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Exploring Crime Patterns in Canada

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Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

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Abstract

This research paper provides an overview of patterns in crime data between 1962 and 2003, with a particular focus on the decline in recorded crime throughout the 1990s. This paper also explores the statistical relationship between selected crime patterns (homicide, robbery, break and enter and motor vehicle theft) and various macro-level demographic and economic changes. Analysis is based on police-reported crime data from the Uniform Crime Reporting Survey, Consumer Price Index, Labour Force Survey and institution data on the control and sale of alcoholic beverages in Canada.

In general, bivariate results indicate that throughout the 1990s the greatest gains in reducing crime rates were made in property crimes, especially among young offenders. Significant declines were also noted for robberies and homicides involving firearms as well as homicides overall.

Multivariate results indicate that, at the macro-level, different types of crime are influenced by different social and economic factors. Specifically, shifts in inflation were found to be associated with changes in the level of all financially motivated crimes examined (robbery, break and enter, motor vehicle theft). Shifts in the age composition of the population, on the other hand, were found to be correlated with shifts in rates of break and enter and were not statistically significant for the other types of crimes studied. Finally, shifts in alcohol consumption and unemployment rates were found to be correlated with shifts in homicide rates.

Background

Canadians witnessed an unprecedented decline in crime rates throughout the 1990s. Rates of crime reported to the police fell by 26% between 1991 and 2000 at an average of 2% per year (see Table A1). Property crime fell by 34% over this nine-year period and other Criminal Code offences by 17%. The downward trend in violent crime began in 1993, two years later than the drop in property crime. From 1993 to 2000, rates of violent crime dropped by 9%. These declines in the crime rate followed fairly steady increases in rates between 1962 and the early 1990s.

The decline in crime rates throughout the 1990s paralleled similar patterns in the United States (see Gannon, 2001). There has been considerable speculation in the United States and Canada as to the causes behind this downward trend. Explanations in the United States have centered on the changing age structure of the population; changing economic conditions; a change in policing style — either more aggressive or moving toward community policing; increased numbers of police officers; rising incarceration rates; dramatic changes in drug markets; and changing social values (Fox, 2000; Spelman, 2000; Eck & Maguire, 2000; Johnson et al, 2000; Rosenfeld, 2000; Markowitz, 2000; LaFree, 1999). The objective of this study is to contribute to discussions and knowledge about crime patterns in Canada throughout the past four decades by testing some of these theories using statistical modeling techniques.

Organization of the report

There are five parts to this report. The first provides a description of crime patterns between 1962 and 2003, with a particular focus on the downward trend throughout the 1990s. The second part of the report outlines policy and societal changes which may have affected crime rates in Canada. The third section examines areas where declines have not occurred, particularly in Western Canada and the North. This is followed, in the fourth section of the report, by bivariate correlation analysis and time series analysis to assess the relationships between patterns in motor vehicle theft, break and enter, robbery and homicide and a number of socio-demographic and economic trends. A description of the methods, variables and data sources used as well as the results of the analysis are included in this section. Finally, the report concludes with a discussion of limitations and implications for future research.

Crime patterns

To begin, an exploration of changes in crime patterns was conducted to address which crimes have declined. The following analysis uses two main time periods: 1962 to 2003, when examining overall crime rates[1] and 1977 to 2003, when examining specific crime types.

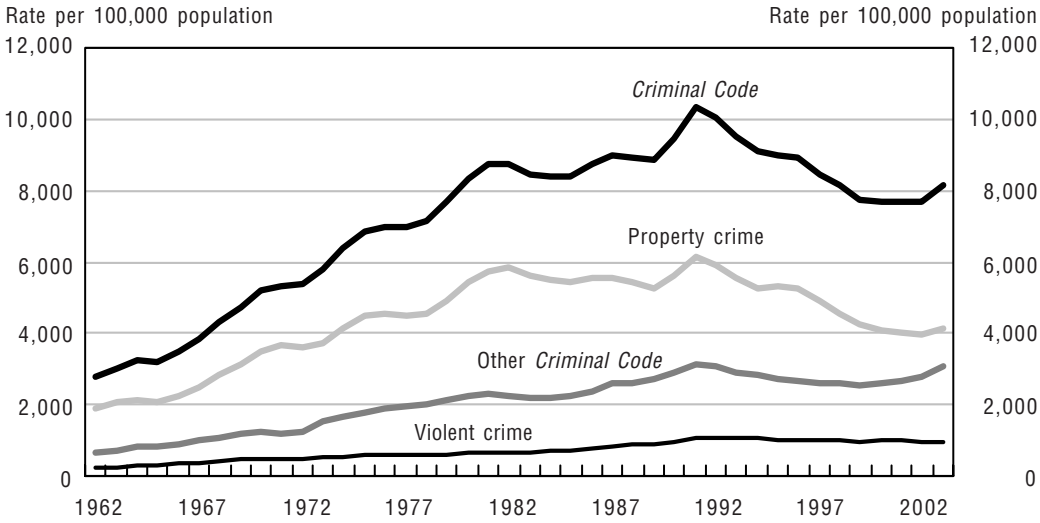
General Trends

As Figure 1 shows, there were four general trends in the crime rate[2] between 1962 and 2000. Rates increased fairly steadily up to the early 1980s, leveled off throughout the decade, increased again in the early 1990s before declining steadily throughout the 1990s.

Between 2000 and 2002 the crime rate was relatively stable, however, in 2003 the national crime rate increased by 6%, the first substantial increase in over a decade[3]. It is too early to tell whether this is the beginning of a new trend; however, it is important to note that the overall crime rate in 2003 was still 21% lower than the crime rate at its peak in 1991 (Table A1).

Figure 1

Rates of *Criminal Code* incidents in Canada, 1962 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

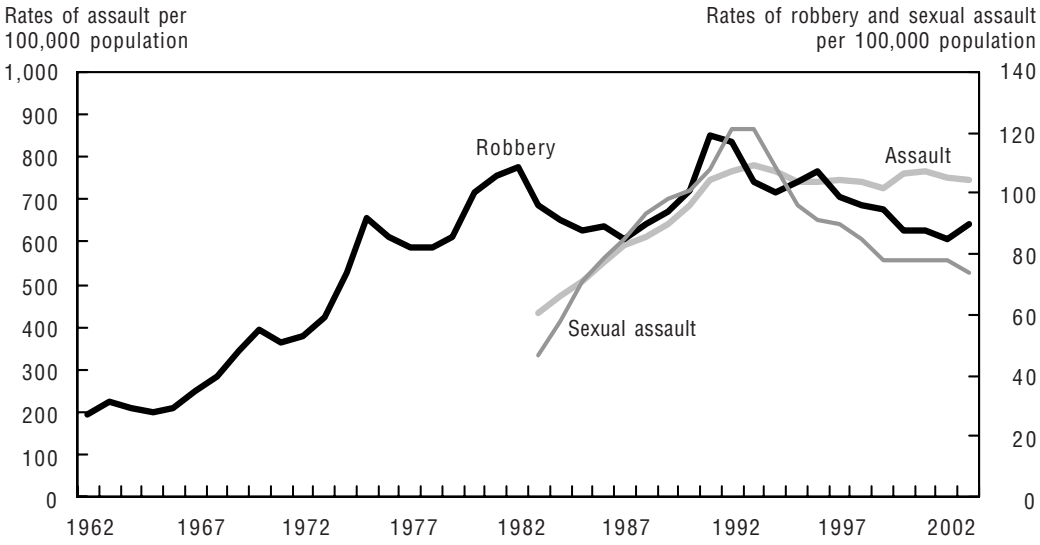
Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Violent Offences[4]

The rate of violent crime declined slightly throughout the 1990s, after having increased steadily through most of the 1960s, 1970s and 1980s (Table A1). Figure 2 compares patterns in selected violent crimes, including sexual assault, assault and robbery (note the different scales used to chart robbery and sexual assault compared to assault). Assault and sexual assault began dropping in 1993, although the drop in sexual assault has been sharper. Declines in violent crime between 1991 and 2003 were particularly evident among male youth charged (down 9%), while rates of female youth charged increased 25% during this time period (Table A2).

Figure 2

Rates of robbery, assault (level 1, 2, 3), and sexual assault (1, 2, 3), Canada



Note: In 1983, changes were made to the *Criminal Code* which affected the classification of assaults and sexual assaults, as a result data prior to 1983 are not presented.

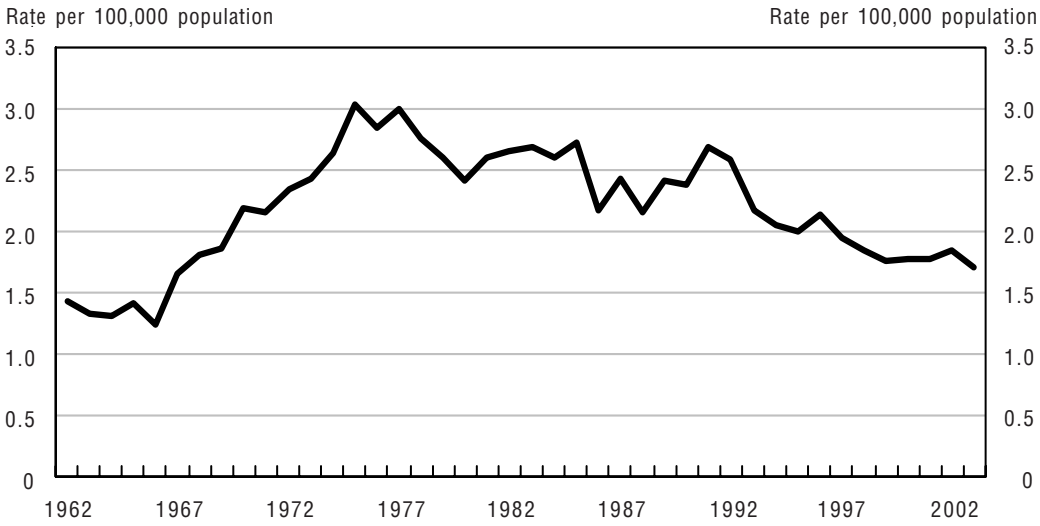
Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

A general decline in homicide has been evident since the mid-1970s (Figure 3). In contrast, robbery rates have had a cyclical pattern, with periods of increase (late 1970s and early 1980s and late 1980s and early 1990s) followed by periods of decline (Figure 2). While the total violent crime rate remained relatively stable in 2003 compared to other years, the rate of robbery increased by 5%.

Figure 3

Homicide rate per 100,000 population, Canada, 1962 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Homicide Survey.*

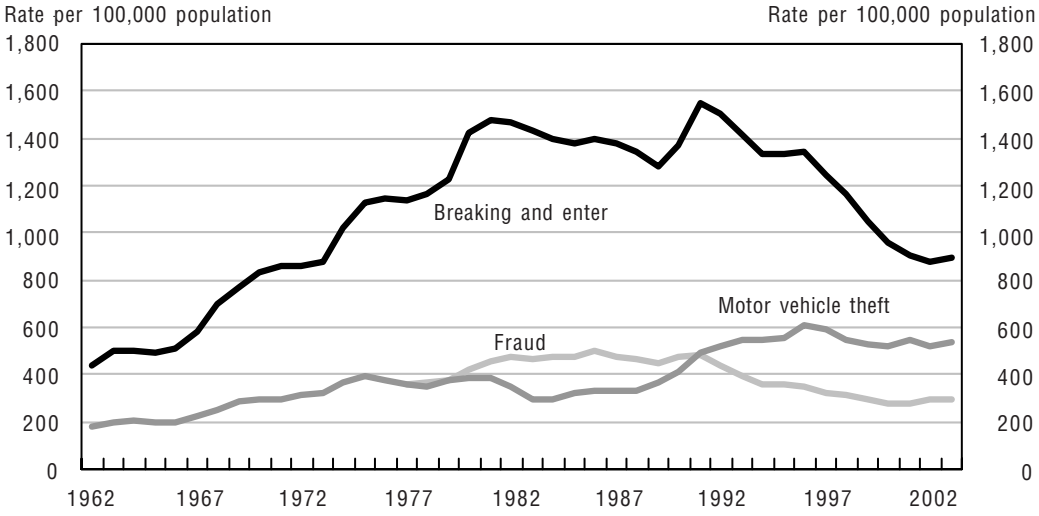
Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Property Offences[5]

Declines in overall property crime rates began in 1991 and were more marked than for violent crime (Figure 1). Break and enter and fraud reported to police show declines similar to the overall trends in property crime (Figure 4). All types of break and enter (residence, business premises, and other premises) declined at a similar pace. Rates of motor vehicle theft, on the other hand, plateaued during the 1990s, with the exception of two years of elevated rates, 1996 and 1997. Theft of trucks (which includes minivans) increased until 1997 and remained relatively stable between 1998 and 2002, while theft of automobiles began to decline in 1997 and other types of motor vehicles in 1994.

Figure 4

Rates of break and enter, fraud and motor vehicle theft, Canada, 1962 to 2003[1]



1. Data on overall trends in violent, property and other *Criminal Code* offences are available beginning in 1962, however data for specific crime types are available electronically starting in 1977. The exception to this are rates of homicide, robbery, break and enter and motor vehicle theft, which were extracted manually from paper publications between 1962 and 1977, because they were chosen for time series modeling (see methodology section).

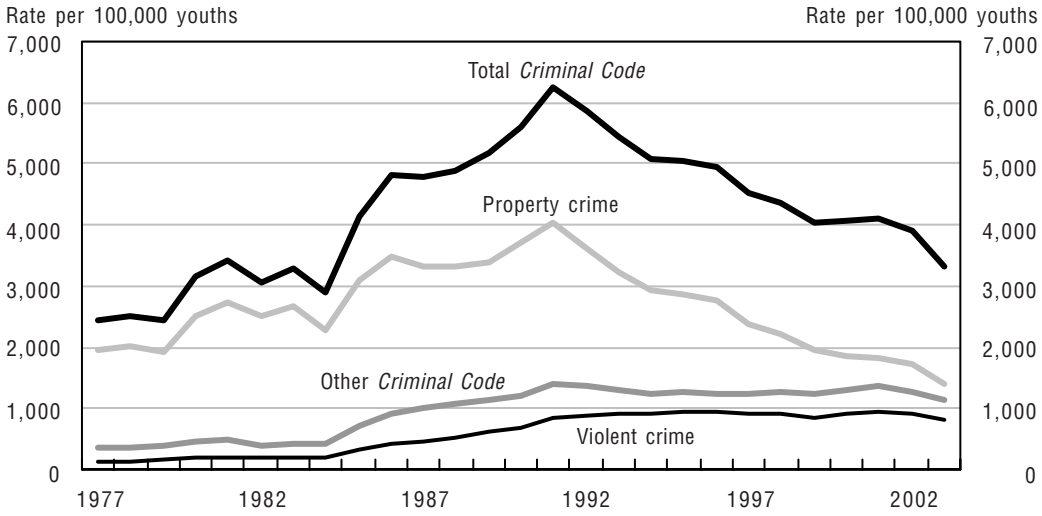
Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Declines in charged property crimes were most notable among young offenders. As Figures 5 and 6 demonstrate, the rate of youths and adults charged with property crime decreased significantly between 1991 and 2003 (down 66% for youth and 47% for adults). This was marginally more pronounced for young male offenders than young female offenders[6] (down 67% and 62% respectively) (Table A2).

Figure 5

Rate of youths aged 12 to 17 charged by crime category, Canada, 1977 to 2003

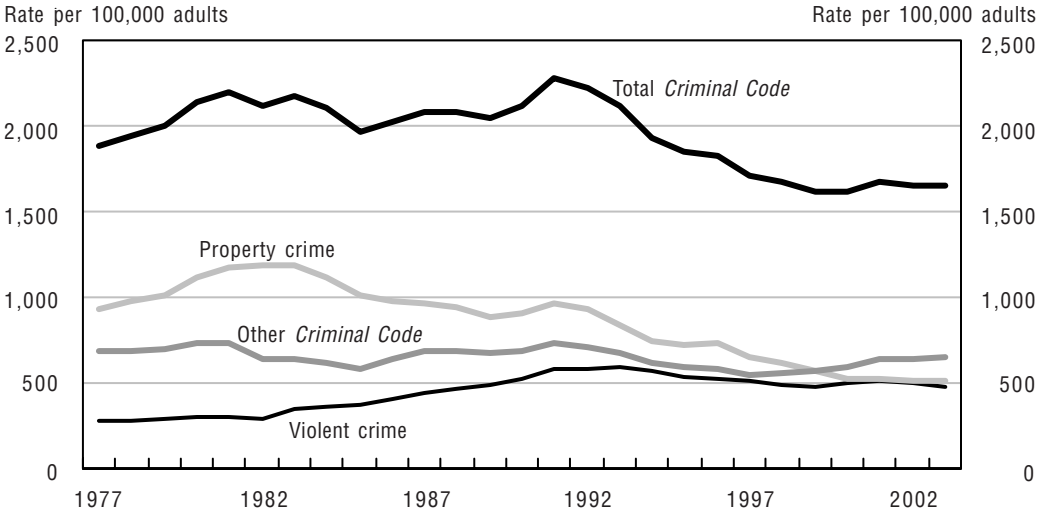


Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 6

Rate of adults charged by crime category, Canada, 1977 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

To further illustrate this point, data from the Incident-based Uniform Crime Reporting Survey which provides actual age of accused persons were used to calculate age-specific rates of offending for females and males in Vancouver and Montreal[7]. While these results are not representative of national trends, they do demonstrate the remarkable reduction in charges for property offending, and to a lesser extent for violent offending, among male youth (Table 1).

Most recently, the property crime rate increased 4%, the first substantial rise in over a decade. This rise was partially the result of increases in rates of theft, break and enter and motor vehicle theft between 2002 and 2003 (Wallace, 2004). Nevertheless, rates of property crime in 2003 were still 33% lower than their peak in 1991 (Table A1).

Table 1

Rates of persons charged by age group and sex of offenders, Vancouver and Montréal, 1996 and 2003

	Violent offences – males					
	Vancouver			Montréal		
Age group	1996	2003	% change	1996	2003	% change
12 to 14	1,168	436	-62.7	2,031	741	-63.5
15 to 17	2,259	1,351	-40.2	3,814	2,260	-40.7
18 to 24	2,812	1,784	-36.6	2,838	2,297	-19.1
25 to 34	2,206	1,267	-42.6	2,423	1,808	-25.4
35 to 54	1,482	1,075	-27.4	1,504	1,510	0.4
55 and over	277	220	-20.6	298	321	8.0
Total	1,590	1,001	-37.1	1,678	1,362	-18.8
	Property offences – males					
	Vancouver			Montréal		
Age group	1996	2003	% change	1996	2003	% change
12 to 14	2,323	586	-74.8	3,953	574	-85.5
15 to 17	6,011	1,651	-72.5	9,474	2,007	-78.8
18 to 24	5,523	2,419	-56.2	6,038	2,169	-64.1
25 to 34	5,001	2,221	-55.6	3,918	1,116	-71.5
35 to 54	3,259	1,710	-47.5	1,895	846	-55.4
55 and over	303	190	-37.3	269	132	-51.0
Total	3,424	1,535	-55.2	2,801	924	-67.0
	Violent offences – females					
	Vancouver			Montréal		
Age group	1996	2003	% change	1996	2003	% change
12 to 14	600	175	-70.8	685	223	-67.4
15 to 17	675	429	-36.4	631	539	-14.7
18 to 24	269	189	-29.5	317	384	21.3
25 to 34	267	169	-36.7	326	288	-11.7
35 to 54	167	87	-48.2	199	228	14.5
55 and over	15	14	-7.9	29	29	0.1
Total	195	112	-42.6	214	204	-5.0
	Property offences – females					
	Vancouver			Montréal		
Age group	1996	2003	% change	1996	2003	% change
12 to 14	1,033	323	-68.7	1,504	105	-93.0
15 to 17	1,288	501	-61.1	1,704	288	-83.1
18 to 24	911	589	-35.4	987	404	-59.0
25 to 34	861	362	-57.9	734	288	-60.9
35 to 54	629	314	-50.0	471	229	-51.3
55 and over	49	66	36.5	93	46	-50.6
Total	608	301	-50.5	537	200	-62.9

Note: Rates are lower than overall rates recorded in the Uniform Crime Reporting Survey because a substantial proportion of crimes do not have an identified offender.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Incident-based Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Other Criminal Code Offences

Rates of other Criminal Code[8] offences also peaked in 1991 followed by a steady decline until 1999, at which point they again began to increase (rates were 21% higher in 2003 compared to 1999) (Figure 1). In 2003, more than 960,000 incidents were in this category, accounting for a 10% increase between 2002 and 2003 (Wallace, 2004). This rise was a result of increases in the rates of the three largest volume offences in this category: mischief (+6%), counterfeiting currency (+72%) and disturbing the peace (+15%). Since 1977 other Criminal Code offences have made up an increasing proportion of overall crime, rising from 26% in 1977 to 37% in 2003.

