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Final Report

Demographic Trends and Crime in the Province of Alberta

Submitted by:

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With support from Alberta Justice and Attorney General, the Centre for Criminology and Justice Research (CCJR) was established in January of 2010, and officially launched in June 2010. The CCJR contribute independently produced, evidence-based research in the study of criminal and social justice issues and the promotion of safe communities. Committed to promotion of collaboration among faculty, students, industry experts, and community members, the CCJR provides independent services to help direct strategy and policy through informed research outcomes.

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Demographic Trends and Crime in the Province of Alberta

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Table of Contents

About the Authors	4
Executive Summary	5
Introduction	6
Background	7
Context: Crime Trends	7
Chart 1: Police-reported Crime Severity Indexes, 1999 to 2009	8
Chart 2: Police-reported Crime Severity Indexes, by province and territory, 2009	9
Framework	9
Correlates and Causes	9
Risk and Protective Factors.....	9
Demographic Risk Factors: Literature Review	11
Age	11
Chart 3: Persons Accused of Crime by Age, per 100 000 Population, Canada, 2009	12
Gender	15
Race.....	17
Region	20
Demographic Projections: Methodology	22
The Base Populations and the Estimation of Births, Deaths and Net Migration.....	23
Assumptions Underlying the Three Series	24
Table 1. Summary of Assumptions Underlying the High, Medium, and Low Population Projections for the Province of Alberta, the Edmonton Metropolitan Area, the Calgary Metropolitan Area, and the Non-Metropolitan region.....	25
Population Projections and Changes in the Age Structure.....	26
Chart 4. Numbers of Albertans in Selected Age Groups in High, Medium, and Low Population Projections.	27
Forecasting Crime Rates: Methodology	27
Chart 5. Persons Charged by Age and Type of Crime, Alberta 2009.....	28
Table 2. Ratios of Total Counts of Incidents to the Sum of Age-Specific Counts of Persons Charged by Region and Crime Category, 2006-2009.....	29
Demography and Crime in Alberta, 2010 to 2020	30
Figure 1a. Rates of Total Crime Under Three Population Projections for Alberta	30
Figure 1b. Rates of Violent Crime Under Three Population Projections for Alberta.....	31
Figure 1c. Rates of Property Crime Under Three Population Projections for Alberta	32
Figure 1d. Rates of Other Crime Under Three Population Projections for Alberta.....	32
Figure 2a. Rates of Total Crime Under Three Population Projections for Calgary	34
Figure 2b. Rates of Violent Crime Under Three Population Projections for Calgary	34
Figure 2c. Rates of Property Crime Under Three Population Projections for Calgary.....	35
Figure 2d. Rates of Other Crime Under Three Population Projections for Calgary	35
Figure 3a. Rates of Total Crime Under Three Population Projections for Edmonton	36
Figure 3b. Rates of Violent Crime Under Three Population Projections for Edmonton	36
Figure 3c. Rates of Property Crime Under Three Population Projections for Edmonton.....	37
Figure 3d. Rates of Other Crime Under Three Population Projections for Edmonton	37
Figure 4a. Rates of Total Crime Under Three Population Projections for Non-metropolitan Alberta	38
Figure 4b. Rates of Violent Crime Under Three Population Projections for Non-metropolitan Alberta	38
Figure 4c. Rates of Property Crime Under Three Population Projections for Non-metropolitan Alberta.....	39
Figure 4d. Rates of Other Crime Under Three Population Projections for Non-metropolitan Alberta	39
Discussion	40
References	44

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Executive Summary

Demographic characteristics such as age and gender are strong predictors of crime. Young adults, for example, are much more likely to be charged with violent crimes and property crimes than older adults, and men are more likely to be charged with crimes than are women. The age composition of a population—in particular, the relative numbers of younger versus older adults—is therefore strongly related to overall rates of crime. In this report, we projected the population of the province of Alberta and three subregions within it (Calgary, Edmonton, and non-metropolitan Alberta) from 2010 to 2020 using three sets of assumptions about fertility, mortality, and net migration. We then estimated the rates of total crime, violent crime, property crime, and other crime taking the age composition of the projected populations into account, and presuming that the age-specific crime rates observed in each of these areas in 2006-09 remain constant. With one major exception, the results suggest that rates of all types of crime in Alberta will drop between 2010 and 2020, largely because of the aging of the population. The one exception concerns the non-metropolitan area of Alberta. The results from the projection that presumes increasing levels of net migration (from the metropolitan areas of the province, from other Canadian provinces, and from outside of Canada) into the non-metropolitan area of Alberta between 2010 and 2020, imply that the rates of total, violent, property and other crime will increase.

Introduction

The purpose of this project is to construct population projections for the Province of Alberta and three subregions during the 2010 to 2020 decade using standard demographic procedures and to use these projections to forecast crime rates over the same time period. We use 2009 data to estimate the base population and then apply a series of assumptions about changes in fertility, mortality and net migration to project the population from 2010 to 2020 under three different conditions of low, medium and high population change. These projections are then used to forecast the rates for these years of total Criminal Code incidents (excluding traffic), as well as the specific categories of violent, property and other Criminal Code crimes. While detailed demographic data required for constructing the population projections are available for the entire province, we were forced to incorporate some demographic assumptions when constructing the projections for the Calgary metropolitan area, the Edmonton metropolitan area, and the remainder or non-metropolitan areas of Alberta. Unfortunately, it was not possible to construct projections or to forecast crime rates for specific subgroups in the population (e.g., Aboriginal) of the population.

The Canadian economic demographer David Foot (1998) famously declared, “demographics explain about two-thirds of everything.” Although the specifics of this claim are debatable, it is undoubtedly the case that demographic variables have a significant impact on many aspects of society, including criminal behaviour. At least since the 18th century social statisticians such as Guerry and Quetelet have recognized the link between demographic characteristics and crime. Quetelet, for example, used the newly published French crime statistics in 1828 to document that those who were young, male, poor, unemployed and undereducated were more likely to commit certain crimes (Vold, Bernard and Snipes, 1998). By the mid-20th century the Chicago School of Sociology in the United States had documented relationships between certain population dynamics and the distribution of various forms of so-called deviant behaviours (Short, 1971). Their social disorganization theory identified demographic processes such as population growth, population turnover, and racial/ethnic heterogeneity as critical variables affecting the level of neighborhood social controls on criminal activity (Bursik, 1988). More recently, scholars investigating the rise and fall of crime rates in the late 1970s and 1980s in the United States argued that a significant part of these trends was explained by the changing age composition of

the American population (Wellford, 1973; Cohen and Land, 1987; Steffensmeier and Harar, 1991; but also see Blumstein and Wallman, 2006).

It is well documented that age, gender, race and region are important demographic correlates of criminal behaviour (Blumstein and Wallman, 2006; Hartnagel, 2009). Therefore, in addition to using the available demographic data to make population projections and crime forecasts, this report also reviews the research literature concerning these four variables and their relationships with crime. This literature will provide relevant background for discussing some of the implications of the forecasts of crime.

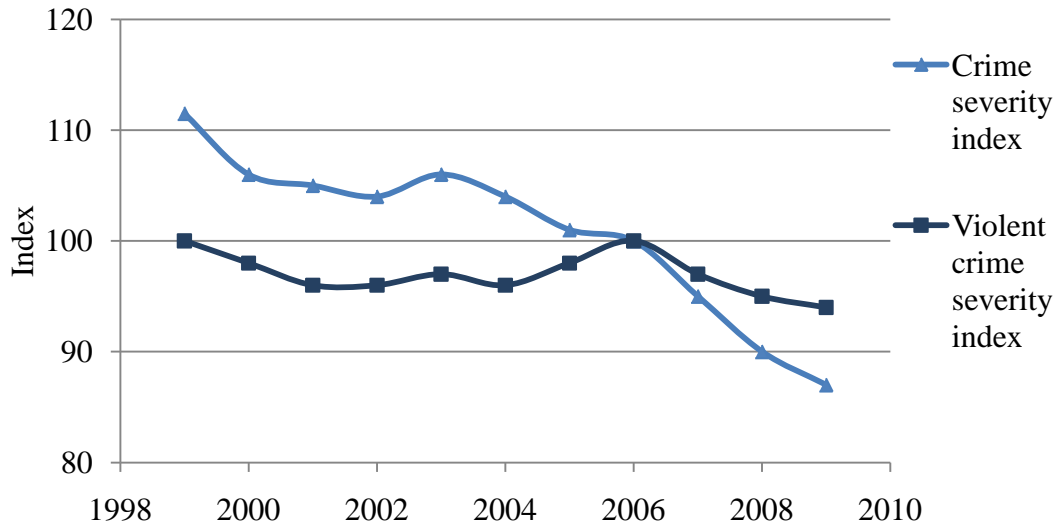
The demographically based crime forecasts provided in this report must be distinguished from the prediction of crime rates. Forecasts examine the impact of expected changes in the age structure or other demographic variables of the population on future crime rates ignoring all other factors that might affect those crime rates (Foot, 1998). In contrast, predicting future crime would require knowledge of future levels of all other variables thought to affect crime (Carrington, 2001).

Background

Context: Crime Trends

Before examining some of the main socio-demographic correlates of crime in Alberta, the recent trends in crime should be described to provide some context for the later discussion. A recent report from Statistics Canada pointed out that “Police-reported crime in Canada continues to decline. Both the severity and the volume of crime dropped in 2009, continuing the general decrease seen over the past decade.... Violent crime in Canada is also declining, but to a lesser extent than overall crime” (Dauvergne and Turner, 2010:5). The Crime Severity Index (CSI)—offences weighted by the severity of sentences handed down by criminal courts—was 22% lower than in 1999; the violent Crime Severity Index (CSI) was 6% lower in 2009 than a decade earlier. The property crime rate and the non-violent CSI have also declined steadily since 1999 (Dauvergne and Turner, 2010).

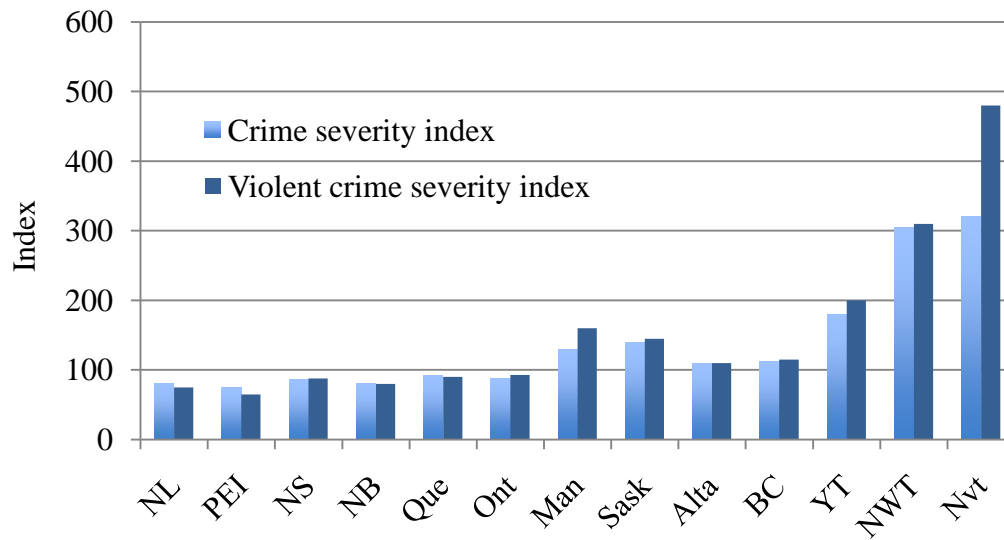
Chart 1: Police-reported Crime Severity Indexes, 1999 to 2009



Note: Indexes have been standardized with the year 2006 equaling 100. Adapted from: Dauvergne, and Turner, 2010.

