



# Understanding Recent Movements in Crime Statistics

September 2006

A report prepared for the  
New Zealand Police

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## Executive Summary

This report was commissioned by the New Zealand Police to provide an independent assessment of the reasons for recent trends in recorded crime. Many factors ultimately influence the level of recorded crime. These may be factors that influence the level of criminal offending in the community (such as social, cultural, economic, situational factors), the level of reporting to police (such as insurance, or requests for police assistance) or the policies and practices for recording and counting crime.

Recorded crime statistics for the 2005/2006 year indicate an 8% increase in total recorded crime compared to the previous 2004/2005 year's statistics. Analysis of the different categories of crime which make up the total crime category reveals that July 2005 showed a step-change in recorded crime:

- Recorded levels of violent crime were trending approximately 3% higher than the previous year's figures to 1<sup>st</sup> July 2005. After this point, levels of recorded violent crime underwent a step-increase, up to approximately 10% higher than the previous year.
- Dishonesty crimes, which make a significant contribution to total recorded crime statistics (approximately 57%), were recorded at levels lower than the previous year to 1<sup>st</sup> July 2005, after which point recorded dishonesty crimes suddenly increased.
- Prior to 1<sup>st</sup> July 2005, property damage crimes were recorded at similar levels compared to the previous year's data. After this point, levels of property damage suddenly increased and were consistently recorded at higher levels than they had been during the previous year.

There is a clear indication, which appears consistently across several different categories of crime, of an event occurring early in July 2005 which caused an increase in recorded crime levels. Analysis of the recorded crime data using a cumulative sum (cusum) technique, which allows easy detection of incremental changes and is used to identify the point at which a process deviates from statistical 'control', confirms July 2005 as when the step-change occurred.

While national figures indicate an increase in recorded crime over 2005/2006 compared to the previous year, the magnitude and direction of change in recorded crime at a district level varied. During the 2005/2006 year, levels of total recorded crime actually decreased in two police districts (Canterbury and Tasman) while increasing in all other districts. Three districts in particular reported high percentage increases in total recorded crime levels during the year with Counties-Manukau up 24%, Waikato up 17% and Eastern up 12%. While some variation in crime statistics between districts is considered normal, the changes reported for the crime statistics recorded in Counties Manukau, Waikato and Eastern Districts have all exceeded the expected levels of statistical variation.

Clearly there are differences in annual changes in recorded crime between districts, with some districts experiencing a decrease in recorded crime from one year to the next and others experiencing significant increases. However, it is of note that the majority of districts appeared to experience an anomaly during July 2005, when crime

levels apparently underwent a step-increase and then continued the steady trend that each district had previously experienced.

While there are a variety of factors outside the police recording environment which have the potential to influence changes in the level of criminal offending in the community, the strongest influence on the level of crime is the overall size of the population. New Zealand's population increased by 0.9% during 2005/2006, meaning the rate of recorded crime on a per capita basis increased by 6.7% to 1034 offences per 10,000 residents. Beyond overall population change, other demographic factors are felt to have far less influence on total crime figures. One such factor is a youth population 'bubble' (higher numbers of persons aged 14-16 years) that is entering 'offending age'. Also, it is important to note that the age profile of the national population is not evenly distributed geographically. There are some locations with higher than average increases in the young population and offending in these locations may potentially be influenced more substantially, than the overall national picture, by changes in local demography.

A counter factor to the increase in apparent recorded crime is that recent trust and confidence figures shows that community trust and confidence in police had declined leading into 2005/2006, potentially reducing the reporting of crime. However, during 2005/2006, trust and confidence has apparently been increasing.<sup>1</sup> The fluctuating level of trust and confidence is likely to introduce variability into the degree to which some types of crime are reported to police. It is important to note that reporting behaviour is important, with the national victimisation survey indicating that many crimes are never reported to police.

Changes in police practices and resources are likely to have influenced levels of recorded crime. An increase in policing hours delivered may have influenced recorded crime in some categories that are influenced by police activity. Police are also pursuing proactive crime targeted strategies, and some of these measures have the potential to cause increases in the recording of some types of crime, not necessarily reflecting an increase in the actual number of offences commissioned. There are also other administrative changes that can influence apparent crime trends. For example, changes sometimes occur in the way offences are categorised.

As part of this investigation, independent data sets were sought for the purposes of validating the trends observed in the recorded crime statistics from police. Analysis of these data sets indicates that the step-change indicated by the recorded crime statistics and the abrupt discontinuity reported during July 2005, are not corroborated. The independent data series that were examined show no evidence of the increase in crime that is suggested by the police crime statistics for the 2005/2006 year. Total telephone calls for service, events recorded by the police communication centres and ACC claim data all show steady time-series behaviours during mid-2005 and reveal no anomalies that correspond with changes over that period in crime statistics.

The overall increase in violent crime seen in police crime statistics is however supported by ACC claim statistics. Prior to July 2005 the level of violent crime being recorded by police was already trending approximately 3% higher than the previous year's figures. Much of the increase in violence, appears to be family violence related,

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<sup>1</sup> Personal communication: Office of Police Commissioner.

and may be a consequence of increased proactive police activity to combat domestic violence.

It would seem that the anomaly observed during July 2005 may have been influenced by the move by police into a new computer environment where more crime statistics have been recorded, simply as a result of new statistics capture processes. Thus, the increase in recorded crime is not primarily driven by an increase in actual criminal incidents, but by different recording practices associated with a new computer system. Changes made to police computer systems, during 2005/2006, have influenced the way in which crimes are recorded and counted. In particular, the migration from the Law Enforcement System<sup>2</sup> (LES) to a new National Intelligence Application (NIA) appears to have influenced the recording and counting of crime since July 2005.

It appears that a discontinuity in statistics has occurred when moving between LES and NIA. The new NIA system essentially replicates the old practices surrounding statistics entry into LES, in that it requires police to separately enter statistics information, rather than automatically deriving crime statistics from case information. However there are some subtle changes that will have influenced the statistics capture and quality control. During the computer transition, minimal change was made to statistics functionality to ensure that there was minimisation of risk, complexity and effort involved in the migration process. However, natural enhancements integral to the NIA application architecture (e.g. wizard entry and a graphical user interface) and processes by which the organisation has adjusted to the NIA environment (training, data entry processes, file auditing) appear to have influenced the statistics capture. There now appears to be a higher propensity to record offence statistics in the NIA system than there was in the LES system. This represents a change in statistics recording practice, not an increase in the level of criminal offending. Likely causes are the different computer environment for data entry, resourcing and/or data entry responsibilities, and possible changes in local auditing practices.

It is of note that there do not seem to be any nationally consistent practices governing the recording of multiple offence statistics, which may have aggravated the impact of the computer system migration on crime statistics.

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<sup>2</sup> The “Wanganui Computer”

## Purpose

Police have commissioned this report as an independent assessment to ascertain the reasons for movements in recorded crime statistics during the 2005/2006 fiscal period. In particular, Police wish to understand the causes behind the sharp increase in the level of recorded offences that has occurred from July 2005.

## Approach

This assessment begins by examining the magnitude of recent crime statistics changes in comparison to historical patterns of variability. The report identifies trends in individual offences, types, classes and categories of offence. It identifies changes in recorded offending that have occurred during the period July 2005 to June 2006 compared to similar periods during the previous several years of recorded offending. This involved:

- Identifying trends in individual offences, types, classes and categories of offence.
- Assessing the magnitude of these changes and comparing this to historical patterns of variability.
- Isolating movements observed in recorded offences during the past year in terms of the timeframes, the nature of the recorded offending, the geographic location and other relevant attributes.

Data for this analysis was taken from the police data warehouse (PDSI). It was taken on 18<sup>th</sup> July 2006 from a snapshot frozen on the 15<sup>th</sup> July 2006. This should closely reflect the final statistics universe for the 2005/2006 year, with the exception of some offences that may be added, moved or removed as part of the normal reconciliation processes that are used to check the accuracy of the statistics.

The assessment then turns to several external data sets to validate observed trends in recorded crime by comparing crime statistics with other independent data series. Independent or semi-independent data sets used for this analysis include other indicator data available within police (such as recorded incidents) and external data sets such as ACC injury statistics.

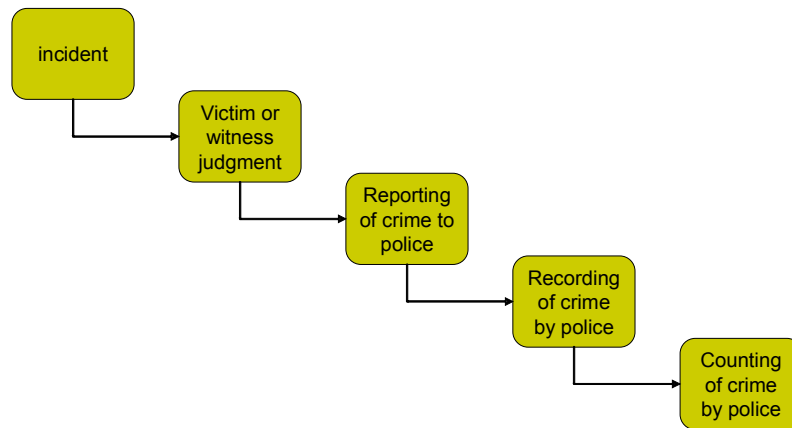
The assessment also considers factors that may have had an impact on recorded crime trends, such as changes in technology, reporting policies and external factors. Any assessment of changes observed in crime statistics should be grounded in an understanding of the chain of events that link the commission of a crime and the actual recording of a crime or offence<sup>3</sup>. These factors are well documented in crime science literature, and form a reference point for the interpretation of the observed movement in recorded crime.<sup>4</sup>

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<sup>3</sup> Bottoms, A., and Coleman, C. (1981) *Understanding Crime Rates*, Farnborough, Saxon House.

<sup>4</sup> Bottoms, A. and Coleman, C. (1981) *Understanding Crime Rates*, Farnborough, Saxon House.  
Coleman, C. & Moynihan, J. (1996) *Understanding Crime Data*, Buckingham: Open University Press.  
Field S. (1999). *Trends in Crime Revisited: A Research, Development and Statistics Directorate Report No. 195*, London: Home Office. (Download from Home Office website).  
Williams, K. (2003) 'The Extent of Crime: A Comparison of Official and Unofficial Calculations', in K. Williams (ed) *Criminology*, Oxford University Press, Oxford  
MacDonald Z *Official Crime Statistics: Their Use And Interpretation The Economic Journal* Volume 112 Page F85 - February 2002





There are a variety of factors that can influence this chain of events, from factors that can impact on actual criminal incidents, such as Government policy influences (e.g. social programmes) and changes in demographics (e.g. age, population migration) through to potential influences on the recording of crime by police, such as technology change and policies and practices impacting on the recording of crime. This assessment considers the likely impact of these possible causal factors, which are substantiated or eliminated as a potential influence on the change in recorded offence patterns.

Finally, conclusions are drawn as to the possible causes of recorded crime movements during 2005/2006.

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Carr-Hill, R. A. (1992) A review of 'Trends in crime and their interpretation: a study of recorded crime in post-war England and Wales' by Simon Field. British Journal of Criminology 32: 222-226.  
Coleman, C.; Moynihan, J. (1996) Understanding crime data: haunted by the dark figure. Open University Press, Buckingham, England.

## Observed trends in recorded crime statistics

### Annual changes from 2004/2005 to 2005/2006

The following table shows a comparison of New Zealand's recorded crime for 2005/2006 with the previous June year.

| Offence category                            |                       |      | Offence class                   | 2004/2005     | 2005/2006     | % change   |
|---|-----------------------|------|---------------------------------|---------------|---------------|------------|
| 1000  | violence              | 1100 | homicide                        | 80            | 105           | 31%        |
|   |                       | 1200 | kidnapping and abduction        | 184           | 268           | 46%        |
|   |                       | 1300 | robbery                         | 2170          | 2600          | 20%        |
|   |                       | 1400 | grievous assaults               | 3418          | 4077          | 19%        |
|   |                       | 1500 | serious assaults                | 15685         | 17713         | 13%        |
|   |                       | 1600 | minor assaults                  | 12931         | 12894         | 0%         |
|   |                       | 1700 | intimidation/threats            | 10994         | 12579         | 14%        |
|   |                       | 1800 | group assemblies                | 479           | 408           | -15%       |
| <b>violence total</b>                       |                       |      |                                 | <b>45941</b>  | <b>50644</b>  | <b>10%</b> |
| 2000  | sexual                | 2200 | sexual affronts                 | 614           | 581           | -5%        |
|   |                       | 2600 | sexual attacks                  | 2187          | 2393          | 9%         |
|   |                       | 2700 | abnormal sex                    | 12            | 15            | 25%        |
|   |                       | 2800 | immoral behaviour               | 258           | 186           | -28%       |
|   |                       | 2900 | immoral behaviour/miscellaneous | 101           | 82            | -19%       |
| <b>sexual offences total</b>                |                       |      |                                 | <b>3172</b>   | <b>3257</b>   | <b>3%</b>  |
| 3000  | drugs and anti social | 3100 | drugs (not cannabis)            | 1481          | 1756          | 19%        |
|   |                       | 3200 | drugs(cannabis only)            | 14654         | 15296         | 4%         |
|   |                       | 3400 | gaming                          | 18            |               | -100%      |
|   |                       | 3500 | disorder                        | 22007         | 22133         | 1%         |
|   |                       | 3600 | vagrancy offences               | 126           | 165           | 31%        |
|   |                       | 3700 | family offences                 | 423           | 292           | -31%       |
|   |                       | 3800 | family offences continued       | 4387          | 4508          | 3%         |
|   |                       | 3900 | sale of liquor act 1989         | 5984          | 7086          | 18%        |
| 5900  | drugs (new drugs)     | 2145 | 3217                            | 50%           |               |            |
| <b>drugs and anti social offences total</b> |                       |      |                                 | <b>51225</b>  | <b>54453</b>  | <b>6%</b>  |
| 4000  | dishonesty            | 4100 | burglary                        | 56513         | 60882         | 8%         |
|   |                       | 4200 | car conversion etc              | 33012         | 38622         | 17%        |
|   |                       | 4300 | theft                           | 118570        | 126301        | 7%         |
|   |                       | 4400 | receiving                       | 2271          | 3012          | 33%        |
|   |                       | 4500 | fraud                           | 13014         | 11890         | -9%        |
|   |                       | 4600 | burglary                        | 332           | 445           | 34%        |
| <b>dishonesty total</b>                     |                       |      |                                 | <b>223712</b> | <b>241152</b> | <b>8%</b>  |
| 5000  | property damage       | 5100 | destruction of property         | 40771         | 46944         | 15%        |
|   |                       | 5200 | endangering                     | 181           | 291           | 61%        |
| <b>property damage total</b>                |                       |      |                                 | <b>40952</b>  | <b>47235</b>  | <b>15%</b> |
| 6000  | property abuses       | 6100 | trespass                        | 11884         | 10531         | -11%       |
|   |                       | 6200 | littering                       | 265           | 295           | 11%        |
|   |                       | 6300 | animals                         | 316           | 292           | -8%        |
|   |                       | 6500 | postal/rail/fire service abuses | 3871          | 3575          | -8%        |
|   |                       | 6800 | arms act offences               | 2677          | 3088          | 15%        |
| <b>property abuses total</b>                |                       |      |                                 | <b>19013</b>  | <b>17781</b>  | <b>-6%</b> |
| 7000  | administrative        | 7100 | against justice                 | 9545          | 10216         | 7%         |
|   |                       | 7200 | births/deaths and marriages     | 9             | 11            | 22%        |
|   |                       | 7300 | immigration                     | 1260          | 592           | -53%       |
|   |                       | 7400 | racial                          | 6             | 6             | 0%         |
|   |                       | 7500 | against national interest       | 9             | 16            | 78%        |
|   |                       | 7600 | by - laws breaches              | 1133          | 706           | -38%       |
|   |                       | 7700 | justice (special)               |               | 1             | n/a        |
| 7900  | justice (special)     | 21   | 138                             | 557%          |               |            |
| <b>administrative total</b>                 |                       |      |                                 | <b>11983</b>  | <b>11686</b>  | <b>-2%</b> |
| <b>NATIONAL TOTAL</b>                       |                       |      |                                 | <b>395998</b> | <b>426208</b> | <b>8%</b>  |

## **Total Crime**

Police recorded a total of 426,208 offences during 2005/2006 (the year ended 30 June 2006)<sup>5</sup> which represents an increase of 8% from the 2004/2005 year.

## **Violence**

Violent offending is made up of homicide, kidnapping and abduction, robbery, assault, intimidation/threats, and group assembly offences. During 2005/2006 there were 50,644 offences in the violence category; an increase of 10% in violence offences recorded in the previous year:

- Recorded robberies increased 20% to 2,600;
- Recorded grievous assaults increased 19% to 4,077;
- Recorded serious assaults increased 13% to 17,713;
- The number of minor assaults that were recorded (12,894) remained approximately the same as in the previous year, and
- Recorded intimidation/threats increased by 14% to 12,579.

## **Dishonesty**

Dishonesty offences include burglary, vehicle conversion, theft, receiving and fraud offences. Dishonesty offences represent over half (57%) of all offences recorded by police. In terms of the number of offences within the category, dishonesty is the largest of the seven categories that police use to categorise crime. Therefore, trends in recorded dishonesty offending have a strong bearing on trends in total recorded offences.

During 2005/2006 the number of dishonesty offences that were recorded increased by 8% from the previous year, to 241,152. Closer examination of this figure shows that:

- Recorded theft offences increased by 7% compared to the previous year. 126,301 such offences were recorded for the 2005/2006 period, which makes up more than a quarter of all crime recorded by police.
- Recorded burglary offences increased by 8% compared to the previous year, with 60,882 offences recorded.
- The number of vehicle conversions recorded increased by 17% compared to the previous year, with 38,622 vehicle conversion offences recorded.

## **Other offences**

### ***Sexual offences***

There were 3,257 offences in the sexual category. This is an increase of 3% on the number of sexual offences recorded during the previous year.

### ***Drugs & Antisocial offences***

Drug and antisocial offences recorded during the 2005/2006 year increased by 6% on the previous year, with 54,453 offences recorded in this category. Disorder offences make up the largest proportion of this offence category, with 22,133 offences recorded during 2005/2006, an increase of 1% on the previous year.

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<sup>5</sup> Data obtained from provisional INCOFF data on 18<sup>th</sup> July 2006. Any provisional data is subject to change.

The most significant increase in terms of percentage change within this category of recorded offences, relates to Sale of Liquor Act offences which were up 18% on the previous year to 7,086 and new drug offences, which were up 50% to 3,217 offences.

The increase in Sale of Liquor Act offences is attributable to proactive policing of local liquor bans and the practice of some police districts only recently making use of specific offences code for this type of offence, rather than recording breaches of liquor bans against general administrative offence codes.

Cannabis offending increased by 4% compared to the previous year to 15,297 offences. This is notable in that this reverses a recent series of annual decreases in recorded cannabis offending.

Recorded non-cannabis drug offences increased 19% from the previous year to 1,756 offences.

### ***Property damage/abuse***

There were 47,235 offences in the property damage category. This is an increase of 15% on the number of property damage offences recorded during the previous year. Destruction of property offences (mostly wilful damage) make up the majority of offences in this category, with 46,944 such offences recorded for the 2005/2006 year.

