Unequal in Life has been produced by **The Ignatius Centre**, the policy and research arm of Jesuit Social Services. Situated in the inner-city Melbourne suburb of Richmond, **The Ignatius Centre** complements the community service programs of Jesuit Social Services with social action, advocacy and research, as a means of standing in solidarity with those in need.

Tony Vinson is an Emeritus Professor of Social Work at the University of New South Wales. He was the Foundation Director of the New South Wales Bureau of Crime and Statistics and Research, a former Chairman of the New South Wales Corrective Services Commission and, as Head of School and Dean of the Department of Social Work at the University of New South Wales for many years, he helped shape a generation of social workers to think about social disadvantage and to discover ways of bringing about change.

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Jesuit Social Services

Unequal in Life

the distribution of social disadvantage in Victoria and New South Wales

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The Ignatius Centre
for social policy and research

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ISBN No.: 0 7334 0627 0

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Australians like to think that everyone is given a 'fair go' in this country. The very idea that some neighbourhoods are in themselves socially disadvantaged runs against our popular culture.

This study of social disadvantage in Australian society draws on information that is available from a range of different sources, but rarely collated. Of course, the Australian Bureau of Statistics provides a broad range of information, but when this information is combined with data already collected by state government authorities, a more accurate and more detailed picture can be drawn.

This is what Professor Tony Vinson has done in this study, *Unequal in Life*, as part of the research program conducted by **The Ignatius Centre**, the policy and research arm of **Jesuit Social Services**.

The study provides a postcode map of social disadvantage in Victoria and New South Wales. The 622 postcode areas in Victoria and the 578 postcode areas in New South Wales were compared against ten indicators of social disadvantage. The frequency with which the same names appeared on the different indices reflected the cumulative score of social disadvantage given to each postcode area.

As Professor Vinson outlines at the outset of this report, our interest in undertaking this investigation goes beyond the mere identification of serious disadvantage in particular localities within Victoria and New South Wales. Our interest goes further to raising awareness in the wider Australian society of the extent to which such disadvantage is becoming entrenched within particular neighbourhoods and to identifying ways in which such disadvantage can be addressed.

Too many government authorities throw up their arms in despair when confronted with such problems. But they proceed to spend untold billions of taxpayers' dollars in addressing the impact of such disadvantage, particularly through child protection services, the criminal justice system, and mental health programs.

The Ignatius Centre believes that such disadvantage can be addressed in more constructive ways and, over the next 12 months, we will commit ourselves to showing the way in which this can occur in some of the most socially disadvantaged neighbourhoods within the Australian community.

Father Peter Norden, S.J.
Director
Jesuit Social Services

ACKNOWLEDGMENTS

A great many individuals and organisations supported the 'disadvantage' project in varied ways:

Data

• *emergency assistance*	Victorian Council of Social Services New South Wales Council of Social Services
• *childhood accidents*	Victorian Injury Surveillance System
• *child abuse*	Youth/Family Services Div. Dept Human Services (Vic) New South Wales Department of Community Services
• *mortality ratio*	Epidemiology and Surveillance Branch, NSW Health Department
• *low birthweight*	Victorian Perinatal Data Collection Unit NSW Midwives Data Unit National Perinatal Statistics Unit, Faculty of Medicine, University of New South Wales
• *court appearances*	Criminal Justice Statistics and Research Unit (Vic)
• *court convictions*	NSW Bureau of Crime Statistics and Research
• *psychiatric hospital admissions*	Victorian Department of Human Services

Data processing

Westir Limited assisted by processing some of the above variables, and also Australian Bureau of Statistics data, by preparing the maps presented in the report, and by generally being an efficient source of quality technical support.

People

Father Peter Norden SJ, Director of The Ignatius Centre, has been a patient and encouraging supporter of the project. Ms Maree Tehan has been an able 'Melbourne connection', providing a necessary link with the people and organisations upon whom we have depended for data.

Professor George Cooney (Macquarie University) once again has helped to iron out the author's statistical problems, and Mr Brian Cooper (Westir Limited) has provided invaluable statistical assistance with good humour and dedication. Ms Dianne Boulton's capacity to extract sense from computers, locate hitherto unknown localities on maps, and turn ragged edged script into a manuscript, has enabled the project to reach published form.

THE VALUE STANCE OF THIS RESEARCH

From the title of the report it is clear that this research will venture into issues of communal inequalities and the setbacks in various forms which many individuals and groups experience in life. An attempt has been made to examine these issues objectively by citing the findings of relevant scholarly research and by presenting the findings of a social indicator study conducted in Victoria and New South Wales.

Inevitably the question has arisen of whether or not to identify areas which emerge from the inquiry as being markedly socially disadvantaged. It has been decided to do so for the following reasons:

- past experience has shown that to omit names or attempt to disguise the identity of areas creates intrigue and guessing, which can be socially harmful while solving nothing;

- evidence presented in the course of the report indicates that unless clear information is provided, and acted upon, neglected areas may simply fall further behind and suffer a decline in community wellbeing;

- to in any sense 'blame' the residents of areas for being disadvantaged is ill-informed and completely beside the point. If any finger pointing is warranted, it should be directed at authorities which have engaged in flawed or negligent planning, or state or national decision makers whose policies have had harmful consequences for disadvantaged communities. There is no sense in which the residents of those communities can be burdened with the blame for cumulative social deprivation. The important questions are whether we can identify instances of severe community disadvantage, and what can be done, in partnership with the residents of those areas, to improve their life opportunities and those of their children. These questions are the ones that should be paramount in a country with Australia's traditions. The present report is an attempt to be of service to those traditions.

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CHAPTER 1: AREA SOCIAL DEPRIVATION RESEARCH

The comparison of geographic areas, defined in a variety of ways, is one of the means by which social inequalities and their effects have been studied. Census units, electoral and administrative boundaries, postcodes, and spatial units for which demographic and social information is available, have been used for this purpose. Characteristically, localities have been socioeconomically graded in terms of selected census variables and the rates of medical and social problems existing within different social strata compared. As will be seen in the following sections of this report, this research strategy has been productive in illuminating persisting, in some instances increasing, gaps in the life opportunities enjoyed by different social groups in industrial societies. One of the pioneers of this type of research, Smith (1994), has focused explicitly on the links between geography and social justice. He embraces the notion of 'justice as spatial equalisation' (p. 149) and builds the case that the same resources devoted to need satisfaction in places with relatively low levels of resources will achieve more than in places with high levels. In addition to inequalities in the distribution of services and material resources, locality itself is a resource. Local networks of friendship, kinship, and mutual support form part of what people draw on in their struggle to satisfy their needs. Smith cites Wolch (1989, p. 215) : 'Some local jurisdictions have far greater voluntary resources on which they are able to draw for service augmentation, public sector substitution, and political action'.

Area studies are a vital part of the research tradition within which the present project has been conceived. The notion of a social gradient is foundational to the investigation but a difference lies in the fact that, rather than relying on variables (like car ownership and housing tenure) which are associated with social disadvantage, we have attempted to make greater use than is usual of direct manifestations of disadvantage or, at the very least, to use variables which self-evidently represent restrictions on life opportunities and the attainment of wellbeing. The phrase cumulative disadvantage aptly describes that which we are attempting to chart by over-laying a series of relevant indicators, the choice of which we justify in the following chapter. The potential gains from this type of exercise include -

- reminding the public generally, and policy makers in particular that, at a time of reduced social expenditures, multiply disadvantaged sections of the community will inevitably fall further behind unless special efforts are made to increase their life opportunities. An adventitious but pertinent element of the project is that one of the investigators (TV) co-authored a similar project based in the NSW city of Newcastle more than 25 years ago (Vinson and Homel 1975). Therefore, it is possible to consider what has happened over the considerable intervening period to the suburbs identified as being 'at risk' in the early seventies, using variables not unlike those employed in the present study. Do such

areas become a permanent feature of the social landscape? Are they transformed by demographic and other dynamics, and/or the kinds of broad social policies that have existed in Australia over the past quarter of a century? Or, is intensive effort required to bring about basic improvements?

- At a time when many parts of Australia are experiencing high levels of social control and intrusive police measures, especially in relation to young people, the degree of inter-connectedness between crime and medico-social disadvantages could serve to generate deeper questioning of the usefulness, and morality, of current policies. Essentially, if crime and disadvantage are found to be highly interrelated, it would seem lop-sided to emphasise controlling the former while paying scant attention to the latter. Without anticipating the findings in this regard, we note the observations of a leading authority that:

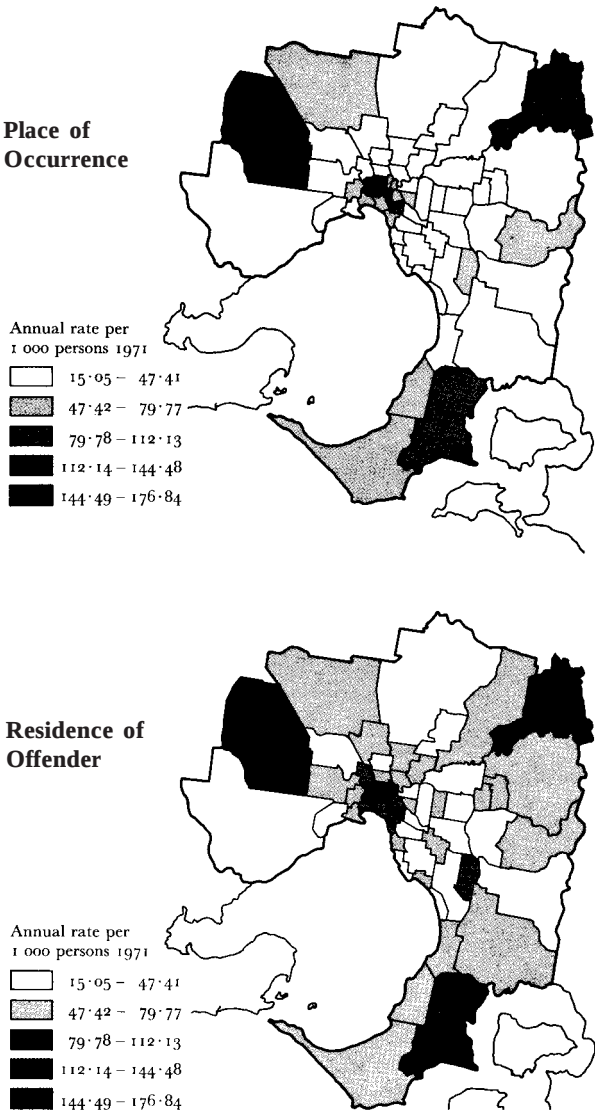
'Anything which increases the tensions and difficulties of family life will decrease tolerance and increase conflict, thereby adding to the numbers of children with behavioural problems and learning difficulties, and to those who at older ages are more likely to be unemployed and to be involved with drugs and crime… The difference between countries in which children do well and those in which they do badly is not family structure but the extent of relative poverty among their families and the stresses this imposes on family life' (Wilkinson 1998, pp. 165-167).

Between the above brief introduction of some possible implications of the research and their elaboration in the final discussion section of this report (Chapter 4), stands a considerable amount of statistical spade-work, some of it of a reasonably technical nature. Our intention is to keep the pathway to the findings as free as possible of technical thickets, so that we will resort to appendices and footnotes to avoid cluttering the main text with technical obscurities. Since we are charting our course on the basis of a limited number of indicators, one of our first tasks is to justify the choices we have made and to explain some of the key procedural steps we intend to take. Before doing that, it may serve to ease readers into these tasks and to get a feel for the subject if they first briefly encounter some examples of similar endeavours drawn from the period when territorial injustice last attracted serious public attention. One reason for that attention was that the Australian Government in the early 1970s was pursuing the policy of promoting social wellbeing via regional initiatives. This was the era of the Australian Assistance Plan, and a national Social Welfare Commission was charged with the responsibility of making that plan operational. It so happened that the emphasis at the time on developing geographic social indicators paralleled a similar focus elsewhere, for example, in America, an approach that was to assume new directions in the 1980s and 1990s (Sawicki and Flynn, 1996) when the indicator field turned to overall 'quality of life' measures in states and cities (not neighbourhoods). More recently, the increasing recognition that people's lives are greatly influenced by what transpires at the street block level (the so-called New Urban Ecology), the development of low-cost, high powered computing, and an emphasis on public-private partnerships and neighbourhood empowerment, has seen the resurgence of interest in local area indicators.

Previous Australian area deprivation studies

The 1970s saw a number of pioneering studies of the spatial distribution of crime in relation to measures of social disadvantage. A 1974 study of 'social dysfunctions and relative poverty' in metropolitan Melbourne revealed a substantial correlation (+0.78) between the socioeconomic status of suburbs and a number of medico-social problems (Little et al. 1974). An important implication of the study was that the most trouble-prone, disadvantaged suburbs provided a disproportionate share of those prosecuted by the law. The same suburbs experienced more than their share of total crime. The coincidence of level of crime and place of residence of offenders can be seen in the accompanying figure.

Figure 1: Crime by residence of offender and place of occurrence



F.M. Little *et al.*, *Social Dysfunction and Relative Poverty in Metropolitan Melbourne*, MMBW, Melbourne, May 1974.

Another study of the time requires mention not, strictly speaking, because of its focus upon the spatial dimension, but because it highlighted the concentration of multiple problems within units of another kind, namely, families. On the basis of their study of 16 Tasmanian families with a multiplicity of problems, Dax and Davies (1974) claimed to have demonstrated 'the large proportion of the total pathology of the State for which a small number of families are responsible.' For example, the members of the 16 study families had spent 250 times as great a time in gaol as Tasmanian families in general; they had experienced 70 times their share of road accidents.

Complementary research by Vinson and Homel (1975) used the types of direct manifestations of medico-social problems in which Dax and Davies had been interested, but examined their spatial distribution, initially in the NSW city of Newcastle and later in Sydney and other centres.

The first stage of the project established that a disproportionate share of Newcastle's health and social problems were concentrated within just seven of 72 minor suburbs, representing 5.5 per cent of the population. The researchers constructed a single score ('risk factor') summarising the overall position of each suburb on the range of problems considered[1]. The seven suburbs were those with distinctly high risk scores, as can be seen in the first of the accompanying figures presenting the array of risk scores:

Figure 2: Distribution of risk scores in Newcastle (72 minor suburbs)

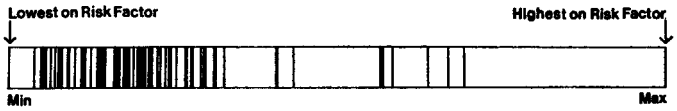


FIGURE 1
Distribution of suburbs on the risk factor (juvenile delinquency excluded).

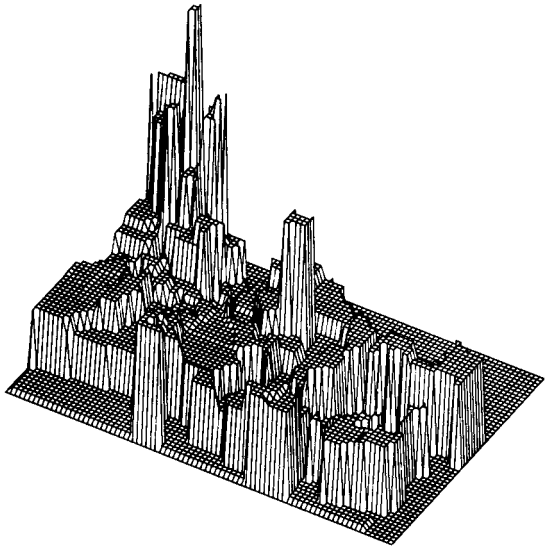
Problems such as infant mortality, low birth weight, dependence on relief, notifiable diseases, unemployment, mental illness, and truancy were found to be two to three times more prevalent than might have been expected on a population basis, within the seven suburbs with the highest risk scores The same suburbs had two to three times their share of adult crime and six times their share of drug offences.

The researchers constructed a single score ('risk factor') summarising the overall position of each suburb on the range of problems considered. Variations in risk scores are depicted in the accompanying computer map. The interrelatedness of delinquency and other medical and social problems was borne out by (i) an + 0.7 correlation between delinquency and risk scores, and (ii) the fact that 12 of the 15 suburbs with the highest rates of delinquency reappeared on the list of the fifteen suburbs with the highest overall risk scores. A follow up survey showed that parents in Newcastle's 'high

[1] The risk scores were based on a principal components analysis.

risk areas' were significantly more likely than parents in the general community to be inclined to see their lives as being shaped by luck, chance, fate or complex forces beyond their influence rather than by their own behaviour and personal characteristics (Vinson, Homel & Bonney, 1976).

Figure 3: Variations in risk scores (Newcastle)



The detailed findings of the survey appeared to indicate that this fatalistic attitude reduces the impact of social services intended to improve the life opportunities of families living in disadvantaged areas. It was also associated with less involvement in local affairs and with local people. Social cohesion in the sense of the existence of mutual trust and respect in a neighbourhood, considered today by authorities like the World Health Organisation (1998) to help protect people and their health, was weak in the 'at risk' areas. Virtually all major psycho-social risk factors for mental illness (including chronic and acute stress, lack of social relationships, supports, and lack of control and mastery), on the basis of the Newcastle evidence, and other studies, are more prevalent at lower socioeconomic levels. Kawachi *et al.* (1988) note eight prospective epidemiological studies reporting an increased risk of total mortality in socially isolated individuals (p. 245). The authors' follow-up of more than 50 000 professional people also confirmed the aforementioned association. An adjusted relative mortality rate of 1.4 for the most socially isolated group is comparable to the effect of cigarette smoking on total mortality reported in many studies. Social support continues to be important in later stages of life (Oxman *et al.* 1992). In persons 65 years and older, it has been found that the greater the social support available, the lower the depression scores three years later. The adequacy of emotional support is more telling than tangible support.

Measuring area social deprivation overseas

The approach adopted in the current study, namely, measuring inequality between geographic units (postcodes), is only one of many applications of the indicator concept. One of the most frequently cited definitions of the term social indicator was provided by Bauer (1966) :

' …statistics, statistical series, and all other forms of evidence…that enable us to assess where we stand and are going with respect to our values and goals, and to evaluate specific programs and determine their impact'.

In addition to the aim we have espoused of assessing local area deprivation, other purposes might include -

- measuring relevant changes in neighbourhoods. The terms of reference could include changes in the variables used to identify the area as being disadvantaged, but the range of concerns would almost certainly be wider than that;
- setting goals for neighbourhood and resident improvement;
- developing models of neighbourhood change;
- valuating the likely impact of policies on neighbourhoods and their residents; and
- measuring the nature and scale of resource inputs deemed relevant to the achievement of goals.

A number of indexes of 'need' and 'progress' are in wide use in America (Sawicki and Flynn, 1996). Human service analysts take advantage of the

Socio-Economic Status (SES) Composite Index of five equally weighted measures: mother and father's education, family income, father's occupation, and the presence of certain items in the respondents' households. Some indexes use a combination of census and other data more immediately reflective of personal/social problems. For example, Fordham University's Index of Social Health measures the combined impact of 16 social problems: infant mortality, child abuse, children in poverty, teen suicide, drug abuse, high school dropouts, unemployment, average weekly earnings, health insurance coverage, poverty among those over 65 years, out-of-pocket health costs for those over 65, homicides, alcohol-related highway deaths, food stamp coverage, access to affordable housing, and the gap between rich and poor.

The foregoing list is a reminder of the tendency for indicators to be chosen with an eye to local issues. The other priority is the opportunity to take advantage of already existing data, an approach which has been characteristic of local area indicators developed in the United Kingdom.

There have been at least five measures of area social deprivation in frequent use (Morris and Carstairs 1991):

- SCOTDEP - developed for the analysis of Scottish health data;
- TOWN - as used by Townsend *et al.* in an analysis for the Northern Region;
- JAR - developed by Jarman and associates in relation to need for primary care. The approach claims to identify areas of varying general practitioner workload, based on an assessment by GPs nationally of the effects of various social factors (Jarman, 1984);
- DOE - Department of Environment measure for application to urban policies;
- SDD - Scottish Development Department measure for application to urban policies.

The following table summarises the variables used in each of the above measures:

Table 1: Range of variables in five area indexes

	SCOTDEP	JAR	TOWN	DOE	SDD
Unemployment	x	x	x	x	x
Youth unemployment					x
No car	x		x		
Low social class	x				
unskilled		x			x
Overcrowding	x	x	x	x	
-below occupancy norm					x
Not owner occupied			x		
Lacking amenities				x	x
Single parent		x		x	x
Under age 5		x			
Elderly households					x
Lone pensioners		x		x	
1-year immigrants		x			
Ethnic minorities		x		x	
Vacant dwellings				x	
Level and access (old)				x	
Level and access (<5y)				x	
Permanent sickness				x	
Large households				x	

(Reproduced from Morris and Carstairs, 1991; p. 320).

There is a high degree of inter-correlation between the five measures although, in general, JAR is more weakly correlated with all the others. To assess the performance of the five deprivation indexes, the researchers correlated them with a set of health indicators, including mortality, permanently sick in private households, temporarily sick, standardised bed-days ratios, and standardised mean stay. Each of these measures was calculated for each of the postcodes. The coefficients were strongest for the SCOTDEP variables (no car, unemployment, overcrowding and social class). Variables with moderate associations with health were those relating to single parents, tenure, the level of, and access to, the dwelling in households with young children, large households, and the permanently sick. The remaining variables all show associations with health measures that are weak and in some cases negative. Four of the eight variables included in the JAR score were in this category.

As Morris and Carstairs (1991) state, tests of 'performance' do not indicate which index is best as a measure of deprivation. What is clear, however, is that they indicate a similarity in the results obtained for four of the measures. The authors conclude by adopting a position very similar to that espoused in the present study: **merely adding census variables to indexes entails conceptual confusion.** Better measures of disadvantage could arguably be constructed 'if government departments would make available some of the wealth of information that currently lies hidden (within them)' (p. 324). They cite the examples of information relating to income levels, supplementary benefits and income support. In *Chapter 2*, we present the indicators of disadvantage used in the present project, together with a review of the evidence from Australia and elsewhere supporting the inclusion of each variable in a study of cumulative social disadvantage.

CHAPTER 2: CHOICE OF INDICATORS AND PROCEDURES

Table 2: Indicators used in project

	Method of Calculation Rate per 1000 x postcode	**Victoria**	**New South Wales**
Unemployment	Number of unemployed as proportion of labour force	✔	✔
Low Income	Proportion of households with incomes <$26,000 p.a	✔	✔
Low Birth Weight	Proportion of all birthweights <2,500 gm	✔	✔
Child Abuse	Number of confirmed instances as proportion of all children (15 years of age	✔	✔
Education Leave School <15 years	Number as proportion of population > 15 years of age	✔	✔
Emergency Assistance	Recipient households as proportion of all households	✔	✔
Psychiatric Hospital Admissions	Number of persons admitted as proportion of population > 18 years of age	✔	–
Court Convictions	Number of convicted persons as proportion of population 18-50 years of age	✔	✔
Child Injuries	Injuries as proportion of population ≤ 18 years of age	✔	✔
Mortality	Number of deaths standardised for population rates (see Technical Appendix for details)	–	✔ partial use
Long-Term Unemployment	Number of long-term unemployed (> 26 weeks) as proportion of population >18 years of age.	–	✔
Unskilled Workers	Number of unskilled workers as proportion of population 18-65 years of age.	✔	✔
Court Defendants	Number of people dealt with by courts for criminal matters as proportion of population 18-50 years of age.	✔	–

Needless to say, our choice of variables has not been unrestricted; although we received generous support from the government and non-government agencies listed at the beginning of the report, not everyone from whom assistance was sought was forthcoming. In some instances, unfamiliarity with the nature of the research provoked caution, in others the controllers of data had yet to embrace the idea that it was not a personal possession. Another difficulty arose from the fact that we selected *postcode* as the geographic unit of analysis. We did so for sound technical reasons that will be explained in the course of this chapter. A consequence was, however, that some relevant information was not immediately available in that format. The cooperation afforded by some agencies extended to converting statistical information to a postcode basis, at least experimentally for the purposes of the project. Finally, we have been restricted by our own knowledge and imagination concerning possible data sources. There is probably a great deal of valuable statistical information stored away in departmental and agency cupboards. It is hoped the example of the present project will encourage those holding the necessary keys to unlock these potential sources of planning information.

THE INDICATORS

(i) MORTALITY

In a succinct and authoritative statement on the social determinants of health, *The Solid Facts*, the World Health Organisation, Europe, (1998) asserts the following: 'Poor social and economic circumstances affect health throughout life. People further down the social ladder usually run at least twice the risk of serious illness and premature death of those near the top. Between the top and bottom, health standards show a continuous gradient ... (which) ... reflects material disadvantage and the effects of insecurity, anxiety and lack of social integration... Disadvantages tend to concentrate among the same people, and their effects on health are cumulative. The longer people live in stressful economic and social circumstances, the greater the physiological wear and tear they suffer, and the less likely they are to enjoy a healthy old age.'

The evidence is international as well as local. This century has witnessed an impressive increase in the life expectancy of the peoples of industrialised countries but, in those for which data are available, the chance of premature death is higher among those with a lower educational level, a lower income level, or a low position in the labour market (Kunst *et al.* 1998). Moreover, the higher educated can expect not only to live longer but also to have a higher proportion of life expectancy spent in good health, compared with people of lesser education (Ari-Pekka Sihvonen 1998). Indeed, the socioeconomic gradient appears to be much steeper in health expectancy than in life expectancy (*ibid*, p. 311).

It is possible to respond to these statistics, as one commentator (*New Statesman*, 1996) has, by observing that 'the poor have only themselves to blame: if they stopped smoking, drank less, ate up their greens, went jogging and stayed married, the differences would disappear.' The problem is that such lifestyle differences account for only half the inequalities in mortality rates. The evidence is that when people quite separated in terms of social class indulge in the same unhealthy practices, major differences in longevity still persist. Within the bureaucracies described in a later section of this review (*Unemployment*), even small differences within a hierarchy influenced the prospects of incurring a health problem.