The largest declines in crime severity from 2008 to 2009 occurred in British Columbia (-9%) and Alberta (-7%). Alberta's violent Crime Severity Index—7th highest among provinces and territories —declined 6% and its non-violent Crime Severity Index—also 7th highest —declined 7%. While youth and young adults commit a disproportionate amount of crime, the 2009 youth CSI was 7% lower than in 1999, but the youth violent CSI was 10% higher than a decade earlier. The police-reported youth CSI, violent CSI and non-violent CSI for Alberta all declined about 10% from 2008. Among census metropolitan areas, Calgary's CSI was below the Canadian average while Edmonton's was above and fifth highest in 2009 (Dauvergne and Turner, 2010).

Chart 2: Police-reported Crime Severity Indexes, by province and territory, 2009



Source: Adapted from Dauvergne and Turner, 2010

The homicide rate has remained relatively stable for the past decade, with Alberta recording the largest drop in the number of homicides in 2009, with 15 fewer than in 2008. However, its rate was still above the national average. But Alberta’s robbery and break and enter rates —both only slightly higher than the Canadian average—each declined. Alberta’s motor vehicle theft rate declined 20% from 2008, and its overall total crime rate was down 5% (Dauvergne and Turner, 2010).

Framework

Correlates and Causes

Correlates of crime are phenomena that are related to criminal activity; and correlation refers to the relationship between phenomena that occur or vary together, such as age and crime or gender and crime. A common mistake is to conflate correlation with causation and to infer that one variable causes another because they are correlated. However, a correlation need not imply causation. It would therefore be a mistake to conclude from the discussion of the correlates of criminal behaviour in this report that these correlates necessarily are causes of crime.

Risk and Protective Factors

The risk and protection framework was developed in the public health field as a general approach to aid in the prevention and/or reduction of various problems such as cancer and

cardiovascular disease. This public health model was adopted in discussions of violence (Esbensen et al., 2010) and then extended to examine various problem behaviours, particularly among adolescents (see Farrington, 2000 for a review of this research). Risk factors are experiences and influences that increase an individual's tendency to become antisocial and delinquent and thus increase the probability of an individual later offending (Kazdin et al., 1997). For example, children who experience poor parental supervision have an increased risk of committing criminal act at a later time (Farrington and Welsh, 2007). However, even in the presence of many risk factors individuals can continue to function in a normal and healthy way. Therefore, research has also begun to focus upon protective experiences and abilities that help people cope with negative and adverse events (Bartol and Bartol, 2009).

Risk factors can be placed into five major domains: community, individual, family, peer and school. This categorization was adopted by the Office of Juvenile Justice and Delinquency Prevention in the United States to promote a comprehensive strategy to address youth violence (see Howell, 2009). Farrington and Welsh (2007) indicate that the most important individual factors that predict offending are low intelligence and attainment, personality and temperament, empathy and impulsiveness. The strongest family factor is usually criminal or antisocial parents. Other strong family factors that predict offending are large family size, poor parental supervision, parental conflict and disrupted families. Community, peer and school predictive factors include: living in deprived areas, growing up in a low socioeconomic status household, associating with delinquent friends, and attending high delinquency rate schools.

Individuals may experience risk factors in one or more of these domains; and those who possess risk factors in multiple domains are the most likely to offend (Loeber et al., 1998). Moreover, exposure to risk in the relative absence of protective factors “dramatically increases the risk of later persistent serious offending” (Stouthamer-Loeber et al., 2002:120). Risk and protective factors also vary over the developmental life course (Howell, 2009). What is a potential risk for a youth may not be for a 30 year old. Furthermore, some resilient individuals are able to overcome their exposure to multiple risk factors without becoming involved in delinquency or crime (Bartol and Bartol, 2009).

Many of the conclusions concerning the relationships between risk factors and crime rests on correlations but the precise causal mechanisms remain unknown (Moffitt, 2005). “If mediating processes or developmental pathways could be established between risk factors and outcomes,

this would help to bridge the gap between risk factor research and more complex explanatory theories, and would assist in devising prevention techniques (Farrington and Welsh, 2007:21). Ideally, interventions to prevent or reduce offending should target causes (Farrington and Welsh, 2007). Unfortunately, it is difficult to determine which risk factors are causes and which are markers or correlated with causes is difficult (Farrington and Welsh, 2007). Researchers have thus focused on investigating the extent to which individual, family, peer, school, and socioeconomic factors measured in childhood or adolescence predict the development of later offending, although more recently researchers have begun to include neighborhood and community factors (Farrington and Welsh, 2007).

Demographic Risk Factors: Literature Review

The primary demographic characteristics of age, gender, and race are among the most powerful and robust individual-level risk factors for criminal offending and victimization. Evidence consistently indicates that young people, males, and members of disadvantaged minorities are at comparatively high risk of becoming offenders and victims, at least with respect to the common ‘street’ crimes” (South and Messner, 2000:84; see also Blumstein and Wallman, 2006; Hartnagel, 2009). In the literature review below we examine the research concerning the relationship between each of these demographic risk factors and criminal behaviour. We will pay particular attention to the Canadian research concerning the correlations of age, gender, Aboriginal status, and geographic region with crime.

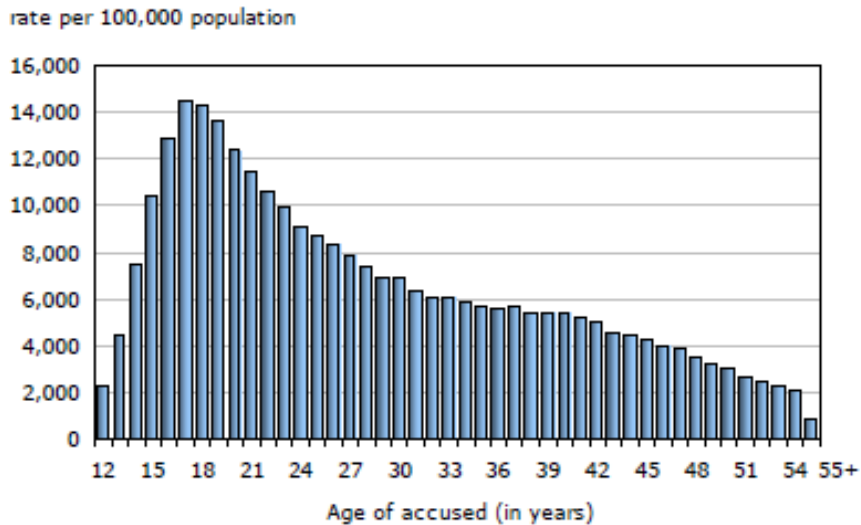
One important implication of the relationships between these individual demographic characteristics and crime is the impact of population structure or so-called compositional effects (South and Messner, 2000). Some of the variation in levels of crime across various social collectivities (e.g., nations, provinces, neighborhoods, etc.) and crime trends over time is due to the relative size of the respective demographic groups. In view of this, we will also review research concerning variation in crime rates by metropolitan and non-metropolitan areas.

Age

Age is one of the most commonly cited correlates of criminal activity (Gannon et al., 2005). Statistics from a variety of years and jurisdictions uniformly indicate a higher prevalence of crime among young persons compared with other age groups. Chart 3 shows the age distribution of persons accused of crime in 2009. The percentage of persons accused of crime increases from

early adolescence to young adulthood and then generally declines. In 2009, age-specific rates for those accused of crime were highest among 15 to 20 year-old, with the peak age at 17 years (Dauvergne and Turner, 2010). This pattern is stronger for property crimes (Bunge et al., 2005).

Chart 3: Persons Accused of Crime by Age, per 100 000 Population, Canada, 2009



Source: Dauvergne and Turner, 2010.

Data for 2008–09 from the Adult Criminal Court Survey (Thomas, 2010) also show that younger adults are over-represented among accused persons when comparing the age distribution of offenders to the age distribution of the general adult population. For example, 18 to 24 year-olds made up 12% of the adult population but accounted for 31% of all cases in adult criminal court in 2008–09. Similarly, persons 25 to 34 represented 17% of the adult population and 28% of the adult criminal court cases. This over-representation by young adults is stronger for property crimes (33% of accused were 18 to 24) than for violent crimes (26% were 18 to 24).

Different crimes peak at different ages, and rates of some types of crime decline more with increasing age (Steffensmeier et al., 1989). Offences where the accused in 2008/09 was 35 years of age or older in the majority of cases included criminal harassment (59 percent), other sexual offences (59%), prostitution (59%), and sexual assault (57%)(Thomas, 2010). Some crimes, including embezzlement, fraud, and gambling do not conform to the general pattern and peak later in the life cycle (Steffensmeier and Allan, 1995). Braithwaite (1989) has pointed out that white-collar crimes, which are committed by persons of respectability and high status in the

course of their occupation, peak later in life because these crimes require the opportunities provided by occupations that most people under 25 have yet to attain.

Because younger age categories are over-represented among criminal offenders, it is quite likely that changes over time in the crime rate reflect, at least in part, changes in the age composition of the total population. Several researchers have shown that a significant amount of the rise and fall of U.S. crime rates can be explained by the changing age composition of the American population, primarily the aging of the “baby boomers” (Cohen and Land, 1987; Sagi and Wellford, 1968; Steffensmeier and Harer, 1991; Wellford, 1973). Overall crime rates rose as this group reached their late teens in the 1960s and then fell as they began to reach their 30s a decade later (Carrington, 2001). Marvell and Moody (1991) reviewed 24 longitudinal studies on the effects of age structure on homicide and reported that 19 had a significant positive relationship with the proportion of young people; and all six time-series studies of robbery found a significant positive relationship with age. However, Levitt (1999) found that age had only a limited impact on United States crime rates even during the demographic shifts resulting from the baby boom. Blumstein and Rosenfeld (1998) have cautioned that age composition changes are relatively small, with cohort sizes growing at a rate of about 1% per year in the United States, while age specific crime rates have at times increased or decreased by as much as 20%. So the importance of the age-crime relationship is easily exaggerated (LaFree, 1999).

Similarly in Canada, baby boomers—those born between 1947 and 1966—reached 15 years of age in the 1960s and 1970s, a time when violent and property crime rates were rising year after year. The percentage of 15-to-24-year-olds began dropping in the early 1980s and property crime rates stabilized and then increased slightly in the early 1990s before declining sharply as the percentage of 25 to 34 year olds began to decline. But violent crime rates don’t parallel this demographic shift as closely, beginning to decline in 1993, several years after the start of the decline in the 15-24 age group (Bunge et al., 2005).

The general decline in crime rates since the early 1990s coincided with a decrease in the proportion of persons aged 15-24 during the same time period (Savoie, 2002). Ouimet (2002) attributed this drop in crime primarily to this shift in the age composition of the Canadian population, as well as improved employment opportunities. Two other Canadian studies reported the changing age composition had a significant impact on the decline in homicide rates (Leenaars and Lester, 2004; Sprott and Cesaroni, 2002). But an examination of the relationships between

changes in the rates of three major crime types and a number of socio-demographic and economic trends from 1962 to 2003 only found a positive relationship between the proportion of the population aged 15-24 and rates of break and enter. Furthermore, the effects of the population 25 to 34 were neutralized when the effects of unemployment, inflation, and per capita alcohol consumption were controlled (Bunge et al., 2005). Carrington (2001) forecast the levels of crime in Canada for 2000 to 2041 based on the 1999 age-specific crime and victimization rates, population age structure projections to 2041, and the assumption that age-specific crime rates will not change in the future. His overall conclusion was that all types of crime would decline because of the aging of the population. Recorded rates of crime characteristic of younger groups, such as robbery and break and enter, should fall slightly faster and farther while crimes more characteristic of older adults, such as sexual assault and drinking & driving, should be less affected by population aging.

Reductions in the size of the young adult cohort are one way in which the demographic composition of a population may affect the crime rate. The other is a reduction in the rate of offending of a given cohort. “In the former, age-specific crime rates are taken as a given and the criminality of all generations is assumed to be constant. However, rates of offending for particular age groups can and do change over time. Fluctuations in other social or economic conditions may interact with demographic conditions such that large cohorts experience greater competition for jobs and other resources, which then may lead to higher tendencies to commit crime for economic gain” (Bunge et al., 2005:18).