Summary

Generally speaking, throughout the 1990s there was a marked decline in overall crime rates, driven in large part by a reduction in property crime and to a lesser extent by reductions in violent crime (particularly assault, sexual assault and homicide). Declines were much more evident among male youth charged than among female youth charged, particularly with regard to violent crime and other Criminal Code offences.

The next section of the report will examine a number of societal, policy and legislative changes as well as changes in police practices which may have influenced these overall declines.

A Contrasting View from Victimization Surveys

Victimization surveys provide an alternative view of crime. However, in Canada national victimization surveys have been conducted by Statistics Canada through the General Social Survey on Victimization only in 1988, 1993 and 1999 and so are able to provide broad trends but not important details about intervening years. The General Social Survey on Victimization interviewed a random sample of men and women 15 years of age and over about their experiences with eight crime categories and found that rates of sexual assault, assault, robbery, break and enter, motor vehicle theft and theft of auto parts, and vandalism did not change significantly between 1993 and 1999. Rates of theft of personal and household property increased over this five-year period. However, the proportion of crimes reported to the police decreased between 1993 and 1999, from 42% to 37%, which may help account for the discrepancy between victimization results and police data. One cause for the decline in reporting may be an increase in insurance deductible amounts. Insurance industry data indicate that in 1994, the deductible amount for the majority (52%) of homeowner policies was $200. By 1998, the majority (53%) of homeowner policies had a deductible amount of $500. At the same time, the 1999 GSS indicates that the value of stolen/damaged property had declined slightly since 1993 (for a complete overview please see Besserer & Trainor, 2000).

Societal, Policy, Legislative and Practice Changes

Declines in crime rates in the 1990s have occurred simultaneously with many societal, policy and legislative changes as well as changes in criminal justice practices. These include the changing age structure of the population, changes in economic conditions, changes in alcohol consumption patterns, changes in policing style, rising incarceration rates, changes in drug markets, and changing social values. These factors have received considerable attention in the United States; their relevance to the Canadian context is assessed below.

Furthermore, important legislative changes have been introduced in Canada such as amendments to the *Criminal Code* regarding firearm legislation (1969, 1977, 1991, 1995 and 1998) and the *Young Offenders Act* (1984 to 2003) which was followed by the *Youth Criminal Justice Act* on April 1, 2003. The potential impact these legislative changes had on crime will also be examined in the following section.

Age structure of the population[9]

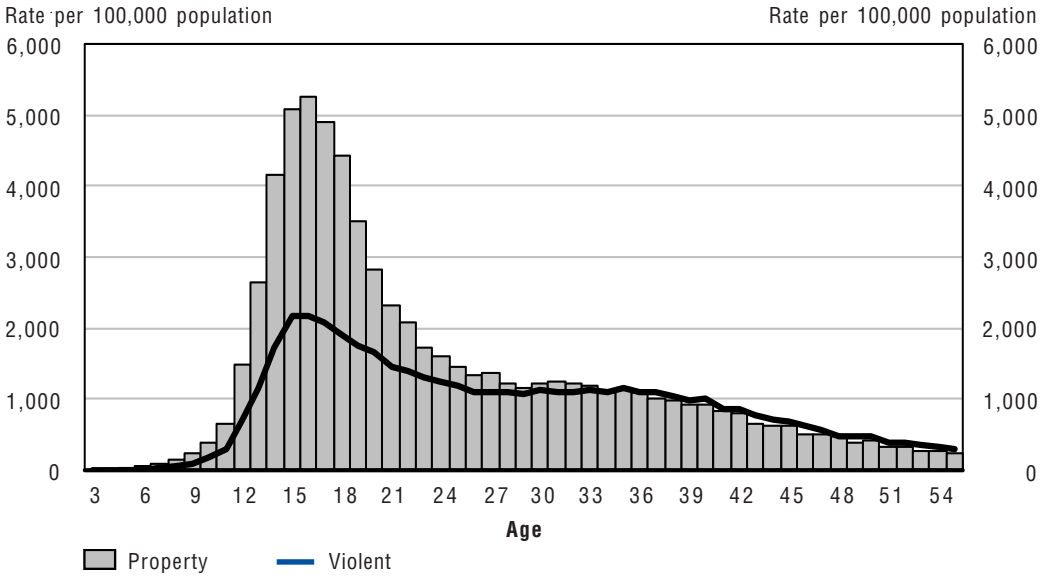
Age and gender are the most commonly cited correlates of crime and delinquency with higher rates of offending recorded for young males cross-nationally (Hirschi & Gottfredson, 1983).[10] As a result, changes in either the size of this high-risk group in the population, or changes in rates of offending by this group can be expected to affect the overall crime rate. Recent patterns in violent offences in the United States have been traced to sharp increases followed by declines in rates of offending by young African American males (Blumstein, 2000; Rosenfeld, 2000; Fox, 2000).

According to age-related theories, crime rates should decline as the crime-prone age group of young people makes up a smaller and smaller fraction of the total population. Data from the Incident-based Uniform Crime Reporting Survey indicate that in 2003 persons aged 15 to 24 years of age represented 14% of the total population while accounting for 45% of those accused of property crimes and 32% of persons accused of violent crime (Wallace, 2004) (Figure 7a). Canada's "baby-boom", which occurred between 1947 and 1966, outpaced the United States and other Western countries and consequently has had an important impact on all aspects of the Canadian economy and society (Foote, 1996). Fertility rates declined toward the end of the 1960s as contraceptives were legalized and women began to delay child-bearing and to enter the labour market in large numbers. Fertility rates have remained low since the early 1970s. As baby-boomers aged and moved into adulthood, those 35 years of age and older have steadily increased their share of the population while the group aged 15 to 24 have declined (Figure 7b). The percentage of adults aged 25 to 34 in the population has also declined since 1990. As a result,

there are fewer potential offenders in the population in the 1990s than there were during the previous two decades. Figure 8 illustrates how the largest proportion of Canadians were under 25 in 1971 and 35 years of age and over in 2003.

Figure 7a

Persons accused of property crimes and violent crimes by age, Canada, 2003

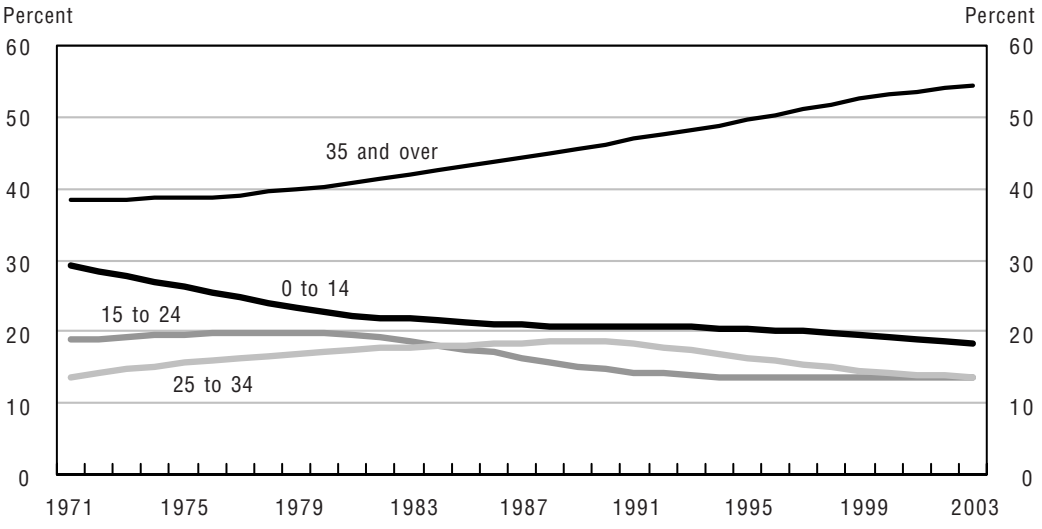


Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Incident-based Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 7b

Proportion of population by age group, Canada, 1971 to 2003

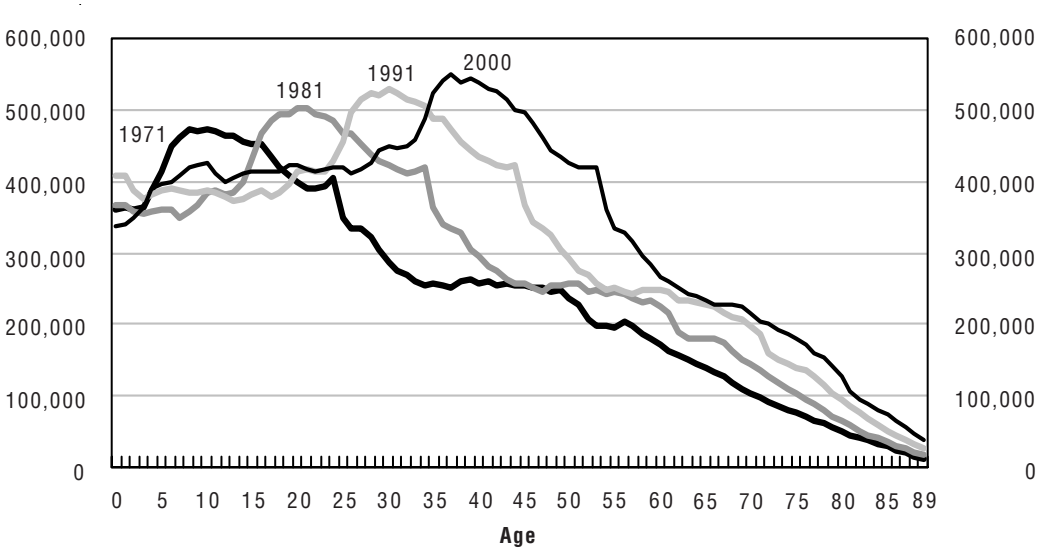


Data source: *Statistics Canada, Demography Division.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 8

Count of the Canadian population by age and year, Canada, 1971 to 2000



Data source: *Statistics Canada, Demography Division.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Reductions in the size of a crime prone cohort are one way in which the demographic composition of a population may affect the crime rate; the other is a reduction in the likelihood of offending for 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 (Levitt, 1999). Ouimet (2002a) contends that a very large cohort of people born in Canada during the early 1960s had higher levels of criminal involvement than any other due to more serious difficulties integrating into the job market during the recession in the early 1980s. This group has also been criminally active for a longer period of time than any other cohort. He argues that the offending behaviour of this group helped extend the period of growth in violent crime rates well into the early 1990s. Demographer David Foote (1996) points out that the largest single-year age group in Canada is those born in 1961. Compared to the boomers born earlier, this group has had a difficult time making a successful transition into adulthood. Foote maintains that 1961 was "one of the worst years in this century to be born" in part because the mass of older boomers who preceded this group pushed the price of rents and housing up and occupied most of the best jobs and opportunities. This caused delays in the ability of the younger cohort to acquire jobs and achieve status in the way earlier cohorts had been able to do.

Researchers who have empirically tested the link between age composition of the population and crime rates have arrived at different conclusions depending on the crime type being examined. Steffensmeier and Harer (1999) found age

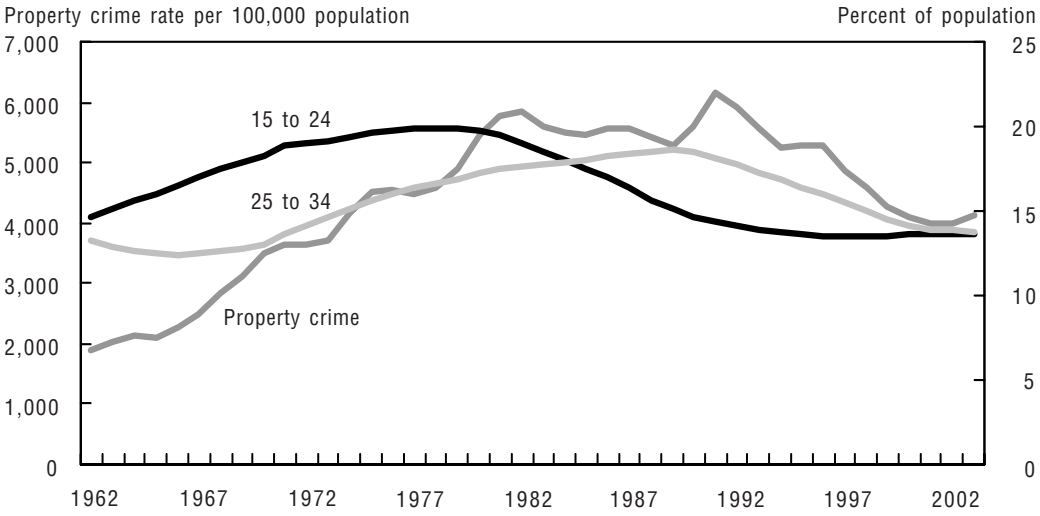
composition made only a small contribution to the crime drop in the United States. Levitt (1999) also found age to have a limited impact on crime rates, about 1% per year, even during the dramatic demographic shifts resulting from the baby boom. Carrington (2001) forecasted a decline in all types of crimes in Canada due to the continuing aging of the Canadian population. He predicted that, all else remaining equal, crimes committed most often by teenagers and young adults, such as robbery and break and enter, would experience greater declines, while those involving older offenders, such as sexual assault and impaired driving, would be affected less (also Ouimet, 2002b).

Leenaars and Lester (2004), however, found the proportion of the population 15 to 24 to be the most significant predicator of declining homicide rates in Canada, even when controlling for other demographic characteristics such as the birth rates and divorce rates and the unemployment rates. Sprott and Cesaroni (2002) estimated that 14% of the decline in Canadian homicide rates between 1974 and 1999 was attributable to changes in age composition of the population.

Crime rates in Canada have followed population shifts, with somewhat of a lag (Figures 9 and 10). Baby-boomers reached 15 years of age between 1960 and 1980, a time when violent and property crime rates were rising year after year. Property crime rates stabilized in the 1980s as the percentage in the 15 to 24 age group began to drop and increased slightly in the early 1990s before declining sharply, a time when the percentage of 25 to 34 year olds began to decline. However, violent crime rates do not parallel as closely this demographic shift, having increased steadily until 1993. The drop in violent crime began several years following the start of the decline in the 15 to 24 age group and shortly after the 25 to 34 age group began its drop.

Figure 9

Comparison over time in rates of property crime and population accounted for by age groups, 1962 to 2003

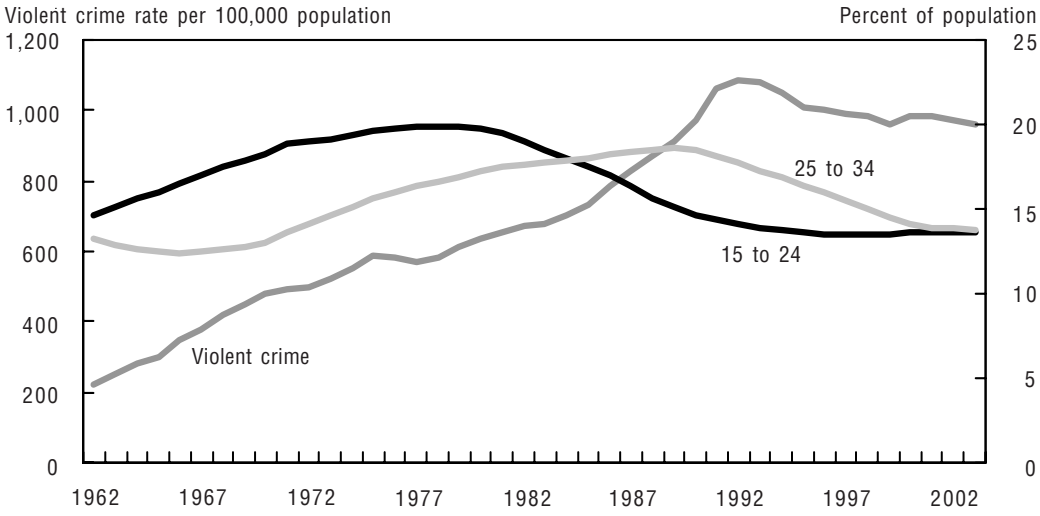


Data source: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Demography Division*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 10

Comparison over time in rates of violent crime and population accounted for by age groups, 1962 to 2003



Data source: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Demography Division.*

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Unemployment

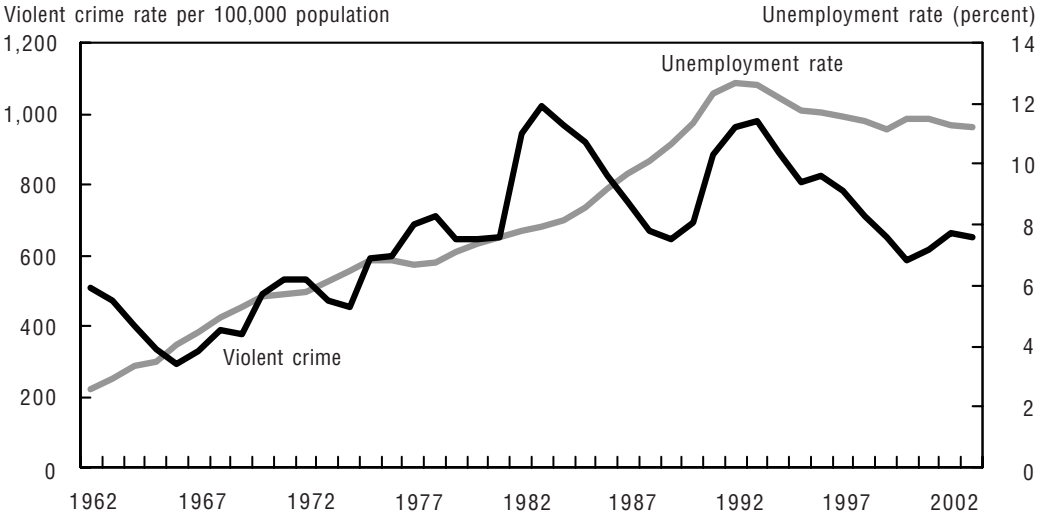
Unemployment and measures of poverty and income inequality are frequently cited as risk factors for criminal activity. Families and individuals living in low-income situations have reduced opportunity to participate in organized recreational activities and to acquire the consumer goods that are considered desirable and necessary in Western society (Brooks-Gunn & Duncan, 1997). Employment may reduce the risk of engaging in criminal behaviour by offering teenagers and young adults a steady income and some purchasing power, increasing time under adult supervision, expanding social bonds thereby raising informal social control, and by enhancing the ability of young people to integrate successfully into society and the economy. Employment is an important component of a successful transition to adulthood that can have a positive impact on lifestyle and which limits exposure to potential offenders (Sampson & Laub, 1993).

According to Ouimet (2002a), exclusion from the means of production can cause stress and role confusion for young males. Unemployment can lead to difficulties integrating into society and the economy, particularly for those who lack other possible avenues for success, which can lead some youth to explore crime and delinquency as a way to acquire status. For most youth, this period is relatively short and they soon enter into steady jobs, positive/supportive relationships and family responsibilities. But those in large cohorts face greater competition in the labour market and therefore may not abandon their delinquency as quickly. Chapman et al (2002) found a strong positive relationship between property crime and the extent of long-term unemployment by male youth. They argue that much of the inconsistency in studies exploring the links between unemployment and crime stem from the imprecision of that concept and recommend using duration of unemployment where possible.

Unemployment rates are used in this analysis to represent economic disadvantage, because of the long time series for which they are available. Unemployment rates for men and women produced similar results in the correlation analysis, as a result, total unemployment rates were selected. As shown in Figure 11 and 12 (juxtaposed with violent and property crime rates), unemployment rates were relatively high in the 1980s and again in the early 1990s. Similarly, overall trends in property crime were also high in the early 1980s and early 1990s. Rates of violent crime did not follow these patterns, they rose steadily throughout the 1970s and 1980s, peaking in 1991.

