

Crime increases in perspective: The regional dispersion of crime in NSW, 2001

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When an increase in crime at the State level is publicly reported, a large proportion of the general community become fearful, and may alter their lifestyles to avoid what they see as their increased vulnerability to becoming included in victimisation statistics. However, the reported change in aggregate risk may have little or nothing to do with the individual risk of victimisation for the majority of citizens. Significant increases in four major categories of crime in NSW were reported in the annual crime statistics for 2001. This paper examines the geographical dispersion of these crime increases using a simple crime dispersion index developed by the NSW Bureau of Crime Statistics and Research. The Offence Dispersion Index calculations show that the 7.6 per cent increase in the number of recorded incidents of assault between 2000 and 2001 was brought about by increases in one-quarter of the Local Government Areas in NSW. In contrast, the 34.1 per cent increase in robbery with a firearm was caused by an increase in less than one-tenth of the State. We conclude that the reporting of official crime statistics is enhanced by incorporating a measure of geographical dispersion and show that, despite a large percentage increase in robbery with a firearm at the State level, the majority of NSW residents did not experience a significant increase in the risk of that offence.

INTRODUCTION

The recently published annual crime statistics report *NSW Recorded Crime Statistics 2001* examines trends in crime in NSW over the past two years.¹ Of the 16 major categories of crime routinely tested for an upward or downward trend, the majority were stable over the 24 months to December 2001.² There were six categories of crime showing a significant trend over this time period, two downward and four upward.³

Table 1 provides information about the four major NSW offence categories which showed a statistically significant upward monthly trend in recorded incidents between January 2000 and December 2001. The first column of Table 1 shows that the recorded incidence of *robbery with a firearm* rose by 34.1 per cent between 2000 and 2001, *steal from person* by 27.8 per

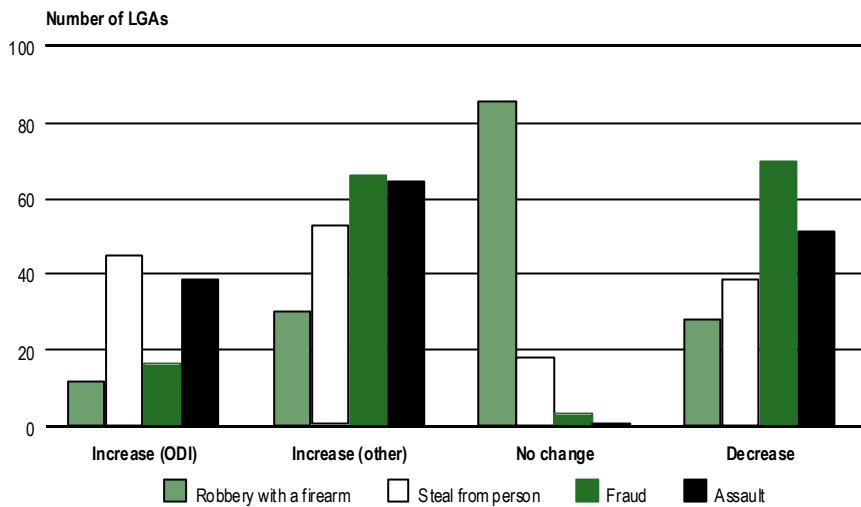
cent, *fraud* by 16.3 per cent, and *assault* by 7.6 per cent. Table 1 also details the total number of incidents recorded in 2001 for each of these crime categories, the absolute increase in recorded incidents between 2000 and 2001, and, in the final column, the Offence Dispersion Index, which will be described below.

According to the information in Table 1, *assault* is clearly a high volume crime, with a large absolute increase in the number of incidents recorded in 2001 compared with 2000, but with a relatively small annual percentage increase. *Robbery with a firearm*, on the other hand, recorded a very high percentage increase, but the smallest

Table 1: Major offence categories showing significant upward monthly trends in crime in NSW, 2000-2001

Offence category	Annual percentage increase 2000 to 2001	Total incidents recorded in 2001	Absolute annual increase 2000 to 2001	Offence Dispersion Index (ODI)
Robbery with a firearm	34.1%	880	224	0.08
Steal from person	27.8%	16,576	3,604	0.29
Fraud	16.3%	32,098	4,491	0.11
Assault	7.6%	67,599	4,802	0.26

Figure 1: Changes in crime incidents experienced by residents in 155 LGAs in NSW, 2000-2001



absolute increase in the number of incidents recorded (224 more incidents in 2001 than in 2000). One would expect that a small absolute increase in offences, such as that for *robbery with a firearm*, would affect only a small proportion of the State. However, this attribute is generally not quantified in official crime statistics publications. To this end, a simple numerical measure of the geographical dispersion of crime, the Offence Dispersion Index (ODI), was recently developed by the NSW Bureau of Crime Statistics and Research. In the present paper, the index will be applied to the trends in recorded crime in NSW in 2001.

