



CaDDANZ

Capturing the Diversity Dividend
of Aotearoa/New Zealand

Visualising and working with population diversity - The New Zealand Atlas of Population Change

Lars Brabyn and Natalie Jackson



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New Zealand Atlas of Population Change

2001 - 2006

2008 - 2013

Urban Places

- Urban Place Locator
- Change by Component (Maps)
- Change by Components (Graphs)

Territorial Authority Areas

- Internal Arrivals and Departures
- Net Internal and International Migration
- Contribution to Change by Component
- Components of Change (past & proj.)
- Share by Ethnic Group (proj.)
- Natural Increase and Decrease (proj.)
- Overseas Born (%)
- Overseas Born by Years Since Arrival
- Projections by Age

Regional Council Areas

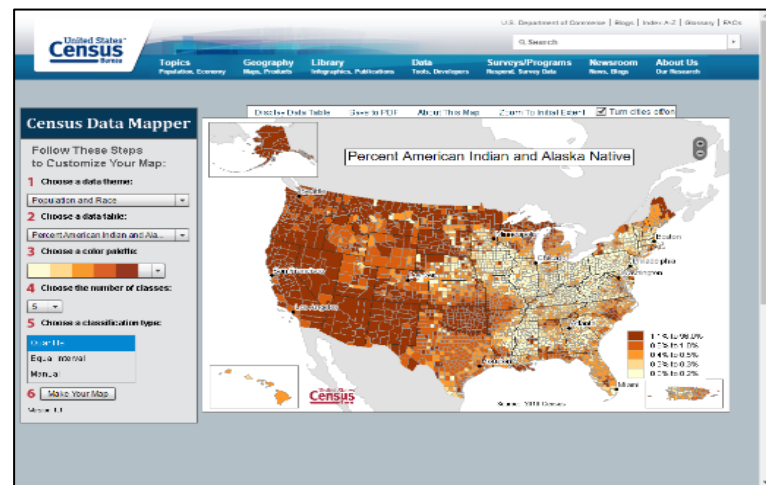
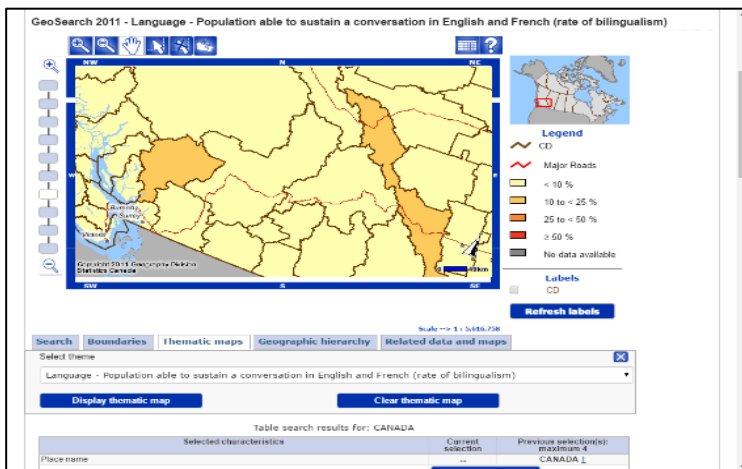
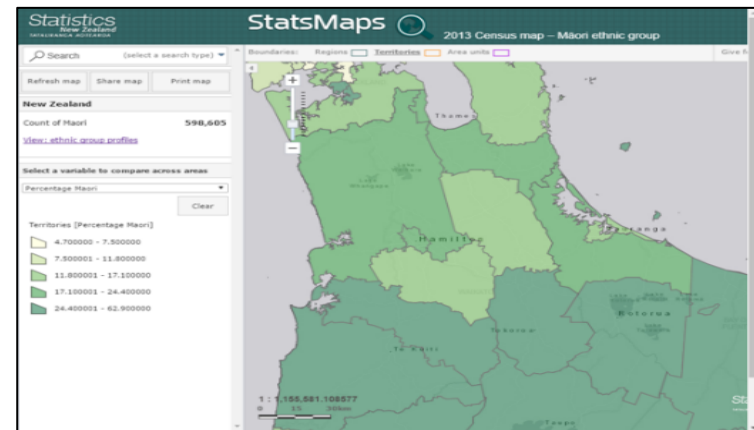
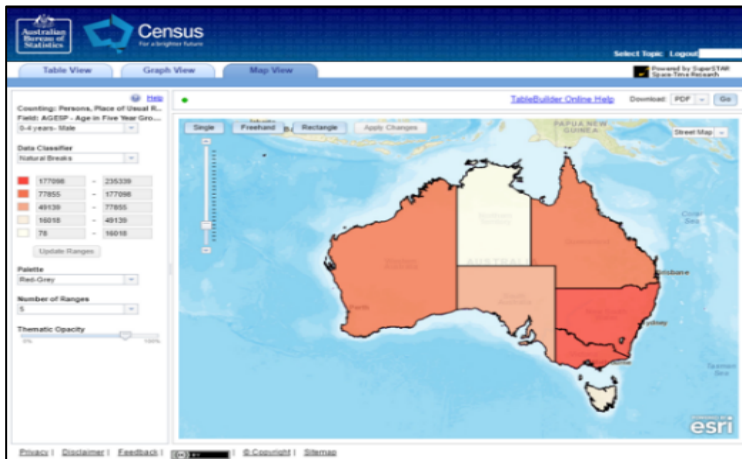
- Internal Arrivals and Departures
- Net Internal and International Migration
- Natural Increase and Decrease (proj.)

The New Zealand Atlas of Population Change is part of a broader research programme looking at the changing composition of New Zealand's population: **Capturing the Diversity Dividend of Aotearoa/New Zealand (CaDDANZ)**. The project's main objective is to assist New Zealand to better prepare for, respond to, and celebrate, an increasingly diverse population. The focus of the Atlas is the provision of maps illustrating New Zealand's spatial diversity across a broad range of variables. The underlying data are drawn from research projects which have used geo-coded data and whose research teams have made them available. In this sense the New Zealand Atlas of Population Change differs from the thematic mapping of raw data by Statistics New Zealand and other organisations in that it is accompanied by supporting research. Researchers generating geo-coded data are warmly invited to have their data mapped and included on the website, with references or links to their reports and publications. The project is ongoing and data will be added as they become available.



The NZ Atlas of Population Change is not just another online map server visualizing population census data.

Before developing the NZ Atlas of Population Change an evaluation of population internet maps servers was undertaken.



Evaluation based on:

- **The needs of population analysts**

Understand and interpret population trends,

- **Principles of cartography,**

Efficient communication using cartographic conventions

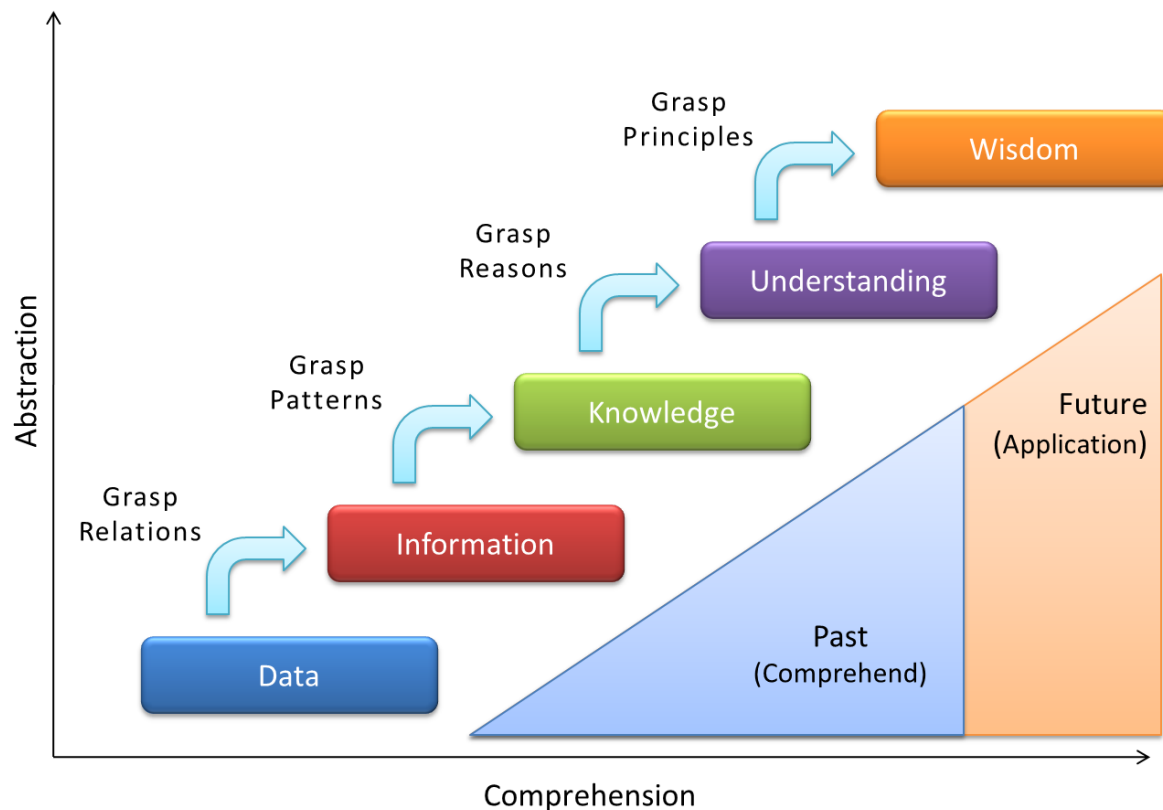
- **Human-computer interaction,**

Functional user interface

- **Internet software**

Use of client and server technologies

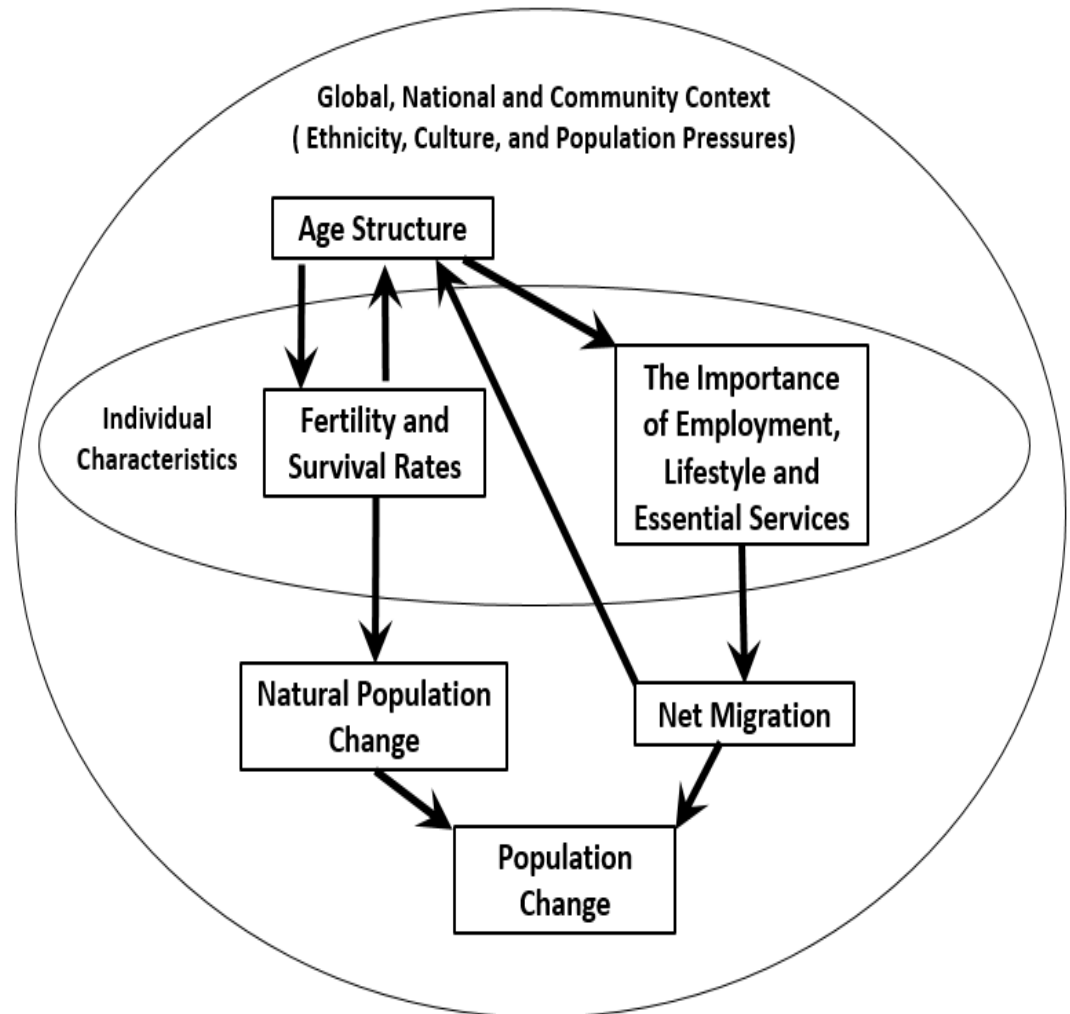
A goal of the NZ Population Change Atlas is to turn population data into knowledge and possibly wisdom (the ability to predict)

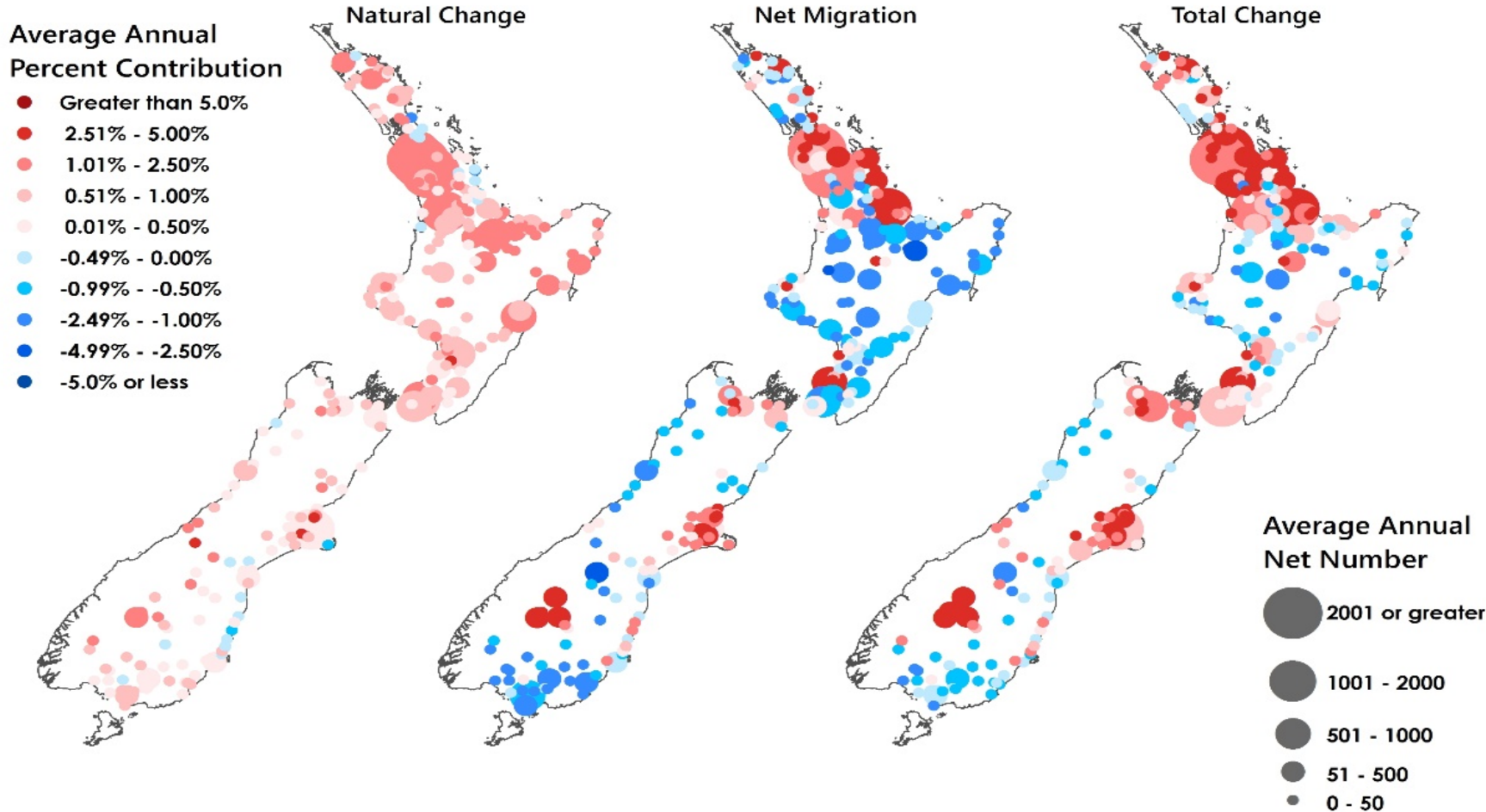


Most online population map servers only convert data into information.

Another goal of the NZ Population Change Atlas is to provide an exemplary example of an online atlas to inform other developers of online map servers.

