Analysing Australian Election Results

How demographic factors influence primary voting

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Acknowledgement of Country

Introduction

Australia is a parliamentary democracy, with a *Westminster-style* system of government.

The lower chamber of parliament - **The House of Representatives** -, is made up of one MP for each **Commonwealth Electoral Division**. MPs are elected using a **preferential voting system**. Voting is compulsory for all 18+ Australian citizens.

Historically a *bipartisan system*, recent elections have brought in new political actors, seemingly challenging pre-conceptions about political persuasions.

Photo by Andy Wang on Unsplash

Questions

This project attempts to study how population make-up may influence how Australian citizens may vote for a particular party.

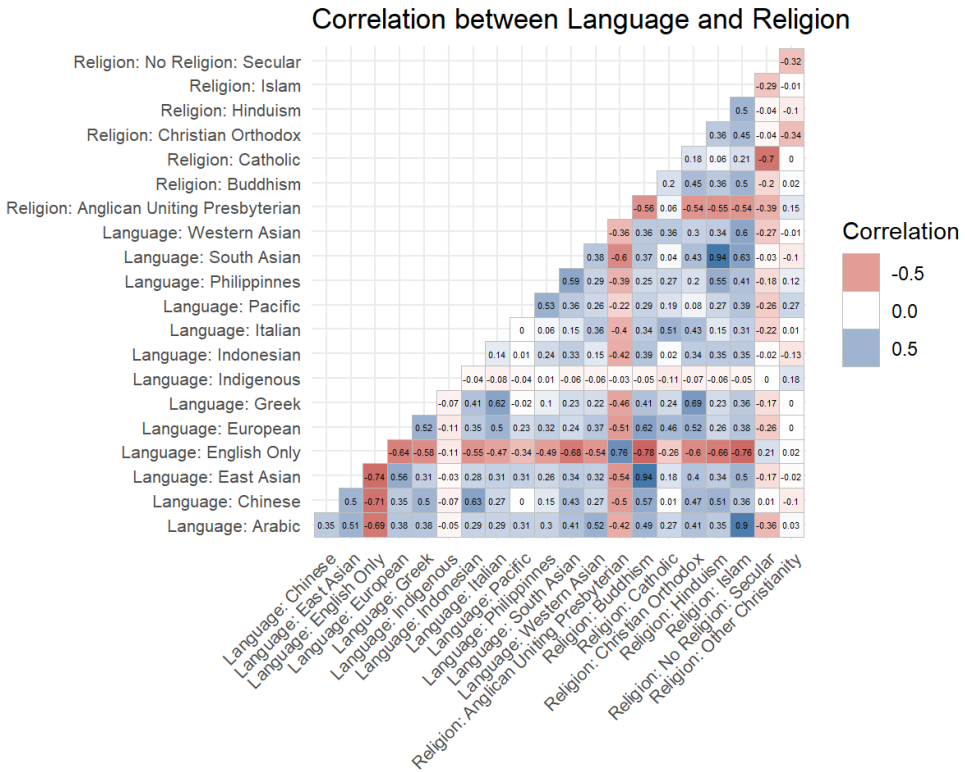
- Are there distinguishable demographic division lines across different electorates?
- What are the main demographic factors influencing political persuasion, expressed through **primary voting** in federal elections? Do they differ in different electorates?
- It is possible use a demographic-based model to understand changes in the 2022 election? It is possible to contrast those against prevalent narratives such as:
  - Was the so-called “Teal Wave” supported by discontent moderate Liberal voters?
  - Are Millenials not becoming more conservative as they age?
  - Is culturally diverse voting relevant?

Approach (summarised)

1. Obtained data from Census and Election Results. Match them by year.
2. Conducted initial selection of potential demographic covariates.
3. Clustered similar electorates, then trained a classification model.
4. Trained explainable model (**Primary Voting = f(covariates)**), as analysis tools.
5. *Naively* attempted to forecast 2022 election, to assess usefulness of coefficients.