There were 17,781 offences in the property abuse category. This is a decrease of 6% on the number of property abuse offences recorded during the previous year.

The biggest decrease occurred in the number of trespass offences that were recorded - down 11% to 10,531 recorded offences.

### ***Administrative crimes***

There were 11,686 offences recorded in the administrative crimes category. This is a decrease of 3% on the number of administrative offences recorded during the previous year. Over half the offences in the administrative category relate to a failure to answer bail. There were 6,918 failure to answer bail offences during 2005/2006, an increase of 27% on the previous year.

## ***Annual Variance***

Every year, recorded levels of some classes or types of crime decrease, while others remain stable or increase. Sometimes this variability can reflect normal statistical dispersion about a decreasing, stable or increasing trend. The variability can also reflect changes in factors that influence that particular class of crime. For example, the number of drug offences recorded can be sensitive to the levels of police resources that are applied to the detection of drug offences.

We conducted a variance analysis of the changes seen during 2005/2006 to ascertain whether these represented changes within the normal statistical dispersion for each class of crime or whether the changes were greater than expected. This analysis was based on a standard linear model, using the annual variance in recorded crime for the past ten years to establish 99% confidence intervals for observed annual changes in each class of crime.

During 2005/2006, the largest increases in either offence class, type of offence, or location occurred in:

- New drug offences, which increased by 50% during the 2005/2006 year;
- Failure to answer bail offences, which increased by 27%;
- Robberies, which increased by 20%;
- Grievous assaults, which increased by 19%;
- Non-cannabis drug offences, which increased by 19%;
- Sale of Liquor Act offences, which increased by 18%;
- Vehicle conversion offences, which increased by 17 %;
- Property damage, which increased by 15%;
- Intimidation/threats, which increased by 14%;
- Serious assaults, which increased by 13%;
- Burglary offences, which increased by 8%, and
- Theft offences, which increased by 7%.

## ***New drugs***

New drug offences, the recording of which increased by 50% in 2005/2006 compared to the previous year, were added as a crime class in 2003/2004. There is therefore no established pattern to assess annual variation in this statistic.

## ***Failure to answer bail***

Recorded Failure to Answer Bail offences have increased by 27% during the past year. In terms of volume this is the major offence type within the Crimes Against Justice Class, which rose by 7% during 2005/2006. The increase seen during 2005/2006 in the Crimes Against Justice offence class lies within the range of previous annual variations to a 95% level of confidence.

## ***Robberies***

Recorded robberies have increased by 20% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence. It also follows a trend of increasing robbery offences, seen since 2000/2001.

### ***Grievous assaults***

Recorded grievous assaults have increased by 19% during the past year. This level of increase is abnormally high and lies outside the range of previous annual variations, exceeding previous variability at a 99.9% level of confidence. However, the increase does continue a trend of increasing grievous assaults offences, seen since 1998/1999.

### ***Non-cannabis drugs***

Recorded non-cannabis drug offences have increased by 19% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence.

### ***Sale of Liquor Act***

Recorded Sale of Liquor Act offences have increased by 18% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence.

### ***Vehicle conversion***

Recorded vehicle conversion offences have increased by 17% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence. The increase reverses a long term trend (since 1996/1997, with the exception of 2001 to 2003) of decreasing levels of recorded conversion offences.

### ***Property destruction***

Recorded destruction of property offences have increased by 15% during the past year. This level of increase is abnormally high and lies outside the range of previous annual variations, exceeding previous variability at a 99.9% level of confidence.

### ***Intimidation/threats***

Recorded intimidation and threats offences have increased by 14% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence. The increase continues a long term trend (apparent since 1995/1996, with the exception of 2003/2004) of increasing levels of recorded intimidation and threats offences.

### ***Serious assault***

Recorded serious assault offences have increased by 13% during the past year. This level of increase is abnormally high and lies outside the range of previous annual variations, exceeding previous variability at a 99.9% level of confidence. However, the increase does continue a trend (apparent since 1990/2000) of increasing levels of recorded serious assault offences.

### ***Burglary***

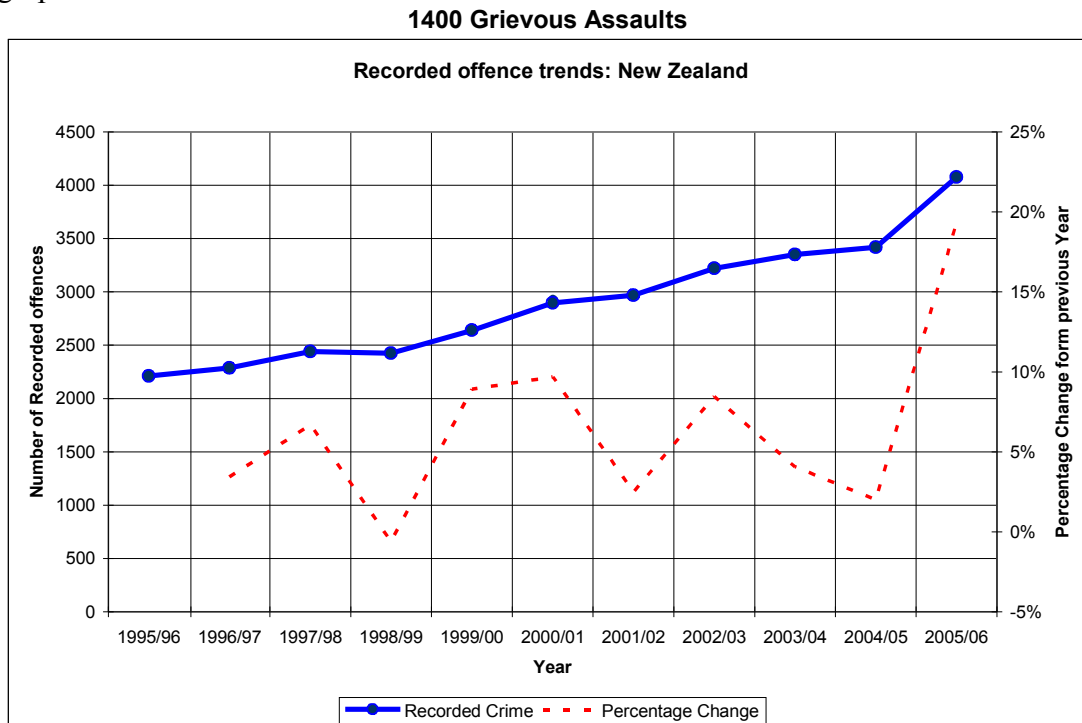
Recorded burglary offences have increased by 8% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence. The increase reverses a long-term trend (since 1996/1997) of decreasing levels of recorded burglary offences.

## Theft

Recorded theft offences have increased by 7% during the past year. This level of increase lies within the range of previous annual variations to a 95% level of confidence.

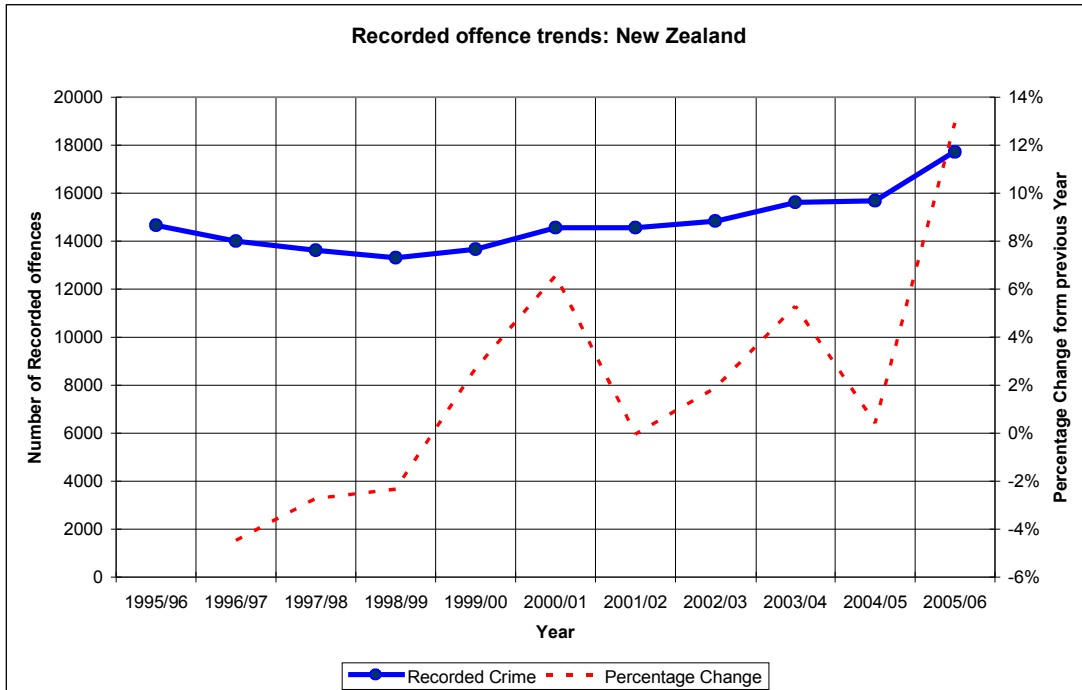
### *Variance observed outside expected ranges*

Despite significant movements, most of these variances lie within the expected range based on the analysis of the previous ten years of annual variation. However, several changes at class level lie outside the expected annual variance. These were the increases seen in the levels of recorded serious assault, grievous assault, and destruction of property. The changes in these statistics all lay outside a 99% confidence limit based on variability in those statistics observed over the past ten years. The ten year trends for these three parameters are charted in the following three graphs:



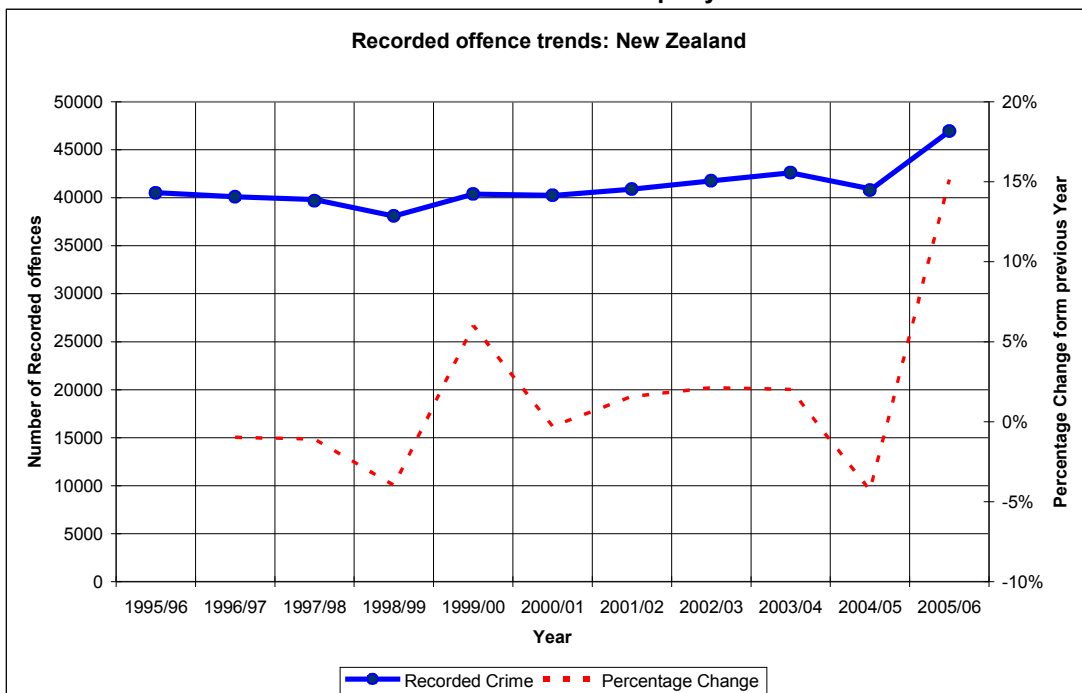
The number of grievous assaults recorded by police has shown an increasing trend for the past ten years. During 2005/2006 these grievous assault offences increased by 19%, which lies outside the expected annual variance seen over the previous decade.

### 1500 Serious Assaults



The number of serious assaults recorded by police has shown an increasing trend for the past six years. During 2005/2006 these serious assault offences increased by 13%, which lies outside the expected annual variance seen over the previous decade.

### 5100 Destruction Of Property



The number of destruction of property offences recorded by police has fluctuated over the past ten years, although rarely changing annually by more than 5% from the previous year. During 2005/2006 these destruction of property offences increased by 15%, which lies outside the expected annual variance seen over the previous decade.



## ***Time-series behaviour***

Having established a significant increase in recorded crime at a national level, we set out to identify when and where this occurred. The first analysis conducted was to observe the time-series behaviour over the past 24 months of recorded crime data. This provides insight into the timing of any increases that have occurred during 2005/2006.

Recorded crime figures have a number of time dependencies. Most offence classes show a strong daily or weekly repeating pattern, for example higher levels of recorded offending are observed during nights or during weekends. This pattern is especially apparent for crimes such as violent offending.

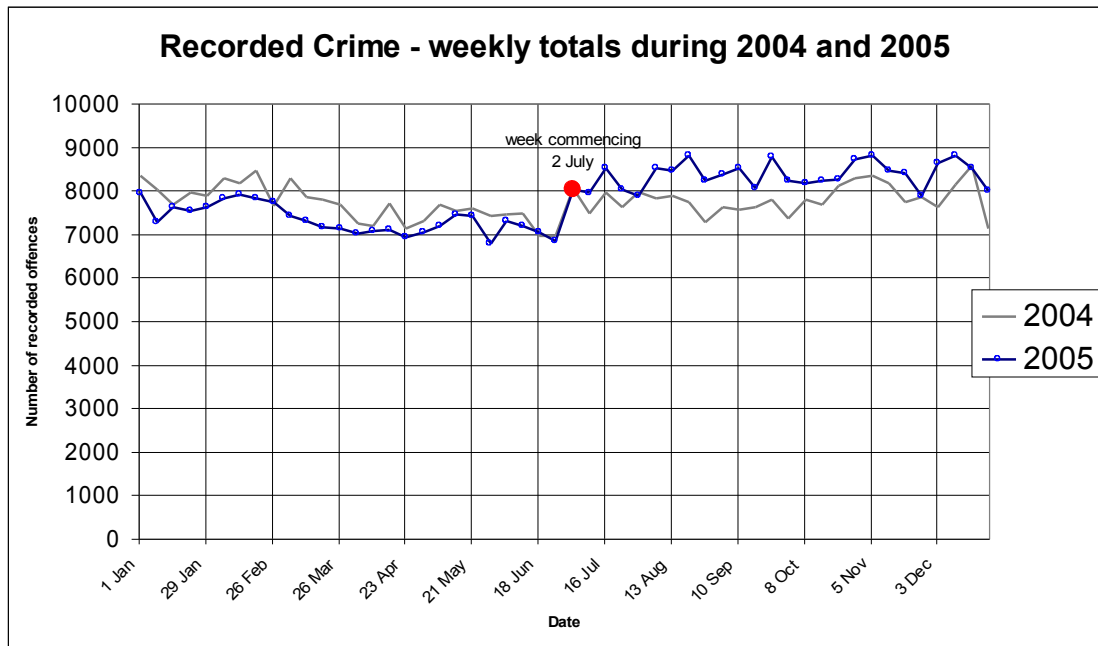
There is also a seasonal pattern of offending within each year, with higher levels of some offence types being clustered predictably around certain times of the year. For example, public place offences such as offences against liquor bans are highest during summer months.

It is also important to note that the crime recording process also affects the level of recorded crime. Official crime statistics present a snapshot of data in police's operational computer system, taken 14 days following the end of the fiscal year. If an offence is recorded 15 days or more after the end of the fiscal year then it will not appear in the official statistics for that year. Although most offences are recorded within a short period of the offence occurring, some types of crime can take some additional time to be recorded. For example, where additional offences are recorded as a result of an investigation and arrest, then those offences may not be counted in some official statistics. Thus, in fiscal year statistics, the months of May and June can often have significantly lower levels of recorded crime than other months, not necessarily because there was actually lower levels of crime, but because further counting of crime in those months was essentially ceased on 15<sup>th</sup> July.

Thus, monthly crime figures vary for many reasons, often in a predictable and recurring fashion. Accordingly, the best baseline against which to examine trends in recorded offending is not the immediately preceding period (i.e. the previous day, week or month) but to compare it to the same period during the previous year(s). This technique allows account to be taken of predictable seasonal patterns where levels of recorded offences rise or fall according to the time of year. The lowest repeating unit that it is useful to examine is one week (because of the predictable weekly cycle of offending).

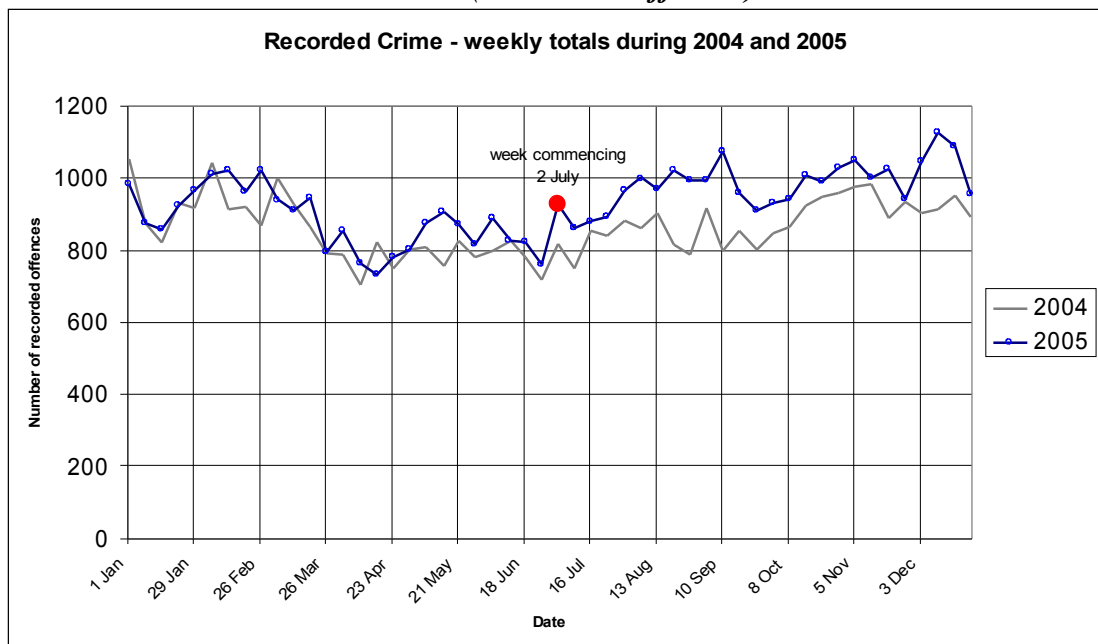
Examining several different types of crime reveals a similar time-series anomaly occurring at the start of July 2005, when recorded crime levels suddenly increased.