Figure 11

Comparison over time in rates of violent crime and unemployment, 1962 to 2003

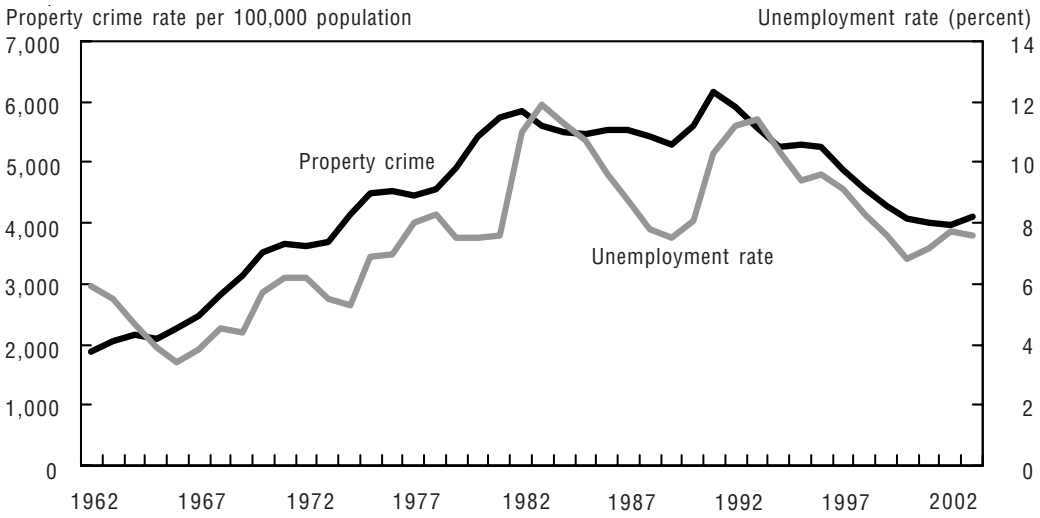


Data source: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Labour Force Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 12

Comparison over time in rates of property crime and unemployment, 1962 to 2003



Data source: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Labour Force Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Inflation

The aggregate level of economic distress in society is viewed as a precipitator of negative social conditions that undermine legitimacy and order and weaken social bonds (Devine et al, 1988). According to Devine et al (1988), models of the relationship between societal economic conditions and crime must use both inflation and unemployment rates as indicators of economic distress (or health) as both unemployment and inflation critically shape macroeconomic and social welfare policies and individual behaviours.

Devine et al (1988) contends that inflation raises a population's "criminal motivational density". In a situation in which many wage and salary earners and persons on fixed or low incomes either experience or perceive an erosion of real income, inflation unleashes distributional conflict and undermines confidence in existing institutional arrangements (Hirsch & Goldthorpe 1978; Lindberg & Maier 1985). Long and Witte (1981) also contend that crime rates increase as inflation rises because hard times motivate criminal behaviour and because inflation inhibits the capacity of communities to deter crime. In a comparative analysis of homicide rates and income inequality in Canada and the United States, Daly et al. (2001) argue that variations in levels of violence over time and place is a reflection of variability in the competition for access to material and social resources. They argue that levels of income inequality are sufficient to account for the fourfold difference in homicide rates between the two countries.

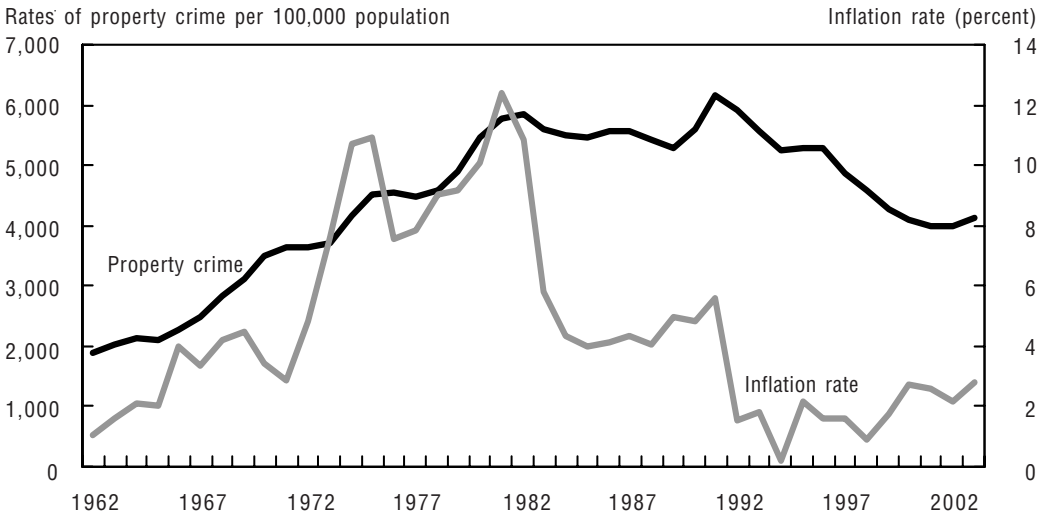
Inflation in Canada rose significantly in the 1970s and early 1980s and then declined by 1984 and again after 1991. CPI inflation averaged 6% per year in the 1981 to 1990 period and 2 % per year in the 1991 to 2000 period (Longworth,

2002). Due to high inflation rates in the 1970s and early 1980s, in February 1991, Canada adopted inflation targets. Canada's initial targets were aimed at reducing the 12-month consumer price index to 3% (plus or minus 1%) by the end of 1992 and to 2% (plus or minus 1%) by the end of 1995. Since then, the inflation-control target has been left unchanged at 2% (plus or minus 1%).

Monetary policy has been successful in achieving its target in most months, with total CPI inflation averaging close to 2% since December 1994 (Longworth, 2002). Lower levels of inflation in the 1990s translated into lower long-term and short-term interest rates (Ibid). Furthermore, unemployment in the second half of the 1990s was more than a percentage point lower than in the 1980s, and unemployment at the end of the 1990s was the lowest since 1976. While a number of factors, including the reform of employment insurance (Sargent, 1995) were behind this reduction, the macroeconomic stability stemming from low and stable inflation would have been an important supporting element (Longworth, 2002). As shown in Figure 13 and 14 (juxtaposed with property and violent crime rates), inflation rates peaked in the mid-1970s and early 1980s and again in the early 1990s. Similarly, overall trends in property crime were also high in the early 1980s and early 1990s. Rates of violent crime did not follow these patterns, they rose steadily throughout the 1970s and 1980s, peaking in 1991.

Figure 13

Comparison over time of rates of property crime and inflation, 1962 to 2003

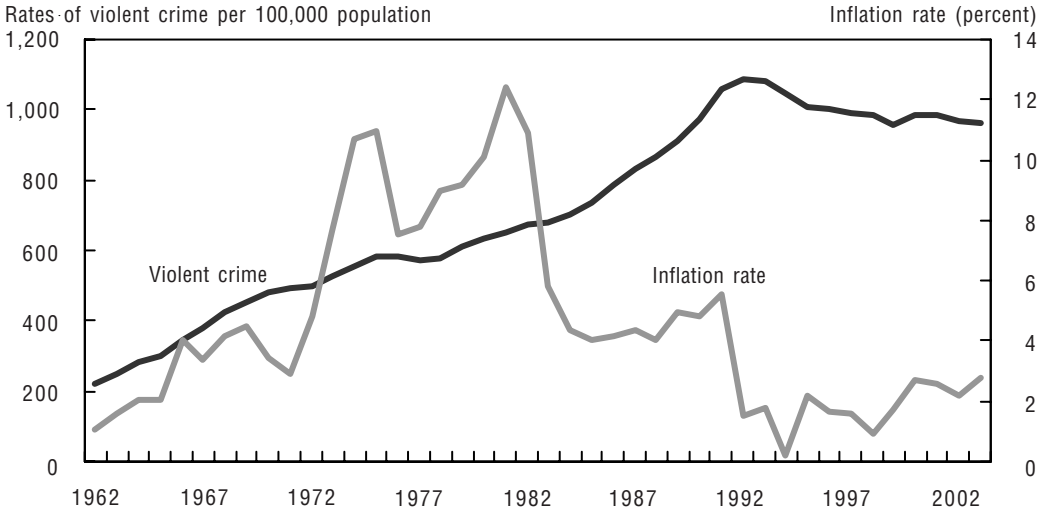


Data sources: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Consumer Price Index.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 14

Comparison over time of rates of violent crime and inflation, 1962 to 2003



Data sources: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics) and Consumer Price Index.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Alcohol and drug consumption

An established body of research consistently points to the co-occurrence of alcohol or drugs and crime in a substantial proportion of cases. For example:

- A recent Canadian study found that between 40% and 50% of crimes were related to alcohol or drugs, because of intoxication at the time, alcohol or drug dependency, or having committed the crime to obtain drugs or alcohol (Pernanen et al, 2002).
- Drugs or alcohol played a role in the criminal activity of 40% of women in Canadian prisons, while half were under the influence of drugs or alcohol when they committed their current offence (Shaw et al 1991).
- Rates of spousal violence are higher and injuries more severe in relationships with heavy drinkers (Johnson 2001). Women victims are more likely than men to say violent partners were drinking at the time of the violent incident (Pottie Bunge & Locke, 2000).
- 65% of jail inmates in the US in 1996 were actively drug-involved at the time of the offence (Wilson, 2000).
- 40% of sentenced women and 50% of women on remand were dependent on drugs in the year before entering British prisons (Home Office, 2002).
- 62% of men and women imprisoned in Australia were regular users of illegal drugs in the six months prior to their arrest (Makkai & Payne 2003; Johnson 2004).

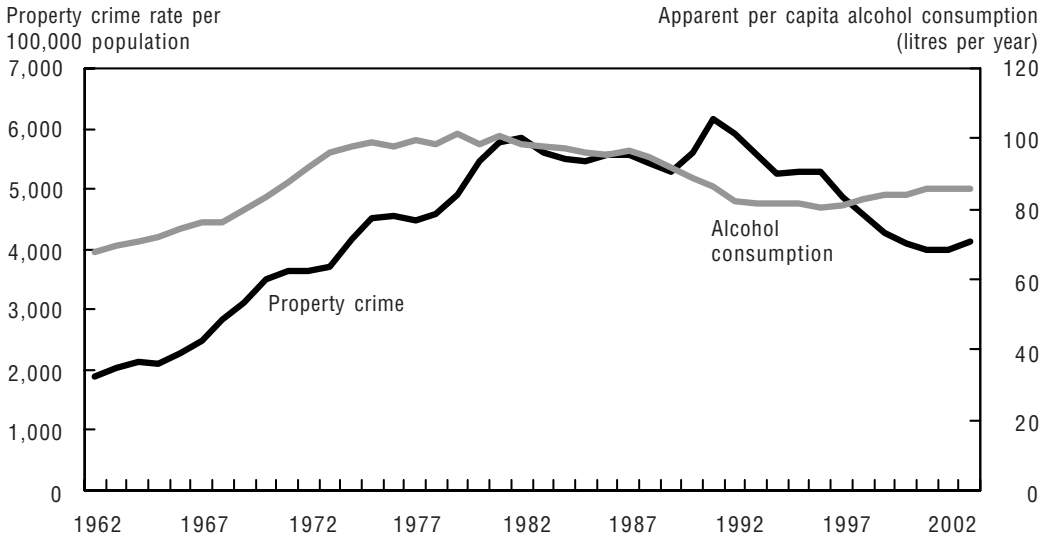
Although links between alcohol and drug use and crime are commonly found, most experts would agree that there is no straight-forward cause-and-effect relationship. With respect to drugs, abuse may lead to crime due to the pharmacological properties of these substances, to acquire money to pay for drugs, or due to the violence associated with the drug trade (Goldstein, 1985). Alternatively, involvement in crime can weaken ties to conventional society so that drugs and crime co-occur as part of a lifestyle. Drug use and criminal activity coexist in some social groups and the motivating factors for drug use and crime are the same — excitement or risk taking (Chaiken & Chaiken, 1990; Simpson, 2003; Denton, 2001). Both drug use and crime can help achieve membership and status in social groups where other options are lacking. Drug abuse and crime also may occur simultaneously due to a third common cause, such as childhood abuse, early school failure, family characteristics, or neighbourhood disorganization (White & Gorman, 2000).

Drug abuse is most often linked to property crime as a means to acquire money required to sustain a drug habit (Makkai & Payne, 2003), whereas alcohol abuse is linked more often to violent crime through the disinhibiting effect it has on cognition and perceptions (Parker, 1995; Fagan et al. 1988; Barnett & Fagan 1993). Alcohol can also act on cognition so as to impair perceptions of the actions and signals of others and the ability to respond appropriately, sometimes resulting in a violent response. A number of interacting factors come into play, including the personality, age, sex and mental set of the actors, amount and frequency of alcohol consumption, a predisposition toward crime or violence, social and cultural factors, and the setting (Boles & Miotto, 2003; Graham et al 1998; Fagan, 1990). Heavy drinking can increase the probability of misinterpretation of social cues and can reduce the actor's ability to cope with stressful situations. Offenders may also drink to work up courage to commit criminal acts (Pernanen et al, 2002). Studies have shown that binge drinkers and those with harmful or hazardous drinking patterns self-report higher levels of multiple and chronic offending (Makkai, 1998).

At the macro-level, an association has been established between robbery rates and heroin use. Chilvers and Weatherburn (2003) estimate that each 10% increase in the annual number of dependent heroin users in one state in Australia predicts a 6% increase in the robbery rate. Cook and Moore (1993) estimate that a hypothetical 10% increase in per capita alcohol consumption in the United States would result in a 6.5% rise in sexual assault, a 1% rise in homicide, a 6% increase in assault and a 9% increase in robbery. Field (1990) also found that variations in beer consumption in the UK were significantly related to rates of violent crime. In the absence of long-term data identifying drinking patterns or drug use among Canadian adults, this study will focus on societal levels of alcohol consumption. Per capita levels of alcohol consumption show overall increases in Canada until the mid-1970s, stabilizing until the early 1980s, and a decline until the mid-1990s. Rates have remained stable since that time (Figures 15 and 16).

Figure 15

Per capita rates of alcohol consumption and rates of property crime, Canada, 1962 to 2003

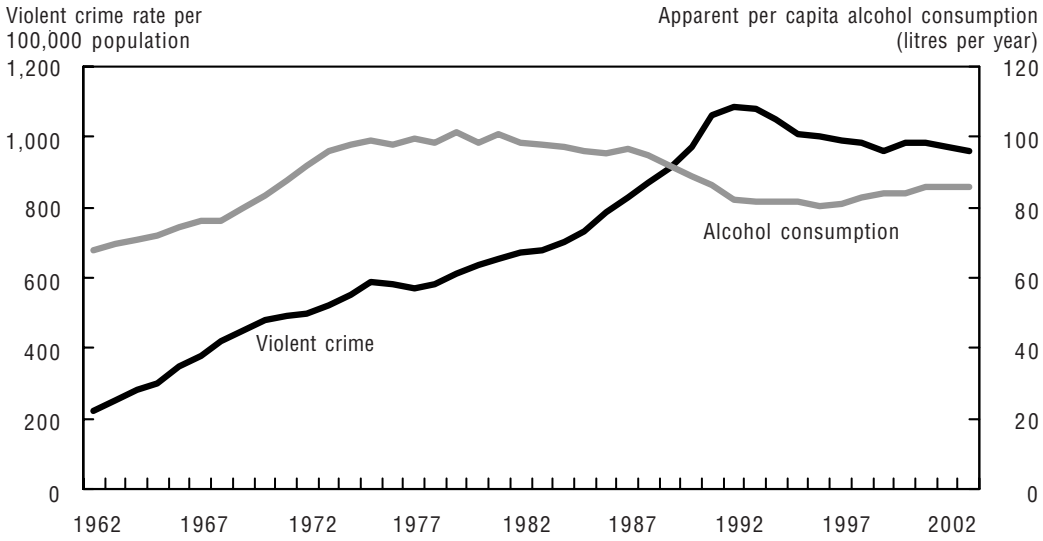


Data sources: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Center for Justice Statistics);* Control and Sale of Alcoholic Beverages in Canada, *Catalogue no. 63-202, Public Institutions Division.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 16

Per capita rates of alcohol consumption and rates of violent crime, Canada, 1962 to 2003



Data sources: *Statistics Canada, Uniform Crime Reporting Survey (Canadian Center for Justice Statistics);* Control and Sale of Alcoholic Beverages in Canada, *Catalogue no. 63-202, Public Institutions Division.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Sentencing and incarceration policies

Prisons serve a function of deterrence, incapacitation, and rehabilitation through treatment. It could therefore be argued that increases in the number of people incarcerated may contribute to declines in the crime rate through removing some offenders from society, at least temporarily, deterring others from committing crimes, and reducing criminal behaviour through effective prison rehabilitation programs. A primary focus of crime reduction efforts in the United States has been harsher prison sentences, which has resulted in an expansion of the prison system (Irwin & Austin, 1997). Incarceration rates in the US began increasing in the mid-1970s and had quadrupled by the end of the century, increasing the cost of prisons by $20 billion per year (Spelman, 2000). Much of the increase in the prison population can be attributed to the war on drugs and to harsher sentencing policies. Most states and the federal government passed legislation in the 1980s and 1990s that mandated certain offenders be sentenced under mandatory minimum or "three-strikes" laws which required them to spend lengthy terms in prison, up to life without parole (Irwin & Austin, 1997: 48). In the federal prison system, where most drug offenders are dealt with, over 60% of the prison population in the mid-1990s were serving sentences for drug offences, double the proportion in 1984.

Spelman (2000) maintains that prison expansion was responsible for up to one-quarter of the drop in violent crime in the United States and that other factors, such as improvements in the economy, changes in the age structure of the population and other social factors, were responsible for the remainder of the decline. Devine et al (1988) and Marvell & Moody (1997) also found evidence of a relationship between growth in imprisonment and declines in rates of homicide, robbery and assault in the United States. Unfortunately, it is not possible to isolate the effects of prison expansion on the crime rate — whether it was due to deterrence, incapacitation or rehabilitation, or a combination of these.

The argument that a rising imprisonment rate can help reduce crime has limited relevance to the Canadian situation where incarceration rates for both adults and youth have remained stable or declined over the past decade.[11]

Canadian courts and policy makers did not respond to drug offences in the same way and, in fact, contrary to US policies, recent changes in sentencing policy in Canada have signaled a move away from the use of incarceration. The introduction of conditional sentencing is one example: a judge can order a prison sentence of less than two years to be served in the community, subject to certain conditions (s. 742.1 *Criminal Code of Canada*). Since 1998/99, the number of conditional sentences for adults increased 33%, while the number of admissions to custody declined by 10% (Johnson, 2004). In addition, the Supreme Court Decision of *R. v. Gladue* encourages judges to consider sanctions other than imprisonment, with particular attention to the special circumstances of Aboriginal offenders, in order to address the problem of overrepresentation of Aboriginal people in correctional institutions (s. 718.2(e) *Criminal Code of Canada*). Restorative justice practices and sentencing circles are being tried, both within and beyond Aboriginal communities, particularly for young offenders, a prime focus of which is finding meaningful alternatives to imprisonment.

Explanations that focus on sentencing policies or incarceration rates as causal factors in the reduction of crime rates therefore do not apply to the same extent to Canada as they might in the United States.

