

Interactive Web Tools Exploring the Effect of Changes to Census Counts

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Background

- Significantly different counts for Census 2018
 - lower response rates
 - higher coverage
- Both scenarios likely to disproportionately affect Māori
- Census data is crucial for many areas
 - Healthcare funding and assessment
 - Electorate allocation
 - Research by government, iwi, universities, etc.
- Consequences of changes are not easily determined



Idea: Publicly-available Interactive Tools

Calculate effect of Census count changes

- Age-standardised rates
- Electoral allocation

Benefits include:

- Fast iteration over scenarios
- Lower risk of miscalculations
- Low barrier of entry



Implementation

- Interactive web-based tools based on:
 - 2013 Census
 - NZ.Stat datasets
 - Mortality dataset

Only require a web browser

Results update immediately

Dynamic graphics

Exportable reports

Easily updatable



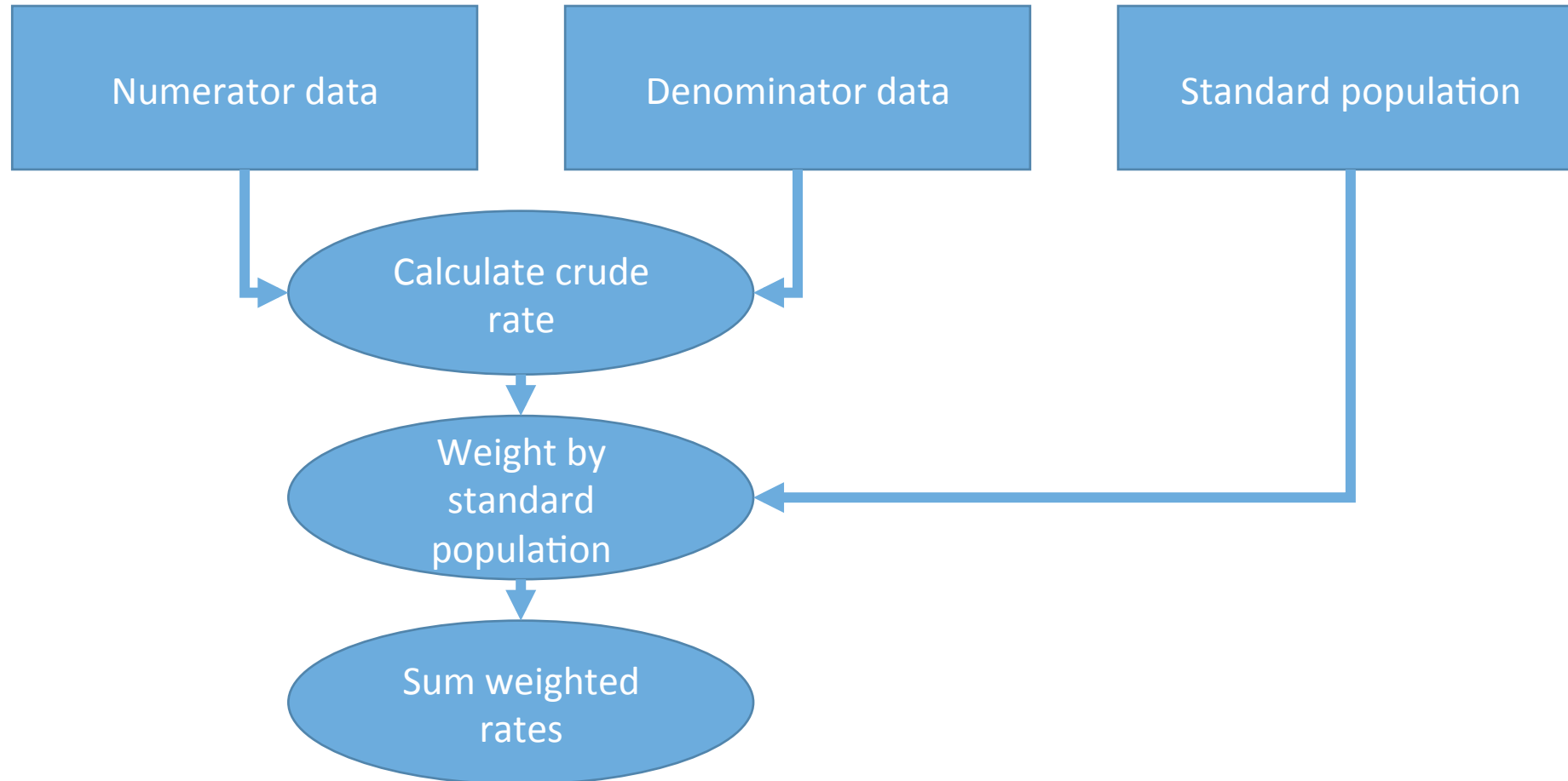
Age-Standardised Rates (ASRs)