While the foregoing comment summarises the present state of knowledge with respect to socioeconomic influences on health, Smith (1997) has offered a word of caution. It would be simplistic to interpret socioeconomic differentials in health as reflecting high levels of susceptibility to disease in general among the socioeconomically disadvantaged, including those who were disadvantaged in infancy and childhood. For some conditions, for example, breast cancer, the direction of the association may be reversed. There are also significant interactions between events at different periods of the life course. For instance, there is evidence that a 'socially patterned factor', low birthweight, appears to interact with obesity in

adult life, to produce elevated risks for high blood pressure and coronary heart disease mortality. These subtleties have to be kept in mind, but substantial evidence exists for the contribution of early life socioeconomic position to a number of illnesses, including respiratory disease, diabetes, some cancers in adulthood and cardiovascular disease (Smith, p. 262).

A prospective observational study with 21 years of follow up (G D Smith, 1997), examined the influence of socioeconomic position over a lifetime on risk factors for cardiovascular disease, and on morbidity and mortality from various causes. Social class was determined as 'manual' or 'non-manual' at three stages of participants' lives. Mortality from cardiovascular disease showed a graded association with cumulative social class (ranging from non-manual on three assessment occasions, to manual on the same three occasions). When adjustments were made for a range of risk factors the pattern was basically preserved. Mortality from cardiovascular disease seems to be more strongly related to cumulative social disadvantage than mortality from cancer or non-cardiovascular, non-cancer causes. Whereas social class in adulthood is the more important socieconomic indicator over a lifetime for differentiating groups with differing risks of mortality from cancer and non-cardiovascular, non-cancer causes, the socioeconomic environment in childhood seems to be particularly important with respect to mortality from cardiovascular disease.

The factors which research has linked to low socioeconomic status and which help to explain its harmful health consequences are linked with many of the indicators used in this study. For example, Brunner (1997) includes financial strain, job insecurity, lack of 'discretion latitude' at work, stressful life events, poor social networks, low self-esteem and fatalism. However, before concluding this section, it is important to note that class-related differentials in mortality not only emerge as life progresses. National statistics have been used in the United States to demonstrate that such differences are present from the earliest years (Singh and Yu 1996). When deaths of children aged one to four years were examined in terms of family incomes, with controls introduced for sex, race and rural/urban residence, children in the lowest family income group had approximately three times higher risks of mortality than their counterparts with higher family incomes. The Australian College of Paediatrics (1993) also has concluded, on the basis of studies covering education, income, occupation and other aspects of the socioeconomic status of suburbs and postcode areas, that mortality rates in infancy for Australia show a similar pattern: the rates increase the lower the socioeconomic status of an area (p. 16).

(ii) UNEMPLOYMENT

On the basis of the best contemporary research evidence, WHO (1998) states that unemployment puts health at risk, and the risk is higher where unemployment is widespread. After allowing for other factors, unemployed people and their families suffer a substantial increased risk of premature death. Some studies indicate that the mortality rate increases by between 30-50% among the unemployed after adjusting for occupation, housing category, geographical region and marital status (Iversen *et al.* 1987). The health effects of both unemployment and job insecurity are linked to the psychological consequences and financial problems, especially debt. These contentions rely on the evidence of current studies like one recently made of male British civil servants anticipating a major change in work status (Ferrie *et al.* 1998). The findings were consistent with those of many other workplace closure researches that have shown that job uncertainty and the threat of job loss are related to increased psychological disorder, anxiety, depression, and significant increases in blood pressure. The British findings, for example, echo the findings of an American study of what the authors call 'ambient threats' (Catalano and Serxner 1992). A threatened reduction in the number of workers in one American state was accompanied by an increased incidence of low birthweight; the reverse was true in another state with unexpectedly low unemployment.

The researchers involved in the civil service study have attempted to identify mediating factors that link environmental stress and ill health. For example, they have focused on the presence of high levels of fibrinogen in the blood which could contribute to clotting and the induction of coronary thrombosis or stroke. They found that the lower people are in the British civil service hierarchy, the higher their plasma fibrinogen levels. One of the key researchers in this project, (Marmot, 1998), has stated that when the body is stressed in a number of ways, fibrinogen levels go up suggesting that the lower you are in the hierarchy, the greater may be your overall level of stress.

While unemployment has its health consequences, the reverse also is true. A United Kingdom longitudinal study by Bartley and Owen (1996), which combined employment trends in the United Kingdom with the findings of general household surveys, showed that, as jobs got harder to come by during the study period (1973-'93), the active labour force was increasingly selective: to have a job, a person had to be in better health in 1993 than in 1997.

Neighbourhood effects

Following the arguments outlined by Wilson (1987), it is claimed that as an area becomes increasingly poor, residents are more likely to face severely reduced access to jobs. They also have fewer social networks and role models of stable, job holding intact families. This picture has been confirmed locally in a study of inner-Sydney unemployed youth (Vinson, Abela, Hutka 1998). In these circumstances, joblessness perpetuates poverty, not just because it undermines the welfare of particular families, but also because it has become concentrated in space. As a consequence, an environment is created which isolates residents from the world of work and promotes a culture of dependency. This view, that the years 1976-1991 saw an increase in the geographic concentration of poverty and unemployment, is consistent with the finding of Gregory and Hunter (1995).

(iii) LOW BIRTHWEIGHT

The importance of prenatal life and early childhood for later health is clearly recognised by the World Health Organisation (1998): 'Slow growth and a lack of emotional support during this period raise the life-time risk of poor physical health and reduced physical, cognitive and emotional functioning in adulthood. Poor social and economic circumstances present the greatest threat to a child's growth, and launch the child on a low social and educational trajectory.'

Disorders relating to short gestation and low birthweight are among the leading causes of death among infants (American Centres for Disease Control and Prevention, 1994). Low birthweight is the strongest risk factor for infant mortality and varies by social class (Botting 1997). In England and Wales, where such research has long been conducted, the average birthweight in Social Class V in 1994 was 115 grams lighter than in Social Class 1. Within the same birthweight group, there are social class differences in infant mortality rates.

A Danish study (Johansen and Christensen 1997) has confirmed the findings of previous research that women who have a low birthweight infant are more likely to give birth to another low birthweight infant than women who have had infants of normal birthweight. However, it is the variation in the realisation of this potential that underlines the social contribution to low birthweight. Johansen and Christensen found that a decline in a woman's social status - the partner with the higher occupational status determined the couple's social status at each birth - was a comparatively strong predictor of low birthweight, suggesting that foetal growth is reduced under poor circumstances. There was a lower risk when social status rose.

Where parents live may also influence the risk of having a low birthweight infant. A large study in Northumberland (Raybould and Jarvis 1993) has found that inequalities in birthweight and height (an indicator of healthy development in children) exist in all rural and urban settings between

deprived and affluent areas. An index of deprivation, comprising car ownership, housing population densities, adult unemployment, and home ownership, was applied. It was found that, in increasingly urban settings, rates of low birthweight became greater and the mean height of children became less. These associations were independent of levels of maternal deprivation and they represent, in the view of the researchers, an additional source of inequality over and above that of maternal circumstances.

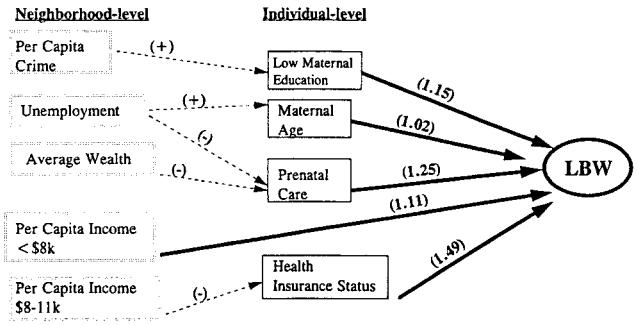
It was once considered that receiving appropriate antenatal care had a substantial influence on the maturity and birthweight of infants and helped to explain the greater proportion of low birthweight babies born within low socioeconomic status groups (NSW Division of Maternal and Perinatal Studies, 1973). Mothers in the latter category more often than women of higher status backgrounds were found to take less advantage of antenatal care. The capacity for the latter to influence the number of low birthweight deliveries has been revised in the light of studies assisted by statistical methods capable of assessing the independent effects of variables. For example, Katz *et al.* (1994), on the basis of a study conducted in British Columbia and Washington State, found that poorer women in both localities were more likely to receive inadequate prenatal care (assessed in terms of the timing and frequency of consultations), but the degree of care was not associated with the incidence of low birthweight. 'The occurrence of low birthweight is influenced by many complex biological and social factors that may not be greatly affected by prenatal care' (pp. 989-990).

Neighbourhood effects

The foregoing researches testify to the importance of individual risk factors for low birthweight but some investigators who have emphasised neighbourhood level factors contend that the traditional focus limits our understanding of the topic. Roberts (1997), on the basis of studies of the Chicago metropolitan area, believes that social phenomena that affect people at the level of entire communities play a role in creating the inequalities which accompany wide differences in rates of low birthweight. Using a method known as logistic regression analysis, it was found that after maternal race and ethnicity, the most substantial risk factor appeared to be an index of *economic hardship*. At the neighbourhood level, components of economic hardship, like unemployment and poverty, can erode the support network available to a mother and can interfere with the stabilising influence of intact families on the community as a whole. However, the capacity of the statistical method used to examine single variables while controlling for the influence of others, throws light on the positive effects of some factors *considered as community attributes.* High concentrations of children and crowded housing units appear to be indicators of neighbourhoods where mothers live in close proximity to their support networks, where responsibilities for support and resource provision are spread over a large number of people (p. 602).

O'Campo *et al.* (1997) also note the long standing reliance on conceptualising risk factors for low birthweight in terms of individual factors. They state that social risk should also take heed of environmental stressors that shape individual vulnerability and resistance to risk factors for health. The researchers made use of census tract data for Baltimore and employed a method of statistical analysis that enabled the direct effects of individual-level and macro-level factors on birthweight to be gauged, as well as interaction effects. Among the individual-level variables, higher maternal education had a predictive effect. Late access to prenatal care was significantly related to the risk of low birthweight, and maternal age entailed a slight increase in risk. Of the census-tract level variables, per capita income had a significant direct relationship to risk of low birthweight. Important interaction effects were also noted. For example, as the level of unemployment in an area increases, the protective effect of early prenatal care initiation diminishes. 'Thus, when the design of policies or interventions is based only upon individual-level analysis, the benefits of interventions aimed at increasing earlier initiation of prenatal care, which are usually targeted toward

high risk populations, may be overestimated.' (p. 1117). In general, O'Campo *et al.* found substantial interaction between macro-level and individual-level factors for low birthweight. Indicators of social class and environmental stressors, such as poor housing conditions and high crime and unemployment rates, appeared to modify the relationship between individual-level risk factors and low birthweight (see Figure 4).



Note: Heavy arrows represent direct effects on low birthweight; odds ratios (ORs) for these direct effects are shown in parentheses. Interaction effects are indicated by broken-line arrows. These interaction effects modify the relationship between individual-level variables and low birthweight. For example, the increased risk of low birthweight for women with low levels of education (OR = 1.15 in neighbourhoods with average crime rates) is stronger (+) in high-crime than in low-crime neighbourhoods; the increase in risk with increasing maternal age (OR = 1.02 in neighbourhoods with average unemployment levels) is stronger (+) in high-unemployment than in low-unemployment neighbourhoods.

Figure 4: Risk of low birthweight in Baltimore, 1998-1989 - direct and interactive effects of neighbourhood level and individual level risk factors (Adopted from O'Campo **et al**, *1997).*

(iv) CHILD MALTREATMENT

Since the days of the classical area based studies of child abuse, there have been many methodological refinements introduced to test more rigorously the authenticity of apparent concentrations of abuse in local areas. Essentially, the statistical refinements that have been introduced help to establish whether the spatial coincidence of maltreatment cases represents a 'true' clustering rather than being merely part of the working out of chance distributions. For example, Fryer and Miyoshi (1995) have examined 830 cases of confirmed child abuse occurring in the period 1986-1990 in 31 rural counties in America. The technique used has analysed temporal-spatial interactions in the distribution of cases in the sense of assessing their tendency to occur within prescribed intervals of time within geographic regions[2]. After introducing these refinements, the researchers found that clustering was statistically demonstrable, with a significant number of cases occurring in excess of what would be expected on the basis of chance.

Visually compelling clusters of child maltreatment cases have been reported in two studies. The first, a 1988 study of the distribution of instances of child abuse within an inner-London borough, was conducted by Cotterill. Households in which confirmed child abuse occurred in the period 1982-1985 were mapped and the clustering of such cases within the borough can be seen in Figure 5 below:

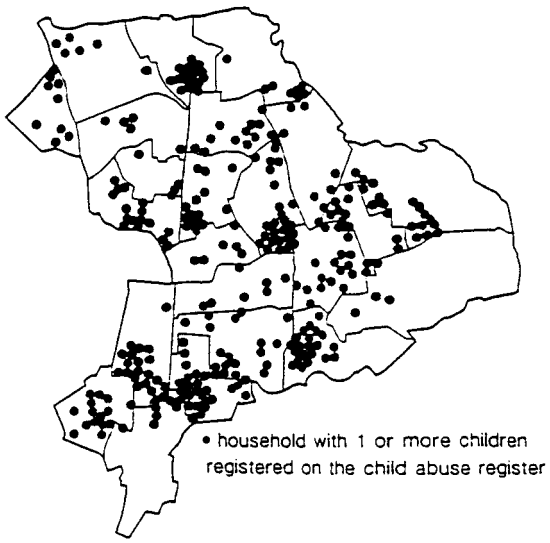


Figure 5: Geographic distribution of child abuse cases, 1982-1985 (Adopted from Cotterill, 1988)

The distribution of cases across the borough was examined for target areas, defined arbitrarily as five or more households with a registered case of child abuse in close proximity. Sixteen target areas were identified; these areas contained 73% of the cases registered over the study period. The areas were of small size, none larger than one-half mile across. Of the 16 areas, 12 were housing estates.

[2] Clustering was measured by calculating the probability of obtaining the observed number of cases adjacent on both dimensions from all possible time and space permutations of cases for a Poisson distribution.

A second study which has uncovered a marked degree of clustering is based in Western Sydney (Vinson and Baldry 1999). In the first stage of this project, a suburb of some 10 000 people was nominated by the NSW Department of Community Services as a locality with a comparatively high rate of confirmed child abuse. The initial research turned on the comparison of survey responses of 51 'carers' in a census unit with a low rate of abuse, and an adjacent census unit within the same suburb, which had a high rate. A range of sociological instruments was used to try and identify differences between the two areas which had similar socioeconomic profiles. The only major difference to emerge concerned the structure of social networks in the two neighbourhoods: residents in the higher risk area had networks which were more focused around the immediate family and home.

The geographic plotting of the homes of children who had been abused revealed the pattern apparent in the accompanying figure and raised the following question: Does the clustering of cases reflect the operation of micro-social environments that encourage abuse?

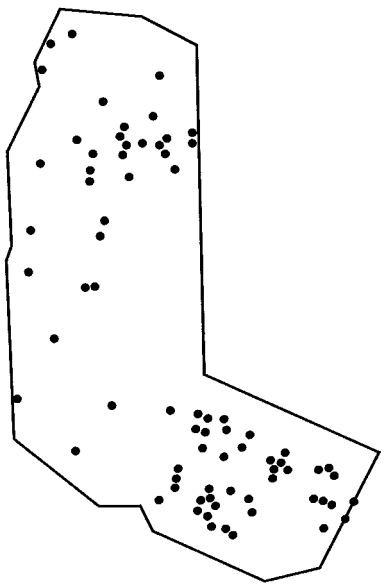


Figure 6: Spatial clustering of child abuse cases, suburb in Western Sydney

An operational definition of cluster has been applied. It has taken the form of a scaled template encompassing 200 square metres of the suburb. A 'cluster' is said to exist when this space contains three or more addresses at which abuse has occurred over the past three years. The survey responses of carers living within cluster areas have been compared with those living elsewhere and, unlike the previous comparisons between census units, significant differences have emerged. There is an association between living in the cluster areas and a lack of attachment to one's neighbourhood, and detachment from local friendships and the people residing there, together with the judgement that it is a poor place in which to bring up children, partly because of the 'dangerous' environment and 'unacceptable' life styles of residents.

(v) CHILDHOOD INJURIES

Injuries have been recognised as the leading cause of mortality in children for 50 years (Santer and Stocking 1991). In Australia between 1979 and 1996 there was a clear downward trend for the component age groups (0-4 years; 5-9 years; and 10-14 years) within the general category *child injury deaths*. The latter includes all external cause deaths excluding 'medical misadventure' (Moller and Kreisfeld 1997). All age groups showed approximately a halving of the death rates during the period under study. The statistics show that the pattern of childhood injury changes with stage of development. In terms of death, the major areas are drowning (mainly one and two year olds), and motor vehicle traffic accidents (all age groups but especially older children). Hospital treatment data reveals a wider range of causes, including falls from playground equipment (and other situations), burns and scalds, and recreation and leisure based injuries.

Overseas research has fairly regularly shown that injuries to children are not spread evenly over all social groups. A study of injuries to children in West London (Alwash and McCarthy 1988), was based on children treated in hospital accident departments. The investigators found a clear trend of greater severity of injuries to children of working class parents. Not only were these children

found to have accidents more commonly but their injuries were more severe. Throughout Britain, age standardised patient consulting data for children under 16 years shows a progressive increase in consultations for injury and poisoning at successively lower levels of the social class scale (Botting and Bunting, 1997, p.191). A study by Wicklund *et al.* (1984), of linked birth and death records from North Carolina and Washington State for the years 1968-1980, found that the risk of fatal accidents among infants during the first year of life decreased with the rising level of education of mothers, regardless of race. Increasing maternal age and parity were also associated with decreasing risk of fatal accidents. In Britain, age standardised patient consulting data for children under 16 years shows a progressive increase in consultations for injury and poisoning at successively lower levels of the social class scale (Botting and Bunting, 1997, p.191).

The gap between classes with respect to injury mortality for children may be widening in some countries. For example, although a study of England and Wales between 1981 and 1991 showed a decline in injury mortality for children in every class, the decline in classes I and II was greater than for children in classes IV and V. Over the period in question, the death rate for children in social class V compared with that of class I grew from being 3.5 times to 4 times greater. 'The differential decline in child injury mortality is consistent with the pattern of steepening mortality gradients that have been observed in adults' (Roberts and Power, 1996; p. 785).

Durkin *et al.* (1994), using a form of small area analysis in Northern Manhattan, found that census tracts with high proportions of low income households, single parent families, non-high school graduates, and unemployed people, had significantly higher rates of childhood injuries. Controls were introduced to enable the assessment of independent effects and these procedures indicated low income was the single most important predictor of all injuries. A recent study in Tennessee (Scholer *et al.* 1997) also took the precaution of attempting to disentangle the interconnected effects of different facets of socioeconomic status. A study cohort of more than one million infants was used and the univariate analysis showed that injury death rates varied with maternal education (less than 12 years), income, number of other children, race, marital status, delayed prenatal care, and gestational age. However, when a statistical method was used which enabled the independent contribution of different factors to be assessed[3], only three factors remained significant. There was a strong inverse association between years of maternal education and rates of death from injury. Injury death rates also increased significantly with number of other children and with young maternal age.

The basic aim of a study by Jolly *et al.* (1993) was to establish whether the relationship between socioeconomic status and child injuries revealed by overseas research was equally present in this country. All children aged from birth to 14 years, who sustained an injury between January 1989 and June 1990 and who lived within the catchment area of several hospitals in Queensland and Victoria, were recorded on the National Injury Surveillance Unit collecting system (38 000 cases). Rates of injury for postcodes were calculated and when these were ranked according to five composite socioeconomic quintiles, it was found that the relative risk of injury in the lowest socioeconomic group was almost three times that of the risk in the highest quintile. Statistically significant correlations were obtained between the injury rate of a postcode and all the measures of socioeconomic status used. The strongest association was between injury rate and income (the proportion in a population earning less than $12 000), and the weakest was between the rate and the Australian Bureau of Statistics index. The pattern of association between 'class' and home-based injuries was similar to that revealed for total injuries but the association was weaker in the cases of sporting and intentional injuries. Path analysis indicated that low income had the most direct association with injury, with other socioeconomic measures 'acting through' this variable. Jolly *et al.* concluded that 'income is the key variable'.

[3] a form of regression multivariate analsis

(vi) EDUCATION

Currently, arguments about the public benefits of education emphasise economic effects. Stacey (1998) has reviewed the impacts of education in a number of fields, including health, parenting, and crime. A number of American studies indicate that the number of completed years of formal schooling is the most important predictor of good health, a better predictor, for example, than occupation or income. So far as the young are concerned, schooling has been found to be associated with smoking, children's nutritional intake, cognitive development, and good health generally. In the realm of parenting, education is associated with out-of-wedlock child bearing, early family formation, child abuse and neglect, the amount and quality of time parents spend with their children, and the number and spacing of births.

People with higher levels of education also experience better mental health, including low levels of depression and psycho-physiological illness (Reynolds and Ross, 1998). Education consistently emerges as one of the most important determinants of individuals' perceptions of wellbeing (Mookherjee 1992). These associations with wellbeing, and others referred to in other sections of this review, constitute ample justification for the inclusion of a *deficient education* indicator in the present study. However, by way of attempting to clarify the basic concept of cumulative deprivation, some reflection on why education is connected with health, is warranted. As Reynolds and Ross (1998) state, 'Is the association between education and good health mostly a reflection of advantaged family background on the one hand, of access to rewarding work with good pay on the other; or does a person's own education improve subjective wellbeing independent of family background and current prestige and privilege?'

Reynolds and Ross attempt to contribute to the elucidation of these possibilities by simultaneously examining the effects of socioeconomic status of one's family of origin and one's own education, work and economic status, and on adult physical and mental health. They conceive an individual's own socioeconomic status as having three components: years of schooling, work and economic resources. The analysis is conducted within a framework of contending perspectives on the social significance of education. One of these is 'education as achieved status', the claim that educational attainment is the proximate cause of adult statuses, linking family background to them by way of acquired skills and knowledge. Involved is a view that education produces larger effects and a receptivity to new knowledge, as well as social usages that attract commendation and opportunities. It has a positive effect on wellbeing net of employment and income. Another perspective, 'education as the reproduction of inequality', amounts to a claim that educational attainment is a symbolic marker which legitimises the intergenerational transmission of social class. It is a *credential*, not significantly related to worker performance. Most of the association between education and wellbeing is due to its association with privileged family backgrounds, and to the labour benefits of access to good jobs.

Such contending views on the meaning of education for people's lives have fuelled debate for decades, and continue to do so. Reynolds and Ross (1998) have tested the propositions by measuring and testing the effects of social origins, education, work characteristics, and economic status on wellbeing in two United States nationally representative data sets. A combination of global self assessments of personal health, and reported impairments to daily functioning formed the basis of the physical health assessment. Psychological wellbeing was assessed by means of a standardised depression scale, a 'sensitive psychological barometer of life strains'. The independent effects of various factors were gauged by means of regression analyses.

The results of the studies showed that years of educational attainment had positive significant effects on physical and psychological wellbeing that were significant and not simply the side-effects of social origins. A part of the apparent effect of

education on wellbeing was attributed to family background. Indeed, family socioeconomic background (parental education and father's occupation) was significantly related to adult wellbeing. People who grew up in families with well educated parents had significantly better health than those who grew up with poorly educated parents, even after adjusting for one's own education. Work and economic conditions explained some, but not most, of the effects of years of education on wellbeing. There was little evidence that education was more beneficial to those from higher status backgrounds. However, there was evidence of the enduring effects of childhood poverty. Even after adjusting for respondents' education, work and economic conditions, childhood poverty continues to have an effect on adult health, especially mental health.

The Reynolds/Ross study is impressive in its scope and methodological refinement but we are still left pondering what lies behind the apparent direct effects of key variables, especially 'years of schooling' which seems to have such beneficial consequences for adult wellbeing. Is it that we acquire more personal/mental resources as a result of extended school education - things like a sense of personal control, and associated problem-solving abilities and health-related disciplines? Reynolds and Ross cite other research which supports such hypotheses but their own data do not cover these issues. The conclusions that can be drawn from their study are as follows:

'Education has positive, meaningful effects on wellbeing net of positions of current power and prestige and of social origins, and education mediates much of the association between social origins and wellbeing. These benefits are not ephemeral or symbolic, they cannot be explained away by advantaged family background, and they are not due solely to rewards in the paid labor force' (Reynolds and Ross, 1998).

Because unemployment is one of the indicators included in the present study, another of Reynolds and Ross's findings should be noted. Engaging in challenging, rewarding and fulfilling work also had significant positive effects on adult physical and psychological wellbeing in both of the data sets used. For the same reason, it is noted that higher incomes and a lack of economic hardship were found to be positively related to physical and psychological wellbeing.

The evidence concerning crime is not conclusive. There is experimental evidence suggesting that intensive education for preschool children and their parents has crime reduction effects. With respect to older children, there is evidence that factors like communities having large numbers of unsupervised teenagers and little community involvement among residents, are more salient than number of years of schooling completed. Stacey concludes that, on the available evidence, the main benefits of education in the sphere of crime prevention arise from the socialising and supervisory roles performed, rather than primary educational activities. On the positive side, there is considerable evidence that participating in a preschool program promotes cognitive development in the short term and prepares children to succeed in school (Boocock 1995). Moreover, preschool experience appears to be a stronger force in the lives of low-income rather than advantaged children. The latter can often, as a result of preschool attendance, achieve at a level nearer that attained by their more advantaged counterparts, but most of these effects seem to diminish over time.

(vii) PSYCHIATRIC ADMISSIONS

So far as admission to hospital for mental illness is concerned, an association with socioeconomic status has been acknowledged for 50 years (Faris and Dunham 1939). In England, the Royal College of Psychiatrists (1988) has found that the prevalence of specific psychiatric disorders is strongly related to social and demographic factors. The Working Party of the College has also shown that a relationship exists between admission rates and rural or urban status of the population served, poverty, isolation, ethnicity, unemployment, and owner occupied housing. The study found correlations of between 0.67 and 0.76 for underprivileged area scores and admission rates in selected health regions. The Working Party

concluded that, if the reported correlations were confirmed for larger and more extensive population groups, social factors could be powerful predictors of psychiatric hospital use.

