and 3 months respectively). Time in custody may have pertained to offences dating prior to or after the index contact. The cohort also accrued 53,698 contacts for a new offence (i.e., that was committed after the index contact), few of which were finalised via a conference (1.9%) or police caution (4.6%). Prolific offenders had a much higher prevalence of recidivism (74.5% vs. NPO 29.1%); 1 in 4 reoffended within 67 days of their index contact (vs. 595 days for NPO) and their times to first reoffence were significantly shorter than NPO (HR = 4.42).

In the 2 years after their index contact, prolific offenders accrued a mean of 1.9 contacts (vs. NPO 0.5) and accounted for 6.1 per cent of the cohort's contacts over this period. Even more strikingly, half of all prolific offenders (but only 11.8% NPO) accrued multiple contacts. Accounting for time spent in custody in the 2 years after the index contact (using an exposure term: 731 minus total days in custody), prolific offenders had five times the rate of contacts as NPO (IRR = 5.33). Prolific offenders also had a much higher prevalence of violent offending (OR = 5.03) and property offending (OR = 7.74) and a higher rate of these offences.⁵

Between-group differences in recidivism were parallel during follow-up, indicating that the proportional hazards assumption was met. Figure 3 presents the time to offence curves (Kaplan-Meier survival estimates) for prolific offenders and non-prolific offenders.

Results of multivariate regression models

The results of multivariate regression models for the three main recidivism outcomes are presented in Table 5; all contrasts were significant unless otherwise noted. Hazard Ratios, Incident Rate Ratios, and Odds Ratios greater than 1 indicate a positive relationship with recidivism while those less than 1 indicate a negative relationship. The size of the ratio indicates the strength of the relationship.

Prolific offending had a broadly consistent predictive effect on recidivism. Being a prolific offender predicted a 70 per cent increase in the hazard of recidivism (HR = 1.70), a slightly greater increase in the odds of violent recidivism (OR = 1.82) and more than a doubling of the rate of recidivism (IRR = 2.07). Indigenous status made a similar contribution to recidivism risk, and its role was most evident for violent offending (OR = 2.34). The strongest predictor of each outcome was age, and offenders aged under 18 had odds of violent recidivism nearly five times greater than those of offenders aged 21 or above (OR = 4.82). Weaker predictors of each outcome included being male, having more concurrent charges, being refused bail, and being legally represented at the index contact. Location did not predict violent recidivism and was of minor consequence for other outcomes (however, bail refusal may have suppressed the result for prison/detention, as noted earlier). Having a property offence at first proven CJS contact predicted recidivism (but was

Figure 3. Time to offence (Kaplan-Meier survival estimates) for prolific offenders and non-prolific offenders