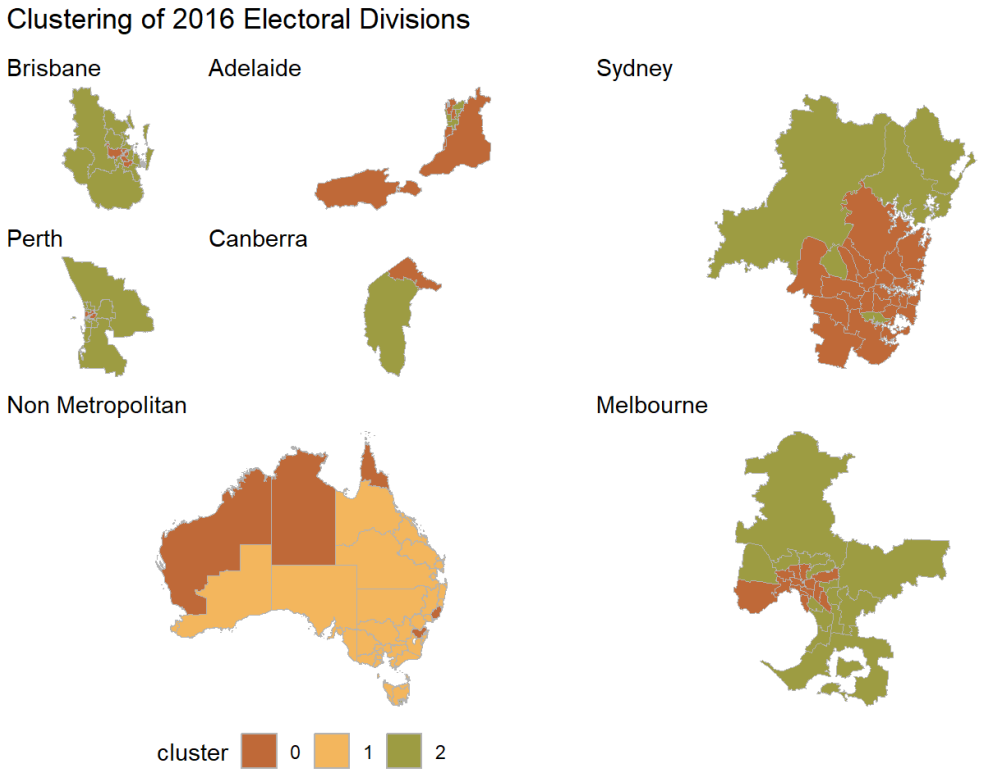
Data Selection

- Data extracted through custom-made packages ({auscensus}, {auspol} and {aussiemaps}).
- Primary voting data consolidated into *3 groups/parties* of interest (The Coalition, Australian Labor Party, Australian Greens).
- Demographic covariates inspected and chosen **55 variables from 9 Groups** (*Income, Education Levels, Age, Relationship Status, Household types, Household tenure, Citizenship, Religion, Language*), plus metropolitan/non-metropolitan flag.
- Covariates showing varying degrees of colinearity.



