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Targeting crime prevention to reduce offending: Identifying communities that generate chronic and costly offenders

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Foreword | *There has recently been renewed interest in place-based approaches for targeting crime prevention, such as justice reinvestment. This project linked research from life course and place-based criminology to explore whether some communities generated chronic and costly offenders. The Semi-Parametric Group-based Method was used to identify non-normative or chronic offenders in the 1990 Queensland Longitudinal Dataset (n=14,171). The postal areas generating chronic offenders were identified based on the proportion of the population who were chronic offenders and the overall cost of chronic offenders. The offender's first recorded postal area was used to assign location. The top 10 percent of postal areas generating chronic offenders accounted for 20.5 percent of chronic offenders. The top 10 percent of most costly locations contained 40.4 percent of chronic offenders and 50.5 percent of the total cost of chronic offenders. The identified locations had a high proportion of Indigenous youth, were in remote or very remote locations and experienced high levels of disadvantage. The authors conclude that there is an urgent need for therapeutic and place-based interventions to reduce crime and victimisation in these communities.*

Adam Tomison
Director

This study explored whether some communities generate chronic and costly offenders. It draws on methods and findings from criminal careers, and crime and place research. Criminal careers research is focused on the individual and is concerned with the different offending patterns developed over the life course. The research presented in this paper uses the Semi-Parametric Group-based Method (SPGM) to identify offenders on different trajectories, who differ in terms of their age of initiation and pattern of offending over the lifecourse (Kreuter & Muthén 2008). This research has found a small group of chronic offenders who began offending early in life and who account for a large proportion of offences (Allard et al. under review; Cohen, Piquero & Jennings 2010a, 2010b; Piquero 2008).

While chronic offender groups can been retrospectively identified, there is difficulty identifying these groups prospectively. For example, no research has adequately differentiated chronic and low-rate trajectories based on risk and protective factors. As such, there is no established method that is useful for targeting interventions based on this approach. Early/developmental interventions aim to intervene early in a negative pathway by addressing the risk and protective factors operating in people's lives (Homel et al. 1999). Although the approach acknowledges that offending pathways may commence at any age, intervening early in an at-risk child's life is viewed favourably because of the importance of early developmental phases and the cumulative nature of risk and protective factors (Farrington 2002). Despite the difficulties of targeting these interventions, they are typically found to have strongest evidence-base and usually reduce offending by about 15 percent (Aos, Miller & Drake 2006; Farrington & Welsh 2003; Lipsey 2009).

Recently, there has been renewed interest in place-based approaches for reducing crime. These approaches are based on findings indicating that the environments in which

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individuals are immediately situated or contextually embedded exert pervasive influences on behaviour (Kelling 2005; Oberwittler 2004). Crime and offenders are usually found to be concentrated in small geographic locations where the opportunities for offending are high or where there is structural disadvantage (Clarke 1997; Sabol, Coulton & Korbin 2004; Schwartz 2010; Silver & Miller 2004).

Interventions that target place include situational and community crime prevention. Situational crime prevention strategies manipulate the immediate environment in which crime occurs to reduce the opportunities for offending (Clarke 1997). Community crime prevention strategies manipulate the wider contextual environment and processes operating in the community that may be causing or maintaining crime (Oberwittler 2004). Although the evidence base for these approaches is weaker than for developmental interventions, situational crime prevention techniques have been found to reduce targeted crime problems in specific locations (Clarke 1997; Eck 2006). Several forms of community crime prevention are also promising, including mentoring, Vocational Education and Training, community economic development and recreational programs (Burghardt et al. 2001; McCord, Widom & Corwell 2001; Sherman et al. 1997; Stewart, Allard & Dennison 2011).

Given the usefulness of understanding place for targeting situational and community-based interventions, the current study aimed to determine whether offenders who were on chronic trajectories were randomly distributed geographically. Whether some communities experienced a disproportionate cost burden associated with chronic offending was also examined. If the communities that generated chronic and costly offenders could be identified, individuals in these locations could be targeted for early/developmental interventions. Given the links between offending, crime and victimisation, identified communities could also be targeted for situational and community-based interventions. The exploration of whether communities generated chronic and costly offenders raised the issue of offender