### Total Recorded Crime – New Zealand



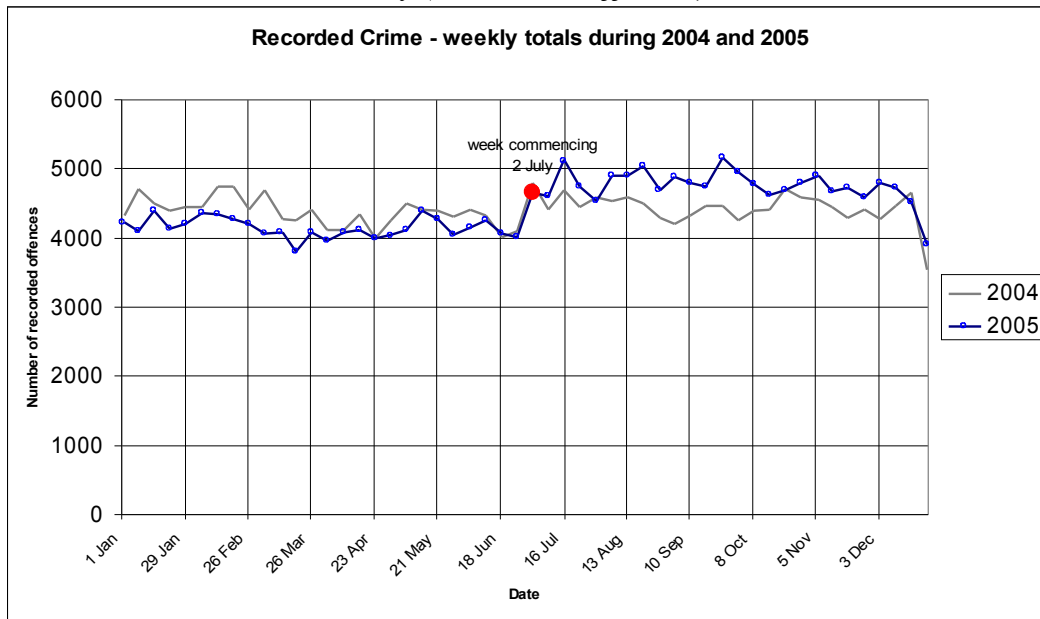
Prior to 1<sup>st</sup> July 2005, total crime recorded each week was consistently trending lower than had been observed in the corresponding weeks of the previous calendar year. However, from the start of July 2005, the levels of recorded crime suddenly increased to a level that consistently exceeded recorded crime during the previous year.

### Recorded Violent Crime (1000 series offences) – New Zealand



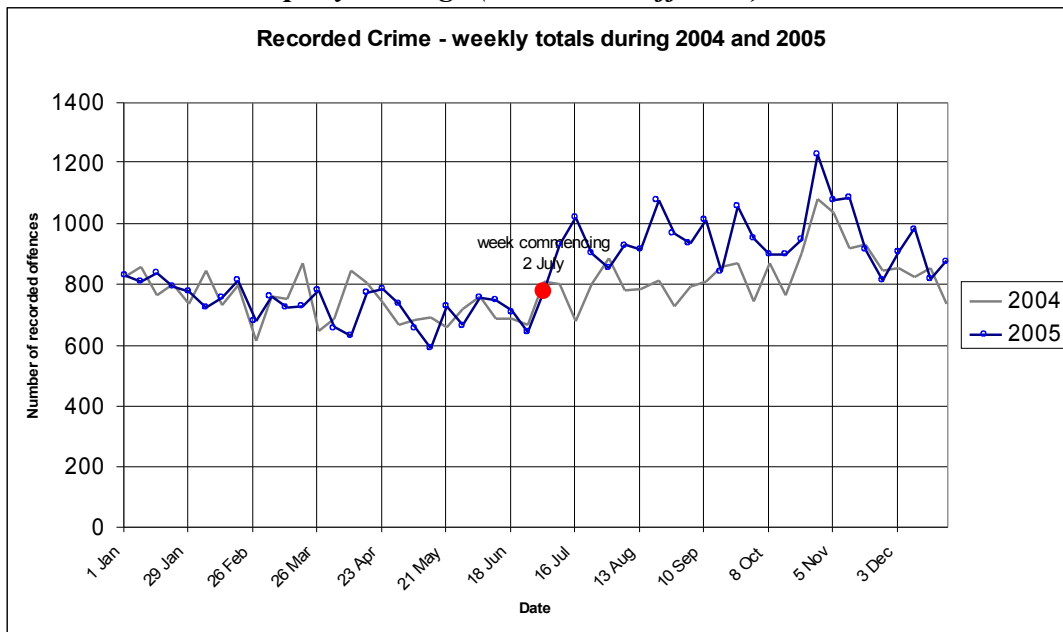
Prior to 1<sup>st</sup> July 2005, violent crime recorded each week was consistently trending higher than experienced in corresponding weeks during the previous calendar year. During the January to June period of 2005, recorded violence was up 3% compared to the equivalent period during the previous calendar year. However, a step-change occurred in July 2005, when the levels of violent crime suddenly increased to an even higher level, which exceeded reported violent crime during the previous year by 10%.

**Recorded Dishonesty (4000 series offences) – New Zealand**



Dishonesty crimes comprise approximately 57% of all crime recorded by police and therefore this offence category has a strong influence over total crime trends. Prior to 1<sup>st</sup> July 2005, dishonesty crime recorded each week was consistently trending lower than experienced in corresponding weeks during the previous calendar year. However, from the start of July 2005, the levels of recorded dishonesty crime suddenly increased to a level that consistently exceeded reported dishonesty crime during the previous year.

**Recorded Property Damage (5000 series offences) – New Zealand**

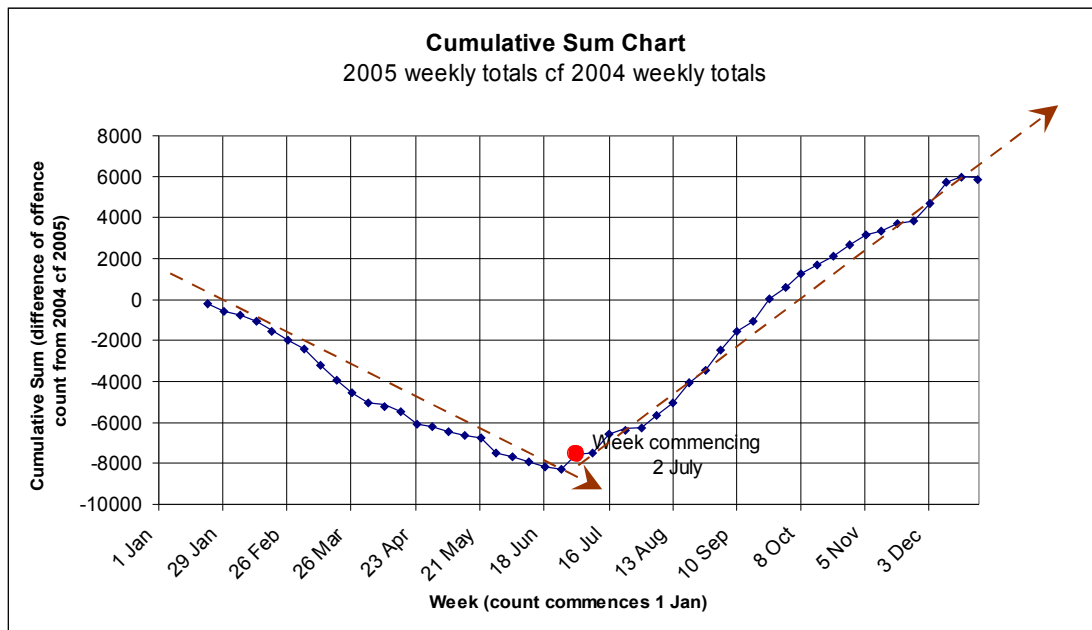


Similarly, the numbers of property damage offences recorded each week prior to 1<sup>st</sup> July 2005 were consistently at a similar level compared to corresponding weeks during the previous calendar year. However, from the start of July 2005, the levels of recorded property damage suddenly increased to a level that consistently exceeded recorded property damage during the previous year.

## Cumulative sum (cusum) charts

We used a cumulative sum technique to highlight changes in crime levels occurring over a particular time period. Cumulative sum charting tracks the integral of consecutive differences, between weekly recorded crime statistics and a standard measure based on the equivalent week from the previous year (or average from three previous years). The technique allows easy detection of incremental changes, and is used to identify the point at which a process deviates from statistical 'control'. A change in slope in a cusum chart indicates a step-change. An uninterrupted (straight) line indicates a continuation of a consistent trend.<sup>6</sup>

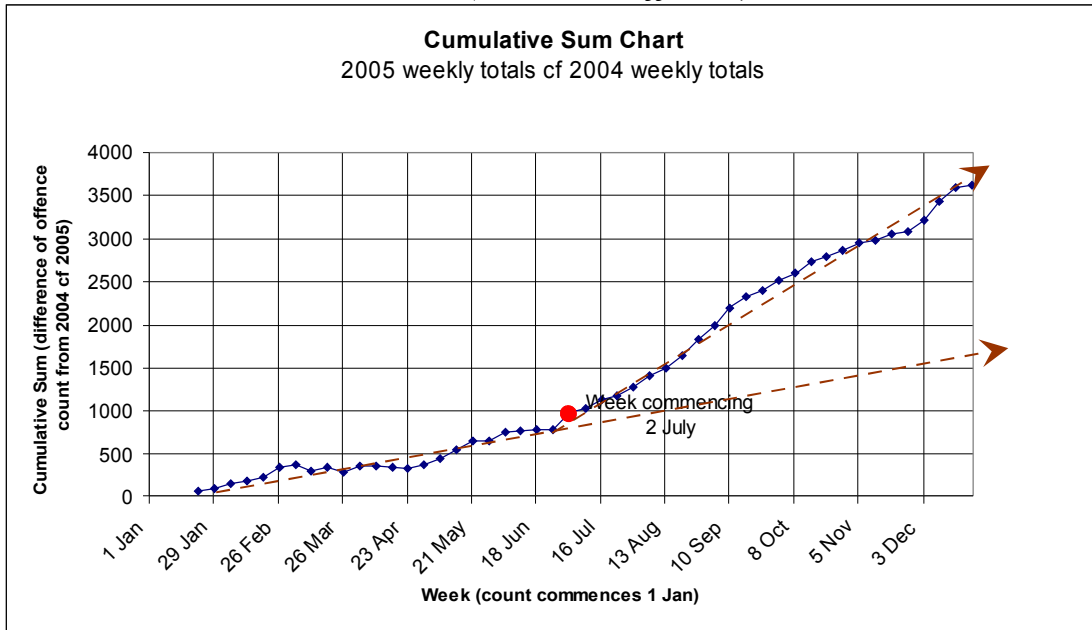
### Total Recorded Crime – New Zealand



The Cusum chart for total recorded crime clearly highlights the step-change in recorded crime that occurred at the start of July 2005. Up until that point, the cusum curve consistently tracks downwards, indicating that recorded crime was consistently lower than the control curve (the previous year's level of recorded crime). However, from the start of July 2005, the cusum curve suddenly changes slope and highlights the shift towards a phase when total recorded crime continues at a steady level, but at a higher level compared to the previous year.

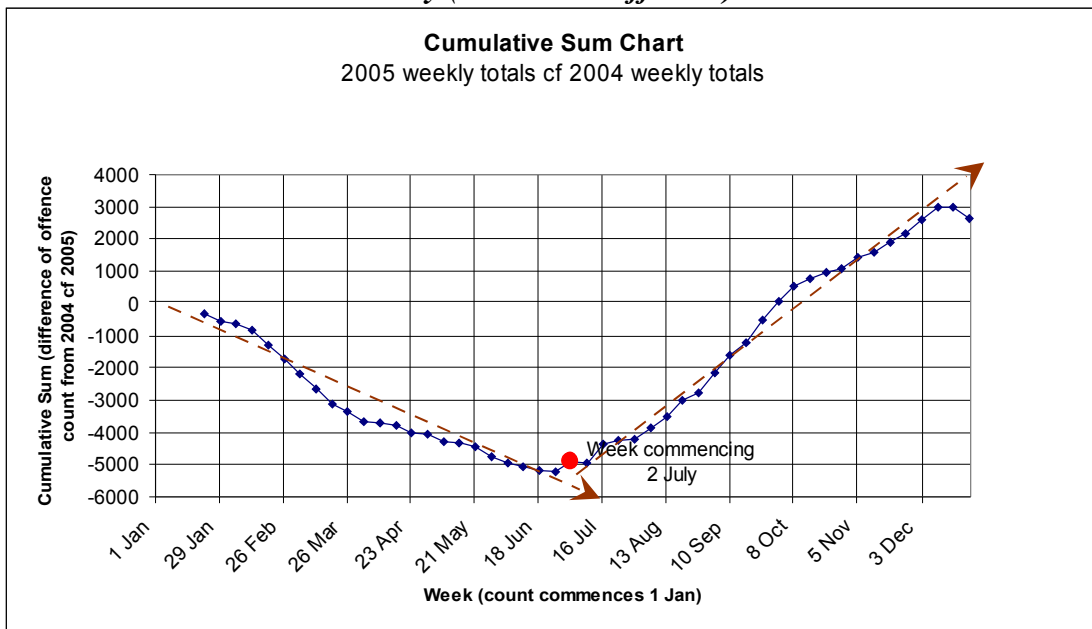
<sup>6</sup> A negative slope indicates a level of recorded crime that is lower than the previous year. A horizontal slope indicates a level of recorded crime that is similar to the previous year. A positive slope indicates a level of recorded crime that is higher than the previous year.

**Recorded Violent Crime (1000 series offences) – New Zealand**



The Cusum chart for recorded violent crime also highlights a step-change in the level of violent crime trend that occurred at the start of July 2005. Up until that point, the cusum curve consistently tracks upwards, indicating that violent crime was trending at a steady level (consistently 3% higher than the previous year). However, from the start of July 2006, the slope of the cusum curve increases indicating a shift towards a phase when recorded violent crime has reset to a steady trend at a higher level compared to the previous year (consistently 10% higher than the previous year).

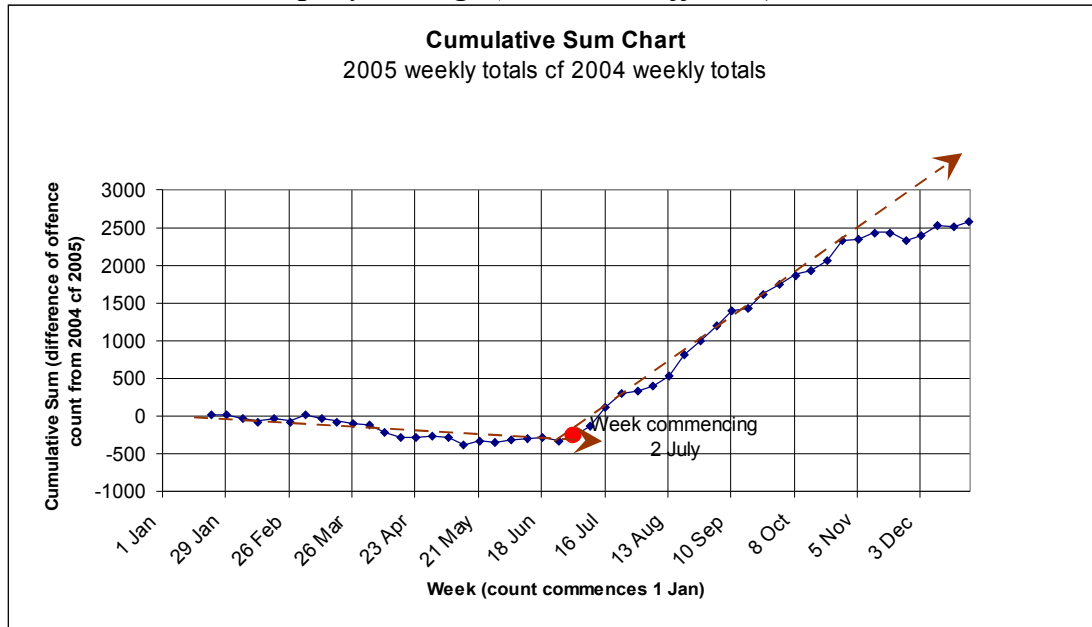
**Recorded Dishonesty (4000 series offences) – New Zealand**



The Cusum chart for recorded dishonesty crime follows a similar pattern to the curve for total crime. Up until July 2005, the cusum curve tracks downward, indicating that dishonesty crime was consistently lower than the previous year. However, from the

start of July 2006, the slope of the cusum curve changes direction indicating a step-change into a phase when recorded dishonesty crime as higher compared to the previous year.

***Recorded Property Damage (5000 series offences) – New Zealand***



The Cusum chart for recorded property damage crime shows similar anomaly at the start of July 2005. Up until July 2005, the cusum curve slowly tracks downward, indicating that property damage crime was slightly lower than the previous year. However, from the start of July 2005, the slope of the cusum curve changes direction indicating a step-change, leading into a phase when recorded property damage crime is higher compared to the previous year.

In summary, there is a clear indication, consistently repeated across several different categories of crime that indicates an event has occurred at the start of July 2005 causing levels of recorded crime to increase. These higher levels have then been sustained across different crime types.