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Calculation



Adjusting Inputs

User-adjustable table of response rates by ethnicity and sex

☰ Response Rate Adjustment

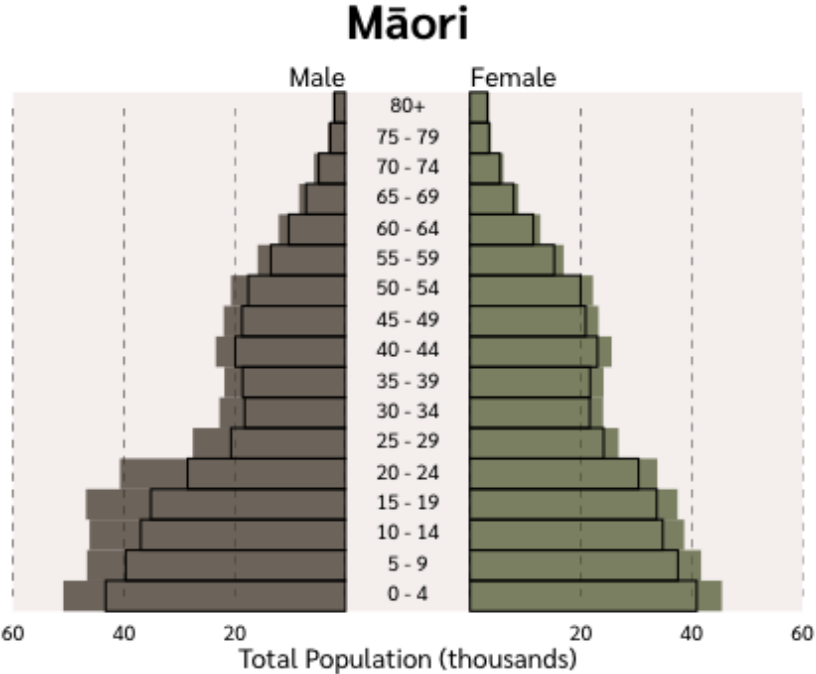
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39
Māori									
Male	82%	85%	85%	80%	75%	70%	75%	80%	85%
Female	90%	90%	90%	90%	90%	90%	90%	90%	90%
Non-Māori									
Male	92%	92%	92%	92%	92%	92%	92%	92%	92%
Female	97%	97%	97%	97%	97%	97%	97%	97%	97%