Jarman *et al.* (1992) have undertaken a total population study of psychiatric admission rates in all health districts in England to assess how these rates are related to more than 150 social, demographic, and health care variables, including various deprivation indexes. Two statistical (regression) models resulted. The first is the more elaborate and explains 79% of the variation of the number of admissions per health district. It relies upon a range of factors including sex, age, marital status, drug misusers and standardised mortality ratios. The second model is intended for use at census electoral ward level where less demographic information is available but underprivileged area scores are. With considerable power, this approach uses underprivileged area scores and crude admission rates to explain variation in psychiatric admission rates, confirming the relevance of social disadvantage to emotional/mental wellbeing, as reflected by the indicator, *psychiatric admissions.*

However, in another study along similar lines, Campbell *et al.* (1991) found that unemployment was a more effective predictor of psychiatric morbidity rates. This line of inquiry has been taken further by Kammerling and O'Connor (1993), who have reported a strong association between unemployment rates within sectors of the Bristol and District Health Authority in the County of Avon, England. Unemployment rates explained 93% of the variation in the crude person based admission rates standardised for those aged under 65 years in the sectors that comprised groupings of neighbouring wards. This result compared with the previously mentioned Royal College of Psychiatrists' finding that disadvantaged area scores explained only about 64% of the variation in admission rates.

The explanations offered by Kammerling and O'Connor for this difference is a reminder of procedural issues that need, where possible, to be heeded in the present study:

- the concurrence of the unemployment and admission data;
- the distinction between individual people and total number of admissions;
- the use of larger sectors rather than wards; and
- the aggregation of data over two years.

In interpreting the meaning of the strong correlations between unemployment and psychiatric admissions, it cannot be inferred that they reflect, pure and simply, a connection between employment status and mental health in a population. There is some evidence to support a direct connection but other things, like having the opportunity to seek help, may enter into the equation. Kammerling and O'Connor have taken the view that an area's unemployment rate is a marker for its general socioeconomic status, which has a major effect on its need for inpatient psychiatric care.

(viii) CRIME

As with the study of many other aspects of urban life, the focus of much crime research is changing from larger population groups to the neighbourhood or street block level. For example, Sherman *et al.* (1989) using an approach called 'the criminology of place' in a study of crime in Minneapolis, estimated the number of 'places' in the city to be 115 000, comprised of 6 000 intersections and 109 000 street addresses. They found that a very high proportion of reported crimes occurred in a relatively few 'hot spots'. Just over half of all calls to the police for which cars were despatched in a year were sent to 3.3% of all addresses and intersections.

This finding is consistent with the results of British studies conducted in the 1980s. In the words of Hope and Hough (1988), crime and problems of law and order are 'local and pocketed'. A small proportion of offenders commits a large proportion of crime; a small proportion of victims suffers a large proportion of crime committed; a

small number of areas experience an unequal amount of crime events. Australian research has revealed a similar concentration of crime to that illustrated by the British crime surveys. For example, a study of repeat burglary victimisation in Beenleigh by the Queensland Criminal Justice Commission (1997) found that just 0.4% of all residential properties in Beenleigh accounted for 11.6% of all reported break-and-enters.

If crime tends to be concentrated in a restricted number of localities, then those charged with perpetrating it also are more often found in a limited number of low socioeconomic neighbourhoods. The three Australian area deprivation studies of the 1970s, cited in the Chapter 1, illustrate the point. Indeed, the low status/offending association has been a recurring feature of official criminal statistics in recent decades (see, for example, the publications of the NSW Bureau of Crime Statistics and Research). The depth of the status/offending association was recently illustrated by the findings of a project *Comparison of the Sentencing of Indigenous and Non-Indigenous Prisoners in New South Wales*, conducted by the present author (Vinson 1998). An increase of 75% in the size of the NSW prison system over the past decade has been serviced by the more intensified quarrying of a relatively small number of indigenous and poor communities. The last place of residence is one piece of status-relevant information that is available concerning prisoners. When a scale of relative prestige of Sydney suburbs (Cunningham, 1995) is applied to this information, the 5% of lowest ranking Sydney suburbs (representing about 6% of Sydney's population), accounted for 34% - or almost six times their share - of Sydney-based male Indigenous prisoners. The same suburbs accounted for 20% of non-Indigenous male prisoners. Among women the picture was even bleaker: just three of the lowest ranking suburbs accounted for 30% of the Sydney-based female prisoners.

While in the foregoing study the analysis of the status background of offenders was confined to metropolitan Sydney, another recent rural NSW study has assessed the relationship between geographically located social structures, as reflected in 26 census variables, and the level and nature of local crime (Jobes, Crosby, Weinand and Donnermeyer 1999). The use of clustering procedures has resulted in the identification of six groups of rural communities with similar geographical locations (coastal communities, small inland towns, large urban centres, and the like) and with variations in crime patterns accompanying the variations in social structures. *The Medium Inland Towns* had comparatively high rates of assault, and were characterised by a higher proportion of males in the 40-49 years age range, relatively lower educational levels, higher unemployment, low median individual incomes, above average proportions of sole parents and less married persons, and a high proportion of Aboriginal people. *The Large Urban Centres* cluster had a comparatively high rate of break and enter offences. This cluster was characterised by relatively high levels of education, a high rate of people moving into the area, more sole parents, a high rate of divorce, and high proportions of the population comprising Aboriginals or people from overseas.

This approach helps in a general way to show disadvantage as part of the social context of crime in its varying forms although the 'data trawl' nature of the design sets limits to the inferences that can be drawn. The authors do claim that there is an underlying assumption in their analysis of crime occurrence data and census variables, namely, that an absence of social cohesion will increase crime. However, no substantial rationale has been provided for the choice of variables taken as being indicators of low social cohesion (including unemployment and proportion of Aboriginal people). The approach is susceptible to the criticism of entailing a circularity of argument. Identifying the absence of *cohesion* seems to rely heavily on the presumed problematic consequences, including a high level of crime.

(ix) INCOME

The important role played by income in the distribution of manifestations of social disadvantage has been implicit in the review of the other

variables included in the present study. Median family income is a close predictor of census tract variations on other indicators, such as median value of owner-occupied housing units, number of people per room, and proportion of population graduating from high school (Smith 1994). A University of Michigan longitudinal study of 895 infants has shown that family income is a better predictor of the IQ of five year olds than ethnicity, mother's educational background, and the number of parents in the household (Bower 1994). However, as Bower declares, destitution is not necessarily destiny. There are many documented examples of favourable responses from poor children exposed to programs, particularly at an early age, which help to make them emotionally secure and confident in their school work, as well as involving parents in the curriculum. There are questions, however, about the longevity of the benefits of such programs. In summarising the findings of early childhood programs from many countries, Boocock (1995) states: 'Preschool attendance can narrow the achievement gaps faced by disadvantaged children, though most of these effects appear to diminish over time.'

The widening of income differences during the late 1980s in Britain was accompanied by a slowing down in the convergence of death rates between richer and poorer areas (Wilkinson, 1998). This trend seems to have been accompanied by a remarkably similar pattern in the results of tests of children's reading ability across local educational areas. 'The only correlates of the decline in standards were the socioeconomic characteristics of the area... There can be little doubt that children's reading abilities were affected by rising material inequalities in much the same way as the death rates of infants, of children and of people in the parental age range. The socioeconomic pattern and the timing of the trends are almost identical' (Wilkinson, p. 161). Economic problems can undermine parenting and family interactions, with long term mental health implications for children. For example, mothers experiencing chronic financial problems interact with their children in a more rejecting and inconsistent way than mothers not encountering these problems.

Is it the absolute material standard of living within an area that is the important ingredient for health and wellbeing, or is inequality *per se* bad for the health of an area or nation? There are strong statistical associations available favouring the latter of these two views, with one proponent, Wilkinson (1994), stating 'the evidence strongly suggests that the health effects of income distribution involve comparative social cognitive processes, rather than the direct effects of material standards.' G. D. Smith (1996) draws the implication that the psychological effects of being low down the social ladder have detrimental health effects, whatever the actual material conditions of life. The previously cited studies of civil servants suggest there could be some truth in this last statement but equally, there is much evidence of the importance of what Smith calls the 'cumulative socioenvironmental insults - early exposures have long lasting effects.' Nor do increases in income inequality make a dramatic impact on mortality rates. 'Inequality may make people miserable long before it kills them.' Smith's way of resolving the dilemma is to draw attention to another factor which tends to accompany income inequality at both the national and local level. The countries and localities which are experiencing large increases in income inequality are those that have systematically under-invested in human resources. For example, poor investment in education and low expenditure on medical care are associated with the most unequal income distribution. In America, low birthweight is commoner in the states with the greatest inequalities, with the detrimental influences on adult health that result. Cross nationally, higher levels of both social expenditure and taxation as a proportion of gross domestic product are associated with longer life expectancy, lower maternal mortality, and a lower proportion of low birthweight deliveries (Smith 1996).

(x) EMERGENCY RELIEF

The indicators used in the present study are intended to capture the varied aspects of disadvantage of which a shortage of money is only one facet. Nevertheless, as we have seen, its importance can hardly be overstated. By including

a second income-related variable in the form of the proportion of households in a postcode area claiming emergency relief, it is hoped to measure economic deprivation at something approaching near-survival level. Moreover, the 1975 study of Newcastle (Vinson and Homel 1975) found that the best single item of information for identifying 'at risk' areas of the city was the distribution of financial aid handled by non-government agencies.

THE CUMULATIVE DISADVANTAGE PERSPECTIVE

Most of the variables we have included in this review are subsumed by the concept of *milieu deprivation*, advanced by Pretorius and Le Roux (1998):

'The poor do not merely get less of everything that we consider important and even necessary for a decent life - less money, less food, clothing and shelter - the deprivation of the poor is pervasive. Compared to the non-poor, their infants are more likely to die. Their children are more likely to fail in school even when they are intelligent. Their children are more likely to drop out of school. They are more likely to become mentally ill. They are more likely to lose their jobs and to drop out of the labour force. They are more likely to experience hostility and distrust rather than neighbourliness with those around them. They are less likely to participate in meaningful groups and associations. They are more likely to get chronic illnesses... Again, as the ultimate deprivation, they are likely to die at a younger age. In other words, poverty diminishes the quality of a person's life in many obvious and in many not so obvious ways.'

Galster (1992) has developed a model not unlike that proposed by W. J. Wilson (1987) which links elements in the process behind the perpetuation of localised poverty. At the heart of the problem is the exclusion of people from certain parts of the labour market, particularly those positions with high wages, stability, and security, compared with those sections marked by insecurity and little opportunity to advance. This in turn constrains access to better housing and neighbourhoods associated with inferior labour market positions, low education and skill, and attitudes that may not be conducive to the conventional expectation of performance at work. The latter can attract prejudice on the part of more fortunate and conforming people. The spatial separation of the poorest groups is implicated in further constraints on labour market opportunities and also in the formation of a sub-culture which may encourage alienation and isolation from mainstream societal values. The various feedback effects indicated in Figure 7 help to explain the self-perpetuating nature of the urban underclass (p. 183).

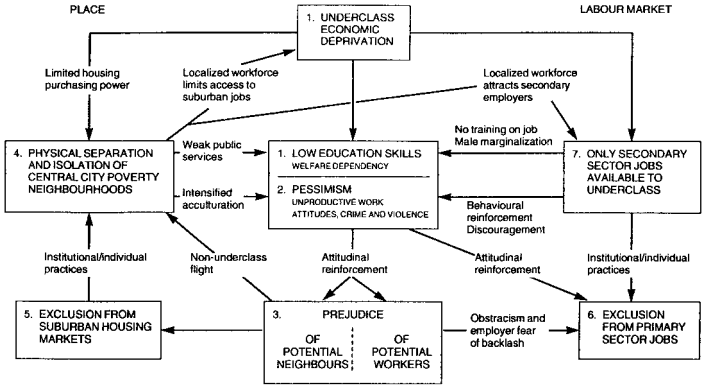


Figure 7: Cumulative causation model of the underclass phenomenon (Galster, 1992, p. 191)

The above accounts of cumulative disadvantage, understandably, are couched in terms of *negatives* of various kinds. Similarly, the indicators used in the present study highlight the **absence** of *goods* that generally contribute to a fair and satisfying life. Given the larger purposes of the project - to draw attention to social inequities and encourage progress towards a fairer distribution of life opportunities - it is appropriate to preface the many portrayals of disadvantage in Chapter 3 with a word about positive wellbeing. All such statements are inevitably a function of time and place. In the mid-1970s, confronted with the same problem of presenting a picture of *community wellbeing*, Vinson and Homel (1975) drew upon the following formulation of Smith (1973). Many elements of Smith's formulation have stood the test of time, but today one would be less certain of consensus about where the line might be drawn between the exercise of personal judgement and choice, and the necessity to maintain institutional and cultural practices.

For example, in 1975 we included the location of marriage breakdowns as an indicator of social deprivation, as well as the number of residents in an area who were permanently separated or divorced. In a more specialised study of marriage and family life it may well prove possible to construct a qualified index covering the negative consequences of relationship breakdown. However, broad brush indicators of the type used two decades ago would be out of place today. In an era which is more accepting of human diversity, the covering of 'deviant behaviour' other than in the criminal sense, for which Smith makes separate provision, would also be out of place:

'In a well society people will have incomes adequate for their basic needs of food, clothing, shelter and a 'reasonable' standard of living . . . Good quality education and health services will be available to all, and their use will be reflected in a high level of physical and mental health and in an informed populace . . . Society will show a low degree of disorganisation, with few personal social pathologies, little deviant behaviour, low crime incidence, and high public order and safety. The family will be a stable institution . . .'

We now enter *Chapter 3*, which presents the analysis of our findings, confident of broad support for the idea that community wellbeing would be enhanced by a diminution in the scale of problems encompassed by each of our chosen indicators.

CHAPTER 3: FINDINGS

The presentation of the findings will start with a non-technical overview of how the 622 postcode areas in Victoria, and the 578 postcode areas in New South Wales, fared on the ten indicators used in each state. For example, to what extent did the same names re-appear among those most affected by the problems represented by the indicators? What were the defining characteristics of the postcodes most beset by multiple problems? Which areas exhibited cumulative disadvantage?

Obtaining the answer to these questions requires nothing more than simple arithmetic calculations and patience. So, one important perspective on the distribution of disadvantage can be gained without leaving familiar territory. However, the next stage, involving questions of the extent to which the scores attained by locations on one indicator parallel those attained on another *(correlation analysis)*, and the underlying structure to those correlations *(principal components analysis)*, are necessarily more technical. The presentation will be kept as simple as possible, but it may assist the non-technically minded reader to know that the ultimate destination of this statistical excursion is to try and arrive at a single factor score for each locality, summarising the area's general susceptibility to the range of problems under consideration.

VICTORIA

OVERALL PICTURE

Concentration of disadvantage

Other more sophisticated analyses will follow, but a first requirement of a useful set of indicators of locational disadvantage is that they should identify concentrations of social deprivation. The present study has succeeded in that respect. A basic finding is that a relatively small number of postcode areas account for a large percentage of the locations which rank highly on the ten social indicators used in Victoria. A simple way of showing that concentration is to take the top ranking five per cent of Victoria's postcodes on each indicator (the Top 30) and see what proportion of the 30 x 10 (indicators) = 300 ranking positions is accounted for by a core set of disadvantaged areas. In fact, a fraction under half (146/300 = **48.7%**) of the 300 positions were filled by 40/622 = **6.4%** of postcode areas. These were the 40 postcodes which accounted for 3, 4, 5, or 6 of the 30 top rankings on each of the ten indicators. Hereafter, it will be convenient to refer to these areas as 'the generally high-ranking postcodes.'

Seven areas, or **1.1%** of the State's 622 postcodes, filled 37 **(12.3%)** of the top 300 rankings. That is Braybrook, Nyah, Churchill, Crossover, Bealiba, Collingwood, and Thorpdale, accounted for approximately one in eight of the 30 top ranking localities across the ten indicators. These were the postcodes which appeared 5 or 6 times in the top listings.

While these figures reflect a marked geographic concentration of social problems, in some respects they understate the degree of concentration. This is because of a decision to exclude localities from the Top 30 rankings on a particular indicator if they had less than five occurrences of the relevant problem within the stipulated reporting period. This was advisable because of the practical planning purposes of the exercise and to avoid misleading impressions. Had the alternative view been taken and the rates accepted at face value, the following would have been the case:

- Thorpdale would have appeared six rather than five times in the Top 30 listings;
- Korong Vale and Noojee five times rather than four, and Taradale five times rather than three;
- Forrest/Mt Sabine and Port Welshpool would have appeared four times rather than three, and Cabbage Tree Creek and Balintore/Cororooke four times rather than twice, in the top rankings.

From this perspective, which will not be pursued, it should be noted in passing that 22 localities (3.5% of all Victorian postcodes) accounted for 101 or a third of the Top 300 ranking positions across the ten indicators.

Profiles of generally high ranking postcodes

A preliminary examination of the above rankings indicates sometimes marked variations in the extent to which a generally large number of high rankings on the set of indicators is accompanied by high rankings on particular ones. For example, it can be seen from Table 4 that being in the *Top 30* on four, five or six occasions was more likely to entail a high ranking on the *court defendants* and *child abuse* indexes, compared with the *low birthweight* and, to a lesser extent, the *unskilled workers* and left *school before 15 years* indexes. The effect of including the 23 localities which were in the Top 30 on three occasions was to confirm the fact that *low birthweight* played a lesser part in identifying the areas that are most generally problematic, which increased the importance of *unemployment* and *low income:*

Another more stringent test of the salience of particular indicators in identifying the most socially disadvantaged areas is to focus on the number of times generally high ranking postcodes appeared in the **top 10** positions on specific indicators. On nine of the ten indicators, locations

Table 3: Frequency of appearance of postcode areas in Top 30 rankings on indicators

No. times listed involved	No. areas	Names of areas (Vic)
6	2	Braybrook; Nyah
5	5	Churchill; Crossover; Bealiba; Collingwood; Thorpdale
4	10	Korong Vale; Rosebud West; Noojee; Mildura; Cavendish; Melbourne; Carlton; Nyah West; Korumburra; Colac
3	23	Nowa Nowa; Seymour; Rupanyup; Frankston North; Corio; Broadmeadows; Taradale; Seaspray; Argyle; Clunes; Fitzroy; Portarlington; Genoa; Marnoo; Dunolly; Port Welshpool; Emerald Hill; Lockington; Forrest/Mt Sabine; St Kilda; Linton; Robinvale; Red Hill
2	35	Port Franklin; Poowong; Swan Hill; Cabbage Tree Creek; Paynesville; Hotham Hill; Footscray; Tankerton; North Springvale; Morwell; Corinella; Rockbank; Mt Lonarch; Wedderburn; Bonnie Doon; Flemington; Lindenow; Baddaginnie; Woodside; Lake Boga; Balintore; Tawonga; Springhurst; Bridgewater; Merrigum; Crib Point; Hastings; Eagle Point; Meredith; Ancona; West Melbourne; West Heidelberg; Doveton; Port Melbourne; Dalyston.
1	84	See Appendix A for list

Figure 8: Map showing the distribution of Social Disadvantage in Melbourne Metropolitian Area

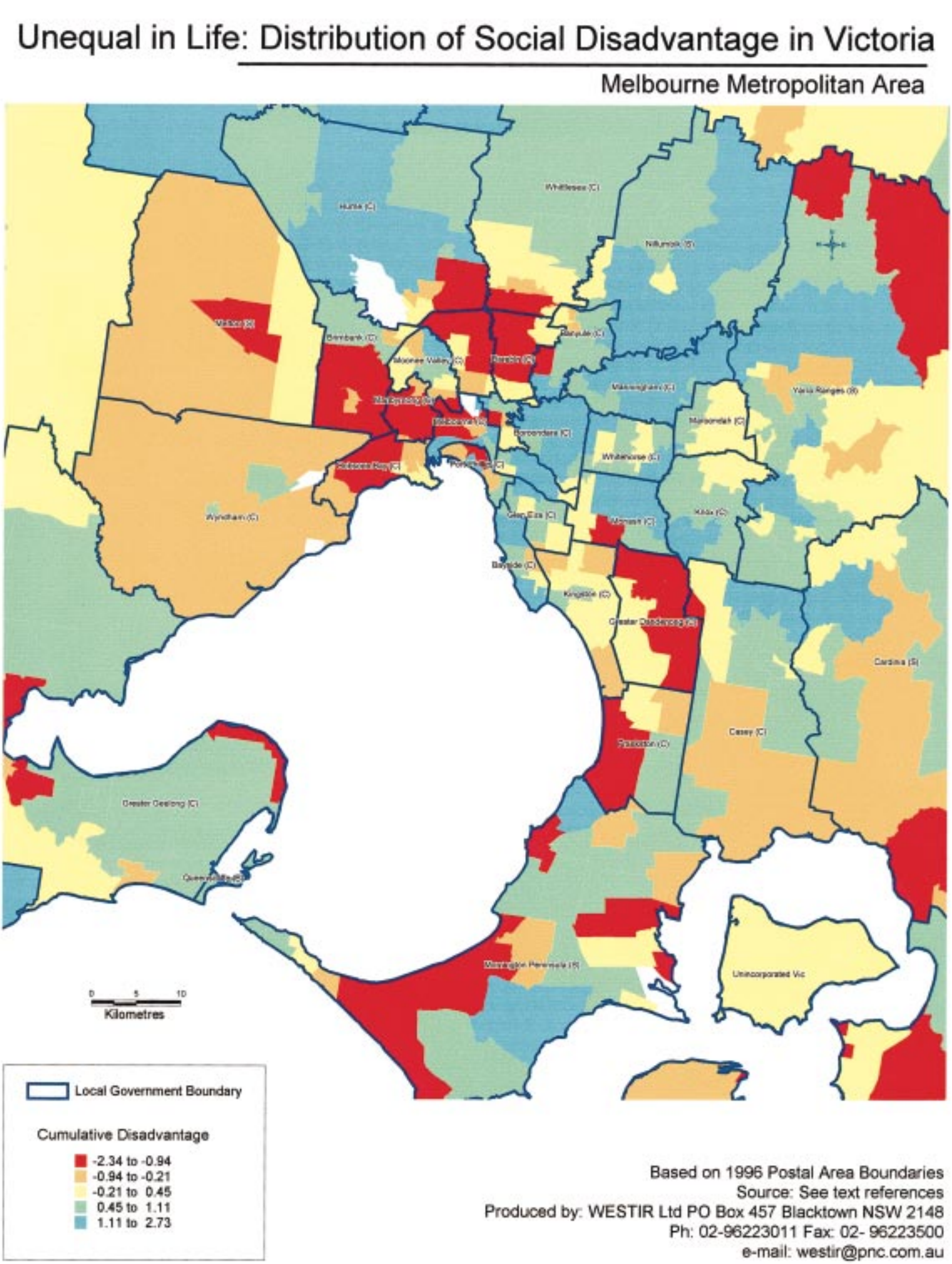


Table 4 : Number of times postcodes ranked in Top 30 on specific indicators (Victoria)

No. times in Top 30	Un-empl	Low income	Low bth wt.	Child abuse	Leave sch. <15	Emg asst	Psy hosp Admis	Un skill wks	Crt defs	Ch. injs
4/5/6 (N=17)	8	8	3	12	6	7	7	5	14	7
3 (N=23)	12	10	5	4	10	7	6	8	2	5
	20	18	8	16	16	14	13	13	16	12

with overall scores of 4, 5, or 6, occupied the first or second rank positions in all but one case — *low birthweight*. In three cases (*unemployment*, *low income*, and *child abuse*), they occupied both of the top two rank positions. Comparisons based on the occupancy of the Top 10 rank positions serve to accentuate the lesser importance of *low birthweight* and *unskilled workers*, and perhaps *child injuries* and *psychiatric hospital admissions*, in identifying the areas with the greatest cumulative disadvantage. On the other hand, *court defendants* and *child abuse*, *unemployment*, *emergency assistance*, and *leaving school before 15 years*, appeared, on the evidence presented in Table 5, to be quite important:

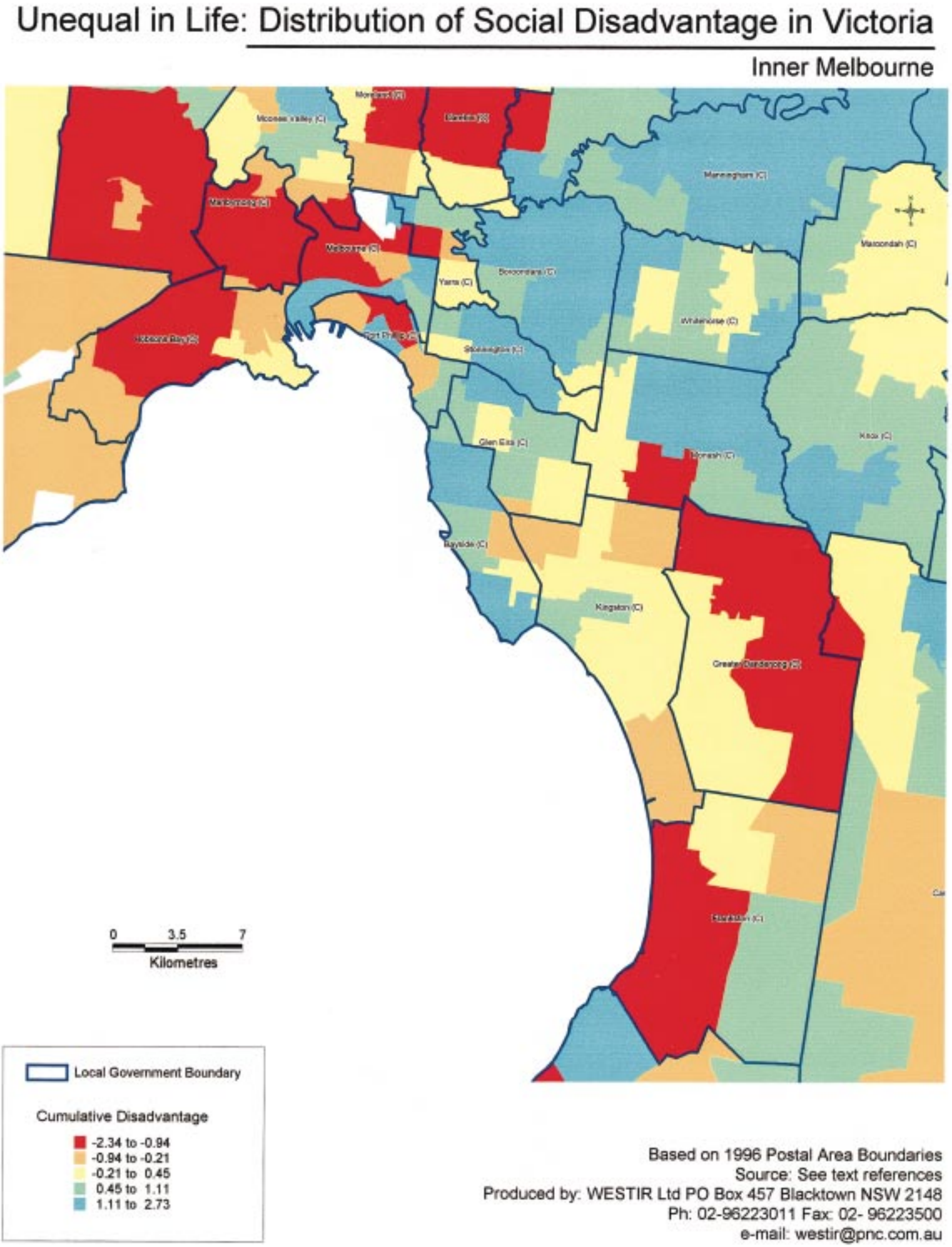
The foregoing general emphasis on particular indicators within 'high risk' areas is reflected in the profiles of specific localities which appeared 5 or 6 times in the *Top 30* lists. Braybrook is characterised by a number of economic problems, ranking 2nd in the State on unemployment, and with associated high rankings on *emergency assistance* (5th), *unskilled workers* (25th), and *low income* (33rd). The last mentioned result means that Braybrook went close to being in the *Top 30* positions on seven of the ten variables, rather than six. Two of the indicators that seem to be closely associated with high ranking localities, namely, *court defendants* and *child abuse*, were prominent in the Braybrook profile. On the remaining three indicators (*Psychiatric hospital admissions*, *Leave school before 15 years*, and *child injuries*), the postcode area was within, or just beyond, the top 25% of scores for all postcodes.

