



**Australian Government**  
**Australian Institute of Criminology**

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

Troy Allard  
April Chrzanowski  
Anna Stewart

**AIC Reports**  
Research and  
Public Policy Series **123**



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# Foreword

There has been a great deal of interest among policymakers and criminal justice practitioners in the use of locally targeted strategies to reduce Indigenous overrepresentation in the criminal justice system, particularly in prisons. Approaches such as justice reinvestment, which aims to direct resources away from the prison system towards locally based crime prevention initiatives, have been highlighted a way of reducing this overrepresentation. These approaches are underpinned by research that demonstrates strong links between risks of engagement with the criminal justice system and residential locations.

In an environment of limited resources and competing policy interests, there is a critical need for crime prevention interventions to be cost effective and directed towards those populations and areas with the greatest need. Being able to identify those communities and locations where chronic and persistent offenders are most likely to reside, and understanding the factors that tend to produce the interconnections between place and offending, has enormous potential for the effective targeting of crime prevention initiatives.

This paper provides a valuable contribution to the evidence base supporting effective crime prevention targeting. By showing that chronic offenders, who account for a large proportion of all offences, are not randomly distributed geographically, those locations where interventions and resources can be effectively directed are highlighted. These locations typically have very high levels of social and economic disadvantage, pointing to the need for programs and social interventions that can effect change at the community level. Interventions likely to yield demonstrable outcomes are those that work with families and that operate holistically to address the multiple dimensions of disadvantage. While there is much still to be done to develop and implement interventions with lasting benefits, the methodological approach and findings reported in this paper will go a long way to informing these efforts.

**Adam Tomison**  
**Director**



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# Introduction

Indigenous overrepresentation is the most significant social justice and public policy issue within the Australian criminal justice system. Despite the existence of justice agreements and plans in every jurisdiction over the past decade, the gap has continued to widen in every jurisdiction (ABS 2012a). Indigenous people aged 10 years and over were between 5.6 and 8.4 times more likely than non-Indigenous people to be arrested during 2009–10 (ABS 2012b). Indigenous youth were 13.4 times more likely than non-Indigenous youth to be under community supervision and 23.9 times more likely to be in youth detention during 2009–10 (AIHW 2011). Indigenous adults were 14.3 times more likely than non-Indigenous adults to be incarcerated during 2011 (ABS 2012a).

Two national policy initiatives are driving attempts to reduce Indigenous disadvantage, including Indigenous overrepresentation in the criminal justice system. The Closing the Gap strategy recognises the need for a long-term approach to reduce Indigenous disadvantage (COAG 2009). The strategy aims to achieve simultaneous improvements in seven areas of life—early childhood, schooling, health, economic participation, healthy homes, safe communities, and governance and leadership. The National Indigenous Law & Justice Framework aims to create safer Indigenous communities (SCAG 2009). One of the main mechanisms proposed to

reduce Indigenous overrepresentation as offenders in the criminal justice system is through the use of effective and targeted crime prevention programs. Unfortunately, little publicly available information exists regarding how programs might be targeted to reduce offending by Indigenous peoples.

## Frameworks driving crime prevention

Two of the main frameworks that shape our understanding of offending and that may be used to target interventions aimed at reducing offending are the criminal careers paradigm, and crime and place. This section provides an overview of each approach, highlighting how they improve our understanding of offending and may be used to target interventions.

### *Criminal careers framework*

The criminal careers framework has been described as one of the most visible areas of scholarship within criminology (DeLisi & Piquero 2011). Within this field, studies that focus on the nature, pattern and correlates of offending over the life course have been conducted in many jurisdictions (see DeLisi & Piquero 2011). These studies aim to improve

understanding about how offending develops and factors that can potentially be manipulated to hinder initiation, hasten desistance and reduce career length (Blumstein et al. 1986; Piquero et al. 2001, 1999). Several major longitudinal studies have been carried out in the United Kingdom (Piquero, Farrington & Blumstein 2007; Jones, Nagin & Roeder 2001), United States (Chung et al. 2002; Piquero et al. 2001), Canada (LaCourse et al. 2003) and New Zealand (Fergusson, Horwood & Nagan 2000). This research has found that:

- offending peaks in the late teenage years;
- the peak onset age of offending is between eight and 14 years;
- the peak desistance age of offending is between 20 and 29 years;
- the process of desistance operates across all offenders;
- early age of onset predicts a relatively long criminal career duration and the commission of relatively many offences;
- there is marked continuity in offending and antisocial behaviour from childhood into adulthood;
- a small proportion of the population commit a large proportion of all crimes; and
- different types of offences are committed at distinctly different ages.

Criminal careers research has been aided by statistical techniques, such as the Semi-Parametric Group-based Method (SPGM; Nagin & Land 1993). The SPGM identifies different groups, each with their own trajectory, to capture the variation in offending in the data (Kreuter & Muthén 2008). In his review of over 80 studies that employed this technique, Piquero (2008) drew four main conclusions. First, research identifies at least two offender groups—an adolescent-peaked pattern and a chronic offender pattern. The chronic offender pattern includes a small proportion of offenders who account for relatively high proportions of offences. This group begins offending early in life, at high rates, and persists at relatively high rates when the norm seems to be desistance from offending. Research also typically identifies a late-onset chronic group, who begins offending during adolescence and continues offending into adulthood. Second, the trajectory

method typically identifies between three and five groups, slightly more in studies using self-reports of offending than official records. Third, a sample size of greater than 500 provides robust categorisation of groups. Finally, there tends to be a low-rate group, a high-rate group and a moderate but declining group.

Knowledge derived from criminal careers research is particularly useful for understanding whether certain groups of offenders should be targeted and when interventions are likely to be most effective. While few trajectory studies have been conducted in Australia, findings indicate that there is a small group of early-onset chronic offenders who account for a large proportion of offending. This group comprises between three percent and 11 percent of offenders and accounts for 27 percent to 33 percent of offences (Allard et al. under review; Livingston et al. 2008; Stewart et al. under review). Not surprisingly, Indigenous Australians are more overrepresented in the early-onset chronic offender group than other offender trajectories. Livingston et al. (2008) found that 50.9 percent of the chronic group were Indigenous offenders, while 25.4 percent of the adolescent limited group and 18.4 percent of the adolescent onset group were Indigenous. Stewart et al. (under review) found that Indigenous peoples were 11.3 times more likely to be in the early onset chronic offender group, with 7.3 percent of all Indigenous peoples in Australia in this group compared with 0.6 percent of non-Indigenous people.

Targeting crime prevention towards potential chronic offenders is likely to be a cost-effective approach. Recent criminal careers research has assessed the costs of individuals on different offender trajectories. Cohen, Piquero and Jennings (2010a) explored costs using 'bottom-up' and 'top-down' costing approaches. The 'bottom-up' approach involved assessing the value of specific cost categories that result from crime, including victim costs, criminal justice system costs and the cost of forgone earnings by the offender. The 'top-down' approach was based on the public's willingness to pay to reduce crime, which produces higher estimates because it includes collateral costs relating to fear of crime (ie crime prevention expenditure, avoidance behaviour and insurance costs) and loss of social cohesion. When costs were applied to individuals in the offender trajectories, the high-rate chronic

offender group constituted 3.1 percent of the sample but over 40 percent of costs. Each high-rate chronic offender was found to cost either US\$515,382 or US\$1.1m by the time they turned 27 years of age, depending on whether intangible costs were included. In their follow-up study, Cohen, Piquero and Jennings (2010b) used a 'top-down' costing approach and examined costs separately based on sex and ethnicity. While a different number of trajectories were identified, 2.8 percent of males were found to be high-rate chronic offenders and they accounted for 37 percent of male offending costs, or in excess of \$1.5m each. Although 0.5 percent of females were chronic offenders, they accounted for 49 percent of female offending costs or US\$754,440 each. Offending by African-Americans was found to be the most expensive out of any ethnic trajectory group and averaged in excess of US\$1.6m for each chronic offender.

Two studies conducted outside the United States have also assessed the costs of crime using 'bottom-up' costing approaches. In Australia, Allard et al. (under review) found that an early onset chronic offender group comprised three percent of offenders yet accounted for 26.5 percent of costs, with each early onset chronic offender costing \$323,645 in criminal justice system and wider social and economic costs. A second chronic offender trajectory group was also identified, with adolescent onset of offending. This group comprised 1.8 percent of offenders and accounted for 15 percent of costs, with each adolescent onset chronic offender costing \$302,034. Piquero, Jennings and Farrington (2011) assessed the costs of offender trajectories based on the Cambridge Study in Delinquency Development, which included convictions of 411 South London males aged 10 to 50 years. The high-rate chronic offender group was found to cost over 10 times as much as other groups, with each offender costing US\$95,241.

Unfortunately, it is difficult to target potential chronic offenders because there is a lack of research that differentiates offender trajectories based on risk factors, with no Australian studies. Nevertheless, this group would be ideal candidates for developmental/early intervention. Programs based on this approach target at-risk children, aiming to reduce the number of risk factors and increase the number of protective factors (see Table 1). The effects of risk factors on

development appear to be cumulative, interactive and sequential (Farrington 2002; Granic & Patterson 2006). However, the accumulation of multiple risk factors appears to be more important than the acquisition of specific risk factors for the development of offending (Farrington 2002; Howell 2003; Stouthamer-Loeber et al. 2002; Tremblay & LeMarquand 2001; Wasserman & Miller 1998; Wasserman & Seracini 2001). Evidence indicates that offending is much more likely among those who are exposed to or experience greater levels of risk, such as many Indigenous peoples (Bonta, LaPrairie & Wallace-Capretta 1997; Day 2003; Ge, Donnellan & Wenk 2001; Loeber & Farrington 2000; Mason & Windle 2001; Tremblay & LeMarquand 2001; Wasserman & Seracini 2001). Specific forms of developmental/early intervention include parental training, home visiting, daycare/preschool and home/community programs (Farrington & Welsh 2003). While family and social factors are not readily amenable to policy intervention, there is ample evidence that these programs can be cost effective and reduce offending by about 15 percent (Aos, Miller & Drake 2006; Farrington & Welsh 2003).

### *Crime and place*

One approach that may assist with targeting interventions towards individuals on different offender trajectories involves examining the locations where offenders resided when they first had contact with the criminal justice system. Geographic Information System technology is increasingly being recognised as a powerful tool that can be used to enhance organisational decision making, better understand the causes of crime, and target and help assess the impact of crime prevention programs (Anselin et al. 2000; Canter 2000; Hirschfield & Bowers 2001; McEwen & Taxman 1995; Paulsen & Robinson 2004; Taxman & McEwen 1997; Weisburd & McEwen 1997). While the spatial dimensions of data have not previously been explored by criminal careers research, there is reason to believe that offenders may not be randomly distributed geographically.

Studies examining the spatial and temporal distribution of crime are essentially descriptive and typically based on cross-sectional data obtained for short periods of time (Chakravorty & Pelfrey 2000;

**Table 1** Risk and protective factors

Risk factors				
Child factors	Family factors	School context	Life events	Community and cultural factors
Prematurity	Parental characteristics	School failure	Divorce and family break-up	Socioeconomic disadvantage
Low birth weight	Teenage mothers	Normative beliefs about aggression	War or natural disasters	Population density and housing conditions
Disability	Single parents	Deviant peer group	Death of a family member	Urban area
Prenatal brain damage	Psychiatric disorder, especially depression	Bullying		Neighbourhood violence and crime
Birth injury	Substance abuse	Peer rejection		Cultural norms concerning violence as acceptable response to frustration
Low intelligence	Criminality	Poor attachment to school		Media portrayal of violence
Difficult temperament	Antisocial models	Inadequate behaviour management		Lack of support services
Chronic illness	Family environment			Social or cultural discrimination
Insecure attachment	Family violence and disharmony			
Poor problem solving	Marital discord			
Beliefs about aggression	Disorganised			
Attributions	Negative interaction/social isolation			
Poor social skills	Large family size			
Low self esteem	Father absence			
Lack of empathy	Long-term parental unemployment			
Alienation	Parenting style			
Hyperactivity/disruptive behaviour	Poor supervision and monitoring of child			
Impulsivity	Discipline style (harsh or inconsistent)			
	Rejection of child			
	Abuse			
	Lack of warmth and affection			
	Low involvement in child's activities			
	Neglect			

**Table 1** (continued)

Protective factors				
Child factors	Family factors	School context	Life events	Community and cultural factors
Social competence	Supportive caring parents	Positive school climate	Meeting significant person	Access to support services
Social skills	Family harmony	Pro-social peer group	Moving to new area	Community networking
Above average intelligence	More than two years between siblings	Responsibility and required helpfulness	Opportunities at critical turning points or major life transitions	Attachment to the community
Attachment to family	Responsibility for chores or required helpfulness	Sense of belonging/ bonding		Participation in church or other community group
Empathy	Secure and stable family	Opportunities for some success at school and recognition of achievement		Community/cultural norms against violence
Problem solving	Supportive relationship with other adult			A strong cultural identity and ethnic pride
Optimism	Small family size	School norms about violence		
School attachment	Strong family norms and morality			
Easy temperament				
Internal locus of control				
Moral beliefs				
Values				
Self-related cognitions				
Good coping style				

Source: Homel et al. 1999

Eck, Gersh & Taylor 2000; Sherman & Rogan 1995; Weisburd & Green 1994; Weisburd & McEwen 1997). Evidence from these studies indicates that, regardless of the unit of analysis, crime is concentrated in hotspots rather than being randomly distributed (Brantingham & Brantingham 1999; Crow & Bull 1975; Pierce, Spaar & Briggs 1986; Roncek 2000; Sherman, Gartin & Buerger 1989; Weisburd et al. 2004; Weisburd & Green 1994; Weisburd, Maher & Sherman 1992). Sherman, Gartin and Buerger (1989) found that three percent of addresses in their study were responsible for half of the calls to police. Sherman (1995: 36–37) argues that future crime is ‘six times more predictable by the address of the occurrence than by the identity of the offender’. While there is limited research examining how crime is temporally distributed, available evidence suggests that crime hotspots are relatively stable over time (Griffiths & Chaez 2004; Kubrin & Herting 2003; Weisburd et al. 2004).