Figure 1 Five offender trajectories identified in the 1990 Queensland longitudinal cohort, by average number of offences per year of age
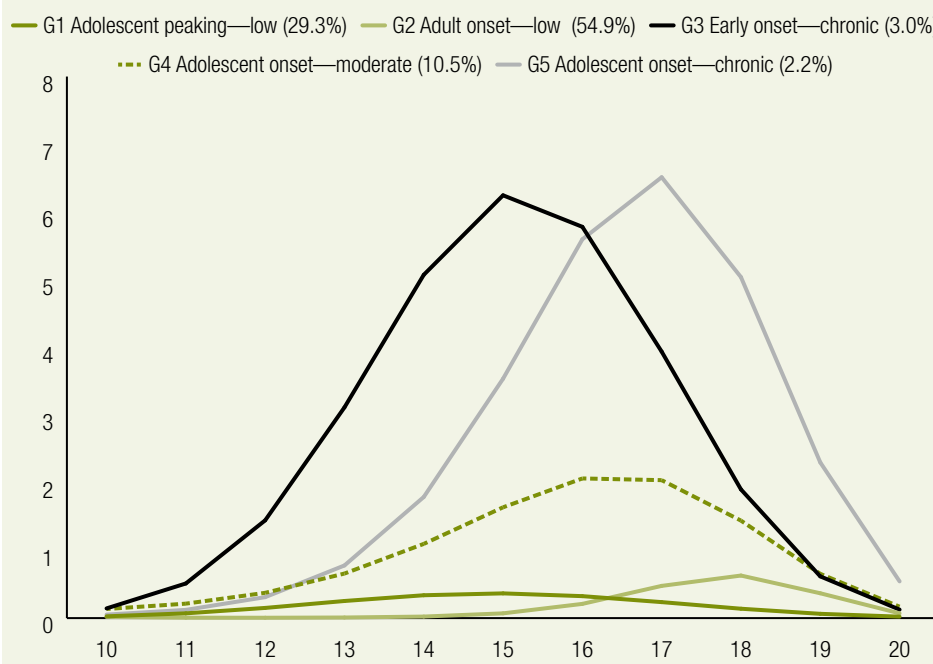
residential mobility. This is important because it makes little sense to target locations if the residential locations of offenders change over time as they move address. The study addressed four research questions:

(1) How many distinct offender trajectories can be identified?

(2) Are some communities more likely to generate chronic offenders than others?

(3) Which communities carry the cost burden of chronic offenders?

(4) How residentially mobile are chronic offenders?

Method

Offender cohort

A longitudinal offender cohort was used in this study, which included all individuals born in 1990 who had committed an offence in Queensland (other than traffic and breach offences) that resulted in a formal police caution, youth justice conference, youth or adult court appearance when the individual was between 10 and 20 years of age. This cohort was established using the data linkage and cleaning processes described elsewhere (Allard, Chrzanowski & Stewart 2012). There were 14,171 offenders in the cohort, most of whom were male (70.2%) and non-Indigenous (86.6%). These individuals were responsible for 71,413

offences and 33,455 cautions, youth justice conferences and finalised court appearances. There were four phases to address the research questions.

Phase 1: Identifying the number of offender trajectories

To address the first research question, which focused on identifying the number of offender trajectories, a dataset was created that had the number of offences for each offender based on their age at the time of the offence. *Age at time of offence* was calculated using the individual's date of birth and the earliest recorded date for each offence. For police cautions and conferences, the earliest date was generally the date when offences were reported to police. The earliest date recorded for court matters was either the date of lodgement or the earliest court appearance relating to the matter.

Nagin and Land's (1993) SPGM was used to model offence frequency annually while individuals were 10 to 20 years old. The SPGM analysis was undertaken using the Statistical Analysis System (SAS) procedure 'PROC TRAJ' developed by Jones, Nagin and Roeder (2001), with offending count data distributed based on the Zero-Inflated Poisson distribution (Fergusson, Horwood & Nagan 2000; Nagin 1999). Additionally, a