Criminologists have typically explained the age-crime relationship in terms of the social position of youth and age-graded variation in informal social controls over the life course (Laub and Sampson, 2001a). Various authors have argued that adolescence is a time of transition between childhood and adulthood; and difficulties in making this transition create a variety of problems, of which crime is one expression (Nettler, 1984; Hartnagel, 1998). However, antisocial behavior is stable and consistent for only a relatively small number of individuals at the extremes of the antisocial conduct distribution (Laub and Sampson, 2001a). As most youth move into the adult ages and their social status and integration increase, the personal costs of crime to the individual also increase—they now have more to lose. Youth acquire added stakes in conforming behaviour as they occupy social roles and acquire material goods that would be jeopardized by criminal behaviour. As individuals become more socially integrated into

relationships, groups, and organizations, they become more dependent on the social rewards of conformity and a reorientation of the costs and benefits of crime is likely to occur (Laub and Sampson, 2001a). Research examining crime over the life course suggests that salient life events such as leaving school, entering the legal labour market, and marrying influence the likelihood of criminal behaviour (Loeber and LeBlanc, 1990; Laub and Sampson, 2001a; 2001b). How these salient life events and transitions affect the individual's social bonds and informal social controls is crucial for desistance from crime to occur (Laub and Sampson, 2001a).

Gender

Along with age, gender is a strong correlate of criminal behaviour: the crime rate for men greatly exceeds the rate for women. Of all adult criminal court cases in 2008/09 in Canada, 77% involved a male accused, while 17% involved a female accused. Gender was not reported in 6% of cases (Thomas, 2010). This gender difference in crime varies somewhat by type of crime. Offences for which males had their highest involvement included sexual assault (98%), other sexual offences (97%), being unlawfully at large (91%), weapons offences (91%), and break and enter (90%). Violent crime, in particular, is correlated with being male. In contrast, the highest representation of females was found in cases of prostitution (31%), fraud (31%), and theft (30%) (Thomas, 2010). Data from victim surveys parallel arrest statistics in demonstrating that offenders are disproportionately male. Victimization data from the 2009 General Social Survey in Canada (Perreault and Brennan, 2010) estimated that males represented 88% of the perpetrators of all violent crime, 87% of sexual assault, 94% of robbery, and 88% of physical assault—figures reasonably similar to those provided by the official data on males charged with these offences. Fitzgerald (2003) examined gender differences in self-reported delinquency among Canadian youth aged 12-15 surveyed in the National Longitudinal Survey of Children and Youth. As expected, the females reported lower rates of delinquency than did the males for each of the property and violent acts; and the ratio of male to female delinquency was greater for the more serious acts.

Kong and AuCoin (2008) examined changes from 1986 to 2005 in the rate at which adult females and of males were charged by police for violent offences. The charge rates for serious violent crimes for females increased after the mid-1980s although they remain substantially lower than the rates for males. Between 1986 and 2005 the rate of serious violent crime among female adults grew from 25 to 46 per 100,000 population, with most of this change occurring

before 1994. The rate at which women were charged with common assault more than doubled from 1986 to 2005, from 44 to 93 per 100,000 population. Rates among adult males took a very different path during the last decade and a half with declining rates of both serious violent crime and common assault since the early 1990s. Consequently, the gap between the number of adult males and females charged with violent crime narrowed from 9 to 1 in 1986 to 5 to 1 in 2005 (Kong and AuCoin, 2008).

Adult female charge rates for serious property crimes have decreased slowly since the mid 1990s, from 137 per 100,000 to 101 per 100,000 in 2005, a 26% decline. Their rates for the more prevalent offence of theft of an item other than a motor vehicle have fallen more drastically than rates for serious property crime. However, these thefts are more likely to be under-reported to the police. The adult male charge rates have declined to a greater degree, but still remain substantially higher than the female rates (Kong and AuCoin, 2008). Examinations of temporal trends in the criminality of women and men indicate that women have increased their participation in crime, although the increase has been greatest for minor property crimes such as theft and fraud. So, although the gender gap in crime has narrowed somewhat over time, it remains substantial, particularly for the most serious crimes (Hartnagel, 2009).

The ratio of men to women has often been included as a control variable in macro-level criminological research (see, e.g., South and Messner, 1987; Messner and Sampson, 1991; Barber, 2000; Altheimer, 2007; 2008). However, it frequently exhibits null effects on rates of violent crime (Messner and Sampson, 1991), perhaps because societies do not vary significantly in their gender ratio (Fox and Piquero, 2003). However, gender distributions may not be constant across some macro level units such as cities; and its effects on violence may be suppressed by certain intervening variables (Messner and Sampson, 1991).

While such factors as exposure to deviant peer influences and weak ties to conventional society are common to explanations of both female and male deviant behaviour, they do not explain gender differences or the gender gap in crime. Rather, the focus has been on how gender differences in socialization affect the nature and extent of the deviant behaviour of males versus females (Lanctot and LeBlanc, 2002). For example, some scholars argue that females are more constrained by moral evaluations of conduct than are males (Mears et al., 1998) or by internalized values (Heimer, 1996). Others claim that boys are socialized to greater independence and risk taking and are, therefore, freer to experiment with deviant conduct. In addition, girls

face stricter social controls, are rewarded for compliance and dependence and so have fewer opportunities to experiment with delinquency. The traditional division of labour between the genders further limits women's opportunities to engage in many forms of criminal conduct while providing more opportunities for males (Hagan et al., 1979).

Race

Race is also a strong predictor of criminality, at least in the United States, although not as strong as age or gender (Tonry, 1995). However, Canadian research on race and crime is limited since race-specific information is generally not collected by the criminal justice system. The information that is available suggests that certain racial minorities, mainly Blacks and particularly Aboriginals, are over-represented in the correctional system relative to their proportion of the population.

Visible minorities account for approximately 11% of those incarcerated and 16% of those serving time in the community. Because they constituted 13% of the total Canadian population in 2006, visible minorities as a category are not over-represented among incarcerated offenders although they are slightly over-represented among those serving time in the community. But differences emerge when specific groups are examined. While they make up only about 2% of the population, Blacks represent 6% of the federally incarcerated and 7% of those serving time in the community. Asian offenders, on the other hand, are under-represented relative to their share of the Canadian population; “other” minorities are not over-represented among the incarcerated, but are slightly over-represented among those serving time in the community. Caucasians are under-represented in both categories of offenders. Aboriginal offenders, on the other hand, are significantly over-represented in both categories. While they made up approximately 3% of the population in 2001, they accounted for 18% of offenders in federal prisons in 2002 and 12% of those under community supervision (Trevethan and Rastin, 2004).

These data sources document various aspects of the disproportionate involvement of Aboriginal offenders in the criminal justice system. For example, while Statistics Canada projected the Aboriginal population at approximately 3% of the Canadian adult population, Aboriginal offenders accounted for 27% of all sentenced admissions to provincial custody in 2008/09, 21% of admissions to remand, and 18% of admissions to federal prisons. In Alberta, 40% of admissions to provincial facilities were Aboriginal persons compared to their 5% portion

of the adult population. Similar patterns exist for community correctional services such as probation and conditional sentences (Calverley, 2010).

This Aboriginal over-representation is not a recent phenomenon; as early as 1967 the report *Indians and the Law* (Canadian Corrections Association, 1967) showed the disproportionate presence of Aboriginal people in the Canadian criminal justice system. LaPrairie's (1996) review of various surveys and research studies dealing with Aboriginal inmates indicated that they are generally younger, have more prior contact with the criminal justice and correctional systems, and come from more dysfunctional backgrounds than non-Aboriginal offenders. Aboriginal women are particularly over-represented in correctional institutions. A recent comparison of the developmental progression of criminal behaviour of Aboriginal and non-Aboriginal offenders from early adolescence to middle adulthood found that, while only a small proportion of these offenders showed persistent and serious offending behaviour over their life course, the size of this group was higher among the Aboriginal group (18.7%) than among the non-Aboriginals (12.3%). The chronic high offending Aboriginal offenders were more likely to come from an impoverished background characterized by an unstable family environment, substance use, and negative peer associations. These risk factors contributed to their serious and persistent pattern of criminality (Yessine and Bonta, 2009).

Crime rates on reserves are higher than those outside reserves, and the nature of the crimes differ. On-reserve crime rates were about three times higher in 2004, and greater still for certain offences. Just over half (55%) of on-reserve incidents were classified as "Other Criminal Code" offences such as mischief and disturbing the peace, while 25% were violent and 21% were property offences. In off-reserve areas, in contrast, property crimes were the most frequently recorded (51%), followed by Other Criminal Code (38%) and violent offences (Brzozowski et al., 2006).

For homicides in which Aboriginal status of the accused is known, Aboriginal persons represented 23% of all those accused of committing a homicide between 1997 and 2004. Aboriginal people were ten times more likely to be accused of homicide than were non-Aboriginal people, with Aboriginal males particularly highly over-represented (Brzozowski et al., 2006). One factor that may contribute to this over-representation is the age composition of the Aboriginal population. The high-risk age group for homicide and other violent crime is 15 to 24, and this age group accounted for 17% of the Aboriginal population in 2001, compared to

13% for the rest of the population (Brzozowski et al., 2006). Overall, Canada's Aboriginal population is younger than the non-Aboriginal population because of higher fertility rates among Aboriginal women. In the 2001 census children 14 years of age and under accounted for 33% of the Aboriginal population, compared to 19% within the non-Aboriginal population. The proportion of the Aboriginal population under 15 years old is higher than this national average in Saskatchewan, Manitoba, Alberta and Nunavut; this may contribute to higher crime rates in these regions as this group moves into the high risk age groups for crime (Gannon et al., 2005).

Although the level of crime among Aboriginal people, particularly violent crime, is considerably higher than that for non-Aboriginals, there is still a great deal of variation in the rates of both violent and property crimes among Aboriginal communities and Aboriginal populations across Canada (Wood and Griffiths, 1996). This variation in recorded crime is probably at least partly due to differences in the nature of policing in these communities and jurisdictions, as well as differences in the likelihood of the police recording incidents reported to them (Roberts and Doob, 1997). A comparison of several research studies conducted in different jurisdictions revealed that the mean of the rates for violent crimes varied between 19 and 70 per 1000 population, while for property crime the rates ranged from 22 to 108 per 1000 population (Wood and Griffiths, 1996). This means that at least some Aboriginal communities have rates of crime below the Canadian average.

LaPrairie (2002) explored the impact of socio-demographic characteristics of Aboriginal populations living in nine Canadian cities and found regional disparities with higher levels of social disadvantage in the Prairie cities of Saskatoon, Regina, and Winnipeg, compared to cities in British Columbia, Ontario, and Nova Scotia. These disadvantaged populations live predominantly in the regions with the highest levels of over-representation of Aboriginal people in the criminal justice system. Furthermore, the three Prairie cities had three to four times as many Aboriginal people living in extremely poor neighbourhoods. LaPrairie (2002) suggests that this concentration of poor, single parent, and poorly educated Aboriginal people in the inner core of cities weakens social cohesion and informal social controls, resulting in more disorder and crime. More recently, Fitzgerald and Carrington (2008) reported that a substantial part of the elevated level of police-reported Aboriginal crime in Winnipeg was explained by the structural characteristics of the disadvantaged neighborhoods in which Aboriginal people tended to live. They found that Aboriginal people are highly overrepresented as offenders in police-reported

crime data—nearly seven times higher than the chances of non-Aboriginal people. Aboriginal people are also more likely to live in higher-crime neighbourhoods, communities characterized by social disorganization and disadvantage. Living conditions in these neighbourhoods, characterized by high levels of socio-economic disadvantage and residential mobility, are a substantial part of the reason for Aboriginal overrepresentation as offenders.

