

# **Making Population Data Usable by Non-Statisticians:**

**Novel tools for reducing the skill barriers to using population statistics**

**Population Association of NZ Conference  
20 June 2019.**

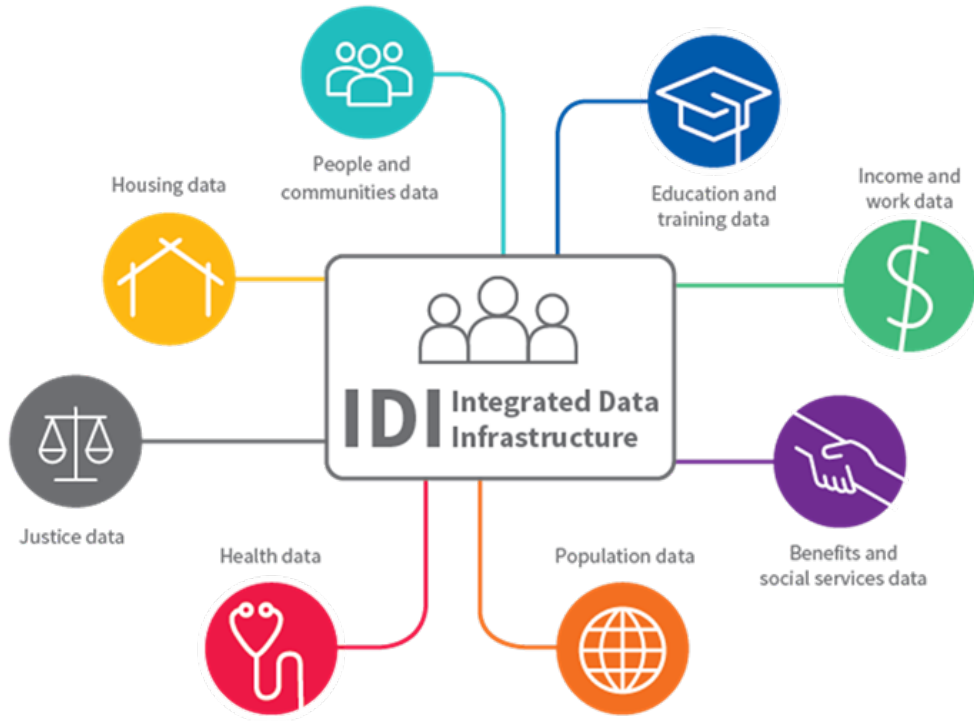
**Andrew  
Sporle  
Daniel  
Bennett**



**THE UNIVERSITY OF  
AUCKLAND**  
Te Whare Wānanga o Tāmaki Makaurau  
NEW ZEALAND

**SCIENCE**  
DEPARTMENT OF STATISTICS

# The Problem



Statistical resources are increasingly complex and decreasingly accessible

Awareness of data value

Demand for access to data

High technical barriers to access

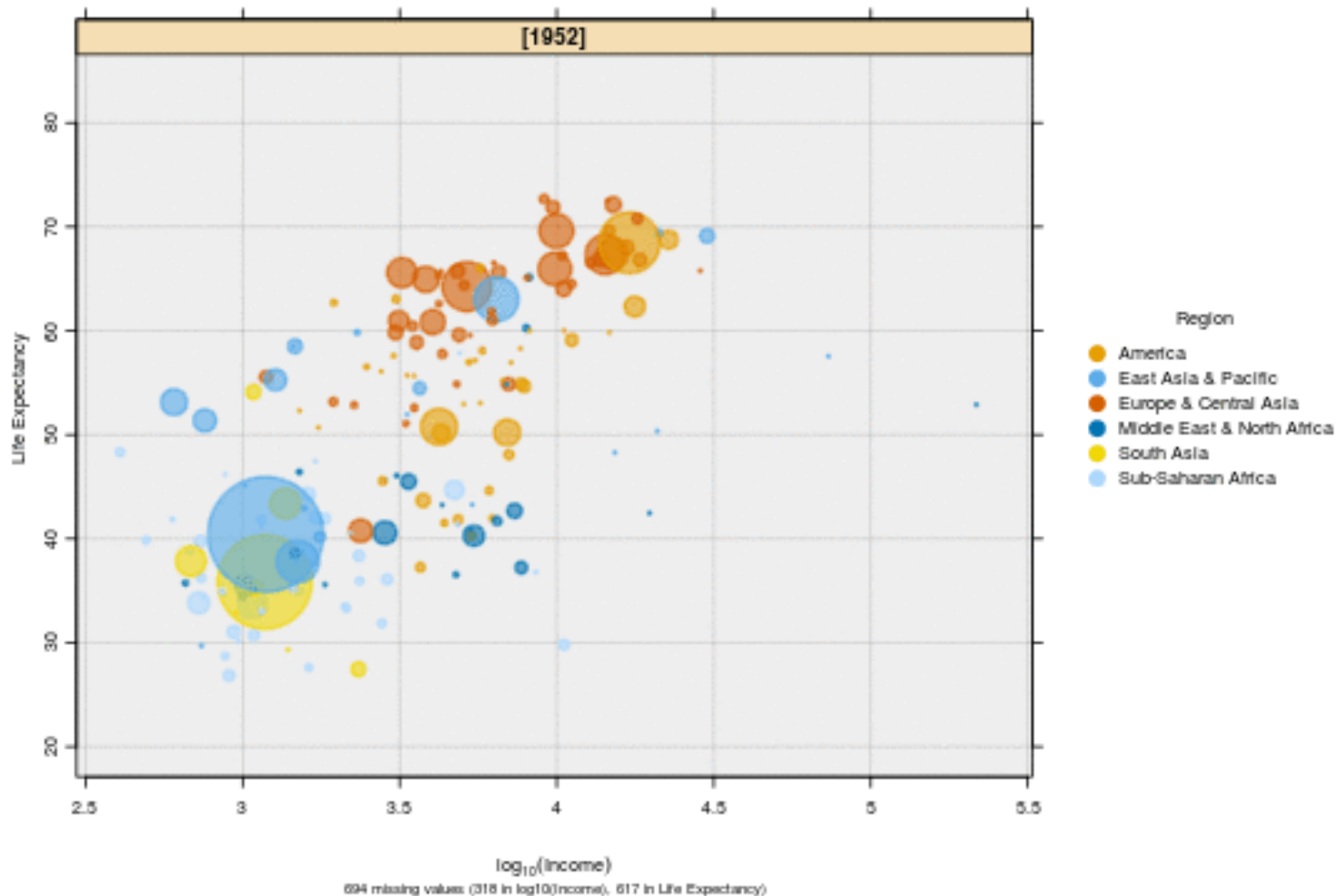
Are data relevant to informing local solutions?