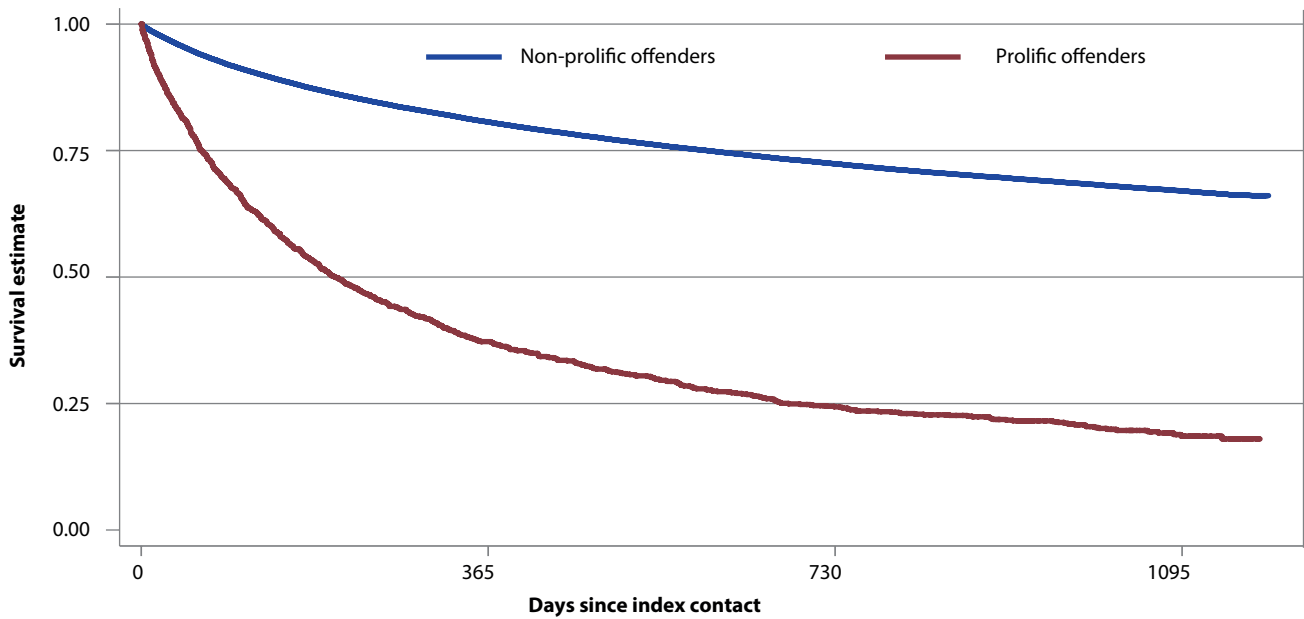


Table 5. Recidivism models

	Time to first new offence	Rate, accounting for time in custody	Violent recidivism
	Hazard Ratio (95% CI) (n = 95,608)	Incidence Rate Ratio (95% CI) (n = 97,386)	Odds Ratio (95% CI) (n = 97,386)
Prolific offenders vs. NPO	1.70 (1.59, 1.82)	2.07 (1.92, 2.22)	1.82 (1.64, 2.03)
DEMOGRAPHICS			
Indigenous vs. non-Indigenous	1.72 (1.67, 1.77)	1.88 (1.82, 1.93)	2.34 (2.23, 2.45)
Age			
18-20 vs. 21 or older	1.47 (1.43, 1.51)	1.40 (1.36, 1.44)	1.59 (1.51, 1.67)
Under 18 vs. 21 or older	3.31 (3.20, 3.44)	3.86 (3.71, 4.01)	4.82 (4.52, 5.14)
Male vs. female	1.32 (1.28, 1.36)	1.38 (1.33, 1.42)	1.46 (1.38, 1.54)
Location			
Regional/remote vs. major city	0.95 (0.92, 0.97)	0.82 (0.80, 0.84)	1.05 (1.01, 1.10)
Prison vs. major city	1.17 (1.07, 1.28)	1.13 (1.03, 1.24) ^b	1.04 (0.91, 1.19)
INDEX CONTACT			
Concurrent charges			
1 vs. 0	1.17 (1.13, 1.20)	1.22 (1.18, 1.25)	1.23 (1.17, 1.30)
2 or more vs. 0	1.32 (1.28, 1.36)	1.36 (1.32, 1.41)	1.40 (1.33, 1.48)
Bail refused vs. other	1.33 (1.27, 1.40)	1.78 (1.69, 1.87)	1.20 (1.11, 1.29)
Legally represented vs. none	1.30 (1.27, 1.34)	1.34 (1.30, 1.38)	1.15 (1.10, 1.21)
CRIMINAL HISTORY			
First proven offence			
Property vs. violent	1.12 (1.08, 1.15)	1.10 (1.06, 1.14)	0.79 (0.75, 0.84)
Other vs. violent	0.98 (0.95, 1.01) ^a	0.93 (0.91, 0.96)	0.73 (0.69, 0.76)
Contacts, 3 to 10 years prior			
1 vs. 0	1.80 (1.74, 1.85)	1.76 (1.70, 1.81)	1.82 (1.72, 1.93)
2 or more vs. 0	3.30 (3.20, 3.41)	3.56 (3.44, 3.68)	3.95 (3.73, 4.19)
Pseudo R²	Not available	.091	.125

Note. CI = confidence interval. Non-significant terms were excluded from the model. Offenders with no location data were excluded. Overall likelihood ratio chi-square tests and other contrasts were significant at $p < .001$ unless otherwise noted. Offenders who were missing data on one or more explanatory variables in a given model were excluded from that model.

a. $p = .233$.

b. $p = .013$.

c. $p = .053$.

positively related to general recidivism and negatively related to violent recidivism); proven contacts 3 to 10 years prior to the index contact also strongly predicted each outcome.