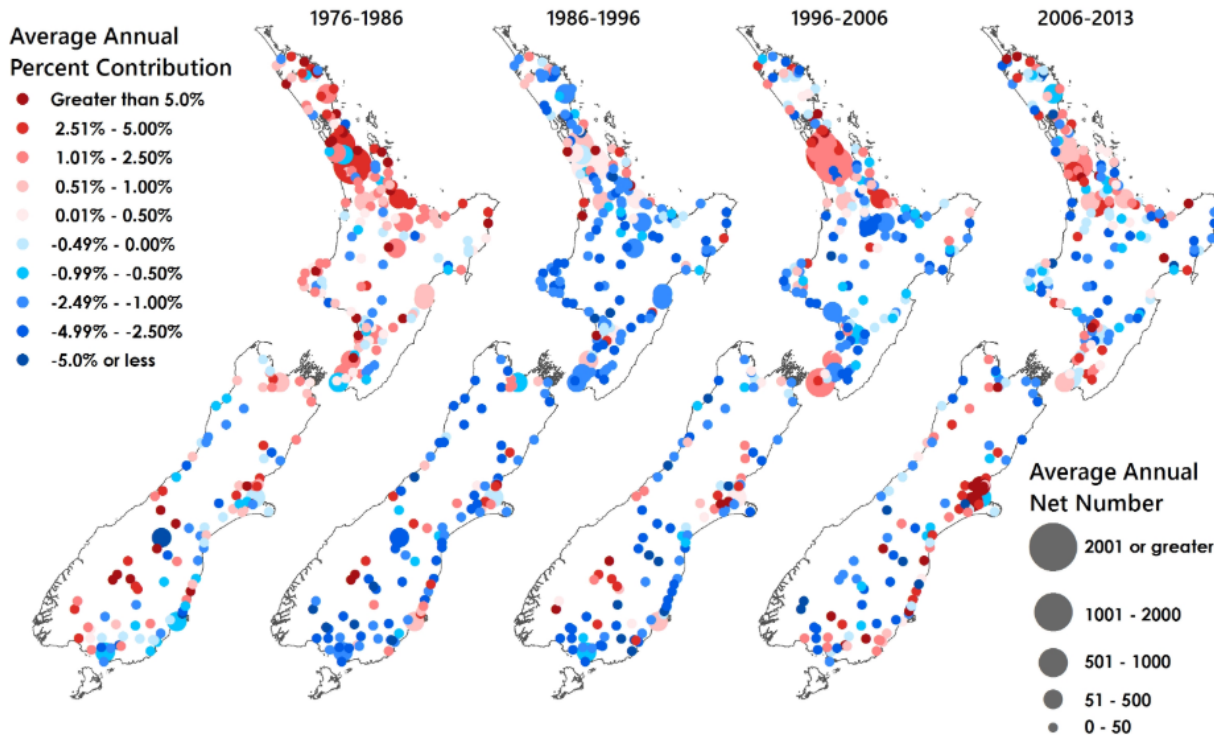
An important narrative for understanding population change and the diversity of NZ's towns, cities and regions is the interaction of migration, aging, and natural change.





Comparison of Natural Change, Net Migration, and Total Change for NZ Towns and Cities between 1976 and 2013

Labour Market Entry Age (15-24) Average Annual Total Change by Decade



Urban Places

Contribution of Natural Change and Net Migration to Total Population Change

- i**
- 15-24 Years Time Series
 - 20-64 Years Time-Series
 - 55-64 Years Time-Series
 - 65+ Years Time Series

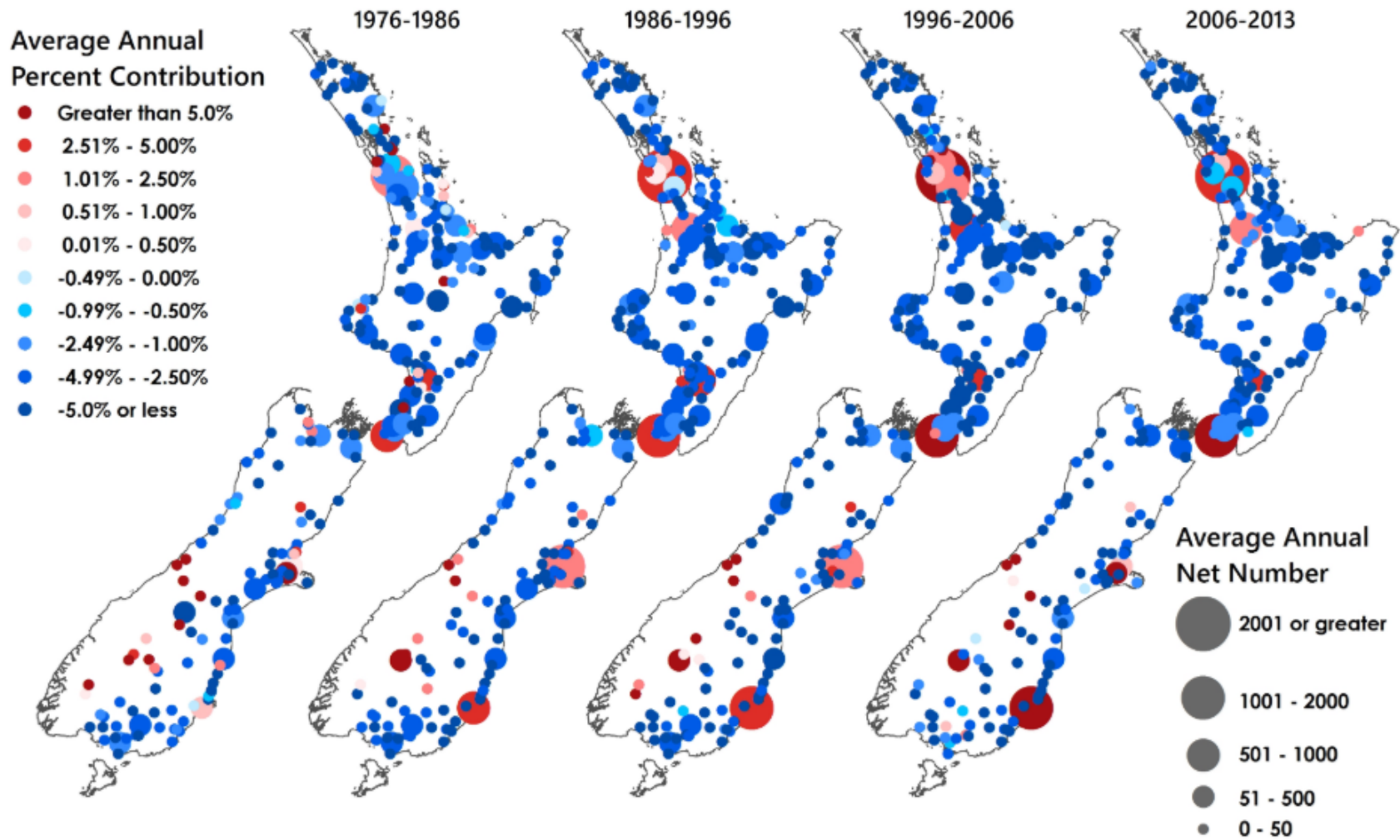
Net Migration

- 1976-1986
- 1986-1996
- 1996-2006
- 2006-2013
- Time-Series (Total)
- 15-24 Years Time-Series
- 20-64 Years Time-Series
- 55-64 Years Time-Series
- 65+ Years Time Series

Total Change

- 1976-1986
- 1986-1996
- 1996-2006
- 2006-2013
- Time-Series (Total)
- 15-24 Years Time-Series
- 20-64 Years Time-Series

Labour Market Entry Age (15-24) Average Annual Net Migration by Decade



Labour Market Entry Age (15-24) Average Annual Natural Change by Decade

Average Annual Percent Contribution

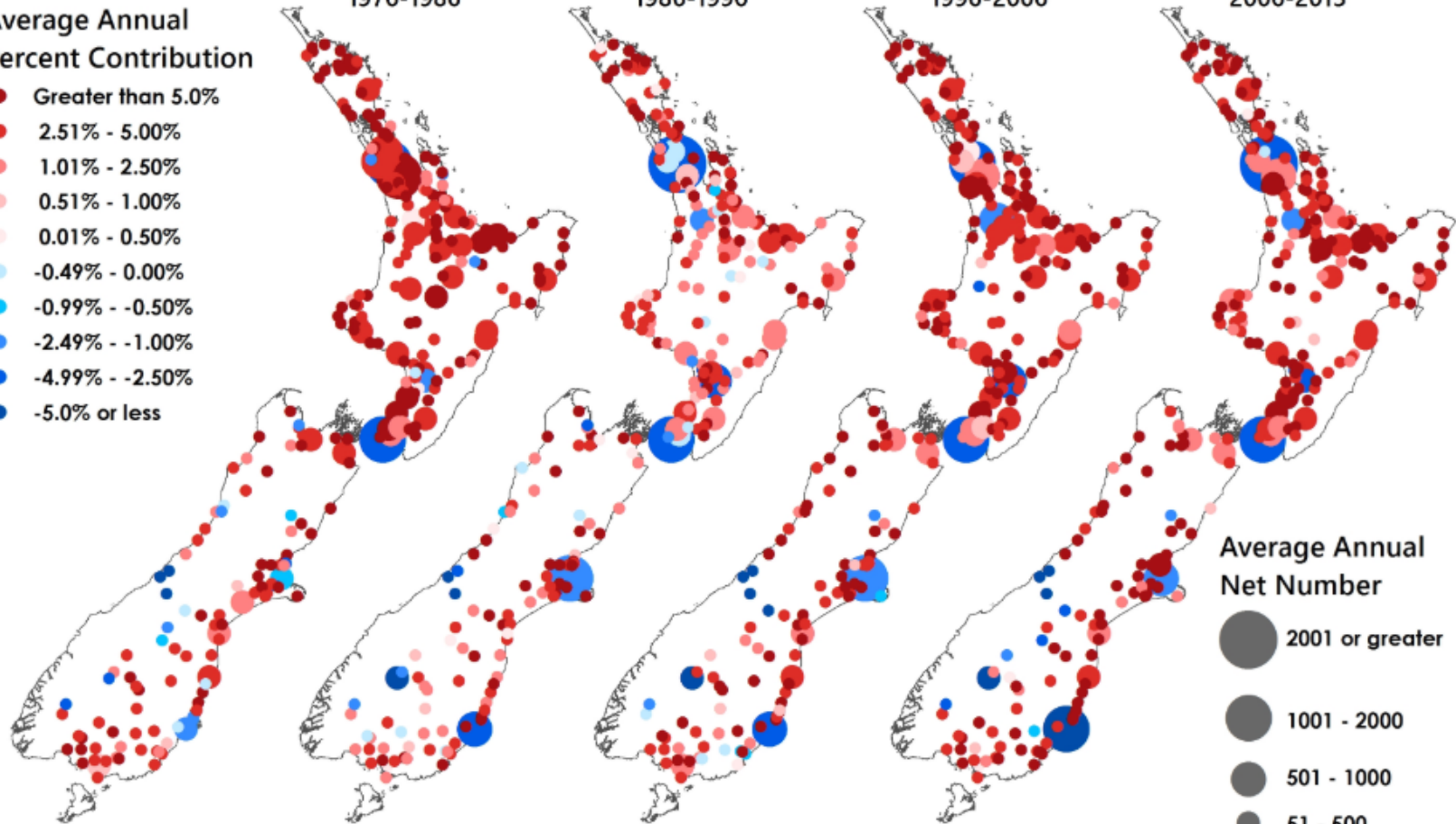
- Greater than 5.0%
- 2.51% - 5.00%
- 1.01% - 2.50%
- 0.51% - 1.00%
- 0.01% - 0.50%
- 0.49% - 0.00%
- 0.99% - -0.50%
- 2.49% - -1.00%
- 4.99% - -2.50%
- 5.0% or less