Are official statistics **for us** or **about us**?

# iNZight – a freeware statistics analyser

[Get iNZight](#)[User Guides](#)[Support](#)[About](#)[Related](#)

Life Expectancy versus  $\log_{10}(\text{Income})$  subset by Year\_cat (size proportional to Populationtotal)



Looking for assistance?

[Tweet to @iNZightUoA](#)[chat](#) [on gitter](#)

Download Now

For Windows, Mac, and Linux

Latest Version: 3.3.1 ([what's new?](#))

Release Date: 10 September 2018

Price: 100% Free!

On a Tablet? Try our online version:

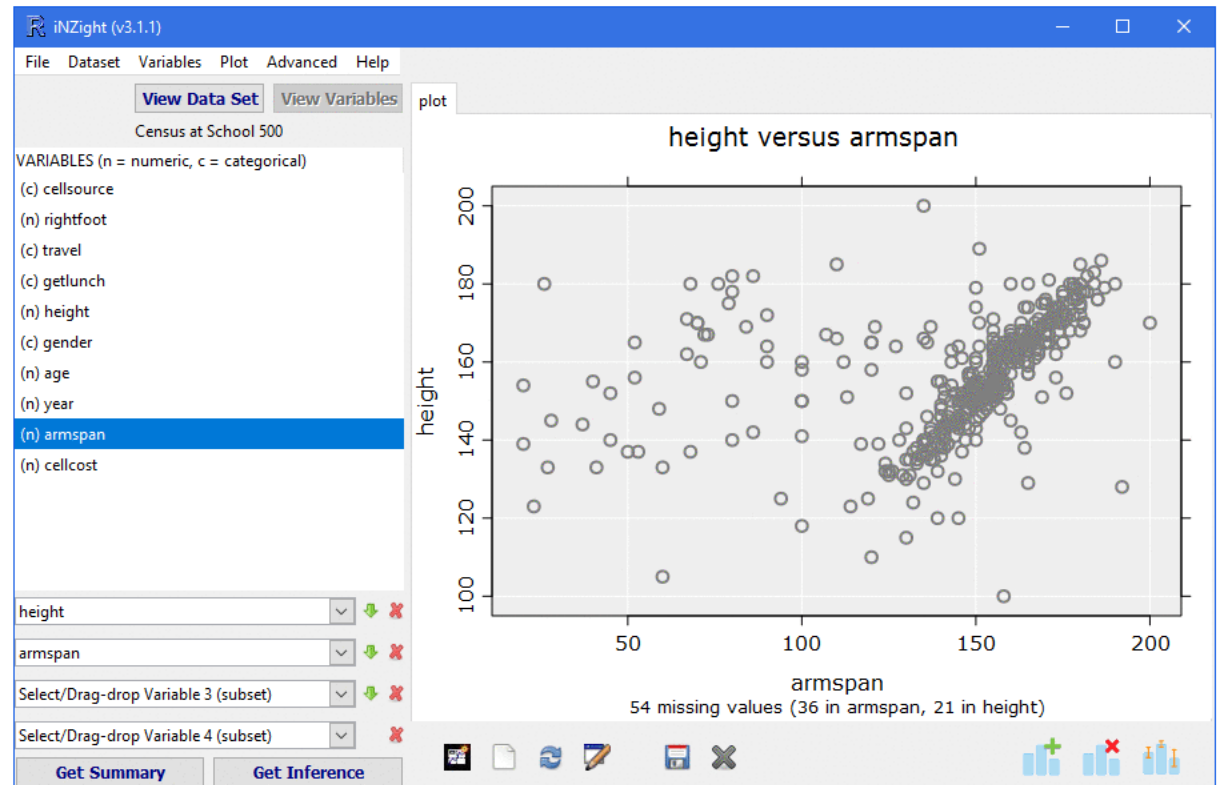
[iNZight Lite](#)

# Graph-driven analysis:

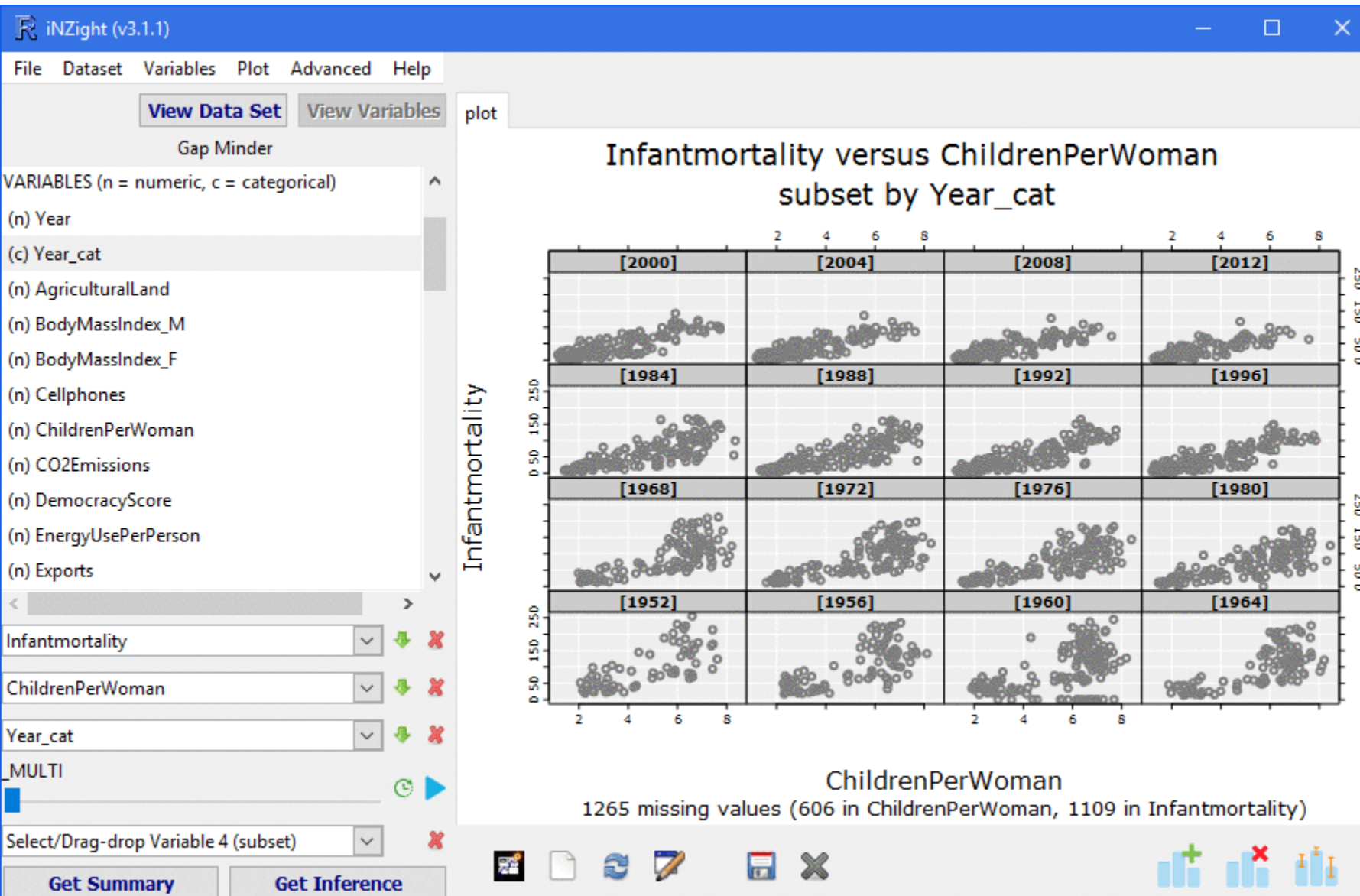
See **inZight** in action below ...