Adjustable over all age groups or individual age groups

Dynamic population pyramids

Percents
 Counts

Adjusted Population
 Original Population

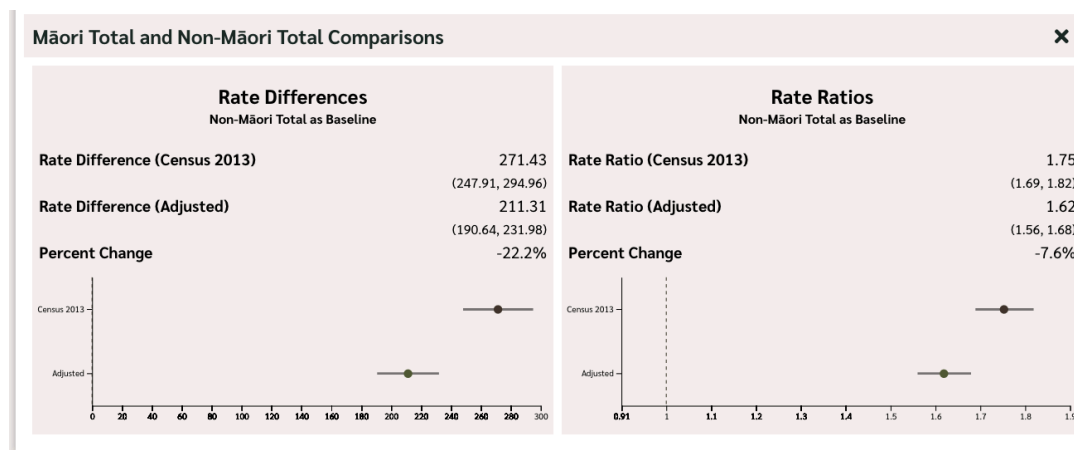
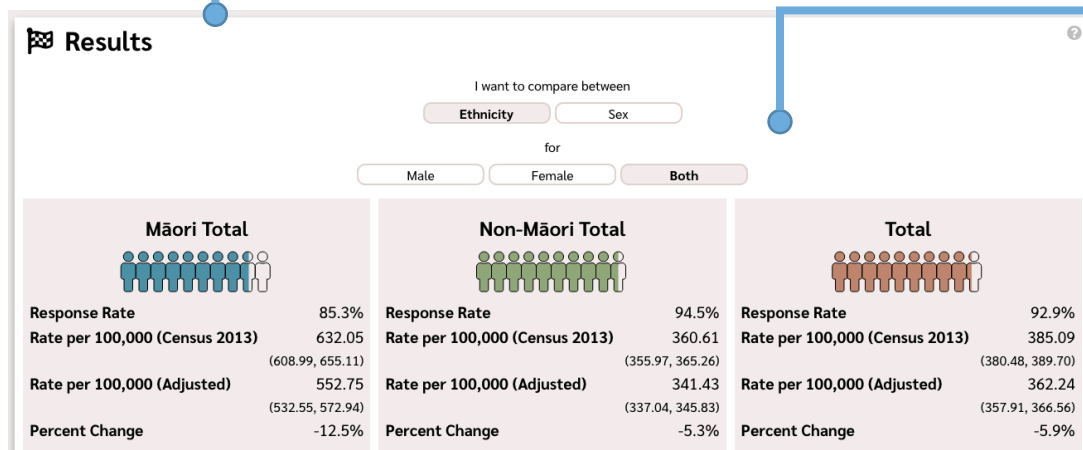