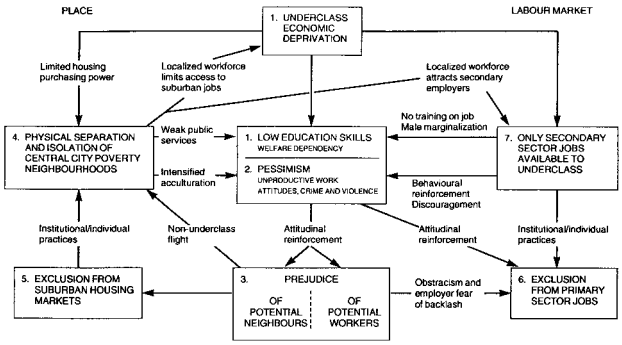
The other postcode which appeared six times in the Top 30 lists, Nyah, has its economic problems in so far as it ranked 20th on both the low income and unskilled workers indexes. However, with the exception of low birthweight, it was in areas more directly concerned with children and youth that Nyah ranked highly - 4th on child abuse, 10th on leave school before 15 years, and 11th on child injuries.

Table 5 : Number of times postcodes ranked in Top 10 on specific indicators (Victoria)

No. times in Top 30	Un-empl	Low income	Low bth wt.	Child abuse	Leave sch. <15	Emg asst	Psy hosp Admis	Un skill wks	Crt defs	Ch. injs
4/5/6 (N=17)	5	5	—	6	4	5	3	1	7	4
3 (N=23)	4	1	3	2	4	4	2	3	1	1
	9	6	3	8	8	9	5	4	8	5

Figure 8a: Map showing the distribution of Social Disadvantage in Inner Melbourne





Graph 1

The foregoing two examples illustrate the fact that postcodes which are generally high ranking may still display considerable variation in the problems that are locally prominent. This was also true of the five localities which appeared five times in the *Top 30* lists and which are profiled in Table 7. *Low birthweight* was again conspicuous by its absence from these profiles, the 75th rank position for Crossover being the highest attained by any of the postcodes on this variable. Consistent with the findings of the previous analyses of the characteristics of generally high ranking areas, *unskilled workers* played a minor role in defining the profile of the localities presented in Table 7. So, too, *did leave school before 15* years, the important variables being *defendants before courts* (prominent in all five postcodes as well as Braybrook and Nyah), *unemployment*, *child abuse*, and *child injuries*.

While there may be particular indicators, like *low birthweight* and *unskilled workers*, on which otherwise high ranking postcodes have low scores, Tables 6 and 7 show that it is relatively unusual for those areas to occupy rank positions in the bottom 50% of the range of any indicator. It is, of course, equally true that there are localities in which it is rare for them to be in the top 50% of the range of scores for a particular indicator. The combined results for Toorak and Camberwell (Table 8) show only three such instances, two of them with respect to *low birthweight*, but the highest, in the sense of most disadvantaged, rank position (Toorak - 116) was only just inside the top 20% of the range.

Widening the picture

The picture presented to this point has been derived from a very restricted part of the available data — predominantly the findings for the 40 postcodes that most frequently occupied the top ranking positions on the ten indicators used in the

Table 6: Profiles of Braybrook and Nyah (postcodes 3019 and 3594 respectively).

Indicator	Rank for Braybrook N=622)	Rank for Nyah (N=622)
Unemployment rate	2	211
Low income	33	20
Low birth weight	15	501
Child abuse	22	4
Leave school before 15 years	135	10
Emergency Assistance	5	75
Psychiatric hospital admissions	115	208
Defendants before courts	22	29
Unskilled workers	25	20
Child injuries	162	11

Table 7: Profiles of Churchill, Crossover, Bealiba, Collingwood, & Thorpdale (postcodes 3842, 3821, 3475, 3066, and 3835, respectively)

Indicator	Rank for Churchill (N=622)	Rank for Crossover (N=622)	Rank for Bealiba (N=622)	Rank for Collingwood (N=622)	Rank for Thorpdale (N=622)
Unemployment rate	12	158	6	9	7
Low income	214	2	3	44	7
Low birth weight	132	75	501	233	501
Child abuse	5	95	496	25	2
Leave school before 15 years	427	139	7	554	193
Emergency assistance	4	396	62	6	396
Psychiatric hospital admissions	151	2	146	22	35
Defendants before courts	8	4	13	19	10
Unskilled workers	103	426	11	380	576
Child injuries	19	9	89	285	3

study of Victoria. It is appropriate that we should have begun by focusing on areas marked by several forms of disadvantage. However, in the next section we employ statistical techniques which use the results for all 622 Victorian postcodes, in an effort to arrive at a more general characterisation of what is entailed in cumulative disadvantage and its distribution across the State.

Associations between the indicators (*correlation analysis*)

To what extent do areas with 'high', 'middling', or 'low' scores on one indicator tend to have similar scores on the other indicators used in our study of Victorian postcodes? To answer this question we have taken advantage of Pearson's product-moment correlation coefficient (r). The correlation coefficient lies between 1.00 and -1.00. When r is 0 we say there is 'no correlation' between two variables (in this case, pairs of indicators). Where r is -1.00 there is a perfect negative correlation; i.e., when X increases, Y decreases. Where r is 1.00 there is a perfect positive correlation; when X increases, Y increases.

Correlation analysis

The correlation coefficients presented in Table 9 reflect a relatively high degree of inter-

Table 8: Profiles of Toorak and Camberwell (postcodes 3142 and 3124 respectively)

Indicator	Rank for Toorak (N=622)	Rank for Camberwell (N=622)
Unemployment rate	581	557
Low income	617	608
Low birth weight	116	289
Child abuse	473	397
Leave school before 15 years	622	604
Emergency assistance	392	374
Psychiatric hospital admissions	412	266
Defendants before courts	488	505
Unskilled workers	607	567
Child injuries	542	514

connectedness between the indicators. Of the 45 distinct pairings of indicators, the correlation coefficients were significant at the 0.05 level or better in 38 instances. The most consistently correlating variables were *court defendants, emergency assistance* and *unemployment*, which had statistically significant associations with all of the other indicators. The same would have been true of *child injuries* and *unskilled workers* but for the absence of a significant association with *low birthweight*, which was the least correlative of the indicators. This latter finding was consistent with the earlier presented analysis of the profiles of generally highly ranking areas, with *low birthweight* conspicuously absent from the group of defining characteristics. This finding may reflect the comparatively unimportant contribution of *low birthweight* to the identification of cumulative disadvantage but a more probable explanation lies in the direction of the small samples derived from the aggregation of just two years of birthweight data in both Victoria and New South Wales. This apparent deficiency is discussed in the *Technical Appendix*.

Court defendants, unemployment and *child abuse* were prominent features of the profiles of high ranking postcodes. The covariance of the *court* and *unemployment* indicators was sustained across the postcodes generally, as shown by a correlation coefficient of 0.51. The association between *court defendants* and *child abuse* was approximately of the same order, but the correlation of abuse and unemployment, while statistically significant, was somewhat weaker (0.27).

Consistent with the research findings reported in *Chapter 2*, Table 9 indicates an association (0.37) between *child injuries* and limited education. The strongest correlation was between the latter factor, expressed negatively in terms of *leaving school before 15 years*, and *low income* (0.76). 'Deficient education' was also associated with *unskilled workers* (0.43) and *unemployment* (0.35). Overall, the picture conveyed by the correlation matrix is one of almost all the indicators co-varying positively and to a moderate degree. Indeed, even in the case of *low birthweight*, there were small but statistically significant correlations with five other indicators.

Disadvantage factor

We have already seen that some localities have generally high rankings on the ten indicators of disadvantage. Now we have reached a crucial point in the project of determining whether all of Victoria's postcodes can be graded according to

Table 9 : Correlations between indicators (Victoria)

	C ABUSE	CDEF	CHILD INJ	EM ASST	LEFT 15	LO BWT	LOINC	PHA	UNEMP	UN–SKIL
Pearson **CABUSE**	1.000	.456**	.267**	.362**	.078	.205**	.051	.333**	.269**	.259**
Correlation **CDEF**	.456**	1.000	.525**	.372**	.272**	.134**	.289**	.496**	.511**	.369**
CHILDINJ	.267**	.525**	1.000	.094*	.374**	.059	.332**	.282**	.270**	.269**
EM ASST	.362**	.372**	.094*	1.000	-.128**	.183**	-.102*	.383**	.287**	.205**
LEFT15	.078	.272**	.374**	-.128**	1.000	-.028	.755**	-.015	.352**	.433**
LOBWT	.205**	.134**	.059	.183**	-.028	1.000	-.030	.191**	.085*	.078
LOINC	.051	.289**	.332**	-.102*	.755**	-.030	1.000	.086*	.511**	.331**
PHA	.333**	.496**	.282**	.383**	-.015	.191**	.086*	1.000	.334**	.170**
UNEMP	.269**	.511**	.270**	.287**	.352**	.085*	.511**	.334**	1.000	.428**
UNSKIL	.259**	.369**	.269**	.205**	.433**	.078	.331**	.170**	.428**	1.000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

their overall degree of cumulative disadvantage. Essentially, we want to arrange the postcodes in an array, like beads on a string, ranging from the area which is most generally vulnerable to the problems represented by our indicators, to the one which is least vulnerable.

A statistical technique that can help us to achieve this goal is Principal Components Analysis. This is a way of examining the structure that underlies the correlations presented in Table 9. If the first component accounts for a sufficiently high percentage of the total variance of the ten indicators, the problem of arranging postcodes according to their degree of susceptibility to the problems entailed is reduced to examining scores along a single 'disadvantage' dimension. The principal component analysis resulted in the extraction of a major factor that accounted for 34.7% of the total variance of the ten indicators throughout the 622 Victorian postcodes. No other component accounted for more than 19.1% of the total variance. Therefore, we have treated the first component as a 'general disadvantage' factor that captures along a single dimension many aspects of disadvantage previously reflected in ten indicator scores.

This does not mean that all of the indicators are reflected to an equal extent by the risk factor. Table 10, which follows, shows that *court defendants* correlated with the general disadvantage factor at the 0.80 level, and that four other indicators (*unemployment*, *unskilled workers*, *child injuries*, and *low income*), correlated with 'disadvantage' at the 0.60 level or higher. The only indicator that correlated with disadvantage below the 0.40 level was low birthweight:

The question of the appropriateness of relying on a single factor, rather than a combination of factors, for the purposes at hand, turns on an understanding of our immediate objective: the disadvantage factor represents an attempt to capture what the indicators measure *in common*, rather than an attempt to summarise (in one or several indexes) *all* of the information conveyed by the whole set of indicators. As already noted, all of the indicators with the exception of low birthweight correlate at a reasonable level with the first principal component, affording reassuring evidence that the disadvantage factor is a meaningful concept.

Calculating disadvantage scores for postcode areas

A postcode's position along the disadvantage continuum is determined by weighting each of its ten indicator scores by a value that reflects that particular indicator's loading on the general disadvantage factor. (See the *Technical Appendix* for the weights assigned). The final score for the locality is then the weighted sum of indices. For Victorian postcodes, the weighted disadvantage scores ranged from - 2.3347, at the disadvantaged end of the continuum, to 2.7273 in the case of the more advantaged areas. Weighted scores for all Victorian postcodes are presented in *Appendix B*.

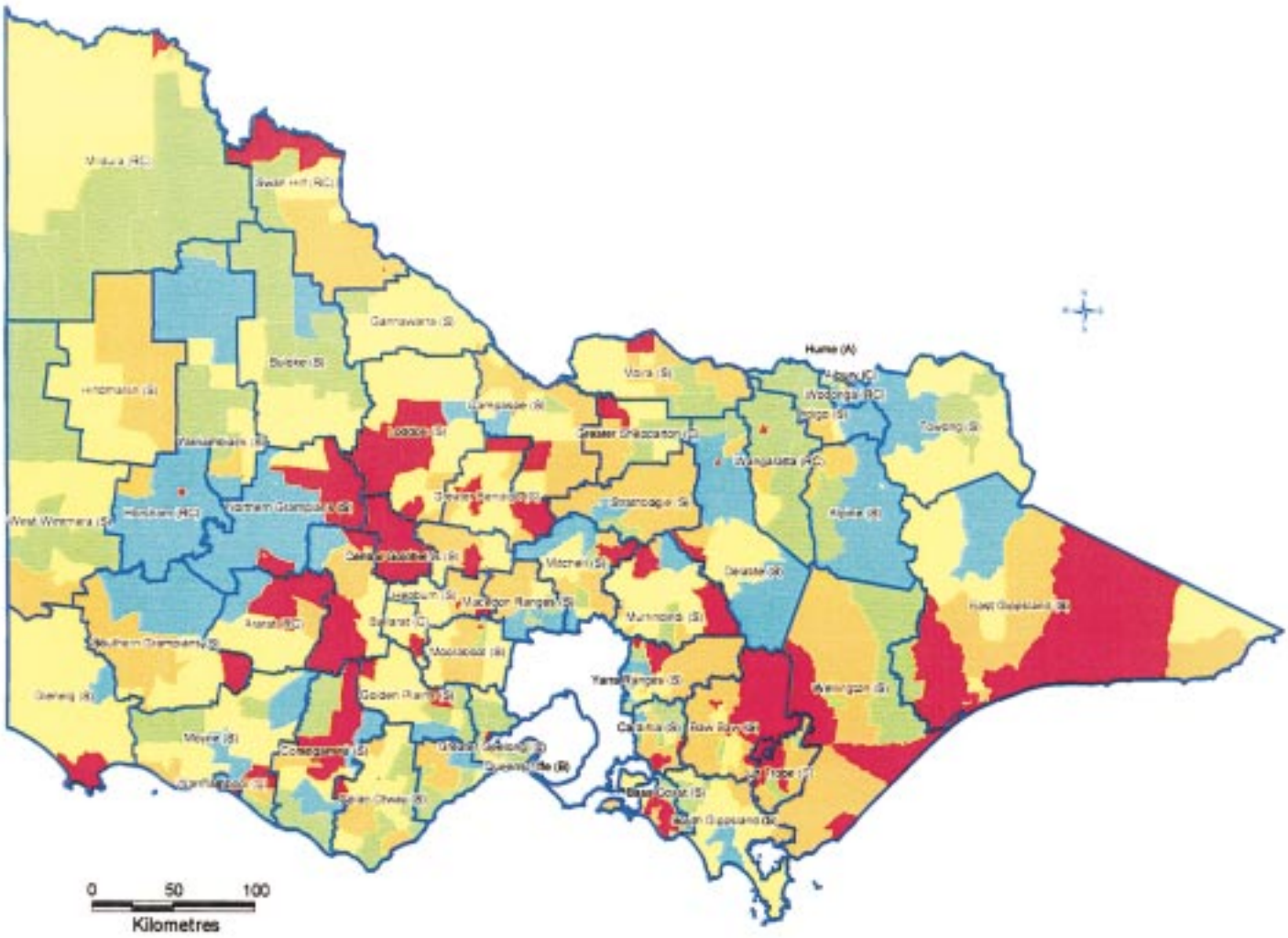
Table 10 : Correlations between General Disadvantage factor and the indicators (Victoria)

Court defendants	.797
Unemployment	.737
Unskilled workers	.632
Child injuries	.629
Low income	.602
Left school <15 years	.574
Psychiatric hospital admissions	.545
Child abuse	.543
Emergency assistance	.408
Low birthweight	.207

Figure 9: Map showing the distribution of Social Disadvantage in Victoria excluding Melbourne

Unequal in Life: Distribution of Social Disadvantage in Victoria

Victoria excluding Melbourne



Local Government Boundary

Cumulative Disadvantage

- -2.34 to -0.94
- -0.94 to -0.21
- -0.21 to 0.45
- 0.45 to 1.11
- 1.11 to 2.73

Based on 1996 Postal Area Boundaries
Source: See text references
Produced by: WESTIR Ltd PO Box 457 Blacktown NSW 2148
Ph: 02-96223011 Fax: 96223500
e-mail: westir@pnc.com.au

There was a considerable degree of overlap between postcodes with the highest disadvantage factor scores and those previously identified as being generally high ranking on the ten indicators of social deprivation. Braybrook and Nyah, the two areas which appeared most frequently — six times — in the *Top 30* lists, were at, or near the top of the disadvantage factor scale (ranks 1 and 6, respectively). Of the seven areas that appeared 5 or 6 times in the *Top 30* lists, **all** were in the top 50 positions on the disadvantage factor. Thirteen of the 17 areas which appeared 4, 5, or 6 times in the *Top 30* rankings, appeared in the top 50 rank positions on the disadvantage factor.

Looking at the degree of overlap from another point of view, all but one of the first ten positions on the disadvantage factor were occupied by areas which had been in the indicator *Top 30* lists at least twice. Indeed, 10 of the top 30 areas on the

Table 11 : Comparison of rankings on disadvantage factor and 'top 30' listings

	Factor Score	Population Size	Disadvantage	No. times in 'top 30' rankings on indicators
Braybrook	-2.3347	5867	1	6
Corinella	-2.1722	2554	2	2
Broadmeadows	-2.0891	18586	3	3
Korumburra	-2.0875	1530	4	4
Corio	-2.0836	25642	5	3
Nyah	-2.0718	346	6	6
West Heidelberg	-2.0550	12823	7	1
Doveton	-2.0066	10143	8	2
Lake Boga	-1.9980	460	9	2
Seymour	-1.9851	7059	10	3
Mildura	-1.9215	20603	11	4
Churchill	-1.9078	2215	12	5
Hastings	-1.9003	6075	13	2
Colac	-1.8957	4373	14	4
Comet Hill	-1.8946	9704	15	-
Bealiba	-1.8782	286	16	5
Frankston North	-1.8681	9535	17	3
Korong Vale	-1.8144	243	18	4
Shepparton	-1.8115	24168	19	1
Morwell	-1.8035	17224	20	2
Seaspray	-1.7834	2592	21	3
Rockbank	-1.7758	1042	22	2
Delacombe	-1.7719	9312	23	-
Nowa Nowa	-1.7448	450	24	3
Albion	-1.7090	32219	25	1
Clunes	-1.6981	855	26	3
Cabbage Tree Creek	-1.6951	151	27	2
Rosebud West	-1.6852	3262	28	4
Rye	-1.6843	9256	29	-
Nyah West	-1.6808	529	30	4

risk factor scores had been in those lists 4, 5, or 6 times; seven had been there three times; eight had been there twice; and two had appeared once in the *Top 30* lists. Only three had not appeared in the earlier listings:

Thus, the two perspectives on our results indicate a considerable degree of overlap. However, there were some major differences in the respective rankings and it is instructive to consider why that should have been so. For example, Cavendish appeared four times in the *Top 30* lists but occupied only the 90th rank position on the disadvantage factor. The major explanation for this seeming disparity was the low rankings which the area attained on *psychiatric hospital admissions* (536), *low birthweight* and *child abuse* (521 on both), and *emergency assistance* (433). The disadvantage factor score is a composite weighted score across all ten indicators so that, in the case of Cavendish, comparatively high (disadvantage) rankings on four indicators were counter-balanced by low rankings on four others. A similar explanation applies to the apparent discrepancy in the rankings for Noojee (four times in the *Top 30* listings but a disadvantage factor ranking of 172).

There were some cases in which the apparent discrepancy ran in the opposite direction, that is, a postcode appeared just a few times in the Top 30 lists but ranked highly on the disadvantage factor scores. For example, Corinella occupied a *Top 30* ranking on two indicators but ranked second on the disadvantage factor. Part of the explanation for this difference is the area's fairly consistently elevated ranking on most of the indicators — it was 11th on *low birthweight*, 22nd on *left school before 15*, and in the range 40-52 on five other indicators. The weights derived from the principal components analysis and assigned to the three indicators on which Corinella was less disadvantaged — *unskilled workers* (102), *emergency assistance* (125), *psychiatric hospital admissions* (231) — were in the middle range of multipliers used to determine the final factor score and did not, therefore, serve to dilute the overall outcome.

We can conclude that the prominence of postcode areas among those most disadvantaged in terms of a set of social indicators — *Top 30* lists in the present case — tells you something valuable both about the degree of geographic concentration of social problems, and the susceptibility of particular locations to an uneven share of those problems. However, by combining all of the available indicator data into a single index, such as our disadvantage factor score, high points of deprivation can be balanced against indications of lesser degrees of problems, in arriving at a single measure of an area's susceptibility to cumulative disadvantage. While this formulation sounds promising, there remains the pragmatic test of whether 'high' factor scores do identify areas of concentrated disadvantage. A way of testing this is to see what proportion of State totals for various problems is accounted for by the 30 postcodes which ranked highest on the factor scores. The findings of such an analysis are presented in the final Discussion chapter.

NEW SOUTH WALES

OVERALL PICTURE

In presenting the findings for New South Wales it will be assumed that the reader is familiar with the methods described, and used, in the previous section dealing with Victoriaís postcode areas.
We will again use the simple device of examining *Top 30* listings of the locations which appear most disadvantaged on each indicator, to gain an overall impression of the distribution of social disadvantage. We will then proceed to a *correlation analysis* and *principal component analysis*, as described earlier in this chapter, to gain an understanding of the structure of social disadvantage, and to derive factor scores which summarise each location's susceptibility to the problems under consideration.

It had been intended to use ten indicators of deprivation in the New South Wales section of the study. Unfortunately, despite the best efforts of the Epidemiology and Surveillance Branch, NSW Health Department, the construction of an

appropriate *mortality* index was only partially completed by the time we had reached the deadline for our analysis. Therefore, the study, essentially, is based on nine indicators, with some references being made to the experimental mortality estimates, where the data is available and appropriate. With the kind agreement of the Epidemiology and Surveillance Branch, the methodology used in constructing the mortality index, is described in the *Technical Appendix*.

Concentration of disadvantage

As was the case with the Victorian data, a relatively small number of postcode areas account for a large percentage of the locations which rank highly on the nine social indicators in New South Wales. That can be demonstrated by taking the top ranking five per cent of New South Wales' postcodes on each indicator (the *Top 30*) and see what proportion of the 30 x 9 (indicators) = 270 ranking positions is accounted for by a core set of disadvantaged areas. In fact, approximately half (134/270 = **49.6%**) of the 270 positions were filled by 31/578 = **5.4%** of postcode areas.