While there is less evidence about how offenders are spatially distributed, studies conducted in the United States and United Kingdom focused on the journey to crime indicate that most crimes are committed close to the offender’s place of residence. On average, offenders travelled less than five kilometres

from their home address to commit offences (Gabor & Gottheil 1984; Phillips 1980; Rhodes & Conly 1981; Townsley & Sidebottom 2010; Wiles & Costello 2000). Young offenders and black offenders have been found to travel less distance to commit offences (Baldwin & Bottoms 1976; Carter & Hill 1979; Davidson 1984; Phillips 1980; Rand 1986; Reiss & Farrington 1991; Rengert & Wasilchick 1985; Reppetto 1974). When the locations of crimes and place of residence are aggregated, evidence suggests that most offenders commit crimes within their own neighbourhoods. Gabor and Gottheil (1984) found that three-quarters of a stratified random sample of offences in Ottawa during 1981 were committed by residents rather than out of towners or transients. Pyle (1976) found that 61 percent of those arrested for crimes against the person and 48 percent of those arrested for property crimes in Cleveland over a two year period resided in the same census tract as where the crime occurred. Others have found that the proportion of crimes committed by local residents varied based on the kind of area, with crimes in the outer city more likely to be committed by local residents than crimes in the inner city (Hesseling 1992; Wikstrom & Dolmen 1990).

The notion that offenders are not randomly distributed geographically is also supported by the findings of studies that have adopted an ecological approach. The ecological environments in which individuals are embedded have been found to exert pervasive influences on behaviour independently of individual factors (Kelling 2005; Kubrin & Weitzer 2003; Oberwittler 2004; Triplett, Gainey & Sun 2003). Research that has adopted an ecological approach is based on aggregate level data such as neighbourhoods (Katzman 1981), cities (Harries 1976), or regions (Dienes 1988) and typically involves the use of widely available Census data (Swartz 2000). There is a large body of research indicating that high crime rates are typically concentrated in small geographical areas characterised by structural disadvantage, including low economic status, poverty, segregation, a high proportion of single parent families, residential instability and a large proportion of racial/ethnic minority groups (Bursik 1986; Oberwittler 2004; Sabol, Coulton & Korbin 2004; Shaw & McKay 1969; Silver & Miller 2004; Swartz 2000; Triplett, Gainey & Sun 2003). In their meta-analysis of 214 studies exploring the macro-level predictors of crime, Pratt and Cullen (2005) found that 11 of the 31 predictors had a high independent mean effect size—strength of non-economic institutions, unemployment (length considered), firearm ownership, percent non-white, incarceration effect, collective efficacy, percent black, religion effect, family disruption, poverty and unsupervised local peer groups. Nine of the predictors were reported as having a medium effect—household activity ratio, social support/truism, inequality, racial homogeneity index, urbanism, residential mobility, unemployment (with age restriction), southern effect and arrest ratio.

Findings suggesting that offenders are not randomly distributed geographically hold great promise for the targeting of not only developmental/early intervention programs but also other forms of crime prevention based on geographic location, such as situational crime prevention and community crime prevention. Situational crime prevention focuses on highly specific problems such as types of offending behaviour and the opportunities in specific environments that facilitate offending at particular times and places (Clarke & Felson 1993). The approach identifies 25 techniques that aim to

increase the effort, increase the risks, reduce the rewards, reduce provocations or remove excuses (see Table 2). These techniques are based on opportunity theories of crime including rational choice, routine activities and crime pattern theories, which view crime as a product of the interaction between an individual and the characteristics of the setting (Felson & Clarke 1998). While evaluations that have assessed the impact of situational crime prevention on crime are typically short term and methodologically weak, evidence indicates that this approach can result in reductions in crime (Clarke 1997; Eck 2006). Within Australia, this approach has been successfully employed to reduce substance misuse among Indigenous Australians in a range of geographic locations (d'Abbs & Shaw 2008; d'Abbs & Togni 2000; Kennedy 1999; Ray & McFarland 2010; Richards, Rosevear & Gilbert 2011).

Community crime prevention aims to confront crime at a 'grass roots' level in particular local contexts to address those factors within that context that may be causing or maintaining crime (Hope 2001; Kelly & Caputo 2006; Labonte 1997). The factors that ecological studies have found to be related to offending are viewed as contributing to, creating or maintaining offending (Oberwittler 2004). This has led to a range of theories and mechanisms being proposed to explain the relationship between structural disadvantage and crime, such as how specific social processes lead to crime (Oberwittler 2004; Sabol, Coulton & Korbin 2004). Some of the interventions based on this approach are focused on the entire community, while others are focused on the individual. Many aim to facilitate the development of social resources so that communities can effectively address problems (Laverack 2001). Although interventions based on this approach are appealing, few studies have explored their impact on offending or there are conflicting findings. International evidence indicates that mentoring and vocational and educational training programs may be effective for reducing offending (Burghardt et al. 2001; Tolan et al. 2008). There is some evidence suggesting that community economic development programs reduce property crimes and that recreational programs may reduce crime (McCord, Widom & Crowell 2001; Sherman et al. 1997). There is insufficient evidence to conclude that community policing, community mobilisation (such as



Neighbourhood Watch) or school after-hours programs reduce crime (Gottfredson, Gottfredson & Weisman 2001; Grinc 1994; Kerley & Benson 2000). While community-based programs operate in many Indigenous communities within Australia, few have been adequately evaluated (see Allard 2011). Available evidence does, however, suggest that night patrols may be an effective way to reduce offending (Blagg 2003; Lui & Blanchard 2001).

One final point that must be considered when focusing on the location of offenders is their mobility. A substantial proportion of the Australian population is mobile and change household address. In 2010, 42 percent of Australians aged over 18 years and who lived in private dwellings had moved within the previous five years, with younger age groups, people renting through private landlords (83%) and the unemployed (62%) more likely to move (ABS 2010). While many of these people may have moved within the same postal area (POA) or Statistical Local Area, this information is not available. Moreover, evidence indicates that individuals are more likely to offend if they have a high number of address changes (Gendreau, Goggin & Little 1996; Hoffman 1994; Worthington, Higgs & Edwards 1999). Therefore, it is essential that research examining where offenders reside explores their mobility. It makes little sense to target government resources and crime prevention resources if hotspots randomly fluctuate over time without intervention (Spelman 1995).

## Current study

This project draws on methods and findings from research focused on offender trajectories and crime and place. Findings from trajectory studies indicate that a small proportion of offenders account for a large proportion of offending and costs. While this group of offenders has been retrospectively identified by studies employing trajectory modelling techniques, there is difficulty identifying chronic offenders prospectively. For example, there is no research that has adequately differentiated between identified trajectory groups based on risk and

protective factors. Despite this, recent findings indicate that Indigenous Australians are most overrepresented in chronic offender groups. Research focused on crime and place has found that the geographic locations of crime and offenders are not randomly distributed.

Given these findings, the project aimed to assess whether communities could be identified that generated chronic offenders and carried substantial cost burdens associated with offending. If such communities could be identified, they would be ideal locations to target early/developmental crime prevention programs. These programs target potential offenders and aim to move them off a chronic offender trajectory by addressing risk and protective factors. Evidence indicated that these programs are a cost-effective way of reducing offending for non-Indigenous populations. Communities generating chronic and costly offenders would also be ideal locations to target situational and community crime prevention interventions. These interventions aim to reduce crime by altering the immediate or contextual environment in which crime occurs. In assessing whether communities generate chronic offenders, the project focused on the offenders first recorded residential postal area when they had contact with the criminal justice system but acknowledges the importance of, and examines the extent of, offender residential mobility. There were six research questions addressed by this project:

- How many distinct offender trajectories can be identified?
- What are the demographic, offence and criminal justice system event characteristics associated with trajectory group membership?
- What are the costs of offender trajectories?
- Are some communities more likely than others to generate chronic offenders?
- How residentially mobile are chronic offenders?
- Which communities carry the cost burden of the chronic offenders?

**Table 2 Twenty-five situational crime prevention techniques**

Increase the effort	Increase the risks	Reduce the rewards	Reduce provocations	Remove excuses
1. Target harder: Steering column locks and immobilisers Anti-robbery screens Tamper-proof packaging	6. Extend guardianship: Take routine precautions—go out in a group at night, leave signs of occupancy, carry phone 'Cocoon' neighbourhood watch	11. Conceal targets: Off-street parking Gender-neutral phone directories Unmarked bullion trucks	16. Reduce frustrations and stress: Efficient queues and polite service Expanded seating Soothing music/muted lights	21. Set rules: Rental agreements Harassment codes Hotel registration
2. Control access to facilities: Entry phones Electronic card access Baggage screening	7. Assist natural surveillance: Improved street lighting Defensible space design Support whistleblowers	12. Remove targets: Removable car radio Women's refuges Pre-paid cards for pay phones	17. Avoid disputes: Separate enclosures for rival soccer fans Reduce crowding in pubs Fixed cab fares	22. Post instructions: 'No Parking' 'Private Property' 'Extinguish camp fires'
3. Screen exits: Ticket needed for exit Export documents Electronic merchandise tags	8. Reduce anonymity: Taxi driver IDs 'How's my driving?' decals School uniforms	13. Identify property: Property marking Vehicle licensing and parts marking Cattle branding	18. Reduce emotional arousal: Controls on violent pornography Enforce good behaviour on soccer field Prohibit racial slurs	23. Alert conscience: Roadside speed display boards Signatures for customs declarations 'Shoplifting is stealing'
4. Deflect offenders: Street closures Separate bathrooms for women Disperse pubs	9. Utilise place managers: CCTV for double decker buses Two clerks for convenience stores Reward vigilance	14. Disrupt markets: Monitor pawn shops Controls on classified ads License street vendors	19. Neutralise peer pressure: 'Idiots drink and drive' 'It's OK to say No' Disperse troublemakers at school	24. Assist compliance: Easy library checkout Public lavatories Litter bins
5. Control tools/weapons: 'Smart' guns Disabling stolen cell phones Restrict spray paint sales to juveniles	10. Strengthen formal surveillance: Red light cameras Burglar alarms Security guards	15. Deny benefits: Ink merchandise tags Graffiti cleaning Speed humps	20. Discourage imitation: Rapid repair of vandalism V-chips in TVs Censor details of modus operandi	25. Control drugs and alcohol: Breathalyzers in pubs Server intervention Alcohol-free events

Source: Cornish & Clarke 2003: 90



# Methods

In this section, an overview of the longitudinal offender cohort that was used in this project will be provided. The five phases involved in the research will then be outlined. First, the process used to establish the offender cohort will be examined. Second, the analytical strategy adopted to assess the number of offender trajectories and their characteristics will be described. Third, the costing approach that was used to assess the cost of individuals in the different offender trajectories will be outlined. Next, the approach that was used to assess whether some communities were more likely to generate chronic offenders and to explore the extent of residential mobility will be reported. Finally, the approach that was adopted to determine whether the communities that generated the most costly chronic offenders could be identified will be outlined.

## Longitudinal offender cohort

The longitudinal offender cohort consisted of all individuals born in 1990 who committed an offence (other than traffic and breach offences) in Queensland and were formally cautioned, referred

by police to a youth justice conference, had a finalised youth court appearance, or had a finalised adult court appearance when aged 10 to 20 years old. There were 14,171 individuals in the final research sample, of which 9,949 (70.2%) were male and 1,895 (13.4%) were identified as Indigenous. The average age of offending onset was 16.21 years ( $SD=2.38$ ). These individuals were responsible for 71,413 offences. Most offences committed by cohort members were property or public order related (see Table 3).

For these offences, individuals had 33,455 criminal justice system events (see Table 4). A criminal justice system event involves a caution or police-referred conference taking place or a finalised youth/adult court appearance. Of the 14,171 individuals, 7,215 had at least one caution, 824 had at least one police-referred conference, 2,337 had at least one finalised youth court appearance and 12,097 had at least one finalised adult court appearance. About one-third (34.5%) of individuals only had contact with the youth justice system, with two-fifths (43.2%) only having contact with the adult system and one-fifth (22.3%) having contact with both the youth and adult systems (see Table 5).

**Table 3** Offences committed by cohort members

Offence types	n	% <sup>a</sup>
Theft and related offences	20,651	28.9
Unlawful entry with intent/burglary, break and enter	10,585	14.8
Public order offences	10,479	14.7
Property damage and environmental pollution	8,069	11.3
Offences against justice procedures, government security and government operations (excluding breaches)	5,763	8.1
Illicit drug offences	4,870	6.8
Acts intended to cause injury	3,567	5.0
Dangerous or negligent acts endangering persons	2,051	2.9
Deception and related offences	1,984	2.8
Miscellaneous offences	1,139	1.6
Weapons and explosives offences	863	1.2
Sexual assault and related offences	638	0.9
Robbery, extortion and related offences	553	0.8
Abduction and related offences	194	0.3
Homicide and related offences	7	0.0
Total	71,413	

a: Percentages may not total 100 due to rounding

**Table 4** Criminal justice system events involving the cohort (n)

Event type	Events	Distinct individuals <sup>a</sup>
Caution	9,799	7,198
Police referred conference	984	822
Children's court appearance (finalised) <sup>b</sup>	6,199	2,130
Magistrates court appearance (finalised)	15,959	9,201
District court appearance (finalised)	471	433
Supreme court appearance (finalised)	43	42
Total events	33,455	14,171

a: Distinct individuals may have had more than one of each event type

b: Children's court includes Children's Court and Children's Court of Queensland

**Table 5** Individuals in cohort who had different types of events (n)

Event type	n	% <sup>a</sup>
Caution only	3,799	26.8
Youth Justice Conference only	104	0.7
Youth Court only	436	3.1
Adult Court only	6,123	43.2
Caution and Youth Justice Conference	150	1.1
Caution, Youth Justice Conference and Youth Court	78	0.6
Caution, Youth Justice Conference, Youth Court and Adult Court	261	1.8
Caution, Youth Justice Conference and Adult Court	140	1.0
Caution and Youth Court	307	2.2
Caution, Youth Court and Adult Court	800	5.7
Caution and Adult Court	1,663	11.7
Youth Justice Conference and Youth Court	14	0.1
Youth Justice Conference, Youth Court and Adult Court	23	0.2
Youth Justice Conference and Adult Court	52	0.4
Youth Court and Adult Court	221	1.6
Total	14,171	

a: Percentages may not total 100 due to rounding

## Research phases

### *Phase one: Establishing the offender cohort*

The offender cohort was created by linking between the cautioning dataset (Queensland Police Service), police referred conferencing dataset (Queensland Police Service), youth court dataset (Department of Communities) and adult court dataset (Department of Justice and Attorney General). The process used has been described elsewhere (Allard et al. 2009), but involved three steps:

Agencies provided identifying information (but not case information) to the Office of Economic and Statistical Research (Queensland Treasury) and case information (but not identifying information) to Griffith University. These datasets included agency identification numbers that were used to link between the identifying and case information datasets.

