

NZDep2018 analysis of census 2018 variables

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The authors

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Acknowledgements

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

Ethics and confidentiality

Ethical approval for the original NZDep91 project was obtained in May 1995 from the Central Regional Health Authority Wellington Ethics Committee.

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Access to the data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the authors, not Statistics New Zealand.

Glossary of abbreviations

DHB	District Health Board
NZDep	New Zealand index of socioeconomic deprivation
TA	Territorial Authority

Purpose of this report

The purpose of this report is to provide information about Aotearoa's socioeconomic landscapes using the measurement tool NZDep2018. The report presents data from the 2018 Census as viewed through the lens of NZDep2018.

The uses to which NZDep is put include planning, needs assessment, research, resource allocation and community-based advocacy. We hope that this report provides information that is useful in assisting with these activities.

Navigation of this report is via the Table of Contents. Census information is provided at the national level, and at the District Health Board (DHB) and Territorial Authority (TA) levels.

Layout of the report

One of the benefits of web-based publication is that we are able to include a very large amount of information using different geographic boundaries (national (total population); District Health Board (DHB); Territorial Authority (TA)).

The Chapter headings in the Table of Contents give guidance as to the contents of the report, along with links to each section.

Overview of NZDep2018

NZDep2018 is an updated version of the NZDep91, NZDep96, NZDep2001, NZDep2006 and NZDep2013 indexes of socioeconomic deprivation. NZDep2018 combines nine variables from the 2018 census which reflect eight dimensions of deprivation. NZDep2018 provides a deprivation score for each Statistical Area 1, and its constituent meshblocks, in New Zealand.

Meshblocks are the smallest geographical units defined by Statistics New Zealand. They are the building blocks for their new small geographical areas, called Statistical Area 1 [SA1], which generally contain between 100 and 200 people. These new areas, and sometimes combinations of them, were used as the basis from which NZDep2018 was calculated.

The NZDep2018 index of deprivation has two forms—an ordinal scale and a continuous score.

- The NZDep2018 index of deprivation ordinal scale ranges from 1 to 10, where 1 represents the areas with the least deprived scores and 10 the areas with the most deprived scores.
- The NZDep2018 index of deprivation interval variable is the first principal component score, which has been scaled to have mean 1000 index points and standard deviation 100 index points. The NZDep2018 10-point scale is derived from this interval variable.

The NZDep2018 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 or SA1 is in the most deprived 10 percent of our small areas in New Zealand, according to the NZDep2018 scores.

It should be noted that NZDep2018 deprivation scores apply to areas rather than individual people.

NZDep2018 combines the following census data (calculated as proportions for each small area).

Table 1: List of variables included in NZDep2018

Dimension of deprivation	Description of variable (in order of decreasing weight in the index)
Communication	People with no access to the Internet at home
Income	People aged 18-64 receiving a means tested benefit
Income	People living in equivalised* households with income below an income threshold
Employment	People aged 18-64 unemployed
Qualifications	People aged 18-64 without any qualifications
Owned home	People not living in own home
Support	People aged <65 living in a single parent family
Living space	People living in equivalised* households below a bedroom occupancy threshold
Living condition	People living in dwellings that are always damp and/or always have mould greater than A4 size

*Equivalisation: methods used to control for household composition.

Cautions

A number of potential practical and ethical problems may arise when using measures of socioeconomic position. The following are of particular importance for NZDep.

The potentially stigmatising effects of language and comparisons

Measures of socioeconomic position, depending on the particular method of their construction, attempt to measure just one dimension that relates to individuals, whānau and communities—that is, where they fit into the social ordering of wealth, employment, education, life opportunities and so on. Measures of socioeconomic position do not (perhaps *should not* would be more accurate) carry a moral judgement; they give no indication of the moral or social worth of individuals or communities. Just as there are many forms of wealth, there are many forms of deprivation,

socioeconomic deprivation being just one of them. Users of NZDep indexes should refer not to 'deprivation' but to 'socioeconomic deprivation as measured by NZDep'.