These were the 31 postcodes which accounted for 3, 4, 5, 6, 7 and 9 of the *Top 30* rankings on each of the nine indicators. Thus, it required a slightly shorter list of New South Wales localities than was the case in Victoria to fill half of the *Top 30* positions, but in both cases, the indicators have served to identify concentrations of social deprivation. Indeed, seven New South Wales postcodes (**1.2%** of the total) filled 46 (**17.0%**) of the top 270 rank positions. That is, Windale, Islington, Carrington, Koorawatha, Lightning Ridge, Menindee, and Tingha accounted for a little under one in six of the *Top 30* ranking localities across the nine indicators. These were the postcodes that appeared 6, 7 or 9 times in the top listings:

It is unnecessary to present as extensive a number of locality profiles as that used to illustrate the basic concept of *cumulative disadvantage* in Victoria. The intention here is to proceed more directly to the correlation and principal component analyses of the New South Wales data. However, the even greater concentration of problems in a limited number of areas apparent from the first phase of the analysis of New South Wales results, requires

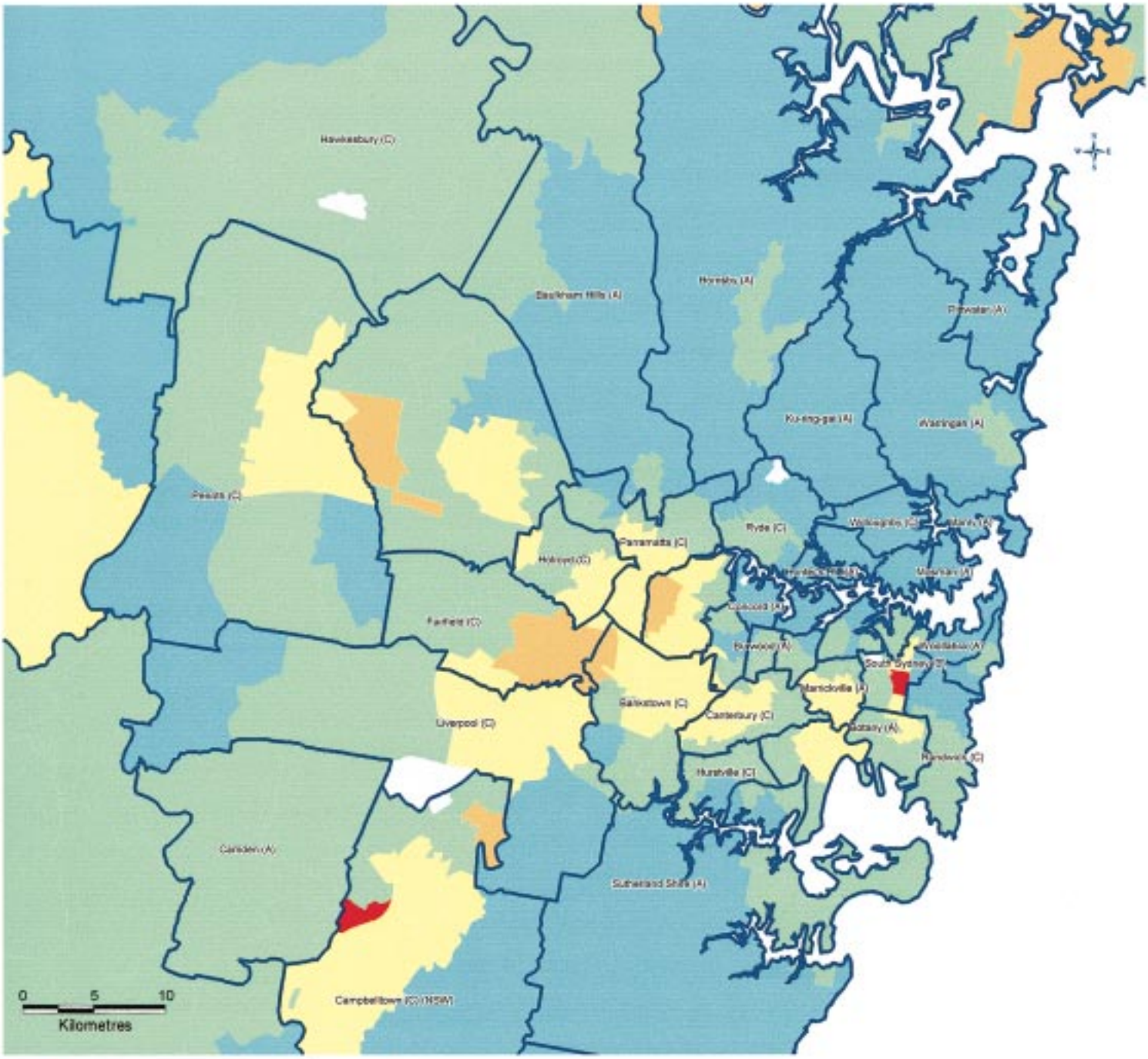
Table 12: Frequency of appearance of postcode areas in Top 30 rankings on indicators

No. times listed	No. areas involved	Names of areas (New South Wales)
9	1	Windale
8	—	
7	1	Islington
6	5	Carrington; Koorawatha; Lightning Ridge; Menindee; Tingha
5	3	Bowraville; Mandurama; Wickham
4	10	Blairmount/Claymore; Coopernook; Dareton; Gunnedah F; Northern Rivers MS; Stockinbingal; Tighes Hill; Tweed Heads; Ulmarra; Waterloo
3	11	Central West Mail; Ganmain; Hastings Point; Lake Cargelligo; Laurieton; Mendooran; Mount George; Stroud Road; Urunga; Wilcannia; Yanco
2	27	Bogan Gate; Boggabilla; Bredbo; Brewarrina; Brunswick Heads; Buronga; Byron Bay; Cabramatta; Callaghan; Collarenebri; Coraki; Evans Head; Foster; Goodooga; Harrington; Iluka; Ivanhoe; Mid-North Coast F; Nambucca Heads; Newcastle; Nowra F; Pallamallawa; Shortland; South West Rocks; Sydney; Walgett; Wyangla
1	78	See Appendix A for list

Figure 10: Map showing the distribution of Social Disadvantage in Sydney Metropolitian Area

Unequal in Life: Distribution of Social Disadvantage in NSW

Sydney Metropolitan Area



Local Government Boundary

Cumulative Disadvantage

- -5.22 to -1.26
- -1.26 to -0.47
- -0.47 to 0.2
- 0.2 to 0.91
- 0.91 to 2.73

Based on 1996 Postal Area Boundaries
Source: See text references
Produced by: WESTIR Ltd PO Box 457 Blacktown NSW 2148
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e-mail: westir@pnc.com.au

some comment. The findings in respect of Windale (Southern Newcastle) are truly remarkable by comparison with the findings for any other postcode in New South Wales or Victoria: on seven of the nine indicators, Windaleís score placed it in seventh rank or below on a State-wide comparison. It ranked 1st on *unemployment*, 2nd on *long term unemployment*, and 3rd on *left school before aged 15 years*. The least disadvantaged rankings attained by Windale were 12th on *court convictions*, and 15th on *low birthweight*.

Also outstanding, on a basis of comparison with postcodes across both Victoria and New South Wales, were the results for another Newcastle (inner-city) suburb, Islington. This locality appeared in the *Top 30* rankings for the nine indicators on seven occasions, on three of them occupying positions at the ninth rank or below. Three other inner-city suburbs of Newcastle were also prominent in the preliminary findings, namely, Carrington (appearing in the *Top 30* lists six times, Wickham (five times), and Tighes Hill (four times). All five of the mentioned Newcastle postcode areas were prominent in the *unemployment* rankings (ranging from 1st to 13th positions). Elevated rankings for *child abuse* was also a feature of four of the five areas (Carrington being the exception), and rank positions on *emergency assistance* also were comparatively high, except for Islington:

As already explained, the intended tenth indicator, *mortality ratio*, was incomplete at the time it was necessary to conclude the present analysis. It could well be worth persevering with the technical difficulties involved in constructing such an indicator (see *Technical Appendix*). Using the available estimates for 546 of the 578 New South Wales postcodes, it can be seen that a number of remote rural communities, many of them with substantial Aboriginal populations, appear both within the *Top 30* lists on some indicators and have high rankings on the available *mortality ratio* data. For the present purposes, the inner-Sydney area, embracing the CBD, Pyrmont, and Ultimo, which have inflated *mortality* rates due to a large homeless population, has been set aside.

Respecting the Epidemiology and Surveillance Branchís request to treat the data as experimental at this stage of its development, and to avoid any impression of false precision, we have listed in **alphabetical order** the ten highest ranking postcodes in terms of their *mortality ratio* scores:

Burren Junction
Brewarrina
Collarenebri
Goodooga
Ivanhoe
Lightning Ridge

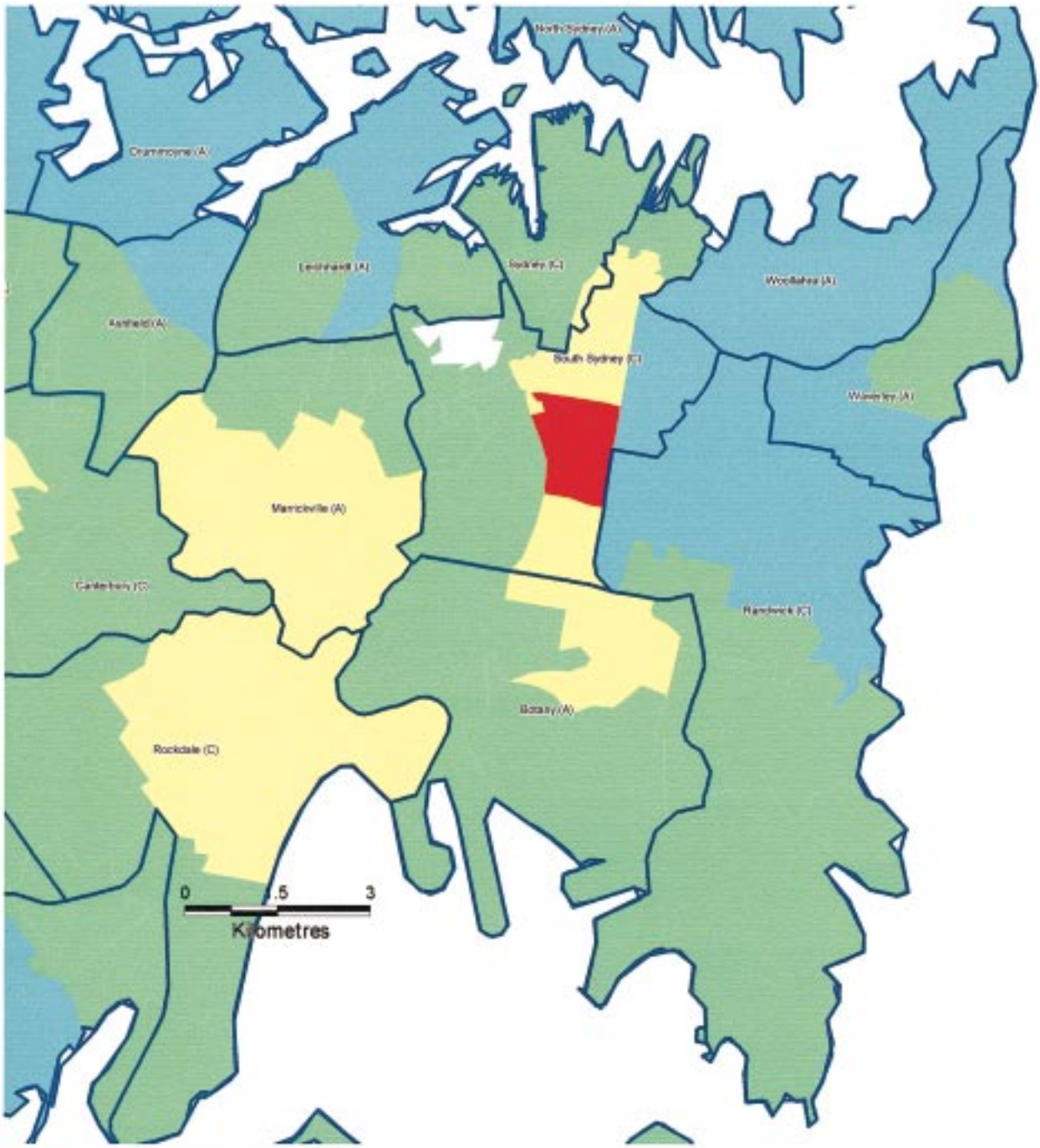
Table 13: Profiles of Windale, Islington, Carrington, Wickham, & Tighes Hill (postcodes 2306, 2296, 2294, 2293, and 2297, respectively)

Indicator	Rank for Windale (N=578)	Rank for Islington (N=578)	Rank for Carrington (N=578)	Rank for Wickham (N=578)	Rank for Tighes Hl. (N=578)
Unemployment	1	7	13	12	8
Long term unemployment	2	9	16	27	24
Unskilled workers	6	30	31	64	95
Left school before 15	3	228	21	190	75
Low income	5	25	28	26	76
Child abuse	6	7	514	21	8
Low birthweight	15	18	7	240	322
Court convictions	12	27	57	133	135
Emergency assist.	7	90	3	20	21

Figure 10a: Map showing the distribution of Social Disadvantage in Inner Sydney

Unequal in Life: Distribution of Social Disadvantage in NSW

Inner Sydney



Local Government Boundary

Cumulative Disadvantage

- -5.22 to -1.26
- -1.26 to -0.47
- -0.47 to 0.2
- 0.2 to 0.91
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Menindee
Rowena
Walgett
Wilcannia

Relating the above information back to the number of times postcodes appeared in the *Top 30* lists (Table 12), Menindee and Lightning Ridge appeared six times, Wilcannia, Ivanhoe, Goodooga, Brewarrina, Walgett and Collarenebri appeared twice, and Burren Junction and Rowena, once. Only two of the first 30 ranked places on *mortality* were non-rural. Thus *mortality* ratio appears to capture an additional facet of cumulative disadvantage which we note on this occasion and would be anxious to see included in further studies of this nature.

Correlation analysis

Compared with the equivalent results for Victoria, the pattern of correlations between New South Wales indicators was more varied. Apart from an expected high correlation with *unemployment* generally, *long term unemployment* correlated comparatively strongly with low income (0.65), *court* convictions (0.60), *leaving school before 15* years (0.50), and being *unskilled* (0.48). Early school departure also was associated with *low income* (0.76), being *unskilled* (0.61), with the latter status, in turn, correlating with *court convictions* (0.46). As observed in the comparable Victorian result, appearances in court on criminal charges were associated with the level of child abuse within postcodes. In the present case, *court convictions* and *child abuse* correlated at the 0.62 level. The earlier Victorian finding of limited connections between *low birthweight* and other indicators was repeated with birthweight failing to correlate significantly with any of the other eight New South Wales indicators:

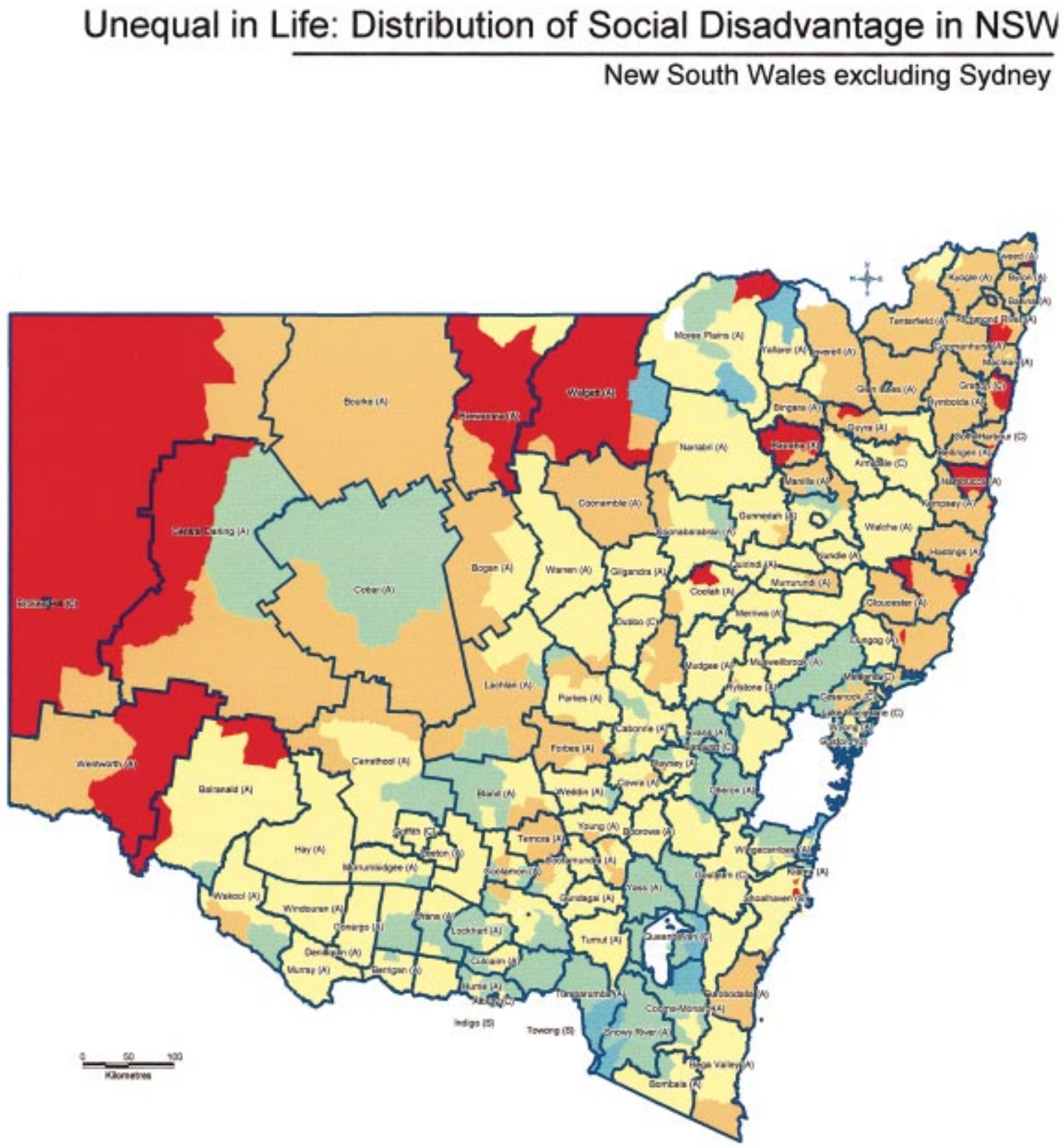
Disadvantage factor

We have again reached the point of examining the structure which underlies the correlations between the indicators, presented in Table 14. The statistical method used is *principal components analysis*. As discussed in the parallel section of the analysis of the Victorian findings, if the first component accounts for a sufficiently high percentage of the total variance of the nine indicators, the problem of arranging postcodes according to their degree of susceptibility to the problems entailed is reduced to examining scores along a single 'disadvantage' dimension. The principal component analysis resulted in the extraction of a major factor which accounted for 46.6% of the total variance of the nine indicators throughout the 578 New South Wales postcodes. No other factor accounted for more than 13.0% of the total variance. Therefore, we have treated the first component as a 'general disadvantage' factor which captures along a single dimension many aspects of disadvantage previously reflected in nine indicator scores.

Table 14: Correlations between indicators (New South Wales)

		C ABUSE	CDEF	LOBWT	LOINC	LEFT15	LT UNEMP	EM ASST	UNEMP	UNSKIL
Pearson	CABUSE	1.000	.618	.054	.270	.231	.356	.236	.362	.265
Correlation	CDEF	.618	1.000	.040	.390	.356	.596	.225	.457	.462
	LOBWT	.054	.040	1.000	.013	.029	-.020	.049	.064	.027
	LOINC	.270	.390	.013	1.000	.759	.646	.224	.765	.557
	LEFT15	.231	.356	.029	.759	1.000	.496	.121	.556	.612
	LT UNEMP	.356	.596	-.020	.646	.496	1.000	.266	.766	.484
	EM ASST	.236	.225	.049	.224	.121	.266	1.000	.306	.134
	UNEMP	.362	.457	.064	.765	.556	.766	.306	1.000	.606
	UNSKIL	.265	.462	.027	.557	.612	.484	.134	.606	1.000

Figure 11: Map showing the distribution of Social Disadvantage in New South Wales excluding Sydney



Not all of the indicators are reflected to an equal extent by the risk factor. Table 15, which follows, shows that *unemployment, low income, long term unemployment, leave school before 15 years, unskilled workers,* and *court convictions,* correlated with the general disadvantage factor at the 0.70 level or higher. The associations were of a lesser but still statistically significant order in the cases of *child abuse* and *emergency assistance*. There was virtually no correlation between low birthweight and the 'disadvantage' factor:

Calculating disadvantage scores for New South Wales postcode areas

Each of the nine indicator scores for each postcode was weighted by a value which reflects that particular indicatorís loading on the general disadvantage factor. (See the *Technical Appendix* for the weights assigned in New South Wales). The final score for a locality is then the weighted sum of indices of 'deprivationí.

Just as had been found with the Victorian data, there was a considerable degree of overlap between postcodes with the highest 'disadvantage' factor scores and those previously identified as being generally high ranking on the nine indicators of social deprivation. Windale appeared most frequently in the *Top 30* lists and had the highest 'disadvantage' factor score. Islington, which ranked highly on seven indicators, retained a prominent place - seventh - on the factor scores but emerged slightly less disadvantaged because of comparatively low rates of *early school leaving and emergency assistance.* Menindee, Tingha, Lightning Ridge and Koorawatha, which had all appeared six times in the *Top 30* lists, respectively occupied second, third, fifth and sixth positions on the disadvantage factor scores. The fourth position was taken by Northern Rivers *MSC,* partly because of a high score on long term unemployment, which contributed substantially to the calculation of factor scores (see *Technical Appendix*).

The general degree of overlap between the two perspectives on disadvantage - high rankings on the indicators and the principal component approach — can be seen in Table 16. When the 20 localities which were listed four times or more in the *Top 30* lists are compared with the 20 that ranked highest on the factor scores, 15 of the same names appear on both lists. The remaining five postcodes that were ranked highly four or more times, appeared 22nd, 24th, 27th, 34th and 37th on the highest factor score list (see Table 16).

A notable feature of the ranked factor scores is that there are only two Sydney metropolitan postcodes among the 30 highest ranking localities on the factor scores — Blairmount/Claymore (9th) and Waterloo (22nd). In contrast, there are five Newcastle suburbs among the 30 highest factor scores — Windale (1st), Islington (8th), Carrington (13th), Tighes Hill (14th), and Wickham (17th). Particular interest attaches to this finding because of a similar study made of Newcastle more than 25 years ago (Vinson and Homel, 1975), and some implications of the present results will be taken up in the concluding chapter.

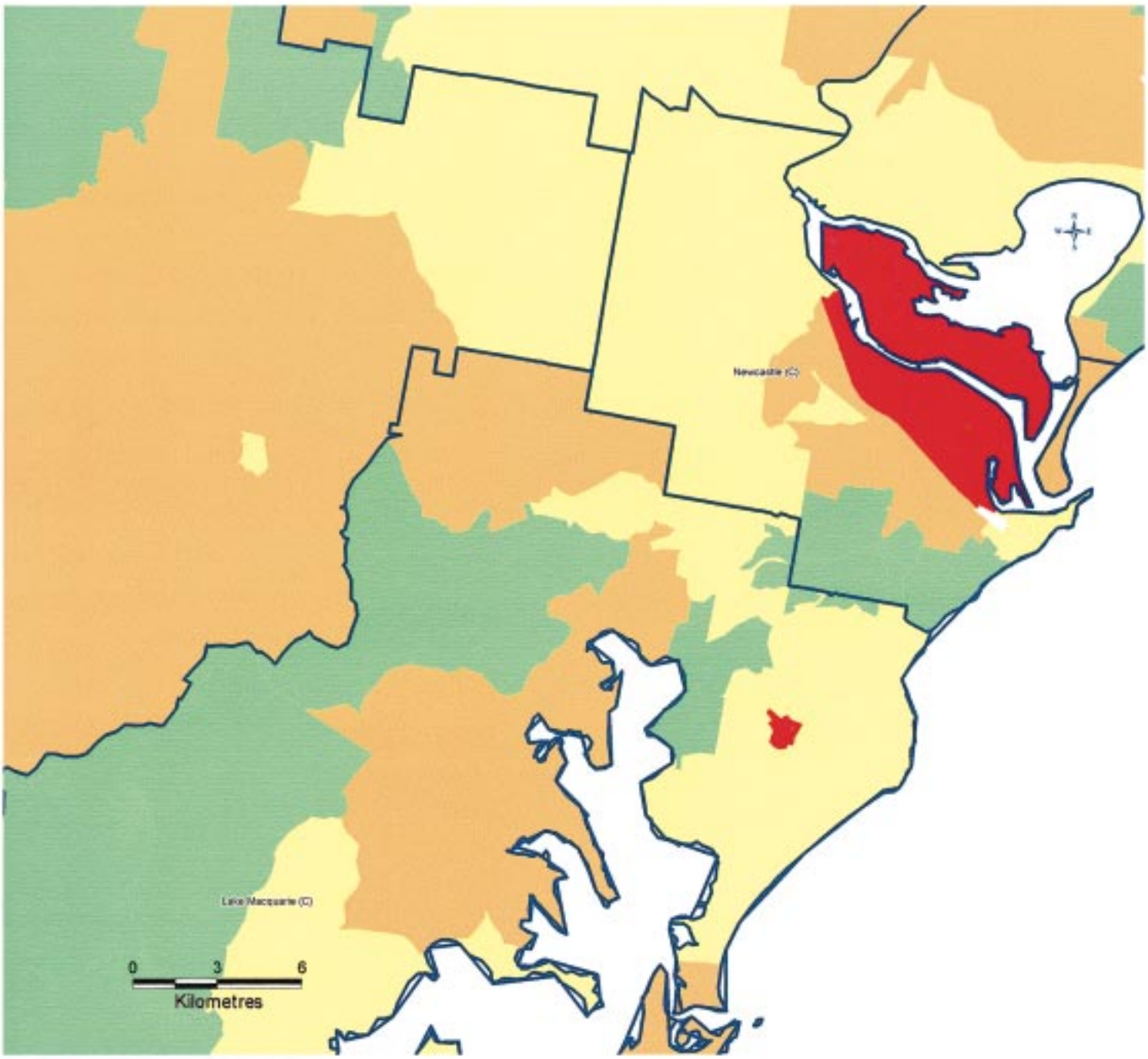
Table 15: Correlations between General Disadvantage factor and nine indicators (New South Wales)

Unemployment	.870
Low income	.842
long t. unemployment	.829
leave sch <15yrs.	.754
unskilled workers	.744
court convictions	.704
child abuse	.542
em. assistance	.361
low birthweight	.020

Figure 12: Map showing the distribution of Social Disadvantage in Newcastle and environs

Unequal in Life: Distribution of Social Disadvantage in NSW

Newcastle and environs



Local Government Boundary

Cumulative Disadvantage

- -5.22 to -1.26
- -1.26 to -0.47
- -0.47 to 0.2
- 0.2 to 0.91
- 0.91 to 2.73

Based on 1996 Postal Area Boundaries
Source: See text references
Produced by: WESTIR Ltd PO Box 457 Blacktown NSW 2148
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e-mail: westir@pnc.com.au

Table 16: Comparison of rankings on disadvantage factor and 'top 30' listings (New South Wales)

	Population size	Factor score	Disadvantage rank	No. times in 'top 30' rankings on indicators
Windale	2075	-5.21484	1	9
Menindee	533	-4.02147	2	6
ingha	855	-3.49042	3	6
Northern Rivers MSC	923	-3.38345	4	4
Lightning Ridge	3354	-3.27648	5	6
Koorawatha	263	-3.03023	6	6
Bowraville	1935	-3.00039	7	5
Islington	1292	-2.89260	8	7
Blairmount/Claymore	4309	-2.86556	9	4
Collarenebri	919	-2.59898	10	2
Mandurama	125	-2.58996	11	5
Wilcannia	1147	-2.49951	12	3
Carrington	1500	-2.47834	13	6
Tighes Hill	1456	-2.27295	14	4
Dareton	1283	-2.26670	15	4
Mid North Coast MSC	2521	-2.01826	16	2
Wickham	1760	-1.96355	17	5
Central West MSC	224	-1.96172	18	3
Gunnedah -Forward	725	-1.95040	19	4
Harrington	1474	-1.92128	20	2
Brewarrina	1597	-1.91889	21	2
Waterloo	5690	-1.83580	22	4
Stroud Road	122	-1.80557	23	3
Tweed Heads	8979	-1.78110	24	4
Nambucca Heads	8688	-1.75549	25	2
Mount George	344	-1.75529	26	3
Coopernook	456	-1.70219	27	4
Walgett	3612	-1.64964	28	2
Nabiac	543	-1.61721	29	1
Evans Head	2615	-1.60515	30	2

CHAPTER 4: DISCUSSION

All the numeric ordering, tables, and statistical analysis reported in *Chapter 3* have been intended to serve the following social purposes :

(i) to disentangle the knotted strands of deprivation and life experience that we commonly refer to as *social disadvantage*, by constructing a range of measurable indicators of community wellbeing;

(ii) to enable estimates to be made of the overall degree of fundamental inequality and diminished life opportunities experienced by people resident in neighbourhoods across Victoria and New South Wales;

(iii) to present the outcome of this research in ways which invite a stepwise response to social disadvantage, rather than causing authorities to turn away from a challenge which seems overwhelming in its totality.