## District variability

The following table shows recorded crime figures for each police district.

| District         | Offence Category                    | 2004/20<br>05 | 2005/20<br>06 | %<br>Change |
|------------------|-------------------------------------|---------------|---------------|-------------|
| Northland        | 1000 violence                       | 1892          | 2358          | 25%         |
|                  | 2000 sexual offences                | 147           | 103           | -30%        |
|                  | 3000 drugs and anti social offences | 2203          | 2678          | 22%         |
|                  | 4000 dishonesty                     | 7870          | 8308          | 6%          |
|                  | 5000 property damage                | 1397          | 1563          | 12%         |
|                  | 6000 property abuses                | 704           | 686           | -3%         |
|                  | 7000 administrative                 | 429           | 210           | -51%        |
| <b>total</b>     |                                     | <b>14642</b>  | <b>15906</b>  | <b>9%</b>   |
| Auckland City    | 1000 violence                       | 4630          | 5417          | 17%         |
|                  | 2000 sexual offences                | 316           | 324           | 3%          |
|                  | 3000 drugs and anti social offences | 6364          | 6989          | 10%         |
|                  | 4000 dishonesty                     | 35670         | 36407         | 2%          |
|                  | 5000 property damage                | 2288          | 2751          | 20%         |
|                  | 6000 property abuses                | 2302          | 1863          | -19%        |
|                  | 7000 administrative                 | 1064          | 1870          | 76%         |
| <b>total</b>     |                                     | <b>52634</b>  | <b>55621</b>  | <b>6%</b>   |
| North Shore-     | 1000 violence                       | 5055          | 5101          | 1%          |
|                  | 2000 sexual offences                | 294           | 284           | -3%         |
|                  | 3000 drugs and anti social offences | 5307          | 5120          | -4%         |
|                  | 4000 dishonesty                     | 20018         | 22846         | 14%         |
|                  | 5000 property damage                | 3437          | 3841          | 12%         |
|                  | 6000 property abuses                | 2202          | 1949          | -11%        |
|                  | 7000 administrative                 | 847           | 899           | 6%          |
| <b>total</b>     |                                     | <b>37160</b>  | <b>40040</b>  | <b>8%</b>   |
| Counties Manukau | 1000 violence                       | 6189          | 7438          | 20%         |
|                  | 2000 sexual offences                | 398           | 563           | 41%         |
|                  | 3000 drugs and anti social offences | 4004          | 5327          | 33%         |
|                  | 4000 dishonesty                     | 25719         | 32124         | 25%         |
|                  | 5000 property damage                | 3351          | 4471          | 33%         |
|                  | 6000 property abuses                | 1964          | 1825          | -7%         |
|                  | 7000 administrative                 | 2029          | 2514          | 24%         |
| <b>total</b>     |                                     | <b>43654</b>  | <b>54262</b>  | <b>24%</b>  |
| Waikato          | 1000 violence                       | 2784          | 3333          | 20%         |
|                  | 2000 sexual offences                | 240           | 211           | -12%        |
|                  | 3000 drugs and anti social offences | 4331          | 4838          | 12%         |
|                  | 4000 dishonesty                     | 16638         | 19912         | 20%         |
|                  | 5000 property damage                | 2593          | 3196          | 23%         |
|                  | 6000 property abuses                | 1023          | 1128          | 10%         |
|                  | 7000 administrative                 | 1030          | 934           | -9%         |
| <b>total</b>     |                                     | <b>28639</b>  | <b>33552</b>  | <b>17%</b>  |
| Bay of Plenty    | 1000 violence                       | 3991          | 3937          | -1%         |
|                  | 2000 sexual offences                | 230           | 229           | 0%          |
|                  | 3000 drugs and anti social offences | 6277          | 5349          | -15%        |
|                  | 4000 dishonesty                     | 19491         | 20747         | 6%          |
|                  | 5000 property damage                | 3182          | 3665          | 15%         |
|                  | 6000 property abuses                | 1594          | 1420          | -11%        |
|                  | 7000 administrative                 | 734           | 788           | 7%          |
| <b>total</b>     |                                     | <b>35499</b>  | <b>36135</b>  | <b>2%</b>   |

| District                 | Offence Category                    | 2004/2005     | 2005/2006     | % Change   |
|--------------------------|-------------------------------------|---------------|---------------|------------|
| Eastern                  | 1000 violence                       | 2700          | 2840          | 5%         |
|                          | 2000 sexual offences                | 187           | 222           | 19%        |
|                          | 3000 drugs and anti social offences | 3141          | 3703          | 18%        |
|                          | 4000 dishonesty                     | 11713         | 13041         | 11%        |
|                          | 5000 property damage                | 2483          | 3120          | 26%        |
|                          | 6000 property abuses                | 1119          | 1124          | 0%         |
|                          | 7000 administrative                 | 568           | 399           | -30%       |
| <b>total</b>             |                                     | <b>21911</b>  | <b>24449</b>  | <b>12%</b> |
| Central                  | 1000 violence                       | 3747          | 4042          | 8%         |
|                          | 2000 sexual offences                | 241           | 194           | -20%       |
|                          | 3000 drugs and anti social offences | 3048          | 3333          | 9%         |
|                          | 4000 dishonesty                     | 17065         | 18301         | 7%         |
|                          | 5000 property damage                | 4037          | 4633          | 15%        |
|                          | 6000 property abuses                | 1155          | 1221          | 6%         |
|                          | 7000 administrative                 | 745           | 711           | -5%        |
| <b>total</b>             |                                     | <b>30038</b>  | <b>32435</b>  | <b>8%</b>  |
| Wellington               | 1000 violence                       | 5501          | 5988          | 9%         |
|                          | 2000 sexual offences                | 316           | 331           | 5%         |
|                          | 3000 drugs and anti social offences | 4788          | 4846          | 1%         |
|                          | 4000 dishonesty                     | 21507         | 22387         | 4%         |
|                          | 5000 property damage                | 4800          | 5462          | 14%        |
|                          | 6000 property abuses                | 1735          | 1669          | -4%        |
|                          | 7000 administrative                 | 1660          | 1494          | -10%       |
| <b>total</b>             |                                     | <b>40307</b>  | <b>42177</b>  | <b>5%</b>  |
| Tasman                   | 1000 violence                       | 1939          | 2023          | 4%         |
|                          | 2000 sexual offences                | 141           | 150           | 6%         |
|                          | 3000 drugs and anti social offences | 2725          | 2879          | 6%         |
|                          | 4000 dishonesty                     | 6821          | 6915          | 1%         |
|                          | 5000 property damage                | 2621          | 2519          | -4%        |
|                          | 6000 property abuses                | 1191          | 1044          | -12%       |
|                          | 7000 administrative                 | 789           | 288           | -63%       |
| <b>total</b>             |                                     | <b>16227</b>  | <b>15818</b>  | <b>-3%</b> |
| Canterbury               | 1000 violence                       | 4376          | 4784          | 9%         |
|                          | 2000 sexual offences                | 412           | 407           | -1%        |
|                          | 3000 drugs and anti social offences | 4230          | 4202          | -1%        |
|                          | 4000 dishonesty                     | 29004         | 27543         | -5%        |
|                          | 5000 property damage                | 5866          | 6234          | 6%         |
|                          | 6000 property abuses                | 2152          | 2117          | -2%        |
|                          | 7000 administrative                 | 1308          | 854           | -35%       |
| <b>total</b>             |                                     | <b>47348</b>  | <b>46141</b>  | <b>-3%</b> |
| Southern                 | 1000 violence                       | 3137          | 3383          | 8%         |
|                          | 2000 sexual offences                | 250           | 239           | -4%        |
|                          | 3000 drugs and anti social offences | 4807          | 5189          | 8%         |
|                          | 4000 dishonesty                     | 12196         | 12621         | 3%         |
|                          | 5000 property damage                | 4897          | 5780          | 18%        |
|                          | 6000 property abuses                | 1872          | 1735          | -7%        |
|                          | 7000 administrative                 | 780           | 725           | -7%        |
| <b>total</b>             |                                     | <b>27939</b>  | <b>29672</b>  | <b>6%</b>  |
| <b>New Zealand total</b> |                                     | <b>395998</b> | <b>426208</b> | <b>8%</b>  |

It is apparent that the annual change in recorded crime varied at a district level. During 2005/2006, levels of total recorded crime actually decreased in two police districts (Canterbury and Tasman) and increased in all other locations. Three districts in particular show high percentage increases in total recorded crime levels during the year with Counties Manukau up 24%, Waikato up 17% and Eastern up 12%.



The increases in total recorded offences in Counties-Manukau, Waikato and Eastern districts all exceed the level of expected annual variation, based on an analysis of the past decade of annual changes in recorded crime in each District. Annual statistics between 1995/96 and 2004/2005 show less variability than that which is seen during 2005/2006 in those three locations. The 2005/2006 percentage increases in these three districts lie outside the bounds of random variation (with a 99% level of confidence).

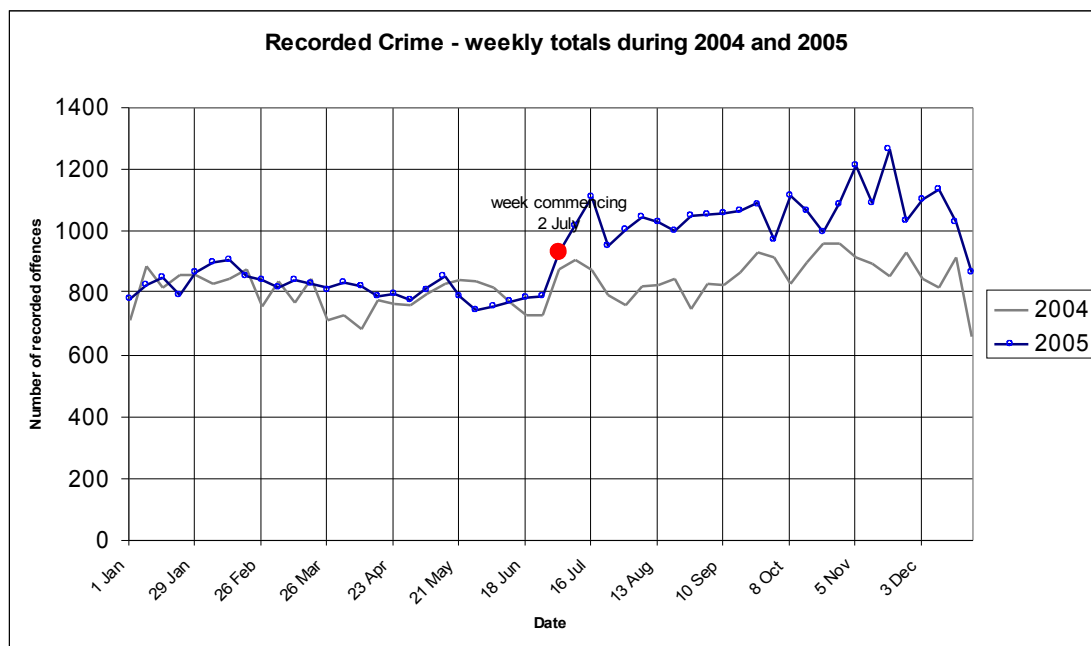
| <i>District</i>      | <i>Average annual variation</i> | <i>Standard deviation</i> | <i>2005/2006 variance</i> | <i>Z (99%=2.58)</i> |
|----------------------|---------------------------------|---------------------------|---------------------------|---------------------|
| Counties Manukau     | -0.6%                           | 6.8%                      | 24.3%                     | 3.59                |
| Waikato              | -3.7%                           | 4.6%                      | 17.1%                     | 3.74                |
| Eastern              | -2.9%                           | 3.9%                      | 11.6%                     | 2.99                |
| <b>All Districts</b> | <b>-1.8%</b>                    | <b>5.3%</b>               |                           |                     |

The annual changes in total recorded crime during the past year in the other nine districts lie within the expected range of variability seen during the past 10 years (within a 95% level of confidence).

### Time-series analysis – District trends

Total recorded offences in each District have different time-series features, indicating some variability at a district level. Time-series analysis of the difference between the 2004 and 2005 periods highlights a discontinuity in the recorded offence time-series which occurs during July 2005. For illustrative purposes, the following time-series graphs show the total crime trends in several districts that have experienced different crime trends during 2005/2006, covering districts with a significant increase (Counties-Manukau, Waikato, Eastern), smaller total crime increases (Northland, North-Shore-Waitakere) and a crime decrease (Canterbury):

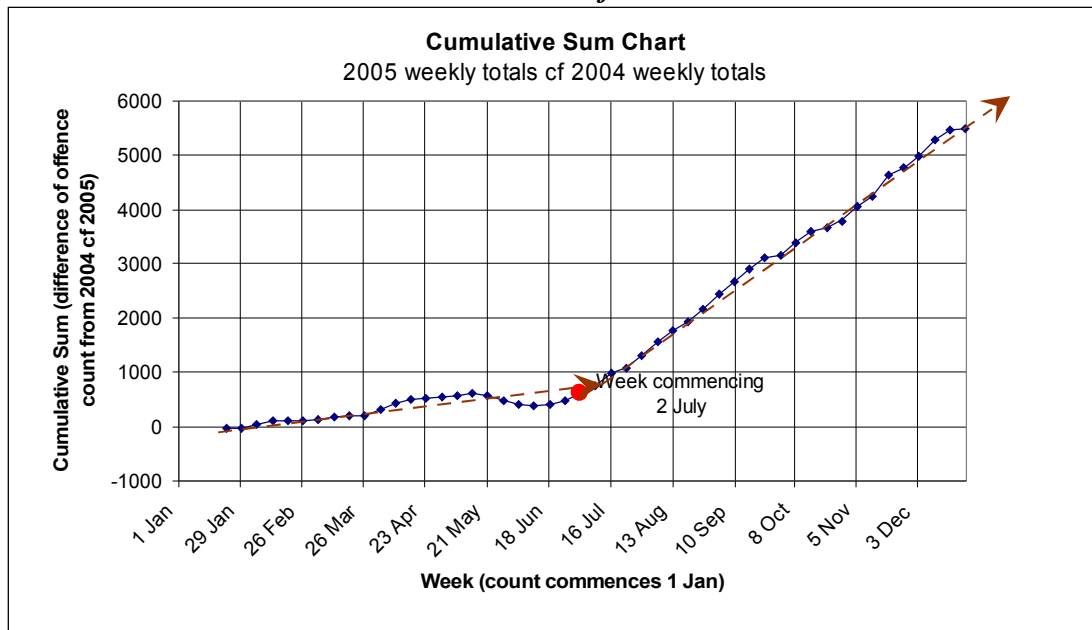
#### *Counties Manukau – Total Recorded Crime*



During the first half of the year Counties-Manukau experienced a period of slightly elevated recorded crime levels during 2005 compared to 2004. On average, offending was up by 3%. From July 2005 to December 2005 the district experienced a much

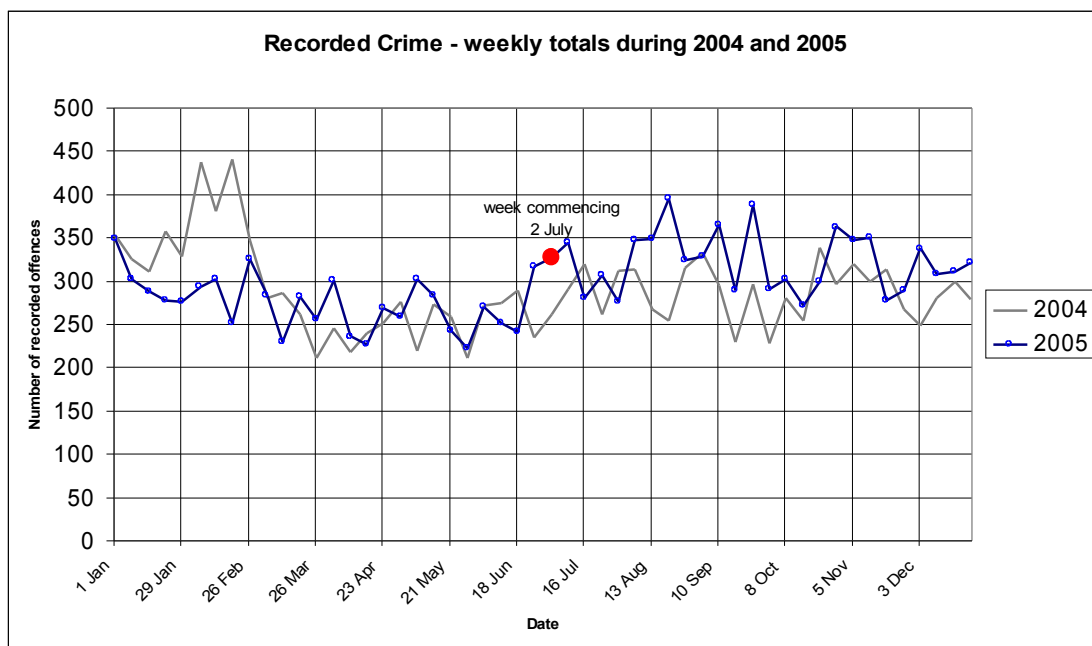
higher level of recorded crime in 2005 compared to 2004. On average, recorded offending was up by 23%.

### *Counties Manukau – Cusum of Total Recorded Crime*



The cusum curve of total recorded crime in Counties-Manukau illustrates that an increase in crime level occurred from July 2005. Up until that point, crime levels had been similar to the previous year's levels. From July 2005, recorded crime in Counties-Manukau began tracking steadily at significantly higher levels than experienced during the previous year.

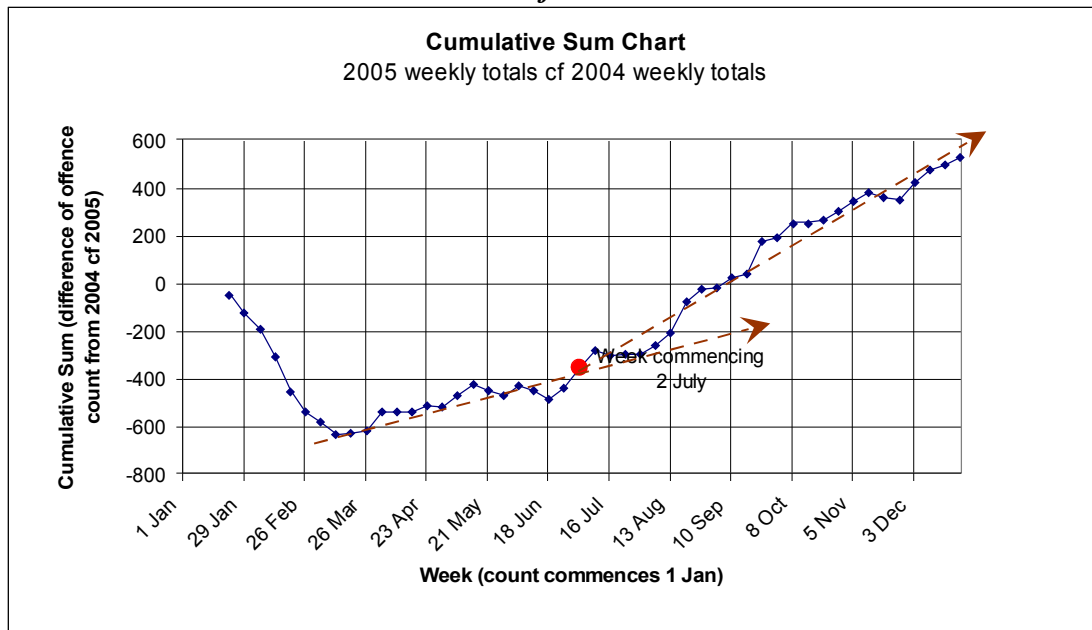
### *Northland – Total Recorded Crime*



Northland experienced a period of lower crime during January and February 2005, compared to these months in 2004. From March 2005 onwards the Northland District statistics report a higher level of recorded crime in 2005 compared to this period in

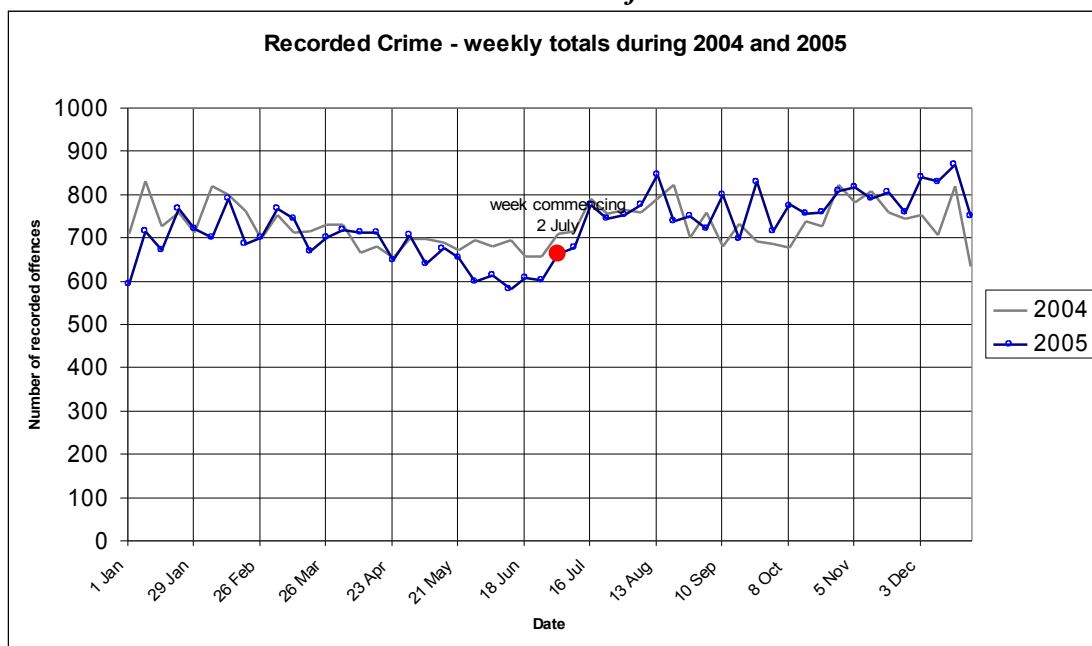
2004. However, from July 2005 the level of recorded crime increased to a greater rate than was apparent between March-June.