Within the Office of Economic and Statistical Research, a researcher linked within and between the datasets based on identifying information,

including name, surname, date of birth and sex. Each unique person was assigned a Griffith University identification code. Agency and Griffith University identification codes were then released to Griffith University. Griffith University identification codes were assigned to the case information to identify distinct individuals for the purposes of analyses.

After linking, there were 90,785 offences finalised across systems, involving 16,558 distinct individuals. The data were cleaned to resolve inconsistencies between systems in the core demographic variables of age, sex and Indigenous status, and missing values were propagated from the known values in another record based on the balance of probabilities. After resolving discrepancies, sex was missing for 11 (0.1%) individuals and Indigenous status was missing for 1,217 (7.4%) individuals. All missing data for sex related to contacts that individuals had with the adult court system. Most individuals who did not have an assigned Indigenous status were from either the cautioning dataset or the adult court dataset. Individuals who were not identified as Indigenous were assumed to be non-Indigenous.

Given that an offender cohort was being created, all offences that resulted in a not guilty (n=1,445) finding were excluded because they did not represent offending. Two offence types were also excluded from the dataset. Traffic and related offences (n=15,077) were excluded because most are dealt with by Infringement Notice and individuals can elect to have a court hearing. Breaches of court orders (n=2,850) were excluded because they may not represent additional offending. After these exclusions, there were 71,413 offences committed by 14,171 offenders.

### *Phase two: Exploring the number of trajectory groups and their characteristics*

A dataset was created to address the first research question *How many distinct offender trajectories can be identified?* The dataset had the annual number of offences for each of the 14,171 offenders in the cohort based on their age at the time of offence. To calculate age at time of offence, the individual's date of birth and the earliest recorded date for each offence were used because the actual date of offence was not recorded. For cautioning and conferencing data, the date of offence was usually the date when the offence was reported to police. For court matters, the earliest date 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 over the life course when individuals were aged 10 to 20 years old. The SPGM analysis was undertaken using the SAS procedure 'PROC TRAJ' developed by Jones, Nagin and Roeder (2001). As the majority of individuals in the cohort offended for short periods of time, there was an excess of data cells with zero counts for offending. Because of this, the offending count data was distributed according to the Zero-Inflated Poisson distribution (Fergusson, Horwood & Nagan 2000; Nagin 1999). Additionally, several individuals had high annual offence counts that exceeded 20 offences in a given year (n=279; 2%). These outliers were scaled to enable the trajectory analysis to converge.

Given the non-parametric nature of the procedure being used, it was necessary to specify the number of trajectory groups being modelled and their form prior to analysis. Thus, the development of the final model was necessarily iterative, with the process being repeated a number of times to determine the parameters that produced the best fit for the data. The final number of trajectories for the model was determined based on both the Bayesian Information Criterion (BIC) and the average probability of group assignment. The BIC increases as the model fit improves (incorporating the penalty for increases in the number of trajectories), while the average probability of assignment is higher for models with more distinct trajectories (Nagin 1999; Piquero 2008). Thus, the model with the optimum number of trajectories needed to have a high BIC (relative to other model options) and an average probability of group membership that was as close to one as possible.

The trajectory group membership that was assigned to individuals was then linked to case information to explore the second research question *What are the demographic, offence, and criminal justice system event characteristics associated with trajectory group membership?* Demographic characteristics examined included sex and Indigenous status. The types of offences committed by individuals in each trajectory group were explored. Criminal justice system event characteristics examined included type of event and number of days sentenced to community based supervision and detention/incarceration.

### *Phase three: Assessing the costs of offender trajectories*

Two approaches were used to address the third research question *What are the costs of offender trajectories?* Criminal justice system costs of individuals in the trajectory groups were assigned based on the interactions they had with the criminal justice system, while wider social and economic costs of crime were assigned by updating Rollings' (2008) assessment and applying costs based on offence type.

## Criminal justice system costs

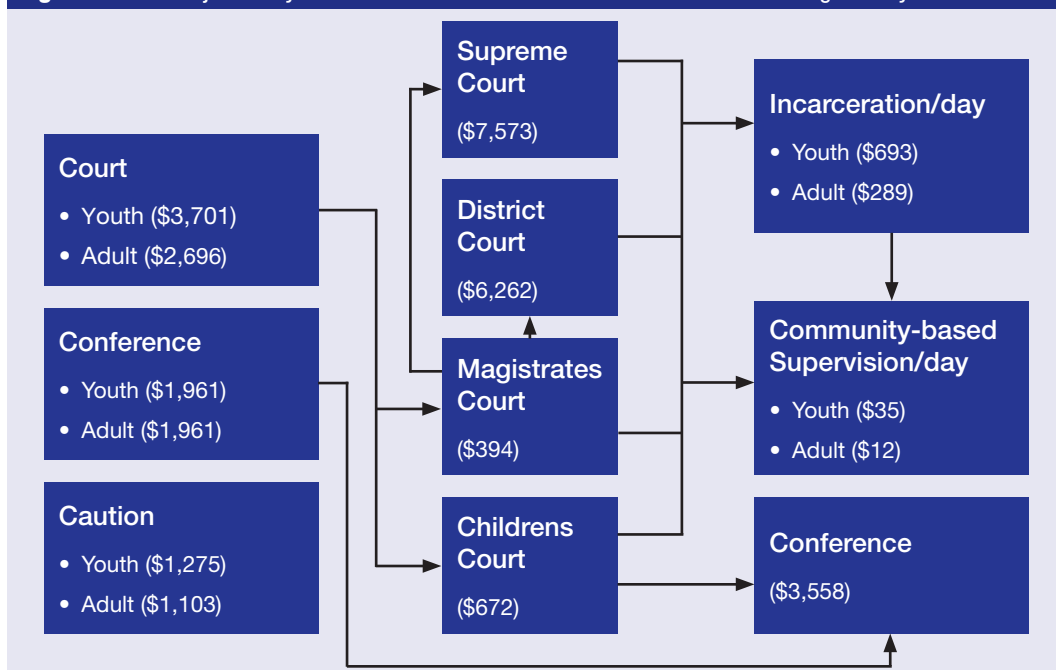
Criminal justice system costs were estimated based on the costs of criminal justice system events and supervision costs. These were assessed using the Transactional and Institutional Cost Analysis (Carey, Waller & Marchand 2006). This approach views offenders as consuming resources when they have transactions with, and are processed through, the criminal justice system. One strength of this approach is that it enables an assessment to be made about the cost of resources invested by multiple agencies. Although the Transactional and Institutional Cost Analysis is frequently used to assess costs at the micro level, the approach was used to determine the average cost of practices as individuals flowed through the criminal justice system.

Figure 1 presents a schematic diagram of the transactions individuals have as they flow through the criminal justice system. The average cost of police, court and supervision practices were assessed for youth and adults. Average police costs were calculated based on publicly available information and an internal police time-in-motion study, which assessed how long particular practices

took for youth and adults. Five steps were used to assess the cost of police responses:

- 35 percent of the 2010–11 police budget was directed towards crime management (\$624,796,550; QPS 2011a, 2009).
- Examination of police practices indicated that 9.3 percent of offences were dealt with by ‘other’ and this proportion was subtracted from the crime management budget (leaving \$566,440,552; QPS 2011b).
- The number of youths and adults cautioned, conferenced and processed through the courts during 2010–11 were examined and total hours was calculated based on how long practices took in the Queensland Police Service time-in-motion study (DJAG 2011a, 2011b; QPS 2011b, 2005).
- The average hourly rate was assessed as \$245.1, calculated by dividing the remaining crime management budget (\$566,440,552) by the total time police spent processing offenders (2,311,118 hours).
- The cost per event was calculated by multiplying the length of time that processes took police by the hourly rate.

**Figure 1** Criminal justice system transactions and costs as individuals flow through the system



Average costs per court finalisation in the Childrens, Magistrates, District and Supreme courts were based on figures provided in the Report on Government Services (Productivity Commission 2012). The average cost of youth conferencing was determined by dividing the overall youth conferencing operating budget (\$9.3m) by the number of referrals (n=2,614; Department of Communities 2009). The cost of community-based supervision and detention for youth was assessed based on the most recent costing information which was available (Blejje 2012; CAIR 2008), while these costs were assessed for adults using costs provided in the Report on Government Services (Productivity Commission 2012).

Figure 1 presents average costs for the main transactions that individuals had with the criminal justice system. Transaction costs were added to calculate the cost per finalisation. For example, police cautioning only involves police expenditure (either \$1,275 per youth or \$1,103 per adult). However, the cost of individuals appearing in court requires police expenditure (\$3,701 per youth or \$2,696 per adult), court expenditure (depending on the level of the court) and possibly supervision costs, which were assessed per day.

As information was only available about the number of days that individuals were sentenced to various forms of supervision, it was assumed that youth would serve 60 percent of their detention sentence, while adults would serve 80 percent of their incarceration sentence before being released. These assumptions were based on advice provided by the relevant agencies about the applicable average proportions that would be subject to early release. Consistent with practice in Queensland, individuals were assumed to serve 100 percent of time sentenced to community-based orders. Where more than one court outcome was recorded at an event because several offences were finalised, it was assumed that sentences would be served concurrently and the most serious outcome for the event was used.

### Wider economic and social costs

Estimating the wider economic and social costs of crime is challenging and there is considerable variability in these costs depending on whether a

bottom-up or top-down approach is used. While bottom-up approaches include a range of specified tangible and intangible costs, they result in lower estimates than top-down approaches (ie willingness to pay). Given the absence of published estimates based on willingness to pay in the Australian context, a bottom-up approach was used that involved updating an assessment about what these costs were in Australia during 2005. Rollings (2008) estimated the average economic and social costs of crime for 12 offence categories. These costs included medical costs, costs of property loss or damage, costs of lost output and intangible costs. Costs that were excluded from the study were justice system costs, costs related to providing government services to victims, and security industry and insurance administration costs. The study acknowledged that there was likely to be considerable variation in costs within each offence category, so offence characteristics were taken into account when assessing costs. For example, most offences against the person involved assessing the number that would have resulted in injury requiring medical treatment or hospitalisation. Property offences were assessed separately for residential and commercial offences and took into account the number of offences that resulted in insurance claims.

Table 6 presents the social and economic costs of crime based on an update of Rollings' (2008) assessment. In mapping the costs from the original assessment to the Australian Standard Offence Classification (ASOC), assault was mapped to two ASOC categories *Acts intended to cause injury* and *Dangerous and negligent acts intended to cause injury*. Six offence types in the original assessment were subsumed by two other ASOC codes—*Theft and related offences* included four theft types and *Property damage and environmental pollution* included criminal damage and arson. Where more than one offence category in the original assessment was included in one ASOC offence code, average costs for the offence code were calculated. Average costs were based on ratios developed to account for the frequency of each offence category in Queensland during 2010–11 (QPS 2011b). The 2005 cost of each offence was then adjusted for inflation to determine the 2012 cost (RateInflation 2011).



**Table 6** Mapping cost of offences from Rollings' assessment to ASOC

2005 assessment in Australia	ASOC	Cost per offence	
		2005 (\$)	2012 (\$)
Homicide	Homicide and related offences	1,915,323	2,293,376
Sexual assault	Sexual assault and related offences	7,500	8,980
Assault	Acts intended to cause injury Dangerous or negligent acts endangering persons	1,695	2,030
Robbery	Robbery, extortion and related offences	2,300	2,754
Burglary	Unlawful entry with intent	2,869	3,435
Theft of vehicles (n=4,095)	Theft and related offences	1,241	1,486
Thefts from vehicles (n=4,949)			
Shop theft (n=14,453)			
Other theft (n=7,563)			
Fraud	Fraud, deception and related offences	21,370	25,588
Criminal damage (n=12,565)	Property damage and environmental pollution	3,357	4,020
Arson (n=232)			

Source: Rollings 2008

Unfortunately, the average cost per offence type was not assessed by Rollings (2008) for six ASOC categories. Offences that were not costed include:

- public order offences (n=10,479; 14.7%);
- illicit drug offences (n=4,870, 6.8%);
- offences against justice procedures, government security and government operations (n=5,763; 8.1%);
- miscellaneous offences (n=1,139; 1.6%);
- weapons and explosives offences (n=863; 1.2%); and
- abduction and related offences (n=194; 0.3%).

Therefore, costs for these offences were not able to be included in the projected costs for the offender trajectories discussed in this report.

#### *Phase four: Exploring whether some communities generated chronic offenders and their residential mobility*

Given that chronic offenders are likely to commit a high number of offences and be costly, the fourth research question was *Are some communities more likely to generate chronic offenders than others?* To

explore this question, the proportion of the population in each POA who were chronic offenders was explored, based on each offenders first recorded residential POA. Chronic offenders included individuals in the moderate and two chronic offender trajectory groups who had a higher level of contact with the criminal justice system and committed more offences than members of the two low trajectory groups. From the trajectory analysis, 2,234 offenders were classified as chronic (as described in *Characteristics of Offender Trajectory Groups* in the *Results* section). Chronic offenders represented 15.8 percent of offenders, but accounted for 67 percent of offences. Indigenous offenders were much more likely to be chronic offenders than non-Indigenous offenders, with two-fifths (39.9%) of Indigenous offenders compared with less than one-fifth (15.8%) of non-Indigenous offenders classified as chronic offenders. Therefore, exploring whether some communities are more likely to generate chronic offenders than others may be an efficient way of targeting crime prevention interventions to reduce offending, crime, victimisation and Indigenous overrepresentation in the criminal justice system.

The geographic measure used to assess community location was the postcode where the offender

resided when they first had contact with the criminal justice system. Each offender had their usual residential postcode recorded for each offence in the cautioning, conferencing, youth court and adult court datasets. These corresponded to POAs, which are the Australian Bureau of Statistics' (ABS) equivalent of the Australia Post defined postal codes (ABS 2006a). The first recorded POA was selected in recognition of the importance placed on the early years of life from a developmental perspective and the cumulative nature of risk and protective factors.