Taking the first of these intentions, we have succeeded, with the cooperation of the individuals and organisations listed at the beginning of the report, in constructing and putting into operation nineteen indicators which, for the greater part, assess different aspects of *social disadvantage*. Consistent with the findings of the literature review presented in *Chapter 2*, we found a substantial degree of interrelatedness among these indicators, reflected in the many significant correlations between them (see Tables 9 and 14).

The pictures which emerged were not uniform; for example, there were instances in which the disadvantage experienced by some localities was of a more 'economic' character, while in others it focused on problems relating to children. Then, for reasons discussed in the *Technical Appendix*, one indicator (*low birthweight*), did not perform well.

However, when a *disadvantage factor*, summarising what each state's indicators shared in common, was developed, we were in a position to allocate a single score to each locality. The score reflected the varying importance of different indicators to the disadvantage factor. One test of the validity of this construct is the extent to which the results obtained from its application resemble those obtained from similar existing measures which are in good standing. A prominent example of the latter is the *index of relative socioeconomic disadvantage*. A difference between this index and the one we have constructed is that the former is totally reliant on census data (Australian Bureau of Statistics, 1994). The variables entailed focus on low income, low educational attainment and high unemployment. The *disadvantage factor(s)* we have developed for both Victoria and New South Wales are derived from a wider range of variables, selected on the basis that they are direct manifestations of *disadvantage*. One would not expect a perfect correlation between the two measures because they assess slightly different things but anything less than a considerable degree of association would be grounds for concern.

In fact, they correlate to a highly significant degree: the Pearson r coefficient between the two indexes in New South Wales is 0.913. In Victoria the correlation is 0.828.

Another expectation of a valid *disadvantage* index is that areas which score highly on it will account for a disproportionate share of the problems encompassed by the indicators used. To see whether this is true in the present case, we have first calculated the percentage of the relevant population included within the postcodes occupying the *Top 30* rank positions on the *disadvantage factor* in each State. Next we have calculated the percentage of the total number of instances of the relevant problem in each State accounted for by the *Top 30* localities. For example, the thirty most disadvantaged postcode areas contained 6.0% of Victoria's children under 15 years, but accounted for 13.7% of abused children across the State — approximately two and a quarter times what could have been expected on a share of population basis. This exercise has been repeated for all but one of the indicators for which we had raw data.[1] The exception was low birthweight which we readily concede is in need of refinement before it will serve a useful purpose. On a per capita basis, the *Top 30* disadvantage areas accounted for:

New South Wales

- four and a quarter times their share of *child abuse;*
- three and a quarter times their share of *emergency assistance;*
- three times their share of *court convictions* and *long term unemployment;*
- twice their share of *low income* households;
- a little under one and a half times their share of *leave school before 15 years.*

[1] Unemployment and Unskilled Workers were not used as they had pre-calculated rates.

Victoria

- three and a quarter times their share of *emergency assistance claimants;*
- two and a quarter times their share of *child abuse* cases;
- twice their share of *court defendants;*
- approximately one and a half times their share of *child injuries; low income* households; *psychiatric hospital admissions;* and a little under one and a half times their share of *leave school before 15 years of age.*

It will be important to measure the degree of association between the disadvantage factor scores and medico-social problems not included in the present study. Once the mortality data that we had intended to use becomes available, we will see the extent to which it correlates with our factor score. We also had hoped to include the geographic distribution of cancer in New South Wales and, now that ethics approval has been gained for the extraction of the relevant data, we hope in the near future to assess the correlation between cancer rates for postcode areas and *disadvantage* factor scores.

The evidence presented in the foregoing paragraphs relates to the third of the purposes of the research mentioned at the commencement of this chapter. The fact that localities which rank highly on the *disadvantage* factor contain significant concentrations of social problems is encouragement to view these areas as worthwhile starting points for any concerted effort to lessen inequality. Of course, efforts to ameliorate social disadvantage need to be conducted on several levels, not least the spheres of national and state social policy. However, there is dramatic evidence from a study similar to the present one of the folly of ignoring the importance of combating inequality at the neighbourhood level. That study was conducted in the city of Newcastle, New South Wales, in the 1970s, and a brief account of it

was presented in *Chapter 1*. In *Chapter 3*, reference was made to the fact that there were five Newcastle suburbs among the 30 highest factor scores for the State — Windale (1st), Islington (8th), Carrington (13th), Tighes Hill (14th), and Wickham (17th).

The study that was conducted more than 25 years ago, using similar indicators, identified seven suburbs of Newcastle as being severely disadvantaged. Using a composite (factor) score, the seven suburbs which were highest on what was termed the 'risk factor' accounted for just 5.5% of the city's population. These seven suburbs had two to three times their share of problems like psychiatric hospital admissions, truancy, notifiable diseases, low birthweight babies, crime and drug offences, and dependence on 'front line' relief agencies. **Five of those suburbs are the ones now listed, on the basis of our state-wide study, as being highly disadvantaged.**

Any serious effort to increase life opportunities for society's most disadvantaged groups cannot ignore such evidence of persistent, localised inequalities. It cannot be assumed that social initiatives taken at the state or national level, can override extreme degrees of local cumulative disadvantage. Indeed, if the residents of such localities and their children are to break free from this web of disadvantage which limits their life opportunities, intensive help in the form of educational, health, family support, housing, justice and other needed community services is required, in combination with supported community-building endeavours to sustain the benefits of assistance rendered. In deciding to meet this challenge by instigating constructive community work in selected highly disadvantaged areas of Victoria and New South Wales, The Ignatius Centre recognises that in no sense can the residents be held responsible for the flawed planning and neglect which has helped to produce the concentrations of social need documented in this report. Having opportunities in life is a birthright of all Australian children, but a right which, in the parlance of the day, will only be attained by some 'levelling of the playing field'. The present report and the demonstration projects which it is planned will flow from it, are intended as research and professional contributions to the reservation of the Australian tradition of 'a fair go'.

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APPENDIX A

VICTORIA

POSTCODE AREAS WHICH APPEARED ONLY ONCE IN THE TOP 30 RANKINGS ACROSS 10 INDICATORS OF LOCATIONAL SOCIAL DISADVANTAGE

Albion
Apsley
Ardeer
Ascot Vale
Avoca
Beaufort
Beechworth
Branxholme
Brunswick
Bruthen
Campbellfield
Cardross
Castlemaine
Caulfield
Clayton
Congupna
Coolaroo
Delahey
Dumbalk
Dunkeld
Ensay
Euroa
Footscray West
Foster
Garvoc
Gilderoy
Harrow
Healesville
Heatherton
Horsham
Inglewood
Inverloch
Jeparit
Kallista
Koondrook
Langkoop
Lalor
Laverton
Leitchville
Lismore
Macedon
Malmsbury
Manifold
Mansfield
Maryborough
Metung
Mirboo North
Moe
Moolap West
Nagambie
Nelson
Nyora
Olinda
Picola
Portsea/Point Nepean
Preston
Quambatook
Richmond
Rosebud
Selby
Shepparton
St Albans
Stanhope
Stawell
Strathmerton
Talbot
Thomastown
Thornbury
Thornton
Tooradin
Torrumbarry
Tungamah
Wahgunyah
Walpeup
Wangaratta
Wattle Glen
Welshpool
Whitfield
Woorinen
Yarram

NEW SOUTH WALES

POSTCODE AREAS WHICH APPEARED ONLY ONCE IN THE TOP 30 RANKINGS ACROSS NINE INDICATORS OF LOCATIONAL SOCIAL DISADVANTAGE

Aberdeen
Arncliffe
Ashford
Barham
Barmedman
Barraba
Batlow
Bellata
Bellingen
Binalong
Bingara
Binnaway
Bodalla
Boolaroo
Boorowa
Bourke
Broken Hill
Bullaburra
Burren Junction
Casino
Cessnock
Condobolin
Currabubula
Darlinghurst
Deepwater
Dori
Dorrigo
Douglas Park
East Gresford
Eden
Euston Glebe
Gloucester
Gooloogong
Greenethorpe
Gulargambone
Guyra
Hamilton
Harden
Jugiong
Kendal
Kurri Kurri
Macksville
Menangle Park
Moree
Moruya
Mount Druitt
Mullumbimby
Murrurundi
Nabiac
Narooma
Nimmitabel
Parramatta
Paterson
Pyrmont
Stroud
Swansea
Taree
Tullamore
Ulladulla
Villawood
Walcha
Wallendbeen
Warrawong
Wee Waa
Wentworth
Werris Creek
West Wallsend
Western Plains MS
Weston
Willow Tree
Wisemans Ferry
Wollongong
Woodburn
Woolgoolga
Yamba
Yenda
Young

APPENDIX B

POSTCODES

VICTORIA

Postcode	Suburb	Risk Score	Rank	Population
3000	MELBOURNE	-.37071	231	5845
3002	E.MELBOURNE	1.16065	539	4506
3003	W.MELBOURNE	-.77805	157	1524
3004	MELB/ST KILDA ROAD	1.60903	592	2412
3006	S.MELBOURNE	2.29301	620	2278
3011	FOOTSCRAY	-1.47182	43	18191
3012	FOOTSCRAY WEST	-1.17852	92	20061
3013	YARRAVILLE	-1.15184	98	11341
3015	NEWPORT	-.60208	180	14496
3016	WILLIAMSTOWN	.08331	325	11899
3018	ALTONA	-1.00519	118	11629
3019	BRAYBROOK	-2.33465	1	5867
3020	ALBION	-1.70901	25	32219
3021	ST ALBANS	-1.16839	95	52852
3022	ARDEER	-.84313	148	8045
3023	DEER PARK	-1.04248	115	14639
3024	WYNDHAM VALE	.85544	490	5705
3025	BROOKLYN	-1.37435	61	13316
3028	LAVERTON	-.75477	162	23105
3029	HOPPERS CROSSING	.59860	437	30894
3030	WERRIBEE	-.67235	169	35924
3031	FLEMINGTON	-1.16171	96	14308
3032	ASCOT VALE	-.68920	166	14787
3033	KEILOR EAST	.23019	352	13368
3034	AVONDALE HEIGHTS	-.09905	281	12108
3036	ARUNDEL	.75661	465	4673
3037	DELAHEY	.09298	326	2790
3038	ALBAN MEADOWS	.81074	481	33643

3039	MOONEE PONDS	.26206	360	11343
3040	ESSENDON	.93917	503	22245
3041	ESSENDON NORTH	1.14813	536	10177
3042	NIDDRIE	-.54583	192	12799
3043	TULLAMARINE	.16462	337	17984
3044	WESTBREEN	-.06695	286	20296
3046	GLENROY	-1.07308	111	29939
3047	BROADMEADOWS	-2.08909	3	18586
3048	COOLAROO	-1.30181	74	17438
3049	ATTWOOD	-.65562	170	7198
3051	HOTHAM HILL	-1.20394	88	8596
3053	CARLTON	-1.32507	71	8261
3054	CARLTON NORTH	1.14981	537	8262
3055	BRUNSWICK SOUTH	-.29873	240	12264
3056	BRUNSWICK	-.87992	138	19408
3057	BRUNSWICK EAST	-.19899	262	6550
3058	BATMAN	-.99971	121	30264
3059	GREENVALE	1.25192	552	8181
3060	FAWKNER	-1.52811	39	10214
3061	CAMPBELLFIELD	-1.23965	81	5289
3064	KALKALLO	.46075	406	17072
3065	FITZROY	-1.00469	119	8831
3066	COLLINGWOOD	-1.45387	44	5061
3067	ABBOTSFORD	-.51709	199	3553
3068	CLIFTON HILL	.51018	418	15411
3070	CROXTON	-.18145	267	20719
3071	THORNBURY	-1.00169	120	16204
3072	PRESTON	-1.51309	40	28251
3073	RESERVOIR	-1.35723	65	44479
3074	THOMASTOWN	-.96507	128	23056
3075	LALOR	-.87557	139	21827
3076	EPPING	.25649	359	18144
3078	ALPHINGTON	14678	333	8638
3079	DAREBIN	1.27989	554	14273
3081	WEST HEIDELBERG	-2.05496	7	12823
3082	MILL PARK	.35702	381	23163
3083	BUNDOORA	-.19756	263	20306
3084	HEIDELBERG	.95017	507	20878
3085	MACLEOD	1.01734	518	11561
3087	WATSONIA	-.28501	245	7665
3088	BRIAR HILL	1.10190	531	26199
3089	DIAMOND CREEK	1.57836	586	10649
3091	YARRAMBAT	27454	365	972

3093	LOWER PLENTY	.78257	470	2926
3094	MONTMORENCY	1.29076	556	8691
3095	ELTHAM	1.76065	606	27820
3096	WATTLE GLEN	.43808	403	876
3097	KANGAROO GROUND	1.78206	608	1005
3099	HURSTBRIDGE	1.08870	530	3945
3101	KEW	1.22710	549	21361
3102	KEW EAST	1.57672	585	6910
3103	BALWYN	1.59723	590	13817
3104	BALWYN NORTH	1.65421	597	17819
3105	BULLEEN	.53733	425	10606
3106	TEMPLESTOWE	1.57070	583	15717
3107	TEMPLESTOWE HEIGHTS	1.51688	579	11700
3108	DONCASTER	.66207	450	16813
3109	DONCASTER EAST	1.35720	563	25927
3111	DONVALE	1.24983	551	9362
3113	WARRANDYTE	1.47877	574	8054
3114	PARK ORCHARDS	1.86576	612	2982
3115	WONGA PARK	1.90082	615	3783
3116	CHIRNSIDE PARK	.41655	397	6111
3121	RICHMOND	-.19609	264	22977
3122	AUBURN SOUTH	.96872	509	18742
3123	AUBURN	1.54755	581	11113
3124	CAMBERWELL	1.61491	594	14754
3125	BURWOOD	.97622	512	19385
3126	CAMBERWELL EAST	1.77865	607	7500
3127	SURREY HILLS	1.75917	605	15667
3128	BOX HILL	-.08764	284	14284
3129	BOX HILL NORTH	1.42480	571	15147
3130	BLACKBURN	.78629	472	25323
3131	NUNAWADING	.18668	340	20175
3132	MITCHAM	.54718	426	13612
3133	VERMONT	1.39443	569	21109
3134	RINGWOOD	.55877	429	28221
3135	RINGWOOD EAST	.28220	369	15101
3136	CROYDON	.37844	389	33360
3137	KILSYTH	.35665	380	12652
3138	MOOROOLBARK	.53170	422	17609
3139	WARBURTON WEST	.30821	373	12683
3140	LILYDALE	-.24689	254	10699
3141	SOUTH YARRA	.48472	413	16843
3142	TOORAK	1.86421	611	12183
3143	ARMADALE	1.40602	570	7874

3144	KOOYONG	1.33958	561	10004
3145	CAULFIELD EAST	1.38862	566	12302
3146	GLEN IRIS	1.83188	610	16269
3147	ASHWOOD	-.10447	279	11194
3148	JORDANVILLE	.37676	388	11448
3149	BAYVIEW	1.11435	532	28627
3150	SYNDAL EAST	1.33218	559	48623
3151	BURWOOD EAST	.79334	474	10218
3152	WANTIRNA	1.06141	526	31140
3153	BAYSWATER NORTH	-.09979	280	20463
3154	THE BASIN	.40172	395	3816
3155	BORONIA	-.11305	276	19978
3156	FERNTREE GULLY	.56478	431	31909
3158	UPWEY	.22360	349	5909
3159	SELBY	-.05197	294	1316
3160	BELGRAVE	.74691	464	9367
3161	CAULFIELD NORTH	1.48988	575	13318
3162	CAULFIELD	.36865	384	14130
3163	CARNEGIE	.67813	452	29606
3165	BENTLEIGH EAST	.43432	401	17500
3166	OAKLEIGH	-.18297	266	16379
3167	MOORLEIGH	.18940	342	13246
3168	CLAYTON	-1.20724	86	17590
3169	CLAYTON SOUTH	-.33030	234	19829
3170	MULGRAVE	.58832	434	23703
3171	SPRINGVALE	-1.43306	50	19473
3172	DINGLEY	.41128	396	22287
3173	KEYSBOROUGH	-.01572	300	17487
3174	NOBLE PARK	-1.19260	89	30869
3175	DANDENONG	-1.34625	68	45395
3177	DOVETON	-2.00655	8	10143
3178	ROWVILLE	1.37449	564	22912
3179	SCORESBY	.79276	473	5976
3180	KNOX PARK	.82902	486	7048
3181	PRAHRAN	.05610	317	16744
3182	ST KILDA	-.78340	153	17250
3183	BALACLAVA	.46916	407	16836
3184	ELWOOD	.58876	435	14280
3185	ELSTERNWICK	.77288	468	13426
3186	BRIGHTON	1.67757	599	14778
3187	BRIGHTON EAST	1.70262	602	13219
3188	HAMPTON	1.07662	528	10871
3189	MOORABBIN	-.53042	197	13596

3190	HIGHETT	-.58466	186	8423
3191	SANDRINGHAM	.94612	505	7544
3192	CHELTENHAM	.18062	339	19074
3193	BEAUMARIS	1.59873	591	15482
3194	MENTONE	.79900	476	14361
3195	BRAESIDE	.23641	354	22081
3196	CHELSEA HEIGHTS	-.90483	135	17501
3197	CARRUM	-.53938	195	9850
3198	KANANOOK	-1.34390	69	14791
3199	FRANKSTON	-1.04396	114	49250
3200	FRANKSTON NORTH	-1.86814	17	9535
3201	CARRUM DOWNS	-.11378	275	13034
3202	HEATHERTON	-.09631	282	1824
3204	BENTLEIGH	.70114	455	16671
3205	EMERALD HILL	-.98885	124	6804
3206	ALBERT PARK	1.38952	567	9899
3207	PORT MELBOURNE	-.91282	133	7877
3211	LITTLE RIVER	.80733	480	1507
3212	LARA	.48791	415	9023
3214	CORIO	-2.08355	5	25642
3215	GEELONG NORTH	-1.12113	101	16807
3216	WANDANA HEIGHTS	.05037	314	37100
3218	MANIFOLD	-.90917	134	11994
3219	MOOLAP WEST	-1.61986	33	18633
3220	GEELONG	-.30042	239	14344
3221	STONEHAVEN	.99041	516	8641
3222	DRYSDALE	.62842	442	11777
3223	PORTARLINGTON	-1.48849	42	3900
3224	LEOPOLD	.65397	448	5469
3225	QUEENSCLIFF	.59167	436	3808
3226	OCEAN GROVE	-.50020	205	8061
3227	BARWON HEADS	-.06458	288	2430
3228	TORQUAY	.26499	361	6582
3230	ANGLESEA	.00199	304	1984
3231	AIREYS INLET	.88252	494	756
3232	ALLENVALE	.39745	394	902
3233	APOLLO BAY	-.50943	200	1439
3236	FORREST/MT SABINE	-.25151	252	127
3237	BEECH FOREST	.55905	430	537
3238	GLENAIRE	-.06658	287	194
3239	CARLISLE RIVER	-.29069	242	510
3240	BUCKLEY	1.58179	587	2449
3241	MOUNT HESSE	-.45629	212	2449

3242	BIRREGURRA	-.88715	137	420
3243	BARWON DOWNS	1.07025	527	1147
3249	KAWARREN	.42756	399	9982
3250	COLAC	-1.89566	14	4373
3251	BEEAC	-.85304	144	474
3254	BALINTORE	-1.36396	63	107
3260	CAMPERDOWN	-.96921	127	4714
3264	TERANG	-.31126	238	3110
3265	GARVOC	-1.15919	97	1114
3266	NAROGHID	.16358	336	2671
3267	SCOTTS CREEK	1.70828	603	1164
3268	TIMBOON	.77513	469	3202
3269	PORT CAMPBELL	.85212	489	724
3271	DARLINGTON	1.43824	573	392
3272	MORTLAKE	.29211	372	2169
3273	HEXHAM	.93422	501	213
3274	CARAMUT	.28193	368	470
3277	ALLANS FOREST	-.58267	187	1309
3280	WARRNAMBOOL	-1.36282	64	25953
3281	WINSLOW	1.17404	543	2199
3282	KOROIT	.23927	355	3569
3284	PORT FAIRY	-.47995	209	3094
3286	MACARTHUR	.84659	488	889
3287	DUNMORE	.80440	478	367
3289	GAZETTE	.32170	376	1095
3292	NELSON	.38392	391	209
3293	GLENTHOMPSON	-1.00609	117	358
3294	DUNKELD	-.03839	296	890
3300	BYADUK NORTH	-.58500	185	11445
3302	BRANXHOLME	-.15347	271	287
3303	CONDAH	.27081	362	381
3304	HEYWOOD	.43855	404	3745
3305	PORTLAND	-1.12853	100	12138
3309	DIGBY	1.11950	533	216
3310	TALISKER	-.19974	261	425
3311	CASTERTON	.05460	316	3017
3312	LANGKOOP	-.39572	226	355
3314	CAVENDISH	-1.18985	90	109
3315	COLERAINE	-.40669	223	1959
3317	HARROW	.22187	348	289
3318	EDENHOPE	.62317	440	1689
3319	APSLEY	.28031	367	340
3321	INVERLEIGH	1.28128	555	1431

3322	CRESSY	.34304	378	464
3323	BERRYBANK	1.57654	584	156
3324	LISMORE	-1.17498	94	426
3325	DERRINALLUM	1.05533	525	812
3329	SHELFORD	.94014	504	796
3330	ROKEWOOD	.34602	379	327
3331	BANNOCKBURN	1.02054	519	2452
3332	LETHBRIDGE	-.16509	270	729
3333	MEREDITH	-1.22632	83	476
3334	ELAINE	-.31754	236	425
3335	ROCKBANK	-1.77576	22	1042
3337	MELTON	-.44028	216	23030
3338	MELTON SOUTH	-.59488	183	10491
3340	BACCHUS MARSH	.04900	313	13673
3341	GREENDALE	.63761	444	978
3342	BALLAN	-.64869	174	3017
3345	GORDON	-.44192	215	776
3350	BALLARAT	-.98142	125	43668
3351	ROKEWOOD JUNCTION	.00386	305	8986
3352	WERNETH	.27774	366	12065
3355	WENDOUREE	-1.57084	37	12119
3356	DELACOMBE	-1.77191	23	9312
3357	GRENVILLE	.00848	306	1796
3360	LINTON	-1.11773	102	538
3361	SKIPTON	-1.07370	110	646
3363	CRESWICK	-1.37382	62	1726
3364	ALLENDALE	.37536	387	4178
3370	CLUNES	-1.69805	26	855
3371	TALBOT	-1.39580	55	917
3373	BEAUFORT	-1.09057	107	2117
3375	BALLYROGAN	-.32212	235	260
3377	ARARAT	-1.44957	45	9388
3379	WILLAURA	.07231	321	853
3380	STAWELL	-.97419	126	5709
3381	BARKLY	1.19879	546	4606
3387	MARNOO	.01245	308	69
3388	RUPANYUP	-1.06608	112	407
3390	MURTOA	-.27905	247	974
3391	BRIM	-.08425	285	215
3392	MINYIP	.20884	345	773
3393	WARRACKNABEAL	.48475	414	3338
3395	BEULAH	.22809	350	572
3396	HOPETOUN	1.19194	545	1212