### Northland – Cusum of Total Recorded Crime



The cusum curve of total recorded crime in Northland District illustrates that changes in recorded crime trends occurred during March 2005 in that district, and during July 2005. Up until March 2005, crime levels had been significantly lower than the previous year’s levels. From March 2005, recorded crime began tracking at higher level. The slope of the cusum chart increases during July 2005, indicating that the level of total recorded crime increases from that point.

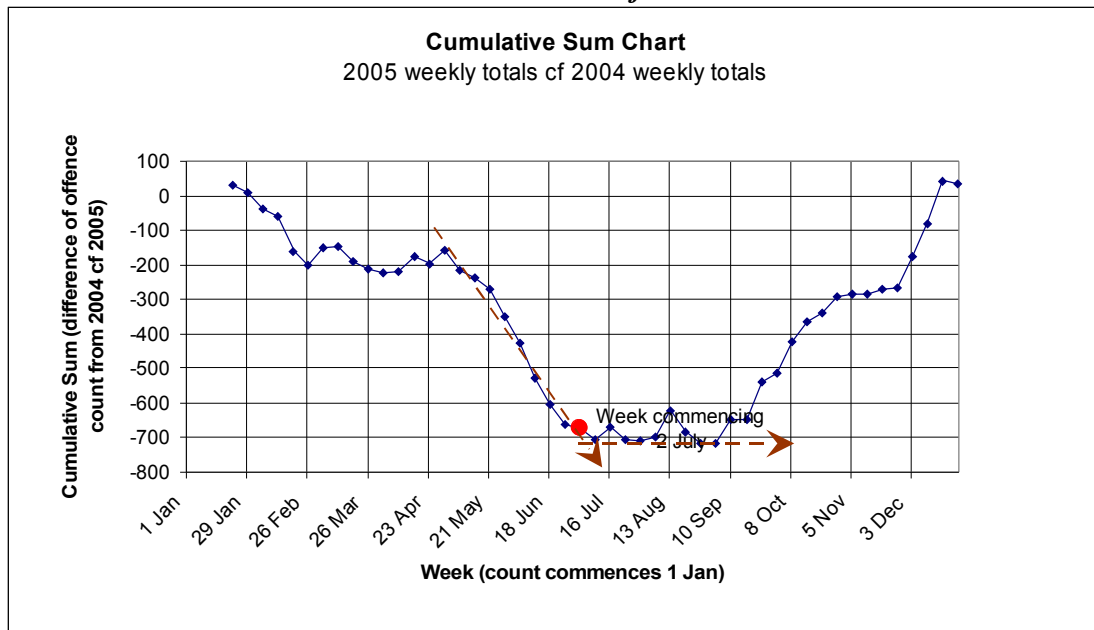
### North Shore-Waitakere – Cusum of Total Recorded Crime



During the first half of the year the North Shore-Waitakere District statistics reported a period of generally lower recorded crime levels during 2005 compared to 2004. From July 2005 to August 2005 this situation changed and the District experienced a

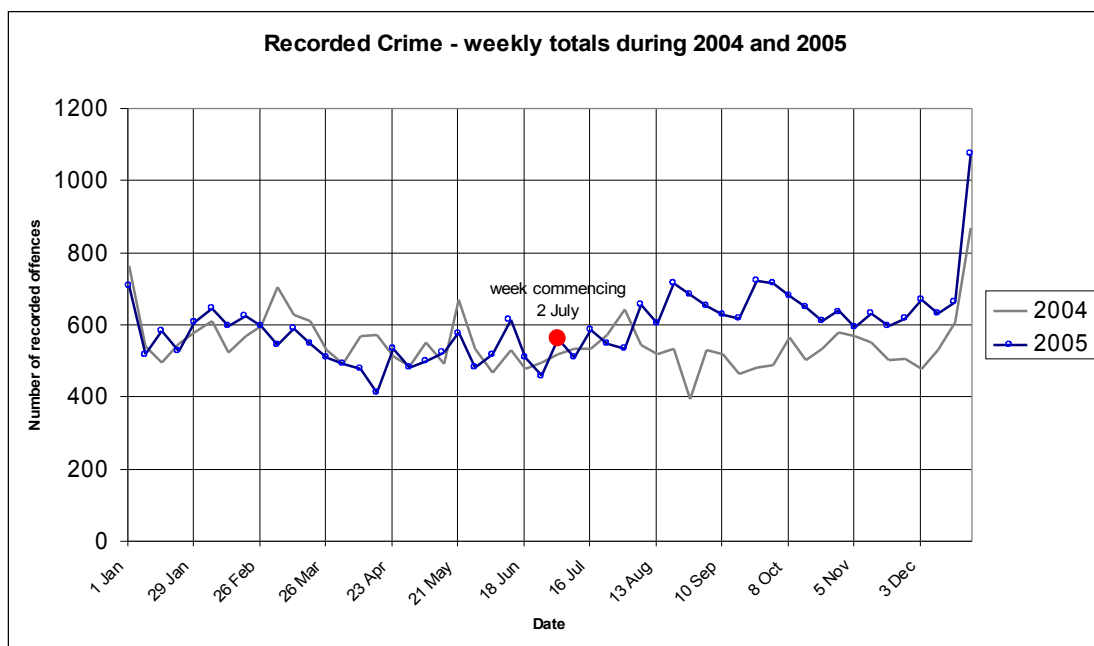
similar level of recorded crime in 2005 compared to 2004. From September 2005 recorded offences increased compared to the previous year.

***North Shore- Waitakere – Cusum of Total Recorded Crime***



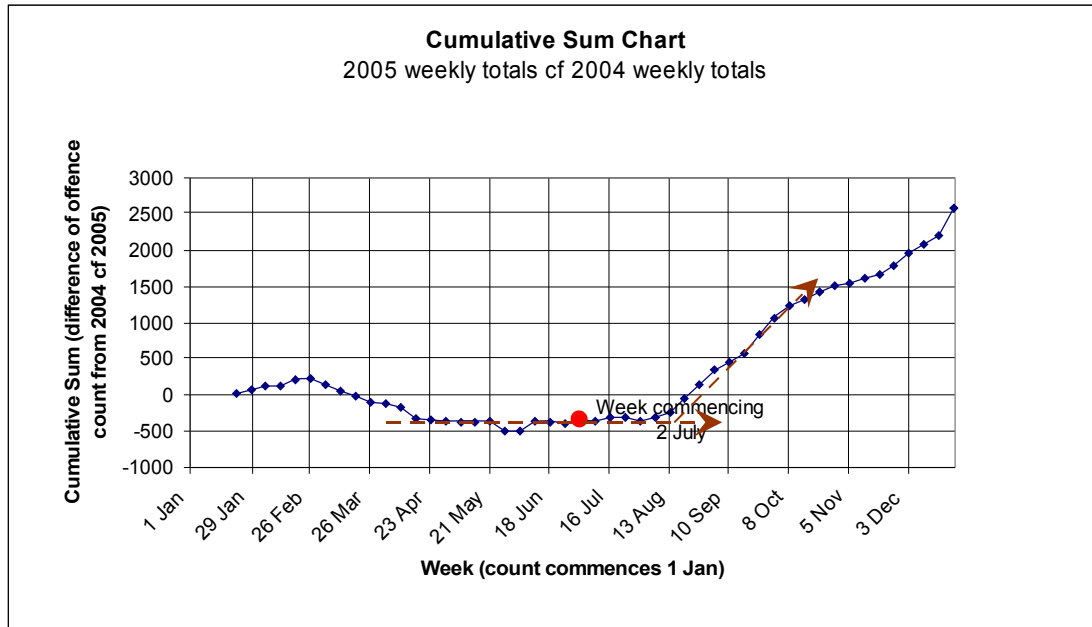
The cusum chart for North Shore-Waitakere illustrates a change in recorded crime levels during July 2005. There are also several changes in crime rate (Feb 2005, May 2005, Sept 2005). However, during the first half of the year the North Shore-Waitakere district experienced a period of generally lower recorded crime levels during 2005 compared to 2004. From July 2005 this situation changed and the District firstly stepped into a similar level of recorded crime in 2005 compared to 2004, then from September 2005 recorded offences again increased compared to the previous year.

***Waikato – Total Recorded Crime***



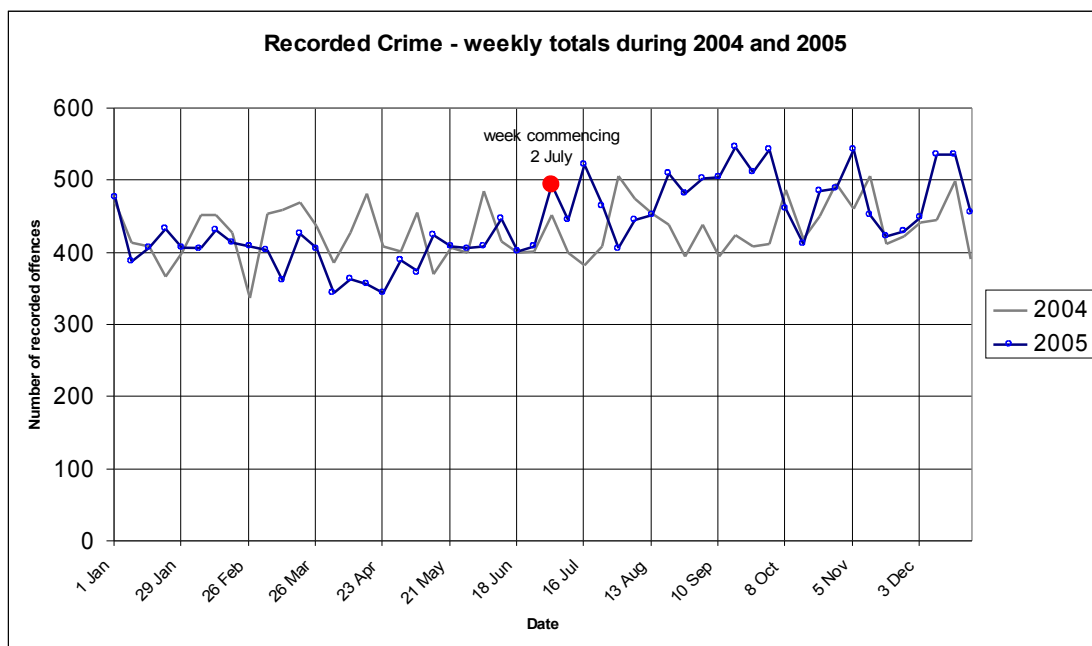
During 2005, the level of recorded crime in Waikato had been tracking at a similar level to the previous year from January until August. From August 2005, there was a step-increase in total recorded crime compared to previous years.

### Waikato – Cusum Total Recorded Crime



The step-increase in recorded crime trend that occurred in the Waikato District during August 2005 is illustrated in the cusum curve for total recorded crime. The curve changes from a relatively horizontal pattern (indicating similar levels during 2005 compared to 2004) to a curve with a positive slope (indicating a higher crime rate in 2005 compared to the corresponding period during 2004).

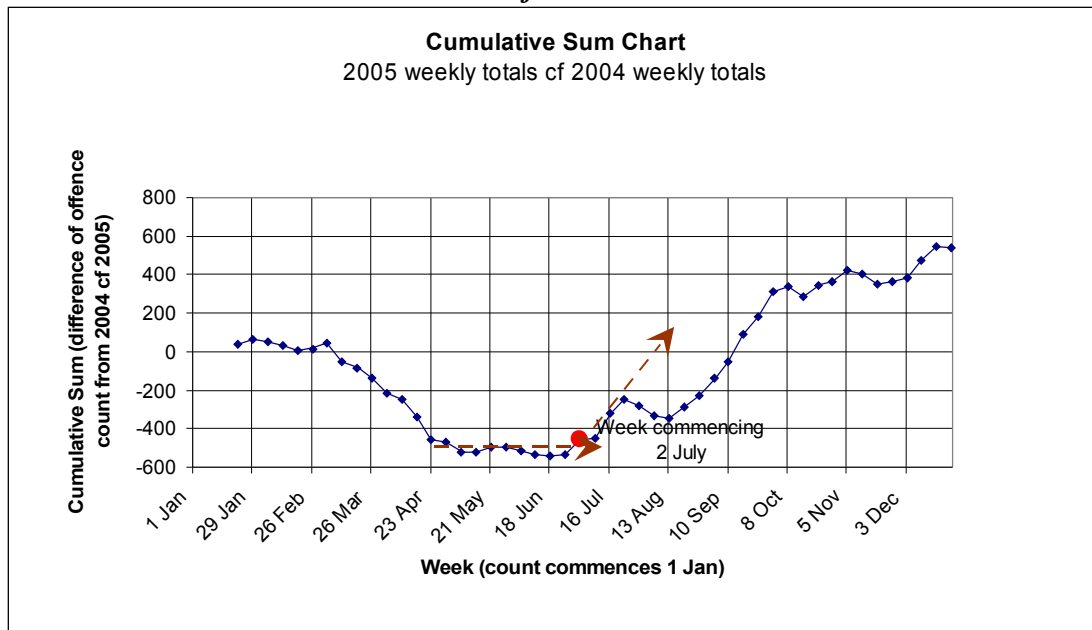
### Eastern – Total Recorded Crime



Up until June-July total recorded crime figures for the Eastern District during 2005 were variable, but were generally indicating lower levels compared to the same period in 2004. From July 2005, the situation reversed with generally higher levels of

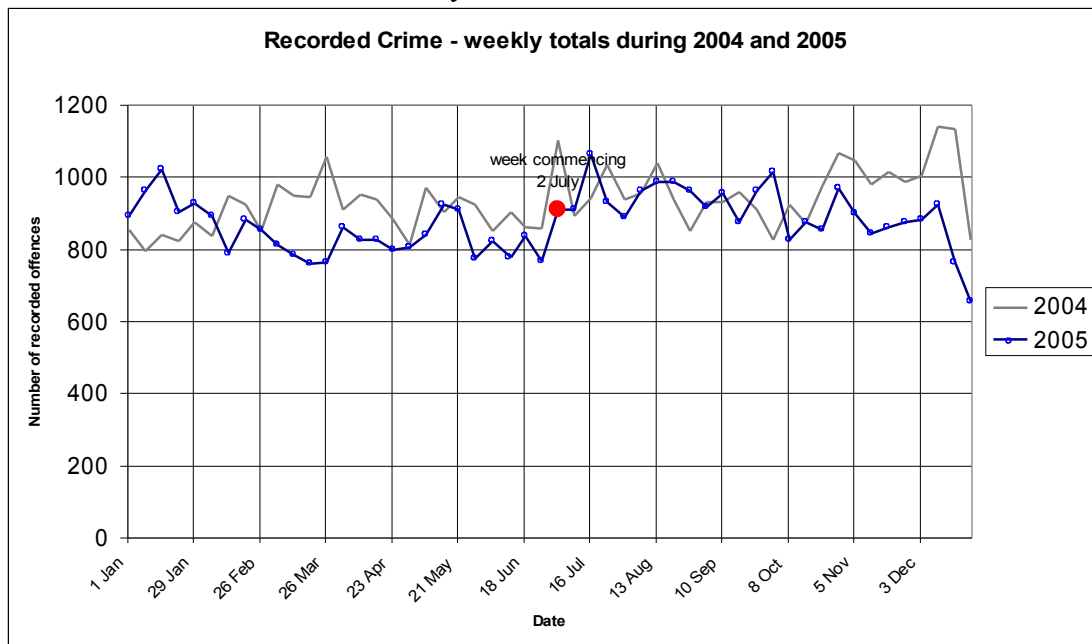
recorded crime compared to previous years, though with some variability in weekly totals.

### *Eastern – Cusum of Total Recorded Crime*



The cusum chart for Eastern District illustrates a change in recorded crime levels during the second half of 2005. There was a generally decreasing crime rate from January to June 2005. However, from July 2005 this situation changed and the District firstly experienced a sharp increase compared to 2004, then from October 2005 a less pronounced increase in recorded offences compared to the previous year.

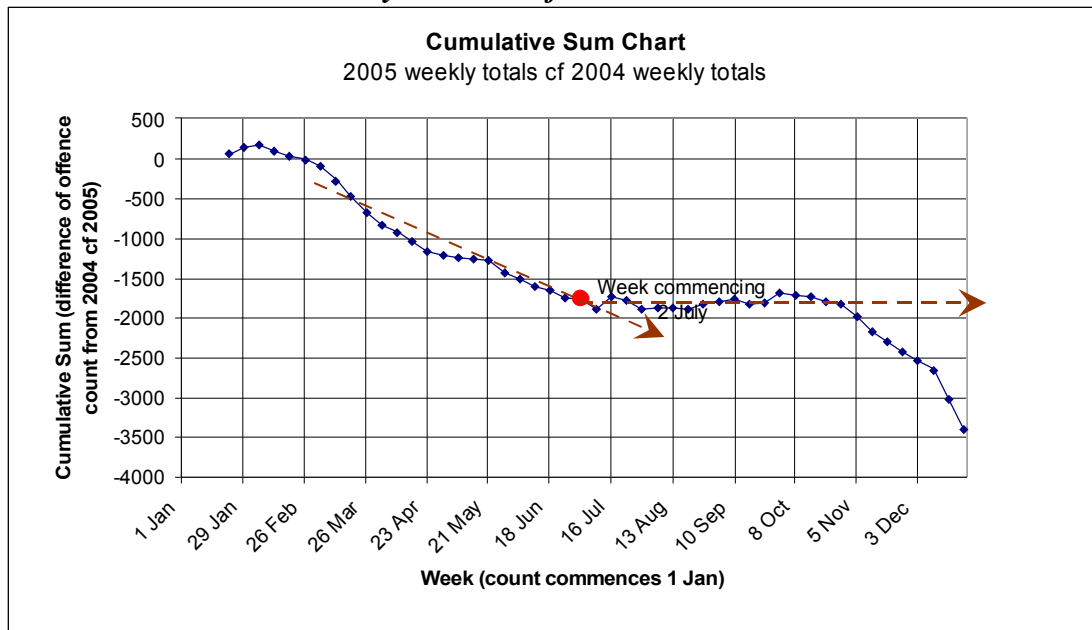
### *Canterbury – Total Recorded Crime*



During the first half of the year Canterbury district experienced a period of lower recorded crime levels during 2005 compared to 2004. From July 2005 to August 2005 the district experienced a similar level of recorded crime compared to the same period

in 2004. From October 2005, the level of recorded crime in Canterbury district again decreased compared to 2004.

### Canterbury – Cusum of Total Recorded Crime



The cusum curve reiterates that, unlike the majority of Districts, Canterbury experiences a decrease in total recorded crime levels during 2005 compared to the previous year. However, the chart also indicates an anomaly in recorded crime levels during July 2005 for this district. Up until July 2005, crime levels had been significantly lower than previous year’s levels. From July 2005 until the end of October 2005, recorded crime in Canterbury stepped up to a higher level, before transitioning into a lower level of recorded offending again from November 2005.