While the ABS provides a number of standardised methods for measuring geographic location along with concordance files, POAs were used as the base measure of geographic location. POAs were used because the standardised geographical measures do not correspond directly to POAs. Alternating to these standardised measures would necessitate the random allocation of chronic offenders within single POAs to one of multiple standardised divisions. While probability derived concordance tables enable this to occur, doing so would introduce another layer of uncertainty into the data.

In Queensland, there were 432 POAs in 2006 (4000 to 4999). POAs differ substantially in both geographical size and population. The average size of a POA was 4,080.2km<sup>2</sup> (SD=16,621.7km<sup>2</sup>). The minimum area covered by a POA was just 0.4km<sup>2</sup> (4229—Bond University). However, the maximum area covered by a POA was 219,415km<sup>2</sup>. The POA that had the largest geographic size was 4871. This POA is located in far north Queensland and includes 58 different locations, one of which was the remote Aboriginal community Aurukun (see *Appendix 1*).

ABS statistics from the census were used to determine the population of each POA who were 16 years old in 2006 (ABS 2011a). These data were

used because they were the most recent census data available at the POA level, covered the time when individuals born in 1990 would have been 16 years old and the average age of onset for offending was 16.21 years old. There was considerable variability in the base population of the 432 POAs, ranging from zero to 1,675 16 year olds (M=130.03, SD=187.14). POAs that had a population of 10 or fewer 16 year olds in 2006 (23.8% of postal areas) were excluded from analyses. This was because of the difficulties associated with small cell size and the random allocation process used by the ABS to prevent individual identification. After excluding these POAs, there were 329 POAs that had a population of more than 10 (M=169.42, SD=198.73, medium=96, maximum=1,675). The POA with the highest population of 16 year olds was 4350, which included the regional town of Toowoomba. It is obvious from these figures that the population is not evenly distributed across the postal areas.

ArcGIS was used to map the proportion of the population in POAs who were chronic offenders to determine whether some communities appeared to generate chronic offenders. POAs were categorised into four groups based on the proportion of the population who were chronic offenders using an average split (see Table 7). Additionally, the top 10 percent of POAs with the highest proportions of chronic offenders (33 POAs) were identified as locations where targeted interventions could be explored.

Because the project focused on the residential POA of chronic offenders when they first had contact with the criminal justice system, it was important to consider the potential role that offender residential mobility may have on limiting the usefulness of the findings for targeting interventions towards particular locations. The fifth research question was *How residentially mobile are chronic offenders?* To

**Table 7** Proportion of population who were chronic offenders by number of postal areas

Category	Population chronic offenders (%)	Postal areas (n)	Postal areas (%)
Nil	0	74	22.5
Low	0.1–4.72	150	45.6
High	4.73–9.09	72	21.9
Very high	>9.09	33	10.0
Total		329	100.0

address this question, the number of times that chronic offenders changed POAs was examined.

### *Phase five: Exploring which communities carry the burden of chronic offenders*

The sixth research question was *Which communities carry the burden of chronic offenders?* As detailed in *Cost of Offender Trajectory Groups* in the *Results* section, individuals in the moderate and chronic trajectory groups cost, on average, between \$58,116 and \$262,057. While representing 3.8 percent of the population and 15.8 percent of offenders, they accounted for 68.6 percent of costs. Therefore, exploring whether communities could be identified that generate the most costly chronic offenders may provide additional information that will

be useful for targeting crime prevention programs towards particular communities. This question was addressed by assigning the longitudinal individual costs to the POA where they first had contact with the criminal justice system. POAs were then ranked based on total cost and the top 10 percent most costly locations were examined. Total costs per chronic offender were established using the costing methodology described in *Phase Three: Assessing the Costs of Offender Trajectories* in the *Methods* section. These costs were aggregated for each POA. Once again, only the 329 POAs that had a population of more than 10 were included and costs were assigned to the offender's usual residential POA when they first had contact with the criminal justice system. Across the 329 POAs with more than 10 individual, the average total cost of chronic offenders was \$808,491 (SD=\$1,441,216; range \$0 to \$14,041,855).

# Results

In this section, the results of the project are presented in five subsections addressing each of the research questions. First, the number of offender trajectory groups that were identified will be reported. Second, the demographic, offence and criminal justice system event characteristics of the trajectory groups will be discussed. Third, the overall cost of and cost per individual in the offender trajectories will be examined. Next, whether some communities were more likely to generate chronic offenders than others and the extent of residential mobility will be explored. Finally, the 10 percent ranked communities that carried the cost burden of chronic offenders will be identified.

## Number of offender trajectory groups

The first research question sought to determine how many distinct offender trajectories could be identified in the criminal careers of individuals in the 1990 cohort. Models with two to seven trajectories were created and the BIC and average group membership probabilities for each of the models were examined (see Table 8). The optimal model included five or six groups, as the seven group model had false convergence. The six group model had a higher value for BIC, while the five group model had a relatively high value for BIC and a slightly higher probability of group membership (>0.75).

Examination of the form of the trajectories indicated

**Table 8** Bayesian Information Criterion and average group membership probability of trajectory models

Number of groups	BIC (1)	BIC (2)	AIC	Avg. group membership probability
2	-105950.3	-105935.9	-105890.5	0.96
3	-103267.5	-103247.1	-103182.8	0.91
4	-102299.8	-102273.4	-102190.3	0.92
5	-101663.7	-101631.3	-101529.2	0.79
6	-101049.7	-101010.1	-100885.4	0.78
7	-100810.5	-100764.9	-100621.3	0.73

**Table 9** Significance of parameter estimates for final trajectory model

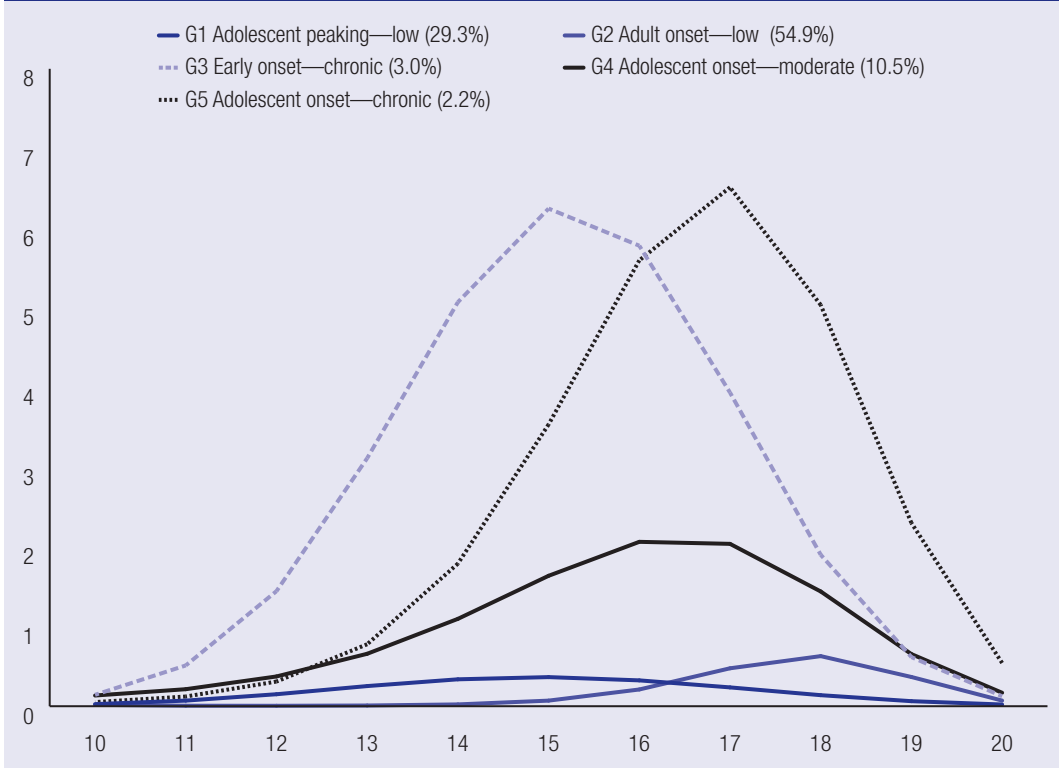
Group	Parameter	p-value
Group one	Intercept	0.8998
	Linear	0.5294
	Quadratic	0.2258
	Cube	0.0488
Group two	Intercept	0.0000
	Linear	0.0000
	Quadratic	0.0000
	Cube	0.0000
Group three	Intercept	0.2789
	Linear	0.0163
	Quadratic	0.0000
	Cube	0.0000
Group four	Intercept	0.0000
	Linear	0.0000
	Quadratic	0.0000
	Cube	0.0000
Group five	Intercept	0.0000
	Linear	0.0000
	Quadratic	0.0000
	Cube	0.0000

that the six group model split the chronic offender trajectory into two groups, but did not add to interpretation. Consequently, the model with the smaller number of groups was selected for ease of interpretation (Fergusson, Horwood & Nagan 2000). Estimates of each component were examined to ascertain the form (ie cubic, quadratic, linear and intercept terms) of the five trajectories. Most terms were significant at the 0.5 level and all trajectories had a significant cubic term (see Table 9), so all five groups were assumed to be described best by cubic functions because of the possible impacts of truncation at age 20 and incarceration for this older group.

Figure 2 presents the five offender trajectories identified by the model. Individuals in groups 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 aged 14 to 16 years, while group two had adult onset where individuals were over 17 years of age. These groups accounted for most of the offender cohort, with 29.3 percent of the cohort in group one and 54.9 percent in group two. Group one was labelled 'adolescent peaking (low)' while group two was labelled 'adult onset (low)'. The third group involved early onset and high levels of offending (M=46.9 offences; SD=46.2 offences), with offending peaking when individuals were 15 years of age. This group included three percent of the cohort and was labelled 'early onset (chronic)'. Group four had adolescent onset when youth were aged 11 to 14 years with moderate offending. On average, each individual in group four was convicted of 11.2 offences (SD=6.2). This group included 10.5 percent of the cohort and was labelled 'adolescent onset (moderate)'. The fifth group had adolescent onset of offending when individuals were aged 12 or 13 years, with high levels of offending that peaked when individuals were 20 to 21 years of age. On average,

**Figure 2** Offences committed by individuals in the offender trajectories by age in years (n)



individuals in the fifth group were convicted of 35.0 offences (SD=29.7). Only a small proportion of the cohort was in this group (2.2%), which was labelled ‘adolescent onset (chronic)’.

## Characteristics of offender trajectory groups

The second research question sought to determine *What are the demographic, offence and criminal justice system event characteristics associated with trajectory group membership?* Table 10 presents the demographic characteristics of the offender trajectory groups. Almost one-quarter (24.5%) of the population offended, although one-fifth (20.6%) were in the two low offending groups. Between 75 percent and 80 percent of each trajectory group were male, with the exception of the adolescent peaking (low) group, which comprised nearly 60 percent males. About one-tenth of the two low offending groups were Indigenous, while one-third

of the two adolescent onset groups and nearly half of the early onset (chronic) offender group were Indigenous.

The number of offences committed by members of each trajectory group and types of offences committed are presented in Tables 11 and 12. Individuals in the two low offending trajectories accounted for 84.2 percent of offenders and 33 percent of offences. Members of the moderate group were 10.5 percent of offenders and were responsible for 23.4 percent of offences. Members of the two chronic groups were 5.2 percent of offenders and committed 43.7 percent of offences.

Visual inspection of the data (see Table 12) indicated that members of the adolescent peaking (low) trajectory were more likely than members of the overall offender cohort to have committed theft and related offences and less likely to have committed unlawful entry offences. Members of the adult onset (low) group were more likely to have committed public order offences, offences against justice procedures and dangerous or negligent acts

endangering persons. They were less likely to have committed theft and related offences, unlawful entry offences and property damage offences. Members of the two chronic groups were more likely to have committed unlawful entry offences. Additionally,

members of the early onset (chronic) group were more likely to have committed theft and related offences and were less likely to have committed public order offences.