**inZight** intelligently draws the appropriate graph depending on the variables you choose

The quick drag-and-drop interface makes it easy to create graphs of your data. **inZight** automatically detects the variable type as either numeric or categorical, and draws a dot plot, scatter plot, or bar chart.



# Drag and drop selection:



Uploads data

R packages embedded

Drag and drop selection

Intuitive analysis

# Works on multiple formats:

Choose your operating system



Windows



Mac



Linux

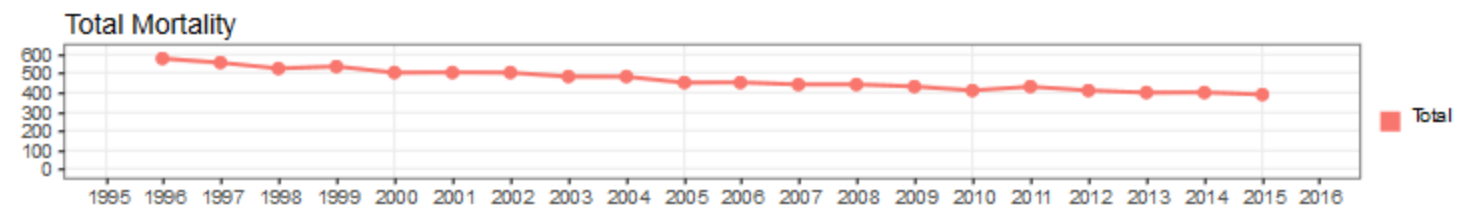
# Mātau: point and click outcome visualisation

- Region** ▼  
*New Zealand (National)*
- Total Mortality** ▼  
*Total Mortality over 1 population*
- Epidemiology** ▼  
*Using WHO standard population and Keyfitz confidence intervals*
- Total** ▼  
*Ethnicity: Total, Sex: Total*

## Total Mortality in New Zealand



Population 1:  
Ethnicity: Total  
Sex: Total




## Region

*New Zealand (National)*

### Country

New Zealand 

### Geographic Region

National 

## Total Mortality

*Total Mortality over 1 population*

## Epidemiology

*Using WHO standard population and Keyfitz  
confidence intervals*

## Total

*Ethnicity: Total, Sex: Total*

# Works for national and sub-national data

### Country

New Zealand 

### Geographic Region

National 

National

Regional Councils

Territorial Authorities

District Health Boards

Rohe

## 💡 Total Mortality ▲

*Total Mortality over 1 population*

Issue of interest

Total Mortality ▼

Number of populations

1 2 3 4

Year range

1996 2015

1996 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015

Age Groups

Total ▼

Select an option to increase precision



None ▼

## Select


- Outcome of interest
- Number of populations
- Year range
- Age groups
- Aggregations for precision

**All pull down menus or sliders**

# Robust epidemiological methods:


 **Epidemiology** 


*Using WHO standard population and Keyfitz confidence intervals*

Age standard type 

External  Internal

External age standard

WHO 



Confidence intervals to calculate 

Keyfitz  Gamma 1  Gamma 2

## Epidemiology methods

- Internal / external standardisation
- External standard
- Internal reference population
- Confidence interval method

**Hidden behind pull down menus**

 **Region** 



*New Zealand (National)*

 **Total Mortality** 

*Total Mortality over 1 population*

 **Epidemiology** 

*Using WHO standard population and Keyfitz  
confidence intervals*

 **Total** 

*Ethnicity: Total, Sex: Total*

**Ethnicity**

Total 

**Sex**

Total 

## Population by

- Ethnicity
- Gender
- Age group(s)

# Multiple presentation pages:

Population Data Visualiser

SUMMARY

RESULTS

RATES

RATE DIFFERENCE

RATE RATIO

DOWNLOAD

?