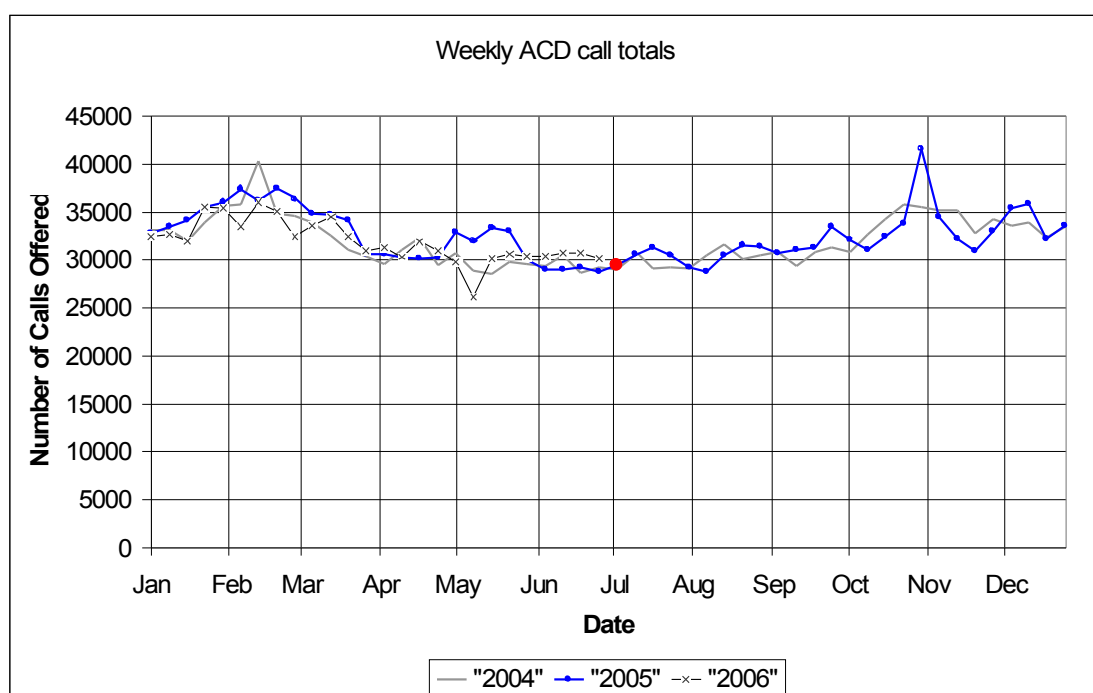
In summary, there are differences in overall annual crime trends in different districts, with some districts experiencing a decrease in recorded crime and others experiencing significant increases. All annual crime figures show additional variability at a local level compared to national trend figures, with this variance naturally occurring when looking at regions with lower crime levels. However, it is of note that the majority of districts appeared to experience an anomaly during July 2005, when crime levels apparently increased in a stepwise manner compared to the levels that each district had been previously experiencing.

## Independent Data Series

We sought to identify whether several other data sets might corroborate the increase in recorded crime seen in Police's crime statistics. However, the following analysis shows that the anomalies that appear to occur in crime statistics, such as the abrupt discontinuity during July 2005, are not reflected in the time-series of other independent data sets that might be expected to correlate with levels of recorded crime.

### Calls for service made to police

The first independent data that was examined was the volume of calls for service that police received. The Call Centre Manager (CCM) is a software system that records the number of external calls presented to the police communication centres (i.e. calls for service). Time-series plots of CCM data do not reveal any discontinuity in total call levels during July. In fact, call levels during 2005 track at similar levels to the corresponding time period during 2004.



Overall calls during 2005/2006 are actually down 1% on levels for the 2004/2005 year, which is in contrast to the increase that has been seen in recorded crime during the same period.

### Crime events data

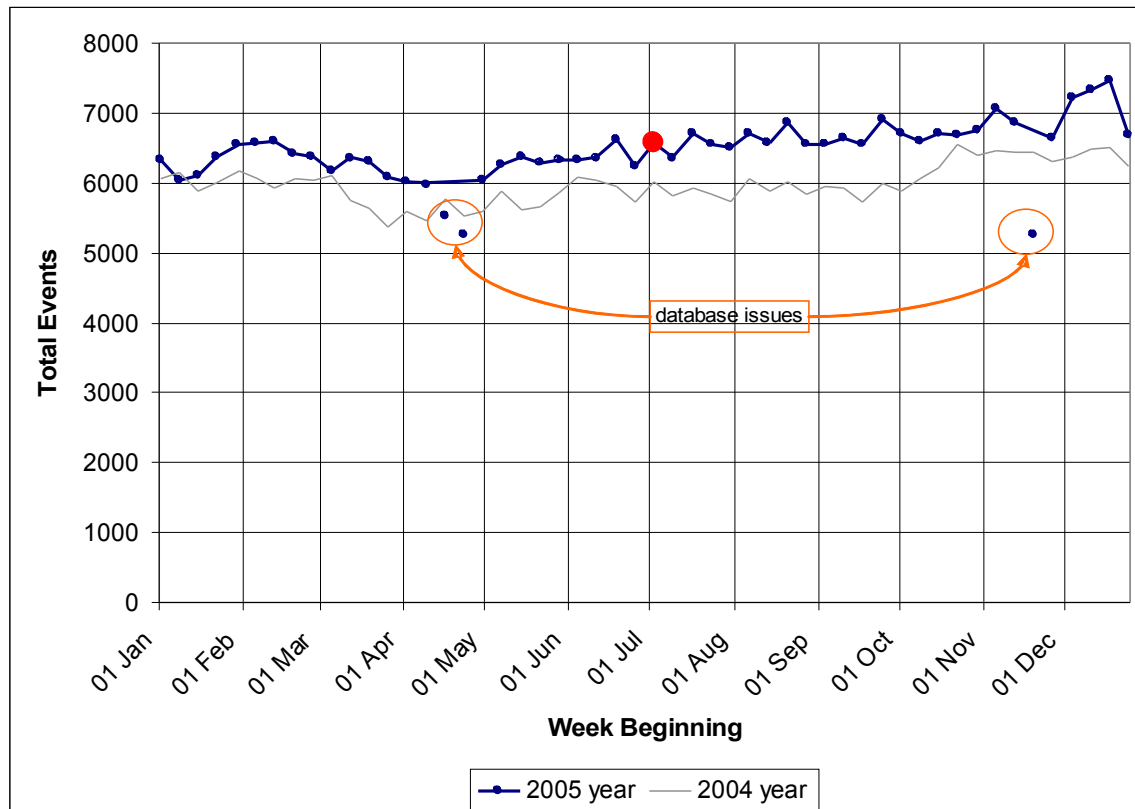
The second independent data set that we examined related to the number of events notified to police communication centres. The police communication centres maintain records of crimes and incidents (events) in a separate system to the police crime statistics. It should be noted, though, that there is a handover of some electronic data from the communication centre data to the crime database, which can influence the level of recorded crime. Nevertheless, communications centre data represents a semi-



independent check on the number of crimes and incidents that are reported to police through the communication centre network.

The following chart shows all events that have been recorded in the communication centre database (CARD) which have been attributed a result at event close-out of either K6 (Offence Report) or K9 (arrest).

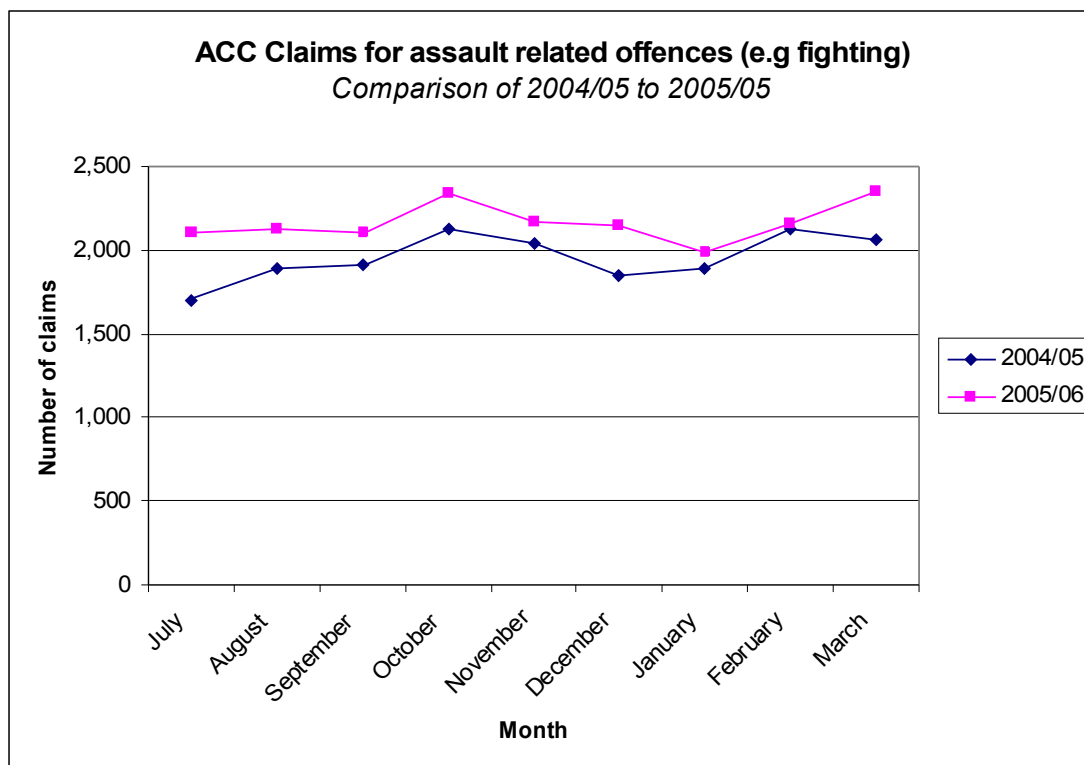
*Weekly CARD events: K6 & K9 at event closeout*



The time-series of K6 and K9 CARD events does not reveal any discontinuity occurring during July 2005. There is however, an increase in recorded CARD events during 2005, compared to the number of CARD events recorded during the previous year (apart from two short periods during April and November, when there may have been technical issues associated with CARD event recording (the three outlying points marked on the chart)). Some increase in CARD events from September 2005 may be attributable to a change in the CARD software system.

### **Accident Compensation Commission Data**

ACC claim data were also sought as an independent data set for comparison to the police crime statistics. This data set relates to claims that are made to ACC for some types of injury. Data was obtained from ACC indicating claims made as a result of injuries received from intentional injury events (for example fighting, assault). This data is collected completely independently of any police recoding systems and presents an independent validation of any trends seen in violent crime, particularly more serious assaults resulting in injury.



The ACC data shows that claims for assault-related injuries increased by approximately 10% during 2005/2006 compared to the previous year. This is consistent with the observation that police were experiencing an increase in levels of recorded violent crime, both in the six months prior to July 2005 and during 2005/2006.

However, somewhat significantly, the ACC data also shows that there is no abrupt increase in the levels of claims received for injuries sustained from July 2005. In fact, the claim patterns throughout 2005 followed largely the same pattern of seasonal variation seen during the previous year.

### **Insurance claim data for loss of property by theft and burglary**

In order to independently corroborate the trends seen in dishonesty offending we contacted the insurance council and wrote to several insurance companies seeking insurance claim statistics for the twenty-four month period from July 2004 to June 2006. We hoped to obtain monthly claim data relating to (a) vehicle theft and (b) loss of personal effects through theft or burglary. Unfortunately, the insurance industry did not respond to our requests and we were unable to source the information.

### **Summary of independent data**

The independent data series that were examined show no evidence to support the increase in crime that is suggested by the police crime statistics for the 2005/2006 year. Call for service data, CARD event data and ACC claim data all indicate steady time-series behaviours during 2005 and reveal no anomalies that correspond with the changes in recorded crime statistics.

The overall increase in violent crime seen in crime statistics is however supported by ACC claim statistics.

## Potential causes of the July 2005 anomaly

There is a clear indication that there has been a change during July 2005 that has influenced recorded crime. Police migrated to a new computer system during this period, moving from the Law Enforcement System<sup>7</sup> (LES) to a new National Intelligence Application (NIA).

The new NIA system essentially replicates the old practices surrounding statistics entry into LES, in that it requires police to separately enter statistics information, rather than automatically deriving crime statistics from case information. However there are some subtle changes that will have influenced the statistics capture and quality control:

- The NIA environment is more user-friendly, with wizards and other features to enhance data entry processes;
- The NIA system provides some pre-population of data fields to minimise duplicate data entry;
- Proactive training of staff in the new NIA system;
- New systems/ways of auditing data in the new NIA system;
- Police districts each implemented their own policies/resourcing models for file entry.

Thus, despite the intention to work towards limited functional enhancement of existing LES statistics capture, there were a number of limitations with the LES system that were addressed as a result of migration to the NIA environment, such as improved integrity of some statistics<sup>8</sup> and increased auditing capabilities.

### Efficiency of statistics entry

The first issue associated with the changes in statistics entry that we examined was file entry. Traditionally, statistics are entered by police administrative staff who transfer information from paper-based forms into the computerised statistics system. Factors such as backlogs of data entry and form design all potentially impact on this statistics entry process. In particular, we were interested to examine whether data entry efficiency had changed.

Potentially, changes in the efficiency of data entry can affect actual levels of recorded crime. Files containing offence statistics from June (or prior months) that are not able to be entered into the computer system by 14<sup>th</sup> July will not be included in counts of official fiscal year statistics. Thus, if the file entry process changes in terms of efficiency, then this could affect whether statistics are captured.

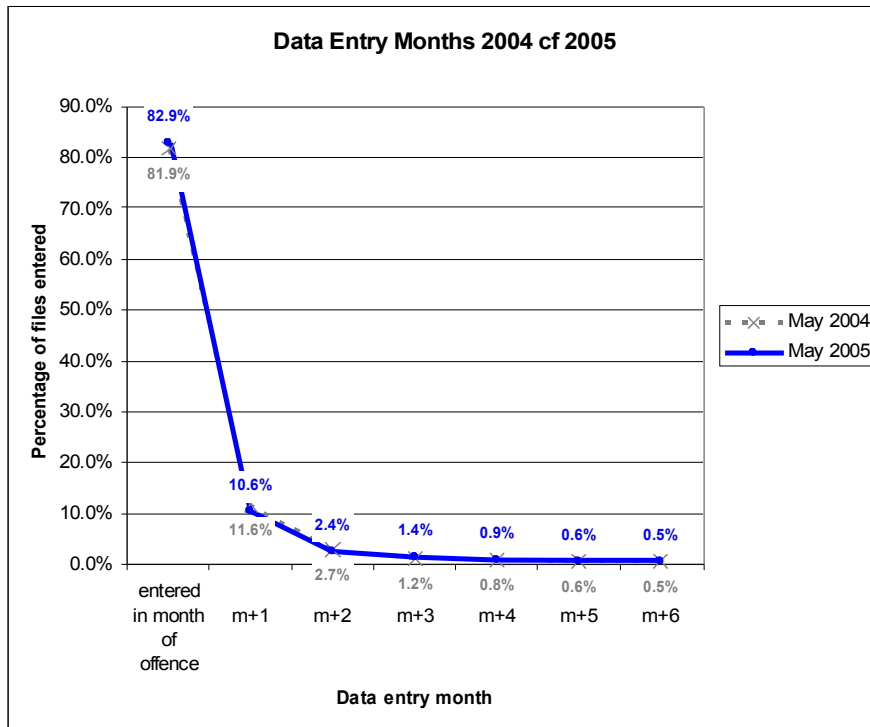
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<sup>7</sup> The “Wanganui Computer”

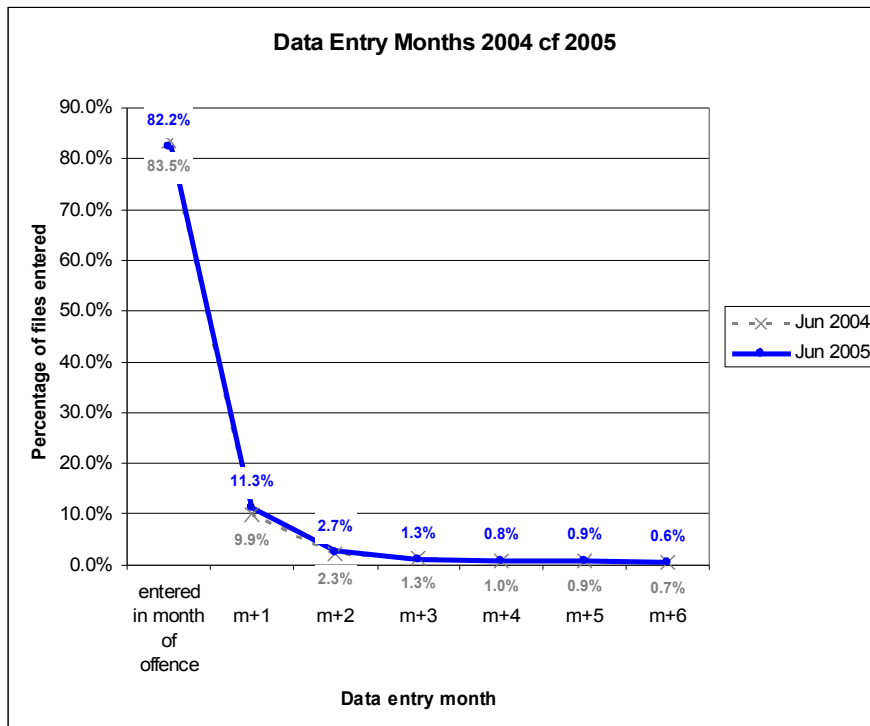
<sup>8</sup> For example family violence data will be improved by correcting a failure to currently capture family violence deletions in PDSI.

To examine this phenomenon we plotted the elapsed time required for data entry to determine if the process had become more of less efficient. The following graphs show representative results of this analysis:

***Month of data entry for crime occurring during May***



***Month of data entry for crime occurring during June***



This analysis of offence date *versus* file entry date data reveals that the changeover to the new NIA system has had no observable impact on the efficiency of data capture and therefore has had no impact on recorded crime.