**Table 10** Demographic characteristics of offending trajectories

Trajectory group	Offenders		Male		Indigenous		% of total
	n	% <sup>a</sup>	n	%	n	%	Population <sup>b</sup>
G1 Adolescent peaking—low	4,159	29.3	2,394	57.6	479	11.5	7.2
G2 Adult onset—low	7,778	54.9	5,824	74.9	660	8.5	13.4
G3 Early onset—chronic	428	3.0	336	78.5	211	49.3	0.7
G4 Adolescent onset—moderate	1,488	10.5	1,138	76.5	443	29.8	2.6
G5 Adolescent onset—chronic	318	2.2	257	80.8	102	32.1	0.5
Total	14,171		9,949	70.2	1,895	13.4	24.5

a: Percentages may not total 100 due to rounding

b: Total estimated population of 16 year olds in 2006: 57,954 (ABS 2011a)

**Table 11** Offences committed by each trajectory group

Trajectory group	Offenders		Offences	
	n	% <sup>a</sup>	n	% <sup>a</sup>
G1 Adolescent peaking—low	4,159	29.3	8,923	12.5
G2 Adult onset—low	7,778	54.9	14,626	20.5
G3 Early onset—chronic	428	3.0	20,069	28.1
G4 Adolescent onset—moderate	1,488	10.5	16,680	23.4
G5 Adolescent onset—chronic	318	2.2	11,115	15.6
Total	14,171		71,413	

a: Percentages may not total 100 due to rounding

**Table 12** Offence types committed by trajectory group members<sup>a</sup>

ANZSOC offence type	G1 Adolescent peaking—low		G2 Adult onset—low		G3 Early onset—chronic		G4 Adolescent onset—moderate		G5 Adolescent onset—chronic		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Theft and related offences	3,319	37.2	2,564	17.5	7,351	36.6	4,369	26.2	3,048	27.4	20,651	28.9
Unlawful entry with intent/ burglary, break and enter	750	8.4	431	2.9	5,111	25.5	2,008	12.0	2,285	20.6	10,585	14.8
Public order offences	1,212	13.6	4,462	30.5	1,249	6.2	2,466	14.8	1,090	9.8	10,479	14.7
Property damage and environmental pollution	1,055	11.8	987	6.7	2,481	12.4	2,003	12.0	1,543	13.9	8,069	11.3
Offences against justice procedures, government security and government operations (excluding breaches)	375	4.2	1,950	13.3	1,107	5.5	1,559	9.3	772	6.9	5,763	8.1
Illicit drug offences	721	8.1	1,385	9.5	600	3.0	1,462	8.8	702	6.3	4,870	6.8
Acts intended to cause injury	568	6.4	698	4.8	741	3.7	1,136	6.8	424	3.8	3,567	5.0
Dangerous or negligent acts endangering persons	197	2.2	1,218	8.3	179	0.9	332	2.0	125	1.1	2,051	2.9
Deception and related offences	119	1.3	388	2.7	459	2.3	318	1.9	700	6.3	1,984	2.8
Miscellaneous offences	239	2.7	117	0.8	278	1.4	370	2.2	135	1.2	1,139	1.6
Weapons and explosives offences	144	1.6	242	1.7	112	0.6	237	1.4	128	1.2	863	1.2
Sexual assault and related offences	159	1.8	94	0.6	168	0.8	179	1.1	38	0.3	638	0.9
Robbery, extortion and related offences	47	0.5	58	0.4	156	0.8	203	1.2	89	0.8	553	0.8
Abduction and related offences	16	0.2	28	0.2	76	0.4	38	0.2	36	0.3	194	0.3
Homicide and related offences	2	0.0	4	0.0	1	0.0	0	0.0	0	0.0	7	0.0
<b>Total</b>	<b>8,923</b>		<b>14,626</b>		<b>20,069</b>		<b>16,680</b>		<b>11,115</b>		<b>71,413</b>	

a: Percentages may not total 100 due to rounding

Note: Shaded indicates that the offence type was included in the assessment of the wider economic and social costs of offending



Table 13 presents the number of criminal justice system events and days supervision based on trajectory group membership. After taking into account the proportion of the cohort that each offender trajectory group comprised, visual inspection of the data indicated that members of the adolescent peaking (low) trajectory were more likely to have been cautioned and were less likely to have had a court appearance. Members of the adult onset (low) trajectory were less likely to have been cautioned, conferenced or to have had a Children's Court appearance and were more likely to have had a Magistrates Court appearance. Members of the two chronic offender trajectories and the moderate offender trajectory were more likely to have had all criminal justice system events. Members of these three groups were also found to have been sentenced to a higher number of days detention/incarceration and community-based supervision than would have been expected given the proportion of the offender cohort that each group represented.

## Cost of offender trajectory groups

The third research question sought to determine the costs of individuals on different offender trajectories. Table 14 presents these costs. Over four-fifths (84.2%) of the cohort were in the two low offending groups, but these groups accounted for less than one-third (30.4%) of total costs. Approximately one-tenth (10.5%) of the cohort were in the adolescent onset (moderate) group, who accounted for 22.4 percent of the costs. Each individual in the moderate group generated a total cost \$58,116, with criminal justice system costs accounting for two-thirds (59.9%) of this cost. While 5.2 percent of the cohort was in the two chronic groups, they accounted for 47.3 percent of the total costs. Each individual offender in the chronic groups cost more than three times as much as someone in the moderate group and over 20 times more than individuals in the two low offending groups. On average, each individual in the adolescent onset (chronic) group generated a total cost of \$221,602, while each individual in the early onset (chronic) group cost \$262,057.

**Table 13** Number of criminal justice system events and days supervision based on trajectory group membership

	Trajectory group											
	G1 Adolescent peaking—low		G2 Adult onset—low		G3 Early onset—chronic		G4 Adolescent onset—moderate		G5 Adolescent onset—chronic		n <sup>a</sup>	%
	n	%	n	%	n	%	n	%	n	%		
Criminal justice system events	4,159	29.3	7,778	54.9	428	3.0	1,488	10.5	318	2.2	14,171	100.0
Cautions	4,753	48.5	1,646	16.8	709	7.2	2,256	23.0	435	4.4	9,799	100.0
Police referred conference	323	32.8	68	6.9	136	13.8	372	37.8	85	8.6	984	100.0
Children's court appearance <sup>b</sup>	698	11.3	328	5.3	2,187	35.3	2,120	34.2	866	14.0	6,199	100.0
Magistrates court appearance	855	5.4	9,571	60.0	976	6.1	3,318	20.8	1,239	7.8	15,959	100.0
District court appearance	13	2.8	118	25.1	80	17.0	165	35.0	95	20.2	471	100.0
Supreme court appearance	4	9.3	18	41.9	7	16.3	8	18.6	6	14.0	43	100.0
Total events	6,646	19.9	11,749	35.1	4,095	12.2	8,239	24.6	2,726	8.1	33,455	100.0
Youth detention	2,385	3.0	2,545	3.2	49,673	62.0	14,170	17.7	11,408	14.2	80,181	100.0
Adult incarceration	6,010	3.3	26,483	14.4	41,489	22.5	52,184	28.3	58,357	31.6	184,523	100.0
Youth community-based supervision <sup>c</sup>	24,580	4.1	14,720	2.5	283,740	47.7	168,059	28.3	103,151	17.4	594,250	100.0
Adult community-based supervision	18,716	4.1	156,795	34.1	54,950	11.9	157,191	34.2	72,542	15.8	460,194	

a: Percentages may not total 100 due to rounding

b: Children's court includes Children's Court and Children's Court of Queensland

c: Assessed as the most serious outcome for the finalisation

**Table 14** Criminal justice system and wider economic and social costs of offender trajectories<sup>a</sup>

Group	Cohort members		Justice system costs			Wider economic and social costs			Total costs		
	n	%	Mean (\$)	Group costs (\$ mil)	% cost	Mean (\$)	Group costs (\$ mil)	% cost	Mean (\$)	Group costs (\$ mil)	% cost
G1 Adolescent peaking—low	4,159	29.3	4,127	17.16	8.5	5,408	22.49	12.2	9,535	39.66	10.3
G2 Adult onset—low	7,778	54.9	5,695	44.30	22.0	4,275	33.25	18.0	9,971	77.55	20.1
G3 Early onset—chronic	428	3.0	130,520	55.86	27.7	131,537	56.30	30.4	262,057	112.16	29.0
G4 Adolescent onset—moderate	1,488	10.5	34,780	51.75	25.7	23,337	34.73	18.8	58,116	86.48	22.4
G5 Adolescent onset—chronic	318	2.2	101,497	32.28	16.0	120,106	38.19	20.6	221,602	70.47	18.2
Total	14,171		14,209	201.35		13,052	184.96		27,261	386.31	

a: Percentages may not total 100 due to rounding

## The extent that communities generated chronic offenders and the level of residential mobility

The fourth research question sought to determine whether some communities were more likely to generate chronic offenders. For the purposes of this analysis, offenders were classified as chronic if they had been identified in the moderate or chronic offender trajectories (15.7% of the offender cohort). Figure 3 graphically displays the proportion of the 16 year old population in each POA identified as chronic offenders. It is evident that chronic offenders are not randomly distributed geographically. About two-thirds of POAs (n=224; 68.1%) had none or a low proportion of the population that were chronic offenders. One-fifth (n=72; 21.9%) of locations were found to have a high proportion of the population who were chronic offenders, where between 5.7 and 9.1 percent of the population were chronic offenders. One-tenth (n=33; 10.0%) had a very high proportion of the population who were chronic offenders, where over nine percent of the population were chronic offenders.

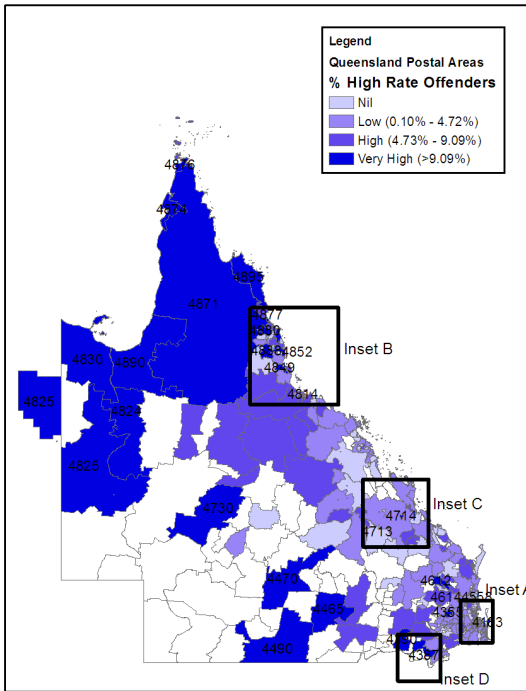
The POAs were then ranked based on the proportion of the population who were chronic offenders. Figure 3 presents the top 10 percent POAs where over nine percent of the population were chronic offenders. While these 33 locations represents 10 percent of all POAs with over 10 individuals aged 16 years old at the time, they accounted for 458 (20.5%) of all chronic offenders. Also presented in this Table is the percentage of 16 year olds in the POA who were Indigenous, the Index of Relative Socio-economic Disadvantage (IRSD) decile and the Australian Standard Geographical Classification—Remoteness Areas. The IRSD is an index developed by the ABS (2006b) 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 Australian Standard Geographical Classification—Remoteness Areas (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*.

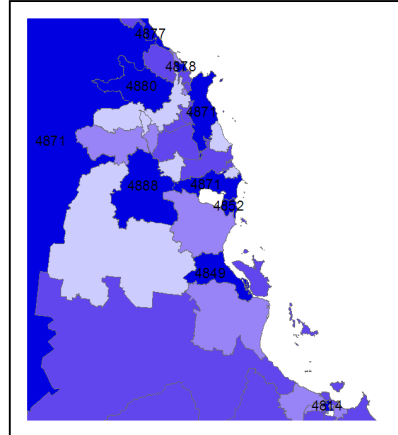
Examination of the information presented in Table 15 indicates that the majority of these POAs had a high proportion of Indigenous 16 year olds. Twenty-two of the 33 POAs had higher than average (5.38%) populations of Indigenous 16 year olds. In three of these POAs (4713, 4830 and 4876), 100 percent of the 16 year olds were Indigenous. These POAs were also classified by high levels of disadvantage. Ten (30%) were classified as being in the lowest decile of disadvantage (mean=3.36). 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 identified Indigenous 16 year olds (based on the census data) and was not classified as disadvantaged (IRSD decile=6). This POA was in western Queensland and included Longreach.

The fifth research question sought to assess the extent of residential mobility among chronic offenders. On average, each chronic offender had 17.7 (SD=19.5) valid POAs recorded. The number of times that chronic offenders changed postal areas is presented in Table 16. About one-third (31.7%) of chronic offenders only had one POA, while about 32.1 percent had three or more POA changes. Hence, chronic offenders appear to be substantially mobile in terms of the number of times they change residential address after their initial contact with the criminal justice system.

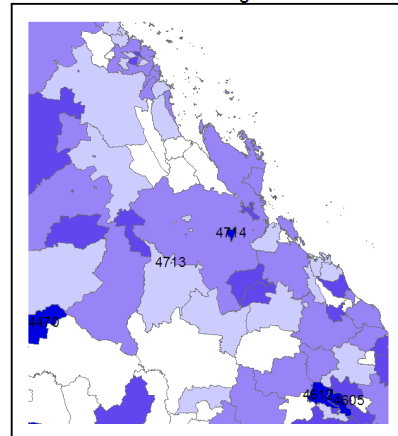
**Figure 3** Proportion of chronic offenders by Queensland postal areas



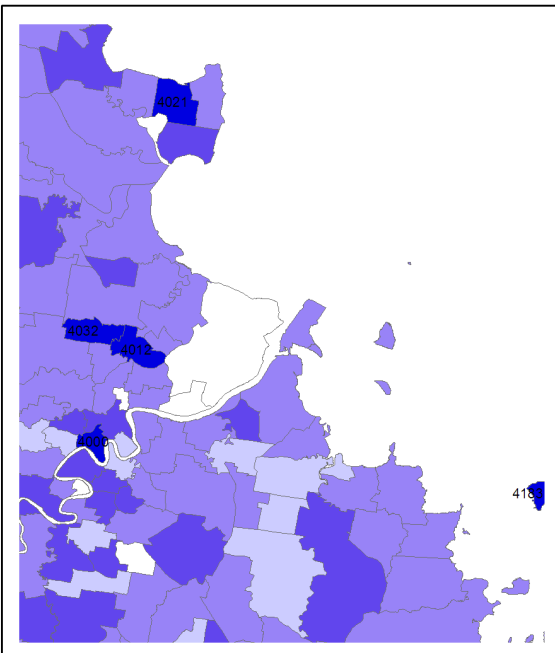
**Inset B: Cairns and Townsville Region**



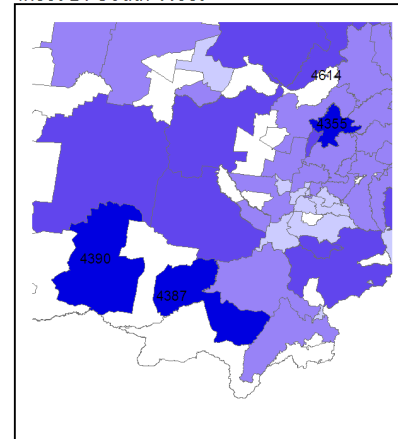
**Inset C: Woorabinda Region**



**Inset A: South East Brisbane**



**Inset D: South West**



**Table 15** Postal areas with the highest proportion of chronic offenders

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

Note: POA locations are provided in *Appendix 1*

**Table 16** Changes of postal area by chronic offenders (n)

Postal area changes (n)	n	%
0	708	31.7
1	423	18.9
2	387	17.3
3	225	10.1
4–5	279	12.5
6+	212	9.5
Total	2,234	100.0

## Communities carrying the cost burden of chronic offenders

The sixth research question sought to determine which communities carried the cost burden of chronic offenders. Table 17 presents the top 10 percent of POAs identified based on the total cost to the community of chronic offenders; these are graphically presented in Figure 4. When aggregated and totalled, chronic offenders in each POA were found to cost between \$2.4 and \$14.0m. Despite representing 10 percent of POAs, the top 33 POAs accounted for 40.4 percent of the chronic offenders, 47.0 percent of offences committed by chronic offenders, 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.