1976-1986

1986-1996

1996-2006

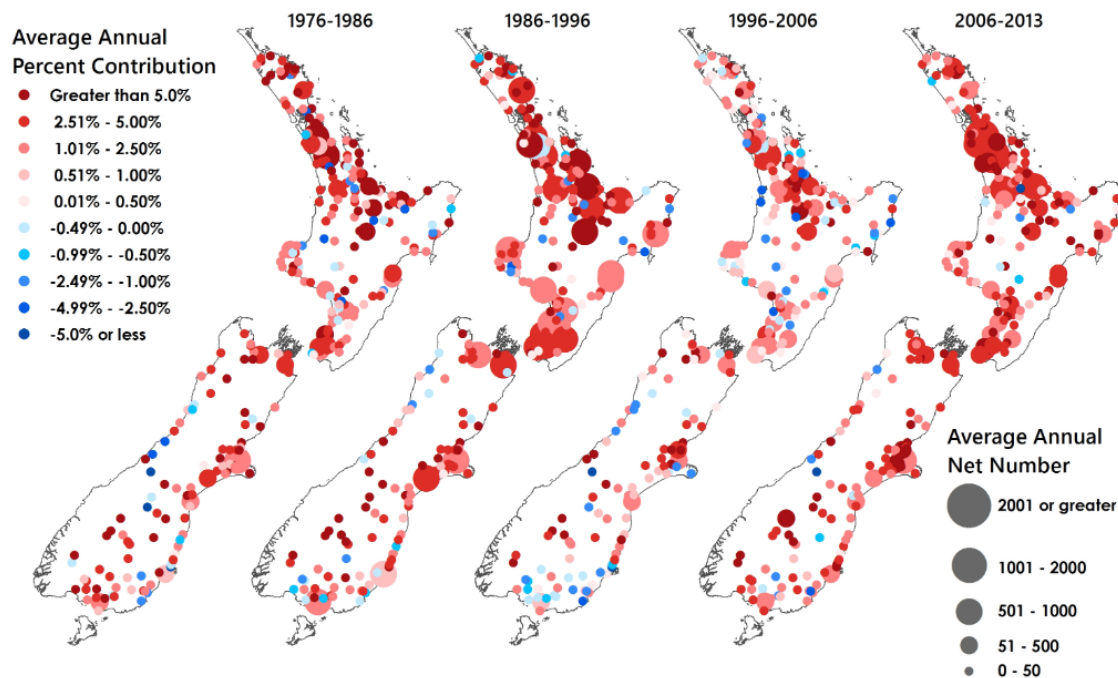
2006-2013



Average Annual Net Number

- 2001 or greater
- 1001 - 2000
- 501 - 1000
- 51 - 500
- 0 - 50

Retirement Zone (65+) Average Annual Total Change by Decade



Urban Places

Contribution of Natural Change and Net Migration to Total Population Change



Natural Change

1976-1986
 1986-1996
 1996-2006
 2006-2013

Time-Series (Total)

15-24 Years Time-Series
 20-64 Years Time-Series
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Total Change

1976-1986
 1986-1996
 1996-2006
 2006-2013

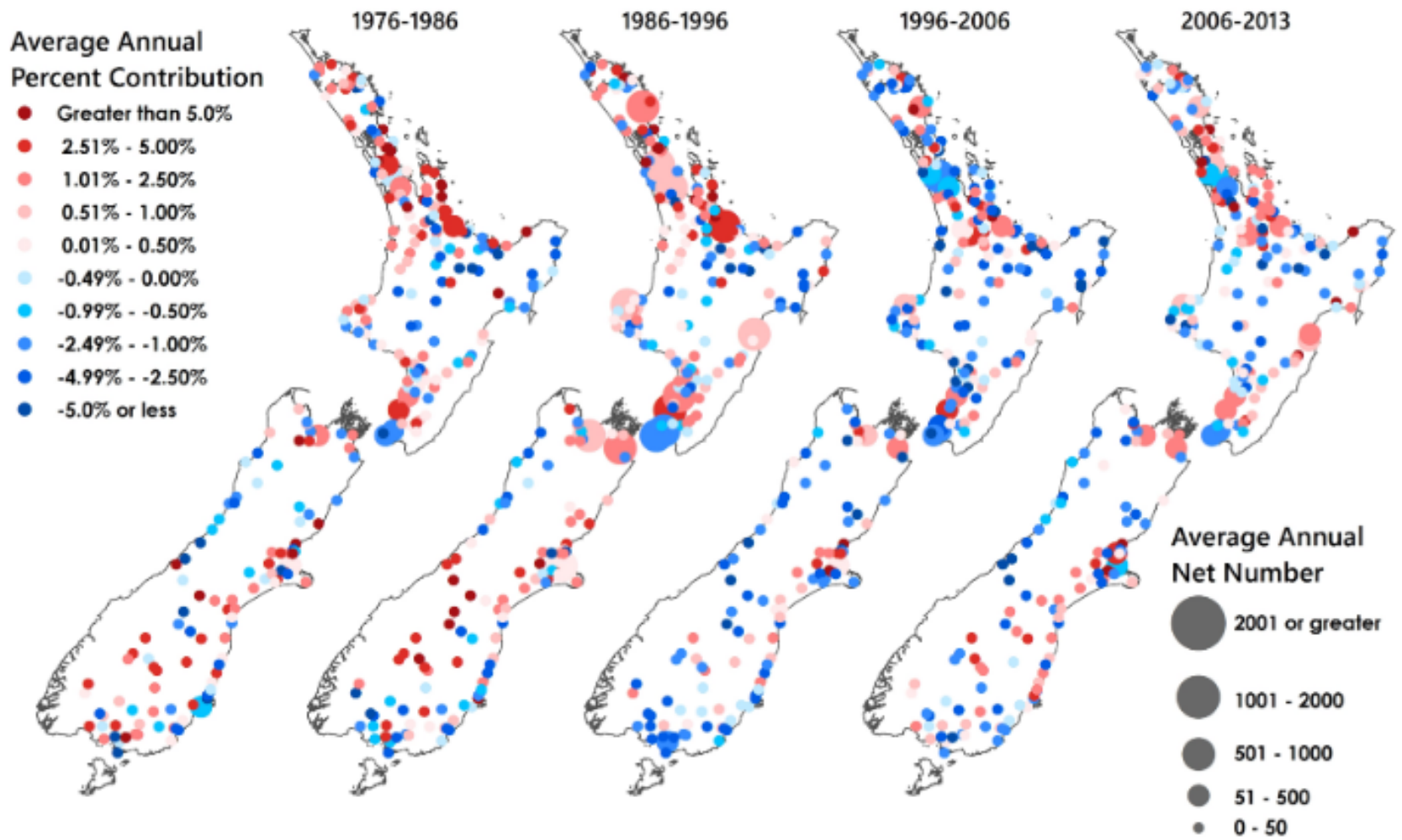
Time-Series (Total)

[Go to graphs](#)

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Period Maps: The **contribution of natural change** maps by **period** indicate the percentage of total population change for each area accounted for by natural increase (the difference between births and deaths). The **contribution of net migration** maps indicate the percentage of total population change for each area accounted for by net migration (internal and international combined). The **contribution of total net change** maps indicate the combined contribution of natural increase and net migration to total change for each area.