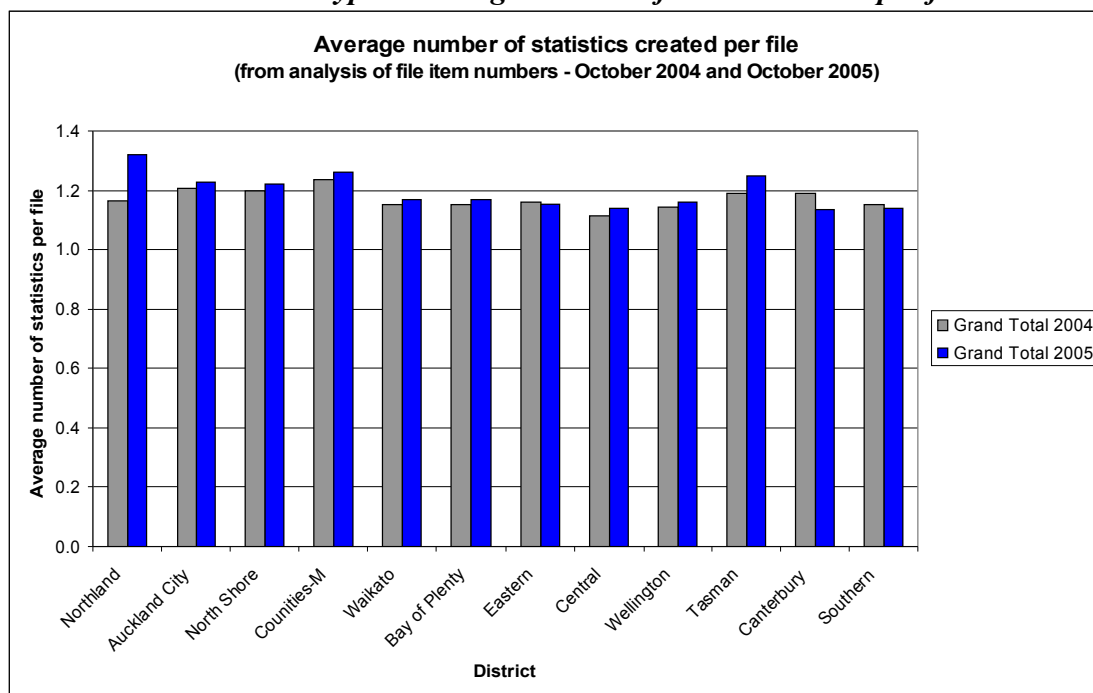
## Other aspects of statistics business processes

It is possible that the migration to the NIA system may have influenced the recording of statistics in more subtle ways. In particular the new Graphic User Interface system in NIA presents a much different user environment to the text based LES system, potentially altering efficiency and business processes. Also, depending on local district policies, sworn staff may be more likely to create their own statistics in the NIA environment rather than rely on administrative data entry staff to transfer information from paper files. Also, the new computer environment presents a different information environment for supervision and file auditing than existed with the LES system. Examination of files revealed some changes may have occurred in statistics entry that could be attributed to these types of factors.

The average number of crime statistics generated from each file appears to have increased following the introduction of the NIA environment - for example, this is attributable to such situations as when files relating to the arrest of an offender record two offences instead of one offence.

The following chart shows how the average number of offence statistics per file has increased across most police district from October 2004 (under the LES system) to October 2005 (under the NIA system):

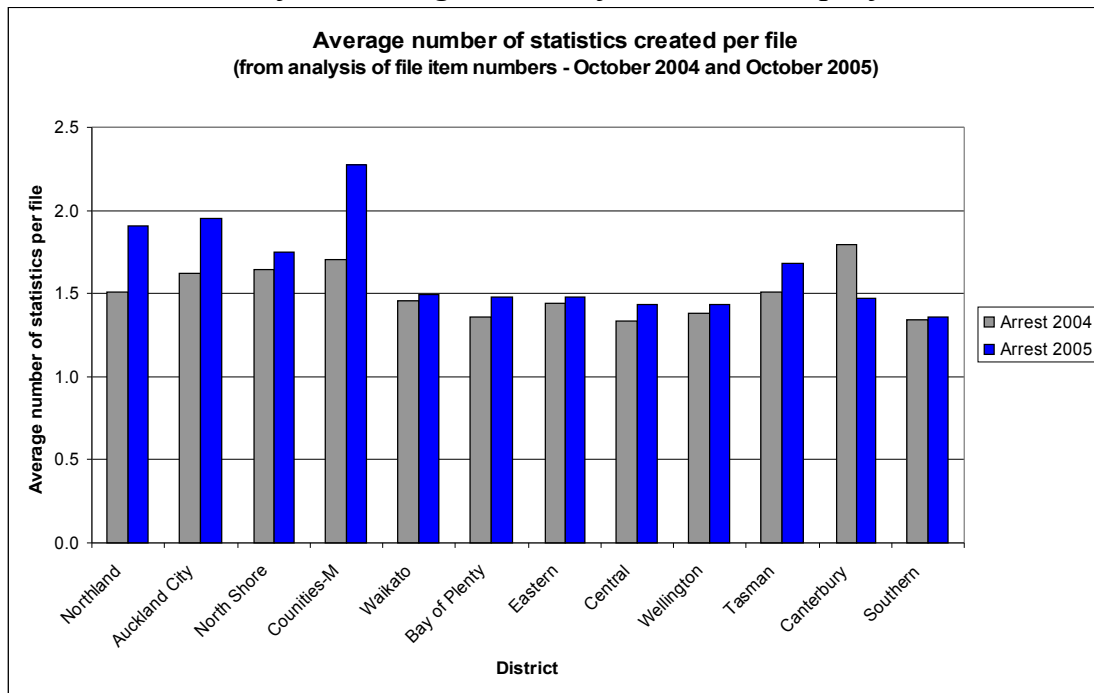
*All resolution types - average number of crime statistics per file*



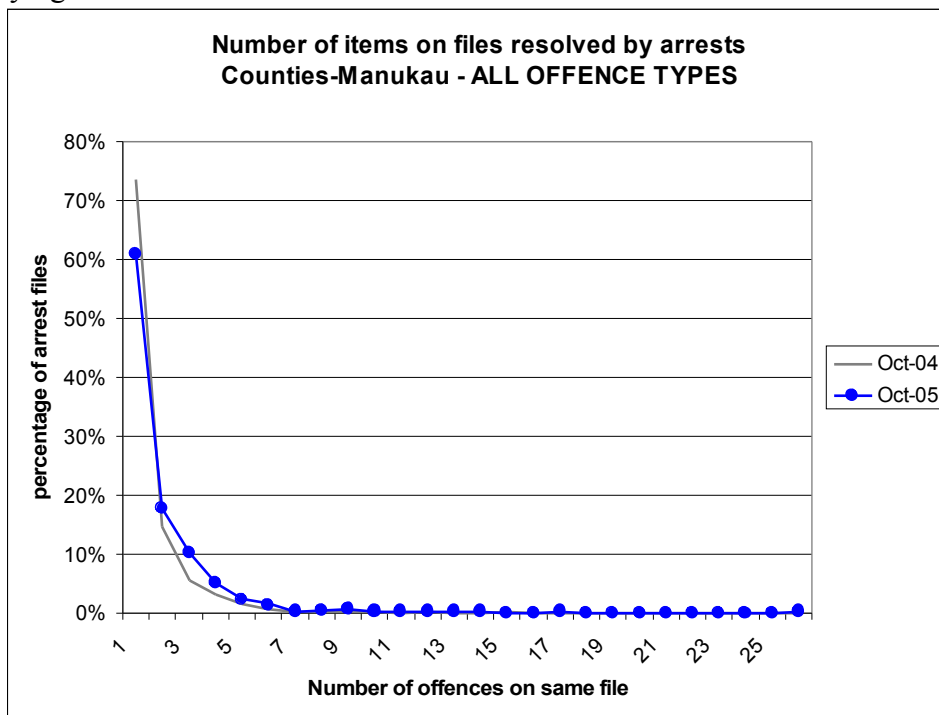
Analysis suggests that some types of files in some districts contain a greater number of offence statistics compared to previous years. Arrest files are particularly affected. Violence, Property Damage, Property Damage and Administrative (Bail) offence classes appear to be also affected. For example, taking the subset of files that relate to offender arrests, it can be seen in the following chart that in some districts (e.g. Northland, North Shore Waitakere, Auckland City, and Counties Manukau) there

have been significant increases in the number of offence statistics that each arrest file generates.

**Arrest files - average number of crime statistics per file**



As Counties Manukau shows the highest relative increase in statistics per arrest file, we conducted an audit of file details to identify the attributes of these files. This audit revealed a drop from 73% of arrest files identifying one offence down to 61% of arrest files identifying one offence, and an increase in the proportion of files identifying three or more offences.



To see what was driving this increase in multiple statistics, we audited a range of files and found what may reflect a change in recording practice and apparent file recording errors. Vehicle conversion and interference offences give particular insight, because it is intuitively relatively easy to understand the relationship between incidents and recorded statistics (one car taken, one offence recorded for example) and offence details often contain features such as vehicle registration numbers that enable file duplications to be identified. The following table shows the results of an analysis of these vehicle conversion and interference files in Counties-Manukau, comparing the July to September quarter, between 2004 and 2005.

| <b>July to September Quarter, Counties-Manukau District</b>  |                          |                     |            |                        |                                  |                |                               |                       |                         |
|--|--------------------------|---------------------|------------|------------------------|----------------------------------|----------------|-------------------------------|-----------------------|-------------------------|
| <b>offence summary: 4200 class</b>                           |                          |                     |            |                        |                                  |                |                               |                       |                         |
| from calendar year detail universe (data already reconciled) |                          |                     |            |                        |                                  |                |                               |                       |                         |
|  | Month                    | Possible duplicates | Duplicates | sub-total (duplicates) | Multiple offences on docloc file | Other problems | sub-total (files with issues) | Unique files-offences | Total recorded offences |
| 2004   | July                     | 3                   | 8          | 11                     | 14                               |                | 25                            | 370                   | 395                     |
|  | August                   | 4                   | 2          | 6                      | 21                               |                | 27                            | 356                   | 383                     |
|  | September                | 2                   | 4          | 6                      | 12                               |                | 18                            | 397                   | 415                     |
|  | <b>total for quarter</b> | <b>9</b>            | <b>14</b>  | <b>23</b>              | <b>47</b>                        | <b>0</b>       | <b>70</b>                     | <b>1123</b>           | <b>1193</b>             |
|  | <i>percentages</i>       | 1%                  | 1%         | 2%                     | 4%                               | 0%             | 6%                            | 94%                   | 100%                    |
| 2005   | July                     | 10                  | 16         | 26                     | 46                               |                | 72                            | 470                   | 542                     |
|  | August                   | 2                   | 7          | 9                      | 33                               |                | 42                            | 488                   | 530                     |
|  | September                | 5                   | 6          | 11                     | 35                               | 1              | 47                            | 437                   | 484                     |
|  | <b>total for quarter</b> | <b>17</b>           | <b>29</b>  | <b>46</b>              | <b>114</b>                       | <b>1</b>       | <b>161</b>                    | <b>1395</b>           | <b>1556</b>             |
|  | <i>percentages</i>       | 1%                  | 2%         | 3%                     | 7%                               | 0%             | 10%                           | 90%                   | 100%                    |

The audit found that a larger proportion of files during the July-September 2005 period were found to have duplicate files (3%) compared to the previous year (2%). These duplicate files appear to relate to the same offence, but there are separate statistic records and file (docloc) numbers.

The proportion of files containing multiple offences relating to the same series of incidents has increased during the July-September 2005 period (7% of files) compared to the previous year (4% of files during July-September 2004). These appear to be predominantly files resolved by the arrest of an offender. This confirms the trends illustrated in the preceding charts where some files contain larger numbers of offence statistics than reflected in the pattern of statistics recorded during the previous year.

Looking across all arrest files (all offence categories) in Counties-Manukau during October 2005, there is a 26% increase in the number of offences recorded on those files compared to 2004.

Thus in summary, there appears to be a higher propensity to record offence statistics in the NIA system than there was in the LES system. This represents a change in statistics recording practice, not an increase in the level of criminal offending. Possible causes are the different computer environment for data entry, resourcing and/or data entry responsibilities, or changes in local auditing practices. We also found a small apparent increase in the level of errors, such as duplicate files, though the sample size of the audit was too small to draw a general conclusion as to whether file duplication has increased.

## **General note about policies for recording multiple statistics**

It is of note that there do not seem to be any nationally consistent practices governing the recording of multiple offence statistics. While the majority of files contain one offence statistic, some arrest files have numerous associated offence statistics. Rather than recording representative offences, it is clear that some staff record many (or all) potential offences that an offender may have committed - while other police members choose to record only representative offences on an arrest file.

For example, one arrest file was found to have recorded 26 separate grievous assault offences (committed by the same offender) as separate crime statistics. Prior to the arrest, there had been only one grievous assault offence recorded on that file. Similar examples of multiple offence recording are available across a spectrum of offence types including violence, theft, burglary, sexual offending, among others. Potentially inconsistent recording practices such as this have the potential to seriously distort the picture of actual levels of offending if these practices vary over time.

It is important that consistent recording practices are maintained in order to preserve the integrity of the crime statistics system. Inconsistent practices can potentially lead to problems such as difficulties interpreting crime data and misleading comparisons between New Zealand and overseas jurisdictions that have more rigorous counting practices. Thus, police should continue to ensure there are consistent business rules and business processes for statistics capture.

## **CARD feed to NIA**

Many people who call police in relation to crimes or incidents make their initial contact with police through the Communication Centres. A significant proportion<sup>9</sup> of crime recorded by police is initially notified to police through these centres. Any factors that cause a change in the number of crime events recorded by the communication centres can impact on total recorded crime.

An earlier section of this report already showed that a time-series analysis of CARD events indicated there was no noticeable anomaly in the trends of crime related events during the June/July 2005 period. However, the recorded number of some types of CARD events has increased during 2005/2006.

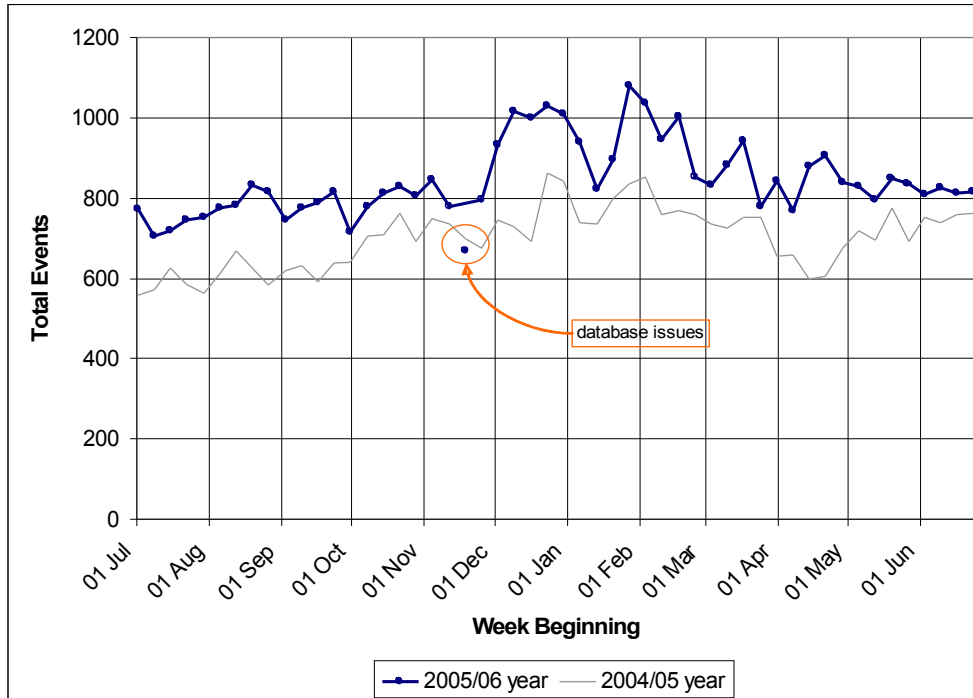
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<sup>9</sup> During 2005/2006, approximately 195,000 CARD events were identified as “crime-related” and were closed with result codes 3 or 6. There were also approximately 150,000 CARD events identified as “incidents” that were closed with result codes 3 or 6.



For example, the following graph shows the level of domestic incidents recorded in CARD is higher during 2005/2006 compared to the previous year. The chart shows domestic incidents closed with result codes of either 6 or 9:<sup>10</sup>

***CARD events recorded as 1D (domestic violence) and resulting in an offence report or an arrest***



It is not clear what may have caused this increase, but it may be influenced by increased public reporting, changes in police practice when attending domestic incidents, recording or coding polices in the communication centres, or may relate to other communication centre changes.

<sup>10</sup>

**Result Code**Description 1Police attendance at scene sufficient 3No Offence Disclosed 6Offence Report 9Arrest

## **Summary of impact from changes in police recording systems**

It appears probable that a discontinuity in statistics has occurred when moving between LES and NIA.

The impact of the computer changeover on crime statistics has resulted from subtle differences between the new and the old systems, and has not arisen as a result of any significant changes being made to the way crime statistics are captured or derived. During the new NIA system design, the scope of changes to business systems affecting statistics capture was controlled to simplify the computer changeover. That approach was adopted to ensure business continuity and to minimise computer project risks. Thus, minimal change was made to statistics functionality to ensure that there was minimisation of risk, complexity and effort involved in the migration process. However, natural enhancements integral to the NIA application architecture (such as “wizard” data entry and a graphic user interface) and processes by which the organisation has adjusted to the NIA environment (training, data entry processes, file auditing) appear to have influenced crime statistics recording.

It appears clear that the anomaly observed during July 2005 represents the move by police into a new computer environment where more crime statistics have been recorded, simply as a result of these new processes. The increase in recorded crime is not primarily driven by an increase in actual criminal incidents, but by these different recording practices.

There also appear to have been some changes in CARD events that have occurred around October 2005, which may have had some influence over recorded crime levels.

It is important to note that there are some clear weaknesses in the current statistics entry process, such as the potential for inconsistent district data entry practices. Inconsistent data entry is a risk to the integrity of statistics and to police data more generally. The integrity of a national statistical system relies on comprehensive national standards for data capture. Moving forward, it will be important to set minimum data entry standards for districts.

## **Actual crime trends?**

Officially recorded crime rates do not always represent actual offending patterns. Changes in official crime statistics can sometimes reflect changes in reporting or recording practices, rather than the level of offending.<sup>11</sup> In the present investigation, changes to the police computer system and associated statistics capture processes appear to have had a strong influence on the most recent figures for the 2005/2006 year.

The question remains as to what extent changes in the level of recorded crime during 2005/2006 reflect an actual increase in offending. Previous work by the Ministry of Justice has shown that *“The interactions between the many social, cultural, economic, situational, criminal justice and other factors that influence both offending*

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<sup>11</sup> Triggs S. (1997) *Interpreting Trends in Recorded Crime in New Zealand*. Ministry of Justice.

*and the public and official responses to offending are universally recognised as being extremely complex. ... Such changes can influence both the long-term trends and the short-term fluctuations in recorded crime rates.*<sup>12</sup>

The periodic national victimisation survey conducted by the Ministry of Justice indicates that many crimes are never reported to police in the first instance. Crimes most likely to be reported include those that involve insurance claims and those where injuries require medical treatment<sup>13</sup>. A range of other factors are known to affect whether a crime is reported to police including:

- Crime type;
- Victim characteristics;
- The victim and offender relationship;
- Perceived seriousness, and
- Perceptions about police.

There is no simple means of correlating any of these variables to the changes observed in recorded crime for the purposes of ascertaining whether any 'real' changes in offending have occurred.<sup>14</sup>

Despite these limitations, the following section covers some potential factors that may have influenced recorded crime during the past year.

## ***Changes in police practices and resources***

### **Police resources**

There are conflicting views as to whether increasing police numbers have an impact on reducing recorded crime rates. The Ministry of Justice consider that while greater police numbers do have an impact on crime in general, this effect is limited. While an increase in police numbers does provide a greater ability to target some types of offenders, such an increase may also have the effect of increasing the recorded rates of some crimes simply by virtue of there being a greater number of police available to attend to such matters.<sup>15</sup> Police timesheet data indicate that there has been a small increase - approximately 1% - in overall policing activity over the past year (though the increase could actually be higher than 1%, as timesheet entry may have been only partially complete for the month of June at the time the 2005/2006 data was obtained).<sup>16</sup>

Any increase in the number of policing hours delivered may have had an impact in levels of recorded crime in certain categories of crime which are particularly sensitive to changes in police activity (e.g. drugs, disorder).