Table 1 Postal areas with the highest proportion of chronic offenders

Postal area	16 year old population Indigenous (%)	IRSD decile	ASGC-RS
4713	100.0	7	Remote Australia
4890	62.5	1	Very Remote Australia
4000	0.0	4	Major Cities of Australia
4824	29.0	1	Remote Australia
4605	45.5	9	Outer Regional Australia
4490	59.1	2	Very Remote Australia
4714	26.1	3	Outer Regional Australia
4830	100.0	1	Very Remote Australia
4465	25.0	4	Remote Australia
4470	10.0	7	Remote Australia
4849	0.0	6	Outer Regional Australia
4387	0.0	1	Outer Regional Australia
4874	55.8	3	Very Remote Australia
4852	0.0	2	Outer Regional Australia
4032	5.0	2	Major Cities of Australia
4876	100.0	2	Very Remote Australia
4825	56.9	4	Remote Australia
4730	0.0	1	Very Remote Australia
4183	27.6	7	Inner Regional Australia
4877	23.5	1	Outer Regional Australia
4888	20.0	2	Outer Regional Australia
4871	53.3	6	Very Remote Australia
4021	3.2	1	Major Cities of Australia
4614	12.0	5	Inner Regional Australia
4880	17.5	1	Outer Regional Australia
4895	46.3	7	Remote Australia
4558	2.4	3	Major Cities of Australia
4355	0.0	1	Inner Regional Australia
4012	0.0	1	Major Cities of Australia
4390	10.1	2	Outer Regional Australia
4814	10.7	2	Outer Regional Australia
4878	7.1	6	Outer Regional Australia
4612	0.0	6	Outer Regional Australia

small proportion (n=279, 2%) of individuals with an annual offence count above 20 were scaled to enable the trajectory analysis to converge. Models with between two and seven trajectories were created, with the five trajectory model selected based on the Bayesian Information Criterion (BIC), average probability of group membership and inspection of the form of the trajectories in each of the models (Allard et al. 2012).

Phase 2: Exploring whether communities generated chronic offenders

The second research question explored whether some communities were more likely than others to generate chronic offenders. This question was addressed by determining whether chronic offenders were randomly

distributed geographically after controlling for the effects of population size and ranking the top 10 percent of postal areas (POAs). The analytical strategy to address this research question involved five steps. First, offenders were classified as chronic if they were in the moderate or two chronic groups identified by the trajectory modelling (n=2,234, 15.8% of offenders). Second, the POA where offenders resided when they first had contact with the criminal justice system was selected as the most appropriate geographic and temporal unit of measurement. The first recorded POA was used because of the importance placed on the formative years by developmental criminology.

Third, because of the high level of population variability across the POAs, the proportion of chronic offenders in each POA was assessed. This was calculated as a proportion of the population of 16 year olds in each POA in 2006 (ABS 2011a). Individuals born in 1990 would have been 16 years old in 2006 and offenders in the offender cohort had a mean age of 16.21 years old for initiation of offending. Postcodes that had a 16 year old population of 10 or less were excluded because of the difficulties associated with small cell size (n=103 POAs). In total, proportions were calculated for 329 out of the 432 postcodes in Queensland. Fourth, postcodes were classified into four groups based on the proportion of the population living in that postcode who had offended—nil (0.0%), low (0.1–4.72%), high (4.73–9.09%) or very high (>9.09%). These postcodes were mapped using ArcGIS. Finally, the top 10 percent of postcodes where a very high proportion of the population were chronic offenders were identified and examined.

Phase 3: Identifying communities that carry the cost burden of chronic offenders

The third research question explored which communities generated the most costly chronic offenders. The analytical strategy used to address this question involved three stages. First, a costing methodology was established. This involved assessing the average cost for criminal justice system events based on the types of contact that individuals had. The wider social and economic costs of crime were estimated based on offence type. The detailed methodology used to establish these costs is described in depth elsewhere (Allard, Chrzanowski & Stewart 2012). The second stage involved assigning each chronic offender a cost based on their interactions with the criminal justice system and the offence types they committed. In the third stage, the total costs for offenders were aggregated for each of the 329 POAs based on the offender's residential postcode at their first recorded contact with the criminal justice system. The top 10 percent most expensive POAs were identified and examined.

Table 2 Postal areas with the highest total cost associated with chronic offenders