Legislation

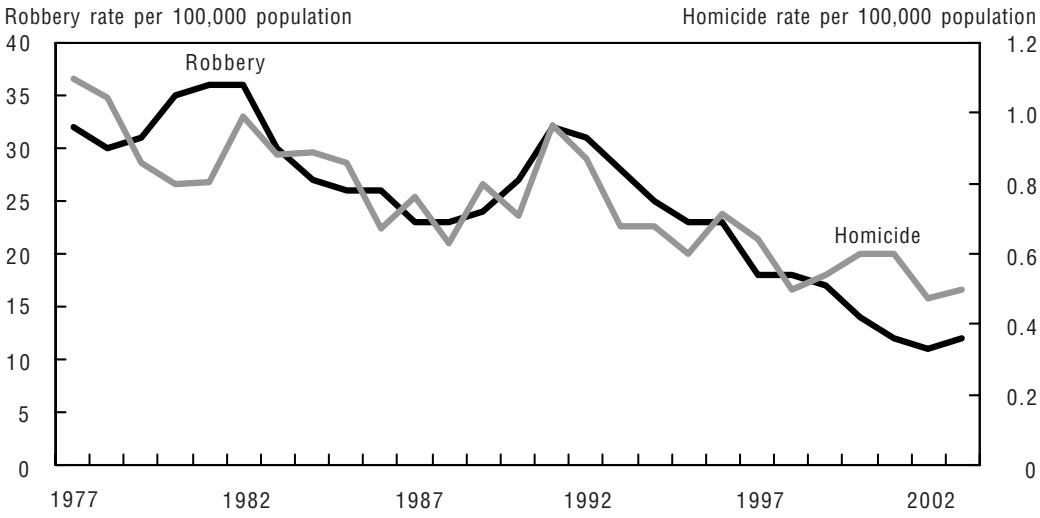
Legislative changes have the potential to affect crime rates by criminalizing certain behaviours not previously considered a crime, or by decriminalizing others. Assault and sexual assault are examples of crimes that have undergone considerable change. In 1983, Criminal Code provisions related to rape and indecent assault were replaced with three levels of sexual assault. Three parallel offences of assault also came into effect and the law was amended to permit police to lay charges where there is "reasonable and probable cause" for believing an assault has occurred. This was an important change from the pre-1983 legislation that stated that, in the absence of physical evidence such as injuries, witnesses were needed to substantiate a charge. Since that time, police and Crown prosecutors have also implemented special units and training in order to improve charging and prosecution of sexual assault and domestic violence cases. These efforts were intended to encourage victims to report to police and may have had the effect of broadening the number of crimes that were included in police statistics. Following these legislative and policy changes, rates of assault and sexual assault increased dramatically but have since declined to late 1980s levels.

Comparisons between the 1993 Violence Against Women Survey and the 1999 General Social Survey on Victimization indicated that five-year rates of spousal violence against women in a spousal relationship dropped from 12% to 8%, but that the percentage reported to the police increased during the same period from 29% to 37% (Johnson & Hotton, 2001). This may be the combined result of increased willingness to report these incidents to the police on the part of victims and zero-tolerance policies in most provinces that require police to respond by laying charges (FPT Working Group, 2003).

Important changes were also made to Canadian firearm legislation in 1969, 1977, 1991, 1995 and 1998 in an effort to reduce firearm-related injuries and death. These provisions defined restricted and prohibited weapons, instituted Firearms Acquisition Certificates, created new penalties for trafficking and smuggling and minimum sentences for offences involving firearms, and implemented a system of licensing for firearm owners. Over this time period, there has been a noticeable drop in firearm-related violent crime. Figure 17 illustrates how rates of robberies and homicides involving firearms declined between 1977 and 2003 (note different scales). The rate of robberies that were committed using firearms dropped by 62% between 1977 and 2003, while the rate of homicides involving firearms dropped by almost 100% from 1.5 to 0.5 per 100,000 population. Nevertheless, as these declines occurred simultaneously with declines in most types of crimes, other factors in addition to changes to firearms legislation are likely to have had an effect.

Figure 17

Rates of homicide and robberies involving firearms, Canada, 1977 to 2003



Data sources: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey and Homicide Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Changes to Canadian Firearm Legislation

Important changes have been made to Canadian firearm legislation in an effort to reduce the level of firearm-related injury and death, including amendments to the *Criminal Code* in 1969, 1977, 1991, 1995 and 1998. They can be summarized as follows:

1969 – Parliament enacted Bill C-150 which, for the first time, made it illegal to provide firearms to persons of "unsound mind" or convicted criminals under prohibition orders. The definition of a "firearm" was also expanded to include non-restricted, restricted and prohibited weapons.

1977 – Amendments were enacted (Bill C-51) requiring a Firearms Acquisition Certificate (FAC) prior to obtaining a firearm. The legislation also introduced a variety of provisions including regulations on safe storage and display of firearms for businesses and bona-fide gun collectors, and mandatory minimum sentences to deter the criminal use of firearms.

1991 – Parliament strengthened the screening provisions for FAC applicants (Bill C-17) including the applicant's personal and criminal history, personal references, photograph and a mandatory 28-day waiting period.

1995 – Firearms *Act* was passed which established a licensing system for persons wishing to posses firearms. Persons who met specified criteria could be licensed to possess firearms that were neither prohibited nor restricted. In addition to licensing persons, the *Firearms Act* established a system for the registration of all firearms.

1998 – Part III of the *Criminal Code* was amended to create a variety of offences relating to the unauthorized possession, transfer, importing and exporting of firearms and the use of firearms in the commission of offences.

2003 – By January 2003 all firearm owners and users were required to obtain a firearms licence and all firearms had to be registered (including non-registered rifles and shotguns).

Youth Criminal Justice Act

Youths aged 12 to 17 who come into contact with the law can be formally charged or dealt with by other means. The *Young Offenders Act*, which was in effect from 1984 to 2003, stated explicitly that "taking no measures or taking measures other than judicial proceedings… should be considered for dealing with young persons." The extent to which police and Crown prosecutors follow this directive will have had an effect on the number of young persons recorded in police statistics as "charged" over time. The *Youth Criminal Justice Act (YCJA)*, which came into force on April 1, 2003 replacing the *Young Offenders Act*, requires that police consider the use of extrajudicial (non-court) measures for less serious offences before considering a charge. The extrajudicial measures include taking no further action, informal police warnings, referrals to community programs, formal police cautions, Crown cautions and extrajudicial sanctions programs.

Comprehensive data have only become available in 2003 to assess the impact diversionary practices may have had on the number of reported incidents that are officially recorded as crimes in police statistics. More than 84,000 youths were charged with Criminal Code offences in Canada in 2003, and a further 100,000 were cleared otherwise. An incident is "cleared otherwise" when police have identified at least one accused and there is sufficient evidence to lay a charge in connection with the incident, but the accused is processed by other means.

The rate of youths charged dropped by 15% in 2003, but was more than offset by a 30% jump in the rate of youths cleared otherwise. The resulting combined rate of youths charged and youths cleared otherwise was 5% higher than in the previous year, continuing the general increase that began in 2000 (Wallace, 2004). These figures indicate that police were more likely to proceed informally than to lay a charge against young people and also suggests that the charging practices of police services adjusted in anticipation of, and in response to, the *YCJA* introduced in 2003. However, it should be noted that any increase in youths cleared otherwise may be partly attributable to increased reporting by police of youths not formally charged, due to the new *YCJA* provisions on extrajudicial measures.

Policing policy

The decline in crime rates in the United States has been noted to have occurred during a period when per capita rates of police officers on the street have increased substantially (Eck & Maguire, 2000). A possible link between increased police presence and a reduction in crime does not apply in Canada, however, where the rate of police officers per 100,000 population has dropped since 1975 (Filyer, 2002). The prevalence of private security increased in the early 1990s in Canada but declined in the later half of the decade (Taylor-Butts, 2004). It is possible that an unknown quantity of criminal incidents were detected by private security personnel but not reported to police, nor recorded in the Uniform Crime Reporting Survey. When the number of private security personnel increases, there could also be a concurrent rise in the number of criminal offences diverted from official police statistics thereby affecting the crime rate.

With respect to policing practices and policies, both Canada and the United States have undergone considerable change since the early 1980s with the introduction of community policing, problem-oriented policing, pro-arrest policies

for some types of offences, improved training, and geocoding and other technological advancements. Community policing, also known as problem-oriented policing, encourages police to work closely with communities to identify and solve problems. If crimes are then redefined as "problems" to be solved rather than as crimes to be processed formally through the criminal justice system, community policing may result in a reduction in incidents recorded in official statistics (Kennedy & Veitch, 1997). However, the opposite can also occur when community/police relations are improved to the point where victims are more comfortable reporting crime to the police.

Police policy regarding responding to minor crimes has also changed recently so that in some jurisdictions victims are required to present themselves to police before a crime will be recorded. This added inconvenience may act as a deterrent to reporting relatively minor crimes, especially property loss that is not covered by insurance. At the same time there has been an increase in the minimum deductible amount in most insurance policies.[12] The 1993 and 1999 cycles of the GSS recorded a decline in the percentage of property crime victims who reported incidents to police for the purpose of filing an insurance or compensation claim (Besserer & Trainor, 2000).

The drop in crime rates also cannot be attributed to a change in police policy to "get tough" on crime by laying charges more frequently against suspects as the rate of adults and youths charged declined between 1991 and 2003 (31% and 42% respectively)[13].

This lists just a few of the changes in policing policy that may contribute to changes in crime rates. American researchers have noted that it has been difficult to substantiate a link between crime rates and police policies because crime rates had already begun to decline in many areas prior to innovations in policing, because other conditions were changing simultaneously, and because declines occurred in cities without significant changes to policing policy (Eck & Maquire, 2000; Rosenfeld, 2004). One general observation that can be made is that crime rates declined in Canada at a pace comparable to the United States without similar increases in criminal justice budgets, police strength or rates of incarceration.

Drug markets

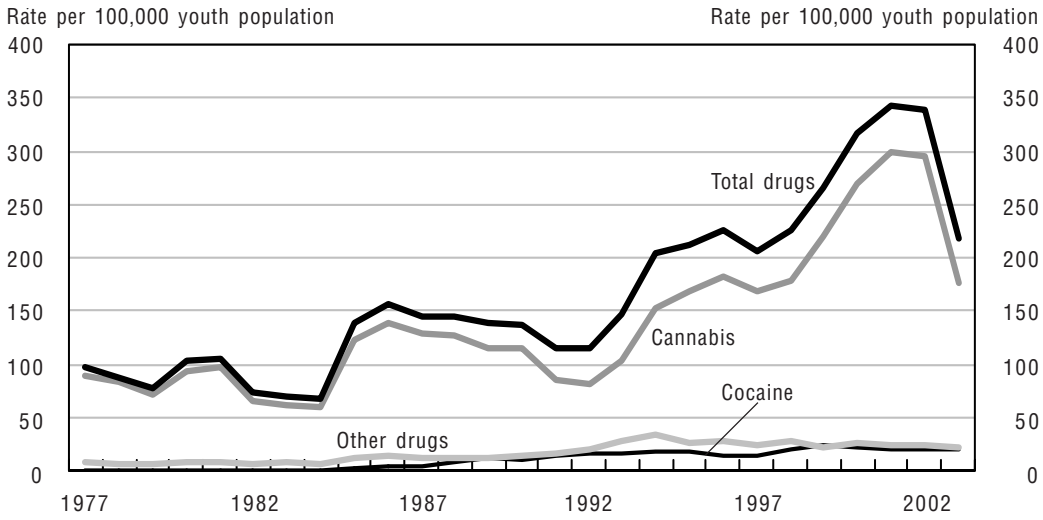
In the United States, the rapid rise and subsequent decline in violent crime rates has been attributed to the rise and fall of the drug market and crack cocaine in particular, a situation that did not take hold to the same extent in Canada. Much of the growth in crime in the U.S. resulted from the recruitment of young people into the crack cocaine markets, who were armed against rival dealers, and the resulting spill-over violence (Johnson et al, 2000; Rosenfeld, 2004). Some analysts attribute the decline in the U.S. drug markets to police crack-downs and to a shift in attitudes among youth that amounted to a rejection of drugs, and the violence and the degenerate lifestyle it engendered (Johnson et al. 2000; Grogger, 2000).

In Canada, rates of youth and adults charged with cocaine offences rose between 1981 and 1991 but declined slightly and have leveled off since then (Figures 18 and 18a). The greatest increase over the past decade has been for youth charged with cannabis-related offences. Despite the increase in youth charged with cocaine offences throughout the 1980s, their overall volume was low, especially when

compared to cannabis offences. Furthermore, the rate of youth charged with cocaine offences has remained relatively stable throughout the 1990s while the crime rate has declined.

Figure 18

Rate of youth charged with drug offences, Canada, 1977 to 2003

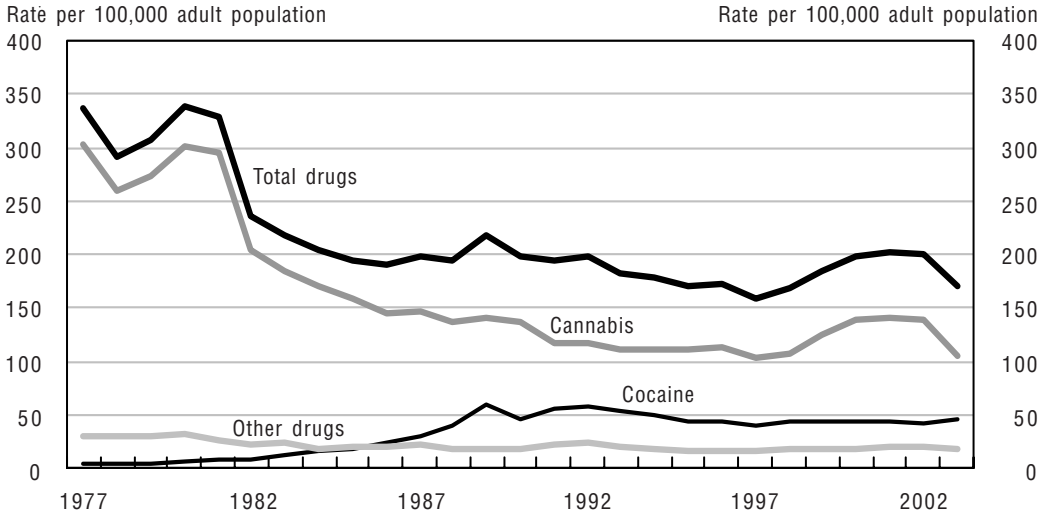


Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 18a

Rate of adults charged with drug offences, Canada, 1977 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Social attitudes

Some writers have argued that, following the permissive era of the 1960s and 1970s, there has been a noticeable change in certain social values, including growing respect for social institutions, a growing aversion to interpersonal violence and a "civilizing" trend (Ouimet, 2002a; Rosenfeld, 2000; LaFree, 1999). Levels of alcohol consumption within a population are one example of changing social values. In Canada, there have been reductions in both alcohol sales (a reflection of consumption patterns) and impaired driving, which reflects positive shifts toward drinking in moderation and reduced societal tolerance for driving while intoxicated. Rates of persons charged with impaired driving offences have declined since 1981 (Janhevich et al, 2003). Tougher penalties and reduced tolerance for impaired driving may have had a generalized effect of reducing excessive drinking both in public and private places. According to polls commissioned by the Traffic Injury Research Foundation, the percentage of Canadian drivers who admitted to driving when they thought they were over the legal limit declined by 33% in the 1980s. The percent of fatally injured drivers with blood alcohol concentration over the legal limit also dropped by 27% in the 1980s and by a further 10% in the 1990s (Beirness et al., 2001). This apparent shift in public attitudes toward more responsible drinking may have helped reduce the occurrence of other crimes, such as assaults and homicide, which often occur in the context of alcohol abuse.

An example of changing attitudes with respect to the equality of women is provided by a recent Environics poll which measured a decline from 42% to 18% of the population between 1983 and 2000 who agreed with the statement "the father of the family must be master in his own house." Elderly Canadians were more likely to agree with this statement than were younger adults, suggesting a cohort effect where younger generations are less likely to adhere to this belief and more likely to share beliefs in women's equality in the family. This change in attitudes toward women's equality occurred during a time of declining rates of spousal assault reported to victimization surveys (Johnson & Hotton, 2001) and declines in spousal homicide rates (Pottie Bunge, 2002). Shifts in attitudes toward a reduced tolerance for partner violence have been the impetus for the growth in services for victims, training for police and prosecutors, specialized domestic violence courts, treatment programs for abusers, and primary prevention programs for youth. These factors, in addition to improvements in the economic and social equality of women and the changing nature of intimate relationships[14], have been identified as important factors behind the declines in spousal homicide in both Canada and the United States (Pottie Bunge, 2002; Dawson 2001; Dugan et al 1999).

One area where there is evidence of a negative shift in public attitudes is in adolescent drug use. The Ontario Student Drug Use Survey (OSDUS), operated by the Centre for Addiction and Mental Health, has been mapping trends in adolescent drug use in Ontario on a biannual basis since 1977 (Adlaf & Paglia, 2003). After a lengthy period of decline during the 1980s, there has been a resurgence in adolescent drug use, although not to 1970s levels. Adolescent use of the following substances was higher in 2003 than in 1989: cannabis, hallucinogens, solvents, cocaine, crack, methamphetamine and PCP. The only drugs to decline in use were LSD and stimulants (Table 2). Thirty percent of students reported using an illicit substance during the previous 12 months in 2003 compared to 17% in 1989. These patterns of drug use parallel trends in charges laid against youth for drug offences between 1989 and 2003.

Table 2

Percentage of Ontario students using drugs at least once during the past 12 months, Grades 7, 9, 11 only

	1979	1989	2003	1989 to 2003 change
Tobacco	35.0	22.2	17.4	-4.8
Alcohol	73.7	62.6	62.9	0.3
Cannabis	29.1	11.9	27.8	15.9
Glue	4.9	2.0	3.2	1.2
Other solvents	7.2	3.4	6.6	3.2
Barbiturates	7.4	2.1	2.7	0.6
Heroin	2.5	1.2	1.4	0.2
Methamphetamine	3.7	2.5	3.6	1.1
Stimulants	11.0	5.8	5.4	-0.4
Tranquillizers	5.8	2.2	2.3	0.1
LSD	9.0	5.4	2.9	-2.5
Other hallucinogens	5.2	3.8	9.5	5.7
Cocaine	5.3	2.4	5.1	2.7
PCP	..	1.2	2.0	0.8
Crack	..	1.3	3.0	1.7
Ice	..	..	1.2	..
Ecstasy	..	..	3.8	..
Any illicit substance	33.4	16.6	30.3	13.7

.. Not available for a specific reference period.

Data source: *Adlaf, E. & A. Paglia (2003)* Drug Use Among Ontario Students: Findings from the OSDUS, *Centre for Addiction and Mental Health.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Not only has drug use by adolescents increased, there has also been a notable reduction since 1989 in the perceived risk of harm in drug use and reduced levels of disapproval of drug use (Adlaf & Paglia, 2003). The percentage of students in grades 7, 9 and 11 who perceived *great risk* in drinking one or two drinks daily, trying cocaine, trying marijuana, and smoking marijuana regularly all dropped considerably during the 1990s (Table 3). The largest drop was in the percentage of students who felt that regular use of marijuana posed a great risk of harm, from three-quarters to 57%. The percentage who *strongly disapproved* of these activities also declined (Table 4). The exception was trying LSD once or twice, for which an increased percentage of students stated their disapproval. On the positive side, these adolescents reported a significant decline in drinking and driving, despite increases in alcohol consumption (Adlaf & Paglia, 2003).

Table 3

Percentage of Ontario students who perceive great risk in using drugs, Grades 7, 9, 11 only

	1989	1999	2003	1989 to 2003 change
Drinking 1 or 2 drinks daily	36.2	32.5	30.9	-5.3
Trying cocaine once or twice	36.7	32.5	31.6	-5.1
Trying cannabis once or twice	29.1	19.4	19.9	-9.2
Smoking marijuana regularly	75.4	53.2	56.5	-18.9
Trying LSD once or twice[1]	..	28.8	30.5	1.7

.. Not available for a specific reference period.

1. Refers to 1999 to 2003.

Data source: *Adlaf, E. & A. Paglia (2003)* Drug Use Among Ontario Students: Findings from the OSDUS, *Centre for Addiction and Mental Health.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Table 4

Percentage of Ontario students who strongly dissapprove of drug use, Grades 7, 9, 11 only

	1989	1999	2003	1989 to 2003 change
Drinking 1or 2 drinks daily	29.7	28.2	28.0	-1.7
Trying cocaine once or twice	50.6	41.1	43.7	-6.9
Trying cannabis once or twice	43.1	28.2	29.6	-13.5
Smoking marijuana regularly	62.5	44.9	47.8	-14.7
Trying LSD once or twice[1]	..	39.8	44.1	4.3

.. Not available for a specific reference period.

1. Refers to 1999 to 2003.

Data source: *Adlaf, E. & A. Paglia (2001)* Drug Use Among Ontario Students: Findings from the OSDUS, *Centre for Addiction and Mental Health.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figures 18 and 18a show that, in contrast to violent and property offences, the rate of persons charged with drug offences, primarily cannabis, has increased since 1993. Most of this increase has involved young offenders (Figure 18). Between 1985 and 2002, the rate of youth charged by police with drug offences climbed 149% compared to just 2% for adults. Rates of drug crimes are more sensitive than most to police policies and decisions to target or "crack down" on drug possession and trafficking. Changes in policies can influence fluctuations in persons charged by police. In fact, this was the case most recently when, following nearly a decade of increases, the rate of drug crimes in Canada fell by 8% in 2003 (Wallace, 2004). A large drop in cannabis offences was mainly responsible for this decline. This drop may in part be the result of a climate of uncertainty within the law enforcement and criminal justice community given the introduction of legislation to decriminalize possession of small amounts of cannabis, as well as a number of court rulings over this time period questioning the constitutionality of current laws regarding cannabis possession, rather than the result of an actual decrease in drug crimes.