The indicator becomes the reality

The problem of confusing the indicator with the underlying phenomenon is discussed by Carr-Hill and Chalmers-Dixon (2002):

A common problem is to confuse the index with the phenomenon it purports to measure and, as a result, forget that *an index is only a proxy or partial measure*. (Emphasis added)

This common problem is referred to as reification. It is crucial that users of any measure of socioeconomic position recognise this problem and scrutinise both the theoretical basis for, and the construction of, the specific index.

Users of NZDep indexes should refer to 'areas that have the most socioeconomically deprived NZDep scores' rather than 'the most deprived areas'.

Area versus individual measures

Please note that NZDep is a small-area measure of deprivation. Caution must be used if the index is applied to individuals. This issue is discussed in greater detail in *NZDep - What does it measure?* (Salmond & Crampton, 2001), in *Heterogeneity of deprivation within very small areas* (Salmond & Crampton, 2002), and in *NZiDep: A New Zealand index of socioeconomic deprivation for individuals* (Salmond et al, 2006).

Relative versus absolute deprivation

A view is sometimes expressed in reference to NZDep that 'it is disgraceful that still 10% of areas are most deprived'. Please note that 10% of areas will *always* fall into the most deprived decile of NZDep scores—NZDep is designed to measure *relative* socioeconomic deprivation, not *absolute* socioeconomic deprivation.

Apparent simplicity

The NZDep scales (from 1 to 10) have been constructed so that they can be readily used in a variety of contexts. They are easily presented graphically. This simplicity should not be allowed to obscure the underlying complexity of construction, the limitation to components available from the Census, and the underlying theoretical assumptions. This is discussed in the *Atlas of Socioeconomic Deprivation in New Zealand: NZDep2006* (White et al, 2008), in *Development of New Zealand's Deprivation Index (NZDep) and Its Uptake as a National Policy Tool* (Salmond & Crampton, 2012),

and in *A comparison of the NZDep and New Zealand IMD indexes of socioeconomic deprivation* (Crampton et al, 2019).

Longitudinal comparisons

Difficulties arise in making comparisons between different NZDep indexes (NZDep91, NZDep96, NZDep2001, NZDep2006, NZDep2013 and NZDep2018). These difficulties are discussed in detail in Appendix five of the NZDep2018 Research Report (Atkinson et al, 2020).

Source of data

All information in this report is derived from the 2018 Census process. Almost all of the data has been sourced from Stats NZ webpage 'Statistical area 1 dataset for 2018 Census – updated March 2020' (<https://www.stats.govt.nz/information-releases/statistical-area-1-dataset-for-2018-census-updated-march-2020>). The information at the Statistical Area 1 (SA1) level used the associated NZDep2018 (SA1 level version). The data have been summarised to the relevant geographical level in the report (All NZ, DHB and TA). Totals in this report therefore may differ slightly from the actual totals due to the use of random rounded SA1 values in the summations.

The question labelled *I08b Birthplace (broad geographic areas)* was not reported by Stats NZ at the SA1 level, therefore SA2 data were used, matched to the weighted average SA2 version of NZDep2018 and then summarised. Totals in this report therefore may differ slightly from the actual totals due to the use of random rounded SA2 values in the summations.

Ethnicity variables by sex (*E_IM, E_IP, E_IA, E_IE, E_IL*) were calculated in the data laboratory by the authors at the relevant geographies, random rounded base 3, confidentiality checked and released.

Interpreting the graphs

The numbers in the stacked bar graphs are rounded to whole numbers. In the line graphs, strictly speaking the data points on the graphs should not be joined by dotted or solid lines, because such lines imply that the underlying NZDep 1-10 scale is a continuous variable, which it is not (it is an ordinal scale). We have included the lines, however, as they make the graphs easier to read and interpret.

The Chapter headings in the Table of Contents give guidance as to the contents of the report, along with links to each section. To assist with navigation, Table 2 below provides a list of Census questions and their respective topics.

