

NZDep96
Index of Deprivation

Instruction Book

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Contents

ABOUT THE HEALTH SERVICES RESEARCH CENTRE	3
ACKNOWLEDGMENTS	4
ETHICS AND CONFIDENTIALITY	4
INTRODUCTION	5
USES FOR <i>NZDEP96</i>	8
HOW TO USE THE DISKETTE	9
HOW TO USE THE INDEX	10
NOTES TO USERS	12
BIBLIOGRAPHY	13
QUESTIONNAIRE	14

About the Health Services Research Centre

The Health Services Research Centre aims to promote excellence in academic research, to encourage interaction between researchers and policy makers and to mount policy-focused research as well as evaluative research. The Centre is a joint venture between the Wellington School of Medicine, University of Otago and the Institute of Policy Studies, Victoria University of Wellington.

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While the contents of this instruction book have benefited considerably from the assistance of colleagues, the responsibility for the instruction book remains solely with the authors.

Ethics and confidentiality

Ethical approval for the original *NZDep91* project was obtained from the Central Regional Health Authority Wellington Ethics Committee.

Access was granted to unrounded Census data under a special contract between Statistics New Zealand and the Health Services Research Centre, so that Clare Salmond and Peter Crampton could undertake the *NZDep96* project. The access was granted in a strictly protected environment on Statistics New Zealand premises, under supervision of Statistics New Zealand staff. Both researchers are bound by the same provisions of the Statistics Act 1975 which bind staff of Statistics New Zealand to preserve the confidentiality of individual respondent data.

Introduction

NZDep96 is an updated version of the *NZDep91* index of deprivation. The index combines nine census variables from the 1996 census which reflect aspects of material and social deprivation. *NZDep96* provides a deprivation score for each meshblock in New Zealand. Meshblocks are geographical units defined by Statistics New Zealand, containing a median of 90 people.

The *NZDep96* index of deprivation is provided on the diskette in two forms – an ordinal scale and a continuous score.

- The *NZDep96* index of deprivation scale, **NZDEP96**, ranges from 1 to 10, where 1 represents the least deprived areas and 10 the most deprived areas.
- The *NZDep96* index of deprivation interval variable, **NZDEP96_PC1**, is the first principal component score, which has been scaled to have mean 1000 index points and standard deviation 100 index points. The *NZDep96* 10 point scale is derived from this interval variable.

The *NZDep96* scale of deprivation from 1 to 10 divides New Zealand into tenths of the distribution of the first principal component scores. For example, a value of 10 indicates that the meshblock is in the most deprived 10 percent of areas in New Zealand.

Important points to note:

- *NZDep96* deprivation scores apply to areas rather than individual people.
- The 1 to 10 scale is ordinal not interval.
- First principal component scores may be used, if desired, instead of the 1 to 10 scale.

NZDep96 combines the following census data (calculated as proportions for each small area):

<i>Variable (proportions in small areas) in order of decreasing weight in the index</i>		
1	Communication	People with no access to a telephone
2	Income	People aged 18-59 receiving a means tested benefit
3	Employment	People aged 18-59 unemployed
4	Income	People living in households with equivalised* income below an income threshold
5	Transport	People with no access to a car
6	Support	People aged <60 living in a single parent family
7	Qualifications	People aged 18-59 without any qualifications
8	Owned home	People not living in own home
9	Living space	People living in households below equivalised* bedroom occupancy threshold

*Equivalisation: methods used to control for family composition.

For further discussion of deprivation, and the application of indexes of deprivation to research, resource allocation and community advocacy refer to: Townsend (1987), Townsend (1993), Crampton and Laugesen (1995), Carstairs (1995), and Morris (1991).

Full research reports detailing the development of *NZDep91* (Crampton et al., 1997) and *NZDep96* (Salmond et al., In press-b) have been published by the Health Services Research Centre, and are intended as companion volumes. Also available from the Health Services Research Centre is a look up directory which provides meshblock numbers and *NZDep96* scores for each meshblock in New Zealand (Salmond et al., In press-a), a technical report containing SAS code and other technical details concerning the development of *NZDep96* (Salmond et al., In preparation), and a research report describing deprivation analysis of health variables in the 1996 census (Crampton et al., In press).

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Uses for *NZDep96*

NZDep96 has been developed with three main purposes in mind, resource allocation, research and advocacy.

1. Indexes of deprivation have application in funding formulas. For example, indexes of deprivation have been used in capitation funding formulas for primary health care services, population based funding formulas for area health boards, and in funding formulas for social services in other sectors.
2. Indexes of deprivation have application in research in a variety of settings such as health and other social services. For example, in the health sector, many researchers have used small area indexes to describe the relationship between deprivation and health outcomes; increasing levels of deprivation are associated with higher mortality rates, and higher rates of many diseases.
3. Indexes of deprivation have been used by community groups and community based service providers to describe the populations they serve, and to advocate for extra resourcing of community based services.

How to use the diskette

The accompanying IBM formatted diskette contains a text file* (**NZDEP96.TXT**) of 36,808 records (one per meshblock) with the following fields:

- 1996 meshblock identification number (**MBNUM96**) [columns 1-7]
- 1996 census area unit number (**CAUNUM96**) [columns 8-14]
- *NZDep96* deprivation scale, where 1 is least deprived and 10 is most deprived (**NZDEP96**) [columns 15-17]
- *NZDep96* first principal component score standardised to mean 1000 index points and standard deviation 100 index points (**NZDEP96_PC1**) [columns 18-22]
- Meshblock usually resident population (**URPOP96**) [columns 23-26]

*This ASCII (DOS) text file can be read fastest by word processing software (such as Microsoft Word), and can also be read by statistical software (such as SAS). However, the file is too big to be read by at least some spreadsheets.