Retirement Zone (65+) Average Annual Net Migration by Decade



Retirement Zone (65+) Average Annual Natural Change by Decade

Average Annual Percent Contribution

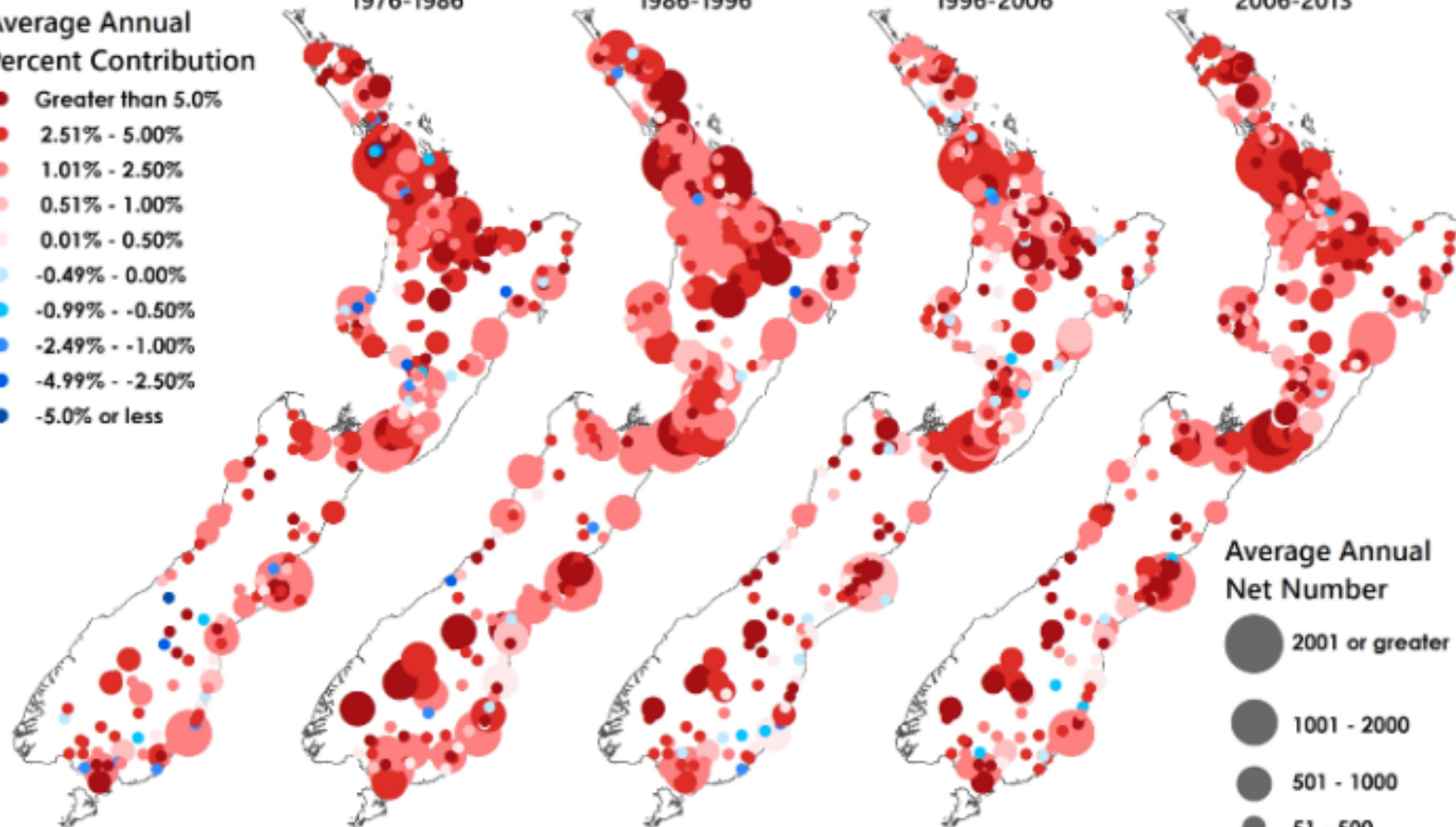
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- 0.51% - 1.00%
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1976-1986

1986-1996

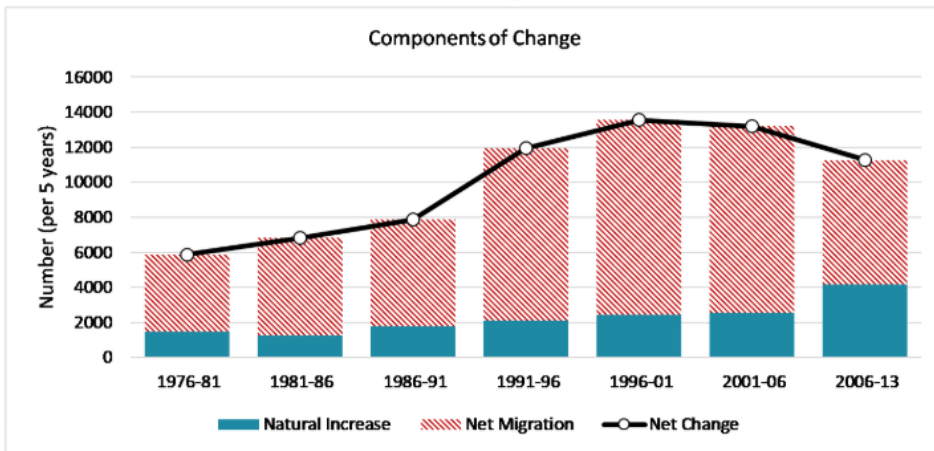
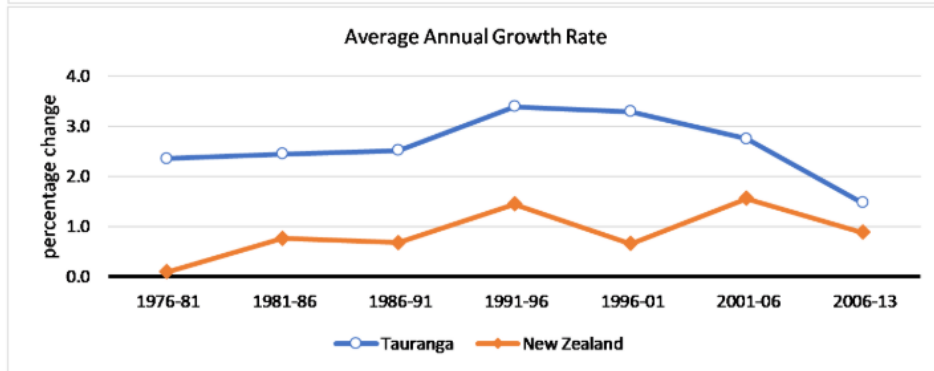
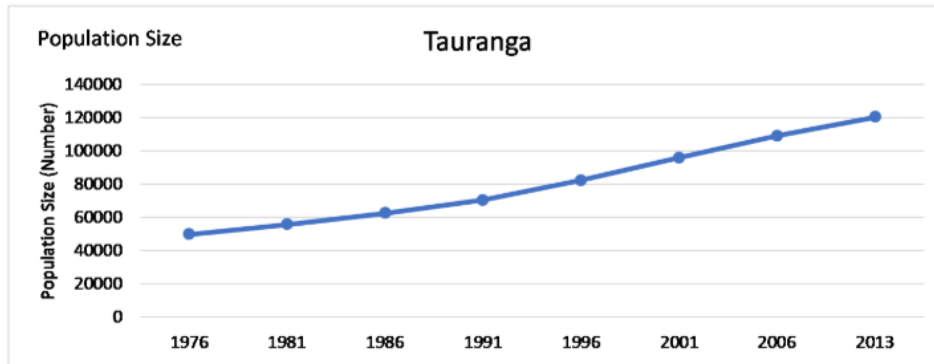
1996-2006

2006-2013



Average Annual Net Number

- 2001 or greater
- 1001 - 2000
- 501 - 1000
- 51 - 500
- 0 - 50



Urban Places



Population Trends and Components of Change (Numbers)