Table 2: List of 2018 Census questions* and topics

Census question number	Topic	Census question number	Topic
C00_	Population counts	I27	Number children born
I03	Sex	I28	Individual home ownership
I00	Unit record data sources	I31	Highest qualification
I02a	Age broad groups	I34	Sources of income
I02b	Age 5 yr groups to 85	I35	Grouped personal income
I02F	Age 5 yr groups (Females)	I36	Work and labour force status
I02M	Age 5 yr groups (Males)	I37	Hours worked per week
I05	Years at usual residence	I39	Status in employment
I06c	Usual residence 5 yrs ago	I40a	Occupation (usual residence)
I07	Ethnicity (total responses)	I40b	Occupation (workplace address)
E_IM	Ethnicity (Maori/nonMaori) by sex	I42a	Industry (usual residence)
E_IP	Ethnicity (Pacific/nonPacific) by sex	I42b	Industry (workplace address)
E_IA	Ethnicity (Asian/nonAsian) by sex	I44a	Travel to work (usual residence)
E_IE	Ethnicity (European/nonEuropean) by sex	I44b	Travel to work (workplace address)
E_IL	Ethnicity (MELAA/nonMELAA) by sex	I19a	Travel to education (usual residence)
I11	Maori descent	I19b	Travel to education (educational institute)
I08a	Birthplace (NZ/overseas)	I49	Unpaid activities
I08b	Birthplace (broad geographic areas)	D00b	Dwelling occupancy status
I09	Years since arrival in NZ	D02	Dwelling record type
I14	Usual residence 1 yr ago	D03a	Occupied private dwelling type
I15	Languages spoken (total responses)	D03b	Occupied non-private dwelling type
I16	Religious affiliations	D05	Tenure of household
I18a	Study participation (usual residence)	D06	Sector of landlord
I18b	Study participation (usual residence 5 yrs ago)	D08	Weekly rent
I22a	Difficulty seeing	D10a	Number of rooms in dwelling
I22b	Difficulty hearing	D10b	Number of bedrooms in dwelling
I22c	Difficulty walking	D11a	Main types of heating in dwelling
I22d	Difficulty remembering	D11b	Main fuel types in dwelling
I22e	Difficulty washing	D12	Access to telecommunications
I22f	Difficulty communicating	D13	Motor vehicles available to dwelling
I24	Smoking status	D14	Dwelling dampness indicator
I26a	Legally registered relationship	D15	Dwelling mould indicator
I26b	Partnership status	D16	Access to basic amenities

*E_IM, E_IP, E_IA, E_IE, E_IL calculated by authors in data laboratory. All others sourced from <https://www.stats.govt.nz/information-releases/statistical-area-1-dataset-for-2018-census-updated-march-2020>

Table 3: Separate documents of tables and graphs for each of these geographic boundaries

Geography	GeoVal	Area Label	Link to file
All	-	Summary for Total NZ	CensusGraphsOverall
DHB	01	Northland	CensusGraphsDHB01
DHB	02	Waitemata	CensusGraphsDHB02
DHB	03	Auckland	CensusGraphsDHB03
DHB	04	Counties Manukau	CensusGraphsDHB04
DHB	05	Waikato	CensusGraphsDHB05
DHB	06	Lakes	CensusGraphsDHB06
DHB	07	Bay of Plenty	CensusGraphsDHB07
DHB	08	Tairāwhiti	CensusGraphsDHB08
DHB	09	Taranaki	CensusGraphsDHB09
DHB	10	Hawke's Bay	CensusGraphsDHB10
DHB	11	Whanganui	CensusGraphsDHB11
DHB	12	MidCentral	CensusGraphsDHB12
DHB	13	Hutt Valley	CensusGraphsDHB13
DHB	14	Capital and Coast	CensusGraphsDHB14
DHB	15	Wairarapa	CensusGraphsDHB15
DHB	16	Nelson Marlborough	CensusGraphsDHB16
DHB	17	West Coast	CensusGraphsDHB17
DHB	18	Canterbury	CensusGraphsDHB18
DHB	19	South Canterbury	CensusGraphsDHB19
DHB	22	Southern	CensusGraphsDHB22
TA	001	Far North District	CensusGraphsTA001
TA	002	Whangarei District	CensusGraphsTA002
TA	003	Kaipara District	CensusGraphsTA003
TA	011	Thames-Coromandel District	CensusGraphsTA011
TA	012	Hauraki District	CensusGraphsTA012
TA	013	Waikato District	CensusGraphsTA013
TA	015	Matamata-Piako District	CensusGraphsTA015
TA	016	Hamilton City	CensusGraphsTA016
TA	017	Waipa District	CensusGraphsTA017
TA	018	Otorohanga District	CensusGraphsTA018
TA	019	South Waikato District	CensusGraphsTA019
TA	020	Waitomo District	CensusGraphsTA020
TA	021	Taupo District	CensusGraphsTA021
TA	022	Western Bay of Plenty District	CensusGraphsTA022
TA	023	Tauranga City	CensusGraphsTA023
TA	024	Rotorua District	CensusGraphsTA024
TA	025	Whakatane District	CensusGraphsTA025