Other societal factors

A number of other societal factors can operate to affect crime rates. A few will be briefly discussed here, including:

1) changes in educational attainment and school drop-out rates
2) changing marital patterns and family structures
3) work patterns

Educational attainment

Levels of educational attainment among Canadians have improved which may have had a positive effect on overall crime rates. Poor attachment to school and low academic achievement are associated with increased risk of delinquency, substance abuse and gang involvement. A positive school experience may act as a protective factor for youth who have other risk factors for delinquency (Fitzgerald, 2003; Bjerregard & Smith, 1993; Sprott, Jenkins & Doob, 2000). The percentage of men and women aged 15 and older with at least some post-secondary education almost doubled between 1971 and 1996, from 17% to 31%. In addition, high-school drop-out rates declined between 1991 and 1999 from 22% to 15% of males and from

14% to 9% of females.[15] Combined with other factors, these improvements in educational achievement may have helped keep young people in school and oriented toward future employment rather than involvement in crime.

Family structure

Family structures have undergone important changes in Canada in recent years, which may have had an effect on crime rates. The divorce rate in Canada increased until 1987 then declined. The number of common-law unions and second marriages has increased resulting in greater numbers of step and blended families. The number of lone parent families in the population doubled between 1961 and 1996 (Statistics Canada, 2000). These trends have resulted in a growing number of children experiencing divorce, single parent families and financial uncertainty, factors that increase the risk of delinquency (Fitzgerald, 2003; Coughlin & Vuchinich, 1996). While the relationship between family structure and delinquency is not clear, single parents are more likely than dual parents to have greater levels of stress and greater financial instability, factors that increase the risk of delinquency in children in these families (Lipman et al. 2002).

If all other conditions were equal, based on these trends, crime rates might have been expected to rise, not fall. However, another situation that contributes to single parent families is the number of children born to teenage mothers and these rates have dropped by more than half between 1961 and 1997 (Statistics Canada, 2000). Young single women are the lone parents who are at particularly high risk due to the multiple social and economic difficulties they face. Children in lone parent families are therefore decreasingly likely to be in families headed by very young women and, as a result, the economic status of children in lone parent families overall has risen (Statistics Canada, 2003).

Furthermore, in addition to becoming increasingly involved in common-law unions, women and men have both been delaying entry into first marriage. The average age of first marriage in 2000 was 28 years for women and 30 years for men (Statistics Canada, 2003a). This is considerably older than two decade ago when the average age of women at first marriage was 22 years of age and 24 years for men. According to Dugan et al (1999) and Rosenfeld (1997, 2000), declining marriage rates among young people (age 20 to 29) has had a significant impact on declining rates of lethal violence for both married women and men. It is argued that delayed first marriages may mean that there is greater selectivity when choosing an intimate partner thereby reducing the proportion of violent relationships among intact marriages. However, the authors also suggest there may be a substitution effect in that falling marriage rates may produce increases in homicides between non-marital partners.

Work patterns

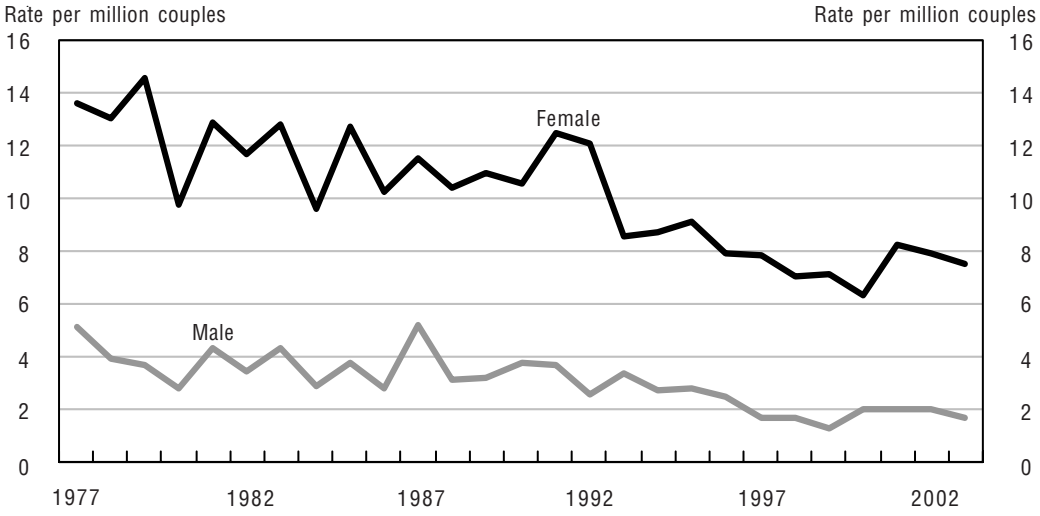
According to routine activity theory, crime is more likely to occur when there is a convergence of three factors: a motivated offender, suitable targets and an absence of capable guardians. Cohen and Felson (1979) argue that the dispersion of activities away from the home increases the opportunity for crime and that the growth in women's labour force participation and in single person households during the post-

World War II period helped explain the rise in crime at that time. As households were increasingly likely to be left vacant during the day, and women and unmarried people exposed themselves to potential victimization outside the home, rates of household burglary, theft and violence rose accordingly. Although women are no less likely to be in the labour force today, there is somewhat of a reversal to this trend with a growing number of homes occupied during the day due to home-based work and retirements. Under these circumstances, guardianship over household property is expected to rise and property crimes in particular can be expected to decline.

Williams and Holmes (1981) have argued that increasing participation of women in the workforce has influenced trends in violent victimization, particularly in the case of family violence. Often referred to as the ameliorative hypothesis, it is argued that as women's labour force participation and economic independence increases, rates of lethal victimization will decrease because women will have the financial means to leave an abusive relationship before it turns lethal. Over the past three decades rates of spousal homicides for women and men have declined quite significantly in Canada (Figure 19), and research has found that part of this decline is attributable to women's increasing socio-economic status (Pottie Bunge, 2002).

Figure 19

Rates of spousal homicide, Canada, 1977 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Crime Trends in Western Canada and the North

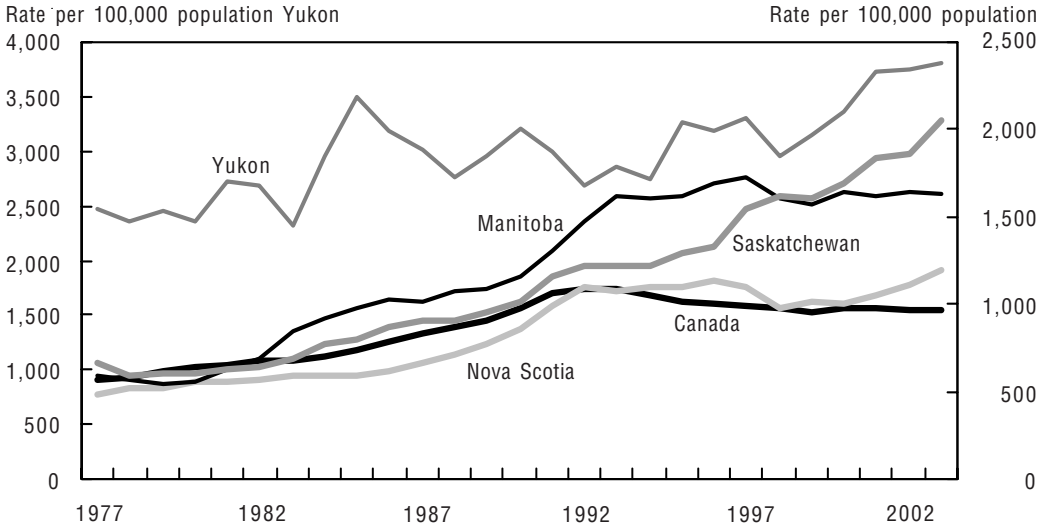
In the preceding section a number of factors were considered at the national level which may have had an effect on overall crime patterns throughout the 1990s. The following section examines provinces where crime rates have increased, counter to the national trend. It explores possible relationships between provincial crime rates, policies and socio-demographic factors.

Trends in Western Canada and the North

Historically, crime rates have tended to be highest in the territories and higher in the Western provinces than in the East.[16] This was the case in Saskatchewan, the Yukon Territory and Manitoba in particular[17] (Figure 20).

Figure 20

Rates of violent crime, selected provinces and territories, 1977 to 2003



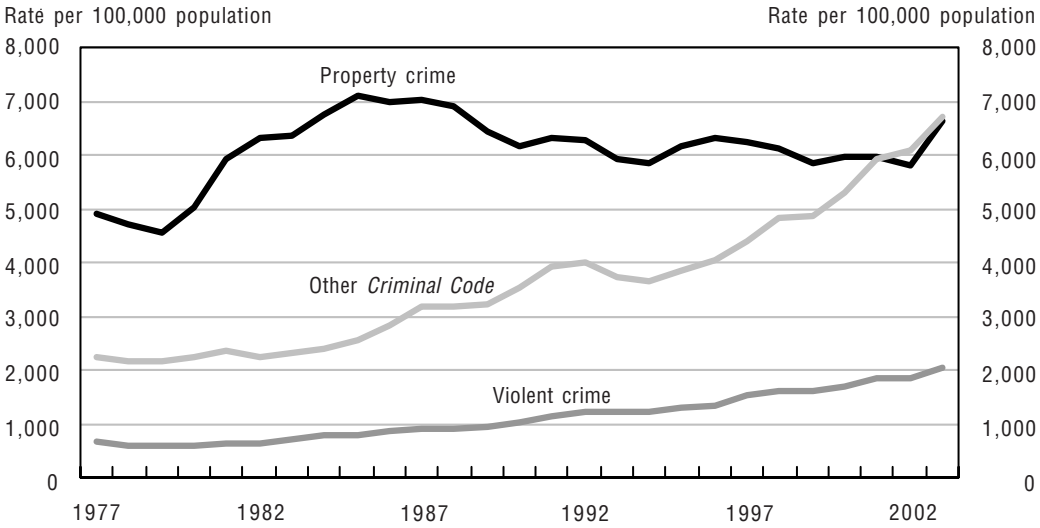
Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*
Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

In Saskatchewan, violent crime and other Criminal Code offences both increased throughout the 1990s during a time of general decline in most other provinces (Figure 21). Between 1991 and 2003 crime in Saskatchewan increased by 35%. This was driven primarily by an increase in other Criminal Code offences (70%), particularly a 199% increase in bail violations and an 81% increase in disturbing the peace (Figure 22). Violent crime, mainly assault and robbery, increased

during this time period as well (78%). There was also a significant increase in the rate of motor vehicle thefts (116%) reflecting significant increases in rates of motor vehicle theft in Saskatoon (up 115%) and Regina[18] (up 129%) (Table A3).

Figure 21

Rates of *Criminal Code* incidents in Saskatchewan, 1977 to 2003

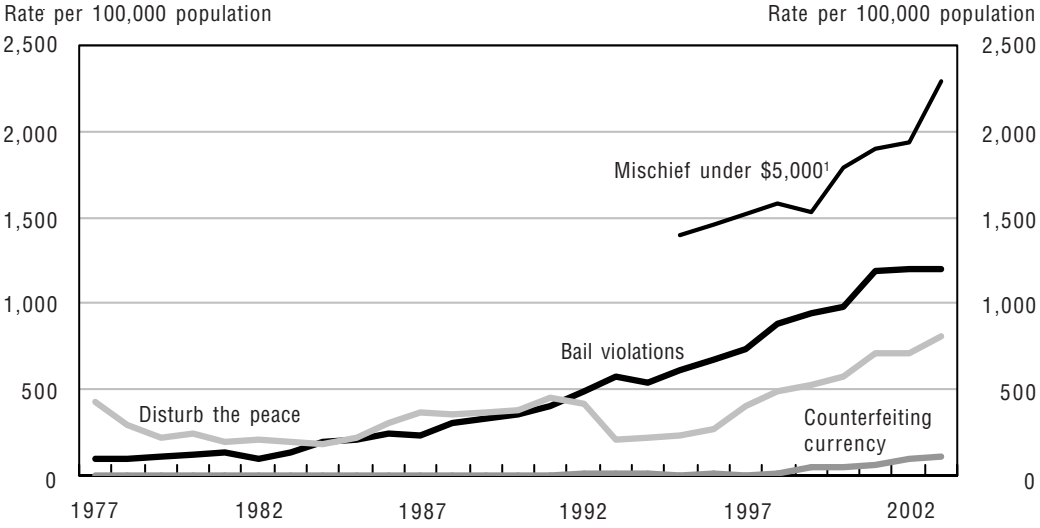


Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 22

Rates of other *Criminal Code* offences, Saskatchewan, 1977 to 2003



1. From 1977 to 1984, the dollar value attached to this offense was $200 and under. From 1985 to 1994, the dollar value was increased to $1,000 and under, and from 1995 onwards, the dollar value is $5,000 and under. Due to the changing dollar values defining this offense, data are presented from 1995 onwards.

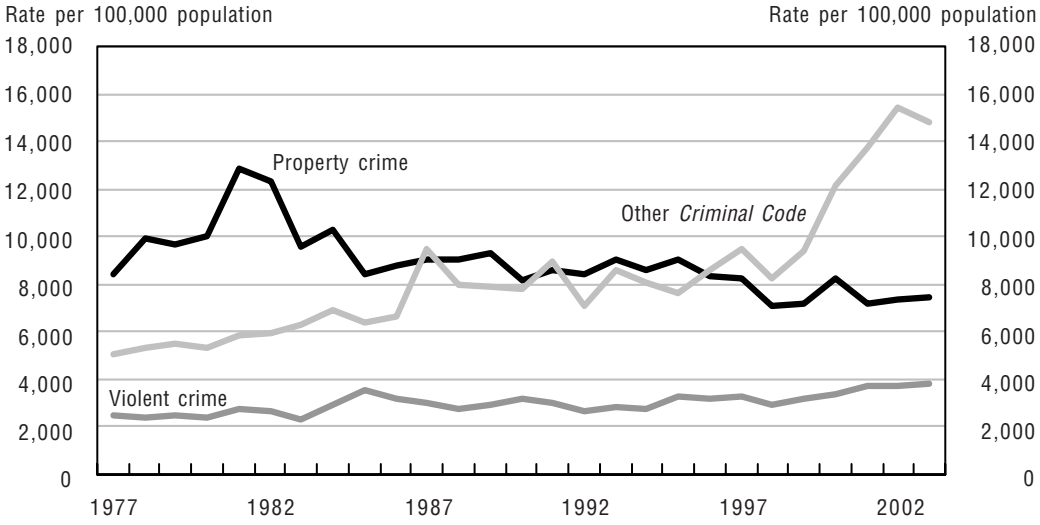
Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Between 1991 and 2003, a 27% increase in crime was recorded in the Yukon Territory. Again, the main drivers were increases in other Criminal Code offences, primarily a 230% increase in bail violations and a 141% increase in disturbing the peace, and to a lesser extent violent crime (up 27%) (Figure 23).

Figure 23

Rates of *Criminal Code* incidents in Yukon Territory, 1977 to 2003



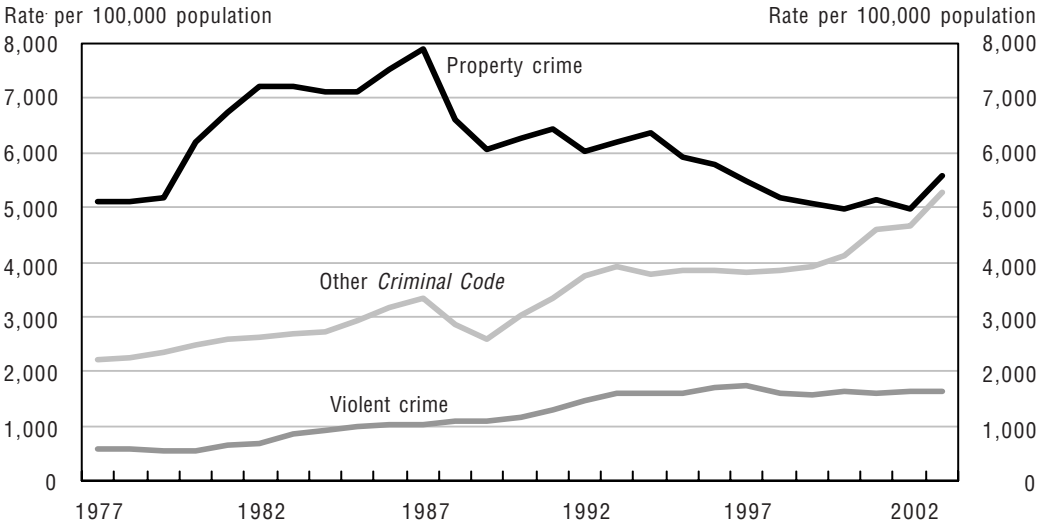
Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*
Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

In Manitoba, the overall increase in crime was less pronounced; a 13% increase was recorded between 1991 and 2003. Again, this was predominately driven by an increase in other Criminal Code offences (58%) and to a lesser extent, violent crime (24%) (Figure 24). While property crime decreased in Manitoba between 1991 and 2003 (down 13%), there was a 239% increase in motor vehicle thefts. This was driven primarily by increases in rates of motor vehicle theft in Winnipeg[19] (301%) (Table A3).

Studies in the United States have shown that the largest increases and subsequent declines in violent crime have been in large metropolitan areas (Blumstein, 2000). In contrast to the US, there have been no such distinct patterns in Canadian crime data. The largest cities do not have the highest per capita levels of crime and have not experienced the greatest crime drops. Smaller cities, like Winnipeg, Regina and Saskatoon have higher crime rates than larger cities like Toronto and Montreal (see Table A4). And, although most cities witnessed substantial declines throughout the 1990s, some, like Winnipeg, Regina and Saskatoon, have seen increases over the past decade (Figure 25).