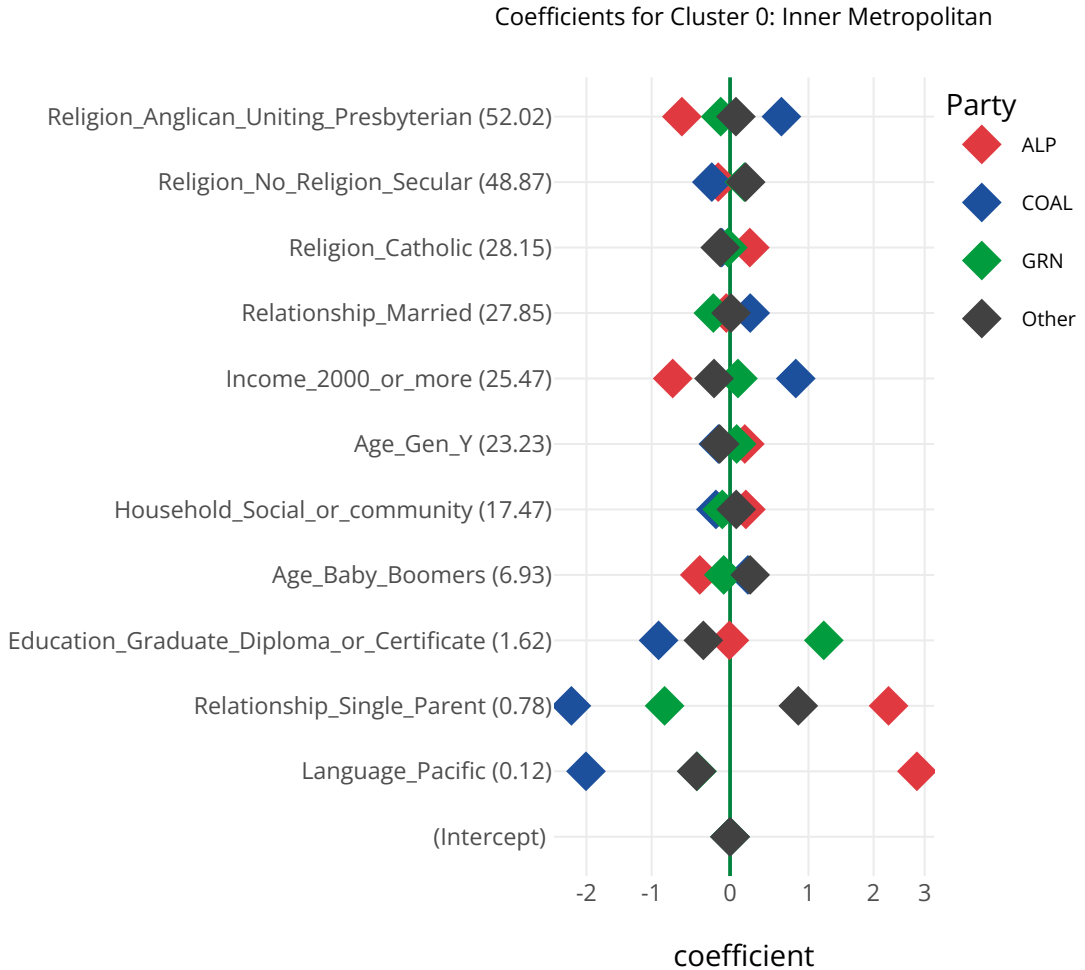
Clustering

- Used **HDBSCAN**, which determines number of clusters.
- Identified 3 clusters, matching narrative of **inner city**, **suburbia** and **regional areas**.
- Used **random forests** for classification of new electorates.
- Key factors in cluster selection : **metropolitan location**, percentage of **flats**, **Chinese speakers**, **monolingual speakers (English)**, **mortgaged households**.