Results

Automatically updates as table is changed

Choice between each pairwise comparison

Pairwise comparison using rate differences/ratios



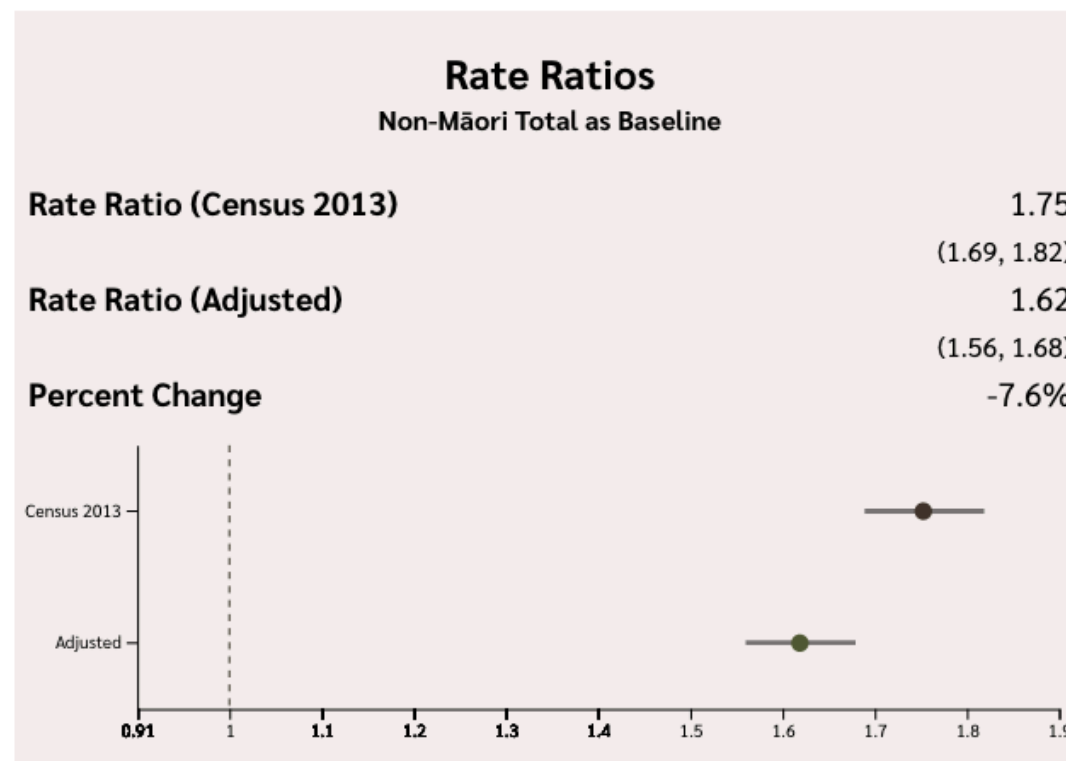
Results for both original and adjusted counts