In addition to these structural explanations that focus upon the economically and socially dependent and deprived position of Aboriginals stemming from their colonization and oppression by Canadian society, Aboriginal overrepresentation in the Canadian criminal justice system has been explained in terms of the conflict between some of the values of Aboriginal culture and the dominant Canadian culture (James, 1979; Native Counselling Service of Alberta, 1982); and by the discriminatory treatment of Aboriginal peoples by the criminal justice system (Task Force on the Criminal Justice System, 1991; Monture-Angus, 1996).

Region

Crime rates vary by community size: rates of many crimes are higher in larger-sized communities than in smaller towns and rural areas. The correlation between community size and crime is stronger for property crime than violent crime (Hartnagel and Lee, 1990). However, crime is not necessarily a large urban phenomenon: overall crime rates as well as total violent and total property crime rates in Canada in 2005 were highest in small urban areas. Smaller cities like Winnipeg, Saskatoon, and Regina had higher total, violent, and property crime rates than the larger cities of Toronto and Montreal. Rural areas had the lowest overall and property crime rates, but reported higher violent crime rates than large urban areas. These findings were consistent across all provinces, except Quebec and Alberta. In Quebec, the highest overall crime rates occurred in the major urban centres, while in Alberta the major urban centres had the lowest crime rates (Francisco and Chenier, 2007).

Criminologists have focused their research efforts on explaining urban crime and have devoted much less attention to the analysis of rural crime and violence (Lee, 2008; Weishert and Donnermeyer, 2000). This may in part be due to difficulty in defining and measuring rural areas as rural places are very diverse in cultural, social and economic conditions; and have been described as unincorporated areas, villages, small towns, townships, counties, and even larger geographic areas (Weishert and Donnermeyer, 2000). Social disorganization theory has been employed most often in the efforts to explain rural crime rates (Osgood and Chambers, 2000;

Schwartz and Gertseva, 2010). Socially disorganized places tend to be characterized by poverty, population mobility, and heterogeneity; and to have weaker informal social control networks, lower organizational participation, and more unsupervised youth peer groups due to the impact of structural characteristics on social organization (Schwartz and Gertseva, 2010). Under these conditions informal social controls are less effective in preventing crime and violence. Several studies have reported results from analyses of rural crime rates that are consistent with a social disorganization perspective (e.g., Osgood and Chambers, 2000; Petee and Kowalski, 1993; Lee et al., 2003). More cohesive, integrated, and stable rural areas generally exhibit less crime (Jobes et al., 2004).

Lee (2008) has recently extended this line of analysis by drawing upon the civic community literature to develop and test a theoretical model to explain variation in rates of violence across rural communities. He hypothesized that rural communities with a stable population base that is locally invested, a vibrant participatory civic culture with a well-developed noneconomic institutional base, and a robust economically independent middle class will have lower rates of violent crime. The empirical results supported this community-level model of social integration. However, in related research Lee (2010) reported that while civically robust rural communities are much better positioned to weather population change than civically weak communities, continuous change over time compromises the protective effect that civic robustness provides against serious crime.

Rural sociologists have discussed the disruptive effects of rapid population growth in rural areas. Freudenburg (1986) argued that rapid growth, such as so-called 'boomtowns', diminishes the density of personal relationships in the community resulting in a weakening of social control. Freudenburg and Jones (1991) reviewed the evidence from a number of studies that investigated whether rapid, resource-related community growth leads to disproportionate increases in criminal activity. They concluded that increases in criminal behaviors outstrip in populations in rapid-growth communities. However, other research has disputed this conclusion (Luthra et al., 2007; Wilkinson et al., 1984). Gouveia and Stull's (1995) examination of the impact of two large meatpacking plants near the small community of Garden City, Kansas, illustrates how efforts to spur economic growth in rural areas have sometimes increased crime-related problems while having little impact on the economic vitality of the area (Weishert and Donnermeyer, 2000). Because of technological advances in meat processing, the new jobs were unskilled and wages

were low. Because the local supply of labor was insufficient, workers were recruited from across the country. Mobile home parks sprung up to house these workers and social problems soon followed. Both violent and property crime climbed in the county throughout the decade while falling in the state.

Within cities, crime rates vary across neighbourhood (Savoie, 2008). These areas tend to be located adjacent to the central business district, although this can vary depending upon local land-use patterns. The early research of Shaw and McKay (1942) in Chicago found these areas to be characterized by physical deterioration, low income, a heterogeneous population, high density, population mobility, and the presence of many renters in multiple-family dwellings. Later studies have generally replicated these findings (Kornhauser, 1978; Stark, 1987; Byrne and Sampson, 1986). There have been only a few Canadian studies on urban neighbourhoods and crime. Jarvis and Messinger (1974) examined delinquency rates in the census tracts of London, Ontario. Their findings were consistent with the U.S. research. The 1985 survey of crime victims in Edmonton found that reports of violent victimization were twice as high for residents of the downtown area as for residents of suburban areas although reports of property crime victimization were similar in the two areas (Solicitor General Canada, 1988).

A recent series of spatial analyses of crime in seven Canadian cities, including Edmonton, found that crime is concentrated in a limited number of neighborhoods, mainly in the core areas. The highest rates of property crime were concentrated in the city centres, although hot spots of lesser intensity were also found near shopping centres and superstores. Violent crime rates were also highest in the core neighborhoods; but a few cities had several areas of moderate crime intensity in residential neighborhoods. Multivariate analyses indicated that access to socio-economic resources and land use characteristics (i.e., commercial use) were the risk factors most closely associated with differences in crime rates among neighborhoods (Savoie, 2008). Charron's (2009) spatial analysis of crime in Toronto found that violent crime rates were also more concentrated in neighborhoods with limited access to socio-economic resources, but also in neighborhoods with higher population densities and higher residential mobility.

Demographic Projections: Methodology

The components of population growth or decline over time are births, deaths, and net migration. Projections of a population into the future rest on the attributes of the starting or base

population, and assumptions about what will happen to fertility, mortality and net migration into the future. There are several approaches to projecting populations but the most accurate approach for projections into the near future is to decompose the total base population into specific age groups in time 't', and then to project the age-specific counts one year into the future using the following equation:

$$P_{i,t+1} = P_{i,t} + M_{i,(t-t+1)} - D_{i,(t-t+1)}$$

P refers to the count of the population aged *i* in time *t*,

M refers to the number of (net) migrants aged *i* entering the population during the interval 't' to t+1

D refers to the number of deaths occurring to individuals aged *i* during the interval 't' to t+1

$P_{0,t+1}$ refers to the number of births during the interval 't' to t+1.

The counts of births, deaths and (net) migrants occurring in the interval can be generated from assumptions about birth and death rates and levels of migration during the interval. In all cases, the results refer to Alberta's permanent population and do not include temporary workers.

The Base Populations and the Estimation of Births, Deaths and Net Migration

The characteristics of the base populations for the province of Alberta, the Edmonton Census Metropolitan Area and the Calgary Metropolitan Area were obtained from Statistics Canada's CANSIM tables (Statistics Canada, 2011). For the non-metropolitan area base population, we subtracted the age-specific and gender-specific counts of the metropolitan populations from the provincial populations. The areas selected for the population bases were constructed to correspond closely to aggregate police service areas requested from the Centre for Criminal Justice Statistics and demographic indicators available for sub provincial population areas.

Age-specific fertility rates were calculated for single ages using Alberta Health and Wellness estimates of birth rates for women aged 15 to 49 in 2009 for the province of Alberta, the Calgary health zone, the Edmonton health zone, and the remaining non-metropolitan areas of the province.

The life expectancies for males and females were obtained from Alberta Health and Wellness for the province and the Calgary Census Metropolitan and the Edmonton Census Metropolitan areas (each of which corresponds to a health zone as defined by Alberta Health and Wellness). The life expectancies for the nonmetropolitan area outside of Edmonton and Calgary were calculated from death counts and population estimates from the three remaining health zones in

the province. Age-specific death rates for females and males were obtained from the 2001 detailed life tables for the province of Alberta (Statistics Canada, 2006) and then adjusted proportionately to reproduce the region-specific life expectancies.

Migration statistics for Alberta and the three subareas of the province were derived from Statistics Canada tables and published statistics from Alberta Finance and Enterprise. In the base population figures for the province of Alberta, the levels of net migration are based on age-specific and gender-specific counts from 2006-2009. We used four years of data on migration to smooth out year-to-year fluctuations. (The net migration figures include net migration from interprovincial and international sources but do not include estimates of non-permanent resident migrants.)

For the subareas of the province, the estimates of net migrants also include intra-provincial net migrants. To establish the patterns of age-specific migration for subareas in the province, the single-age provincial migration patterns for males and females was adjusted by the broad age observations for the three different subareas observed between 2000 and 2007.

Assumptions Underlying the Three Series

For the project, the PRL research team generated three series of population projections from 2011 to 2020 for the province of Alberta and three regions within it: the Edmonton Census Metropolitan Area, the Calgary Metropolitan Area and the remaining nonmetropolitan areas of Alberta. The three series of projections rest on different combinations of assumptions about fertility, mortality and net migration and these assumptions vary slightly by region. One series is based on assumptions that tend to produce higher population growth over time (labeled the “high” series); the second series presumes stability in levels of fertility, mortality and migration (the “medium” series); while the third series is based on assumptions that tend to produce lower levels of population growth (the “low” series). In general, levels of fertility were assumed to remain fairly stable and below the replacement level of 2.1 births for all three series with only slight differences between the high, medium, and low series. Life expectancy was also expected to remain quite stable in this period for all three series. Levels of net migration, on the other hand, were allowed to vary dramatically across series. The demographic assumptions underlying the three varied slightly across the three regions. The high, medium, and low series for the province and the three regions were constructed using the application of the assumptions about

fertility, mortality, and net migration (as described below) to age-specific data for each year to produce the age-specific and gender-specific population counts for the following year.

Table 1 presents a summary of the demographic assumptions underlying the three series for the province of Alberta and the three regions. Although the projections were prepared using the component age-specific rates of the total fertility rate (i.e., age-specific birth rates), and life expectancy at age zero (i.e., the age-specific death rates) along with age-specific estimates of net migration, the table lists the total fertility rate and life expectancy at age zero because the TFR and e_0 are summary measures of the age-specific matrix of age-specific fertility and mortality rates respectively. (The total fertility rate (TFR), which is the weighted sum of the age-specific birth rates for women aged 15 to 49, can be interpreted as the number of births a woman will bear under the prevailing regime of age-specific birth rates. The life expectancy (e_0) is the weighted sum of person-years lived that is generated by a prevailing regime of age-specific death rates and can be interpreted as the average age at death.)

For example, Table 1 shows that the “high” population projections for the province of Alberta assumes that the total fertility rate (TFR) decreases slightly from 1.88 to 1.80 births per woman, and that the life expectancies (e_0) for males and females increase by about a total of half a year between 2009 and 2020. In addition, this series assumes that net migration increases by 10% a year between 2012 and 2020.

Table 1. Summary of Assumptions Underlying the High, Medium, and Low Population Projections for the Province of Alberta, the Edmonton Metropolitan Area, the Calgary Metropolitan Area, and the Non-Metropolitan region.