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<sup>12</sup> Triggs S. (1997) Interpreting Trends in Recorded Crime in New Zealand. Ministry of Justice.

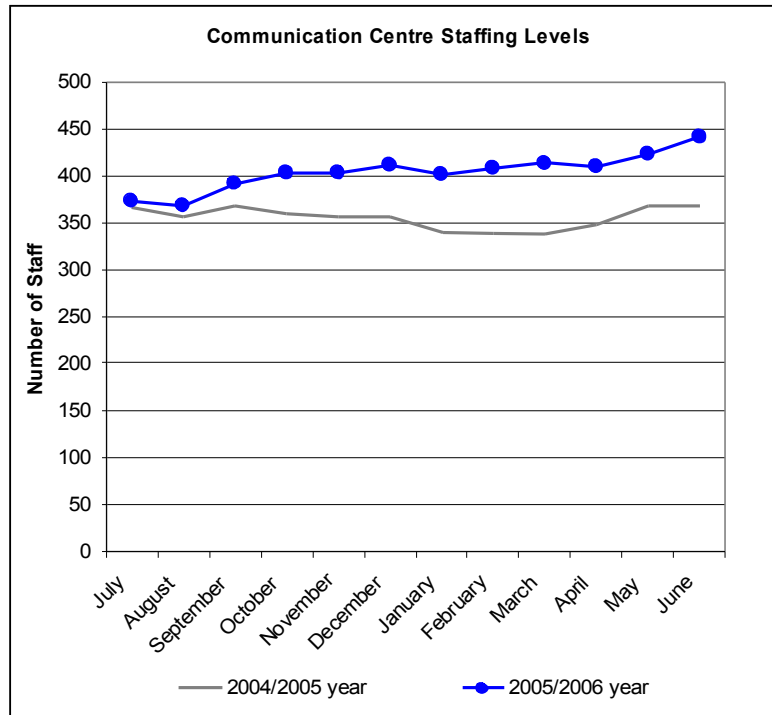
<sup>13</sup> Statistics New Zealand website: Overview of recording and counting crime. <http://www.stats.govt.nz/products-and-services/table-builder/crime-tables/overview.htm>

<sup>14</sup> Triggs S. (1997) Op. Cit.

<sup>15</sup> Triggs S. (1997) Op. Cit.

<sup>16</sup> Data was obtained from the police data warehouse (PDSI), which is fed timesheet data from the police Activity Management System. As at the 31<sup>st</sup> July, 2006 there were 20,888,547 hours of activity recorded for 2005/2006. This compares to 20,664,329 hours delivered during the previous year.

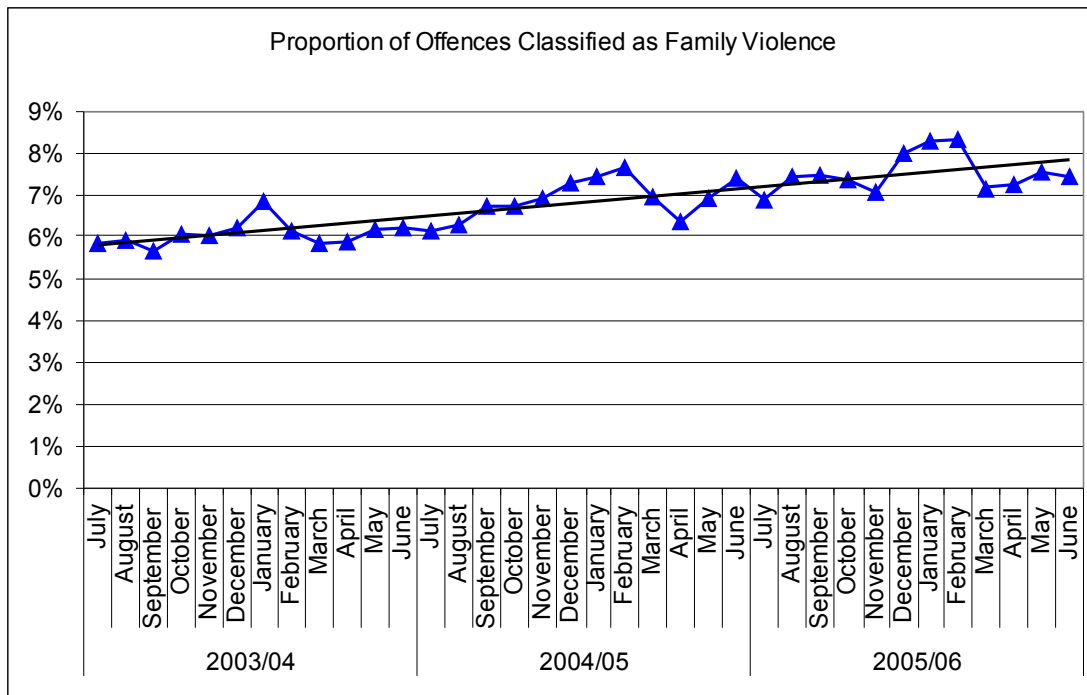
Increases to the level of police resourcing have been particularly noticeable in the communication centres, where staff numbers increased significantly during 2005/2006. By June 2006, staff numbers were 20% higher than the number of staff located in the communication centres at June 2005. Any increase in communication centre staffing has the potential to increase the level of recording of crime and incidents by police.



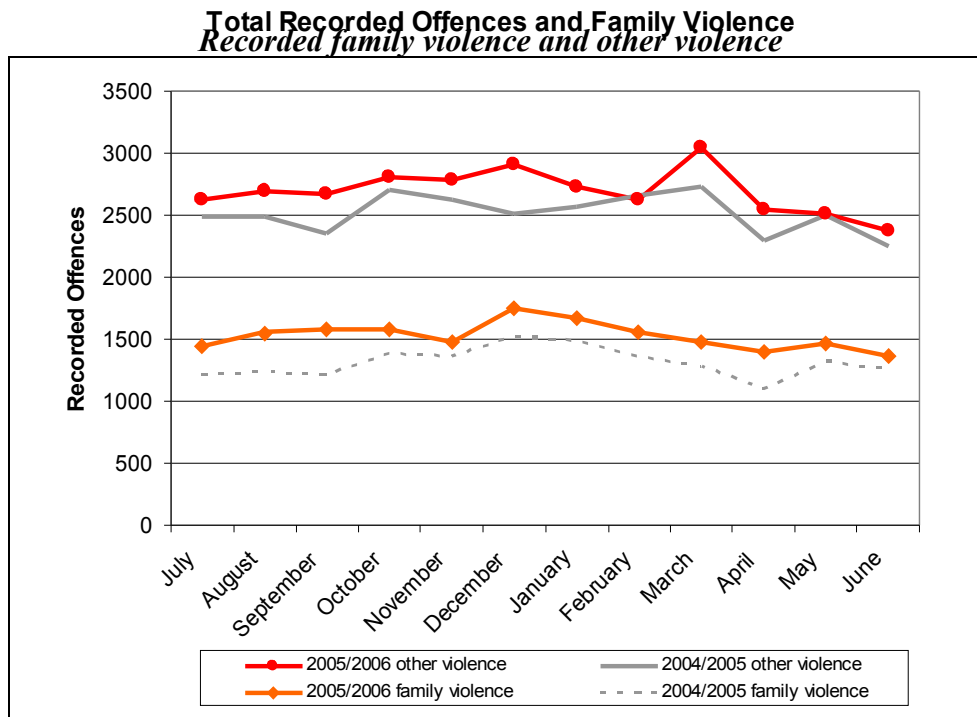
## Operational tactics and strategies

Police are increasingly pursuing proactive offender, victim and location targeting strategies, both unilaterally and in combination with other agencies. Some of these measures have the potential to cause increases in the recorded levels of some types of crime. Examples of this include the increasingly proactive approach police have been taking in their enforcement of laws relating to alcohol, as part of their strategy to reduce alcohol-related crime. This approach involves greater proactive policing of licensed premises and public place drinking situations and is undoubtedly underpinning much of the increase in alcohol-related offences in the drugs and alcohol category of crime.

Another example is the role police have played in whole of government efforts to reduce family violence. This is also an area of offending that is recognised as being significantly under-reported, and one in which recorded crime has the potential to be influenced by police activity and public awareness. Police are working in partnership with other agencies to make interventions based on the probability that action is required. This includes a joint Family Safety Teams initiative. Potential involvement in practice strategies such as this, and an increased awareness of family violence related issues in the community and among police staff, is reflected in crime statistics by increased reporting and recording of these types of crime. The proportion of total offences that are classified by police as family violence related has been gradually increasing over the past several years (see following chart).



The following chart illustrates that the rate of increase in recorded family violence offences during 2005/2006, which have increased 16% compared to the previous year. This has been higher than the rate of increase of other offences in the violence category, which have increased by 7% compared to the previous year. Thus, it is arguable that much of the increase in violence might be attributable to changes in the way police are managing their response to reported incidents of domestic violence, rather than reflecting a general rise in the commission of violent crime.



## **Other police policy influences**

Other administrative changes can also influence apparent crime trends. For example, changes sometimes occur in the way offences are categorised<sup>17</sup>. These changes occur for reasons such as changes in legislation or the desire to gain more specificity in statistics for certain type of offences. For example, liquor ban offences were for some time recorded as administrative by-law breaches, in the administrative offences category. More recently, a new offence type has been created for these offences in the drugs and alcohol category.

## **Trust and confidence in police**

A proportion of offences go unreported or unrecorded, especially for less serious offences (Harland 1995). Victimization surveys show that for some offences, there is a high likelihood that an offence will not be reported (e.g. sexual crimes). Other types of crime have higher reporting rates (e.g. vehicle theft and serious violent offences are likely to be well reported). Whilst the factors influencing the levels of reporting of crimes to police are complex and varied, it is understood that one factor is a victim's perception of police. Overall community trust and confidence in police can have a significant influence on the level of reported crime.

The most recently published trust and confidence figures show that community trust and confidence has declined in the recent year, from consistent highs exceeding 76% of people with high trust and confidence in 2003/04 down to 67% in 2004/2005. However, during 2005/2006, trust and confidence has apparently been increasing.<sup>18</sup> The fluctuating level of trust and confidence is likely to introduce variability into the degree to which some types of crime are reported to police.

## ***Social and demographic factors***

### **Economic conditions**

The Ministry of Justice has found that general indicators of the economic cycle appear to be consistently associated with fluctuations in recorded crime both in New Zealand and overseas, especially for dishonesty offences (burglary, theft and fraud). However, the indicators most strongly associated with crime differ between studies. This finding suggests some sort of general response to the prevailing economic conditions, however little support for an unemployment-crime link has been found.<sup>19</sup>

### **Overall population growth**

Perhaps the strongest influence on the level of recorded crime is the overall size of the population.

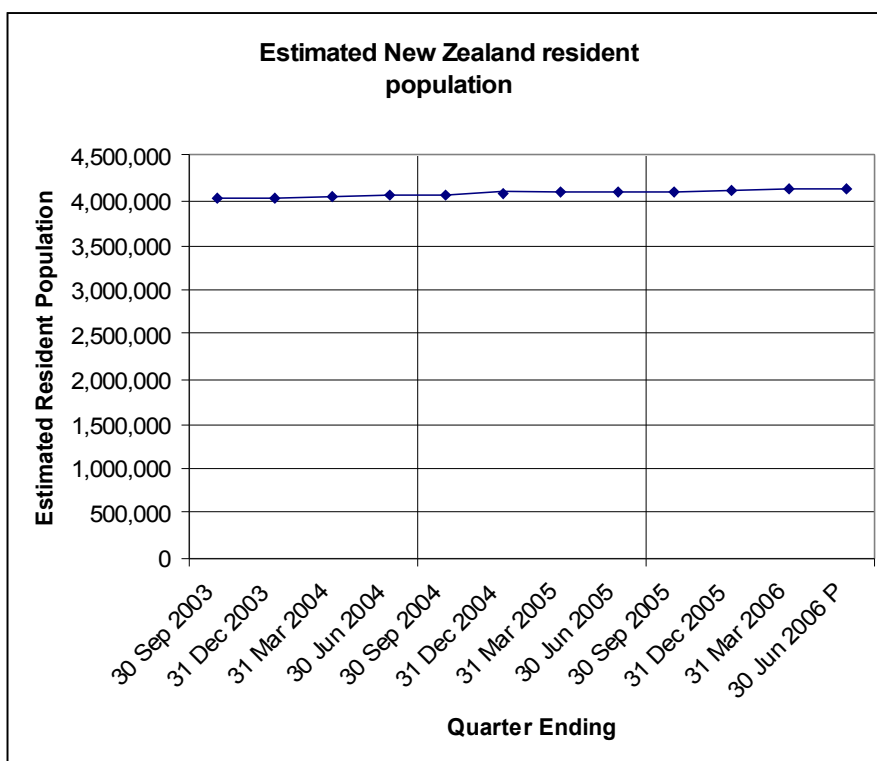
At the midpoint of 2005/2006 it is estimated that the New Zealand population (4,120,900) was 0.9% higher than at the same point during 2004/2005 (4,083,900). The rate of reported crime on a per capita basis therefore increased by 6.7% to 1034 offences per 10,000 residents during the 2005/2006 year.

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<sup>17</sup> Notes accompanying the crime statistics published on the Statistics New Zealand website.

<sup>18</sup> Personal communication: Office of Police Commissioner.

<sup>19</sup> Triggs S. (1997) *Interpreting Trends in Recorded Crime in New Zealand*. Ministry of Justice.



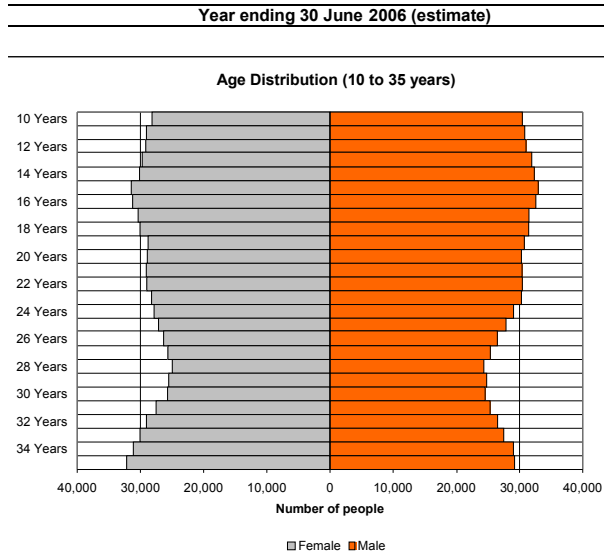
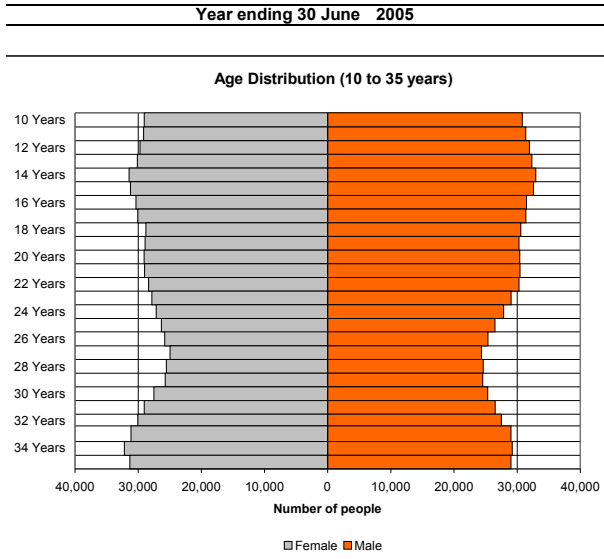
### Change in size of youth population

The Ministry of Justice has highlighted that “...one of the most consistent findings in criminology is the relationship between age, gender and offending. Males are more likely than females to participate in offending and young offenders have the highest offending rates. For property offences, the peak age of offending occurs during the teens, whereas violent and drug offenders are more likely to be in their twenties. Young offenders also tend to have high recidivism rates, leading to a further over-representation in crime statistics.”

Based on these observations, it is possible that one factor which may have an impact on recorded crime statistics is a ‘bubble’ of potential offenders entering ‘offending age’. This has the potential to have an impact on crime over the next ten years, though with annual changes in the size of the at-risk age group not likely to exceed approximately 2% per year.

The Ministry of Justice found that the proportion of 15-19 or 15-24 year olds was a major predictor in the models for serious and minor drug offences and a significant, but minor, variable for theft, burglary, vehicle conversion, robbery, fraud, and violent offences.<sup>20</sup>

<sup>20</sup> Triggs S. (1997) Interpreting Trends in Recorded Crime in New Zealand. Ministry of Justice.



Importantly, it should also be noted that the population within different age cohorts is not evenly distributed nationally. There are some locations with higher than average increases in the young population. For example, Manukau City and Auckland City have relatively high rates of increase in the younger age range.<sup>21</sup> These local differences may contribute to any offending levels that have stronger correlations with age distribution. However, it is notable that the annual changes in the size of any given age range is rarely larger than  $\pm 2.5\%$ , which is a much smaller than the rate of change seen in 2005/2006 crime statistics. The exception being the 15-39 year old cohort in Queenstown-Lakes District, which has increased in size on average by 6.9% annually between 2001 and 2006.

<sup>21</sup> Statistics New Zealand projected population changes of territorial authorities.



## Conclusions

- Recorded crime during 2005/2006 increased 8% compared to the 2004/2005 year. There are differences in overall annual crime trends in different districts, with some districts experiencing a decrease in recorded crime and others experiencing significant increases. It is of note that the majority of districts appeared to experience an anomaly during July 2005, when crime levels apparently increased compared to the trends that each district had been previously experiencing.
- Examination of time-series charts show a change in the recorded crime trend occurring during July 2005. From the start of July there was a shift towards a phase when total recorded crime is at a higher level compared to the previous year.
- Independent data indicates that the upward trend indicated by the recorded crime statistics and the abrupt discontinuity reported during July 2005, are not corroborated by other observations (such as CARD data, calls for service, ACC claim data).
- The overall increase in recorded violent crime is however supported by ACC claim statistics. Much of the increase in violence, appears to be family violence related, and may be a consequence of increased proactive police activity to combat domestic violence.
- There is a clear indication of an event in July 2005 that has influenced recorded crime. One event in particular which may have had a significant impact on police crime statistics was the migration to a new computer system; from the Law Enforcement System to a new National Intelligence Application.
- There appears to be a higher propensity to record offence statistics in the NIA system than there was in the LES system. This represents a change in statistics recording practice, not an increase in the level of criminal offending. Enhancements integral to the NIA application architecture (e.g. wizard entry) and processes by which the organisation has adjusted to the NIA environment (training, data entry processes, file auditing and supervision) appear to have influenced the statistics capture.
- Looking outside the police recording environment, a variety of factors have the potential to influence changes in the level of criminal offending in the community or the level of reporting to police. Because of this complexity and the variety of causal factors there are unlikely to be simple factors that can be correlated with the observed changes in recorded crime. However, it is recognised that the strongest influence on level of crime is the overall size of the population. New Zealand's population increased by 0.9% during 2005/2006, possibly underpinning some of the observed trends in recorded offending.