Select an option to increase precision

None

Epidemiology

Using WHO standard population and Keyfitz confidence intervals

Non-Maori Total (Baseline)

Ethnicity: Non-Maori, Sex: Total

Maori Total

Ethnicity: Maori, Sex: Total

Ethnicity

Maori

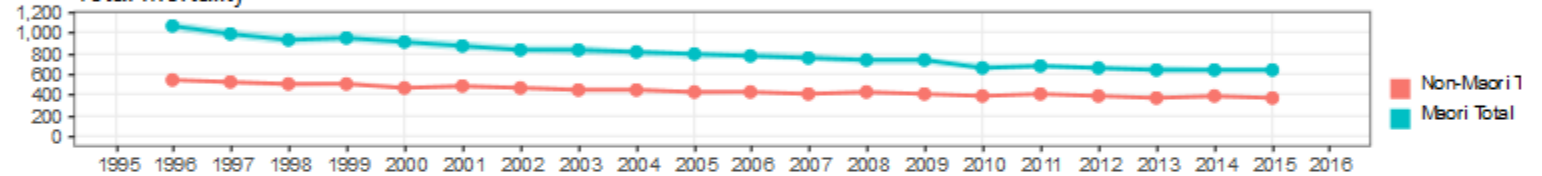
Sex

Total

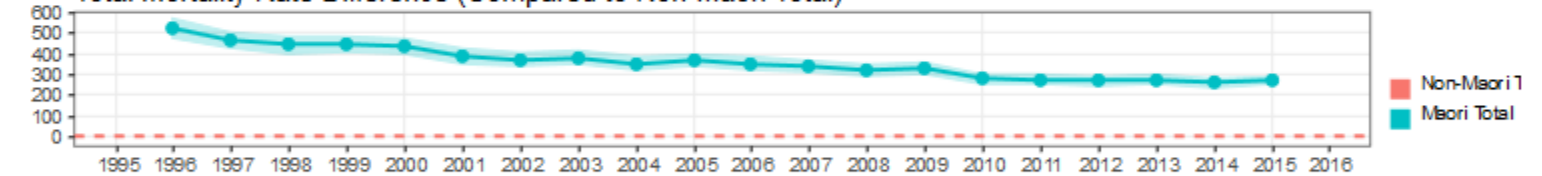
## Total Mortality in New Zealand

Population 1: Ethnicity: Non-Maori, Sex: Total  
Population 2: Ethnicity: Maori, Sex: Total

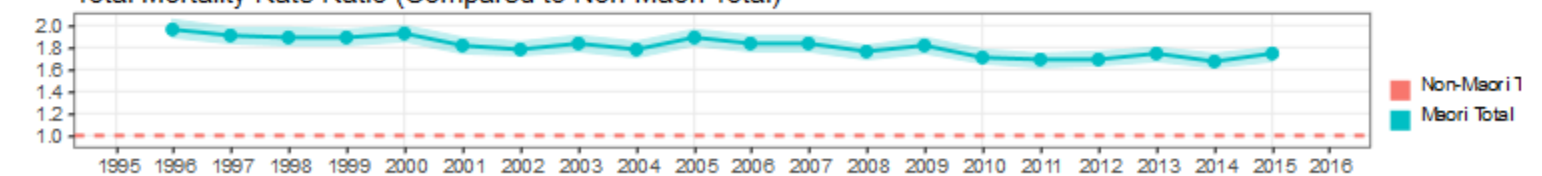
Total Mortality



Total Mortality Rate Difference (Compared to Non-Maori Total)



Total Mortality Rate Ratio (Compared to Non-Maori Total)



# Multiple graph outputs:

Select an option to increase precision  
None

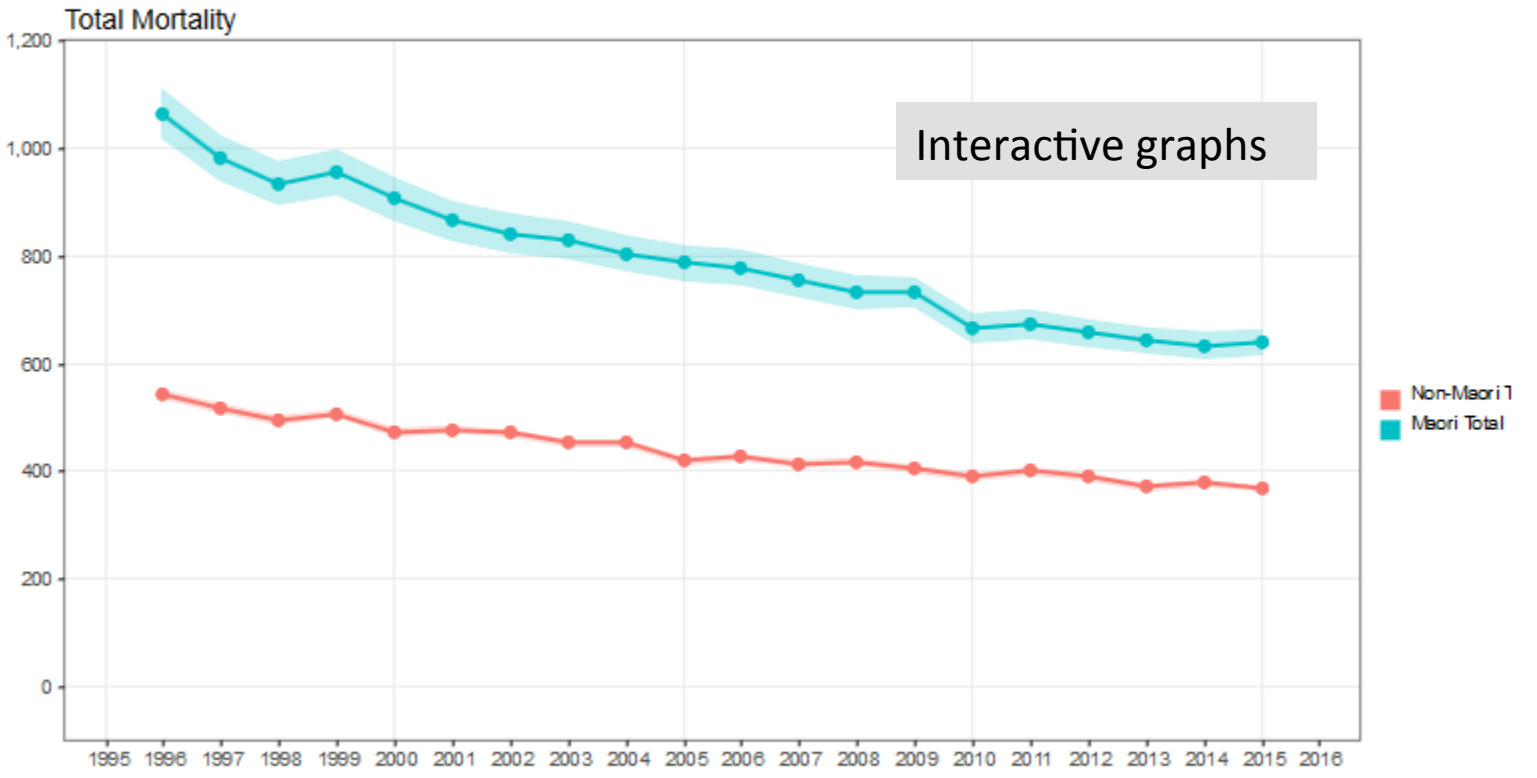
**Epidemiology**   
*Using WHO standard population and Keyfitz confidence intervals*