Population Projection Series	Alberta	Edmonton	Calgary	Non-metropolitan region
HIGH				
TFR	1.88 to 1.80	1.76 to 1.65	1.76 to 1.65	2.12 to 1.80
e_0 males	78.52 to 79.38	78.35 to 79.16	79.99 to 80.84	76.90 to 79.00
e_0 females	83.21 to 83.78	83.42 to 83.97	83.89 to 84.44	81.71 to 83.5
Net migration	increases 10% annually after 2012	increases 10% annually after 2012	increases 10% annually after 2012	increases 10% annually after 2012

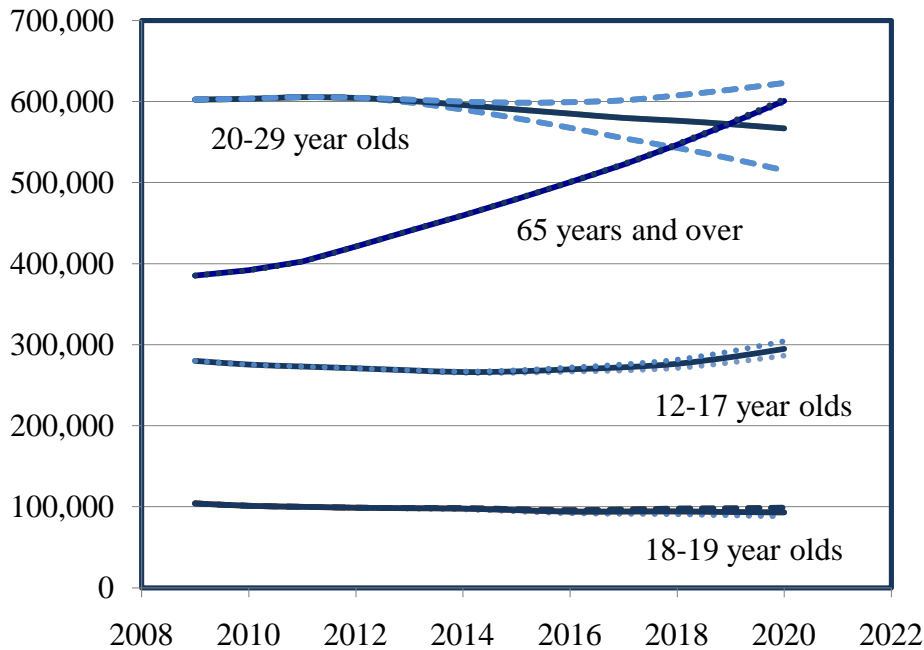
MEDIUM				
TFR	1.88 to 1.80	1.76 to 1.65	1.76 to 1.65	2.12 to 1.80
e ₀ males	78.52 to 79.38	78.35 to 79.16	79.99 to 80.84	76.90 to 79.00
e ₀ females	83.21 to 83.78	83.42 to 83.97	83.89 to 84.44	81.71 to 83.5
Net migration	same as 2009-2010	same as 2000 – 2007	same as 2000 - 2007	same as 2000 - 2007
LOW				
TFR	1.88 to 1.80	1.76 to 1.65	1.76 to 1.65	2.12 to 1.80
e ₀ males	78.52 to 79.38	78.35 to 79.16	79.99 to 80.84	76.90 to 79.00
e ₀ females	83.21 to 83.78	83.42 to 83.97	83.89 to 84.44	81.71 to 83.5
Net migration	decreases 20% annually after 2012	decreases 20% annually after 2012	decreases 20% annually after 2012	decreases 20% annually after 2012

Population Projections and Changes in the Age Structure

Chart 4 shows the changes in the age composition of the total Albertan population under each of the high, medium, and low series of population projections. (The results are parallel for the subregions of the province.) The chart focuses on the changes in the sizes of key age groups. For example, the top set of lines shows the changes in the number of 20-29 year olds under the high, medium, and low projections respectively. In the medium series, the number of young adults declines during the interval 2010-2020. Because migrants are disproportionately young adults, the number of young adults increases if levels of net migration are high and positive, and decreases if levels of net migration are negative. The next three lines, which refer to the three projections of retirement-age populations aged 65 and over, lie almost on top of one another. The projected numbers of elderly people are not affected by changes in fertility and are not affected much by variation in levels of mortality. The lines all slope upwards because of the aging of the baby boom cohorts over the interval. Meanwhile the numbers of adolescents subsides slightly and then recovers over the interval for all three projections. (There is little change across the interval because the number of young adolescents during the interval is not affected by fertility, mortality or migration.) Meanwhile, the numbers of older adolescents, those aged 18-19 slides slightly downward under all three series of projections. There are therefore two main conclusions about changes in the age structure of the Albertan population during the interval between 2009 and 2020. First, the number of older Albertans increases substantially no matter what the assumptions are about fertility, mortality or migration. Second, the number of young adults

remains fairly stable or increases slightly if net migration is presumed to high and drops if net migration remains stable at 2006-09 levels or decreases.

Chart 4. Numbers of Albertans in Selected Age Groups in High, Medium, and Low Population Projections.



Forecasting Crime Rates: Methodology

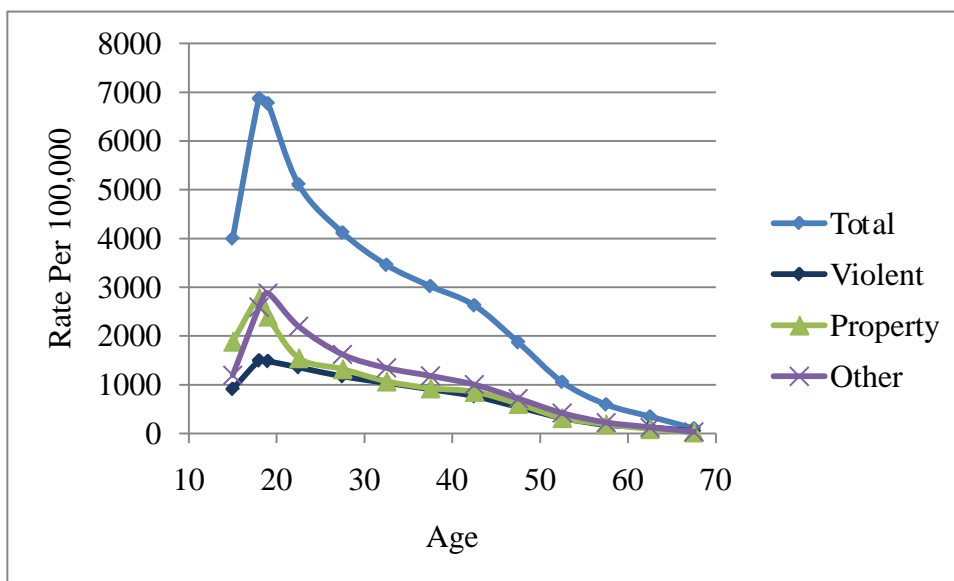
The main goal of this project is to forecast crime rates for 2010 to 2020 for Alberta and three regions within it. Our general approach was to construct a series of population projections for the province and the three regions, assume that age-specific rates of crime remain constant, and then to multiply the age-specific rates of crime by the age-specific numbers of people in the projected population. Summing the products over age results in an estimated total crime rate for the province (or region) in a given year.

The data for the age-specific rates of crime were provided in custom special tabulations produced by the Canadian Centre for Justice Statistics (CCJS) at Statistics Canada. The crime data refer to counts of persons charged and the total age-specific populations for the years, 2006 to 2009 for total Criminal Code offences (excluding traffic), the three major types of crime (i.e., violent crime, property crime, other crime) for Alberta and the three geographic regions. The population data in these tabulations were based on police servicing areas that report incident,

accused persons and persons charged data to CCJS data. For sub-areas of the province, we requested a match of police-servicing areas that correspond to the Census Metropolitan and Non-Metropolitan areas. According to the CCJS, about 99% of the population of the province is covered by the police servicing areas. The selection of areas in the province was determined by the availability of data from a variety of sources for demographic indicators to generate population projections. Discussions between the PRL research analyst and the CCJS concerning the most appropriate aggregating of the data resulted in the following age categories: 18, 19, 20 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44, 45 to 49, 50 to 54, 55 to 59, 60 to 64, and 65 and over. The implication of this selection of ages was that forecasted populations also had to match the above listed age groupings. To smooth annual fluctuations, the data were pooled over the years 2006 to 2009 to get average counts and rates.

Chart 5, which is based on data from the special tabulations from CCJS, shows the age-specific rates (per 100,000 population) of persons in Alberta charged for total crime, violent crime, property crime and “other” crime. The graph displays the expected relationships between age and crime with much higher rates for older adolescents and young adults with a steady decline into the older age groups (refer back to Chart 3). However, this graph, like all of the data in the special tabulations, refers only to persons charged and not to incidents of crime.

Chart 5. Persons Charged by Age and Type of Crime, Alberta 2009



The actual number of crime incidents is unknown because not all crime is reported to the police or discovered by them. The incidents appearing in the Uniform Crime Reports issued by Statistics Canada include only those known to the various police jurisdictions and reported to Statistics Canada. Furthermore, only a percentage of these incidents result in arrests, and only a percentage of those persons arrested are charged. The age of offenders is only available for incidents resulting in an arrest or charge. The data on persons charged therefore severely understates the number of incidents. To address this shortfall, the PRL research analyst obtained UCR aggregate statistics from CANSIM for all of Alberta and the three subareas by the four crime categories and compared them to the persons charged file provided by CCJS. The following table shows the ratios of total counts of incidents (from UCR data) to the weighted sum of age-specific counts of persons charged (from the CCJR data) by type of crime for the four areas of the province.

Table 2. Ratios of Total Counts of Incidents to the Sum of Age-Specific Counts of Persons Charged by Region and Crime Category, 2006-2009.

Year	Region	Violent Crime	Property Crime	Other Crime	Total Crime
2006-2009	Alberta	2.48	7.16	2.04	4.01
2006-2009	Calgary	2.31	5.64	1.35	3.72
2006-2009	Edmonton	2.62	7.52	1.32	3.70
2006-2009	Non metropolitan	2.48	8.22	3.12	4.44

Multiplying the persons-charged counts by the ratios in Table 2 results in a better estimate of incidents of crime. The crime rates (by type) for each series of projected populations for each specific year ‘t’ and region were therefore estimated as

$$C_t = \text{ratio} \times \sum_i (P_i \times C_i) / P \times 100,000$$

in which C_t refers to the overall crime rate in year t for the specific category of crime and region, “ratio” refers to the appropriate ratio from Table 2, P_i refers to the number of people in age category i in the projected population, C_i refers to the age-specific crime rate, and P refers to the total population.

Demography and Crime in Alberta, 2010 to 2020

Figure 1a presents the forecasted total Criminal Code crime rates for the years 2010 to 2020 under the three population projections of high, medium and low change for the province of Alberta. In this and subsequent figures the rates of crime are displayed on the vertical dimension, the years on the horizontal dimension, with the starting point the average of the 2006 to 2009 crime rates. The shapes of the curves in Figure 1a indicate substantial forecasted decreases under all three population projections. As would be expected, the largest decrease occurs under the low population change projection, somewhat less under the high population change projection, while the medium change projection exhibits an intermediate forecasted decrease in the rate of total crime. The forecasted rates under each of the three population change projections are very similar for the years up to 2015 when they begin to diverge. While all three rates continue to decline in subsequent years, that decline is greater under the low projection series, somewhat less in the medium series, while the forecasted rates taper off slightly under the high series. From their common starting point of the average of the 2006 to 2009 total crime rate of 10,535 per 100,000 population, the low population change forecasted rate declines to 9,305 per 100,000 in 2020; the medium change forecasted rate declines to 9,504 per 100,000; and the high change forecasted rate declines to 9,708 per 100,000 population by 2020.