Postal area	Total cost of chronic offenders	16 year old population Indigenous (%)	IRSD decile	ASGC-RS
4350	14,041,855	5.9	5	Inner Regional Australia
4870	9,490,998	14.2	5	Outer Regional Australia
4814[a]	6,880,943	10.7	7	Outer Regional Australia
4500	5,526,594	2.4	8	Major Cities of Australia
4605[a]	5,219,528	45.5	1	Outer Regional Australia
4740	5,142,393	6.8	6	Inner Regional Australia
4825[a]	4,980,879	56.9	4	Remote Australia
4114	4,486,789	7.5	1	Major Cities of Australia
4871[a]	4,433,063	53.3	1	Very Remote Australia
4000[a]	4,145,758	0.0	9	Major Cities of Australia
4680	4,083,812	3.6	7	Inner Regional Australia
4815	4,073,432	14.9	5	Outer Regional Australia
4701	3,906,402	9.4	4	Inner Regional Australia
4650	3,870,516	3.2	2	Inner Regional Australia
4300	3,771,011	4.9	4	Major Cities of Australia
4700	3,718,443	5.8	3	Inner Regional Australia
4305	3,633,307	5.8	3	Major Cities of Australia
4405[a]	3,633,085	8.6	5	Inner Regional Australia
4207	3,287,461	5.0	4	Major Cities of Australia
4655	3,118,401	4.4	3	Inner Regional Australia
4077	3,071,191	7.3	1	Major Cities of Australia
4152	2,966,410	2.0	9	Major Cities of Australia
4053	2,909,976	2.4	8	Major Cities of Australia
4880[a]	2,687,249	17.5	2	Outer Regional Australia
4510	2,644,249	5.3	2	Major Cities of Australia
4021[a]	2,604,052	3.2	3	Major Cities of Australia
4557	2,601,894	1.3	7	Major Cities of Australia
4280	2,598,683	2.4	8	Major Cities of Australia
4713[a]	2,530,978	100.0	1	Remote Australia
4503	2,521,033	1.7	7	Major Cities of Australia
4869	2,470,170	15.4	6	Outer Regional Australia
4551	2,467,375	2.0	5	Major Cities of Australia
4812	2,421,583	13.4	4	Outer Regional Australia

a: Also identified as a POA with a high proportion of chronic offenders

Phase 4: Investigating offender residential mobility

The final research question required an assessment to be made about how residentially mobile chronic offenders were. For each offence, the offender's usual residential postcode was recorded. Offender residential mobility was explored by examining the number of times that offenders changed their residential postal address.

Results

Number of offender trajectories

The first research question required examination of the number of offender trajectory groups that could be identified in the offender cohort. Figure 1 presents the five trajectories identified by the model. Individuals in group one and two offended less frequently, with individuals in group one averaging 2.1 offences (SD=1.4) and individuals in group two averaging 1.9 offences (SD=1.5). Group one peaked during adolescence when individuals were 14 to 16 years of age, while group two had adult onset offending when individuals were over 17 years of age. These two groups accounted for most of the cohort, with 4,159 (29.3%) of the cohort in group one and 7,778 (54.9%) offenders in group two. However, these groups accounted for a low proportion of offending. Group one committed 8,923 (12.5%) offences and group two committed 14,626 (20.5%) offences. Group one was labelled 'Adolescent Peaking (low)' while group two was labelled 'Adult Onset (low)'.

The third group had early onset and high levels of offending (M=46.9 offences, SD=46.2 offences), with offending peaking when offenders were 15 years of age. Three percent of the cohort were classified into this group; however, they accounted for 28.1 percent of all offences. Group three was labelled 'Early Onset (chronic)'. Offenders classified into group four started offending when they were 11 to 14 years of age, with moderate offending. On average, each individual in group four was convicted of 11.2 offences (SD=6.2). Group 5 offenders accounted for 10.5 percent of the offending cohort and 23.4 percent of offences. This group was labelled 'Adolescent Onset (moderate)'. The fifth group initiated offending when they were 12 or 13 years of age, with high levels of offending that peaked when they were 17 years old. Only a small proportion of the cohort was classified in group five (n=318, 2.2%). On average, individuals in this group committed 35.0 offences (SD=29.7) and were responsible for 15.6 percent of offences. The group was labelled 'Adolescent Onset (chronic)'.
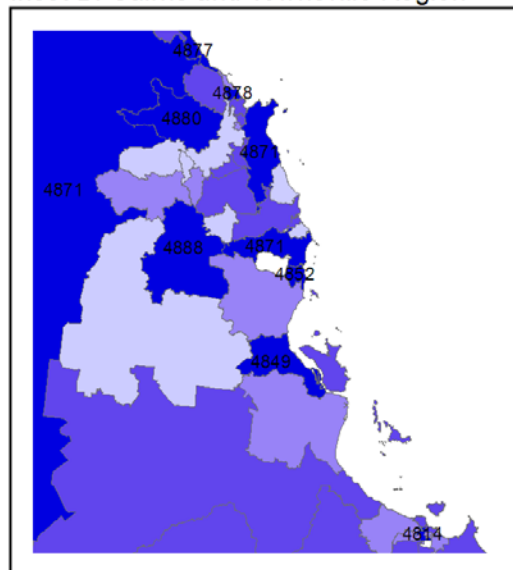
Geographic distribution of chronic offenders