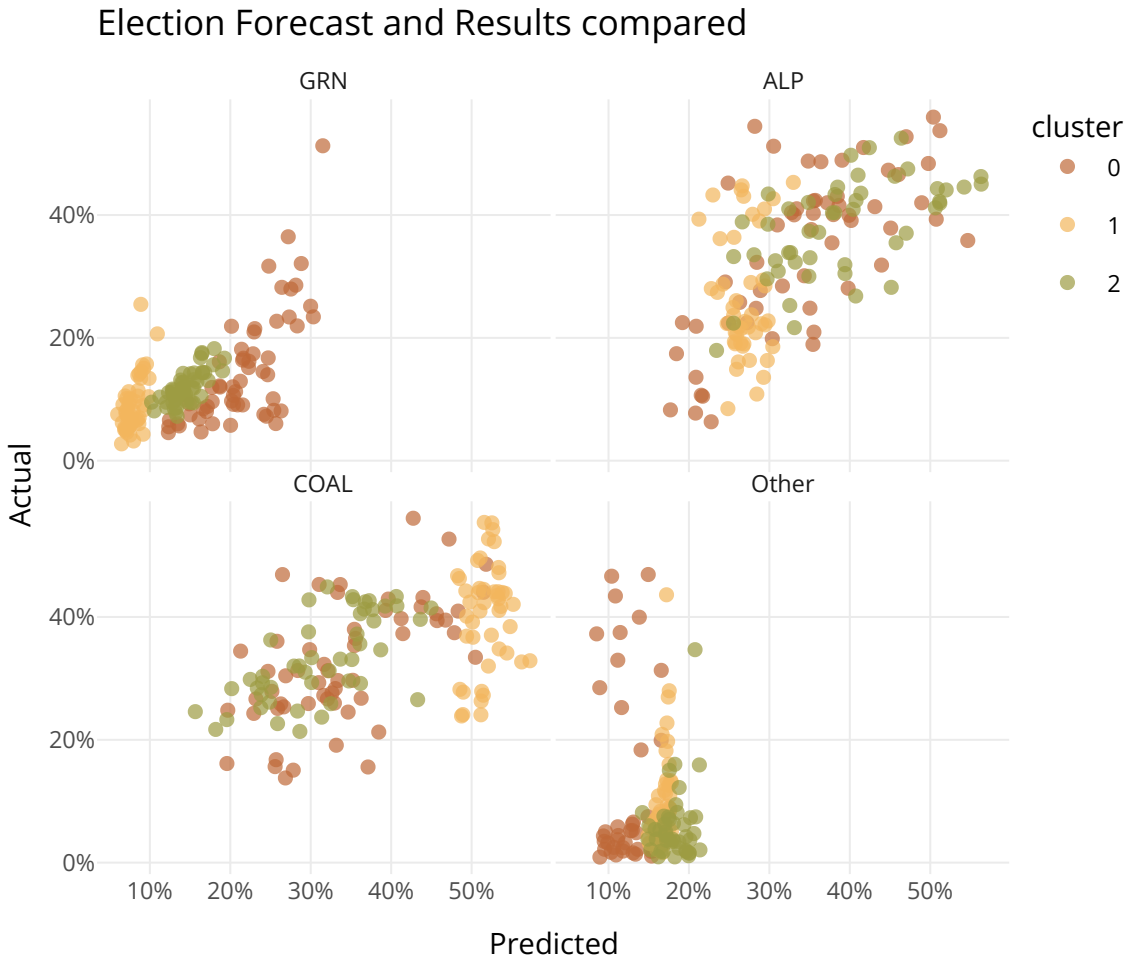
Elastic Net Regression

- Multivariate regression model - $Y = \beta X$
- Lasso Regression to reduce number of variables for each cluster.
- Elastic net fitted, independently for each cluster
- Distinct clusters, produced distinct results:
  - In inner-city electorates, **religiosity** (or lack of), **age**, and **income** are the most relevant factors.
  - In suburban electorates, there are similar dynamics, plus **household tenure**.
  - In regional and rural electorates, **higher incomes** tend to prefer **Labor** vote.