**Non-Maori Total (Baseline)**   
*Ethnicity: Non-Maori, Sex: Total*






**Maori Total**   
*Ethnicity: Maori, Sex: Total*

**Ethnicity**  
Maori

**Sex**  
Total



# All results are exportable:

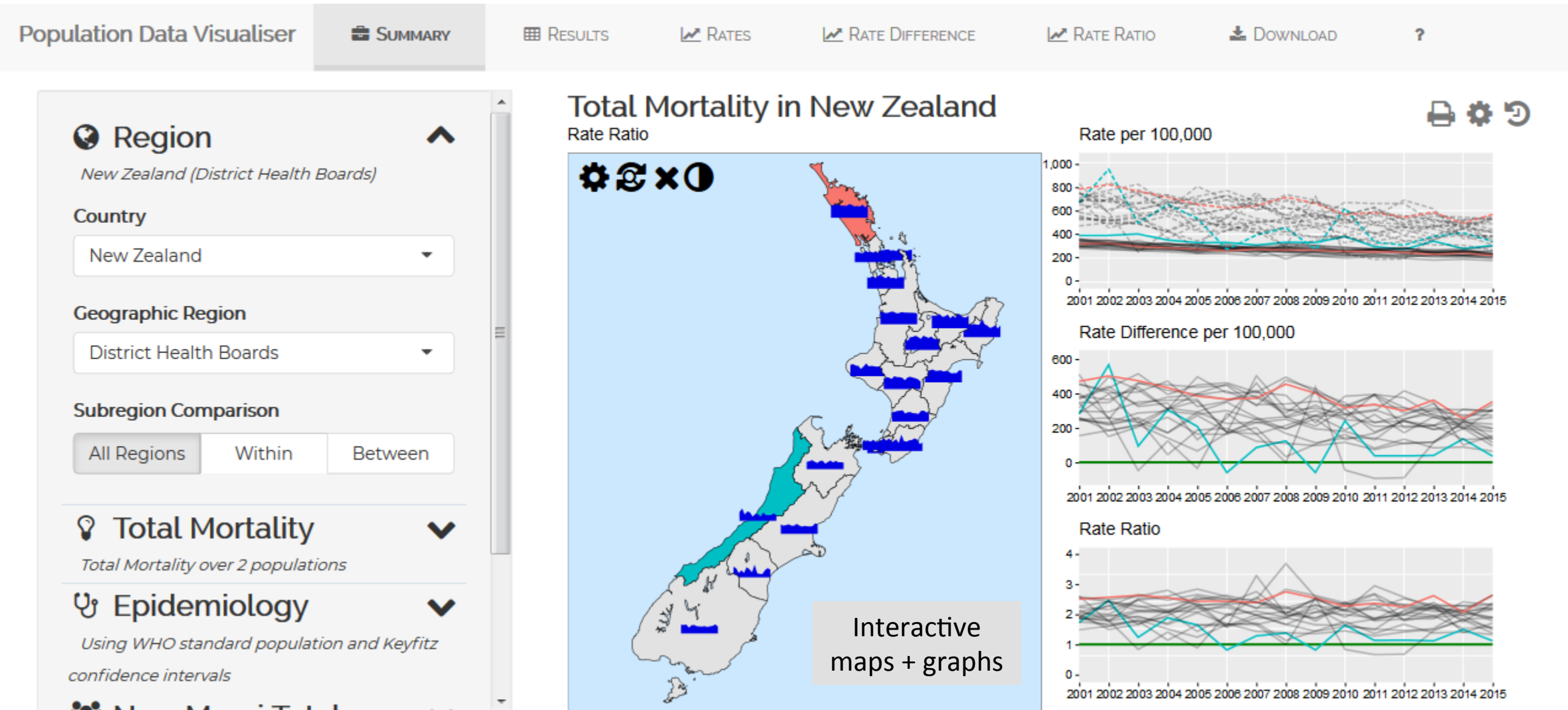
- Region**   
*New Zealand (National)*
- Total Mortality**   
*Total Mortality over 2 populations*
- Epidemiology**   
*Using WHO standard population and Keyfitz confidence intervals*
- Non-Maori Total (Baseline)**   
*Ethnicity: Non-Maori, Sex: Total*
- Maori Total**   
*Ethnicity: Maori, Sex: Total*

- Results table
- Rate per 100,000 plot
- Rate difference plot
- Rate ratio plot
- All result tables and plots