Although not shown in the table, higher proportions of prolific offenders than NPO were censored, due to new custodial episodes (11.3% vs. NPO 2.5%) or finalisations for offences committed prior to the index contact (22.3% vs. NPO 8.6%). Between-group differences in recidivism were parallel during follow-up, indicating proportion hazards across this time.

The model predicting recidivism rate (accounting for time in custody) was very similar to the previous model and so is not described here in detail.

The model for violent recidivism differed slightly; prolific offending predicted violent recidivism as did Indigenous status; violent recidivism was not predicted by location, but in contrast with the other outcomes, was predicted by initiation of offending with property or non-violent offending rather than by violent offending. These models explained relatively little variation in recidivism.

Discussion

This study had four aims:

1. To describe the frequency of contacts over the past 2 years and the volume of contacts accounted for by prolific offenders and non-prolific offenders (NPO);
2. To compare demographic, geographic and offence correlates of prolific offenders and NPO;
3. To measure the time to new offence, frequency of new contacts, prevalence of violent recidivism, and the proportion of each of these outcomes accounted for by prolific offenders and NPO;
4. To identify the risk of each recidivism outcome for prolific offending, adjusting for demographic characteristics and criminal histories.

Prolific offenders were defined as those with at least four contacts (police cautions, youth justice conferences, or court appearances for a proven offence) in the 2 years prior to their index contact; offenders with fewer than four contacts in the past 2 years were defined as NPO. Over the 2 year window examined here, prolific offenders averaged 2.34 CJS contacts per year, which is 12 times the rate of CJS contacts of persons with less than four contacts in the preceding 2 years. They comprised 1.7 per cent of the cohort but accounted for 16.8 per cent of all contacts over the preceding 2 years.

The distribution of prolific offending among demographic subgroups and criminal history characteristics was highly uneven. By far the strongest multivariate correlate of prolific offending was younger age. The geographic distribution of prolific offending was also uneven, however the prevalence of prolific offending may be underestimated in areas with relatively high imprisonment; rates of prison admissions are well above average in some postcodes in the Far West (e.g., Bourke; Vinson, Rawsthorne, Beavis & Ericson, 2015).

In the 2 years following their index court appearance, prolific offenders were more likely than NPO to re-offend (74.5% compared with 29.1%), tended to re-offend faster (25% reoffended within 67 days, compared with 595 days for NPO), were more likely to spend time in custody (64.9% compared with 14.9%), were more likely to commit a violent offence (39.7% compared with 11.6%) and were more likely to commit a new property offence (41.2% compared with 8.3%).

The disproportionate contribution of prolific offenders to the total volume of offending and recidivism (including both violent and property recidivism) is consistent with previous research (Dawson & Cuppleditch, 2007; Drugs Crime Prevention Committee, 2009; Moffitt, 2003) and suggests that this group warrants intensive intervention (Loeber & Ahonen, 2004). The results of programs targeting prolific offenders, however, have not been entirely clear.

An extensive police operation (Operation Anchorage) in the Australian Capital Territory repeatedly targeted recidivist property offenders, one fifth of whom had at least 15 prior offence episodes (Makkai et al., 2004). Reductions in recorded rates of burglary were observed during and for a period following the operation but the burglary rate eventually returned to pre-intervention levels. Statistical analysis indicated that the reduction in burglary was not due to the heroin shortage or to a secular decline in rates of burglary across the ACT, suggesting that Operation Anchorage had at least a transient impact on offending.

A less convincing result emerged from the UK "Prolific and Priority Offender" scheme. This scheme targeted a small number of offenders in each local area, using collaborative, multi-agency management to prevent and rehabilitate prolific offenders; it had a community focus but also reached into prison and had after-care provisions. A major evaluation (Dawson & Cuppleditch, 2007) found reductions in offending by participants during follow-up, particularly among younger offenders, but the causal effect of program participation remained unclear.

Some limitations of this study bear mention. The study considered the past 2 years when defining prolific offending, however prolific offenders' earlier criminal histories were diverse. Offenders with short versus long histories of prolific offending are likely to have divergent recidivism outcomes, particularly in the long term, and could be compared in future research.

Prolific offending (and the models overall) explained very little variance in recidivism and this may partly reflect the absence of dynamic risk factors; prolific offending has previously been associated with modifiable risk factors including patterns of drug use. Key elements of criminal history (e.g., prior prison) and exogenous factors such as opportunity and neighbourhood characteristics (Weatherburn & Lind, 2001) could not be included in the models. Finally, this study did not evaluate the merits of different definitions of prolific offending over another.