Geography	GeoVal	Area Label	Link to file
TA	026	Kawerau District	CensusGraphsTA026
TA	027	Opotiki District	CensusGraphsTA027
TA	028	Gisborne District	CensusGraphsTA028
TA	029	Wairoa District	CensusGraphsTA029
TA	030	Hastings District	CensusGraphsTA030
TA	031	Napier City	CensusGraphsTA031
TA	032	Central Hawke's Bay District	CensusGraphsTA032
TA	033	New Plymouth District	CensusGraphsTA033
TA	034	Stratford District	CensusGraphsTA034
TA	035	South Taranaki District	CensusGraphsTA035
TA	036	Ruapehu District	CensusGraphsTA036
TA	037	Whanganui District	CensusGraphsTA037
TA	038	Rangitikei District	CensusGraphsTA038
TA	039	Manawatu District	CensusGraphsTA039
TA	040	Palmerston North City	CensusGraphsTA040
TA	041	Tararua District	CensusGraphsTA041
TA	042	Horowhenua District	CensusGraphsTA042
TA	043	Kapiti Coast District	CensusGraphsTA043
TA	044	Porirua City	CensusGraphsTA044
TA	045	Upper Hutt City	CensusGraphsTA045
TA	046	Lower Hutt City	CensusGraphsTA046
TA	047	Wellington City	CensusGraphsTA047
TA	048	Masterton District	CensusGraphsTA048
TA	049	Carterton District	CensusGraphsTA049
TA	050	South Wairarapa District	CensusGraphsTA050
TA	051	Tasman District	CensusGraphsTA051
TA	052	Nelson City	CensusGraphsTA052
TA	053	Marlborough District	CensusGraphsTA053
TA	054	Kaikoura District	CensusGraphsTA054
TA	055	Buller District	CensusGraphsTA055
TA	056	Grey District	CensusGraphsTA056
TA	057	Westland District	CensusGraphsTA057
TA	058	Hurunui District	CensusGraphsTA058
TA	059	Waimakariri District	CensusGraphsTA059
TA	060	Christchurch City	CensusGraphsTA060
TA	062	Selwyn District	CensusGraphsTA062
TA	063	Ashburton District	CensusGraphsTA063
TA	064	Timaru District	CensusGraphsTA064
TA	065	Mackenzie District	CensusGraphsTA065
TA	066	Waimate District	CensusGraphsTA066

Geography	GeoVal	Area Label	Link to file
TA	067	Chatham Islands Territory	CensusGraphsTA067
TA	068	Waitaki District	CensusGraphsTA068
TA	069	Central Otago District	CensusGraphsTA069
TA	070	Queenstown-Lakes District	CensusGraphsTA070
TA	071	Dunedin City	CensusGraphsTA071
TA	072	Clutha District	CensusGraphsTA072
TA	073	Southland District	CensusGraphsTA073
TA	074	Gore District	CensusGraphsTA074
TA	075	Invercargill City	CensusGraphsTA075
TA	076	Auckland	CensusGraphsTA076

Resource documents

Atkinson, J., Salmond, C., & Crampton, P. (2019). NZDep2018 Index of Deprivation User's Manual. Wellington: University of Otago. <http://www.wnmeds.ac.nz/NZDep-info.html>

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