-  CSV
-  PDF  JPG
-  PDF  JPG
-  PDF  JPG
-  ZIP

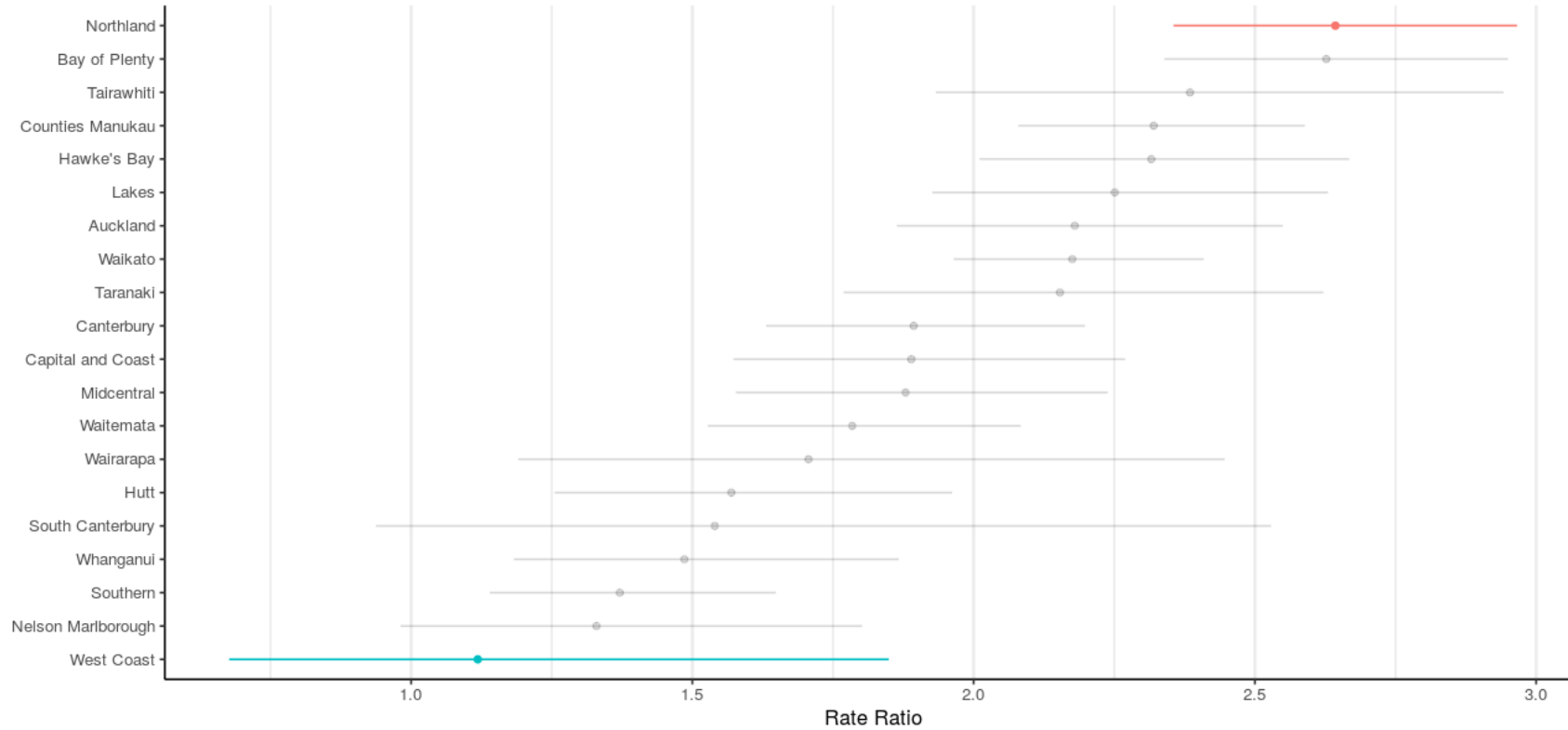
Results in operable data file

# Interactive regional maps:



# Simple Visual Comparisons:

Last Year Ranking - Rate Ratio



# Even works with Australian data 1:

Population Data Visualiser

SUMMARY

RESULTS

RATES

RATE DIFFERENCE

RATE RATIO

DOWNLOAD

?