Figure 24

Rates of *Criminal Code* incidents in Manitoba, 1977 to 2003

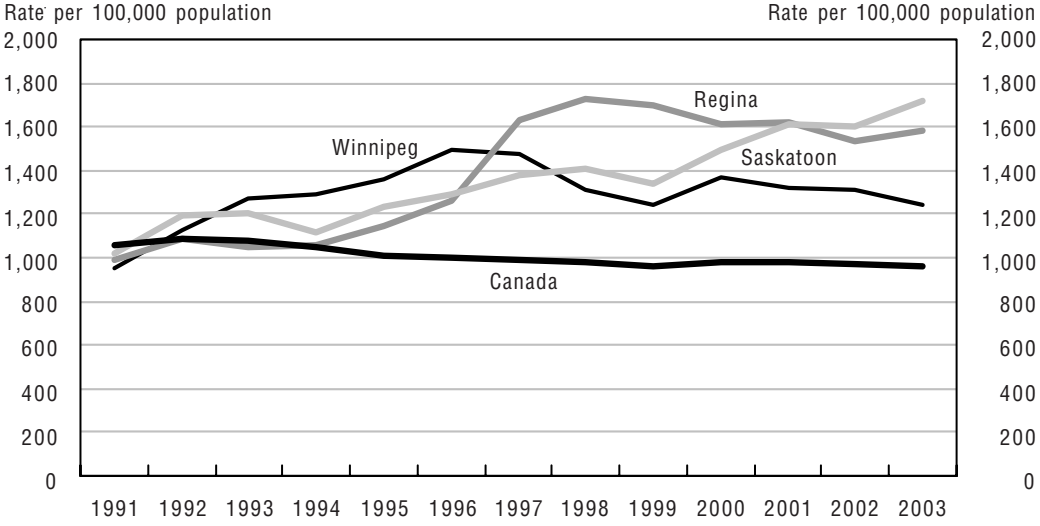


Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Figure 25

Rates of violent crime in selected CMAs, 1991 to 2003



Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

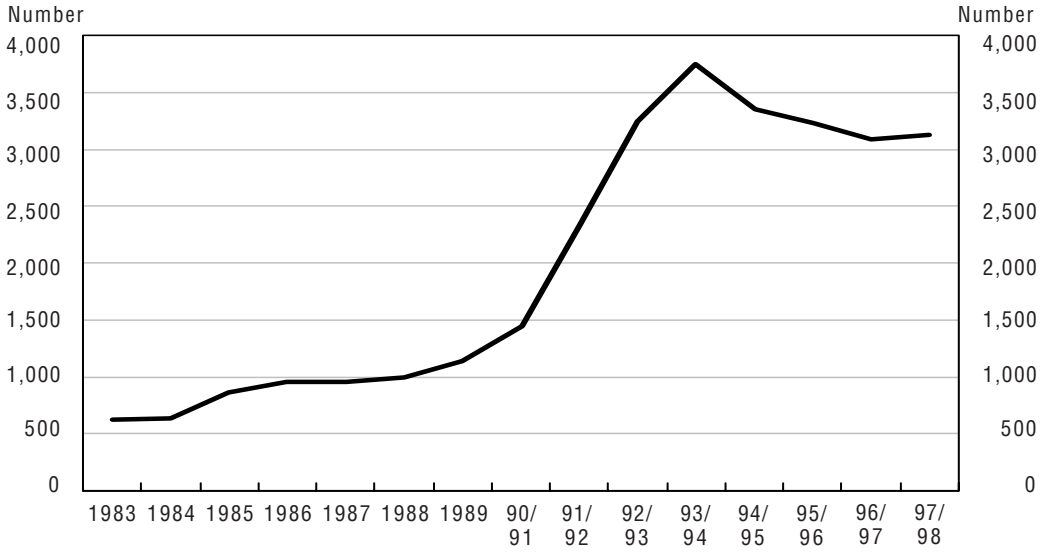
Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Criminal justice policies

Criminal justice policies and policing practices are factors that can influence variations in crime rates by jurisdiction. As an example, Figure 26 illustrates the effect that policies relating to family violence can have on crime rates in one jurisdiction. In the early 1990s, Manitoba developed a specialized criminal justice system response to family violence cases comprised of five components: (1) a pro arrest policy; (2) a women's advocacy and child victims witness program; (3) a specialized prosecutorial unit; (4) specially designated court rooms and dockets for intake, screening court and trials; and (5) a special probation unit to deliver court-mandated treatment programs. The effect of this initiative has been a threefold increase in the number of charges laid in spousal violence by Winnipeg police after the introduction of Family Violence Courts in that city. This may have been a significant contributor to the overall violent crime rate not seen to the same extent in other provinces. Special Domestic Violence Courts have recently been implemented in Calgary, Whitehorse and a number of cities in Ontario but trend data are not yet available to assess their impact.

Figure 26

Increase in number of charges laid in spousal assault cases in Winnipeg, 1983 to 1998



Data source: *Ursel, 2000.*

Figure source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Regional differences in crime rates can sometimes be due to differences in diversionary practices and in the manner in which crimes are recorded in official statistics. A comparative study of Calgary and Edmonton in 1990 revealed that police completed an occurrence report in 80% of calls to police in Calgary compared to 94% in Edmonton (CCJS, 1990). Part of the reason for the higher crime rates in Edmonton at that time could therefore be attributed to differences in administrative procedures for recording incidents that came to the attention of the police, especially minor crimes. Similar comparative analyses have not yet been made to the same extent in other areas of the country, however some of the variability in provincial

and territorial rates of crime is likely due to differences in police reporting practices, particularly with regard to high-volume offences such as disturbing the peace, where police have more opportunity to exercise discretion[20].

Programs to assist youth and other high-risk groups, services for victims and other interventions also vary among jurisdictions, in part because of variations in resources available to support such initiatives. This can lead to geographic differences in criminal justice processing and in outcomes for those who are involved, or at risk of becoming involved, in the justice system.

Economic and social characteristics

Variations in demographic and economic conditions within provinces may influence crime patterns in various jurisdictions. An examination of overall trends in unemployment rates, age composition and education levels does not reveal any discernable pattern that would distinguish Manitoba, Saskatchewan and the Yukon Territory from Eastern Canada (provinces which have traditionally had lower crime rates).

Since the early 1990s, rates of unemployment in Manitoba and Saskatchewan have been relatively low compared to Canada overall and particularly the East. For example, in 2002 the unemployment rate in Manitoba was 5.1% and 5.7% in Saskatchewan[21]. This was lower than the national average (7.7%) and considerably lower than unemployment rates in Newfoundland and Labrador (16.6%).

While the percentage of young people (15 to 24 years of age) in Saskatchewan was amongst the highest in the country (15%) in 2002, Alberta also had similar demographics - 15% of its population in 2002 was 15 to 24 years of age. In fact, Saskatchewan and Alberta have had comparable youth populations throughout the past decade but have not had comparable rates of youth crime. The percentage of young people in Manitoba has also been somewhat lower than Newfoundland and Labrador over the past decade.

Furthermore, in Manitoba and Saskatchewan, the percentage of individuals with a university degree is comparable to Eastern Canada (except Newfoundland and Labrador where the percentage is lower). For example, in 2002, 12% of people living in Saskatchewan had a university degree. This was similar in Prince Edward Island and New Brunswick and has been over the past decade. The percentage of the population with a university degree in Manitoba and Nova Scotia has also been comparable over the past decade.

Rates of inflation, on the other hand, tended to be somewhat higher in Manitoba and Saskatchewan. For example, the average rate of inflation in Manitoba and Saskatchewan between 1990 and 2002 was 2.5%, while the average rate in the Atlantic Provinces ranged from 2.1% to 2.3%. Rates of inflation in Whitehorse[22] have been lower than the national average (average rate of 2.1% between 1990 and 2002) while rates in Alberta have tended to be higher (average rate of 2.7% since 1990).

Another possible explanation for the disparity in patterns of crime in Saskatchewan and Manitoba compared to other parts of Canada is the fact that these provinces are home to a larger proportion of Aboriginal people, and, as La Prairie (2002) explains, a group of Aboriginal people who have higher levels of social disadvantage than Aboriginal people in other parts of the country.

La Prairie (2002) compares nine Canadian cities on the socio-demographic characteristics of the Aboriginal and non-Aboriginal populations living there and found that regional disparities are more extreme for the Aboriginal than for the non-Aboriginal populations. Higher levels of social disadvantage were identified for Aboriginal people living in the Prairie cities of Saskatoon, Regina, Winnipeg and the Ontario city of Thunder Bay, compared to cities in British Columbia, Ontario and Nova Scotia. Aboriginal populations in the Prairie cities and Thunder Bay are the largest, youngest, least educated, poorest and most mobile compared to the others. Registered Indians fared worse than other Aboriginal people, but only in the Prairie cities and Thunder Bay. Registered Indians in the other cities are socio-economically more similar to non-aboriginal groups than to other Aboriginal people. Armstrong (1999) finds similar patterns of disadvantage for Aboriginal people living on reserve in these provinces.

These highly disadvantaged populations live predominantly in areas with the highest levels of over-representation of Aboriginal people in the criminal justice system (CCJS 1998; CCJS 2000). In addition, Winnipeg, Saskatoon and Regina have inner city areas where the Aboriginal population comprises 25% or more of the total population. Examining the proportions of Aboriginal people who live in very poor areas in these cities, La Prairie (2002) found that 41% of Aboriginal people in Winnipeg, 30% of those in Saskatoon and 27% of those in Regina live in very poor inner city areas, 3 to 4 times the percentage of non-Aboriginals. Cities or communities populated by disadvantaged minority groups tend to have low levels of social cohesion and informal social control among residents which can help avert or prevent crime (Sampson & Raudenbush, 2001).

Geographic mobility

Hartnagel (1997) suggests that higher crime rates in the Western Provinces can be explained in part by the greater geographic mobility in the West that can work against informal community control mechanisms. Additionally, the degree to which communities are willing to reintegrate marginal people back into society following a criminal conviction may vary across the country leading to differences in rates of re-offending (Hackler, 2003). Statistics Canada data show some variation in provincial in-migration across the country and over time. All provinces show declines in inter-provincial in-migration since 1972; however, migration into Alberta continued into the 1980s and has increased in recent years in that province yet they have not experienced a significant increase in crime.

Victims' reactions to crime

Just as police policies and reactions to crime can vary across the country, variations may exist in victims' reactions to crime and their willingness to report criminal incidents to the police. In the 1999 GSS, crime victims in Manitoba (44%) and Saskatchewan (40%) were more likely than those in other provinces (37% nation-wide) to report these events to the police, and victims in Newfoundland and Labrador were least likely (30%). With respect to the most serious crimes,[23] victims in Newfoundland and Labrador, New Brunswick, Quebec and British Columbia reported to police at lower than average rates which would have the effect of lowering the number of recorded crimes in those provinces relative to others.

Statistical relationships between crime trends and major socio-economic trends[24]

The following section examines the statistical relationships between changes in crime rates and a number of macro-level socio-demographic and economic trends. The focus is on four major crime types over the period 1962 to 2003: homicide, robbery, break and enter and motor vehicle theft. These offences were chosen for time series analysis because they have been consistently reported to the Uniform Crime Reporting Survey (UCR) over time and are less likely than other types of offences to be subject to changes in legislation and police charging practices (as is the case with offences such as sexual assault, assault, drug offences and prostitution) or the reporting behaviour of victims. Furthermore, we postulate, as others have (Cantor & Land, 1985), that different crimes are influenced by different factors. In order to accommodate differences in the relationship between the independent variables and crime, specific crime types are examined as opposed to overall rates of violent crime or property crime.

The statistical method chosen for this study was time series analysis. This method has been employed by a number of other researchers to investigate the link between specific crime types, economic and demographic change (LaFree, 1999; LaFree et al, 1992; Cohen & Land, 1987). Time series analysis is used in this report because variables in the analysis are time-ordered (for example, trends in crime rates and unemployment rates). This method has the advantage of being able to take account of what happened in the preceding year or two as well as to make current year comparisons among variables. This allows the flexibility to address important questions, such as whether unemployment rates are correlated with crime rates in the current year or after a lag of a year or two.

A primary limitation of time series analysis is that it can include only those factors that have been measured and recorded annually over many time points. This necessarily eliminates the primary source providing statistical data on characteristics of the population, the Census, which is conducted every five years. There are some important exceptions, such as age and sex of the population, which are available annually through intercensal estimates. Table 5 lists the wide range of socio-demographic and economic indicators considered for this analysis, as well as the source and the time period for which they are available.

It is also important for time series analysis that all variables are available in an identical and lengthy time period. Unfortunately, potentially important measures such as lone parent families and a number of economic indicators, including low-income, the percentage of families receiving employment insurance and social assistance are available only from 1980 onward. As a longer time series was needed to yield reliable estimates, analysis was restricted to those variables available for the

years relatively consistent with UCR crime rates: 1962 to 2003. These variables are marked in Table 5 with an asterisk. This longer time series provides the maximum number of degrees of freedom and hence more robust time series models.

Table 5

Variables considered for analysis

Variable	Data source	Time period[1]
Socio-demographic factors		
Age distribution of the population*	Census and intercensal estimates	1962 to 2003
Percentage of families headed by lone parents	Survey of Consumer Finances and Survey of Labour and Income Dynamics	1980 to 2002
Percent of children born to teenage mothers (lag of 15 years)	Vital Statistics	1960 to 2002
Divorce rate	Vital Statistics	1971 to 2002
Percentage of population age 15 and over with high school graduation	Labour Force Survey	1990 to 2004
Per capita alcohol consumption*	Food Consumption in Canada	1960 to 2003
Provincial in-migration rates	Annual Demographic Statistics	1972 to 2004
Economic conditions		
Unemployment rates*	Labour Force Survey	1962 to 2004
Long-term unemployment	Labour Force Survey	1976 to 2004
Help wanted index (indicator of jobs available)	Labour Force Survey	1981 to 2000 (terminated)
Percentage of individuals living under low income cut-offs	Survey of Consumer Finances and Survey of Labour and Income Dynamics	1980 to 2002
Percentage of families living under low income cut-offs	Survey of Consumer Finances and Survey of Labour and Income Dynamics	1980 to 2002
Percentage of lone parent families living under low income cut-offs	Survey of Consumer Finances and Survey of Labour and Income Dynamics	1980 to 2002
Percentage of families receiving employment insurance	Labour Force Historical Review	1980 to 2002
Percentage of families receiving social assistance	Labour Force Historical Review	1980 to 2002
Gini index of income inequality	Survey of Consumer Finances and Survey of Labour and Income Dynamics	1980 to 2002
Inflation*	Consumer Price Index	1962 to 2004

* Variables included in the time series models due to data availability over an extended time period.

1. While some of the independent variables are available prior to 1962, analysis was restricted to those variables available for the years relatively consistent with UCR crime rates: 1962 to 2003.

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Description of variables

Crime rates

The primary source of information on crime trends in Canada is Statistics Canada's Uniform Crime Reporting (UCR) Survey. Since 1962, all police departments across the country have supplied the following summary statistics to the UCR Survey:

1) criminal offences known to the police;
2) unfounded offences (deemed not to be a crime following police investigation);
3) actual criminal offences (those deemed founded);
4) the number cleared by charge and cleared otherwise; and
5) the number of adults and youth charged.

Socio-economic variables

The predictor variables in this analysis were selected on the basis of their relevance to the criminological explanations for crime summarized earlier in this report, as well as their availability in a time series to 1962. These include the age structure of the population, unemployment, inflation and per capita alcohol consumption.

Age structure of the population:

The age composition of the population is one of the most prominent explanations for changes in crime rates. To test the relationship between crime patterns and age, the percentage of the population 15 to 24 and 25 to 34 years of age will be included in this analysis. Data for age are derived from the average of quarterly population estimates and the estimates of population in certain age groups used by the Labour Force Survey (LFS uses the estimates obtained from the Census). These estimates are adjusted for any under coverage and population growth.

Unemployment:

Unemployment rates are derived from the Labor Force Survey. This survey covers approximately 98% of the population and excludes residents of the Yukon, Northwest Territories and Nunavut, persons living on Indian Reserves, full-time members of the Canadian Armed Forces and inmates of institutions. Unemployed persons are defined as those persons who were available for work and were either on temporary lay off, had looked for work in the past 4 weeks or had a job to start within the next 4 weeks. The unemployment rate excludes discouraged workers who are available to work but are no longer actively seeking employment.

Inflation:

Inflation is derived from the Consumer Price Index (CPI) and is simply the year-over-year difference in the CPI expressed as a percentage of the previous year. Inflation occurs when there is an upward movement in the average level of prices.

Per capita levels of alcohol consumption:

Per capita levels of alcohol consumption is based on disappearance of alcohol in Canada (expressed in litres) divided by the total population. Alcohol disappearance is derived from the Control and Sale of Alcoholic Beverages in Canada (Public

Institutions Division). In the absence of long term data identifying drinking patterns among Canadian adults, alcohol disappearance is used as a proxy for alcohol consumption; consumption being defined as disappearance minus wastage. In the case of alcohol, the average annual wastage is quite low (3.5%) especially when compared to other food categories (e.g. the average annual wastage for fruits and vegetables is approximately 40%).

Time Series Methods

In this analysis we are exploring the extent to which changes over time in the dependent variable, the crime rate, can be explained by changes in independent variables, a selection of socio-economic indicators. These socio-economic indicators may, however, move in a similar way to the crime rate over time, but have no causal relationship with the crime rate. As a result, modeling with the variables as they are, using either simple correlation analysis or multiple regression techniques, could lead to a false conclusion that a causal relationship exists, when, in reality, there is none.

In technical terms, this problem exists because the crime rate and other socio-economic indicators to be included in the model are not stationary in the mean (average) or its variance over time. What this means is if, over the whole time series from 1962 to 2002, one took repeated samples of shorter time series for each variable, the variable's mean and its variance would be different across the samples.

Terminology

What is a logarithm?

Taking the logarithm of a variable is a common technique used on variables with a large range and a high variability among values. The log re-scales the values of the variable to help improve the statistical properties of the variable and therefore the properties of the time series results.

What is a correlation?

A correlation measures the linear relationship between two variables measured over a series of paired observations (in this case, years). Values of a correlation range from –1 to +1. A value of +1 indicates a perfect positive relationship (e.g. the variables move in the same direction) whereas a value of -1 indicates a perfect negative relationship (e.g. the variables move in opposite directions). A value of 0 indicates no linear relationship.

What is time series analysis?

A key statistic in time series analysis is the autocorrelation coefficient, which is the correlation of the time series with itself, lagged by 1 or more periods. The autocorrelation coefficient indicates how values of the variable in question relate to each other at zero lag, lag 1, lag 2, etc. Autocorrelation within the data means that some of the variance in the current value is explained by the history of the variable. For example, unemployment in 2004 is partially explained by unemployment in 2003, all things being equal. For this analysis, lag 1 refers to the past year, lag 6 refers to 6 years in the past, etc.

What is an ARIMA model?

ARIMA models are Autoregressive Integrated Moving Average models, a general model widely used in time series analysis. The technique is premised on investigation of the prior behaviour of a series and is also used to adjust for seasonality. ARIMA models are particularly beneficial if one is interested in forecasting future values to calculate new values of the series and confidence intervals for those predicted values. The estimation and forecasting process is performed on transformed (differenced) data and then the series needs to be *integrated* (integration is the inverse of differencing) so that the forecasts are expressed in values compatible with the input data. The integration feature gives the order of differencing needed to achieve stationarity.

The first step in time-series modeling is to transform the variables to be included in the model in a way that reduces the risk of spurious or false correlations by creating a stationary mean and variance. Taking the logarithm of a variable is a common technique to transform variables to achieve this goal, particularly when the variables have a large range and a high variability among the values.

For these time-series models, the log of each variable to be included in the models was calculated and then the growth rate in the log values was calculated, resulting in a transformed data series for each variable. The only exception to this was for the rate of inflation, because the variable itself is a growth rate. For this variable, the log value was sufficient.

Using the transformed variables, bivariate or one-on-one models were constructed to determine which independent variables had a statistically significant relationship with the crime rate. Multivariate models were then constructed by testing different combinations of independent variables that had been significant in the bivariate models.

In any modeling exercise it is usually not possible to include within the model all of the variables that would be important to explaining why changes in the dependent variable, in this case the crime rate, have occurred. Error in the models that result from missing important variables is referred to as the "residual". While it is rare for models to eliminate error, to accurately interpret how significant the variables included in the model are to explaining changes in the crime rate over time, that is to avoid false or spurious results, it is important that this error or "residual" be random or white noise[25].

In time series models, autocorrelation coefficients are key statistics that measure whether the dependent variable, the crime rate, is correlated with itself, last years crime rate (lag of 1 period), the crime rate six years ago (lag6), or twelve years ago (lag12) etc. Autocorrelation within the data means that some of the variance in the dependent variable, the crime rate, is explained by the history of the crime rate itself. The presence of autocorrelation in the models results in residuals that are not random but that have a pattern to them. Lag variables, that is the crime rate six years ago, 12 years ago, 18 years ago and 24 years ago are included in the time series models, in order to test for the presence of autocorrelation. Models where these lag variables are statistically insignificant pass the "white noise test", that is the residuals in the models are random or white noise.

Further, as the fit of the models was to be further tested by examining the models' ability to predict observed crime rates in 2002 and 2003, the residuals themselves could contain information that tell us something about the movement in

other important variables that are missing from the models. This information can help us to develop better models to predict future crime. Moving average (MA) terms were added to the models to capture any information in the residuals over time that could improve the models' predictive ability. As a result, the time series models developed for this analysis are ARIMA models (Autoregressive Integrated Moving Average models).

The results of all models were then compared with three criteria used to determine the models that "best fit" each crime type studied.

1. Socio-economic variables included had statistically significant parameters
2. Residuals were rendered random (white noise test was passed)
3. Highest accuracy of the forecasts resulting from the models

Table 6 presents the "best fit" models for each crime type.