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Notes

1. A small proportion (1.8%) of offenders accrued fewer than four contacts in the past 2 years, but due to time spent in custody had accrued these contacts at a prolific rate (i.e., at more than two per year of "free time"). A further 0.2 per cent of offenders had spent the past 2 years in custody (i.e., their rate of contacts could not be calculated).
2. Offender and prolific offender totals for City/Inner South may be inflated by the city's high transient population, so this area has been excluded from Figure 1. Offender and prolific offender totals could potentially be inflated for the same reason in for Newcastle/Lake Macquarie.
3. Very similar results for location were obtained when disaggregating remote/very remote areas from regional areas. However, the result for prison/detention versus major city (OR = 1.06, $p = .588$) differs starkly from the bivariate odds ratio of 5.59 (95% CI = 4.68, 6.68, $p < .001$) for this contrast. Bail refusal was strongly associated with prison/detention at the index contact (chi-square test, $p < .001$) and suppresses the effect of prison/detention in the multivariate model.
4. The true estimate for Indigenous status may be slightly lower. The odds ratio in Table 3 (OR = 2.02) is the upper bound for the association between Indigenous status and prolific offending, because this model treats persons with missing Indigenous status as non-Indigenous. Treating persons with missing data as Indigenous, the lower bound for this estimate would be OR = 1.61 (95% CI = 1.47, 1.79, $p < .001$).
5. For offenders with a new violent offence within 2 years of their index contact, the mean number of new violent offences was 2.3 for prolific offenders (vs. 1.8 NPO); For offenders with a new property offence within 2 years of their index contact, the mean number of new property offences was 3.3 for prolific offenders (vs. 2.9 NPO).

References

Allard, T., Stewart, A., Smith, C., Dennison, S., Chrzanowski, A., & Thompson, C. (2014). The monetary cost of offender trajectories: Findings from Queensland (Australia). *Australian & New Zealand Journal of Criminology*, 47(1), 81-101.

Allard, T., Chrzanowski, A., & Stewart, A. (2014). Integrating Criminal Careers and Ecological Research: The Importance of Geographic Location for Targeting Interventions Toward Chronic and Costly Offenders. *Crime & Delinquency*, 1-25, Retrieved 25 Jul. 2015 from doi: 10.1177/0011128714568187.

Australian Bureau of Statistics. (2011a). *Australian Standard Geographical Classification (ASGC)* (Cat. No. 1216.0). Retrieved 10 Jul. 2015 from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1216.0>.

Australian Bureau of Statistics. (2011b). *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia* (Cat. no. 2033.0.55.001). Retrieved 14 Jul. 2015 from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001>

Australian Bureau of Statistics. (2011c). *Australian and New Zealand Standard Offence Classification (ANZSOC)* (Cat. no. 1234.0) (3rd Edition). Retrieved 14 Jul. 2015 from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1234.0>

Blokland, A. A., & Nieuwebeerta, P. (2007). Selectively incapacitating frequent offenders: Costs and benefits of various penal scenarios. *Journal of Quantitative Criminology*, 23(4), 327-353.

Blumstein, A. (Ed.). (1986). *Criminal careers and "career criminals"* (Vol. 2). Washington: National Academy Press.

Boorman, R., & Hopkins, K. (2012). *Prisoners' criminal backgrounds and proven re-offending after release: results from the Surveying Prisoner Crime Reduction (SPCR) survey* (Research Summary No. 8/12). Retrieved 14 Jul. 2015 from Ministry of Justice website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/219801/proven-re-offending-after-release.pdf

Brame, R., Mazerolle, P., & Piquero, A. R. (2010). Criminal career progression among serious youthful offenders in Australia. *Journal of Criminal Justice*, 38(4), 340-347.

Cohen, M., & Piquero, A. (2009). New evidence on the monetary value of saving a high risk youth. *Journal of Quantitative Criminology*, 25(1), 25-49.