The second research question sought to determine whether some communities were more likely than others to generate chronic offenders. To explore chronic offenders, information on individuals in the moderate and two chronic groups were combined. In total, individuals in these groups represented 15.9 percent of the offender cohort but were responsible for 67.0 percent of offences. In Figure 2, the distribution of these chronic offenders is mapped. It is apparent from this map that some POAs have a higher
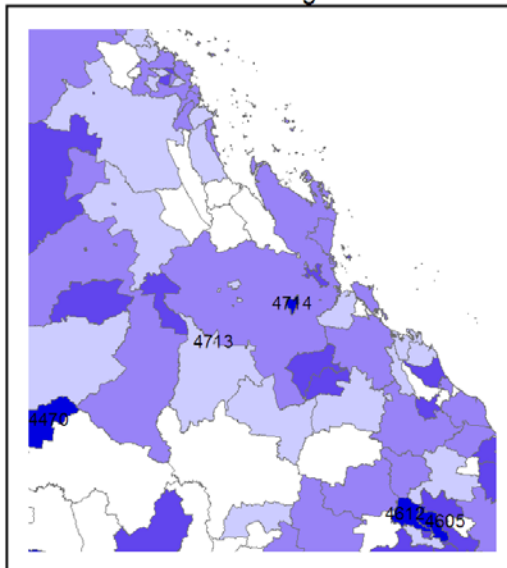
Figure 2 Proportion of chronic offenders by Queensland postal area