Table 6

Time series results, selected offences, 1962 to 2003

Dependent variables	Independent variables	Parameter value[2]	Residual P-values (white noise test)[1]			
			Lag 6	Lag 12	Lag 18	Lag 24
Homicide rates	Unemployment	0.39***	0.585	0.877	0.952	0.649
	Alcohol consumption	1.38***				
Robbery rates	Inflation	0.026***	0.357	0.303	0.463	0.447
	MA-term of order 1 (in the error)[3]	0.37***				
Rates of motor vehicle theft	Inflation	0.0185***	0.653	0.944	0.581	0.597
	MA-term of order 1 (in the error)[3]	0.4676***				
	MA-term of order 5 (in the error)	0.2367***				
	MA-term of order 8 (in the error)	-0.3551***				
	MA-term of order 9 (in the error)	-0.4703***				
Rates of break and enter	Inflation	0.0211***	0.452	0.555	0.806	0.9
	Population 15 to 24	1.6736***				
	MA-term of order 1 (in the error)[3]	0.2899***				
	MA-term of order 9 (in the error)	-0.5348***				

*** p<0.001, **p<0.01, *p<0.05

1. In the case of time series, errors will themselves constitute a time series. The goal of the white noise test is to render the residuals non-significant (or devoid of any structure) by extracting the correlation in the error terms. The white noise test checks for autocorrelation up to Lag 6 (6 years previous), Lag 12 (12 years previous), etc. Time series models must be modified until values at Lag 6, 12, 18 and 24 are non-significant.
2. The value of the parameter indicates how much change there will be in the dependent variable when there is a 1% shift in the independent variable. For example, in the case of homicide, a 1% shift in unemployment will be associated with a .39% shift in homicide rates (in the same direction).
3. The MA-term (moving-average) order describes the history of the error process and is used only for forecasting purposes.

Data source: Statistics Canada, Uniform Crime Reporting Survey (Canadian Centre for Justice Statistics), Labour Force Survey, Consumer Price Index, *Control and Sale of Alcoholic Beverages in Canada*, Catalogue no. 63-202 and Demography Division.

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Multivariate Results

The following section presents the results of the time series models for each of the four crime types examined.

Homicide rates[26]

As shown in Table 6, results of the time series analysis indicate that over the past four decades, shifts in unemployment rates and alcohol consumption are associated with changes in homicide rates. When the growth rate in unemployment varies by 1% the growth rate in homicides varies by approximately 0.39% in the same direction. Also, when the growth rate in alcohol consumption varies by 1%, the growth rate in homicides varies by approximately 1.38% in the same direction. This model indicates that there is a positive relationship between homicide and unemployment rates and rates of per capita alcohol consumption such that when rates of unemployment increase (or decrease) there is a corresponding change in homicide rates in the same direction. Similarly, when rates of per capita alcohol consumption increase (or decrease) there is a corresponding change in rates of homicide in the same direction.

Financially motivated crimes[27]

Inflation — and not unemployment rates — was found to be associated with all "financially motivated" crimes examined: robbery, motor vehicle theft[28] and break and enter. Results of the time series analysis indicate that when the inflation rate varies by 1%, the growth rate of robbery will vary by approximately 0.026% and the growth rate of motor vehicle theft will vary by approximately 0.019% in the same direction. That is to say, if inflation increases (or decreases) so too will rates of robbery and motor vehicle theft.

In this study, only rates of break and enter were found to be significantly affected by changes in both the age structure of the population and inflation rates. The time series model[29] indicates that there is a positive relationship between rates of break and enter and the proportion of the population aged 15 to 24, such that when the growth rate of the population 15 to 24 years of age varies by 1%, growth rates of break and enter vary by approximately 1.67% in the same direction. When inflation varies by 1%, growth rates of break and enter varies by approximately .021% in the same direction.

Trends in Crime Revisited: Predicting crime in 2002 and 2003

A further test of the validity of the models was to examine their capacity to predict crime patterns. An important question is whether the models for predicting crime patterns over the past several decades, in particular the decline during the 1990s, are equally effective in accounting for changes in 2002 and 2003.

The forecasting models developed for rates of homicide, robbery, break and enter and motor vehicle theft were statistically significant and accurate[30] . This was particularly the case for forecasting crime trends in 2003[31] (Table 7). Between 2002 and 2003 rates of homicide declined slightly, while rates of robbery, break and enter and motor vehicle theft increased. The forecasting models presented in this paper would have accurately predicted a decline in homicide and increases in the other types of crimes examined, although to a greater extent than observed.

Table 7

Observed and forecasted crime rates per 100,000 population (specific offences), 2002-2003

	Observed crime rates		Forecasted crime rates	Error percentage
	2002	2003	2003	2003
Homicide	1.85	1.7	1.83	7.64
Robbery	85	90	93	3.33
Break and enter	879	899	948	5.50
Motor vehicle theft	516	541	539	-0.36

Note: The forecasting error is calculated by subtracting the observed value (O) from the forecast value (F) divided by the observed value (O), in other words (F-O)/O*100.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Forecasting crime trends in 2002 was slightly less accurate[32] than forecasting crime trends in 2003, partially because additional degrees of freedom increase the accuracy of forecasting models (in this case it is equivalent to an additional year of data) (Table 8). Between 2001 and 2002 rates of homicide increased while rates of robbery, break and enter and motor vehicle theft declined slightly. The forecasting models presented in this paper would have accurately predicted the observed decrease in motor vehicle theft and the observed increase in rates of homicide. On the other hand, the forecasting models would have predicted increases in rates of robbery and break and enter when in fact they declined.

Table 8

Observed and forecasted crime rates per 100,000 population (specific offences), 2001-2002

	Observed crime rates		Forecasted crime rates	Error percentage
	2001	2002	2002	2002
Homicide	1.78	1.85	1.82	-1.62
Robbery	88	85	90	5.88
Break and enter	901	879	935	6.35
Motor vehicle theft	543	516	534	3.52

Note: The forecasting error is calculated by subtracting the observed value (O) from the forecast value (F) divided by the observed value (O), in other words (F-O)/O*100.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Discussion

The greatest gains in reducing crime rates in recent years were made in property crimes, especially among young offenders. Significant declines were also noted for robberies and homicides with firearms as well as homicides overall. This study suggests there are relationships between crime rates and trends in other major socio-economic indicators, including inflation rates, population shifts, unemployment rates and per capita rates of alcohol consumption, and demonstrates the value of using time series analysis to examine these relationships. The results can be interpreted to mean that years in which certain social problems occur with greater frequency also tend to have higher rates of crime. In this study, years with higher rates of inflation

tended to have higher rates of financially motivated crimes (robbery, break and enter, motor vehicle theft), while years with higher rates of per capita alcohol consumption and unemployment tended to have higher rates of homicide.

This study also stresses the importance of including inflation as a macroeconomic indicator of economic health. In this study, shifts in inflation rates - not unemployment rates - were associated with the financially motivated crime types examined. According to Devine et al. (1988), both unemployment and inflation critically shape macroeconomic and social welfare policies and therefore both indicators should be included in any macro-level analysis of crime. Results from this analysis support this argument.

Furthermore, these results suggest an unexpected consequence of the Bank of Canada's monetary policy, which aimed at keeping inflation rates around 2% throughout the 1990s. Readers will recall that inflation in Canada rose significantly in the 1970s and early 1980s and then declined by 1984 and again after 1991. Due to high inflation rates in the 1970s and early 1980s, in February 1991 Canada adopted inflation targets. Prior to these targets CPI inflation averaged 6% per year between 1981 and 1990 and 2 % per year between 1991 and 2000 (Longworth, 2002).

Previous research has found a positive relationship between crime rates and inflation (Devine et al, 1988; Long & Witte, 1981; Land & Felson, 1976). According to these researchers, there are a number of factors which contribute to the positive relationship between crime and inflation. During periods of high inflation, the price of goods relative to wages increases which results in a reduction of real income. This reduction in real income has a significant impact on persons on fixed or minimum wage incomes. Inflation also destroys confidence in existing institutions and fuels a general climate of uncertainty and fear about the future (e.g. interest rates for personal loans and mortgages are higher, unemployment rates are higher, etc.). Cantor and Land (1985) have argued that economic distress prompts an "upward shift in the density distribution of the population along the criminal-motivation continuum". In other words, in times of high inflation when there is a significant differential between the price of goods and wages and uncertainty about one's economic future is high, those located at or near the motivational margin of legality may be more likely to cross the threshold into criminality. Furthermore, as Devine et al (1988) point out, inflation rewards property criminals due to the rising demand of goods and subsequent real profits in the illegal goods market.

Finally, our results appear to support the contention that shifts in the age composition of the population is only one of many factors contributing to the overall crime drop (Steffensmeier & Harer, 1999; Levitt, 1999). Keeping in mind that only four crime types were examined in this study, shifts in the relative proportion of at-risk age groups in the population 15 to 24 years of age were found to be associated with shifts in rates of break and enter and were not significant for the other types of crimes studied. Furthermore, the effects of the population 25 to 34 were neutralized when the effects of unemployment, inflation and per capita alcohol consumption were controlled. This finding suggests that age can have a significant association depending on the type of crime being examined, however it also suggests that other factors may offset the effects of a change in the age composition (or profile) of the population.

Limitations and future research

Readers should be aware of possible limitations with the data source and measures used in this analysis. This study uses police-reported data, which provide one particular view of the nature and extent of crime. Many factors can influence the police-reported crime rate, including the willingness of the public to report crimes to the police, recording of these crimes in the UCR Survey, and changes in legislation, policies and enforcement practices.

The extensive research literature in the field of criminology has identified many factors associated with offending behaviour, including, but not limited to, socio-economic conditions, social control, education attainment and attachment to school, opportunity, routine activities, as well as various individual characteristics such as low self-control, poor self-esteem and learning disabilities. Statistical models are limited in that they cannot consider the importance of many socio-demographic changes in Canadian society that are not available in a statistical time series. Consequently, these models should be viewed as a macro-level exploration of crime patterns in Canada which cannot tap the critical intervening psychosocial elements implicated in individual decisions to engage in crime (Devine et al, 1988) nor the range of neighbourhood level characteristics which have been shown to be correlated with the crime patterns of local areas (Fitzgerald et al, 2004). Further research is required to decompose the relationship between the macro-economic concept of inflation and the various community and individual level factors associated with an individual's decision to engage in crime.

Quantitative analysis also cannot take account of all potential factors of relevance to crime given limited data availability and challenges in their quantification. Any analysis of changing crime rates must consider additional factors that are specific to the local level, such as crime and violence prevention programs in schools and communities, drug and alcohol treatment programs, prevention efforts targeted at young people and high-need families, and treatment and rehabilitation programs for offenders.

This study also raises a number of other important questions to be addressed in future research. Re-examining crime models in five to ten years when more extensive data are available over a lengthy time period (e.g. percentage of lone parent families, percentage of families receiving employment insurance) would further our understanding of what social and demographic characteristics influence crime rates over time. Similarly, a more thorough exploration of provincial level patterns would provide insight into what influences crime at the provincial, regional and local level and how these factors may differ from results observed at the national level.

Supplementary Tables

Table A1

Rates of *Criminal Code* incidents, Canada, 1962 to 2003[1]

	Total *Criminal Code*[2]		Violent crime		Property crime		Other *Criminal Code*	
Year	Rate	% change*	Rate	% change*	Rate	% change*	Rate	% change*
1962	2,771	...	221	...	1,891	...	659	...
1963	3,022	9.0	249	13.0	2,047	8.2	726	10.1
1964	3,245	7.4	284	13.8	2,146	4.9	815	12.3
1965	3,199	-1.4	299	5.4	2,091	-2.6	809	-0.7
1966	3,511	9.8	347	15.9	2,258	8.0	907	12.0
1967	3,850	9.6	381	9.9	2,484	10.0	985	8.7
1968	4,336	12.6	423	11.0	2,826	13.8	1,087	10.3
1969	4,737	9.3	453	7.1	3,120	10.4	1,164	7.1
1970	5,212	10.0	481	6.2	3,515	12.6	1,217	4.6
1971	5,311	1.9	492	2.4	3,649	3.8	1,170	-3.9
1972	5,355	0.8	497	1.0	3,634	-0.4	1,224	4.6
1973	5,773	7.8	524	5.3	3,704	1.9	1,546	26.3
1974	6,388	10.6	553	5.6	4,151	12.1	1,684	8.9
1975	6,852	7.3	585	5.9	4,498	8.4	1,769	5.0
1976	6,984	1.9	584	-0.2	4,533	0.8	1,867	5.6
1977	6,971	-0.2	572	-2.0	4,466	-1.5	1,933	3.5
1978	7,154	2.6	580	1.4	4,579	2.5	1,995	3.2
1979	7,666	7.2	610	5.1	4,903	7.1	2,153	7.9
1980	8,343	8.8	636	4.3	5,444	11.0	2,263	5.1
1981	8,736	4.7	654	2.8	5,759	5.8	2,322	2.6
1982	8,773	0.4	671	2.7	5,840	1.4	2,262	-2.6
1983	8,470	-3.5	679	1.2	5,608	-4.0	2,182	-3.5
1984	8,387	-1.0	701	3.1	5,501	-1.9	2,185	0.1
1985	8,413	0.3	735	4.8	5,451	-0.9	2,227	1.9
1986	8,727	3.7	785	6.9	5,550	1.8	2,392	7.4
1987	8,957	2.6	829	5.7	5,553	0.1	2,575	7.6
1988	8,919	-0.4	868	4.7	5,439	-2.0	2,613	1.5
1989	8,892	-0.3	911	5.0	5,289	-2.7	2,692	3.0
1990	9,485	6.7	973	6.8	5,612	6.1	2,900	7.8
1991	10,342	9.0	1,059	8.9	6,160	9.8	3,122	7.7
1992	10,040	-2.9	1,084	2.3	5,904	-4.2	3,052	-2.3
1993	9,538	-5.0	1,082	-0.2	5,575	-5.6	2,881	-5.6
1994	9,125	-4.3	1,047	-3.2	5,257	-5.7	2,821	-2.1
1995	9,008	-1.3	1,009	-3.7	5,292	0.7	2,707	-4.0
1996	8,932	-0.8	1,002	-0.7	5,274	-0.3	2,656	-1.9
1997	8,475	-5.1	993	-0.9	4,880	-7.5	2,603	-2.0
1998	8,161	-3.7	982	-1.1	4,569	-6.4	2,610	0.3
1999	7,752	-5.0	958	-2.4	4,276	-6.4	2,518	-3.5
2000	7,666	-1.1	984	2.7	4,081	-4.6	2,601	3.3
2001	7,655	-0.1	984	-0.1	4,004	-1.9	2,668	2.6
2002r	7,708	0.7	969	-1.5	3,975	-0.7	2,765	3.6
2003	8,132	5.5	963	-0.7	4,121	3.7	3,048	10.3
1991 to 2003 decline		-21.4		-9.1		-33.1		-2.4
1991 to 2000 decline		-25.9		-7.1		-33.8		-16.7
1991 to 2003 average decline		-1.9		-0.8		-3.2		-0.1
1991 to 2000 average decline		-3.3		-0.8		-4.4		-2.0

... Not applicable.

* In comparison to the previous year's rate. Percent change based on unrounded rates.

r Revised.

1. Rates are calculated on the basis of 100,000 population. The population estimates come from the *Annual Demographic Statistics, 2003* report, produced by Statistics Canada, Demography Division. Populations as of July 1st: intercensal estimates for 1962 to 1970, without adjustment for net census undercoverage. Populations as of July 1st: revised intercensal estimates for 1971 to 1995, final intercensal estimates for 1996 to 2000, final postcensal estimates for 2001, updated postcensal estimates for 2002, and preliminary postcensal estimates for 2003.
2. Excluding traffic offences.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Table A2

Rate of youth charged, *Criminal Code* incidents, Canada, 1991 to 2003[1]

	Violent crime			Property crime			Other *Criminal Code*		
Year	Rate	Male	Female	Rate	Male	Female	Rate	Male	Female
1991	832	1,290	349	4,031	6,367	1,564	1,396	2,270	473
1992	869	1,329	384	3,629	5,622	1,522	1,375	2,199	504
1993	923	1,369	450	3,221	4,951	1,392	1,307	2,086	484
1994	918	1,383	426	2,924	4,514	1,244	1,234	1,984	442
1995	941	1,411	444	2,856	4,323	1,307	1,263	1,992	493
1996	932	1,387	452	2,761	4,186	1,257	1,250	1,939	522
1997	908	1,321	473	2,389	3,640	1,068	1,242	1,911	535
1998	902	1,307	473	2,198	3,332	999	1,266	1,925	568
1999	855	1,247	441	1,945	2,935	900	1,224	1,875	537
2000	915	1,331	476	1,869	2,795	892	1,291	1,976	567
2001	947	1,369	502	1,811	2,673	902	1,359	2,053	628
2002	919	1,313	505	1,715	2,496	892	1,285	1,940	595
2003	816	1,177	437	1,386	2,136	597	1,135	1,736	502
% change 1991 to 2003	-1.9	-8.8	25.1	-65.6	-66.5	-61.9	-18.7	-23.5	6.0
% change 1991 to 2000	10.0	3.2	36.5	-53.6	-56.1	-43.0	-7.5	-13.0	19.9

1. Rates are calculated on the basis of 100,000 population. The population estimates come from the *Annual Demographic Statistics, 2003* report, produced by Statistics Canada, Demography Division. Populations as of July 1st: intercensal estimates for 1962 to 1970, without adjustment for net census undercoverage. Populations as of July 1st: revised intercensal estimates for 1971 to 1995, final intercensal estimates for 1996 to 2000, final postcensal estimates for 2001, updated postcensal estimates for 2002, and preliminary postcensal estimates for 2003.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Table A3

Selected rate of *Criminal Code* incidents, Saskatchewan, Manitoba and Yukon Territory, 1991 to 2003

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1991 to 2000	1991 to 2003	1993 to 2003
	Rate per 100,000 population													% change		
Violent crime																
Saskatchewan	1,156	1,223	1,220	1,218	1,287	1,333	1,549	1,614	1,610	1,692	1,833	1,854	2,057	46	78	69
Saskatoon	1,018	1,193	1,201	1,113	1,233	1,293	1,376	1,407	1,338	1,500	1,614	1,597	1,718	47	69	43
Regina	990	1,083	1,052	1,055	1,148	1,262	1,628	1,727	1,700	1,613	1,619	1,535	1,578	63	59	50
Manitoba	1,310	1,472	1,617	1,612	1,614	1,691	1,723	1,608	1,574	1,642	1,617	1,638	1,626	25	24	1
Winnipeg	949	1,129	1,271	1,290	1,359	1,498	1,476	1,314	1,243	1,365	1,320	1,308	1,242	44	31	-2
Yukon	2,996	2,693	2,853	2,751	3,275	3,186	3,312	2,951	3,158	3,356	3,721	3,751	3,799	12	27	33
Robbery																
Saskatchewan	54	57	50	52	66	79	96	95	87	92	109	108	143	70	165	186
Saskatoon	91	98	77	84	134	163	199	200	185	207	222	219	306	128	237	300
Regina	129	126	119	122	123	154	180	164	151	155	191	196	230	20	78	93
Manitoba	125	146	141	162	182	177	188	160	174	161	158	141	151	29	21	7
Winnipeg	196	226	218	256	285	281	298	250	270	252	247	221	235	29	20	8
Yukon	59	50	96	64	56	48	85	39	49	43	90	96	106	-27	80	10
Property crime																
Saskatchewan	6,299	6,287	5,939	5,858	6,141	6,316	6,251	6,119	5,828	5,965	5,967	5,797	6,613	-5	5	11
Saskatoon	6,743	6,983	6,593	5,948	6,484	6,859	6,841	6,311	6,466	6,910	6,416	6,370	7,975	2	18	21
Regina	9,899	9,390	8,607	8,897	9,659	10,018	9,070	8,911	8,493	8,469	9,671	8,312	8,699	-14	-12	1
Manitoba	6,427	6,038	6,207	6,371	5,937	5,773	5,469	5,168	5,089	4,975	5,134	4,964	5,581	-23	-13	-10
Winnipeg	7,241	6,823	7,115	7,388	6,785	6,643	6,058	5,782	5,638	5,745	6,013	5,601	6,447	-21	-11	-9
Yukon	8,610	8,435	9,029	8,604	9,069	8,333	8,254	7,097	7,187	8,231	7,172	7,376	7,421	-4	-14	-18
Motor vehicle theft																
Saskatchewan	361	340	335	426	522	635	688	715	698	758	799	695	780	110	116	133
Saskatoon	346	377	360	425	513	567	626	567	534	670	551	532	744	94	115	107
Regina	591	490	473	756	1,120	1,491	1,469	1,615	1,638	1,600	1,992	1,443	1,355	171	129	186
Manitoba	328	338	710	851	845	902	994	926	939	1,029	1,147	1,049	1,111	214	239	56
Winnipeg	372	373	981	1,178	1,182	1,263	1,370	1,284	1,320	1,435	1,592	1,385	1,493	285	301	52
Yukon	785	614	1,028	953	719	599	673	684	741	796	793	740	612	1	-22	-40
Break and enter																
Saskatchewan	1,732	1,835	1,673	1,716	1,786	1,810	1,849	1,748	1,662	1,569	1,512	1,522	1,737	-9	0	4
Saskatoon	1,712	2,022	1,850	1,719	2,003	2,090	2,031	1,817	1,806	1,759	1,750	1,649	2,083	3	22	13
Regina	3,043	2,845	2,765	2,998	3,148	3,014	2,816	2,550	2,349	1,951	2,004	1,849	2,071	-36	-32	-25
Manitoba	1,762	1,648	1,713	1,806	1,471	1,473	1,482	1,411	1,331	1,239	1,157	1,092	1,215	-30	-31	-29
Winnipeg	1,941	1,791	1,890	1,995	1,548	1,549	1,506	1,404	1,246	1,236	1,160	1,042	1,162	-36	-40	-39
Yukon	1,757	1,933	2,029	1,930	2,549	2,422	2,432	1,952	1,820	2,544	2,031	1,773	1,819	45	4	-10