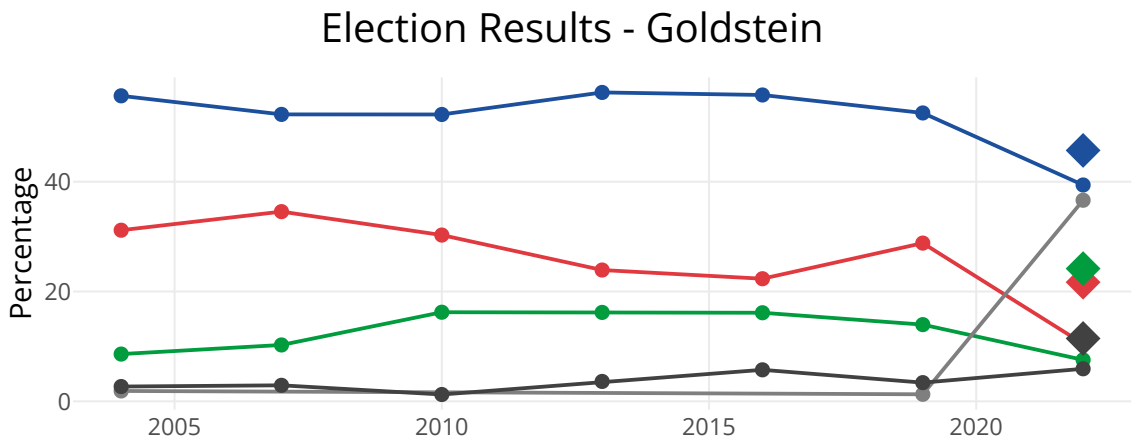
2022 Election

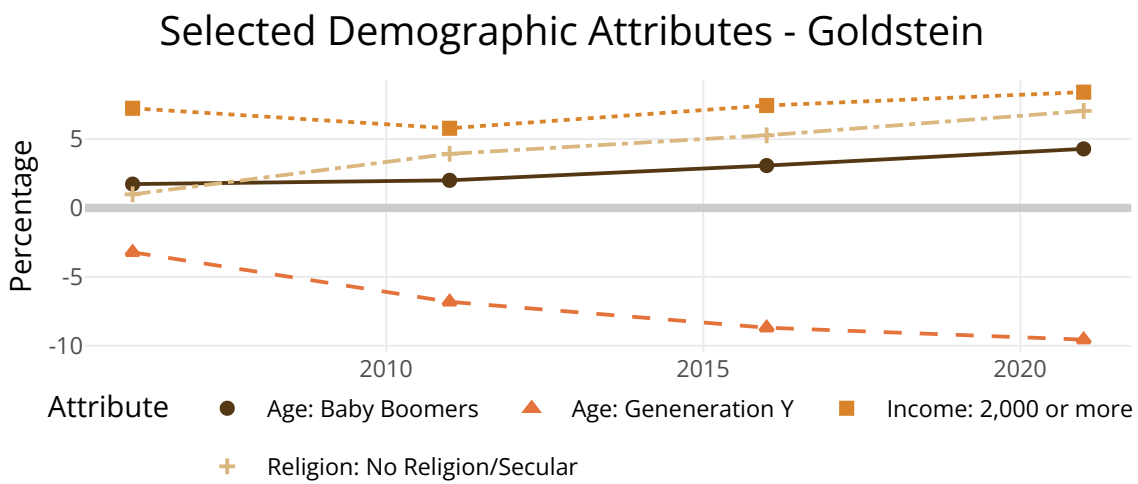
- A naive attempt to retroactively forecast the 2022 was attempted.
- Forecast using last Newspoll results prior to election.
- Modest accuracy obtained, however model proved valuable as analysis tool.



2022 Election - A Teal Wave?

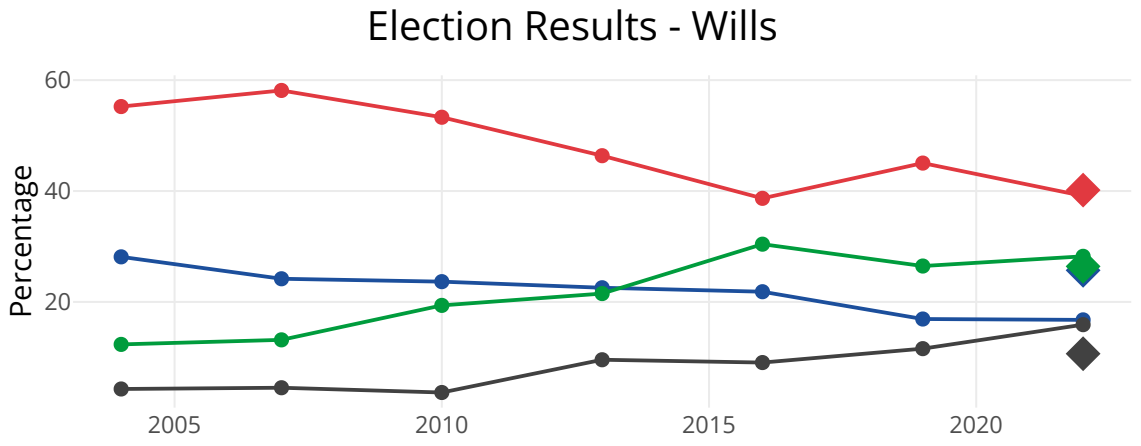
- Centrist independents running on a platform of centre-right economics, plus environmental policies (**Teals**).
- Teal candidates successfully unseated moderate Liberal incumbents across several *safe seats*.
- Perceived shift of *dissatisfied Liberal* does not match model - hinting that Teals were actually elected on Green + Labor vote.