Choose Age Group/Total

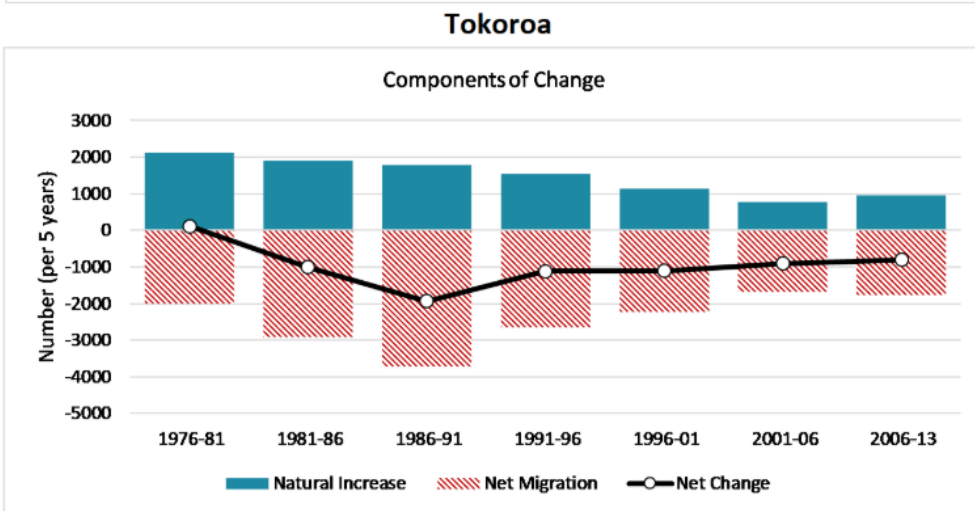
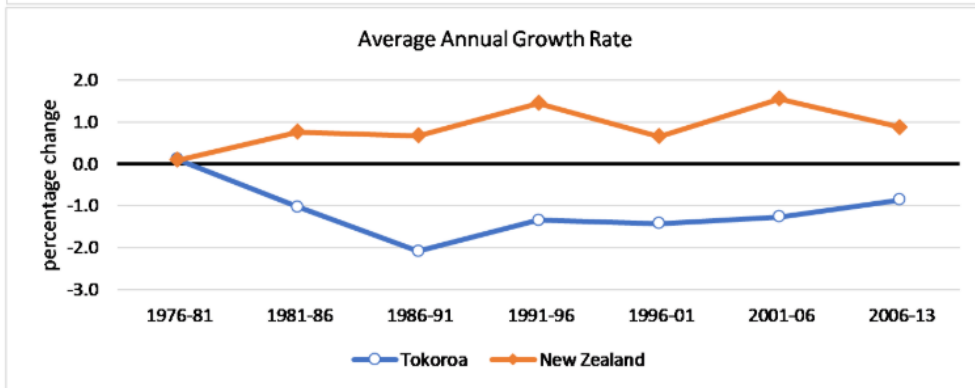
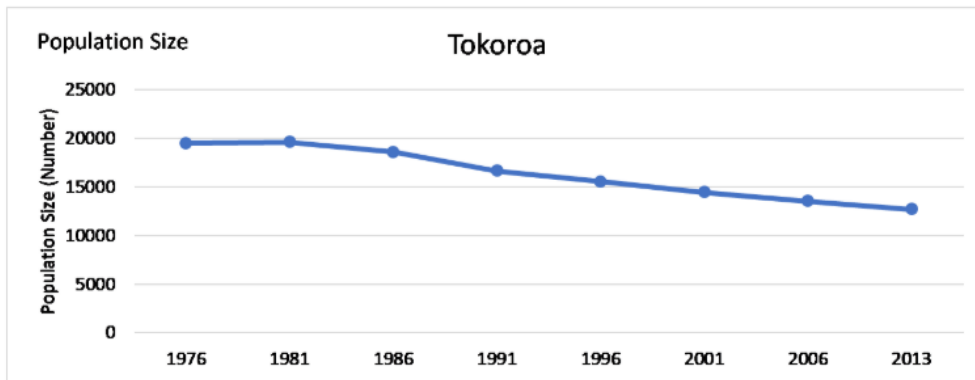
Total Population

Choose Urban Place:

- Rural Centre Wyndham
- Shannon
- Snells Beach
- Stratford
- Taihape
- Taipa Bay-Mangonui
- Tairua
- Takaka
- Taumarunui
- Taupo
- Tauranga
- Te Anau
- Te Aroha
- Te Awamutu Zone
- Te Kauwhata
- Te Kuiti
- Te Puke Community
- Temuka
- Thames
- Timaru
- Tokoroa
- Turangi
- Twizel Community
- Upper Hutt Zone
- Waiheke Island
- Waihi Beach
- Waihi
- Waikouaiti



Go to maps



Jackson and Brabyn 2017

Urban Places



Population Trends and Components of Change (Numbers)

Choose Age Group/Total

Total Population

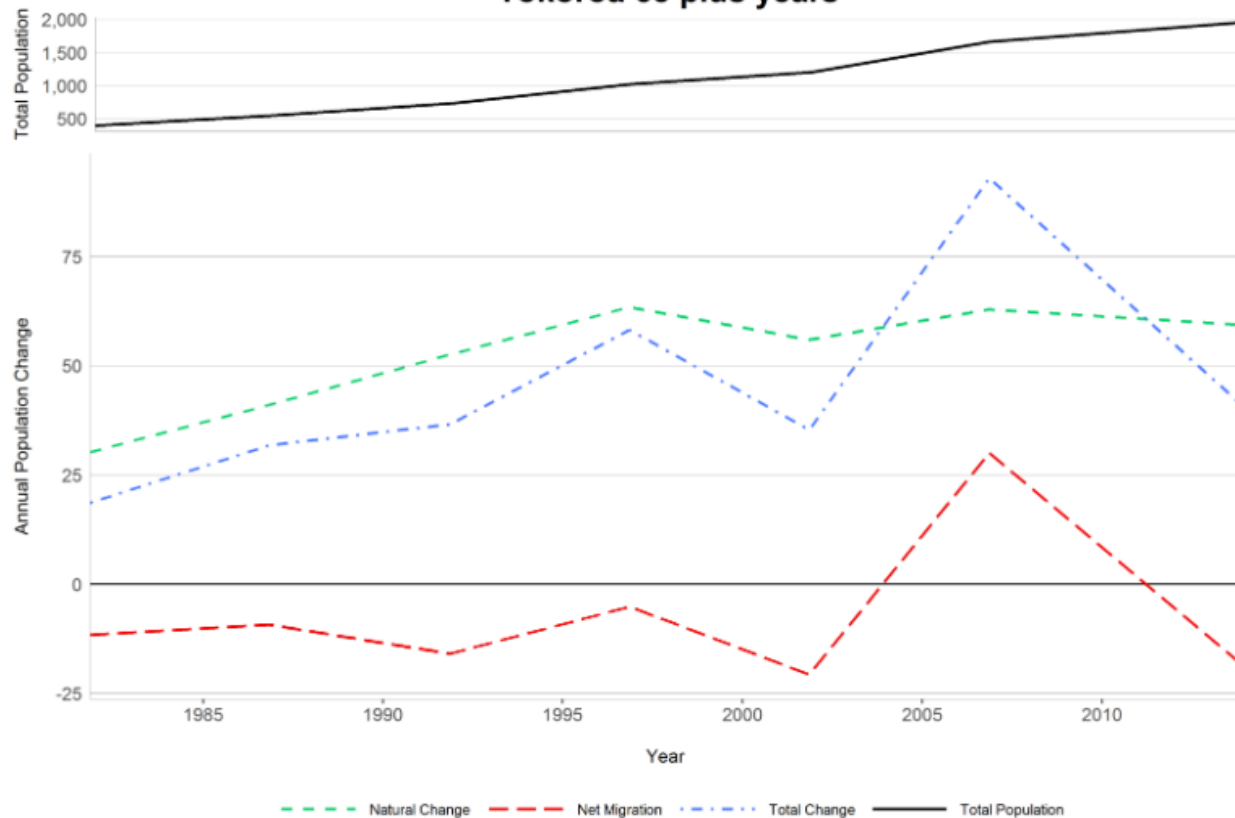
Choose Urban Place:

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- Twizel Community
- Upper Hutt Zone
- Waiheke Island
- Waihi Beach
- Waihi
- Waikouaiti
- Waimate
- Waiouru
- Waipawa

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Tokoroa 65 plus years



Urban Places



Population Trends and
Components of Change
(Numbers)

Choose Age Group/Total

65+ Years

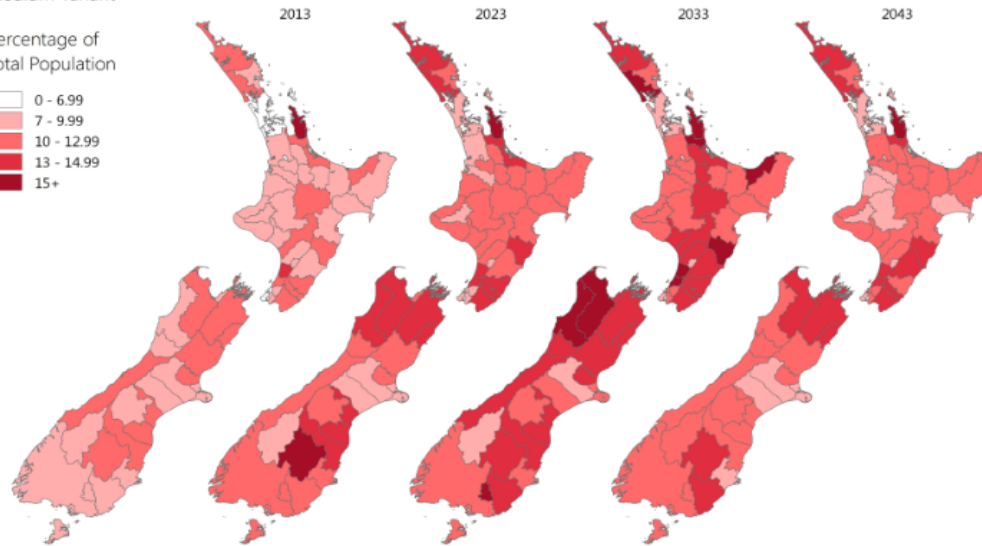
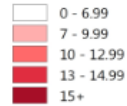
Choose Urban Place:

- Te Kauwhata
- Te Kuiti
- Te Puke Community
- Temuka
- Thames
- Timaru
- Tokoroa
- Turangi
- Twizel Community
- Upper Hutt Zone
- Waiheke Island
- Waihi Beach

Projected Percentage Aged 65-74 Years

Medium Variant

Percentage of Total Population



Source: Authors/Statistics New Zealand (2017) 2013(base)-2043 projection updates

Projected Population Share by Territorial Authority i

Variant

Low

Medium

High

Percent of Population

Up to 14 Years

15 to 24 Years

25 to 44 Years

45 to 54 Years

55 to 64 Years

65 to 74 Years

75+ Years

65+ Years

Working Age 20-69 Years

Ratios

75+ Years : 65-74 Years

Labour Market Entry : Exit

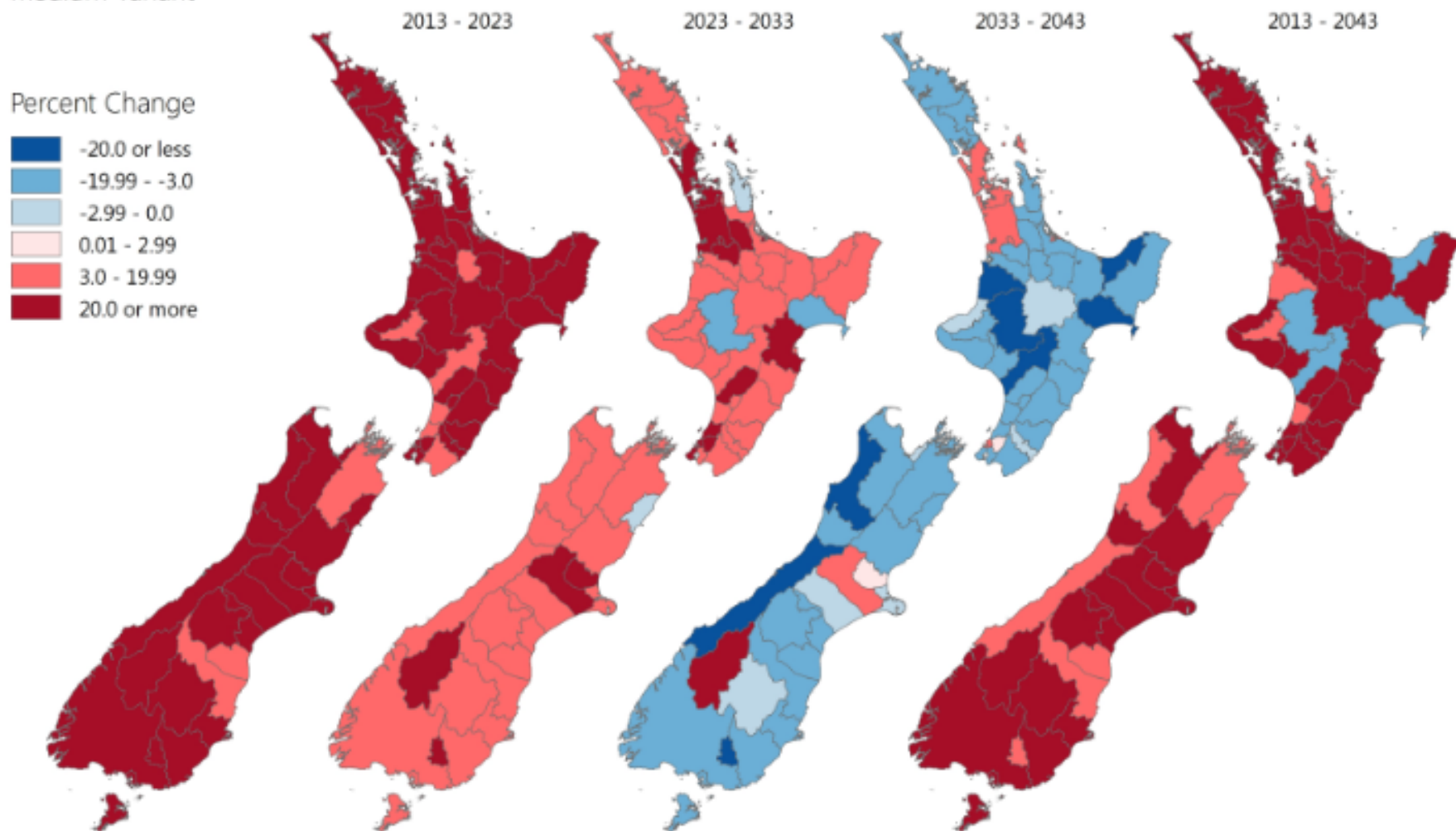
Senior : Child

[Go to Projected Percent Change](#)

These maps show the percentage of each Territorial Authority Area's (TA) population by broad age group, according to Statistics New Zealand's High, Medium and Low Variant assumptions (Statistics New Zealand 2017, 2013(base)-2043 Update; data for key functional age groups are also given (such as the ratio of people at the main labour market entry ages to those approaching 'exit' age). The different indices illustrate the general progression of *structural ageing* (the general shift from lower to higher proportions at older ages and from higher to lower proportions at younger ages): at the older ages, the colours deepen over time, while at younger ages they lighten, but in each case do so differently for each TA. However, the generally progressive nature of the trends can also be confusing to interpret, as they are not strictly linear. The differences by variant also require some thinking about. For example, under the high variant assumptions there are *lower* proportions at older ages (and slower structural ageing), reflecting the greater impact of higher birth rates and higher migration at younger ages, while under the low variant assumptions, proportions at older ages are greater (and structural ageing is accelerated), reflecting the opposite (lower birth rates and migration at the younger ages). See i for additional detail and important methodological notes

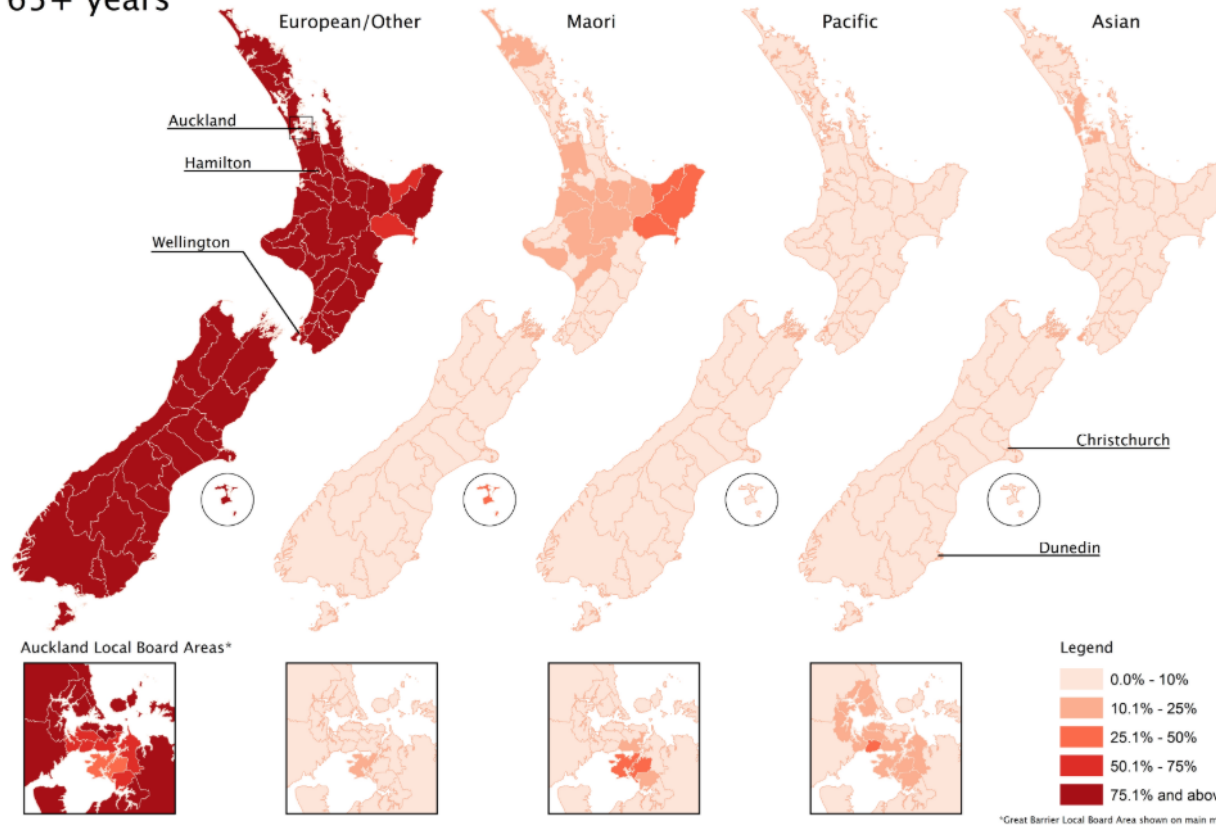
Projected Change in Percentage Aged 65-74 Years