A different picture emerged when the costs of chronic offending were examined (see Figure 4).

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.

Finally, both the concentration of chronic offenders (Top 10% proportion of population chronic offenders) and the cost of chronic offenders (Top 10% total cost of chronic offenders) were mapped to examine the spatial distribution of these postal areas (see Figure 4). Eight POAs were identified that experienced high concentrations of chronic offenders and high costs of chronic offenders. These POAs are predominantly located in north and far north Queensland and contain a high proportion of Indigenous young people. The outer regional POA in Inner South West (Insert D of Figure 4) includes Cherbourg—a large Indigenous community. This map also clearly indicates that the costly POAs include the outer suburbs of Brisbane and the regional areas of Rockhampton, Gladstone and Toowoomba. However, the areas where high rates of chronic offenders are located are predominately in the remote and very remote areas of Queensland.

**Table 17** Postal areas with the highest total costs associated with chronic offenders

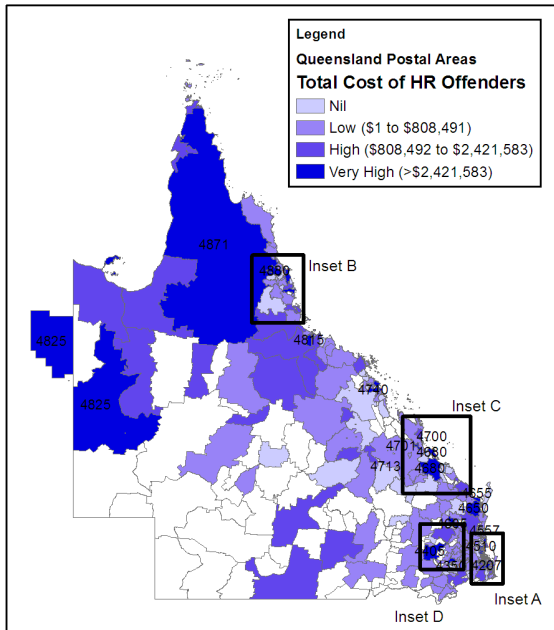
Postal area	Total cost of chronic offenders \$	% 16 year old population Indigenous	IRSD decile	ASGC-RS
4350	14,041,855.40	5.9	5	Inner Regional Australia
4870	9,490,998.20	14.2	5	Outer Regional Australia
4814 <sup>a</sup>	6,880,943.40	10.7	7	Outer Regional Australia
4500	5,526,594.00	2.4	8	Major Cities of Australia
4605 <sup>a</sup>	5,219,528.50	45.5	1	Outer Regional Australia
4740	5,142,393.20	6.8	6	Inner Regional Australia
4825 <sup>a</sup>	4,980,879.60	56.9	4	Remote Australia
4114	4,486,789.60	7.5	1	Major Cities of Australia
4871 <sup>a</sup>	4,433,063.80	53.3	1	Very Remote Australia
4000 <sup>a</sup>	4,145,758.00	0	9	Major Cities of Australia
4680	4,083,81.002	3.6	7	Inner Regional Australia
4815	4,073,432.80	14.9	5	Outer Regional Australia
4701	3,906,402.20	9.4	4	Inner Regional Australia
4650	3,870,516.31	3.2	2	Inner Regional Australia
4300	3,771,011.60	4.9	4	Major Cities of Australia
4700	3,718,443.50	5.8	3	Inner Regional Australia
4305	3,633,307.60	5.8	3	Major Cities of Australia
4405	3,633,085.00	8.6	5	Inner Regional Australia
4207	3,287,461.20	5	4	Major Cities of Australia
4655	3,118,401.00	4.4	3	Inner Regional Australia
4077	3,071,191.40	7.3	1	Major Cities of Australia
4152	2,966,410.00	2	9	Major Cities of Australia
4053	2,909,976.11	2.4	8	Major Cities of Australia
4880 <sup>a</sup>	2,687,249.30	17.5	2	Outer Regional Australia
4510	2,644,249.80	5.3	2	Major Cities of Australia
4021 <sup>a</sup>	2,604,52.40	3.2	3	Major Cities of Australia
4557	2,601,894.00	1.3	7	Major Cities of Australia
4280	2,598,683.00	2.4	8	Major Cities of Australia
4713 <sup>a</sup>	2,530,978.80	100	1	Remote Australia
4503	2,521,033.00	1.7	7	Major Cities of Australia
4869	2,470,170.80	15.4	6	Outer Regional Australia
4551	2,467,375.00	2	5	Major Cities of Australia
4812	2,421,583.60	13.4	4	Outer Regional Australia

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

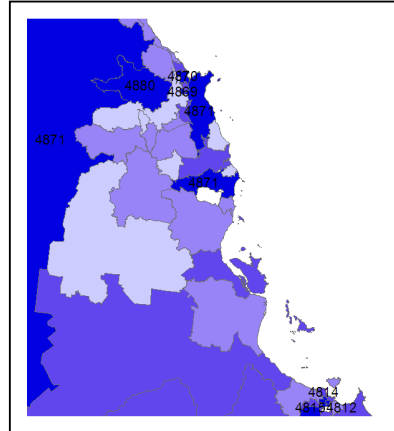
Note: POA locations are provided in *Appendix 1*



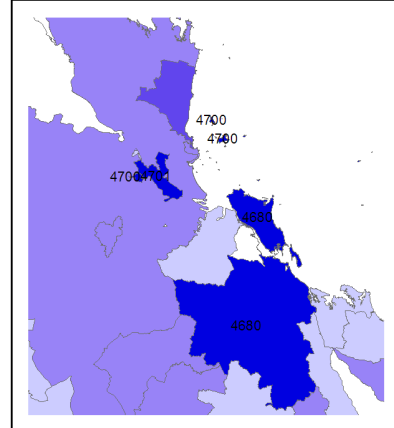
**Figure 4** Distribution of total costs for chronic offenders by Queensland postal areas



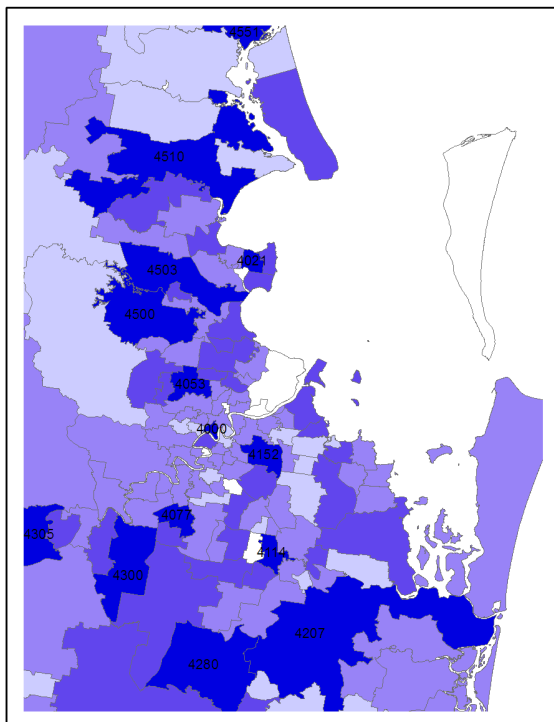
**Inset B: Cairns and Townsville Region**



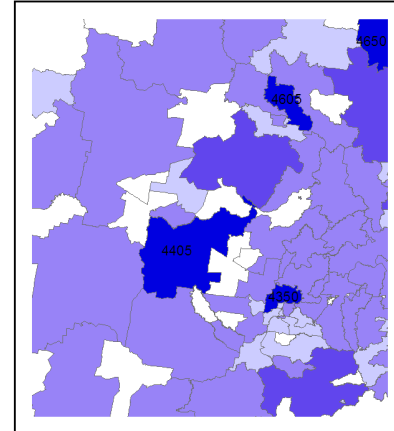
**Inset C: Gladstone Region**



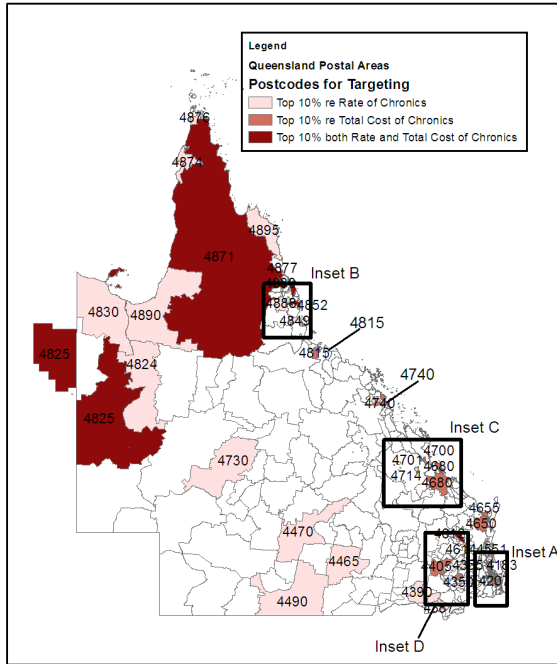
**Inset A: South East Brisbane**



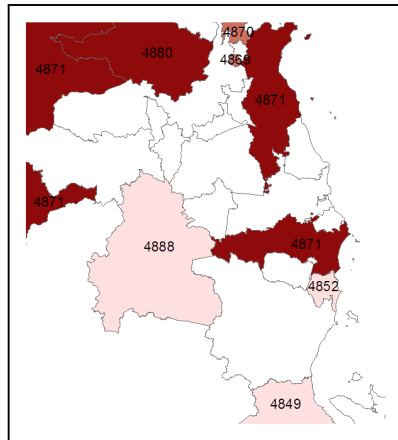
**Inset D: Inner South West**



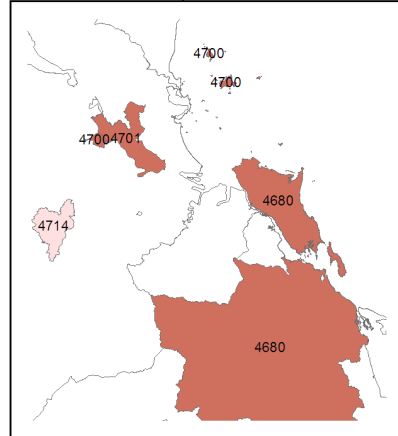
**Figure 5** Top 10 percent of locations based on proportion in population who were chronic offenders and the top 10 percent of most costly high-rate offender postcodes



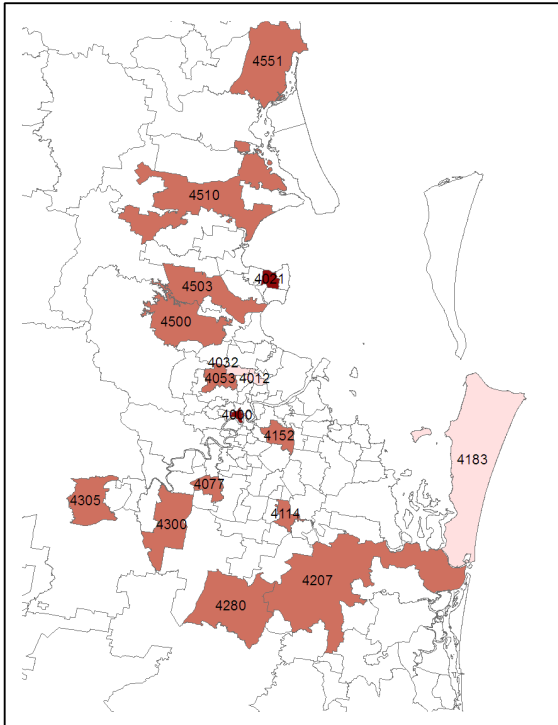
**Inset B: Cairns Region**



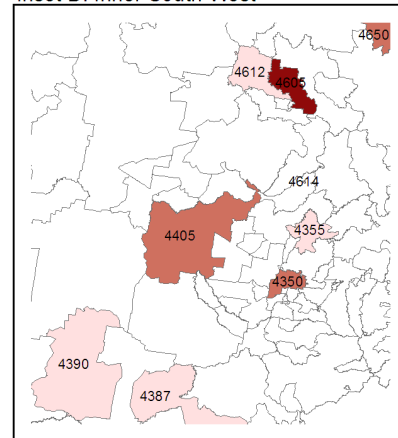
**Inset C: Rockhampton and Gladstone Region**



**Inset A: South East Brisbane**



**Inset D: Inner South West**





# Discussion

In this section, an outline of the rationale for the project will firstly be presented. Second, the findings of the project will be summarised in the context of previous findings. Third, the implications for policy arising from the project will be discussed. Next, the limitations of the research will be reported. The section will conclude by outlining directions for future research.

## Rationale for project

This project aimed to assess whether communities that generated chronic offenders and carried substantial cost burdens associated with offending could be identified. If such communities could be identified, costly interventions may be targeted towards these locations to reduce offending, crime, victimisation and Indigenous overrepresentation. The project drew on methods and findings from research focused on offender trajectories and crime and place. Trajectory research finds that there is a small group of chronic offenders who account for a disproportionate amount of offending and costs (Piquero 2008). While this group can be retrospectively identified, research has not adequately been able to prospectively identify individuals who may be on this trajectory based on risk and protective factors. Findings from crime and

place research suggest that these offenders are not randomly distributed geographically and highlight the importance of understanding the temporal aspects of locational data such as offender residential mobility (Gabor & Gottheil 1984; Oberwittler 2004; Sabol, Coulton & Korbin 2004; Schwartz 2010; Wiles & Costello 2000). Given these findings, the project firstly explored the number of offender trajectories, their nature and their cost. The project then focused on individuals in the moderate and chronic offender groups and explored how individuals and costs were geographically distributed. The six research questions addressed by the study were:

- How many distinct offender trajectories can be identified?
- What are the demographic, offence and criminal justice system event characteristics associated with trajectory group membership?
- What are the costs of offender trajectories?
- Are some communities more likely to generate chronic offenders than others?
- How residentially mobile are chronic offenders?
- Which communities carry the cost burden of chronic offenders?