Legend
Queensland Postal Areas
% High Rate Offenders
- Nil
- Low (0.10% – 4.72%)
- High (4.73% – 9.09%)
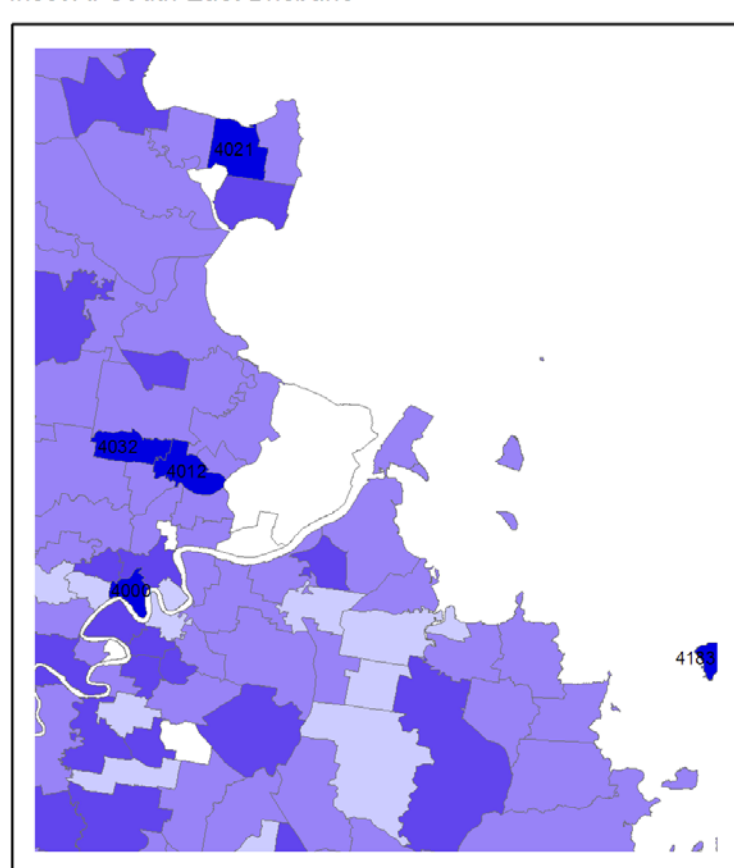- Very High (>9.09%)
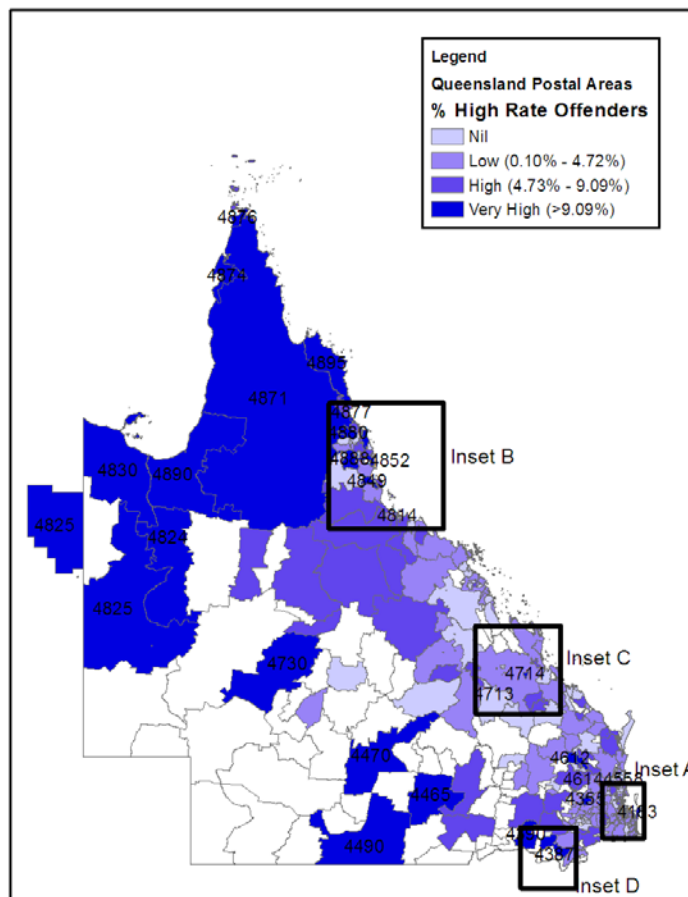
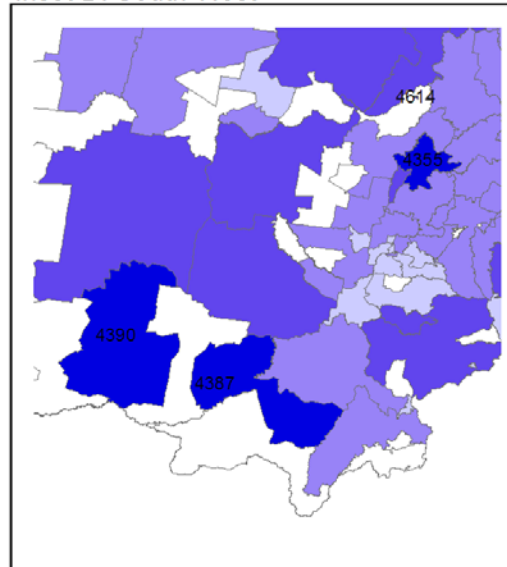Inset B: Cairns and Townsville Region

Inset C: Woorabinda Region

Inset A: South East Brisbane

Inset D: South West

proportion of chronic offenders. These areas are concentrated around far north Queensland. The 10 percent of POAs with the highest concentration of chronic offenders are presented in Table 1. While these 33 locations represent 10 percent of all POAs, they included 20.5 percent of all chronic offenders. Also presented in Table 1 is the percentage of 16 year olds in the POA that are Indigenous, the Index of Relative Socio-economic Disadvantage (IRSD) decile and the Australian Standard Geographical Classification—Remoteness Areas (ASGC-RA). The IRSD is an index developed by the Australian Bureau of Statistics (ABS) (2008) that summarises census data about low income, high unemployment and low levels of education. The index scores are presented as deciles, that is, an index score of 1 indicates the postal area is in the 10 percent of most disadvantaged areas in Australia. The ASGC-RA (ABS 2011b) classifies areas into five broad geographical categories based on access to goods and services. These categories include *Major Cities*, *Inner Regional*, *Outer Regional*, *Remote* and *Very Remote*.