Figure 1a. Rates of Total Crime Under Three Population Projections for Alberta

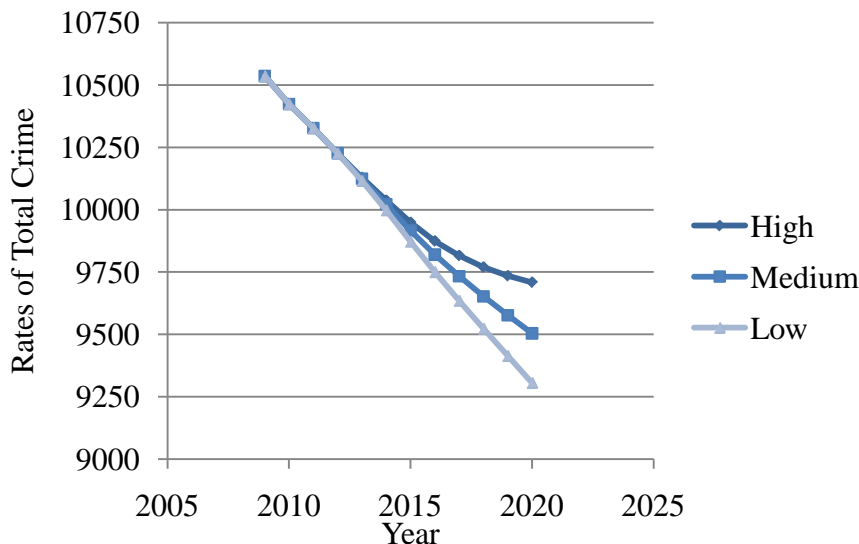
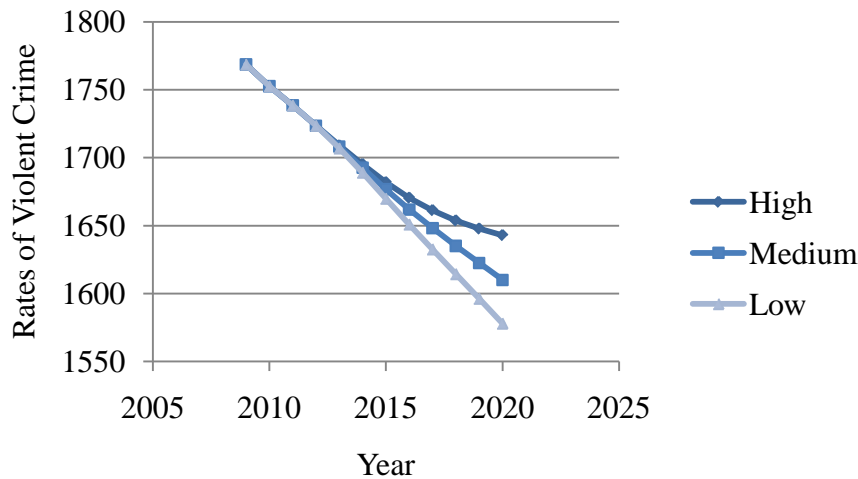


Figure 1b shows the forecasted violent crime rates to the year 2020 under the three population projections of high, medium and low change for the province of Alberta. There are

sizeable decreases under all three population projections. As expected, the decrease is greatest under the low population change projection, somewhat less under the high population change projection, with an intermediate sized forecasted violent crime decrease under the medium population change projection. From the starting point of the average violent crime rate of 1768 per 100,000 population for the years 2006-2009, the forecasted rates under each of the three population change projections are very similar for the first several years, until the mid-point of 2015 when they begin to diverge. While the rates under all three population projections continue to decline to 2020, the forecasted violent crime rate under the high population projection does so to a lesser degree (to 1642 in 2020) while the forecasted rate under the low population projection continues a fairly steady decline to a low of 1577 per 100,000 population in 2020.

Figure 1b. Rates of Violent Crime Under Three Population Projections for Alberta



The same general pattern is visible in Figures 1c and 1d, which display the forecasted property and other criminal code rates, respectively, to the year 2000 under the three population projections for all of Alberta. The forecasted property crime rates under the three population projections are very similar for the first few years in the series but then begin to diverge around 2015. For the low population projection the forecasted property crime rate decreases from a high of 6785 per 100,000 population at the starting point to a low of 5980 per 100,000 population in 2020. Under the high population projection the forecasted property crime rates decline from the high of 6785 per 100,000 population to a low of 6226 per 100,000 in 2020. The forecasted rates for the medium population projection are again intermediate between the low and high projection series.

Figure 1d exhibits the same pattern of forecasted rates for other criminal code violations. These rates are forecast to decrease from 1967 to 1728 per 100,000 population under the low population change projection; to 1768 under the medium projection; and to 1809 under the high projection. As Figure 1c indicates, it is again after the mid-point of 2015 that the three forecasted rates show some divergence.

Figure 1c. Rates of Property Crime Under Three Population Projections for Alberta

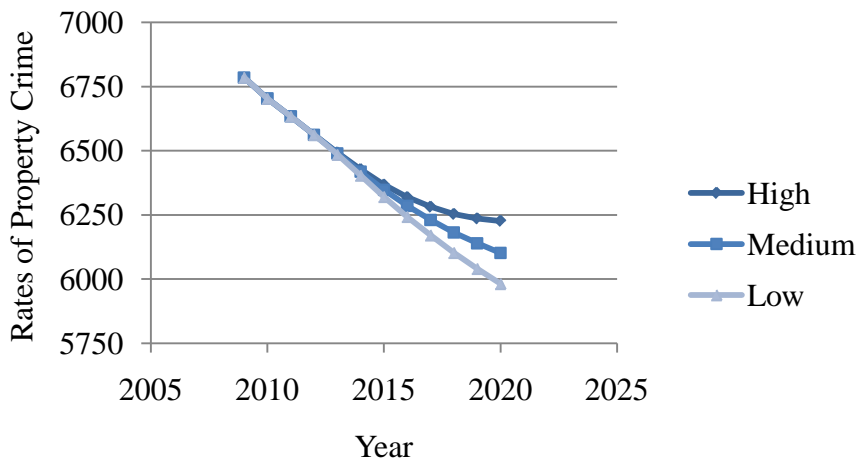
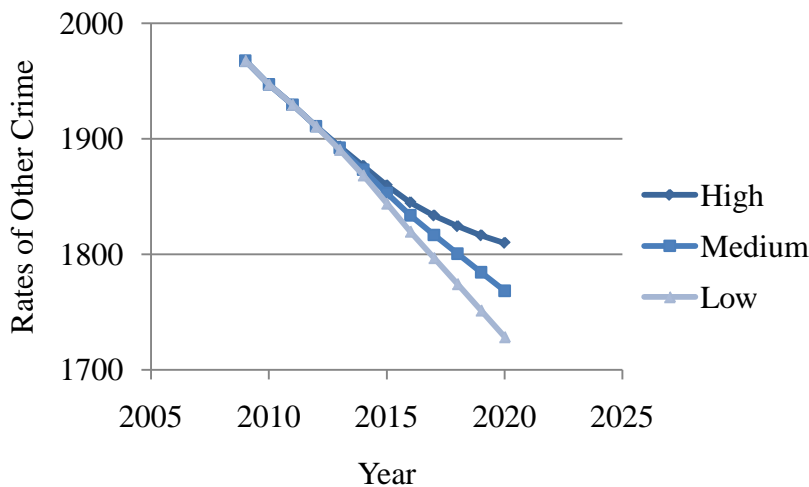


Figure 1d. Rates of Other Crime Under Three Population Projections for Alberta



As indicated in the methodology section, in addition to these rates for the entire province of Alberta, we are also able to forecast violent, property, other criminal code and total criminal code

crime rates for three geographic subregions of the province: the Calgary metropolitan area, the Edmonton metropolitan area, and the other (non-metropolitan) areas of the province. The forecasted crime rates for Calgary and Edmonton are all lower in 2020 than at the starting point of the 2006-2009 averages. However, the trends vary from those observed above for all of Alberta. Furthermore, the non-metropolitan rates are distinct in that the forecasted rates for all four categories of crime are expected to increase under the high population change projection.

Looking more specifically, first at the Calgary metropolitan data, Figures 2a, 2b, 2c and 2d indicate that, similar to the province as a whole, there is little difference until about the mid-point of 2015 among the three series of projections in the forecasted crime rates. Under the low population projection the rates for all four categories of crime consistently drop to their low points in 2020. The total crime rate drops from 6764 to 6022 per 100,000; the forecasted violent crime rate drops from 1013 to 905 per 100,000; the forecasted property crime rate drops from 5111 to 4557 per 100,000; and the forecasted other criminal code rate drops from 637 to 564 per 100,000. However, under the high population change projection, Calgary's violent crime rates drop from 1013 per 100,000 at the starting point to 975 in 2017, where they remain fairly stable without further decreases to 2020. In fact, these rates are forecasted to rise slightly toward the end of the series. The forecasted total, property and other criminal code rates for Calgary under the high population projection exhibit a similar trend, declining to the year 2017 and then rising slightly to 2020. Under the medium population projection the forecasted rates of decrease in all four categories of crime are intermediate between those of the high and low population projections.

Figure 2a. Rates of Total Crime Under Three Population Projections for Calgary

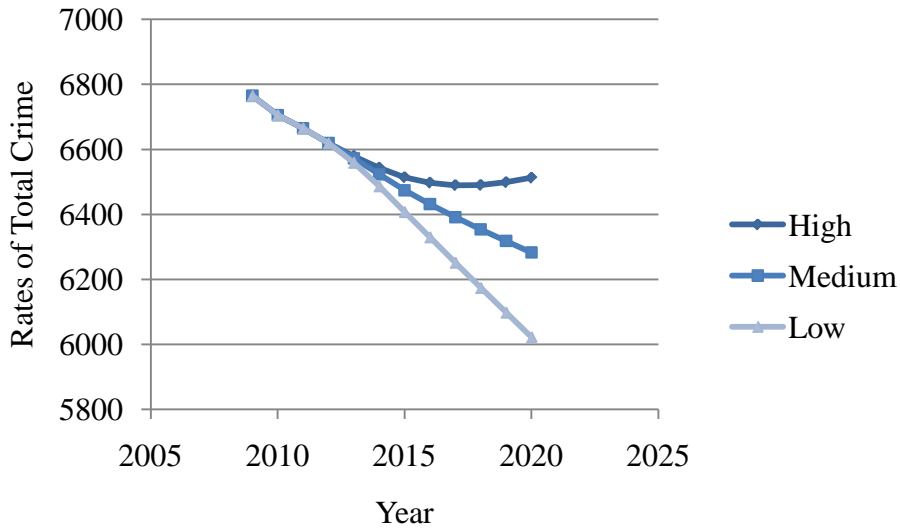


Figure 2b. Rates of Violent Crime Under Three Population Projections for Calgary

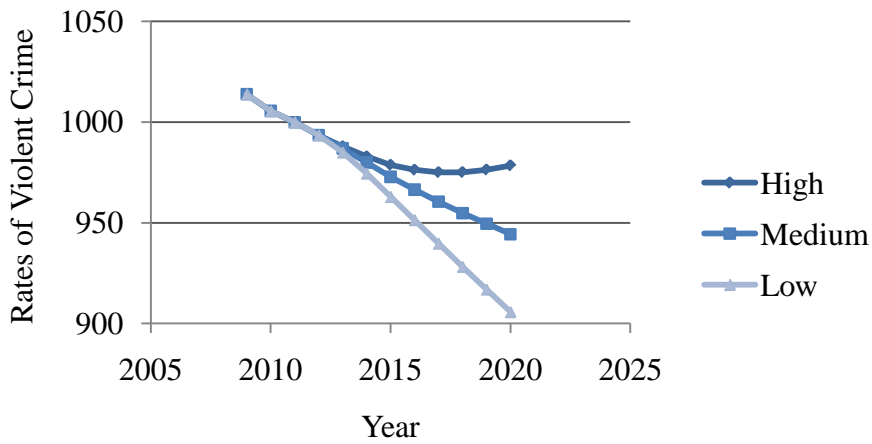


Figure 2c. Rates of Property Crime Under Three Population Projections for Calgary