Dawson, P., & Cuppleditch, L. (2007). *An impact assessment of the Prolific and other Priority Offender programme* (Online Report 08/07). Retrieved 13 Jul. 2015 from <http://217.35.77.12/Cb/england/papers/pdfs/2007/rdsolr0807.pdf>

Drugs Crime Prevention Committee. (2009). *Inquiry into strategies to prevent high volume offending and recidivism by young people: final report*. Retrieved from http://www.parliament.vic.gov.au/dcpc/Current_Inquiries/High_volume_crime/DCPC-Report_HighVolumeCrime_2009-07-22.pdf

Evans, E., Huang, D., & Hser, Y. I. (2011). High-risk offenders participating in court-supervised substance abuse treatment: characteristics, treatment received, and factors associated with recidivism. *Journal of Behavioural Health Services Research*, 38(4), 510-525.

Farrington, D. P. (2003). Key results from the first 40 years of the Cambridge Study in Delinquent Development. In T. P. Thornberry & M. D. Krohn (Eds.), *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies* (pp. 137-183). New York: Kluwer Academic/Plenum.

Home Office. (2010). *Prolific and Other Priority Offenders: Results From the 2009 Cohort for England and Wales*. Retrieved 14 Jul.

- 2015 from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/115712/misc0310.pdf
- Hua, J., Baker, J., & Poynton, S. (2006). *Generation Y and crime: A longitudinal study of contact with NSW Criminal Courts before the age of 21* (Crime and Justice Bulletin No. 96). Retrieved 14 Jul. 2015 from NSW Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb96.pdf>
- Hua, J., & Fitzgerald, J. (2006). *Matching court records to measure reoffending* (Crime and Justice Bulletin No. 95). Retrieved 14 Jul. 2015 from NSW Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb95.pdf>
- Jones, C. (2009). *Does Forum Sentencing reduce re-offending?* (Crime and Justice Bulletin No. 129). Retrieved 14 Jul. 2015 from New South Wales Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb129.pdf>
- Kinlock, T. W., O'Grady, K. E., & Hanlon, T. E. (2003). Prediction of the criminal activity of incarcerated drug-abusing offenders. *Journal of Drug Issues*, 33(4), 897-920.
- Loeber, R., & Ahonen, L. (2014). What are the policy implications of our knowledge on serious, violent, and chronic offenders? *Criminology & Public Policy*, 13(1), 117-125.
- Makkai, T., Ratcliffe, J., Veraar, K., & Collins, L. (2004). *ACT recidivist offenders* (Research and Public Policy Series No. 54). Retrieved 14 Jul. 2015 from Australian Institute of Criminology website: http://www.aic.gov.au/media_library/publications/rpp/54/rpp054.pdf
- Moffitt, T. E. (2003). Life-course-persistent and adolescence-limited antisocial behavior: a 10-year research review and a research agenda. In B. B. Lahey, T. E. Moffitt & A. Caspi (Eds.), *Causes of conduct disorder and juvenile delinquency* (pp. 49-75). New York: Guildford Press.
- NSW Bureau of Crime Statistics and Research. (2015). *New South Wales Recorded Crime Statistics 2014*. Retrieved 14 Jul. 2015 from <http://www.bocsar.nsw.gov.au/Documents/RCS-Annual/RCS2014.pdf>
- NSW State Government. (2015). *State Priorities*. Retrieved 5 Nov. 2015 from <http://www.nsw.gov.au/making-it-happen>
- Piquero, A. R., Sullivan, C. J., & Farrington, D. P. (2010). Assessing differences between short-term, high-rate offenders and long-term, low-rate offenders. *Criminal Justice and Behavior*, 37(12), 1309-1329.
- Smith, N. E. (2010). *Why is the NSW juvenile reconviction rate higher than expected?* (Crime and Justice Bulletin No. 146). Retrieved 14 Jul. 2015 from NSW Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb146.pdf>
- Smith, N. E., & Jones, C. (2008a). *Monitoring trends in re-offending among adult and juvenile offenders given non-custodial sanctions* (Crime and Justice Bulletin No. 110). Retrieved 14 Jul. 2015 from NSW Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb110.pdf>
- Smith, N. E., & Jones, C. (2008b). *Monitoring trends in re-offending among offenders released from prison* (Crime and Justice Bulletin No. 117). Retrieved 14 Jul. 2015 from NSW Bureau of Crime Statistics and Research website: <http://www.bocsar.nsw.gov.au/Documents/CJB/cjb117.pdf>
- Tollenaar, N., & van der Laan, A. M. (2013). *Frequent offenders: specialists or not?* Retrieved 14 Jul. 2015 from Netherlands Ministry of Security and Justice website: http://english.wodc.nl/images/ob309-summary_tcm45-519403.pdf
- Vaughn, M. G., DeLisi, M., Gunter, T., Fu, Q., Beaver, K. M., Perron, B. E., & Howard, M. O. (2011). The severe 5%: A latent class analysis of the externalizing behavior spectrum in the United States. *Journal of Criminal Justice*, 39(1), 75-80.
- Vinson, T., Rawsthorne, M., Beavis, A., & Ericson, M. (2015). *Dropping of the edge 2015: Persistent communal disadvantage in Australia. NSW Rank Summary*. Retrieved 22 Jul. 2015 from <http://www.dote.org.au/wordpress/wp-content/themes/dote2015/resources/new-south-wales-rank-summary.xlsx>
- Weatherburn, D. & Lind, B. (2001). *Delinquent-prone communities*. Cambridge: Cambridge University Press.
- Wolfgang, M., Figlio, R., & Sellin, T. (1972). *Delinquency in a birth cohort*. Chicago: University of Chicago.