THE REGIONAL DISPERSION OF CRIME INCREASES IN NSW, 2000-2001

In a previous publication, details of how the ODI was developed and applied to NSW crime statistics to describe the geographical dispersion of crime were provided.⁴ The detailed method of calculation of the index will not be repeated in the present paper, but can be obtained from the sources referred to in note 4. In essence, the ODI enumerates the proportion of Local Government Areas (LGAs) which contribute significantly to the Statewide aggregate percentage increase in recorded crime incidents between one

year and the next, for a particular offence category. This group of LGAs is comprised of the geographical regions which experienced the largest absolute increases in the number of incidents recorded for that offence over the two-year period. The index is calculated as the proportion of LGAs which must be removed from the calculation of a Statewide increase in order to achieve a zero increase in crime across the remainder of the State.

The ODI ranges from zero to one, with a low index indicating an offence category with rate increases confined to only a few geographical areas. An index closer to unity suggests that the annual increase has affected most LGAs in the State. It will be shown later in this paper that the ODI does not simply measure the proportion of LGAs where there was an increase in the incidence of the offence. In fact the complement of the ODI (i.e. one minus ODI) measures the proportion of LGAs where the increases are offset by decreases, and hence the net effect is no change in crime overall amongst those LGAs.

The final column of Table 1 shows the ODI for each of the four offence categories which exhibited an increase in crime between 2000 and 2001 at the State level. The ODI calculation shows that the 34.1 per cent increase in the rate of *robbery with a firearm* between 2000 and 2001 actually reflects an increase in 8 per cent of the State's

LGAs (ODI = 0.08), while the 7.6 per cent increase in the rate of *assault* over the same period was effected by increases in 26 per cent of the State (ODI = 0.26). A similarly high level of geographical dispersion exists for the *steal from person* offence category, with an ODI of 0.29. This offence category showed the second highest percentage increase in the State rate of 27.8 per cent. Note, however, that this increase can be partly attributed to a change in recording practice by NSW Police.⁵ The increase in *fraud* (ODI = 0.11) is confined to a small number of regions despite a relatively high absolute annual increase (16.3%).

The ODI calculation helps to put the crime increases experienced in NSW into perspective. The most common statistic reported about a crime change between one year and the next is the percentage change at the aggregate level. When a high percentage change is reported for a serious offence, persons in the NSW community who have not experienced an increased risk of victimisation may become unnecessarily fearful. Highlighting the relative dispersion of crimes using an index such as the ODI adds a dimension to understanding the changes in crime from one year to the next.

A further dimension may be added to the analysis of crime trends by examining the direction of crime changes in all LGAs. It was noted earlier that not all LGAs which experienced an increased crime risk are counted in the ODI calculation. This is because in the ODI calculation, a zero crime change Statewide is achieved when the increase in crime in some LGAs is offset by the decrease experienced in other areas. Figure 1 and Table 2 summarise the changes in crime incidents experienced by residents in the 155 LGAs in NSW.⁶

Figure 1 shows that each NSW LGA falls into one of four categories with respect to the change in crime incidents between 2000 and 2001 for each offence. The first block of columns in the figure show, for each offence, the number of LGAs with high absolute increases in crime which effected the Statewide increase in crime. It is these LGAs which contribute to the ODI

calculation. (The specific LGAs within this group for each of the four crime categories are listed in full in the Appendix, where the total number of incidents which occurred in 2000 and in 2001 are shown for each LGA.)

Figure 1 shows that a very small number of LGAs contributed to the State increase for both *robbery with a firearm* and *fraud*. In each case, less than 20 of the State's LGAs effected the Statewide increase. In contrast, increases in around 40 of the State's LGAs effected the NSW increases in *assault* and *steal from person*.