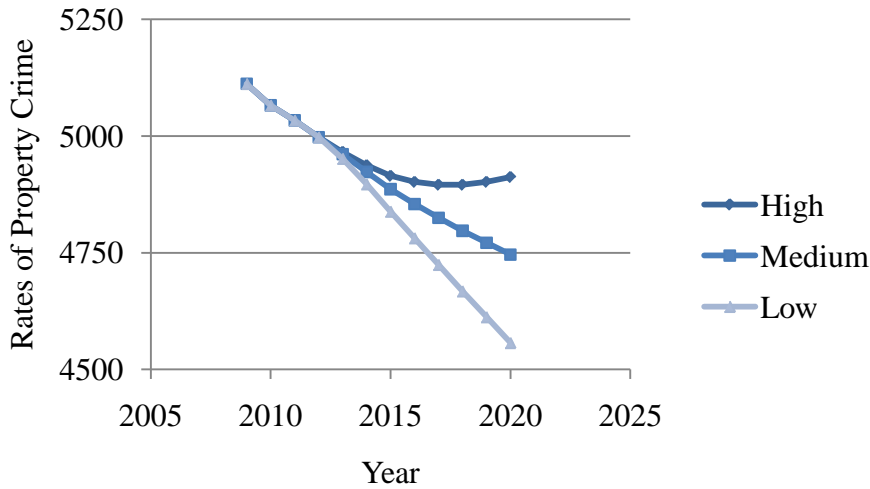
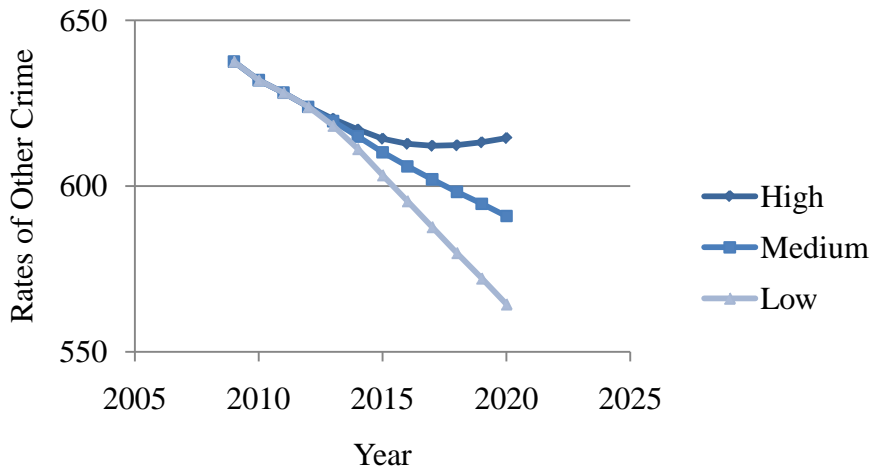


Figure 2d. Rates of Other Crime Under Three Population Projections for Calgary



Turning to the figures for the Edmonton metropolitan area, Figures 3a, b, c and d display trends over time that parallel those observed above for Calgary. For all four categories of crime the forecasted rates are very similar in all three population projection scenarios until the mid-point year of 2015, after which they begin to diverge. However, while the forecasted rates for all four categories of crime continue to decline under the low and medium population projections, these rates begin to level out and stabilize toward the end of the time series under the high population change projection. But in contrast to Calgary, these rates are not forecast to increase slightly at the end of the series.

Figure 3a. Rates of Total Crime Under Three Population Projections for Edmonton

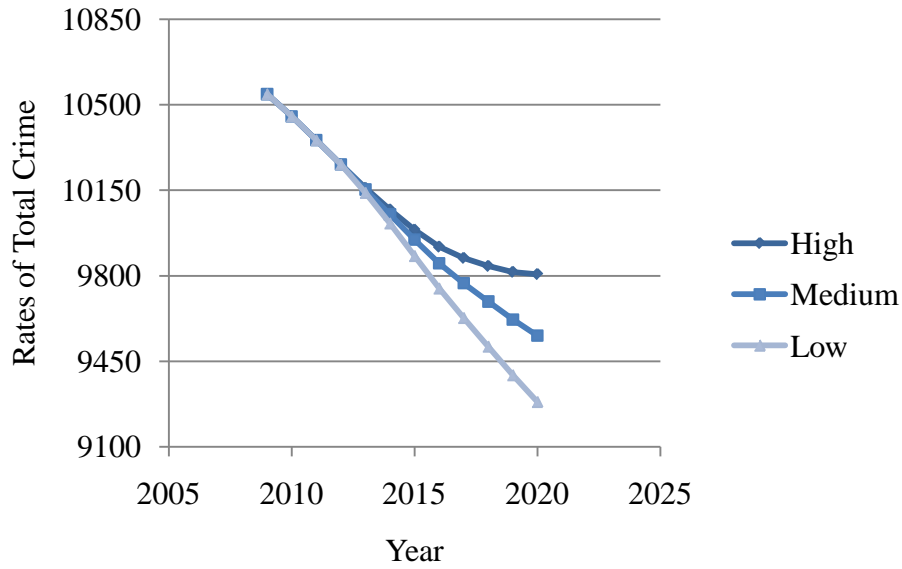


Figure 3b. Rates of Violent Crime Under Three Population Projections for Edmonton

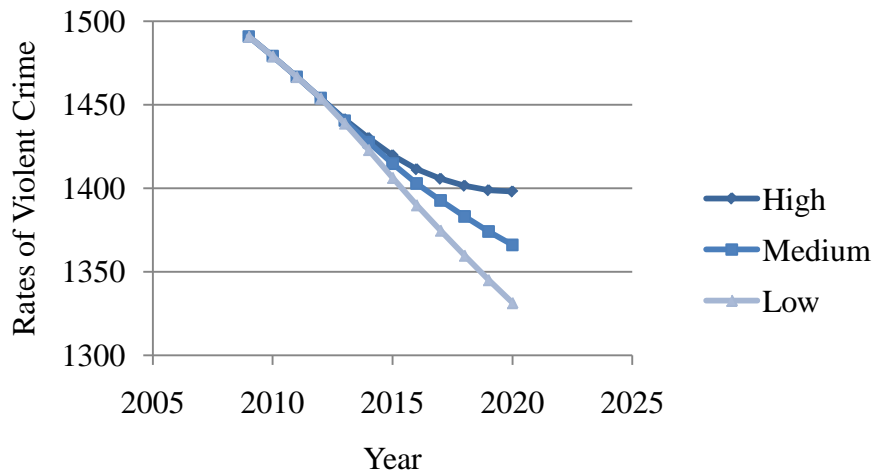


Figure 3c. Rates of Property Crime Under Three Population Projections for Edmonton

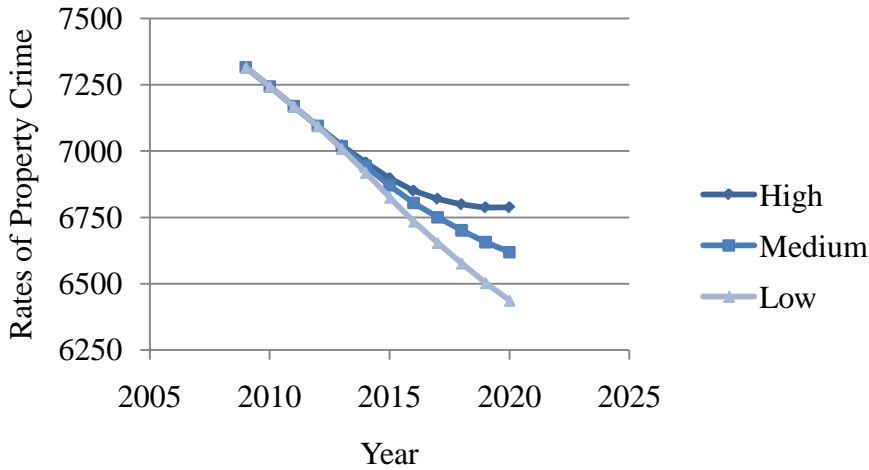
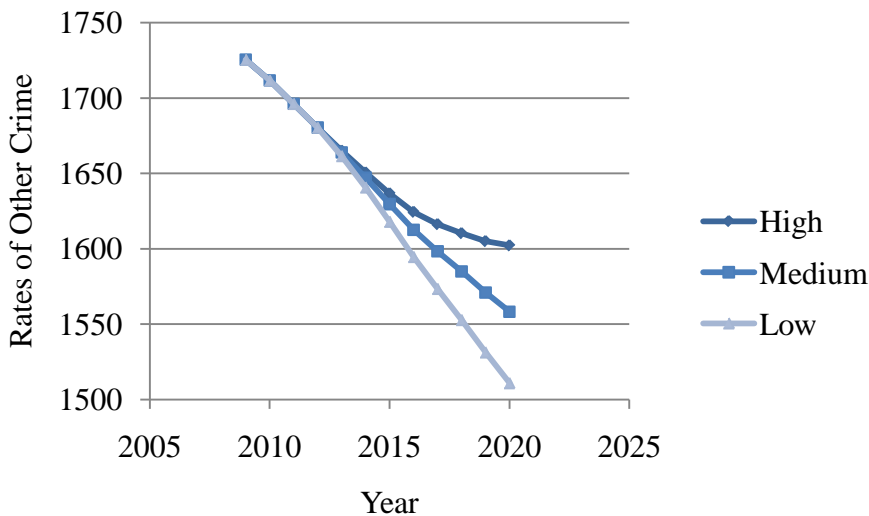


Figure 3d. Rates of Other Crime Under Three Population Projections for Edmonton



The pattern of results for the non-metropolitan areas of Alberta, which are shown in figures 4a through 4d, are strikingly different for those observed for the two major metropolitan areas of Alberta. While the forecasted rates under the low population projection exhibit the now familiar decline over the years as those observed above, the rates for total, violent, property and other crimes increase under the high population change projection. In addition, the forecasted rates under the medium population change scenario decline from the starting point, these declines are less consistent and not as steep as those observed for Edmonton, Calgary and the entire province.

Figure 4a. Rates of Total Crime Under Three Population Projections for Non-metropolitan Alberta

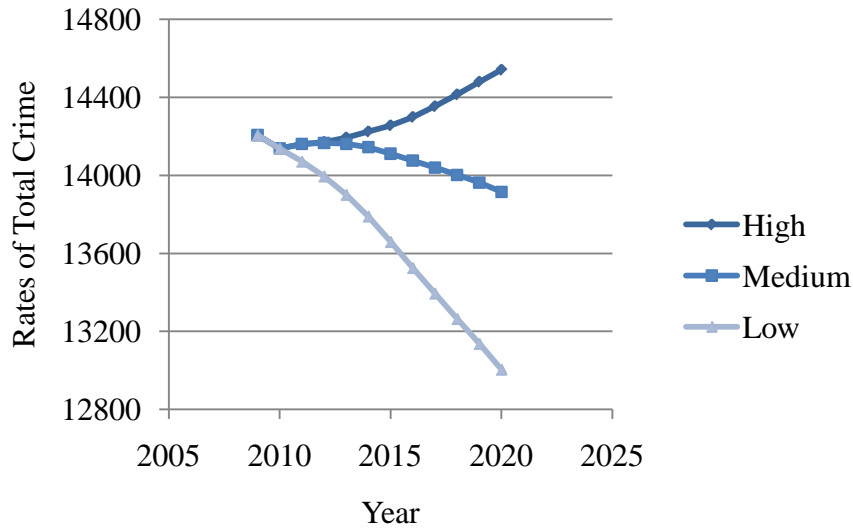


Figure 4b. Rates of Violent Crime Under Three Population Projections for Non-metropolitan Alberta