## Total Female (Baseline)

Ethnicity: Total, Sex: Female

Ethnicity

Total

Sex

Female

## Total Male

Ethnicity: Total, Sex: Male

Ethnicity

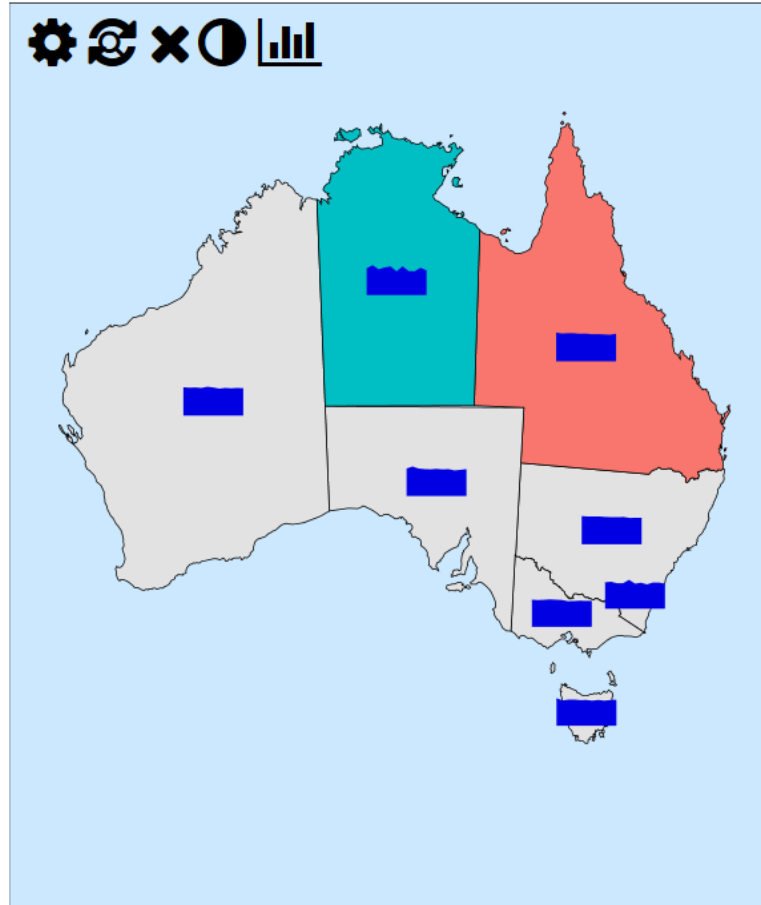
Total

Sex

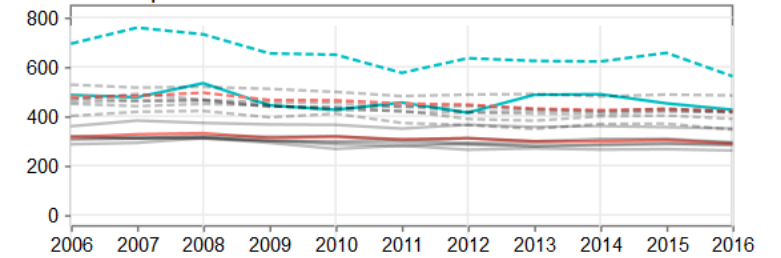
Male

## Total Mortality in Australia

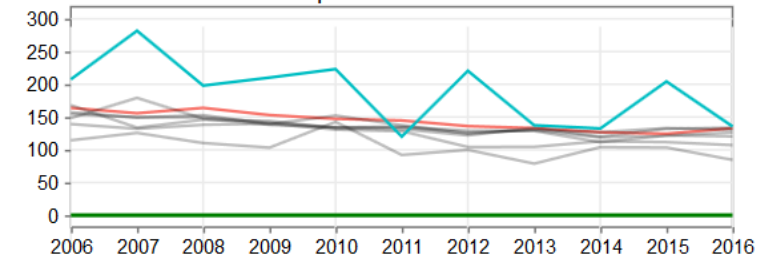
Rate Ratio



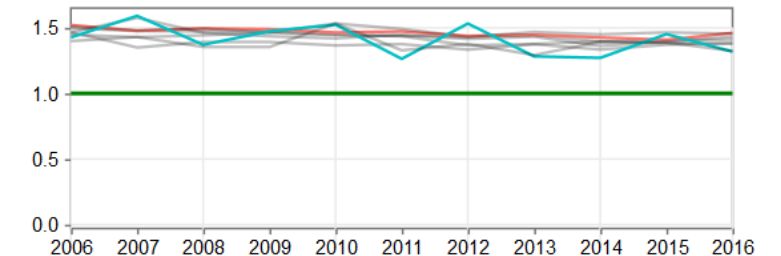
Rate per 100,000



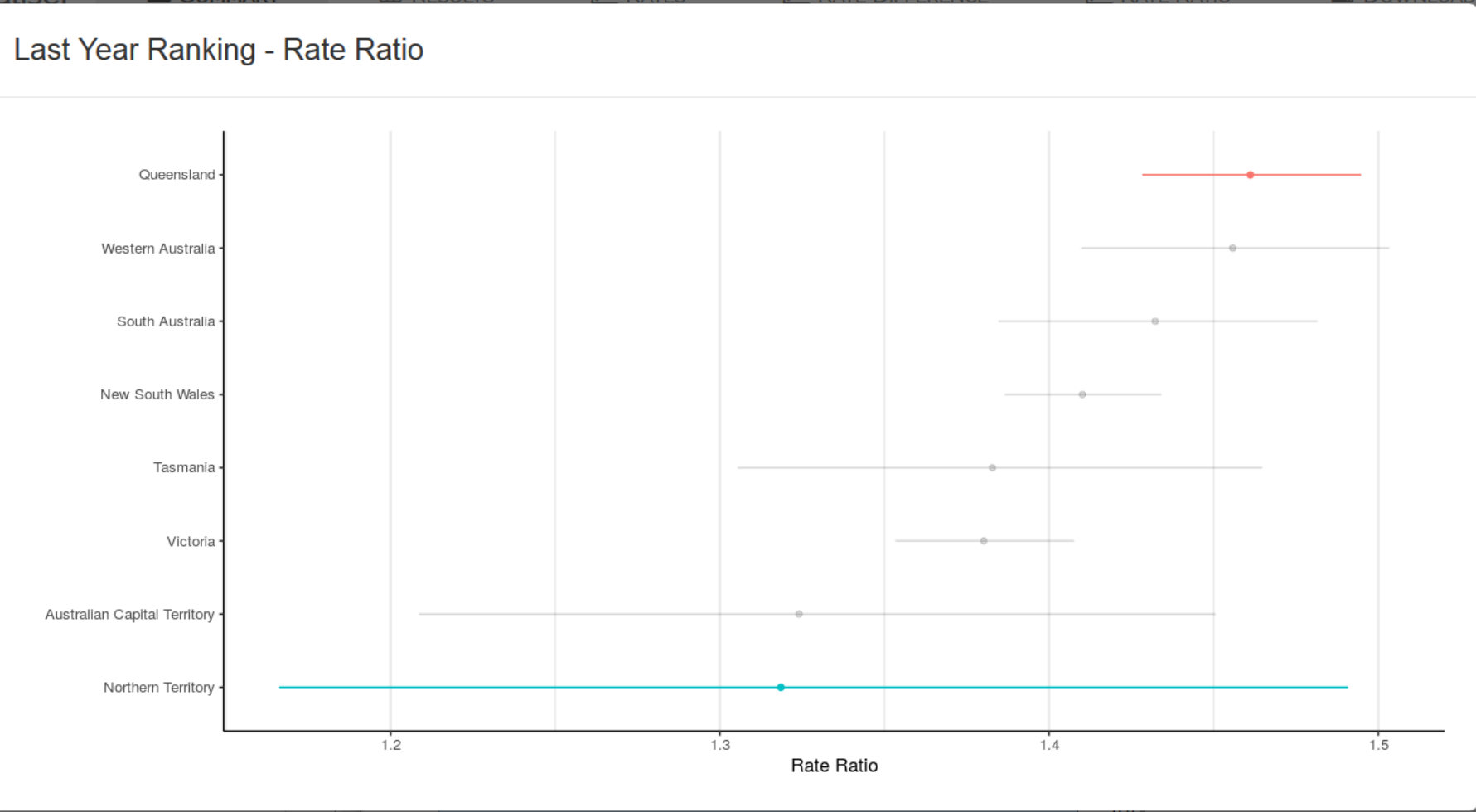
Rate Difference per 100,000



Rate Ratio



# Even works with Australian data 2:



Total Female  
(Baseline)

Ethnicity: Total, Sex

Ethnicity

Total

Sex

Female

Total Male

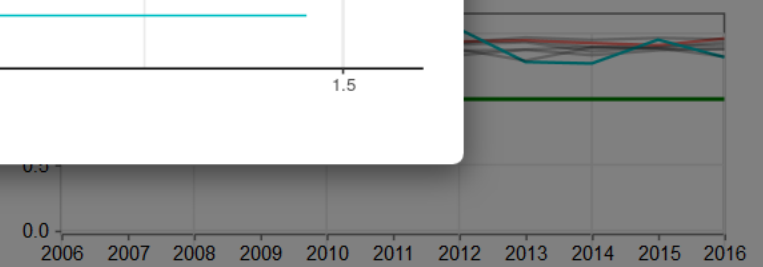
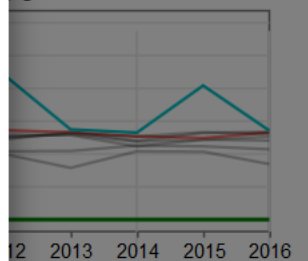
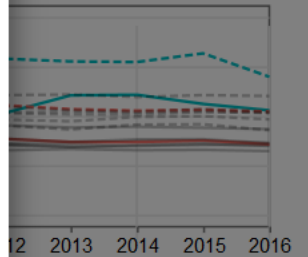
Ethnicity: Total, Sex