Appendix

Table A1. Population, total offenders and prolific offenders by area

SA4 area	Population	Total offenders		Prolific offenders		
		N	per 100,000 population	N	per 100,000 population	% among total offenders
GREATER SYDNEY						
Baulkham Hills/Hawkesbury	218,742	2,712	1,240	23	10.5	0.8
Blacktown	314,998	6,472	2,055	123	39.0	1.9
City and Inner South	284,457	5,819	2,046	195	68.6	3.4
Eastern Suburbs	267,974	1,726	644	17	6.3	1.0
Inner South West	550,209	6,689	1,216	102	18.5	1.5
Inner West	278,974	2,207	791	21	7.5	1.0
North Sydney/Hornsby	396,273	2,153	543	20	5.0	0.9
Northern Beaches	250,402	2,320	927	26	10.4	1.1
Outer South West	243,569	2,729	1,120	47	19.3	1.7
Outer West/Blue Mountains	297,940	2,391	803	29	9.7	1.2
Parramatta	414,096	6,367	1,538	104	25.1	1.6
Ryde	170,997	496	290	3	1.8	0.6
South West	376,539	4,840	1,285	79	21.0	1.6
Sutherland	219,137	2,100	958	25	11.4	1.2
OUTSIDE GREATER SYDNEY						
Capital Region	214,983	3,788	1,762	46	21.4	1.2
Central Coast	321,685	4,466	1,388	76	23.6	1.7
Central West	203,329	3,414	1,679	38	18.7	1.1
Coffs Harbour/Grafton	135,071	2,534	1,876	38	28.1	1.5
Far West/Orana	118,768	3,025	2,547	65	54.7	2.1
Hunter Valley	251,196	4,142	1,649	63	25.1	1.5
Illawarra	288,036	5,513	1,914	70	24.3	1.3
Mid North Coast	207,677	3,331	1,604	64	30.8	1.9
Murray	113,700	2,809	2,471	52	45.7	1.9
New England/North West	183,116	3,308	1,807	42	22.9	1.3
Newcastle/Lake Macquarie	356,041	4,617	1,297	107	30.1	2.3
Richmond/Tweed	236,557	3,307	1,398	27	11.4	0.8
Riverina	155,123	1,712	1,104	17	11.0	1.0
Southern Highlands/Shoalhaven	141,879	1,521	1,072	24	16.9	1.6
MISSING						
Missing (prison/detention)	-	1,721	-	152	-	8.8
Missing (interstate/no data)	-	4,215	-	21	-	0.5

Note. Values for total and prolific offenders in each SA4 area exclude offenders in prison/detention, interstate or with no postcode data.

Table A2. Offending in past 2 years by the cohort and proportion of prolific offenders

OFFENCE TYPE	Total (n=102,446)	Prolific offenders % (n=1,716)
Violent		
No	91,307	0.7
Yes	9,423	10.4
Property		
No	93,536	0.6
Yes	7,194	14.3
Drug		
No	96,807	1.2
Yes	3,923	12.0
Traffic		
No	90,784	1.1
Yes	9,946	6.4
Justice		
No	93,692	0.6
Yes	7,038	14.3
Other		
No	91,669	0.4
Yes	9,061	13.1

Note. All differences significant at $p < .001$.