Medium Variant



Source: Authors/Statistics New Zealand (2017) 2013(base)-2043 projection updates

Major ethnic group percent share by age group, 2013 65+ years



Population Share (%) by Major Ethnic Group

2013 and Projected

2013

Previous Year

Projected

Age Share

- 0-14 years
- 15-24 years
- 25-39 years
- 40-54 years
- 55-64 years
- 65+ years

Ethnic Share

- Asian
- European
- Maori
- Pacific

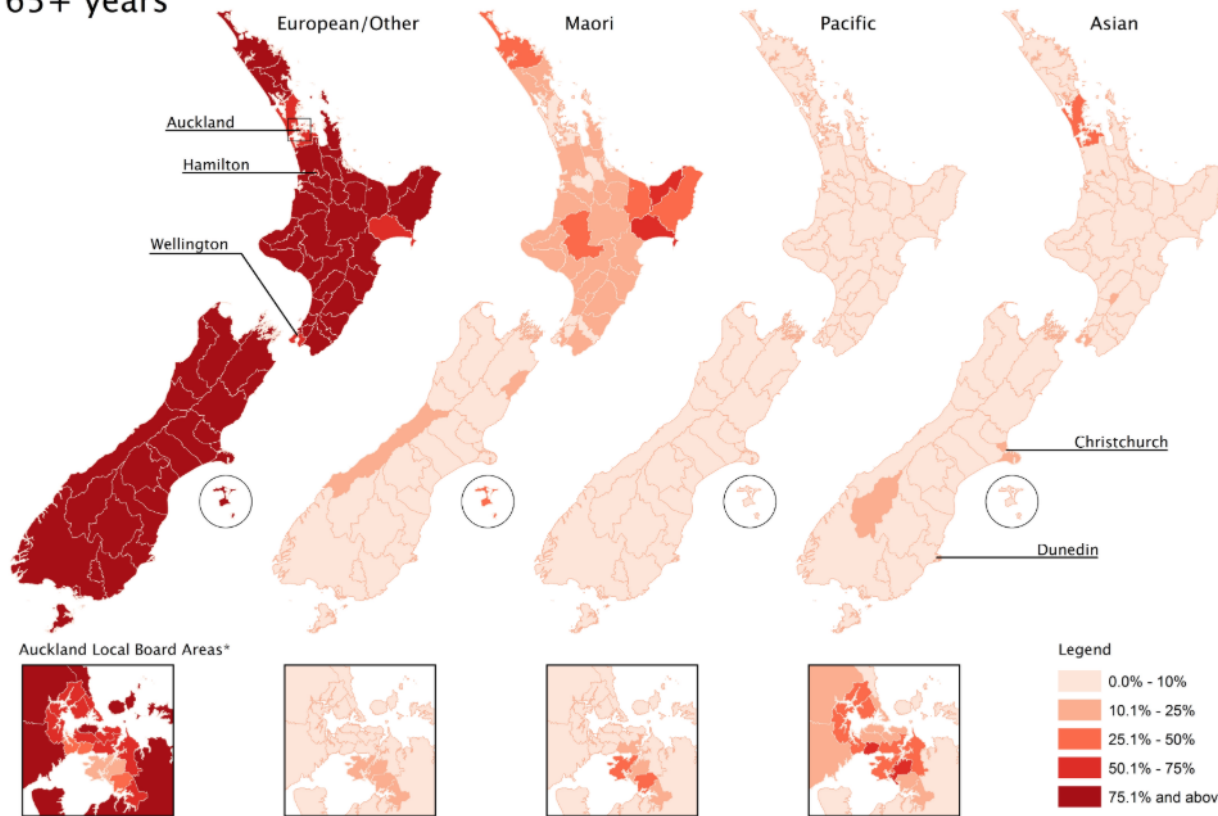
Ethnic Overcount

- 2013
- 2023
- 2038

The **share by age** maps show the percentage of each age group accounted for by each ethnic group. The **ethnic share** maps show the percentage of the total population accounted for by each ethnic group. The **ethnic overcount** maps show the extent to which **ethnic group responses** for each broad age group and each area exceed **head count** (that is, the extent to which people are counted into more than one ethnic group). Notably, the lower the age group, the higher the ethnic overcount, and vice-versa, reflecting increasing levels of intermarriage and partnering over time.

These data have been drawn from Statistics New Zealand NZStat (Subnational ethnic population projections 2013(base)-2038, medium variant) and converted for visualisation by the CaDDANZ Population Atlas research team.

Major ethnic group percent share by age group, 2038 65+ years



Population Share (%) by Major Ethnic Group



2013 and Projected

2038

Previous Year | Projected

Age Share

- 0-14 years
- 15-24 years
- 25-39 years
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- 65+ years

Ethnic Share

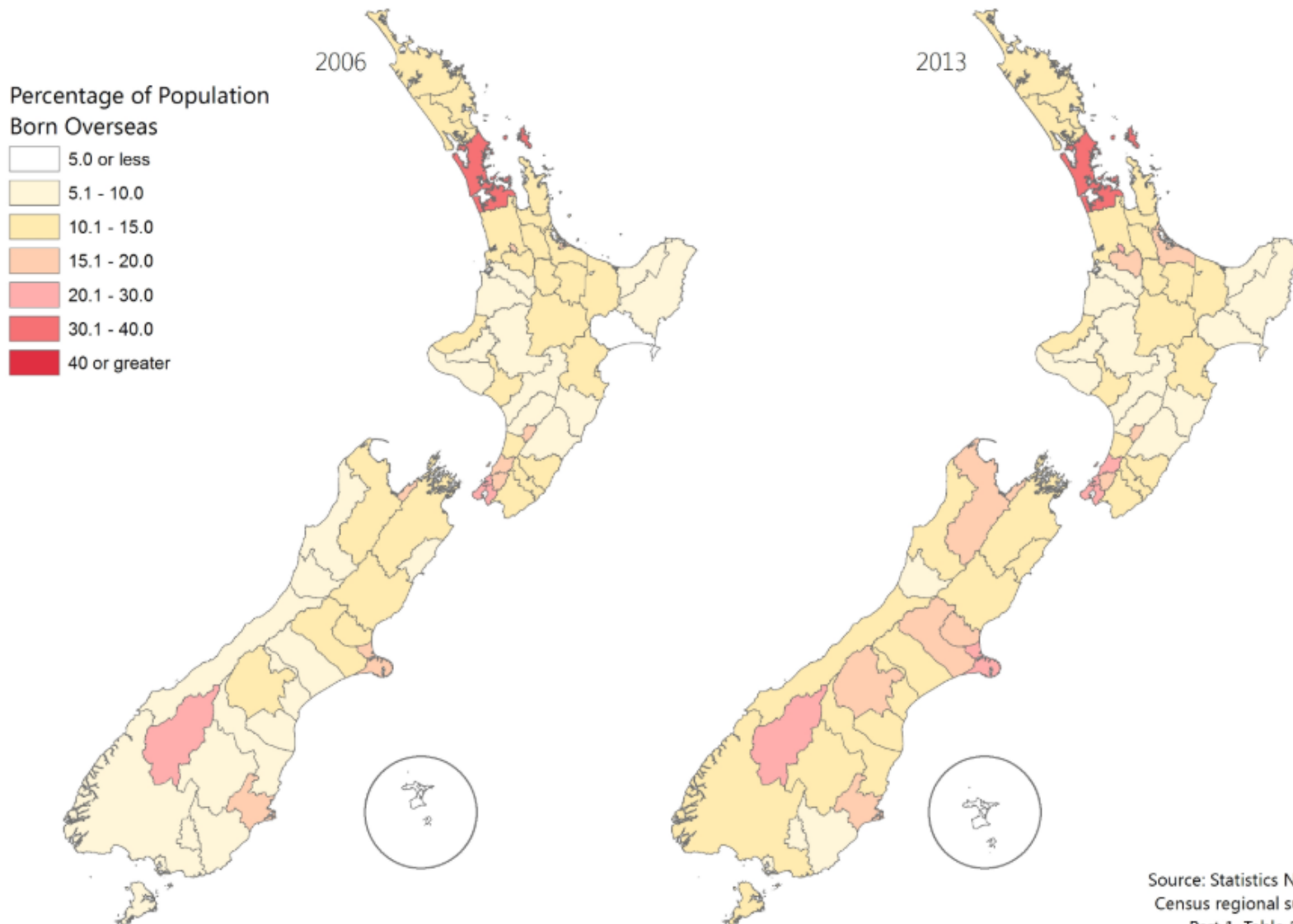
- Asian
- European
- Maori
- Pacific

Ethnic Overcount

- 2013
- 2023
- 2038

Percentage of Population Born Overseas

Usually resident population, 2006 and 2013, by Territorial Authority Area



Source: Statistics New Zealand 2013
Census regional summary tables –
Part 1, Table 1 and Table 2

There are many more maps, graphs and explanations in the NZ Population Change Atlas

NZ Population Change Atlas :

- Demonstrates an alternative form of mapping population data, which involves careful consideration of the needs of both demographic and cartographic communication principles, and end-usage.**
- Promotes the importance of having a narrative accompany the maps in order to assist users understand the story the data are telling.**
- Shows that making sense of data may also require social and historical context, which cannot be so readily auto-manufactured using online map servers.**

www. socialatlas.waikato.ac.nz

Thank You

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