As previously discussed, there are other LGAs in the State which experienced an increase in the number of incidents recorded for each offence category, but which do not contribute to the ODI calculation. The second block of columns in Figure 1 details the number of additional LGAs which experienced an increase in the number of incidents recorded for each offence category. This group is in addition to the LGAs which have already contributed to the ODI. Note that the increases in this second group of LGAs are offset by decreases in other LGAs in the State. (The number of LGAs with decreases are shown in the final group of columns in Figure 1.)

The third group of columns in Figure 1 shows the number of LGAs with no change in the number of recorded offences between 2000 and 2001. These columns, and the more detailed statistics provided in Table 2, show that more than half of the State's LGAs experienced no change in the number of *robbery with a firearm* incidents recorded, and hence no change in the risk of this offence. Furthermore, Table 2 shows that the residents in a total of 113 LGAs (out of 155) experienced either a decreased risk, or no change in the risk of *robbery with a firearm*. Closer examination of the number of *robbery with a firearm* incidents recorded in each LGA in 2001 shows that there were no incidents of *robbery with a firearm* recorded in a total of 88 LGAs in NSW. (Details are not shown in this paper.) This represents more than half of the total 155 LGAs examined.

The final set of columns in Figure 1 shows the numbers of LGAs which recorded a decrease in incidents between 2000 and 2001, for each offence category. It is notable that the *robbery with a firearm* category does not show a large number of LGAs with a decrease. This is because so many LGAs recorded no change in the number of incidents recorded for this offence.

SUMMARY

What does this mean for our interpretation of the recent crime increases in NSW? In summary, the tables and figure in this paper show that:

- While *robbery with a firearm* is the offence category with the largest Statewide percentage increase in recorded incidents (34.1%), it is also the crime category with the lowest absolute increase (224 extra incidents), and the lowest prevalence (a total 880 incidents Statewide in 2001).
- The ODI shows that the increase in *robbery with a firearm* incidents which led to the high percentage Statewide increase was effected by increases in a very small section of the State (only 8 per cent of all LGAs).
- The majority of geographical regions in NSW experienced a decrease or no change in the risk of *robbery with a firearm* (73% of all LGAs) and, overall, more than half of the LGAs in NSW experienced no incidents of *robbery with a firearm* in 2001.

Table 2: Number of LGAs with changes in crime incidents, by offence category, 2000-2001

Offence category	No. of LGAs effecting NSW annual increase	No. of additional LGAs with increase	Total no. of LGAs with increase	No. of LGAs with no change	No. of LGAs with decrease	Total no. LGAs stable or with decrease	Total no. of LGAs [†]
Assault	40 26%	63 41%	103 66%	1 1%	51 33%	52 34%	155 100%
Robbery with a firearm	13 8%	29 19%	42 27%	85 55%	28 18%	113 73%	155 100%
Steal from person	45 29%	53 34%	98 63%	18 12%	39 25%	57 37%	155 100%
Fraud	17 11%	65 42%	82 53%	3 2%	70 45%	73 47%	155 100%

[†] The percentage calculations are based on 155 LGAs in NSW. See note 6.

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NOTES

- 1 See Allen, J. et al. 2002, *New South Wales Recorded Crime Statistics 2001*, New South Wales Bureau of Crime Statistics and Research, Sydney.
- 2 The trend test used was Kendall's rank-order correlation test (see, for example, Conover, W.J. 1980, *Practical Non-Parametric Statistics*, 2nd edn, John Wiley and Sons, pp. 256-260). A two-tailed test was used to determine whether there had been an increasing or decreasing trend in the recorded numbers of criminal incidents over the most recent twenty-four month period covered in the report. Some month to month variations in the numbers of recorded incidents could be due in part to seasonal factors. The test for trend is not sensitive to seasonal variations; it is sensitive only to a generally increasing or generally decreasing trend over the time period examined.
- 3 The offence category *indecent assault / act of indecency and other sexual offences* decreased by 6.0 per cent between 2000 and 2001, while the category *break and enter - dwelling* decreased by 3.2 per cent. There was no significant upward or downward monthly trend in the recorded incidence of *murder, sexual assault, robbery without a weapon, robbery with a non-firearm weapon, break and enter (dwelling and non-dwelling), motor vehicle theft, stealing (from a motor vehicle, from a retail store, and from a dwelling)*, and *malicious damage to property*. The four upward trends are discussed in the Bulletin
- 4 See Chilvers, M. 2001 'Measuring crime dispersion', in *International Journal of Police Science and Management*, vol. 3(4) pp.350-363; or Chilvers, M. 1998, *Measuring Crime Dispersion*, Crime and Justice Bulletin No. 39, New South Wales Bureau of Crime Statistics and Research, Sydney.