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*
Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Table A4

Crime rates in census metropolitan areas (CMA)[1,2,3], 2003

CMA	Population	Crimes of violence		Property crime		Other *Criminal Code*		Total *Criminal Code*	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Toronto[4]	5,118,992	39,654	775	150,789	2,946	81,088	1,584	271,531	5,304
Montréal	3,586,221	29,978	836	138,456	3,861	116,237	3,241	284,671	7,938
Vancouver	2,126,111	21,854	1,028	155,426	7,310	68,844	3,238	246,124	11,576
Ottawa-Gatineau	1,143,554	8,783	768	40,837	3,571	22,366	1,956	71,986	6,295
Calgary	1,023,666	8,647	845	45,342	4,429	20,239	1,977	74,228	7,251
Edmonton	997,938	9,317	934	60,432	6,056	39,710	3,979	109,459	10,969
Ottawa-Gatineau (Ontario portion)[5]	866,621	6,540	755	31,229	3,604	17,051	1,968	54,820	6,326
Québec	709,323	3,469	489	21,139	2,980	11,333	1,598	35,941	5,067
Winnipeg	688,746	8,556	1,242	44,405	6,447	28,755	4,175	81,716	11,864
Hamilton	682,741	6,213	910	25,518	3,738	13,603	1,992	45,334	6,640
Kitchener	470,022	2,649	564	17,140	3,647	7,879	1,676	27,668	5,887
London	464,076	3,091	666	20,137	4,339	11,623	2,505	34,851	7,510
St.Catherines-Niagara	429,949	2,541	591	16,255	3,781	10,656	2,478	29,452	6,850
Halifax	377,932	5,076	1,343	18,128	4,797	12,033	3,184	35,237	9,324
Windsor	329,241	2,275	691	13,303	4,041	8,429	2,560	24,007	7,292
Victoria	323,592	3,677	1,136	17,956	5,549	12,630	3,903	34,263	10,588
Ottawa-Gatineau (Québec portion)[6]	276,933	2,243	810	9,608	3,469	5,315	1,919	17,166	6,199
Saskatoon	241,391	4,146	1,718	19,250	7,975	13,209	5,472	36,605	15,164
Regina	197,734	3,120	1,578	17,200	8,699	9,622	4,866	29,942	15,143
St. John's	177,843	1,402	788	6,709	3,772	3,414	1,920	11,525	6,480
Sudbury	160,113	1,209	755	5,891	3,679	3,304	2,064	10,404	6,498
Abbotsford[7]	157,720	1,834	1,163	12,502	7,927	6,729	4,266	21,065	13,356
Kingston[7]	153,707	1,070	696	5,569	3,623	3,847	2,503	10,486	6,822
Saguenay	148,061	753	509	3,584	2,421	1,871	1,264	6,208	4,193
Sherbrooke	145,766	855	587	5,557	3,812	3,275	2,247	9,687	6,646
Saint John	144,752	1,692	1,169	4,833	3,339	4,605	3,181	11,130	7,689
Trois-Rivières	144,262	780	541	4,344	3,011	2,537	1,759	7,661	5,310
Thunder Bay	124,628	1,523	1,222	4,752	3,813	4,360	3,498	10,635	8,533

1. Note that a CMA typically comprises more than one police force. Also, note that the Oshawa CMA is excluded from this table due to the incongruity between the police agency jurisdictional boundaries and the CMA boundaries.
2. Rates are calculated per 100,000 population. The population estimates come from the *Annual Demographic Statistics, 2003* report, produced by Statistics Canada, Demography Division. Populations as of July 1st: preliminary postcensal estimates for 2003.
3. Populations for all CMAs have been adjusted to better reflect police service boundaries.
4. Toronto Police implemented a new records management system in September 2003 (no change so far). As the transition had a short-term impact on data quality, data for September to December 2003 were estimated from 2002 data for the same period.
5. Ottawa refers to the Ontario part of the Ottawa-Gatineau CMA.
6. Gatineau refers to the Quebec part of the Ottawa-Gatineau CMA.
7. Abbotsford, British Columbia and Kingston, Ontario became new CMAs as of the 2001 Census.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

Table A5

Selected *Criminal Code* incidents, Canada and the provinces and territories, 2003[1]

		N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.[2]	Yukon	N.W.T.	Nvt.	Canada
	Population, 2003	519,570	137,781	936,025	750,594	7,487,169	12,238,300	1,162,776	994,843	3,153,723	4,146,580	31,060	41,872	29,384	31,629,677
Homicide	Number	5	1	8	8	100	178	43	41	63	93	1	4	3	548
	Rate	1.0	0.7	0.9	1.1	1.3	1.5	3.7	4.1	2.0	2.2	3.2	9.6	10.2	1.7
	% change in rate*	149.9	-0.6	-11.3	-11.2	-15.7	-1.2	18.7	52.0	-11.1	-26.8	...	-1.0	46.7	-6.6
Assault (1,2,3)	Number	4,098	1,020	9,304	6,079	37,657	73,246	14,829	16,678	27,227	40,481	1,028	2,532	1,924	236,103
	Rate	789	740	994	810	503	599	1,275	1,676	863	976	3,310	6,047	6,548	746
	% change in rate*	2.8	2.1	8.7	2.6	-1.0	-6.4	-1.6	12.0	1.6	0.4	3.9	19.9	11.2	-0.7
Sexual assault (1,2,3)	Number	496	142	889	645	4,326	7,682	1,504	1,381	2,405	3,424	65	176	290	23,425
	Rate	95	103	95	86	58	63	129	139	76	83	209	420	987	74
	% change in rate*	-10.2	-4.0	-4.2	-13.6	3.8	-9.2	0.6	-7.6	-8.5	-2.0	-31.5	-3.2	-7.9	-5.2
Robbery	Number	64	18	623	206	6,952	9,567	1,753	1,427	3,210	4,443	33	27	9	28,332
	Rate	12	13	67	27	93	78	151	143	102	107	106	65	31	90
	% change in rate*	-20.0	-0.6	11.1	-9.7	0.7	6.0	6.7	33.3	20.7	-4.2	10.4	27.2	-2.2	5.4
Violent crime – Total	**Number**	**4,845**	**1,236**	**11,220**	**7,442**	**53,373**	**95,948**	**18,906**	**20,466**	**34,696**	**50,025**	**1,180**	**2,844**	**2,334**	**304,515**
	Rate	**933**	**897**	**1,199**	**992**	**713**	**784**	**1,626**	**2,057**	**1,100**	**1,206**	**3,799**	**6,792**	**7,943**	**963**
	% change in rate*	**1.3**	**1.2**	**7.3**	**0.3**	**-0.7**	**-5.4**	**-0.7**	**11.0**	**2.0**	**-0.3**	**1.3**	**18.5**	**9.0**	**-0.7**
Break and enter	Number	3,824	1,033	7,665	5,337	67,346	81,661	14,122	17,279	30,692	52,949	565	1,003	1,020	284,496
	Rate	736	750	819	711	900	667	1,215	1,737	973	1,277	1,819	2,395	3,471	900
	% change in rate*	10.0	5.2	16.2	10.7	-4.8	-1.1	11.3	14.1	11.1	4.3	2.6	9.2	16.1	2.4
Motor vehicle theft	Number	656	273	2,709	1,761	36,981	46,549	12,913	7,763	20,868	39,729	190	381	244	171,017
	Rate	126	198	289	235	494	380	1,111	780	662	958	612	910	830	541
	% change in rate*	11.9	11.2	3.1	12.4	-0.5	-0.4	5.9	12.2	14.6	9.5	-17.4	11.5	17.6	4.7
Other theft	Number	7,699	3,169	19,280	12,652	120,435	223,670	34,445	34,290	90,883	172,398	1,367	1,405	748	722,441
	Rate	1,482	2,300	2,060	1,686	1,609	1,828	2,962	3,447	2,882	4,158	4,401	3,356	2,546	2,284
	% change in rate*	2.2	12.3	6.5	4.3	0.1	0.8	17.6	16.3	8.6	4.8	4.3	27.2	16.7	4.2
Property crime – Total	**Number**	**13,565**	**4,957**	**34,206**	**22,770**	**244,757**	**396,655**	**64,899**	**65,784**	**161,490**	**287,036**	**2,305**	**3,023**	**2,122**	**1,303,569**
	Rate	**2,611**	**3,598**	**3,654**	**3,034**	**3,269**	**3,241**	**5,581**	**6,613**	**5,121**	**6,922**	**7,421**	**7,220**	**7,222**	**4,121**
	% change in rate*	**4.9**	**9.0**	**8.1**	**6.8**	**-2.1**	**0.2**	**12.4**	**14.1**	**9.5**	**5.9**	**0.6**	**18.4**	**15.2**	**3.7**
Offensive weapons	Number	166	71	664	431	1,326	5,020	1,262	967	2,338	4,450	86	92	67	16,940
	Rate	32	52	71	57	18	41	109	97	74	107	277	220	228	54
	% change in rate*	-23.5	85.8	5.7	8.2	9.7	0.6	12.2	8.7	7.6	5.7	32.4	15.2	52.4	5.4
Mischief	Number	6,359	2,035	13,902	8,145	50,696	99,083	30,052	24,693	48,488	64,007	1,807	4,392	2,484	356,143
	Rate	1,224	1,477	1,485	1,085	677	810	2,585	2,482	1,538	1,544	5,818	10,489	8,454	1,126
	% change in rate*	8.1	10.2	17.2	8.0	0.8	1.4	13.4	17.1	8.4	4.8	3.7	13.4	28.5	5.9

Table A5 – concluded

Selected *Criminal Code* incidents, Canada and the provinces and territories, 2003[1]

		N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.[2]	Yukon	N.W.T.	Nvt.	Canada
Other *Criminal Code* – Total	Number	13,861	5,683	34,623	23,211	181,558	253,612	61,245	66,711	127,772	175,962	4,590	9,569	5,762	964,159
	Rate	2,668	4,125	3,699	3,092	2,425	2,072	5,267	6,706	4,052	4,244	14,778	22,853	19,609	3,048
	% change in rate*	3.2	12.5	14.1	8.2	23.9	4.3	12.8	10.6	7.0	8.6	-4.1	10.4	23.1	10.3
Criminal Code – Total – without traffic offences	Number	32,271	11,876	80,049	53,423	479,688	746,215	145,050	152,961	323,958	513,023	8,075	15,436	10,218	2,572,243
	Rate	6,211	8,620	8,552	7,117	6,407	6,097	12,475	15,375	10,272	12,372	25,998	36,865	34,774	8,132
	% change in rate*	3.6	9.8	10.5	6.4	6.5	0.7	10.7	12.1	7.7	6.2	-2.1	13.3	17.9	5.5

* In comparison to the previous year's rate.

1. Rates are calculated on the basis of 100,000 population. The population estimates come from the *Annual Demographic Statistics, 2003* report, produced by Statistics Canada, Demography Division. Populations as of July 1st: preliminary postcensal estimates for 2003.
2. Homicide investigations undertaken by the Missing Women's Task Force in Port Coquitlam, B.C resulted in 15 homicides being reported by police in 2002 and another 6 in 2003. Homicide counts reflect the year in which police file the report.

Data source: *Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey.*

Table source: *Statistics Canada, 2005, Exploring Crime Patterns in Canada, Catalogue no. 85-561-XIE2005005.*

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Endnotes

1. Data on overall trends in violent, property and other criminal code offences are available beginning in 1962, however data for specific crime types are available electronically starting in 1977. The exception to this are rates of homicide, robbery, break and enter and motor vehicle theft, which were extracted manually from paper publications between 1962 and 1977, because they were chosen for time series modelling (see methodology section). Furthermore, in 1983, Criminal Code provisions related to rape and indecent assault were replaced with three levels of sexual assault. Three parallel offences of assault also came into effect and the law was amended to permit police to lay charges where there is "reasonable and probable cause" for believing an assault has occurred. As a result, trends in assault and sexual assault are presented from 1983 onwards.
2. The total crime rate is a composite of violent crime, property crime and other Criminal Code offences (excludes traffic offences).
3. This increase was driven primarily by an increase in counterfeiting currency which rose 72% between 2002 and 2003.
4. Violent crime is composed of homicide, attempted murder, sexual assault, assault, robbery, discharging a firearm with intent, assault against a peace-public officer, kidnapping and abduction.
5. Property crime is composed of break and enter, motor vehicle theft, theft over and theft under $5,000, possession of stolen goods and fraud.
6. The rate of youth cleared otherwise began increasing in 1999 due, in part, to anticipation of, and the eventual introduction of the *Youth Criminal Justice Act* in April 2003. While the rate of youth charged has been declining steadily since the early 1990s, the rate of youth cleared otherwise has been increasing since 1999. In the 2004 release *Crime Statistic*, rates of youth charged and cleared otherwise were combined to present an overall youth crime rate. The combined rate indicates an overall increase in youth crime beginning in 1999. This increase has been driven by an increase in youth cleared otherwise, which may be partly attributable to increased reporting by police of youths not formally charged, due to the new *YCJA* provisions of extrajudicial measures. For the purposes of this paper, which focuses on crime trends dating back to 1977, the rate of youth charged with violent and property crimes will be presented. An examination of the impact of the *YCJA* will be examined in Chapter 2: Societal, Policy, Legislative and Practice Changes.
7. While the age of accused is available on the Revised UCR Survey from 1992 onwards, corresponding population data are only available from 1996. As a result, this analysis focuses on the period 1996 to 2003. Furthermore, analysis is restricted to the police services of Vancouver and Montreal because these sites have consistently reported incident-based crime data between 1996 and 2003.
8. Other criminal code offences include mischief, counterfeiting currency, bail violations, disturbing the peace, offensive weapons, prostitution, arson and "other".
9. Age variables are derived from the average of quarterly population estimates and the estimates of population in certain age groups used by the Labour Force Survey (LFS uses the estimates obtained from the Census). These estimates are adjusted for any under coverage and population growth.
10. Males accounted for 77% of property offenders and 83% of violent offenders known to the police in Canada in 2002. The gender distribution among offenders has shifted somewhat since 1977 when males made up 83% of property and 91% of violent offenders.
11. Based on average per capita daily counts of inmates.
12. This information was provided by the Insurance Information Centre of Canada (IICC) which represents approximately 64% of companies in the insurance industry.
13. Similar results were found when charge rates were examined between 1991 and 1999 prior to the anticipation and eventual introduction of the *YCJA* (2003). The rate at which adults and youths were charged declined 30% during this period.

14. Researchers (Browne et al. 1993; Dugan et al 1999; Rosenfeld 2000) have highlighted that males and females have increasingly delayed entry into first marriage or remarriage during the past few decades. As a result, common-law unions and dating relationships of longer duration have become more common. Researchers speculate that the decreasing popularity of marriage has contributed, to some extent, to the reduction in intimate partner killings.
15. Drop-out rates are defined as the percentage of 20 year olds who have not completed high school and are not working toward completion.
16. Recently, crime rates in the Atlantic Provinces have exceeded those in Quebec and Ontario. For more information see Wallace, 2004.
17. Similar increases may have been found in the Northwest Territories, however the formation of Nunavut in 1999 limits examination of trends over time.
18. Regina, Winnipeg and Vancouver have reported the highest motor vehicle theft rates in the country each year since 1995. According to Wallace (2004a), while the highest rates of total vehicle thefts are reported in the western provinces, most of these vehicles are later recovered. Thrill-seeking and transportation, not organized crime, were reportedly the main motives for motor vehicle thefts in Winnipeg.
19. Regina, Winnipeg and Vancouver have reported the highest motor vehicle theft rates in the country each year since 1995. According to Wallace (2004a), while the highest rates of total vehicle thefts are reported in the western provinces, most of these vehicles are later recovered. Thrill-seeking and transportation, not organized crime, were reportedly the main motives for motor vehicle thefts in Winnipeg.
20. As a result of data quality initiatives within the RCMP, the reporting of disturbing the peace and bail violations incidents has increased substantially over the past few years. These initiatives may explain, to a large extent, the increases noted in RCMP jurisdictions in Saskatchewan and Manitoba and the North.
21. This however, may be an underestimate of unemployment in Saskatchewan and Manitoba as the Labour Force Survey does not include persons living on Indian Reserves.
22. In the Yukon Territory rates of inflation are only available for Whitehorse. Unemployment and education data are not available for Yukon Territory.
23. The most serious crimes were those in which victims were injured, took time off daily activities or spent time in bed due to the victimization, a weapon was present, or the cost of property theft or damage exceeded $1,000.
24. An important question is the extent to which the results and conclusions of the multivariate analysis at the national level are equally applicable in each of the provinces. However, there are many limitations to modeling crime rates at the provincial level related to availability of data that do not apply to the national level. Data for the independent variables selected for this study are available but for a shorter timeframe. For example provincial inflation rates are available from 1980 onward, and a measure of inter-provincial migration is available only from 1972.
25. In the case of time series, errors will themselves constitute a time series. One usually aims for the errors to be devoid of any structure, although they may be correlated. However, if one can extract the correlation in the errors then one ought to be left with a residual series with no correlation (or structure). Such a series is referred to as a white noise.
26. The time series model for homicide is: $\Delta\log Hom(t) = 0.39\Delta\log unemp\ (t) + 1.38\Delta\log Alcohol\ (t) + Z(t)$.
27. The time series model for robbery is: $\Delta\log Rob(t) = 0.026\log Inf(t) + Z(t) + 0.37Z(t-1)$. The time series model for motor vehicle theft is: $\Delta\log Motor\ (t) = 0.0185\ \log Inf\ (t) + Z(t) + 0.4676Z(t-1) + 0.2367Z(t-5) - 0.3551Z(t-8) - 0.4703Z(t-9)$.
28. Available data from 22 large police services (accounting for almost three-quarters of all police-reported vehicle thefts in Canada) indicate that approximately one out of every five stolen vehicles were not recovered in 2002 (Wallace, 2004a). Therefore, approximately one in five motor vehicle thefts may be linked to organized groups or theft rings. This is a large increase over the early 1970s when approximately 2% of all stolen vehicles were not recovered. Based on Wallace's (2004a) analysis, it could be inferred that the large majority of motor vehicle thefts are not "financially motivated", however there is an element of financial gain when organized crime is involved and also when the vehicle is used for transportation or to commit another crime.
29. The time series model for break and enter is: $\Delta 0.0211\log Inf(t) + 1.6736\Delta\log Pop15(t) + Z(t) + 0.2899Z(t-1) - 0.5348Z(t-9)$.
30. When conducting time series analysis at Statistics Canada the acceptable limit for forecasting error is 15% or less. The forecasting models presented in this paper meet this criterion.

31. Errors percentages were calculated for each of the crime types examined by subtracting the observed crime rate in 2003 from the forecasted crime rate in 2003 divided by the observed crime rate in 2003 multiplied by 100. For example, the observed homicide rate in 2003 was 1.7 per 100,000 population. The ARIMA model developed for homicide would have predicted a rate of 1.8 per 100,000 population. Therefore the forecasting error is ((1.8-1.7)/1.7)*100 or 7.64%.

32. Errors percentages were calculated for each of the crime types examined by subtracting the observed crime rate in 2002 from the forecasted crime rate in 2002 divided by the observed crime rate in 2002 multiplied by 100. For example, the observed robbery rate in 2002 was 85 per 100,000 population. The ARIMA model developed for robbery would have predicted a rate of 90 per 100,000 population. Therefore the forecasting error is ((90-85)/85)*100 or 5.88%.

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