## Summary of findings

Consistent with Piquero's (2008) review of trajectory research, five offender trajectory groups were identified. The offending patterns of these groups were similar to those found by prior research. There was an adolescent-peaked group who offended at low levels (29.3% of cohort; 12.5% of offences) and two groups who offended at chronics—early-onset chronic offenders (3.0% of cohort; 28.1% of offences) and adolescent-onset chronic offenders (2.2% of cohort; 15.6% of offences). Additionally, there was an adult-onset group who offended at low levels (54.9% of cohort; 20.5% of offences) and an adolescent onset group who offended at moderate levels (10.5% of cohort; 23.4% of offences). About one-tenth of the two low offending groups were Indigenous, while between one-third and one-half of the moderate and chronic groups were Indigenous. Therefore, targeting offenders in these three groups is likely to be a useful approach for reducing Indigenous overrepresentation. Chronic offenders were more likely to have committed unlawful entry offences and theft and related offences. They were also more likely to have been subjected to each of the criminal justice system events that were examined and found to account for a disproportionate number of days sentenced to detention/incarceration and community-based supervision.

Costs were applied to the five offender trajectory groups and findings were consistent with previous research, with chronic offender trajectory groups found to account for a disproportionate amount of costs. Early onset (chronic) and adolescent onset (chronic) offenders were 5.2 percent of the cohort, but these two types of offenders combined accounted for 47.2 percent of total costs. On average, each chronic offender cost over \$220,000 by the time they turned 21 years of age. Approximately one-tenth (10.5%) of the cohort were in the adolescent onset (moderate) group, but 22.4 percent of the costs were accrued by members of this group. Each adolescent onset (moderate) offender cost \$58,116 by the time they turned 20 years of age. Four-fifths (84.2%) of the cohort were adolescent peaking (low) or adult onset (low) members, and 30.4 percent of total costs were accrued by members of these groups. On average,

each offender in these low offending groups cost \$9,535 or \$9,971 respectively by the time they turned 21 years old. Differences between the actual costs of the offender trajectories in the current study and previous research may be explained by the length of criminal careers captured by studies, the offences included and costed in the studies and the overall costing method that is applied (Allard et al. under review).

While information about the trajectory groups and their costs provides useful information about the small group of offenders who account for a large proportion of offences, it does not enable crime prevention interventions to be targeted towards chronic and costly offenders. When the moderate and chronic groups were combined as chronic offenders, they represented 3.8 percent of the population and 15.8 percent of offenders. However, they accounted for 67 percent of offences and 68.6 percent of the costs. Because the residential location of chronic offenders may prove useful for targeting interventions, the proportion of the population in each POA who were chronic offenders was explored. The POA where chronic offenders resided when they first had contact with the criminal justice system was used to assign costs because of the emphasis placed on the early years of life by developmental crime prevention and ABS census statistics were used to determine the populations of POAs.

It was evident that chronic offenders were not randomly distributed, with two-thirds ( $n=224$ ; 68.1%) of POAs having none or less than five percent of the 16 year old population identified as chronic offenders. One-tenth ( $n=33$ , 10.0%) of POAs had over nine percent of the population that were chronic offenders and 20.5 percent of chronic offenders came from these POAs. Most of these locations had a high proportion of Indigenous peoples in the population, were outer regional, remote or very remote locations and many faced extreme disadvantage.

Given that the residential POA when offenders first had contact with the criminal justice system was used to assign location, it was considered important to investigate offender residential mobility. About one-third (31.7%) of chronic offenders only had one POA, while one-third (32.1%) had three or more

POA changes. While a significant proportion of chronic offenders were not residentially mobile, overall chronic offenders were substantially mobile in terms of the number of times they changed residential postal code after their initial contact with the criminal justice system.

Finally, the project identified communities that carried the burden of costly chronic offenders. The top 10 percent of POAs were identified based on total cost of chronic offenders and these postcodes were found to account for 40.4 percent of chronic offenders and 50.5 percent of the total cost of chronic offenders. Many of these POAs were located in regional Queensland, with each POA costing between \$2.4 and \$14.0m.

## Implications for policy

The findings from this project indicate that chronic offenders represented a small proportion of offenders (15.9%) but accounted for a large proportion of offences (67.0%) and costs (68.6%). Three-quarters (77.5%) of chronic offenders were male, while one-third (33.8%) were Indigenous. On average, they committed 21.4 offences and had 6.7 finalised criminal justice system events. Chronic offenders were not found to be randomly distributed geographically and there was a substantial cost for some communities. The top 10 percent of POAs, where over nine percent of the population were chronic offenders, accounted for 20.5 percent of chronic offenders. The 10 percent most costly locations accounted for 50.5 percent of the total cost of chronic offenders.

These findings highlight the need for urgent action. Many of the communities where a high proportion of chronic offenders first had contact with the criminal justice system had extreme social and economic disadvantage. As such, these locations may benefit from community-wide programs that target the risk factors for offending by reducing substance abuse and unemployment and improving educational levels and housing conditions (Allard 2010). International evidence indicates that addressing community-wide risk factors through Vocational and Education Training, or community economic development, may reduce offending (Burghardt et al. 2001; McCord,

Widom & Crowell 2001; Sherman et al. 1997). While the extent that these programs would reduce offending by Indigenous peoples remains unknown, the Closing the Gap strategy aims to improve educational and employment outcomes for Indigenous peoples (COAG 2009). As such, the current project may provide additional information to assist decisions about which locations should be targeted to most efficiently improve outcomes and reduce Indigenous overrepresentation as offenders in the criminal justice system.

A range of programs targeting the individual and their ecological environment may also be useful for reducing Indigenous overrepresentation. Early/developmental programs include parental training, home visiting, daycare/preschool programs and home/community programs (Farrington & Welsh 2003). Multi-modular programs such as Multi-Systemic Therapy typically focus on the family and the individual's ecological environment to address risk factors occurring in multiple domains simultaneously. These programs could be implemented in locations that were either identified as having high proportions of the population who were chronic offenders or that were identified as costly locations. They could be made available to the entire communities or could be further targeted to individuals using risk assessment tools.

Evidence from meta-analyses indicates that programs targeting the family may reduce offending by between 13.3 percent and 52 percent (Aos et al. 2001; Drake, Aos & Miller 2009; Latimer 2001; Lipsey & Wilson 1998; Woolfenden, Williams & Peat 2002). Programs that adopt a Multi-Systemic Therapy framework reduce offending by between 7.7 percent and 46 percent (Aos et al. 2001; Curtis, Ronan & Borduin 2004; Lipsey & Wilson 1998; Littell, Popa & Forsythe 2005). Whether these programs would result in similar reductions in offending for Indigenous peoples remains unknown. Nevertheless, the POAs identified in the current study might be ideal locations where these interventions could be implemented and rigorously evaluated to determine whether they can have an impact on Indigenous offending.

The identified locations may also be prime sites where situational crime prevention interventions could be implemented. Situational crime prevention

focuses on highly specific problems and the opportunities in specific environments that facilitate problem behaviour (Clarke & Felson 1993). Intervention aims to alter the immediate environment in which crime occurs or address factors within the context that may be causing or maintaining offending. As such, further spatial analysis of offending and crime data should be undertaken for the POAs where a high proportion of the population was found to offend or for the POAs that were found to have a high cost. Additional spatial analysis would enable determination of whether specific forms of offending occur in specific locations. The identification of micro locations would enable interventions to be planned and implemented that manipulate the environment to reduce the opportunities for offending. These interventions can result in real reductions in offending and have proven effective for reducing risk factors related to offending, such as substance abuse within Indigenous communities (Clarke 1997; Eck 2006; Richards, Rosevear & Gilbert 2011).

It must be emphasised that developing and implementing crime prevention interventions in many of the communities would be challenging. Many were disadvantaged and in regional, remote or very remote locations. The crime prevention literature suggests that successful programs have several core features, including:

- highly skilled leaders and staff;
- adequate funding;
- effective coordination and collaboration mechanisms across government and non-government agencies; and
- a high level of community involvement to ensure community acceptance and participation, that local community needs are met and to ensure that interventions are culturally appropriate (AIC 2012; Calma 2008; Cherney & Sutton 2007; Doone 2000; Gillbert 2012; Stacey and Associates 2004).

Even if interventions have these core features, they may still need to overcome the challenges resulting from poor access to services and infrastructure (Schwartz 2010).

Given the apparent usefulness of understanding geographic location for targeting crime prevention resources, other jurisdictions should consider using

this approach to target interventions to reduce offending, crime, victimisation in Indigenous overrepresentation in the criminal justice system. A similar place-based approach for targeting resources that is gathering traction internationally and in Australia is justice reinvestment (Allen 2011; Clear 2011; Guthrie, Adcock & Dance 2011; House of Commons 2009; Queensland Government 2011; Schwartz 2010; Young & Solonec 2011). This approach involves using 'justice mapping' or 'prisoner geographies' to redirect a proportion of corrections budgets to the communities that generated the most costly prisoners. Mapping conducted overseas has enabled million dollar blocks to be identified and evidence is emerging that the approach is an effective way of reducing crime and expenditure on imprisonment (Schwartz 2010). The findings of the current study lend support to this approach, as costly chronic offenders were not found to be randomly distributed. Moreover, the methodology developed in the study may assist jurisdictions to assess the cost of offenders using a justice reinvestment framework.

## Limitations of the project

Despite the potential importance of the findings, they should be interpreted in light of seven main limitations. First, the study was based on administrative data which is of variable quality and does not include offending that is not reported to justice agencies or attributed to an offender. Second, the study was not able to take into account cohort attrition (through death or population mobility) or migration into the cohort in assessing the offender trajectories. Taking migration and attrition into account may result in some variation in the final trajectory models identified (Eggleston, Laub & Sampson 2004). Third, the study did not control for the effects of exposure time when assessing the number of offender trajectories. Individuals in the cohort were in detention/incarceration for 62,870 days. When the number of days available for individuals in each offender trajectory group to offend is considered, the two low offender trajectory groups had the most time available to offend (<.01% of the time). Members of the moderate group were detained/incarcerated for 0.9 percent of the time,

while members of the early onset and adolescent onset chronic groups were detained/incarcerated for 4.0 and 4.6 percent of the time respectively.

Fourth, criminal justice system costs were assessed based on the average cost of finalised events, taking into account how individuals flowed through the system, while the wider social and economic costs were assessed based on an update of Rollings' (2008) assessment. In assessing criminal justice system costs, average costs were used although costs would vary based on factors such as whether the offender pleaded guilty, the offence type and the location of the offence. The cost of responding to offending in rural and remote areas is likely to be significantly higher for each event and individual than in cities. In assessing wider economic and social costs, six offence types were not assigned a cost. While these offence types could be considered less expensive, there were a large number of offences (32.7%) that were not assigned a cost. Inclusion of these costs would increase the wider economic and social costs of the trajectory groups, but particularly the adult onset (low) and adolescent peaking (low) groups. Members of these two groups had the highest proportions of the six offence categories that were not able to be included in the assessment of cost.

Fifth, the project was reliant on the POA recorded for each chronic offender when they first had contact with the criminal justice system and ABS census population data. Postcode 4000, which includes Brisbane City, was identified as being a location where a high proportion of chronic offenders first resided when they had contact with the system and as a high-cost location. Given the small residential population of this location, it is believed that this location may have been recorded when a residential address was not provided, for offenders who were homeless or for offenders who were detained. Additionally, there was considerable mobility among offenders, with two-thirds of high-risk offenders changing POAs at least once based on their contacts with criminal justice agencies and about one-tenth (9.5%) changing six or more times. However, there was no way of determining how frequently the chronic offenders moved residential address in the years prior to having contact with the criminal justice system or whether changes in POA location were not captured by criminal justice system data.

Sixth, POAs are a very crude approximation for communities. Some POAs are geographically very large with very small populations. Furthermore, while population data were available based on POAs, it should be noted that these are only approximations of POAs and that these data were subject to random allocation processes used by the ABS to prevent individual identification (ABS 2006a). Finally, there were also numerous challenges using the census data. The number of 16 year olds in 2006 was assumed to be an approximation for the cohort population. While the offender cohort would have been 16 years old in 2006, there was no way of determining the attrition from or migration into the cohort.

## Directions for future research

Additional research focused on the cost of offender trajectories and considering their geographic distribution is clearly needed to promote the use of this evidence within policymaking environments. The need for this research is apparent given that jurisdictional differences in criminal justice practices, economic conditions, monetary values and geographic locations makes it difficult to generalise findings from one context to another. Moreover, there is considerable difficulty assigning market values to intangible costs and surprisingly little research has adopted a top-down costing approach based on methods such as willingness to pay. Additional research that assesses the costs of crime and assesses intangible costs will enable researchers to develop more valid and reliable cost estimates. The need for research that predicts future offending and differentiates offender trajectories based on risk factors and locations is also essential to further assist targeting of crime prevention programs.