Ethnicity

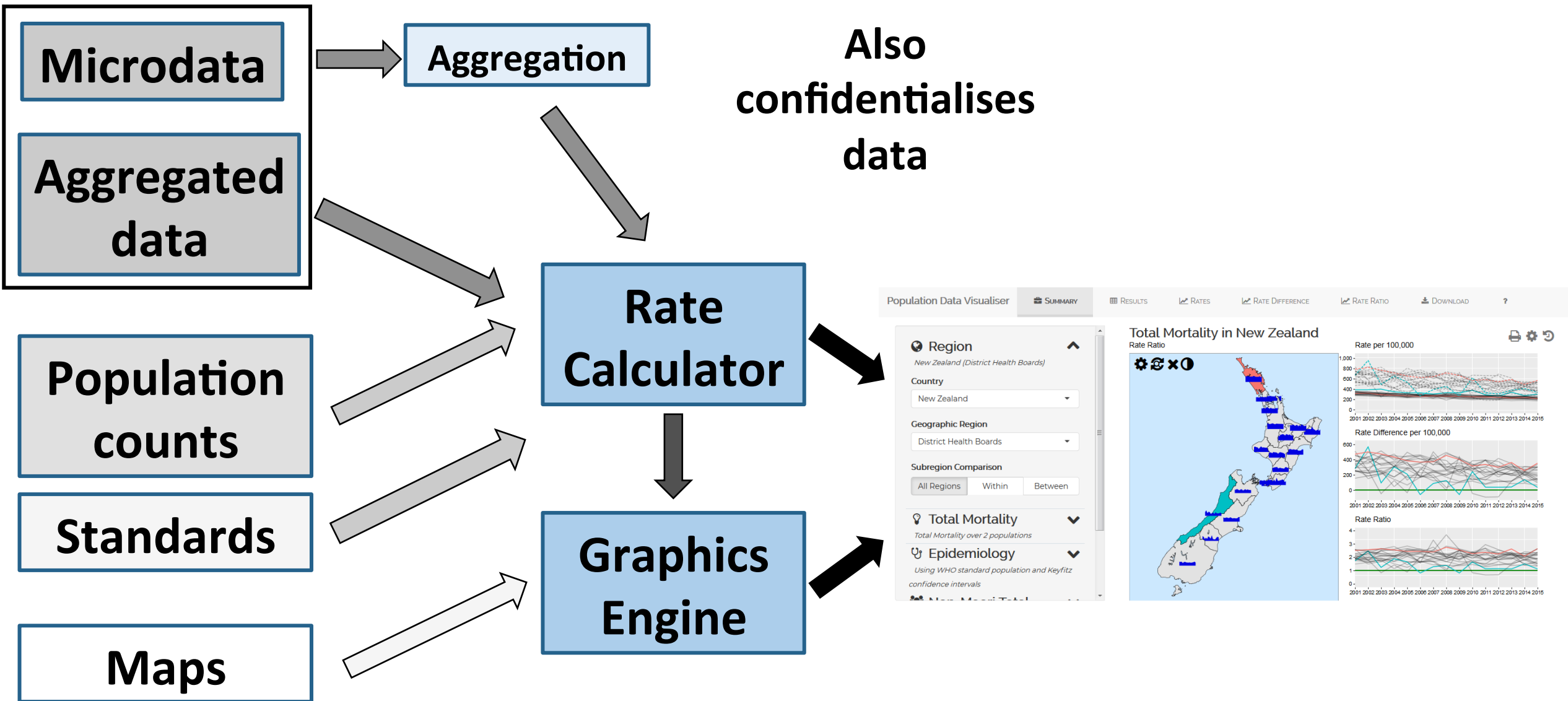
Total

Sex

Male



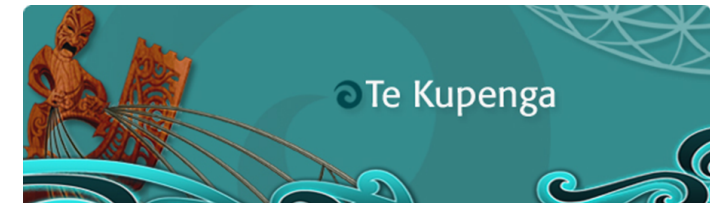
# Process:



# Next steps:



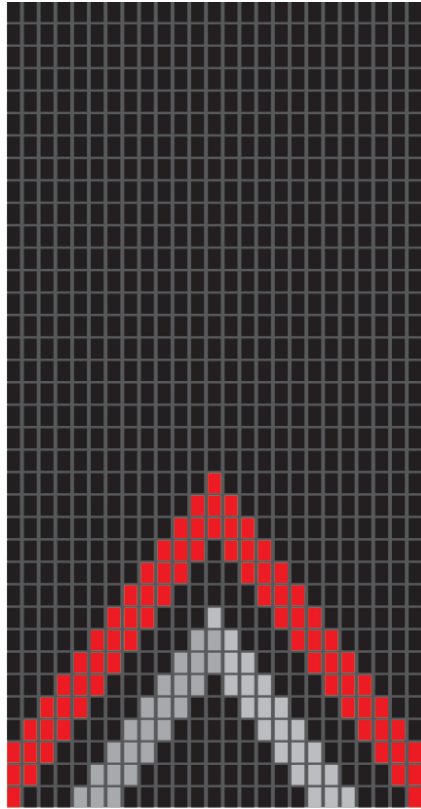
data explorer tool with enhanced graphics, time series and mapping capability



mātau

Scoping potential for national health statistics





# TE MANA RARAUNGA

Māori Data Sovereignty Network

**Advocating for the development of capacity and capability across the Māori data ecosystem including:**

- Data rights and interests
- Data governance
- Data storage and security
- Data access and control

<https://www.temanararaunga.maori.nz/>

# More Information:



## Download:

[www.stat.auckland.ac.nz/~wild/iNZight/](http://www.stat.auckland.ac.nz/~wild/iNZight/)

## Applications:

Prof. Chris Wild     [c.wild@auckland.ac.nz](mailto:c.wild@auckland.ac.nz)

mātau

## Download:

Publication pending

## Applications:

Andrew Sporle     [a.sporle@auckland.ac.nz](mailto:a.sporle@auckland.ac.nz)



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