The diskette also contains a text file (**CAUNAMES.TXT**) giving census area unit numbers and names.

- 1996 census area unit number (**CAUNUM96**) [columns 1-7]
- 1996 census area unit name (**CAUNAME96**) [columns 8-37]

How to use the index

Using the index as a deprivation variable in analysis

1. Clean addresses, ie make sure components of addresses are in the right fields. Note that rural delivery (RD) addresses cannot be geocoded. Address cleaning is done commercially by various organisations as listed below for geocoding.
2. Geocode each observation in your outcome dataset (eg mortality, crime events, immunisation status) to meshblock. Automatic geocoding services are provided by various organisations, including:
 - Statistics New Zealand, phone (04) 495 4600 (Wellington), or (09) 358 4588 (Auckland), or (03) 374 8700 (Christchurch), or (03) 477 7511 (Dunedin)
 - Critchlow Associates Ltd, phone (04) 472 8244 (Wellington)
1. Merge your dataset with the *NZDep96* file (**NZDEP96.TXT**) using meshblock number, thus linking each geocoded address with its area deprivation score.
2. Examples of possible analyses include:
 - If you are comparing two (or more) groups (eg fully immunised versus not fully immunised; or cot death cases versus control babies) compare the distributions of 10 scale values (or principal component scores) using a non-parametric test (since the scale values are ordinal, and the principal component scores are skewed, and may be more skewed in your dataset).
 - If you are comparing rates of events with deprivation (eg mortality rates in a region compared across the ten deprivation scale values) you could calculate a rank correlation coefficient, or simply plot your results. Note that the denominators for your rates can be added up from the usually resident meshblock populations (**URPOP96**) given on the diskette.

Calculating an average NZDEP96_PC1 value for a user defined region

1. Define the regions in terms of the component meshblocks (**MBNUM96**). To help define your regions we have provided census area unit numbers on the diskette (**CAUNUM96**). A list of the names for census area units is also provided on the diskette.
2. To calculate a score for a region we suggest you take the weighted average of **NZDEP96_PC1** values, using population counts (**URPOP96**), across all the meshblocks in the region.
3. A weighted average is obtained by multiplying each meshblock **NZDEP96_PC1** value by the meshblock **URPOP96**, adding these over all meshblocks in the region, and dividing this total by the total regional population count (the sum of **URPOP96** for all meshblocks in the region).

Please note:

Average deprivation values for user defined regions calculated using the **NZDEP96** scale from 1 to 10 are less accurate than average deprivation values calculated using **NZDEP96_PC1** values.

Notes to users

- **What does it mean if a particular meshblock does not have a *NZDep96* value (field is blank)?**

A number of meshblocks (458) have been omitted from the index (most of these meshblocks are mainly sea or estuary), and in total contain very few people. A further 30 meshblocks could not be assigned deprivation values for technical reasons. The 30 meshblocks are:

94700	974500	1042200	1593700	1798501
149200	1041600	1042300	1593800	1798502
149400	1041701	1042500	1593900	1875001
364601	1041702	1169400	1594000	1916800
393700	1041703	1239300	1594100	1916900
815402	1041800	1593600	1594200	3138800

- **How are very small meshblocks handled in *NZDep96*?**

Meshblocks with populations of less than 100 people have been joined with neighbouring meshblocks to make areas with at least 100 people before creating the index. In the accompanying file the small area scale value has been assigned to each component meshblock. Note that if any meshblock, or joined meshblocks, have more than one proportion (out of nine) based on fewer than 20 people the *NZDep96* value is unreliable and has been withheld. These are the 30 meshblocks listed above.

- **I found that the distribution of *NZDEP96_PC1* did not have mean = 1000 and standard deviation = 100. Why?**

The first principal component was created from a file of 21,201 small areas with populations (as far as possible) exceeding 100 persons. Typically, each small area is one or two meshblocks. In the file of 21,201 small areas the mean is 1000 and the standard deviation is 100. For usage we have provided the file of all meshblocks giving each component meshblock of any small area the small area *NZDEP96_PC1* value.

- **I found that the distribution of *NZDEP96* did not have exactly 10 percent in each of its 10 categories. Why?**

NZDEP96 was created from our small areas, not from meshblocks. See comments about *NZDEP96_PC1* in the paragraph above.

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Questionnaire

To provide feedback, please remove this page and return to:

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1. What was your purpose in using NZDep96? Tick all that apply.

Research (specify broad area of inquiry eg, cot death research)

.....

Resource allocation / funding (specify type of funding eg, health)

.....

Needs analysis

Other (specify)

.....

2. Did you use the NZDep96 10 point scale, and/or the NZDep96 principal component scores?

Principal component scores

10 point scale → was the 10 point scale adequate for your purposes, or would you have preferred fewer/more categories. Please give details of your preference.

.....

.....

.....

.....

Please turn over 



3. **Based on your local knowledge, have you noticed any unexpected deprivation scores?**

Yes (specify meshblock number if possible, and nature of the anomaly)

.....

.....
(Continue on separate sheet if necessary)

No

4. **In future versions of the user manual we would like to indicate the uses to which *NZDep96* has been put, that is, the answer to question 1. Do you consent to us using the information in question 1? You, personally, will not be identified.**

Yes No

5. **Was the instruction book adequate for your purposes.**

Yes

No → please suggest improvements

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