Dynamic plots update as results change



Findings

Small changes can produce significant differences in rates



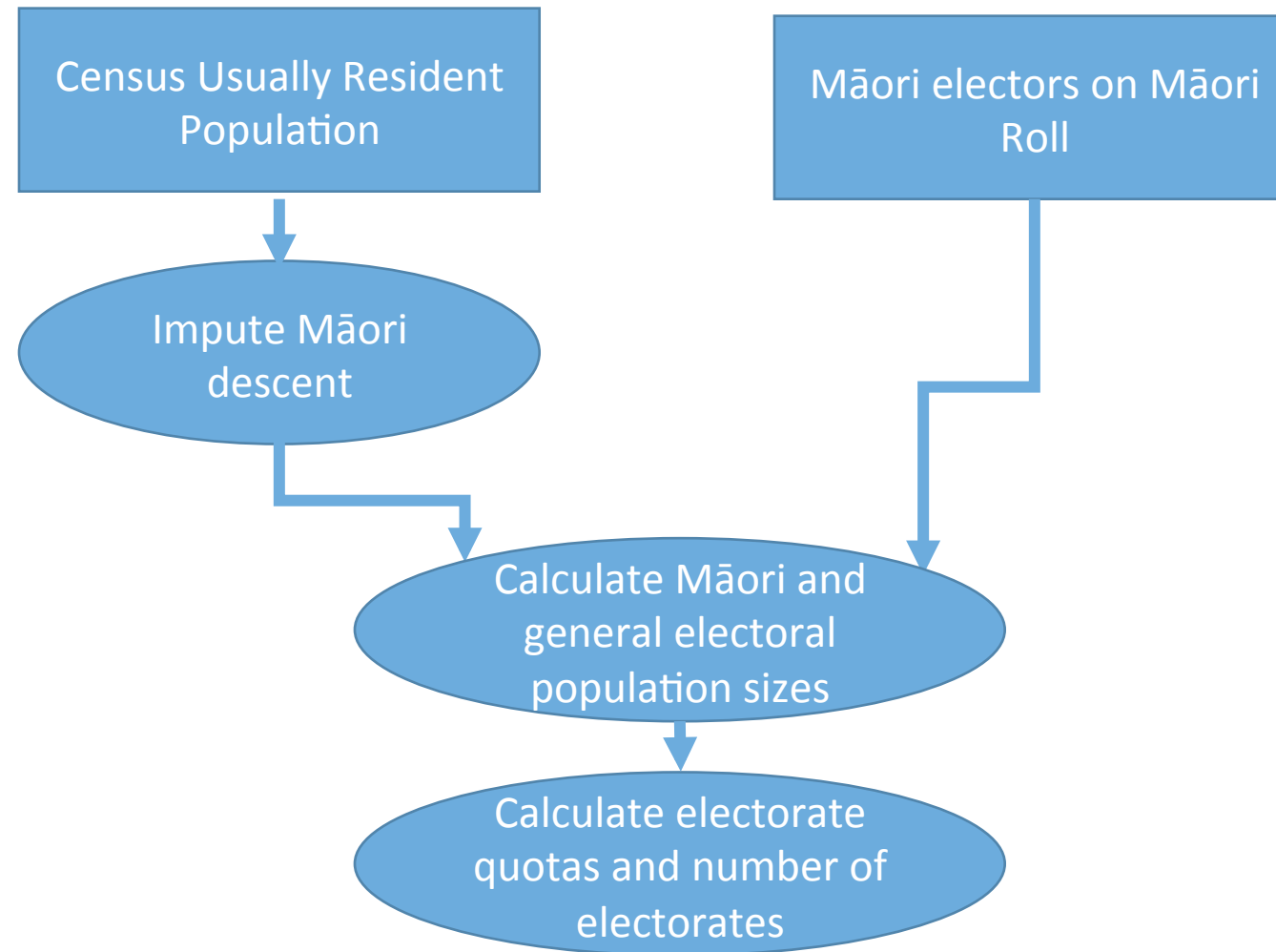
Electorate Allocation



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Calculating Electorates



Adjusting Inputs

Separate adjustment inputs for each island

Adjustments in both directions

Adjustment table region ?

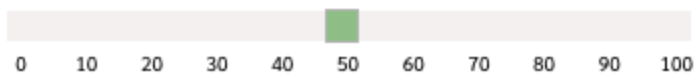
North Island
 South Island
 Chatham Islands

Adjustment type ?

Census Undercount
 Population Undercount

	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64
Māori														
Male	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Female	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Non-Māori														
Male	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Female	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Percent of Māori on Māori Electoral Roll