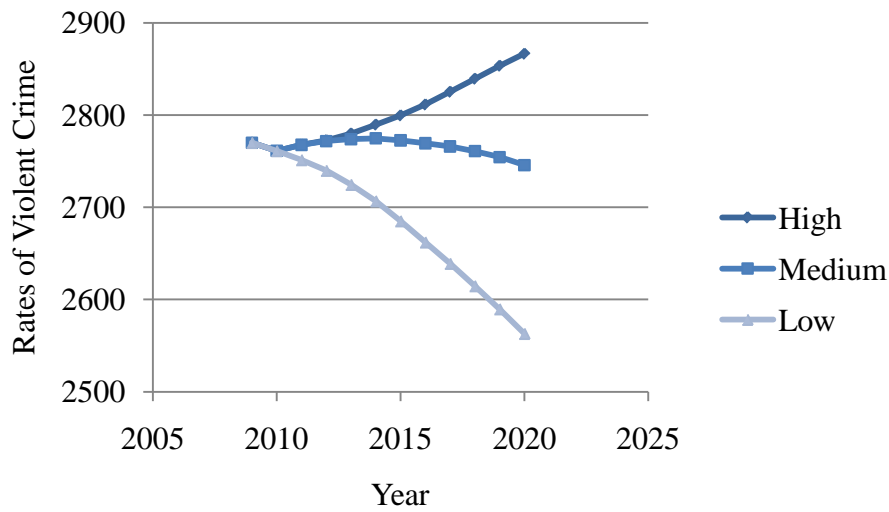


Figure 4c. Rates of Property Crime Under Three Population Projections for Non-metropolitan Alberta

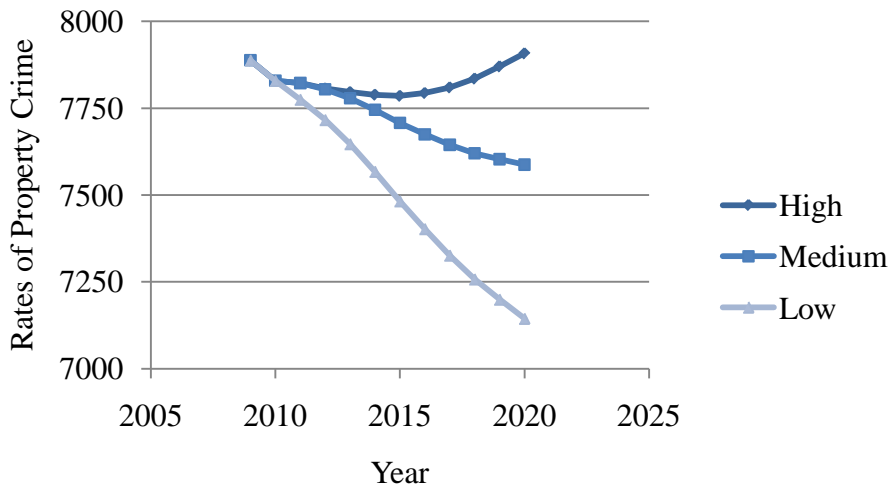
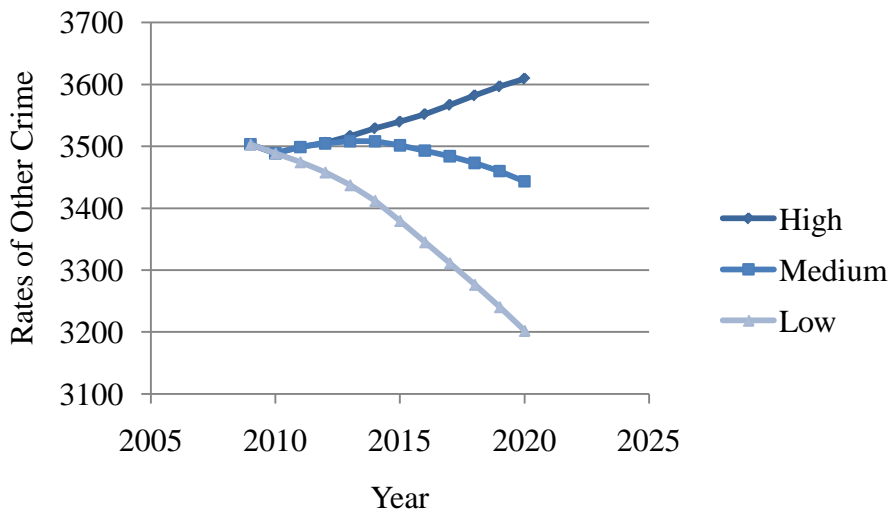


Figure 4d. Rates of Other Crime Under Three Population Projections for Non-metropolitan Alberta



Examining these non-metropolitan data more specifically and looking first at the high population change projections, we observe that the forecasted total crime rate initially declines in 2010 and then begins to rise, reaching a rate of 14,224 in 2014, which is above the starting rate of 14,206 per 100,000. From 2014 on, it continues to increase, reaching a high point of 14,540 per 100,000 in 2020. Violent crime rates are forecast to increase from 2770 per 100,000 at the outset of the time series to 2866 per 100,000 population in 2020. Except for a slight decline at the outset, the forecasted rate is already above that at the outset by 2012 and is forecast to

consistently rise thereafter. In contrast, the forecasted property crime rates initially decline from 7888 per 100,000 to their low point of 7785 in 2015 and then begin to increase until 2020 when they reach a forecasted level of 7907 per 100,000 population, their highest point in the time series. The forecasted trend for other criminal code offences is similar to that for violent crime; after a slight decline from 3503 to 3488 per 100,000 at the outset, the rates increase consistently and reach their high point in 2020 at 3609 per 100,000 population.

For the non-metropolitan areas the forecasted crime rates under the medium population projection are, as expected, intermediate between those for the high and low population projections. Furthermore, their overall trend is toward somewhat lower rates in 2020 than at the outset. The forecasted total crime rate drops in 2010 from the starting rate of 14,206 and then is forecast to rise slightly to 14,144 in 2014, after which it declines to 13,915 per 100,000 population in 2020. However, after a slight drop at the outset, the violent crime rates are forecast to rise slightly from a beginning rate of 2770 to 2774 in 2014 and 2772 in 2015 before beginning a gradual decline to 2745 in 2020. The trend is quite similar for the forecasted rates of other criminal code offences. The forecasted property crime rates under the medium population change scenario exhibit a consistent downward trend from 7888 at the outset to 7587 per 100,000 in 2020.

Discussion

There are two main conclusions to draw from the forecasts of crime rates in Alberta, and its three subregions from 2010 to 2020. First, crime rates are likely to decline for the province from 2010 to 2020. This decline occurs under all three population projection conditions. Second, there are regional differences in the patterns of these decreases in crime rates. While the forecasted trends are quite similar for the Calgary and Edmonton metropolitan areas, the rates for the non-metropolitan areas are quite different and even exhibit a projected increase for all four categories of crime under the high population change projection.

The forecasted overall decrease in crime for the province represents a continuation of recent trends. This is most likely to be due in part to the changing population composition projections for the Alberta population. As Chart 4 in this report indicates, the number of older adolescents is projected to decrease slightly under all three projection conditions, the number of adolescents is fairly stable, and the number of young adults is projected to decline under the medium and low

population projections. As our literature review points out, crime peaks in late adolescence/young adulthood. The research literature has generally supported the claim that at least some of the decrease over time in the crime rate can be attributed to changes in the age composition of the population. Our population projections for the 2010 to 2020 time period provide some support for this conclusion.

The forecasted overall decrease in crime for the province is consistent with the results from Carrington's (2001) forecast of the levels of crime in Canada from 2000 to 2041. Carrington concluded that all types of crime, particularly those typical of younger aged groups such as breaking and entering, and robbery, will decline due to the continuing aging of the population. Crimes more characteristic of older adults should be affected less by the aging of the population. Within the categories of violent, property and other criminal code offences that we have forecast are, of course, a number of specific offence types. Some of these specific offences may have somewhat different relationships to demographic changes than the overall general categories. For example, as the population ages, fraud may also increase. As Foot (1998) points out, an aging population has more potential crime victims because it has more people who own something worth stealing. Carrington (2001:348) forecasted rates of several specific offences and concluded that "rates of particular types of crime are related to their age profiles: crimes such as robbery, break and enter and other indictable property crime, and drug offences, which are characteristic of teenagers and young adults, are forecast to decline somewhat faster and farther; whereas crimes such as sexual assault, Criminal Code traffic offences, and miscellaneous offences against the person, which are more characteristic of older adults, are forecast to decline less." It's possible, then, that the general crime categories forecasted in the present report may mask some differences in the likely future rates of some specific offence types.

Our data analysis revealed some regional differences in the relationships between projected demographic changes and forecasted crime rates. All four categories of crime exhibit rather consistent declines over the time period in their forecasted rates under the projected condition of low population change irrespective of region. But while the same decreasing trend was apparent under the projected condition of medium population change, the non-metropolitan area's decline was not as steep or consistent. Furthermore, the non-metropolitan area exhibits distinctive increasing forecasted rates for the four categories of crime when the high population projection is employed. This trend over the ten years is partly the result of the projected high net migration

into these areas, a migration that would be disproportionately composed of young adults, an age category more at risk for crime. In addition, the average crime rates for 2006-2009—the starting point for the forecasts—for the non-metropolitan areas are higher than those for the province as a whole, as well as Calgary and Edmonton metropolitan areas. This is consistent with recent research that concluded that the major urban centres in Alberta had the lowest crime rates (Francisco and Chenier, 2007). Furthermore, our literature review indicates that areas experiencing rapid population growth tend to become more socially disorganized with weaker informal social control networks, particularly over youth. These conditions lead to increased rates of crime and other social problems.

Unfortunately, the demographic data for constructing population projections for more specific locations within the non-metropolitan area are not readily available. Therefore, it is not possible in this report to forecast crime rates for locations such as small cities, towns and rural areas. It is possible, of course, that the forecasted increased rates of crime in the non-metropolitan area could be located in only certain specific locales, particularly those most likely to experience the most rapid population growth. For example, areas that experience increased net in-migration, particularly of young males, due to increased economic activity are at greater risk of also experiencing more socially disorganized social relationships and weakened networks of social control resulting in higher rates of crime.

The non-metropolitan area is also home to a number of Aboriginal reserves and communities. The literature review documents how Aboriginal people are over-represented in the correctional system. While we lack data on the Aboriginal status of persons charged and are therefore not able to forecast their specific crime rates, it is very likely that they are disproportionately involved in certain crimes relative to their proportion of the population. LaPrairie (1992; 1996) has described the breakdown of traditional social relations and controls in some Aboriginal communities contributing to the disproportionately high rates of Aboriginal crime and violence. It is also the case that the Aboriginal population is younger on average than the non-Aboriginal population. According to the 2006 Census of Canada (20% sample), the median age of the Alberta's total population was 35.8 but the median age of Alberta's Aboriginal Identity population was 24.8. The proportion of Alberta's Aboriginal population under 15 years of age is higher than the national average and may contribute to higher crime rates in regions of the

province with larger Aboriginal populations as this age group moves into the high risk age categories for crime (Gannon et al., 2005).

Carrington (2001) pointed out that the projected change in age structure of the First Nations population is very different from that of other Canadians, and that this may have substantial effects on future local crime rates in areas with large First Nations populations. The Alberta Aboriginal population is projected to increase from 167,900 in 2001 to 232,600 in 2017, making it the second largest in the country (Statistics Canada, 2005). Therefore, it is possible that some of the forecasted increase in crime rates in non-metropolitan areas under the projection of high population change would be attributable to Aboriginal offenders in these areas.

In conclusion, it is important to recall that this crime forecasting exercise has been based upon selected demographic variables. It is not an attempt to explain crime trends or to predict future crime rates. Demographic changes are not the only, or even, the strongest contributor to crime rates; other variables occurring during the same time period as these demographic changes can have important effects on crime (Fox and Piquero, 2003). As Carrington (2001) has pointed out, predicting future crime would require knowledge of future levels of all other variables thought to affect crime as well as a model of how they impact on crime. Various social and economic factors and criminal justice policies are quite likely to have a continuing impact on crime through time. LaFree (1999) identified a number of variables likely to affect crime rates over time, such as: economic stress, family disorganization, drug markets, changes in routine activities of everyday life that affect the opportunities for crime, as well as such public policy effects as various policing initiatives, incarceration rates, education and welfare programs. Demographic variables may also have indirect effects on crime by precipitating economic, social and/or policy changes which may in turn cause a change in the crime rate (Carrington, 2001). While demographic change is an important variable, it should not distract us from examining other important contributors to crime, particularly those that are more amenable to public policy.

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