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# Appendix

# Appendix 1 Postal areas and locations

<b>Table A1</b> Postal areas and locations						
Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4000	Brisbane Adelaide Street, Brisbane City, Petrie Terrace, Spring Hill	0	9	Highly accessible	Major cities of Australia	Both top 10%
4012	Nundah, Toombul, Wavell Heights, Wavell Heights North	0	7	Highly accessible	Major cities of Australia	Top 10% proportion
4021	Kippa-Ring	3.25	3	Highly accessible	Major cities of Australia	Both top 10%
4032	Chermside, Chermside Centre, Chermside South, Chermside West	5	6	Highly accessible	Major cities of Australia	Top 10% proportion
4053	Brookside Centre, Everton Hills, Everton Park, Mcdowall, Mitchelton, Stafford, Stafford Dc, Stafford Heights	2.41	8	Highly accessible	Major cities of Australia	Top 10% costs
4077	Doolandella, Durack, Inala, Inala East, Inala Heights, Richlands	7.34	1	Highly accessible	Major cities of Australia	Top 10% costs
4114	Kingston, Logan Central, Logan City Dc, Woodridge	7.47	1	Highly accessible	Major cities of Australia	Top 10% costs
4152	Camp Hill, Carina, Carina Heights, Carindale	1.99	9	Highly accessible	Major cities of Australia	Top 10% costs
4183	Amity, Amity Point, Dunwich, North Stradbroke Island, Point Lookout	27.59	2	Highly accessible	Inner regional Australia	Top 10% proportion
4207	Alberton, Bahrs Scrub, Bannockburn, Beenleigh, Belivah, Buccan, Cedar Creek, Eagleby, Edens Landing, Holmview, Logan Village, Luscombe, Mount Warren Park, Stapylton, Steiglitz, Windaroo, Wolffdene, Woongoolba, Yarrabilba, Yatala, Yatala Dc	5.04	4	Highly accessible	Major cities of Australia	Top 10% costs
4280	Jimboomba, North Maclean, South Maclean, Stockleigh	2.42	8	Highly accessible	Major cities of Australia	Top 10% costs
4300	Augustine Heights, Bellbird Park, Brookwater, Camira, Carole Park, Gales, Goodna, Springfield, Springfield Central, Springfield Lakes	4.91	4	Highly accessible	Major cities of Australia	Top 10% costs

**Table A1** Postal areas and locations

Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4305	Basin Pocket, Brassall, Bremer, Churchill, Coalfalls, East Ipswich, Eastern Heights, Flinders View, Ipswich, Leichhardt, Limestone Ridges, Moores Pocket, Newtown, North Ipswich, North Tivoli, One Mile, Raceview, Sadliers Crossing, Tivoli, West Ipswich, Woodend, Wulkuraka, Yamanto	5.79	3	Highly accessible	Major cities of Australia	Top 10% costs
4350	Athol, Blue Mountain Heights, Centenary Heights, Charlton, Clifford Gardens, Cotswold Hills, Cranley, Darling Heights, Drayton, Drayton North, East Toowoomba, Finnie, Glenvale, Gowrie Mountain, Harlaxton, Harristown, Kearneys Spring, Middle Ridge, Mount Kynoch, Mount Lofty, Mount Rascal, Newtown, North Toowoomba, Northlands, Prince Henry Heights, Rangeville, Redwood, Rockville, South Toowoomba, Toowoomba, Toowoomba City, Toowoomba Dc, Toowoomba East, Toowoomba South, Toowoomba Village Fair, Toowoomba West, Top Camp, Torrington, Wellcamp, Westbrook, Wilsonton, Wilsonton Heights, Wyalla Plaza	5.91	5	Highly accessible	Inner regional Australia	Top 10% costs
4355	Anduramba, Crows Nest, Emu Creek, Glenaven, Jones Gully, Mountain Camp, Pierces Creek, Pinelands, Plainby, The Bluff, Upper Pinelands	0	3	Highly accessible	Inner regional Australia	Top 10% proportion
4387	Brush Creek, Bybera, Coolmunda, Greenup, Inglewood, Mosquito Creek, Terrica, Warroo, Whetstone	0	2	Accessible	Outer regional Australia	Top 10% proportion
4390	Billa Billa, Calingunee, Callandoon, Goodar, Goondiwindi, Kindon, Lundavra, Wondalli, Wyaga, Yagaburne	10.13	5	Moderately accessible	Outer regional Australia	Top 10% proportion
4405	Blaxland, Bunya Mountains, Dalby, Ducklo, Grassdale, Pirrinuan, Ranges Bridge, St Ruth, Tipton	8.56	5	Accessible	Inner regional Australia	Top 10% costs
4465	Dunkeld, Forestvale, Mitchell, V Gate, Womalilla	25	2	Remote	Remote Australia	Top 10% proportion
4470	Charleville, Langlo	10	4	Very remote	Remote Australia	Top 10% proportion
4490	Barrington, Coongoola, Cunnamulla, Cuttaburra, Humeburn, Jobs Gate, Linden, Noorama, Tuen, Widgegoara, Yowah	59.09	1	Very remote	Very remote Australia	Top 10% proportion



**Table A1** Postal areas and locations

Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4500	Bray Park, Brendale, Brendale Bc, Cashmere, Clear Mountain, Joyner, Strathpine, Strathpine Centre, Warner	2.4	8	Highly accessible	Major cities of Australia	Top 10% costs
4503	Dakabin, Griffin, Kallangur, Kurwongbah, Murrumba Downs, Whiteside	1.65	7	Highly accessible	Major cities of Australia	Top 10% costs
4510	Beachmere, Bellmere, Caboolture, Caboolture Bc, Caboolture South, Donnybrook, Meldale, Moodlu, Rocksberg, Toorbul, Upper Caboolture	5.29	2	Highly accessible	Major cities of Australia	Top 10% costs
4551	Aroona, Battery Hill, Bells Creek, Caloundra, Caloundra Dc, Caloundra West, Currimundi, Dicky Beach, Golden Beach, Kings Beach, Little Mountain, Meridan Plains, Moffat Beach, Pelican Waters, Shelly Beach	1.97	5	Highly accessible	Major cities of Australia	Top 10% costs
4557	Mooloolaba, Mountain Creek	1.27	7	Highly accessible	Major cities of Australia	Top 10% costs
4558	Cotton Tree, Kuluin, Maroochydore, Maroochydore Bc, Sunshine Plaza	2.37	4	Highly accessible	Major cities of Australia	Top 10% proportion
4605	Barlil, Bye, Cherbourg, Cloyna, Cobbs Hill, Crownthorpe, Glenrock, Kitoba, Manyung, Merlwood, Moffatdale, Moondoener, Murgon, Oakdale, Redgate, Silverleaf, Sunny Nook, Tablelands, Warnung, Windera, Wooroonden	45.45	1	Accessible	Outer regional Australia	Both top 10%
4612	Hivesville, Kawl Kawl, Keysland, Stonelands, Wigton	0	6	Accessible	Outer Regional Australia	Top 10% proportion
4614	Neumgna, Upper Yarraman, Yarraman	12	1	Accessible	Inner Regional Australia	Top 10% proportion
4650	Aldershot, Antigua, Bauple, Bauple Forest, Beaver Rock, Bidwill, Boonooroo, Boonooroo Plains, Duckinwilla, Dundathu, Dunmora, Ferney, Glenorchy, Gootchie, Grahams Creek, Granville, Gundiah, Island Plantation, Maaroom, Magnolia, Maryborough, Maryborough Dc, Maryborough West, Mount Urah, Mungar, Netherby, Oakhurst, Owanyilla, Pallas Street Maryborough, Pilerwa, Pioneers Rest, Poona, Prawle, St Helens, Talegalla Weir, Tandora, Teddington, The Dimonds, Thinoomba, Tiaro, Tinana, Tinana South, Tinnanbar, Tuan, Tuan Forest, Walkers Point, Yengarie, Yerra	3.2	2	Accessible	Inner Regional Australia	Top 10% costs

**Table A1** Postal areas and locations

Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4655	Booral, Bunya Creek, Craignish, Dundowran, Dundowran Beach, Eli Waters, Great Sandy Strait, Hervey Bay, Hervey Bay Dc, Kawungan, Nikenbah, Pialba, Point Vernon, River Heads, Scarness, Sunshine Acres, Susan River, Takura, Toogoom, Torquay, Urangan, Urraween, Walliebum, Walligan, Wondunna	4.44	3	Accessible	Inner regional Australia	Top 10% costs
4680	Barney Point, Beecher, Benaraby, Boyne Island, Boyne Valley, Boynedale, Builyan, Burua, Byellee, Callemondah, Calliope, Clinton, Diglum, Gladstone, Gladstone Bc, Gladstone Central, Gladstone Dc, Gladstone Harbour, Glen Eden, Heron Island, Iveragh, Kin Kora, Kirkwood, Mount Alma, New Auckland, O'Connell, River Ranch, South End, South Gladstone, South Trees, Sun Valley, Tablelands, Tannum Sands, Taragoola, Telina, Toolooa, Ubobo, West Gladstone, West Stowe, Wooderson, Wurdong Heights	3.59	7	Accessible	Inner regional Australia	Top 10% costs
4700	Allenstown, Depot Hill, Fairy Bower, Great Keppel Island, Port Curtis, Rockhampton, Rockhampton City, Rockhampton Hospital, The Keppels, The Range, Wandal, West Rockhampton	5.8	3	Highly accessible	Inner regional Australia	Top 10% costs
4701	Berserker, Central Queensland University, Frenchville, Greenlake, Ironpot, Kawana, Koongal, Lakes Creek, Limestone Creek, Mount Archer, Nankin, Nerimbera, Norman Gardens, Park Avenue, Red Hill Rockhampton, Rockhampton Dc, Rockyview, Sandringham, The Common	9.4	4	Highly accessible	Inner regional Australia	Top 10% costs
4713	Woorabinda	100	1	Moderately accessible	Remote Australia	Both top 10%
4714	Baree, Boulder Creek, Fletcher Creek, Hamilton Creek, Horse Creek, Johnsons Hill, Leydens Hill, Limestone, Moongan, Mount Morgan, Nine Mile Creek, Oakey Creek, Struck Oil, The Mine, Trotter Creek, Walmul, Walterhall, Wura	26.09	1	Accessible	Outer regional Australia	Top 10% proportion
4730	Camoola, Chorregon, Ernestina, Longreach, Maneroo, Morella, Stonehenge, Tocal, Vergemont	0	6	Very remote	Very remote Australia	Top 10% proportion

**Table A1** Postal areas and locations

Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4740	Alexandra, Alligator Creek, Andergrove, Bakers Creek, Balberra, Balnagowan, Beaconsfield, Belmunda, Blacks Beach, Cape Hillsborough, Chelona, Cremorne, Dolphin Heads, Dumbleton, Dundula, Dunnrock, East Mackay, Eimeo, Erakala, Foulden, Glenella, Grasstree Beach, Habana, Haliday Bay, Hay Point, Homebush, Mackay, Mackay Caneland, Mackay Dc, Mackay Harbour, Mackay North, Mackay South, Mcewens Beach, Mount Jukes, Mount Pleasant, Munbura, Nindaroo, North Mackay, Ooralea, Paget, Racecourse, Richmond, Rosella, Rural View, Sandiford, Slade Point, South Mackay, Te Kowai, The Leap, West Mackay	6.81	6	Moderately accessible	Inner regional Australia	Top 10% costs
4812	Currajong, Gulliver, Hermit Park, Hyde Park, Hyde Park Castletown, Mundingburra, Mysterton, Pimlico, Rosslea	13.41	4	Accessible	Outer regional Australia	Top 10% costs
4814	Aitkenvale, Annandale, Cranbrook, Douglas, Garbutt, Garbutt East, Heatley, Mount Louisa, Murray, Vincent	10.74	7	Moderately accessible	Outer regional Australia	Both top 10%
4815	Condon, Gumlow, Kelso, Rasmussen	14.88	5	Accessible	Outer regional Australia	Top 10% costs
4824	Cloncurry, Oorindi	29.03	3	Very remote	Remote Australia	Top 10% proportion
4825	Breakaway, Buckingham, Carrandotta, Dajarra, Duchess, Fisher, Georgina, Gunpowder, Happy Valley, Healy, Lawn Hill, Menzies, Mica Creek, Miles End, Mornington, Mount Isa, Mount Isa City, Mount Isa Dc, Mount Isa East, Parkside, Pioneer, Piturie, Ryan, Soldiers Hill, Sunset, The Gap, The Monument, Townview, Waverley, Winston	56.92	4	Remote	Remote Australia	Both top 10%
4830	Burketown, Doomadgee	100	2	Very remote	Very remote Australia	Top 10% proportion
4849	Cardwell	0	2	Moderately accessible	Outer regional Australia	Top 10% proportion
4852	Bingil Bay, Carmoo, Djiru, Garners Beach, Midgere Bar, Mission Beach, South Mission Beach, Wongaling Beach	0	6	Moderately accessible	Outer regional Australia	Top 10% proportion
4869	Bentley Park, Edmonton, Mount Peter, Wrights Creek	15.38	6	Accessible	Outer regional Australia	Top 10% costs

**Table A1** Postal areas and locations

Postcode	Locations	Percent ATSI	IRSD Decile	ARIA category	ASGC category	Target flag
4870	Aeroglen, Brinsmead, Bungalow, Cairns, Cairns City, Cairns Dc, Cairns North, Earlvile, Edge Hill, Freshwater, Kamerunga, Kanimbla, Manoora, Manunda, Martynvale, Mooroolool, Parramatta Park, Portsmith, Redlynch, Stratford, Westcourt, Whitfield	14.21	5	Accessible	Outer regional Australia	Top 10% costs
4871	Almaden, Aloomba, Aurukun, Basilisk, Bellenden Ker, Bellevue, Bombeeta, Boogan, Bramston Beach, Camp Creek, Chillagoe, Coen, Cowley, Cowley Beach, Cowley Creek, Croydon, Crystalbrook, Currajah, Deeral, Desailly, East Trinity, Edward River, Einasleigh, Fishery Falls, Forsayth, Gamboola, Georgetown, Germantown, Glen Boughton, Green Island, Gununa, Julatten, Kowanyama, Kurrimine Beach, Lakeland, Laura, Lockhart, Lower Cowley, Mena Creek, Mirriwinni, Moresby, Mount Carbine, Mount Molloy, Mount Mulligan, Mount Surprise, Nychum, Petford, Pormpuraaw, Sandy Pocket, Southedge, Stockton, Thornborough, Utchee Creek, Wangan, Warrubullen, Waugh Pocket, Wopen Creek, Yarrabah	53.28	1	Remote	Very remote Australia	Both top 10%
4874	Evans Landing, Mapoon, Mission River, Nanum, Napranum, Rocky Point, Trunding, Weipa, Weipa Airport	55.77	2	Very remote	Very remote Australia	Top 10% proportion
4876	Bamaga, Injinoo, New Mapoon, Seisia, Umagico	100	1	Very remote	Very remote Australia	Top 10% proportion
4877	Craiglie, Killaloe, Mowbray, Oak Beach, Port Douglas, Wangetti	23.53	7	Moderately accessible	Outer regional Australia	Top 10% proportion
4878	Barron, Caravonica, Holloways Beach, Machans Beach, Smithfield, Yorkeys Knob	7.09	7	Accessible	Outer regional Australia	Top 10% proportion
4880	Arriga, Bibohra, Chewko, Glen Russell, Mareeba, Paddys Green	17.46	2	Moderately accessible	Outer regional Australia	Both top 10%
4888	Evelyn, Kaban, Millstream, Ravenshoe, Tumoulin	20	1	Moderately accessible	Outer regional Australia	Top 10% proportion
4890	Normanton	62.5	1	Very remote	Very remote Australia	Top 10% proportion
4895	Bloomfield, Cooktown, Hope Vale, Rossville, Wujal Wujal	46.34	1	Remote	Remote Australia	Top 10% proportion