Examination of the information presented in Table 1 indicates that the majority of these POAs had a high proportion of Indigenous 16 year olds. Twenty-two of the 33 POAs had higher than average (5.38%) populations of Indigenous 16 year olds. In two of these POAs (4713 and 4876), 100 percent of the 16 year olds were Indigenous. These POAs were also classified by high levels of disadvantage. Eleven (33%) were classified as in the lowest decile of disadvantage (mean=3.34). However, a substantial number of POAs with high proportions of chronic offenders were classified as not disadvantaged. When these POAs are examined, they include the Brisbane city central business district, the inner suburbs of Brisbane and the coastal suburbs around Cairns. A substantial number of POAs (13 of the 33) with high proportions of chronic offenders were classified as *Remote* and *Very Remote*. These are areas where it is difficult and costly to deliver goods and services. Additionally, 12 POAs were classified as *Outer Regional*. Interestingly, one of the *Very Remote* POAs (4730) that had a high proportion of chronic offenders had no officially recorded Indigenous

16 year olds and was not classified as disadvantaged (IRSD decile=6). This POA was in western Queensland and included Longreach.

Communities carrying the cost burden of chronic offenders

The third research question sought to determine which communities carried the cost burden of chronic offenders. Table 2 presents the top 10 percent of POAs identified, based on the total cost to the community of chronic offenders. When aggregated and totalled, chronic offenders in these POAs were found to cost between $2.4 and $14.0m. Despite representing 10 percent of postal areas, the top 33 POAs accounted for 40.4 percent of the chronic offenders, 47.0 percent of offences, 50.5 percent of the total cost of chronic offenders and 35.2 percent of the total cost of the all offenders in the cohort. These areas differed from the areas with the highest proportion of chronic offenders as these estimates do not take into account total population. Consequently, these POAs have the highest number of chronic offenders but not necessarily the highest concentration of chronic offenders.

Regional Queensland appears to be carrying the major cost burden of chronic offenders. Almost half of the high-cost POAs were classified as *Regional*. The POA that incurred the highest cost of chronic offenders was 4350, with the cost estimated at over $14m dollars. This POA includes the regional city of Toowoomba. Only three of the areas were classified as *Remote* or *Very Remote*. These POAs had high proportions of Indigenous young people and high levels of disadvantage. The cost of crime in these areas is considerable.

Eight POAs were identified that experienced high concentrations of chronic offenders and high costs as a result of chronic offenders. These POAs are predominantly located in north and far north Queensland and contain high proportion of Indigenous young people.

Offender residential mobility

The fourth research question required exploration of chronic offender residential

mobility. Examination of the number of times that chronic offenders changed POAs indicated that 31.7 percent of chronic offenders only had one POA over the 10 year period. There was substantial population mobility for most offenders, with 32.1 percent having three or more POAs. Furthermore, almost 10 percent had six or more residential postcodes.

Discussion

The aim of this study was to determine whether some communities were more likely than others to generate chronic and costly offenders. Five offender trajectories were identified consistent with previous research (Piquero 2008). These included two low-rate groups, one moderate group and two chronic groups. Offenders in the moderate and two chronic trajectories were combined to form a chronic offender group. The geographical distribution of this group was explored based on their residential postcode when they first had contact with the criminal justice system. Findings indicated that chronic offenders were not randomly distributed geographically. Most POAs (n=224, 68.1%) had none or a low proportion of the population who were chronic offenders (<4.73%). In the top 10 percent of locations (n=33), over 9.1 percent of the population were chronic offenders. These POAs were characterised by high proportions of Indigenous youth, high levels of disadvantage and remoteness. Similarly, costs were not randomly dispersed. The top 10 percent of the most costly POAs accounted for 50.5 percent of the total cost of chronic offenders and 35.2 percent of the total cost of all offenders in the cohort. Additionally, there was substantial residential mobility among chronic offenders and this should be considered when planning and implementing crime prevention interventions.

The findings from this study may assist interventions to be developed and targeted in Queensland. The identification of communities where there was a high proportion of the population who were chronic offenders and where chronic offenders cost substantial amounts of money should facilitate the place-based targeting of interventions. The substantial proportion of the population who were found to be chronic offenders in some locations indicates an urgent need for

appropriate evidence-based responses to reduce offending in these communities. Because of the frequent, sustained and serious nature of offences committed by chronic offenders, targeting interventions towards this group is likely to be difficult, but has the potential to result in considerable returns on investment.