3400	HORSHAM	-1.35026	67	12584
3401	BLACKHEATH	1.42538	572	3483
3407	BALMORAL	1.25472	553	1177
3409	NATIMUK	-.50401	203	649
3412	GOROKE	.39205	393	762
3414	DIMBOOLA	-.47780	210	2070
3418	NHILL	-.06075	291	2912
3419	KANIVA	.93428	502	1475
3423	JEPARIT	-.25732	249	805
3424	RAINBOW	-.65240	171	786
3427	DIGGERS REST	.04103	312	1752
3428	BULLA	1.13855	535	1372
3429	SUNBURY	.73364	461	23504
3431	RIDDELLS CREEK	.47683	409	1903
3432	BOLINDA	1.50833	577	558
3433	MONEGEETTA	1.69604	601	363
3434	ROMSEY	.97439	511	3960
3435	LANCEFIELD	.24843	357	2384
3437	GISBORNE	1.69541	600	6876
3438	NEW GISBORNE	.88900	496	758
3440	MACEDON	.45466	405	1253
3441	MOUNT MACEDON	2.08582	617	1619
3442	WOODEND	-.49596	206	5656
3444	KYNETON	-.39454	227	7403
3446	MALMSBURY	-1.09285	106	518
3447	TARADALE	-1.35301	66	184
3448	ELPHINSTONE	.28985	371	1130
3450	CASTLEMAINE	-1.43996	47	6683
3451	GOWAR	-1.39708	54	2469
3453	HARCOURT	-.78084	155	885
3458	BLACKWOOD	-1.42421	52	1173
3460	DAYLESFORD	-1.21371	85	2138
3461	KORWEINGUBOORA	-.53272	196	3776
3462	NEWSTEAD	-.39408	228	1338
3463	MALDON	-.24036	255	3212
3464	CARISBROOK	-.40555	224	572
3465	MARYBOROUGH	-1.43659	49	9647
3467	AVOCA	-.81086	151	1510
3468	MOUNT LONARCH	-.50747	201	230
3472	DUNOLLY	-1.33622	70	1476
3475	BEALIBA	-1.87822	16	286
3478	ST ARNAUD	-.98928	122	3369
3480	DONALD	.37177	385	2114

3482	WATCHEM	.43236	400	214
3483	BIRCHIP	.67120	451	959
3485	WOOMELANG	1.29447	557	445
3487	LASCELLES	1.31710	558	145
3489	TEMPY	.82760	485	299
3490	OUYEN	.70232	456	2337
3496	RED CLIFFS	-.20330	260	8403
3498	IRYMPLE	-.60617	177	3407
3500	MILDURA	-1.92150	11	20603
3501	MILDURA SOUTH	.67879	453	6737
3505	MERBEIN	-1.42701	51	4503
3506	COWANGIE	.48145	411	124
3507	WALPEUP	.19375	343	110
3509	UNDERBOOL	.98938	514	310
3512	MURRAYVILLE	.81695	482	344
3515	MARONG	-.68598	167	711
3516	BRIDGEWATER	-.69731	165	507
3517	INGLEWOOD	-1.28067	76	1388
3518	WEDDERBURN	-1.25250	78	1358
3520	KORONGVALE	-1.81435	18	243
3521	PYALONG	.01061	307	448
3523	ARGYLE	-1.37843	60	3008
3525	CHARLTON	-.00299	303	1593
3527	WYCHEPROOF	1.04062	521	1178
3529	NULLAWIL	.74112	462	155
3530	CULGOA	1.62823	595	252
3531	BERRIWILLOCK	.53630	424	139
3533	MITTYACK	.57212	432	1125
3537	BOORT	.18773	341	1341
3540	QUAMBATOOK	.01589	310	374
3542	COKUM	.80492	479	192
3544	ULTIMA	.71186	457	157
3546	MANANGATANG	.65598	449	543
3549	ROBINVALE	-1.32277	72	4072
3550	BENDIGO	-1.23533	82	40587
3551	NEWBRIDGE	.28851	370	14263
3555	GOLDEN SQUARE	-1.39556	56	11526
3556	COMET HILL	-1.89459	15	9704
3557	GOORNONG	-.75942	159	459
3558	ELMORE	-1.17524	93	1126
3559	COLBINABBIN	-.45547	213	309
3561	NANNEELLA	.23442	353	5435
3562	TORRUMBARRY	-.40698	222	286

3563	LOCKINGTON	-1.39312	58	362
3564	ECHUCA	-.87074	140	11753
3566	GUNBOWER	.43710	402	631
3567	LEITCHVILLE	-.24797	253	535
3568	COHUNA	.01648	311	3598
3570	RAYWOOD	.06628	319	1136
3571	DINGEE	.27143	363	423
3572	MILLOO	1.91560	616	726
3573	MITIAMO	.21232	346	270
3575	PYRAMID HILL	.10704	329	1141
3579	KERANG	-.17782	268	6553
3580	KOONDROOK	-.41042	221	659
3584	LAKE BOGA	-1.99804	9	460
3585	SWAN HILL	-.73227	163	14099
3589	WOORINEN	-.75872	161	287
3594	NYAH	-2.07181	6	346
3595	NYAH WEST	-1.68075	30	529
3596	WOOD WOOD	.24416	356	323
3597	PIANGIL	.07770	323	467
3607	TABILK	1.16704	542	343
3608	NAGAMBIE	-.84565	147	1820
3610	MURCHISON	-.58854	184	1537
3612	RUSHWORTH	-.38965	229	1926
3614	TOOLAMBA	-.85236	145	669
3616	TATURA	-.25234	251	5264
3618	MERRIGUM	-1.29776	75	500
3620	KYABRAM	-.76300	158	7677
3621	TONGALA	-.38947	230	2065
3622	CORNELIA CREEK	.74321	463	443
3623	STANHOPE	-.78460	152	954
3624	GIRGARRE	.20173	344	699
3629	MOOROOPNA	-1.42085	53	8558
3630	SHEPPARTON	-1.81150	19	24168
3631	SHEPPARTON EAST	1.04506	522	8047
3633	CONGUPNA	.15818	335	315
3634	TALLYGAROOPNA	.22841	351	2046
3635	WUNGHNU	.25532	358	627
3636	NUMURKAH	-.43461	217	5211
3638	NATHALIA	.11478	331	2429
3639	PICOLA	-.18812	265	986
3640	KATUNGA	.11670	332	567
3641	STRATHMERTON	-1.18060	91	827
3644	COBRAM	-.44242	214	7200

3646	DOOKIE	.71804	459	729
3649	KATAMATITE	.94695	506	823
3658	BROADFORD	-.50270	204	4424
3659	TALLAROOK	.87261	492	702
3660	SEYMOUR	-1.98514	10	7059
3662	PUCKAPUNYAL	1.33866	560	2320
3663	MANGALORE	.81980	483	429
3664	AVENEL	-.40529	225	764
3665	LONGWOOD	-.43068	218	324
3666	EUROA	-.60401	179	4283
3669	VIOLET TOWN	-.92113	130	890
3670	BADDAGINNIE	-.29514	241	218
3672	BENALLA	-1.24691	79	8570
3673	BLACKFIELDS	1.37938	565	3845
3675	GLENROWAN	-.78145	154	650
3677	WANGARATTA	-1.50961	41	14636
3678	WANGARATTA NORTH	.80172	477	8071
3682	SPRINGHURST	-.06162	290	193
3683	CHILTERN	.53211	423	2201
3685	RUTHERGLEN	.47805	410	2558
3687	CARLYLE	.84441	487	824
3688	BARNAWARTHA	.55310	427	913
3690	WODONGA	-.85105	146	22996
3691	CORAL BANK	1.49211	576	9274
3693	BONEGILLA	2.20335	619	282
3694	BANDIANA	2.65075	621	460
3695	HARLEROI	1.21298	547	423
3697	TAWONGA	-.00861	302	235
3699	MOUNT BEAUTY	1.60948	593	4703
3700	TALLANGATTA	1.22932	550	1756
3701	TALLANGATTA VALLEY	-.13835	273	413
3705	CRONINS	.76117	467	542
3707	CORRYONG	-.03057	298	1740
3709	BURROWYE	.35837	382	461
3711	BUXTON	-.20711	259	425
3712	THORNTON	-.27882	248	146
3713	EILDON	-1.10238	105	960
3714	ACHERON	.01343	309	2984
3715	ANCONA	-1.05173	113	164
3717	YEA	.42219	398	3610
3719	YARCK	1.16258	540	406
3720	BONNIE DOON	-.54026	194	303
3722	MANSFIELD	-.03300	297	4992

3723	BARJARG	1.86714	613	3489
3726	BUNGEET	.50309	417	392
3727	ST JAMES	1.04850	523	605
3728	TUNGAMAH	-.64264	176	505
3730	YARRAWONGA	-.65137	173	5431
3732	MOYHU	-.31307	237	565
3733	WHITFIELD	-.01464	301	470
3735	WHOROULY	.63983	446	898
3737	MYRTLEFORD	-.60585	178	4144
3740	POREPUNKAH	.62126	439	1353
3741	BRIGHT	1.17612	544	6590
3747	BEECHWORTH	-.55895	190	4125
3749	YACKANDANDAH	.31802	375	814
3752	MORANG SOUTH	.64200	447	2954
3753	BEVERIDGE	1.81698	609	1049
3754	DOREEN	.71776	458	1357
3756	WALLAN WALLAN	-.06203	289	2904
3757	WHITTLESEA	.76016	466	5972
3758	WANDONG	.63915	445	2101
3759	PANTON HILL	1.16630	541	1603
3761	ST ANDREWS	1.71453	604	1387
3762	BYLANDS	2.11132	618	640
3763	KINGLAKE	-.23674	257	1289
3764	KILMORE	-.23760	256	3339
3765	MONTROSE	.90418	500	6959
3766	KALORAMA	1.58456	588	1200
3767	MOUNT DANDENONG	.62589	441	1130
3770	CAHILLTON	1.13449	534	4186
3775	YARRA GLEN	.88226	493	2690
3777	HEALESVILLE	-1.03819	116	8828
3778	NARBETHONG	.88274	495	344
3779	MARYSVILLE	-.23209	258	784
3781	COCKATOO	-.04850	295	3494
3782	EMERALD	.36088	383	6137
3783	GEMBROOK	.99025	515	2360
3786	FERNY CREEK	1.88284	614	1964
3787	SASSAFRAS	1.55198	582	1464
3788	OLINDA	.38775	392	1309
3789	SHERBROOKE	1.21314	548	559
3791	KALLISTA	.96265	508	1769
3792	THE PATCH	1.02755	520	921
3793	MONBULK	.31551	374	3739
3795	SILVAN	-.25719	250	821

3796	MOUNT EVELYN	.55557	428	8423
3797	GILDEROY	-.89863	136	2404
3799	WARBURTON	-.85401	143	6450
3802	ENDEAVOUR HILLS	.33972	377	25228
3803	HALLAM	.17207	338	8314
3804	NARRE WARREN EAST	1.67450	598	6283
3805	NARRE WARREN	.49340	416	23911
3806	BERWICK	1.08572	529	14673
3807	BEACONSFIELD	.08004	324	2620
3808	BEACONSFIELD UPPER	1.64814	596	2676
3809	OFFICER	.52508	420	1078
3810	PAKENHAM	-.48588	208	12240
3812	MARYKNOLL	.63641	443	2399
3813	TYNONG	.09970	327	704
3814	CORA LYNN	.48330	412	2164
3815	BUNYIP	-1.20453	87	1319
3816	LONGWARRY	-.64500	175	1904
3818	DROUIN	-.83187	149	7849
3820	WARRAGUL	-.71652	164	12094
3821	CROSSOVER	-1.61030	34	339
3822	DARNUM	.52686	421	1090
3823	YARRAGON	-.05281	293	1877
3824	TRAFALGAR	-.59946	182	3481
3825	MOE	-1.59383	36	20685
3831	NEERIM	.38283	390	1319
3833	NOOJEE	-.65169	172	109
3835	THORPDALE	-1.43881	48	188
3840	MORWELL	-1.80351	20	17224
3842	CHURCHILL	-1.90783	12	2215
3844	TRARALGON	-.75877	160	24594
3847	ROSEDALE	-.91633	132	1849
3850	SALE	-.85867	141	15031
3851	SEASPRAY	-1.78342	21	2592
3852	SALE EAST	2.72729	622	240
3854	GLENGARRY	1.05258	524	1117
3856	TOONGABBIE	-.52503	198	910
3858	HEYFIELD	-1.39434	57	2281
3859	NEWRY	.51318	419	354
3860	MAFFRA	-.54357	193	7426
3862	DARGO	.68685	454	4108
3865	LINDENOW	-1.08268	109	229
3869	YINNAR	.71824	460	3273
3870	BOOLARRA	-.68317	168	1116

3871	MIRBOO NORTH	-.46393	211	2488
3874	WOODSIDE	-.98895	123	230
3875	BAIRNSDALE	-1.27238	77	15636
3878	EAGLE POINT	-1.08435	108	576
3880	PAYNESVILLE	-.92107	131	2652
3882	NICHOLSON	.07094	320	1248
3885	BRUTHEN	-.57734	188	1896
3887	NOWA NOWA	-1.74480	24	450
3888	BENDOC	-1.31029	73	4144
3889	CABBAGE TREE CREEK	-1.69505	27	151
3890	CANN RIVER	-1.24090	80	391
3891	GENOA	-.28988	243	54
3892	MALLACOOTA	.14970	334	1240
3895	ENSAY	.10527	328	272
3896	SWIFTS CREEK	.06559	318	360
3898	OMEO	-.09093	283	784
3900	BENAMBRA	1.34235	562	124
3903	SWAN REACH	-.85700	142	453
3904	METUNG	-.28568	244	498
3909	LAKES ENTRANCE	-1.55364	38	6736
3910	LANGWARRIN	.82090	484	15547
3911	BAXTER	-.42495	219	2530
3912	SOMERVILLE	.58549	433	12503
3913	TYABB	-.60063	181	1582
3915	HASTINGS	-1.90030	13	6075
3916	SHOREHAM	1.39425	568	1386
3918	BITTERN	.11452	330	3856
3919	CRIB POINT	-1.60995	35	1797
3921	TANKERTON	-.14554	272	72
3922	COWES	-.81150	150	4196
3923	RHYLL	-1.11627	104	400
3925	CAPTAINS GULLY	-1.13489	99	1716
3926	BALNARRING	.89558	498	2726
3927	BALNARRING EAST	.05098	315	957
3928	MAIN RIDGE	1.59656	589	943
3929	FLINDERS	.89229	497	880
3930	CANADIAN BAY	1.15622	538	15405
3931	MORNINGTON	-1.11764	103	15314
3933	MOOROODUC	.98915	513	1356
3934	BALCOMBE	.90229	499	8258
3936	DROMANA	-1.44410	46	6326
3937	RED HILL	-.93875	129	662
3938	DROMANA WEST	-1.38499	59	1573

3939	ROSEBUD	-1.67808	31	11060
3940	ROSEBUD WEST	-1.68524	28	3262
3941	RYE	-1.68432	29	9256
3942	BLAIRGOWRIE	-.41517	220	1972
3943	SORRENTO	.21632	347	1479
3944	PORTSEA	.78600	471	567
3945	LOCH	.47031	408	908
3946	BENA	.79766	475	280
3950	KORUMBURRA	-2.08748	4	1530
3951	KARDELLA	.86254	491	3079
3953	LEONGATHA	-.17678	269	6007
3956	DUMBALK	-.05820	292	2515
3957	STONY CREEK	.27285	364	181
3958	BUFFALO	1.51334	578	659
3959	FISH CREEK	1.51763	580	768
3960	FOSTER	-.02999	299	2709
3962	TOORA	-.35576	233	862
3964	PORT FRANKLIN	-.56916	189	102
3965	PORT WELSHPOOL	-.11633	274	214
3966	WELSHPOOL	-.49522	207	538
3971	YARRAM	-.78077	156	4228
3975	LYNDHURST	.60388	438	233
3976	HAMPTON PARK	.07231	322	18129
3977	CRANBOURNE	-.50665	202	31575
3978	CLYDE	.97281	510	487
3979	KERNOT	1.00550	517	952
3980	TOORADIN	-.55257	191	1960
3981	BAYLES	-.28480	246	3407
3984	CORINELLA	-2.17215	2	2554
3987	NYORA	-.11086	277	1020
3988	POOWONG	-.11049	278	654
3991	BASS	.37491	386	479
3992	DALYSTON	-.37040	232	360
3995	WONTHAGGI	-1.64867	32	7873
3996	INVERLOCH	-1.22383	84	2433
				4347624

NEW SOUTH WALES

Postcode	Suburb	Risk Score	Rank	Population
2000	SYDNEY	0.50316	403	15998
2007	BROADWAY/ULTIMO	0.74662	445	3016
2008	CHIPPENDALE	0.45466	391	4218
2009	PYRMONT	0.82406	459	3657
2010	DARLINGHURST	-0.12541	240	19842
2011	POTTS POINT	0.75274	450	21297
2015	BEACONSFIELD	0.75099	448	3951
2016	REDFERN	-0.3019	189	10433
2017	WATERLOO	-1.8358	22	5690
2018	ROSEBERY	0.17119	324	13390
2019	BOTANY	0.3651	363	7123
2020	MASCOT	0.25149	341	8104
2021	PADDINGTON	1.4811	552	15704
2022	BONDI JUNCTION	1.21761	515	10384
2023	BELLEVUE HILL	1.83241	578	9274
2024	WAVERLEY	1.19196	513	10986
2025	WOOLLAHRA	1.75242	574	7308
2026	BONDI	0.82943	461	30836
2027	EDGECLIFF	1.73139	572	7662
2028	DOUBLE BAY	1.47775	550	3264
2029	ROSE BAY	1.43576	548	8939
2030	VAUCLUSE	1.61718	561	13049
2031	RANDWICK	1.12227	508	30469
2032	KINGSFORD	0.63897	433	14941
2033	KENSINGTON	1.00696	490	10457
2034	COOGEE	1.13845	509	20494
2035	MAROUBRA	0.56263	418	25434
2036	MATRAVILLE	0.41042	372	25151
2037	GLEBE	0.29182	349	13601
2038	ANNANDALE	1.19273	514	7580
2039	ROZELLE	1.26338	523	6091
2040	LEICHHARDT	0.79864	456	18566
2041	BALMAIN	1.42704	547	12176
2042	NEWTOWN	0.49601	401	13778
2043	ERSKINEVILLE	0.68813	439	3350
2044	ST PETERS	0.00427	277	6964
2045	HABERFIELD	0.94489	480	7022
2046	ABBOTSFORD	0.91604	473	20518
2047	DRUMMOYNE	1.35283	533	9748
2048	WESTGATE/STANMORE	0.36348	362	5507
2049	PETERSHAM	0.39136	367	12751

2050	CAMPERDOWN	0.89269	469	4828
2060	NORTH SYDNEY	1.5497	557	12811
2061	MILSONS POINT	1.53397	555	4498
2062	CAMMERAY	1.66536	566	5436
2063	NORTHBRIDGE	1.73585	573	5506
2064	ARTARMON	1.48057	551	8409
2065	CROWS NEST	1.64591	565	21528
2066	LANE COVE	1.52147	554	25382
2067	CHATSWOOD	1.32645	529	15400
2068	WILLOUGHBY	1.42601	545	14421
2069	ROSEVILLE	1.7206	569	12866
2070	LINDFIELD	1.72163	570	10723
2071	KILLARA	1.75812	575	11109
2072	GORDON	1.56751	558	6104
2073	PYMBLE	1.71153	568	13040
2074	TURRAMURRA	1.54683	556	19140
2075	ST IVES	1.72713	571	17367
2076	WAHROONGA	1.51313	553	22007
2077	HORNSBY	0.83922	464	25215
2079	MOUNT COLAH	1.22376	516	6621
2080	MOUNT KURING-GAI	1.2257	517	2606
2081	BEROWRA	1.18887	512	3703
2082	BEROWRA HEIGHTS	1.31453	526	5080
2083	BROOKLYN	0.55515	416	1446
2084	TERREY HILLS	1.39316	540	4110
2085	BELROSE	1.38307	537	9795
2086	FRENCHS FOREST	1.36779	536	12799
2087	FORESTVILLE	1.31842	528	11485
2088	MOSMAN	1.79293	576	23387
2089	NEUTRAL BAY JUNCTION	1.57511	559	7970
2090	CREMORNE	1.80994	577	14172
2092	SEAFORTH	1.42175	544	5418
2093	BALGOWLAH	1.14597	511	18725
2094	FAIRLIGHT	1.3483	532	5296
2095	MANLY	1.06506	501	14491
2096	HARBORD	1.08185	503	13383
2097	COLLAROY	1.23576	518	12842
2099	DEE WHY	0.75614	451	30530
2100	BROOKVALE	0.93994	478	16296
2101	NARRABEEN	1.05561	497	16117
2102	WARRIEWOOD	0.96011	482	2475
2103	MONA VALE	1.05934	499	8556
2104	BAYVIEW	1.3463	531	3794

2105	CHURCH POINT	1.64028	564	1525
2106	NEWPORT BEACH	1.31785	527	9583
2107	AVALON BEACH	1.35721	535	13735
2108	PALM BEACH	0.8674	467	1071
2110	HUNTERS HILL	1.58395	560	9572
2111	GLADESVILLE	1.04234	495	11246
2112	RYDE	0.84075	465	25351
2113	NORTH RYDE	1.02286	491	17635
2114	WEST RYDE	0.89441	470	16897
2115	ERMINGTON	0.26001	343	7059
2116	RYDALMERE	0.62639	430	5164
2117	TELOPEA	0.73865	444	19804
2118	CARLINGFORD	1.28797	525	19522
2119	BEECROFT	1.67263	567	8502
2120	PENNANT HILLS	1.34593	530	17550
2121	EPPING	1.38798	539	22982
2122	EASTWOOD	1.23702	519	26607
2125	WEST PENNANT HILLS	1.62116	562	12838
2126	CHERRYBROOK	1.62164	563	17894
2130	SUMMER HILL	0.71116	441	7361
2131	ASHFIELD	0.41728	377	19541
2132	CROYDON	0.75089	447	10238
2133	CROYDON PARK	0.65439	436	11307
2134	BURWOOD	0.58581	424	9286
2135	STRATHFIELD	1.11167	507	17202
2136	ENFIELD	0.66862	437	6801
2137	CONCORD	0.94452	479	16519
2138	CONCORD WEST	1.09381	505	5064
2140	HOMEBUSH	0.42667	378	8240
2141	LIDCOMBE	0.01342	280	21554
2142	GRANVILLE	-0.29135	194	18197
2143	REGENTS PARK	0.08899	300	7011
2144	AUBURN	-0.53318	149	25191
2145	WENTWORTHVILLE	0.43412	382	55805
2146	TOONGABBIE	0.43973	384	15662
2147	SEVEN HILLS	0.51509	406	33963
2148	BLACKTOWN	0.1452	312	52730
2150	PARRAMATTA	-0.08682	251	20288
2151	NORTH PARRAMATTA	0.89473	471	14635
2152	NORTHMEAD	0.91524	472	6509
2153	BAULKHAM HILLS	1.27785	524	45732
2154	CASTLE HILL	1.39437	541	28716
2155	KELLYVILLE	0.97497	485	8344

2156	ANNANGROVE	1.42682	546	9751
2157	GLENORIE	0.98073	487	3133
2158	ROUND CORNER/DURAL	1.35558	534	7010
2159	GALSTON	1.25484	521	5050
2160	MERRYLANDS	-0.13952	235	26266
2161	GUILDFORD	-0.14096	234	25005
2162	CHESTER HILL	-0.04577	259	11747
2163	VILLAWOOD	-0.85047	103	13316
2164	SMITHFIELD	0.27068	345	21664
2165	FAIRFIELD	-0.55147	144	31735
2166	CABRAMATTA	-0.95727	81	52442
2167	GLENFIELD	0.57018	420	7292
2168	MILLER	-0.4105	168	32985
2170	LIVERPOOL	0.00933	278	72240
2171	LIVERPOOL - FORWARD	0.50527	404	19520
2173	HOLSWORTHY	1.39663	542	7485
2176	BOSSLEY PARK	0.46769	395	44793
2177	BONNYRIGG	-0.37715	174	14285
2190	GREENACRE	0.06787	294	20702
2191	ELFIELD	0.3308	357	5767
2192	ELMORE	-0.00135	274	14174
2193	CANTERBURY	0.49277	400	14036
2194	CAMPSIE	-0.15217	231	19209
2195	LAKEMBA	-0.38371	173	22261
2196	PUNCHBOWL	0.00206	276	30442
2197	BASS HILL	0.0944	301	8037
2198	GEORGES HALL	0.75153	449	8136
2199	YAGOONA	-0.19905	217	11924
2200	BANKSTOWN	-0.17267	222	30549
2203	DULWICH HILL	0.17592	325	12228
2204	MARRICKVILLE	-0.14504	232	27673
2205	ARNCLIFFE	0.05407	291	13383
2206	EARLWOOD	0.51676	407	17098
2207	BEXLEY	0.51448	405	23257
2208	KINGSGROVE	0.43293	380	12196
2209	BEVERLY HILLS	0.28216	348	11417
2210	RIVERWOOD	0.31679	354	25408
2211	PADSTOW	0.54766	413	14582
2212	REVESBY	0.20745	329	12914
2213	PANANIA	0.50305	402	18071
2214	MILPERRA	0.9632	483	4344
2216	ROCKDALE	0.07093	296	20187
2217	KOGARAH	0.31107	353	20293

2218	CARLTON	0.61586	428	13305
2219	SANS SOUCI	0.45254	390	10977
2220	HURSTVILLE	0.52091	410	21008
2221	HURSTVILLE SOUTH	1.05669	498	13907
2222	PENSHURST	0.46271	393	8563
2223	MORTDALE	0.92834	475	19677
2224	SYLVANIA	0.76032	453	11829
2225	OYSTER BAY	1.24643	520	4464
2226	JANNALI	0.92277	474	13032
2227	GYMEA	0.96425	484	12438
2228	MIRANDA	0.60723	426	15490
2229	CARINGBAH	0.85075	466	24303
2230	CRONULLA	0.81914	458	24681
2231	KURNELL	0.44026	385	2191
2232	SUTHERLAND	0.93332	477	27751
2233	ENGADINE	1.13861	510	29407
2234	MENAI	1.40337	543	27932
2250	GOSFORD	0.23079	336	57809
2251	CENTRAL COAST MAIL CENTRE	0.2309	337	29370
2256	WOY WOY	-0.5541	142	14165
2257	ETTALONG BEACH	-0.60528	135	25325
2258	OURIMBAH	0.41017	371	3294
2259	WYONG	-0.27946	200	46846
2260	TERRIGAL	0.40131	370	17243
2261	THE ENTRANCE	-1.18198	55	32625
2262	BUDGEWOI	-0.98643	77	14550
2263	TOUKLEY	-1.00892	75	21151
2264	MORISSET	-0.43368	164	10132
2265	COORANBONG	0.22603	333	4663
2267	WANGI WANGI	-0.21378	215	2584
2280	BELMONT	-0.15527	230	22224
2281	SWANSEA	-0.80075	111	11348
2282	WARNERS BAY	0.43218	379	13300
2283	TORONTO	-0.47148	158	21651
2284	BOOLAROO	-0.64932	130	10866
2285	CARDIFF	-0.13915	236	23216
2286	WEST WALLSEND	-0.55221	143	3588
2287	WALLSEND	-0.02311	268	26712
2289	ADAMSTOWN	0.22233	332	17468
2290	CHARLESTOWN	-0.22494	209	31951
2291	MEREWETHER	0.43406	381	12877
2292	BROADMEADOW	-0.97532	78	1634
2293	WICKHAM	-1.96355	17	1760
2294	CARRINGTON	-2.47834	13	1500
2295	STOCKTON	-0.61734	134	5058