Note that in the ODI applications described in each of these references, the LGAs are ranked on the basis of crime rate changes rather than on the absolute changes in the number of incidents. The choice of ranking procedure is explained in the publications. In the present paper, the method of ranking on absolute numbers of incidents was adopted, so that details of LGAs with the highest numbers of incidents could be provided. This information is considered more relevant in crime reduction analyses than information about areas with substantial changes in risk, but with very small numbers of additional incidents recorded.

- 5 It should be noted that part of the increase in the number of recorded incidents of *steal from person* offences in 2001 is due to a change in recording practices by NSW Police in the second half of that year. Guidelines published in the August 6, 2001 issue of the *Police Service Weekly* (vol. 13, no. 31, p. 10) clarified the interpretation of the *steal from person* offence category for police. Before August 2001, some *steal from person* offences were classified as *other stealing* offences (not shown here). It appears that steal from person offences are now being correctly recorded resulting in an apparently large increase in the number of incidents recorded between 2000 and 2001. It is not possible to estimate what proportion of the increase in recorded incidents for this offence category is due to true changes in crime rates in the community.
- 6 The ODI calculation is based on the 155 LGAs in NSW which had an estimated resident population of 3,000 persons or above at 30 June 2001. Areas with very small populations are generally excluded from detailed regional analyses of crime statistics because the calculations of crime rates for such areas may be unreliable. In 2000 and 2001 there were 20 rural LGAs with an estimated resident populations less than 3,000.

APPENDIX

The tables in this appendix list, for each of the four offence categories analysed in this paper, the LGAs which showed the largest absolute increases in the number of incidents recorded between 2000 and 2001. The LGAs are ranked from highest to lowest on the basis of the absolute increase, and only those LGAs which contributed to the Statewide increase (that is, those which contributed to the ODI calculation) are shown. For each LGA listed, the tables show (1) the number of incidents recorded in 2000, (2) the number of incidents recorded in 2001, (3) the increase in recorded incidents between 2000 and 2001, and (4) the rate of recorded incidents per 100,000 resident population in 2001.

Although crime rates have not been specifically discussed in this Bulletin, it is useful to note that while some NSW LGAs have experienced large increases in the number of criminal incidents recorded for a particular offence between 2000 and 2001, the current rate per 100,000 population for the offence in that area remains well below the average NSW rate.

For comparative purposes, the NSW annual rates per 100,000 population for each offence category are:

- robbery with a firearm – 13.5
- fraud – 491.4
- steal from person – 253.7
- assault – 1,034.8.

Table A1: Robbery with a firearm

<i>LGA</i>	<i>Incidents recorded in 2000</i>	<i>Incidents recorded in 2001</i>	<i>Increase in incidents 2000 to 2001</i>	<i>Rate per 100,000 population 2001</i>
Parramatta	26	55	29	37.1
Fairfield	49	71	22	36.9
Liverpool	21	43	22	27.7
Canterbury	32	53	21	37.8
Rockdale	17	37	20	40.0
Sydney	25	43	18	159.8
Blacktown	13	31	18	11.9
Bankstown	56	73	17	41.9
Holroyd	17	31	14	34.4
Randwick	10	23	13	18.0
Campbelltown	13	25	12	16.6
Hurstville	8	18	10	24.3
South Sydney	30	40	10	45.2

Table A2: Fraud

<i>LGA</i>	<i>Incidents recorded in 2000</i>	<i>Incidents recorded in 2001</i>	<i>Increase in incidents 2000 to 2001</i>	<i>Rate per 100,000 population 2001</i>
Bankstown	1,136	1,637	501	940.2
Sydney	1,871	2,313	442	8,594.7
Blacktown	1,456	1,873	417	716.9
South Sydney	776	1,165	389	1,315.9
Parramatta	908	1,279	371	861.6
Sutherland	591	930	339	433.4
Fairfield	1,053	1,338	285	696.3
Penrith	839	1,074	235	609.9
Holroyd	483	693	210	769.0
Canterbury	470	663	193	473.2
Warringah	363	517	154	380.7
Randwick	497	650	153	510.1
Shellharbour	110	261	151	444.2
North Sydney	270	420	150	708.3
Rockdale	241	390	149	421.4
Willoughby	326	464	138	729.3
Griffith	98	224	126	924.3