49%

Slider for Māori Option



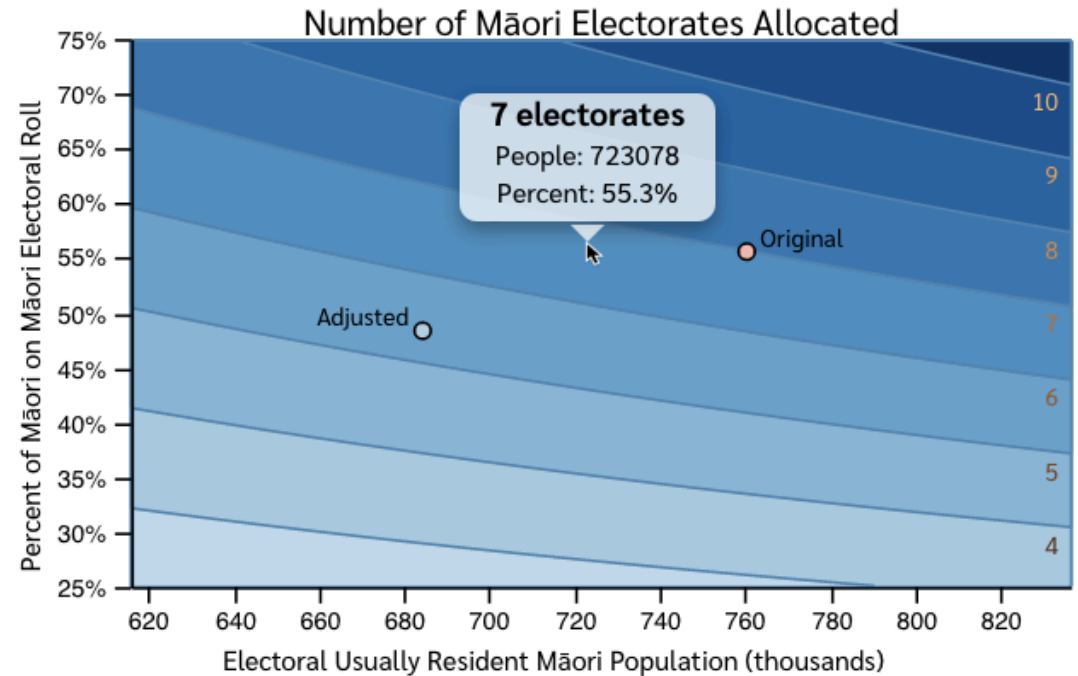
Results

Separate results for each set of electorates

Māori		North Island General		South Island General	
6 electorates ↓ 1 electorate loss		49 electorates ↑ 1 electorate gain		16 electorates No gain or loss	
Electoral Population	331,339	Electoral Population	2,757,988	Electoral Population	903,193
Unrounded Electorates	5.87	Unrounded Electorates	48.86	Unrounded Electorates	16.00
Quota	55,223	Quota	56,285	Quota	56,450
Range	52,462 - 57,984	Range	53,471 - 59,099	Range	53,628 - 59,273

Same set of results as Stats NZ reports

Sensitivity plot with tooltip showing on mouse hover



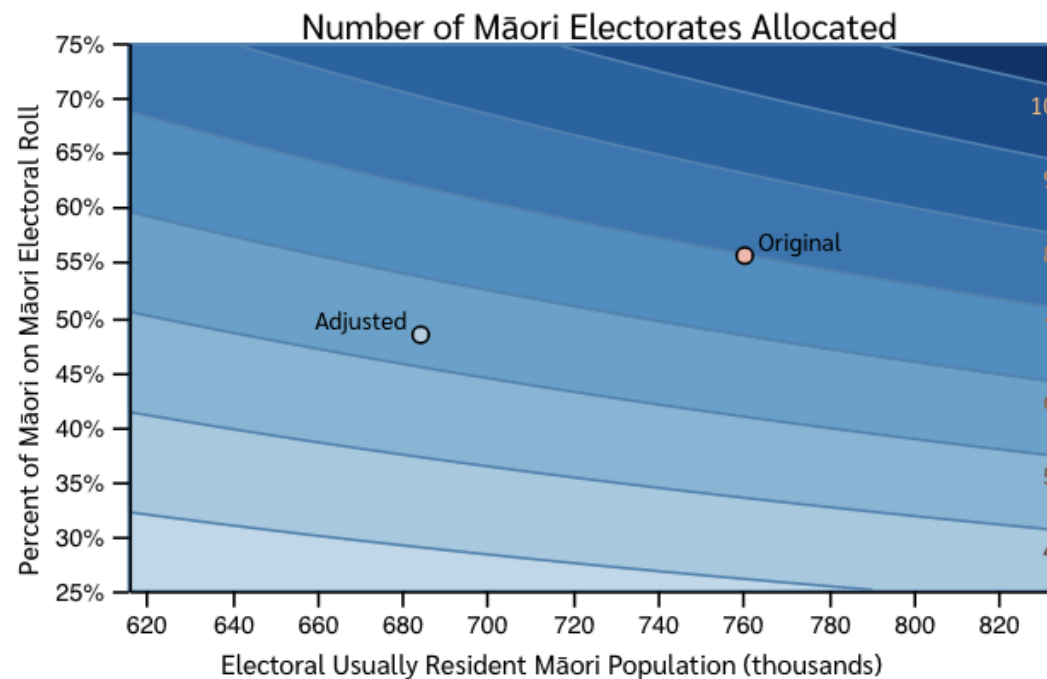
Drawbacks

- We do not have all required data
 - Therefore our results must be treated as estimates
1. Māori descent is imputed using the percent Māori in the 2013 Census at the regional council level
 - Assumes missing-at-random which is unlikely
 - However, results are close to Stats NZ electorates report
 2. Assumes equal impact to Māori populations in Māori and general rolls



Findings

- Changes in Māori population can easily change number of electorates



Calculation is more sensitive to Māori option



Summary

Age-Standardised Rates

- Changes to Census counts can easily produce ASRs significantly different to "original" counts

Electoral Allocation

- Electorates can be gained/lost via reasonable changes to counts
- However, electoral allocation is more sensitive to percent Māori on Māori roll



Links

To be hosted on www.temanararaunga.maori.nz