2296	ISLINGTON	-2.8926	8	1292
2297	TIGHES HILL	-2.27295	14	1456
2298	WARATAH	-0.81257	108	9355
2299	LAMBTON	-0.56781	140	9491
2300	NEWCASTLE	-0.42619	165	8156
2301	CATHERINE HILL BAY/ WILLIAMTOWN	0.36539	364	25047
2303	HAMILTON	-0.87314	99	9455
2304	MAYFIELD	-1.32705	44	13928
2305	NEW LAMBTON	0.28	347	11900
2306	WINDALE	-5.21484	1	2075
2307	SHORTLAND	-0.77964	114	3486
2308	CALLAGHAN	-0.40389	169	1097
2311	EAST GRESFORD	0.12268	307	1145
2312	NABIAC	-1.61721	29	543
2315	NELSON BAY	-0.90551	93	8394
2320	MAITLAND	-0.85902	100	15677
2321	MAITLAND - FORWARD	0.36982	365	8514
2322	BERESFIELD	-0.28965	196	13981
2323	EAST MAITLAND	-0.13712	237	19724
2324	RAYMOND TERRACE	-0.63792	131	19121
2325	CESSNOCK	-1.03238	71	23165
2326	WESTON	-1.03031	72	6633
2327	KURRI KURRI	-0.83482	106	6972
2328	DENMAN	0.14546	313	2746
2329	MERRIWA	-0.11767	241	1876
2330	SINGLETON	0.5188	408	19646
2333	MUSWELLBROOK	0.02339	285	12818
2334	GRETA	0.43856	383	5728
2335	BRANXTON	0.44923	389	4105
2336	ABERDEEN	-0.19511	218	2205
2337	SCONE	0.14788	314	7564
2338	MURRURUNDI	-0.70011	126	1547
2339	WILLOW TREE	-0.0597	256	622
2340	TAMWORTH	-0.16288	227	40722
2341	WERRIS CREEK	-0.85666	101	1676
2342	CURRABUBULA	0.16146	321	1011
2343	QUIRINDI	-0.02708	267	5227
2344	DURI	-0.03787	264	237
2345	ATTUNGA	0.23558	339	1160
2346	MANILLA	-0.779	116	3085
2347	BARRABA	-1.31145	47	2099
2350	ARMIDALE	0.17969	328	26048
2352	KOOTINGAL	-0.3072	187	1904
2353	MOONBI	0.21806	331	1801
2354	WALCHA	0.01534	282	3521
2355	BENDEMEER	-0.537	148	619

2357	COONABARABRAN	-0.36841	177	4804
2358	URALLA	-0.26533	201	4417
2359	BUNDARRA	-0.77943	115	731
2360	INVERELL	-0.92496	88	12548
2361	ASHFORD	-1.05211	70	1044
2365	GUYRA	-0.562	141	3259
2369	TINGHA	-3.49042	3	855
2370	GLEN INNES	-0.62522	133	7994
2371	DEEPWATER	-1.10633	62	1080
2372	TENTERFIELD	-0.52205	151	5329
2379	MULLALEY	0.57091	421	206
2380	GUNNEDAH	-0.11282	245	11145
2381	GUNNEDAH - FORWARD	-1.9504	19	725
2382	BOGGABRI	-0.29376	192	1601
2386	BURREN JUNCTION	-0.48054	156	265
2387	ROWENA	1.02553	492	317
2388	WEE WAA	-0.16632	225	2784
2390	NARRABRI	-0.09802	248	9360
2395	BINNAWAY	-1.32802	43	709
2396	BARADINE	-0.71341	122	1388
2397	BELLATA	0.53389	411	358
2398	GURLEY	1.09161	504	463
2399	PALLAMALLAWA	-1.53302	35	317
2400	MOREE	-0.28099	199	12158
2401	GRAVESEND	0.15667	317	447
2402	WARIALDA	-0.40221	171	1984
2403	DELUNGRA	-0.2556	203	868
2404	BINGARA	-0.8388	105	1841
2405	GARAH	0.83083	462	694
2406	MUNGINDI	-0.20873	216	1147
2408	NORTH STAR	0.95723	481	499
2409	BOGGABILLA	-1.57575	33	1116
2415	STROUD ROAD	-1.80557	23	122
2420	DUNGOG	-0.15731	229	4846
2421	PATERSON	0.10047	304	914
2422	GLOUCESTER	-0.54942	146	5053
2423	BULADELAH	-0.79422	113	3246
2424	MOUNT GEORGE	-1.75529	26	344
2425	STROUD	-0.50127	154	1942
2426	COOPERNOOK	-1.70219	27	456
2427	HARRINGTON	-1.92128	20	1474
2428	FORSTER	-1.2191	53	19457
2429	WINGHAM	-0.65068	129	10843
2430	TAREE	-1.10571	63	28312
2431	SOUTH WEST ROCKS	-1.29491	48	3963
2439	KENDALL	-0.76414	117	1712
2440	KEMPSEY	-1.22273	52	23165

2441	MID NORTH COAST MSC	-2.01826	16	2521
2443	LAURIETON	-1.58004	32	8093
2444	PORT MACQUARIE	-0.9723	79	34162
2445	BONNY HILLS	-0.83232	107	3940
2446	WAUCHOPE	-0.70898	124	9946
2447	MACKSVILLE	-1.33946	42	6386
2448	NAMBUCCA HEADS	-1.75549	25	8688
2449	BOWRAVILLE	-3.00039	7	1935
2450	COFFS HARBOUR	-0.85433	102	32488
2452	SAWTELL	-0.93405	87	13240
2453	DORRIGO	-0.81233	109	2661
2454	BELLINGEN	-0.8747	96	7725
2455	URUNGA	-1.59236	31	2944
2456	WOOLGOOLGA	-1.17914	56	11847
2460	GRAFTON	-0.936	86	29144
2462	ULMARRA	-1.45213	37	2598
2463	MACLEAN	-0.80432	110	6071
2464	YAMBA	-1.0903	64	5339
2465	HARWOOD ISLAND	-0.3723	175	382
2466	ILUKA	-1.39928	40	1866
2469	NORTHERN RIVERS MSC	-3.38345	4	923
2470	CASINO	-0.87368	98	17154
2471	CORAKI	-1.25454	50	2038
2472	WOODBURN	-1.15816	57	1761
2473	EVANS HEAD	-1.60515	30	2615
2474	KYOGLE	-0.95338	82	6614
2475	URBENVILLE	-0.29094	195	417
2476	WOODENBONG	-0.15735	228	1043
2477	ALSTONVILLE	-0.19007	221	9029
2478	BALLINA	-0.69497	127	24183
2479	BANGALOW	-0.21888	213	3775
2480	LISMORE	-0.60514	136	44203
2481	BYRON BAY	-1.0122	74	10926
2482	MULLUMBIMBY	-1.07648	67	5447
2483	BRUNSWICK HEADS	-1.46392	36	9133
2484	MURWILLUMBAH	-0.65336	128	16896
2485	TWEED HEADS	-1.7811	24	8979
2486	TWEED HEADS SOUTH	-0.57802	139	24985
2487	KINGSCLIFF	-1.06406	68	7975
2488	BOGANBAR	-1.19189	54	2682
2489	HASTINGS POINT	-1.31636	45	2340
2490	TUMBULGUM	-0.10303	247	1051
2500	WOLLONGONG	-0.167	224	32326
2502	WARRAWONG	-1.40172	39	13001
2505	PORT KEMBLA	-1.00633	76	6248
2506	BERKELEY	-1.41906	38	6656
2508	HELENSBURGH	1.06939	502	7807

2515	THIRROUL	0.71715	443	9407
2516	BULLI	0.09708	302	5407
2517	WOONOONA	0.1762	326	9961
2518	CORRIMAL	-0.75084	120	17928
2519	FAIRY MEADOW	0.1604	320	16158
2525	FIGTREE	0.6435	435	9425
2526	UNANDERRA	0.48417	399	16179
2527	ALBION PARK	0.30537	352	16533
2528	WARILLA	-0.91728	91	23374
2529	SHELLHARBOUR SQUARE	0.08498	299	14296
2530	DAPTO	0.0247	286	24402
2533	KIAMA	0.54399	412	13553
2534	GERRINGONG	0.44225	386	4048
2535	BERRY	-0.06987	253	6347
2536	BATEMANS BAY	-1.08218	66	14335
2537	MORUYA	-1.13039	60	9001
2538	MILTON	-0.12948	238	4526
2539	ULLADULLA	-1.24364	51	11499
2540	NOWRA - FORWARD	-1.37952	41	24204
2541	NOWRA	-0.46761	159	29665
2545	BODALLA	-1.15502	58	776
2546	NAROOMA	-1.13958	59	8136
2548	MERIMBULA	-0.3222	185	6023
2549	PAMBULA	-0.33467	181	2363
2550	BEGA	-0.3431	179	15103
2551	EDEN	-0.88579	95	3728
2558	EAGLE VALE	0.70925	440	11609
2559	BLAIRMOUNT/CLAYMORE	-2.86556	9	4309
2560	CAMPBELLTOWN	-0.04468	260	66156
2563	MENANGLE PARK	0.57487	423	252
2564	MACQUARIE FIELDS	-0.70186	125	13107
2565	INGLEBURN	0.40046	369	14924
2566	MINTO	0.15701	318	26897
2567	NARELLAN	0.80248	457	12114
2568	MENANGLE	1.09625	506	1061
2569	DOUGLAS PARK	0.60904	427	733
2570	CAMDEN	0.82875	460	20767
2571	PICTON	0.56496	419	6955
2572	THIRLMERE	0.32556	356	1562
2573	TAHMOOR	0.10665	306	4745
2574	BARGO	0.16673	322	5305
2575	MITTAGONG	0.23519	338	13751
2576	BOWRAL	0.63183	431	8823
2577	MOSS VALE	0.14906	315	12098
2578	BUNDANOON	0.25737	342	2058
2579	MARULAN	0.17928	327	2135
2580	GOULBURN	-0.03906	263	26184

2581	GUNNING	0.63605	432	2200
2582	YASS	0.39306	368	8359
2583	CROOKWELL	0.10343	305	4421
2584	BINALONG	-0.36213	178	433
2585	GALONG	-0.16628	226	461
2586	BOOROWA	-0.22654	208	2137
2587	HARDEN	-0.52957	150	3148
2588	WALLENDBEEN	-0.21894	212	452
2590	COOTAMUNDRA	-0.33733	180	7435
2594	YOUNG	-0.4577	160	10025
2618	HALL	1.38711	538	692
2620	QUEANBEYAN	0.54971	414	33287
2621	BUNGENDORE	0.97755	486	4472
2622	BRAIDWOOD	-0.11534	243	2418
2626	BREDBO	-0.91943	89	165
2627	JINDABYNE	1.44115	549	9517
2628	BERRIDALE	0.57343	422	2007
2630	COOMA	0.74912	446	14974
2631	NIMMITABEL	0.1289	308	901
2632	BOMBALA	-0.0134	271	1924
2633	DELEGATE	-0.1934	220	574
2640	ALBURY	0.01416	281	27558
2641	LAVINGTON	-0.38683	172	15105
2642	MURRAY REGION MSC	0.62522	429	4565
2643	HOWLONG	-0.26022	202	2039
2644	HOLBROOK	0.30042	351	3364
2645	URANA	0.4555	392	880
2646	COROWA	-0.25393	204	6629
2647	MULWALA	0.01867	283	2208
2648	WENTWORTH	-0.50344	153	3445
2650	WAGGA WAGGA	0.05697	292	49437
2652	RIVERINA MSC	0.41152	374	5220
2653	TUMBARUMBA	0.25122	340	2945
2655	THE ROCK	0.06826	295	1463
2656	LOCKHART	0.44653	388	1624
2658	HENTY	0.0503	290	1685
2659	WALLA WALLA	0.08296	298	581
2660	CULCAIRN	-0.21523	214	1544
2663	JUNEE	-0.58867	138	3686
2665	TEMORA - FORWARD	-0.28912	197	2266
2666	TEMORA	-0.49881	155	5703
2668	BARMEDMAN	-0.54835	147	587
2669	WEST WYALONG - FORWARD	0.47389	397	2732
2671	WEST WYALONG	0.00197	275	4151
2672	LAKE CARGELLIGO	-0.94428	84	1786
2675	HILLSTON	-0.11409	244	1662
2680	GRIFFITH	0.13724	311	20410

2681	YENDA	0.06227	293	1262
2700	NARRANDERA	-0.04462	261	8382
2701	COOLAMON	0.13432	309	1642
2702	GANMAIN	-0.87391	97	956
2703	YANCO	-1.31407	46	571
2705	LEETON	-0.09431	249	9068
2706	DARLINGTON POINT	-0.29877	190	1208
2707	COLEAMBALLY	0.55262	415	930
2710	DENILIQUIN	-0.00832	272	11335
2711	HAY	0.02081	284	4124
2712	BERRIGAN	0.07874	297	1769
2713	FINLEY	0.01074	279	2657
2714	TOCUMWAL	-0.03318	266	2638
2715	BALRANALD	-0.14337	233	1879
2716	JERILDERIE	0.47379	396	1721
2717	DARETON	-2.2667	15	1283
2720	TUMUT	-0.2934	193	7383
2721	QUANDIALLA	-0.11257	246	227
2722	GUNDAGAI	-0.31832	186	3256
2725	STOCKINBINGAL	-1.54727	34	247
2726	JUGIONG	-0.0685	254	173
2727	COOLAC	-0.04248	262	392
2729	ADELONG	-0.06687	255	1548
2730	BATLOW	-0.41964	166	2010
2731	MOAMA	0.15861	319	3652
2732	BARHAM	0.29833	350	2206
2733	MOULAMEIN	0.15637	316	1054
2734	KYALITE	0.58907	425	173
2736	TOOLEYBUC	-0.24081	205	543
2737	EUSTON	-0.75164	119	468
2738	GOL GOL	-0.50721	152	617
2739	BURONGA	-0.9154	92	909
2745	REGENTVILLE	1.0326	493	13634
2747	KINGSWOOD	0.13553	310	32060
2748	ORCHARD HILLS	0.68807	438	1539
2749	CRANEBROOK	0.3178	355	13846
2750	PENRITH	0.36095	361	44998
2752	WARRAGAMBA	0.71381	442	4974
2753	RICHMOND	0.41044	373	16174
2754	NORTH RICHMOND	0.77448	455	5126
2756	WINDSOR	0.5623	417	30770
2757	KURMOND	0.83217	463	818
2758	KURRAJONG	0.99897	489	5231
2759	ERSKINE PARK	1.0379	494	28862
2760	ST MARYS	-0.37115	176	23762
2761	PLUMPTON	0.76017	452	22633
2762	SCHOFIELDS	0.64233	434	3372

2763	QUAKERS HILL	0.98502	488	21325
2765	RIVERSTONE	0.37803	366	16420
2766	ROOTY HILL	0.33232	358	11077
2767	DOONSIDE	-0.03617	265	15318
2770	MOUNT DRUITT	-1.02197	73	55816
2773	GLENBROOK	1.26232	522	6077
2774	BLAXLAND	1.06039	500	12467
2775	WISEMANS FERRY	-0.7098	123	931
2776	FAULCONBRIDGE	0.92891	476	3795
2777	SPRINGWOOD	1.04615	496	16752
2778	WOODFORD	0.87923	468	1532
2779	HAZELBROOK	0.46767	394	3516
2780	KATOOMBA	0.04517	288	13717
2782	WENTWORTH FALLS	0.47822	398	5379
2783	LAWSON	0.26428	344	3069
2784	BULLABURRA	0.52059	409	1009
2785	BLACKHEATH	0.09781	303	4120
2786	MOUNT VICTORIA	0.41178	375	1070
2787	OBERON	0.44469	387	5710
2790	LITHGOW	-0.07404	252	14493
2791	CARCOAR	-0.41431	167	416
2792	MANDURAMA	-2.58996	11	125
2793	WOODSTOCK	-1.06056	69	662
2794	COWRA	-0.32446	183	10718
2795	BATHURST	0.22984	335	34358
2797	CENTRAL WEST MC	-1.96172	18	224
2798	MILLTHORPE	0.36026	360	1537
2799	BLAYNEY	-0.23921	206	3593
2800	ORANGE	-0.05736	257	36979
2803	BENDICK MURRELL	0.03	287	394
2804	CANOWINDRA	-0.28881	198	2654
2805	GOOLOOGONG	-0.89503	94	472
2806	EUGOWRA	-0.43425	163	748
2807	KOORAWATHA	-3.03023	6	263
2808	WYANGLA	-1.11825	61	124
2809	GREENETHORPE	0.27123	346	362
2810	GRENFELL	-0.2246	210	3464
2820	WELLINGTON	-0.9478	83	7285
2821	NARROMINE	-0.30292	188	4699
2823	TRANGIE	-0.12594	239	1579
2824	WARREN	-0.22424	211	2937
2825	NYNGAN	-0.32779	182	3058
2827	GILGANDRA	-0.4026	170	4562
2828	GULARGAMBONE	-0.59665	137	1063
2829	COONAMBLE	-0.47686	157	3647
2830	DUBBO	-0.01744	270	36649
2831	WESTERN PLAINS MSC	-0.84516	104	2213

2832	WALGETT	-1.64964	28	3612
2833	COLLARENEBRI	-2.59898	10	919
2834	LIGHTNING RIDGE	-3.27648	5	3354
2835	COBAR	0.34479	359	5184
2836	WILCANNIA	-2.49951	12	1147
2838	BREWARRINA DISTRICT	-0.16865	223	158
2839	BREWARRINA	-1.91889	21	1597
2840	BOURKE	-0.96886	80	4115
2842	MENDOORAN	-1.08833	65	559
2843	COOLAH	0.04755	289	1492
2844	DUNEDOO	-0.43567	162	1443
2845	WALLERAWANG	-0.02059	269	2044
2846	CAPERTREE	-0.11691	242	397
2847	PORTLAND	-0.23774	207	2286
2848	KANDOS	-0.93659	85	1557
2849	RYLSTONE	-0.6258	132	909
2850	MUDGEE	-0.32305	184	14366
2852	GULGONG	-0.29553	191	3977
2864	CUDAL	0.22931	334	707
2865	MANILDRA	-0.08821	250	908
2866	MOLONG	0.16716	323	2574
2867	CUMNOCK	0.41691	376	782
2868	YEOVAL	-0.00603	273	1057
2869	PEAK HILL	-0.72976	121	1692
2870	PARKES	-0.19404	219	12270
2871	FORBES	-0.55117	145	9705
2873	TOTTENHAM	-0.05519	258	758
2874	TULLAMORE	0.20927	330	558
2875	TRUNDLE	-0.44533	161	814
2876	BOGAN GATE	-0.91884	90	317
2877	CONDOBOLIN	-0.76018	118	5049
2878	IVANHOE	-0.79963	112	660
2879	MENINDEE	-4.02147	2	533
2880	BROKEN HILL	-1.27315	49	22343
2898	LORD HOWE ISLAND	0.7671	454	364
				6022840

APPENDIX C

TECHNICAL APPENDIX

The issues discussed in this appendix are:

(i) weights used in calculating factor scores;

(ii) problems with the birthweight indicator;

(iii) development of a mortality indicator.

Calculating factor scores

The factor score for any postcode area in Victoria or New South Wales was a weighted sum of scores on the relevant indicators. The weights used to calculate Victorian scores were as follows:

Indicator	Component
Child abuse	.157
Court defendants	.230
Child injuries	.181
Emergency assistance	.118
Left school <15years	.165
Low birthweight	.060
Low income	.174
Psychiatric hospital admission	.157
Unemployment	.213
Unskilled workers	.182

In the case of New South Wales, the near to zero correlations between low birthweight and the other indicators resulted in the use of eight, rather than nine, weights in the calculation of factor scores:

Indicator	Component
Child abuse	.118
Court convictions	.163
Low income	.192
Left school <15 years	.174
Long term unemployment	.199
Emergency assistance	.059
Unemployment	.198
Unskilled workers	.171

Problems with low birthweight indicator

Taken at face value, the 30 highest ranking Victorian postcodes on *low birthweight* included 25 where the apparently high rates involved four or fewer infants weighing less than 2500 gms. These low frequencies reflected the limited yield from aggregating data over a two year period (1996/ '97 and 1997/ '98) of low weight births in Victoria. Even after relocating high ranking postcodes with four or fewer births, to ranks immediately below the *Top 30* positions, as discussed in the main text, the findings still appeared insubstantial because of the limited sample. The adjusted *Top 30* positions on this indicator in Victoria had a median total births score of 65, and a median of 7.5 low birthweight babies. The latter figure was a little higher in New South Wales (11.5), with the median total births within the *Top 30* ranked positions being 91. By comparison, another indicator compiled on the basis of a two year aggregation of data, *child abus*e, had a median frequency for the *Top 30* postcodes in Victoria of 32.5, and 22.5 in New South Wales.

The small to negligible correlations obtained in both states between *low birthweight* and the other indicators may, despite the findings of much previous research, reflect a decline in the importance of the relationship between birthweight and social conditions. More likely is an explanation for the present findings based on the inadequacy of the samples drawn in both Victoria and New South Wales. It would be instructive, as a prelude to further work of the present kind, to re-calculate the correlations based on say, a 5-10 year aggregation of birthweight data.

Development of a *mortality* indicator

Given the associations reported in the literature between *mortality* and a range of measures of social deprivation, it was considered desirable to include a standardised mortality ratio among the indicators of disadvantage used in both Victoria and New South Wales. The major problem encountered within the relevant branches of the health authorities of both states was that such information is not routinely gathered on a sub-local government area basis. The Epidemiology and Surveillance Branch, NSW Health, went to considerable lengths to try and meet our request to compile 'mortality' data on a postcode level and we are extremely appreciative of the effort made. Unfortunately, the deadline for completing the research was reached without a complete set of estimates for New South Wales postcodes being attained. (No estimates were available for 43 postcode areas).

The modest use made of the *mortality ratios* calculated for 534 localities in New South Wales, namely, the observation that nine of the ten highest ranking areas were in the West and North West of the State and contain substantial Aboriginal populations, is enough to indicate that it is worth persevering with the construction of a 'mortality' index. As a methodological contribution to that development, reproduced below is a communication from Dr Tim Churches, Epidemiology and Surveillance Branch, NSW Health Department, concerning the experimental work already undertaken towards the creation of an appropriate indicator:

'We have calculated two sets of *Standardised Mortality Ratios* (SMRs). The first is a "synthesised" estimate of the postcode-level SMR based on the SMR at the Statistical Local Area (SLA) level. Denominators for the SLA-level SMRs were calculated by summing the mid-year Australian Bureau of Statistics (ABS) Estimated Residential Populations for each of the years 1995, 1996, and 1997. Total New South Wales mortality was used as the standard. The proportion of the population of each postcode area which resides in each SLA was calculated (based on usual resident counts at the SLA and postcode level from the ABS 1996 census), and these proportions were used to calculate weighted means of the SMRs of the SLAs which each postcode area subtends. For example, 60% of the population of a particular postcode might reside in SLA A, which has an SMR of 120, while the remaining 40% of the population of that postcode resides in SLA B, which has an SMR of 80. The "synthesised"

postcode SMR is then (0.6 x 120) + (0.4 x 80) = 104. If the postcode area is wholly contained within an SLA, then the estimated SMR for that postcode will be identical to the SMR of that SLA.

The second set of postcode-level SMRs are based on the postcode reported on the death certificate. This information is not checked or corrected by the NSW Registrar of Births, Deaths and Marriages or ABS and is often discordant with the reported street address or locality. Approximately 1% of all death certificates do not have a postcode recorded - these were excluded from our analysis. An examination of the geographical distribution (by SLA) of these records revealed that with the exception of Sydney SLA there was no significant variation in the proportion of records with missing postcodes, indicating that the exclusion of these records is unlikely to bias the resulting SMRs. Because Estimated Residential Populations are not available at the postcode level, 1996 census usual resident counts were used as the denominators. A number of postcodes have quite small populations with a correspondingly small number of deaths, leading to a number of extremely high or low estimates due to random variation. In order to correct this problem, all postcode areas with SMRs higher than 156 or lower than 58 (the 95th and 5th percentiles respectively), were aggregated with geographically adjacent postcodes in order to improve the reliability of the estimates for these areas. Despite these efforts to make these postcode-level SMRs more robust, there is still a great deal of unexpected variation which is probably partly random variation and partly due to misreporting of postcodes on death certificates.

With the exception of Sydney SLA, which is discussed below, SLA-level SMRs are known to be reasonably accurate due to the extra steps taken by ABS in checking the address on each death record and assigning it to an SLA. Therefore, the "synthesised" postcode-level SMRs which we have prepared are likely to be unbiased estimates of the true underlying SMR for each postcode. We recommend that you use these estimates when constructing your index, rather than the SMRs derived directly from the postcode reported on the death certificate.

The "synthesised" SMRs for postcodes in Sydney SLA are high due to the large number of homeless people who die and have given their address as one of the inner city hostels. The effect of this is exaggerated by the relatively small residential population of the Central Business District, which by definition does not include people of no fixed address.

Please note that although the reliability of the SMR series which we have provided may be sufficient for use in a compound index, we do not consider either of these postcode-level SMRs sufficiently reliable to be published independently...'