Table A3: Steal from person

<i>LGA</i>	<i>Incidents in 2000</i>	<i>Incidents in 2001</i>	<i>Increase in incidents 2000 to 2001</i>	<i>Rate per 100,000 population 2001</i>
South Sydney	1,161	2,148	987	2,426.3
Sydney	3,102	3,765	663	13,990.0
Parramatta	374	557	183	375.2
Wollongong	334	489	155	259.7
Sutherland	187	301	114	140.3
Randwick	309	413	104	324.1
Waverley	206	301	95	463.6
Blacktown	439	525	86	200.9
Marrickville	248	334	86	420.7
Newcastle	213	297	84	209.1
Burwood	129	198	69	642.2
Campbelltown	256	310	54	206.2
North Sydney	137	191	54	322.1
Liverpool	278	331	53	213.5
Hornsby	77	129	52	85.3
Rockdale	142	194	52	209.6
Willoughby	193	240	47	377.2
Pittwater	27	73	46	129.3
Manly	131	176	45	449.1
Woollahra	137	179	42	325.0
Lane Cove	18	56	38	174.9
Holroyd	147	182	35	202.0
Leichhardt	171	203	32	320.8
Ryde	125	157	32	159.9
Wagga Wagga	17	49	32	88.5
Fairfield	456	486	30	252.9
Botany Bay	149	177	28	481.9
Drummoyne	25	49	24	141.2
Hawkesbury	18	40	22	63.5
Shoalhaven	47	69	22	81.4
Kogarah	83	104	21	191.7
Penrith	295	316	21	179.5
Wyong	83	103	20	76.1
Warringah	144	163	19	120.0
Coffs Harbour	29	46	17	75.5
Maitland	28	45	17	81.4
Ballina	12	28	16	74.6
Byron	40	56	16	189.5
Armidale Dumaresq	15	30	15	123.0
Baulkham Hills	92	107	15	74.0
Lismore	48	63	15	147.0
Concord	17	31	14	113.0
Greater Taree	43	56	13	126.4
Shellharbour	52	65	13	110.6
Tweed	30	42	12	57.6

Table A4: Assault

<i>LGA</i>	<i>Incidents in 2000</i>	<i>Incidents in 2001</i>	<i>Increase in incidents 2000 to 2001</i>	<i>Rate per 100,000 population 2001</i>
Wollongong	2,076	2,421	345	1,285.9
South Sydney	2,483	2,807	324	3,170.7
Campbelltown	2,085	2,399	314	1,595.7
Wagga Wagga	758	1,034	276	1,867.7
Lake Macquarie	1,164	1,410	246	758.0
Wyong	1,414	1,651	237	1,219.5
Blacktown	3,602	3,833	231	1,467.1
Penrith	1,842	2,043	201	1,160.3
Liverpool	1,217	1,384	167	892.6
Bankstown	1,296	1,451	155	833.4
Goulburn	285	419	134	2,049.2
Sutherland	1,098	1,222	124	569.4
Randwick	911	1,028	117	806.7
Griffith	299	415	116	1,712.4
Gosford	1,331	1,437	106	885.9
Newcastle	1,896	1,994	98	1,403.8
Fairfield	1,616	1,708	92	888.8
Hornsby	481	569	88	376.3
Hawkesbury	423	503	80	799.0
Coffs Harbour	833	908	75	1,491.0
Kempsey	463	537	74	1,972.3
Greater Taree	553	624	71	1,408.7
Blue Mountains	447	516	69	670.9
Canterbury	694	763	69	544.6
Cowra	166	235	69	1,869.1
Great Lakes	309	378	69	1,191.0
Albury	533	601	68	1,409.3
Holroyd	701	765	64	848.9
Rockdale	521	584	63	631.0
Byron	357	418	61	1,414.3
Nambucca	201	262	61	1,508.2
Lismore	722	782	60	1,825.0
Shoalhaven	1,004	1,056	52	1,246.5
Bathurst	338	389	51	1,268.6
Narrandera	113	164	51	2,468.4
Dubbo	579	628	49	1,652.7
Tamworth	336	384	48	1,079.6
Cessnock	457	503	46	1,077.6
Gunnedah	102	147	45	1,188.3
Woollahra	274	319	45	579.2

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