There are a range of programs that have an international evidence base and may be used to reduce offending. Programs that are most likely to reduce offending are based on a therapeutic intervention philosophy, target high-risk offenders and are viewed as being implemented with care (experiencing few problems and with researcher involvement; Lipsey 2009). Evidence indicates that therapeutic programs that provide counselling (ie individual/group/family counselling and mentoring), multiple services (ie case management, referral or multi-modular programs), skill building (ie behavioural/cognitive-behavioural programs, social skills training, challenge programs and Vocational, Education and Training (VET) programs) or are restorative (ie restitution or mediation) typically reduce offending by 10–13 percent (Lipsey 2009). Surveillance-orientated programs (ie intensive probation/parole) are about half as effective, while programs that are based on deterrence (ie Scared Straight) and discipline (ie boot camps) are criminogenic (Lipsey 2009). While it is difficult to assess the cost of these programs in Australia, family-based programs have been reported as costing between US$2,000 and US$10,000 per participant, while Multi-Systemic Therapy (MST) has been reported as costing US$6,500 per participant (Aos, Miller & Drake 2006). As such, assessments should be made about the viability of making therapeutic programs available in these communities.

Given that these offenders are likely to offend and victimise within their own communities, place-based approaches addressing the opportunities in the immediate environment or underlying causes of crime in the wider contextual environment may also be useful in these communities. While situational techniques need to be developed with knowledge of highly specific problems in highly specific places, these techniques can result in reductions in crime (Clarke 1997; Eck 2006). Within Australia, situational crime prevention

has been successfully used to reduce substance abuse in several Indigenous communities (Richards, Rosevear & Gilbert 2011). Further, community-based approaches that have been adopted overseas that show promise include community economic development programs and recreational programs (McCord, Widom & Crowell 2001; Sherman et al. 1997). Community economic development programs would appear to be particularly relevant, given that many of the communities experienced disadvantage.

Such programs would need to be tailored to address the specific needs of individuals and communities. Many of the communities where a substantial proportion of the population were chronic offenders had a high Indigenous population. As such, programs would need to be sensitive to moral and cultural issues. The literature suggests that programs are likely to be most effective for Indigenous peoples when they:

- adopt an holistic approach that incorporates multiple components to address multiple and extensive needs;
- involve significant others including the family and community;
- are culturally appropriate; and
- involve Indigenous people, organisations and elders as well as other trained and culturally sensitive staff (Bonta, LaPrairie & Wallace-Capretta, 1997; Day 2003; Jones et al. 2002).

Moreover, many communities were in *Remote* or *Very Remote* locations. The provision of programs in remote communities would therefore need to overcome the challenges resulting from poor access to services and infrastructure (Schwartz 2010).

Despite the important implications of the study for assisting to target individually focused early/developmental crime prevention programs and placed-based interventions such as situational and community crime prevention, the findings should be interpreted in light of five main limitations. First, the study's reliance on administrative data means that it was reliant on the quality of the data contained within operational systems and excludes offending that is not reported or attributed to an offender. Second, the study was not able to take attrition into account or the effects of exposure time when exploring offender

trajectories. Attrition and exposure time may result in some variation in the final number of trajectory models identified (Eggleston, Laub & Sampson 2004). Third, there are limitations associated with the costing methodology that was used. Criminal justice system costs were based on averages and did not take into account the considerable variability that is likely to exist based on whether offenders plead guilty, the offence type and the location. Responses in regional and remote locations are likely to cost considerably more than in major cities. Social and economic costs could not be assessed for six ASOC offence codes, which represented 32.7 percent of offending. Therefore, the project is likely to significantly underestimate costs. Fourth, the postcode where offenders resided when they first had contact with the system was used to assign location and the project was reliant on the ABS approximation of postcodes using POAs; however, this is only an approximation of postcodes (ABS 2006). A considerable proportion of chronic offenders changed location, but there was no way of assessing the length of time for which offenders were residentially mobile or whether they changed location before having contact with the criminal justice system. The ABS equivalent of postcodes was used (POAs). Finally, there are limitations resulting from the project's reliance on ABS population data. These data are subject to the random allocation process used by the ABS to ensure anonymity.

While the findings from the study are not directly relevant for targeting prevention programs in jurisdictions other than Queensland, the methods employed show promising results in terms of their ability to identify communities that generate chronic and costly offenders. The methods employed in this study could be replicated to determine whether chronic offenders are randomly distributed and to explore the extent of offender residential mobility. Such research is vital because of differences in criminal justice system practices, monetary values and geographic locations. Future research that aims to prospectively identify individuals on different offender trajectories based on risk and protective factors is also vitally important. This knowledge, along with knowledge derived from future place-based studies, will enable the more effective targeting of crime prevention interventions.

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Acknowledgements

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All URLs correct at August 2012

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