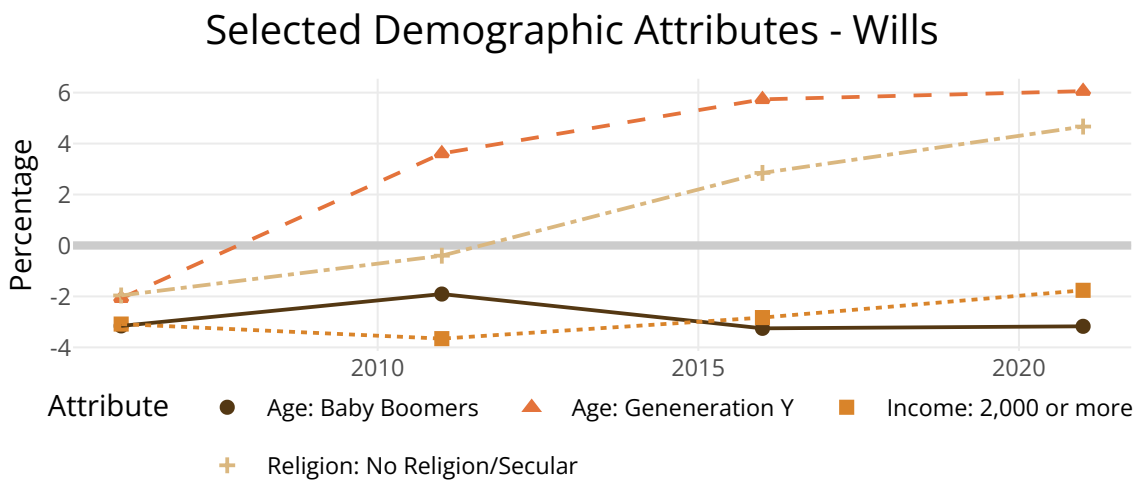




2022 Election - Green Electorates?

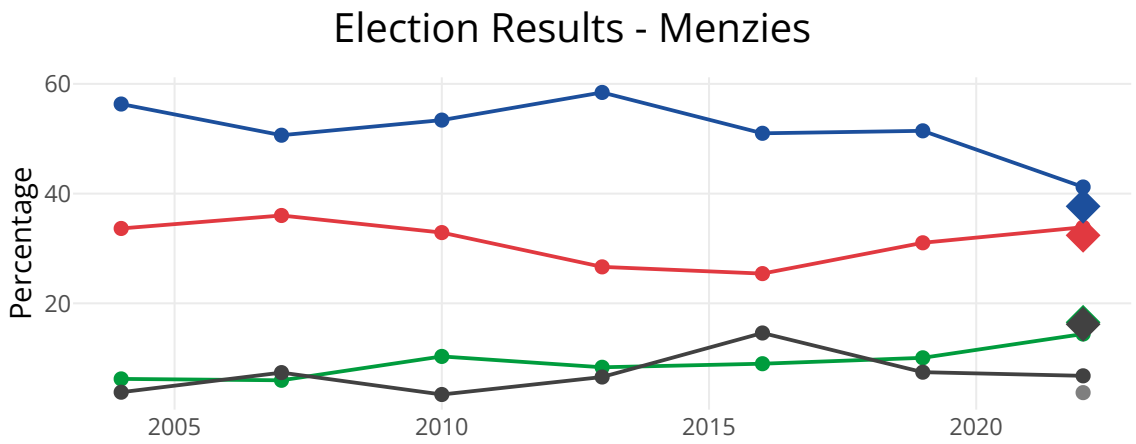
- In the 2022 election, Greens increased number of MPs from 1 to 4.
- Greens primary voting higher in inner cities, driving by a combination of higher income, age (Millenials) and irreligiosity.
- In these areas, Green voting as grown alongside Millenial population.

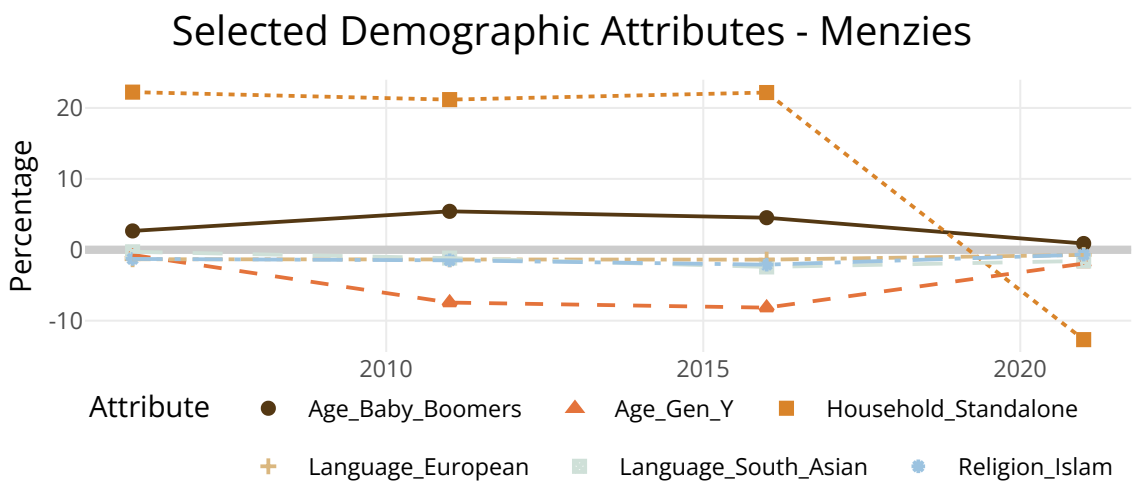




2022 Election - Surbubia?

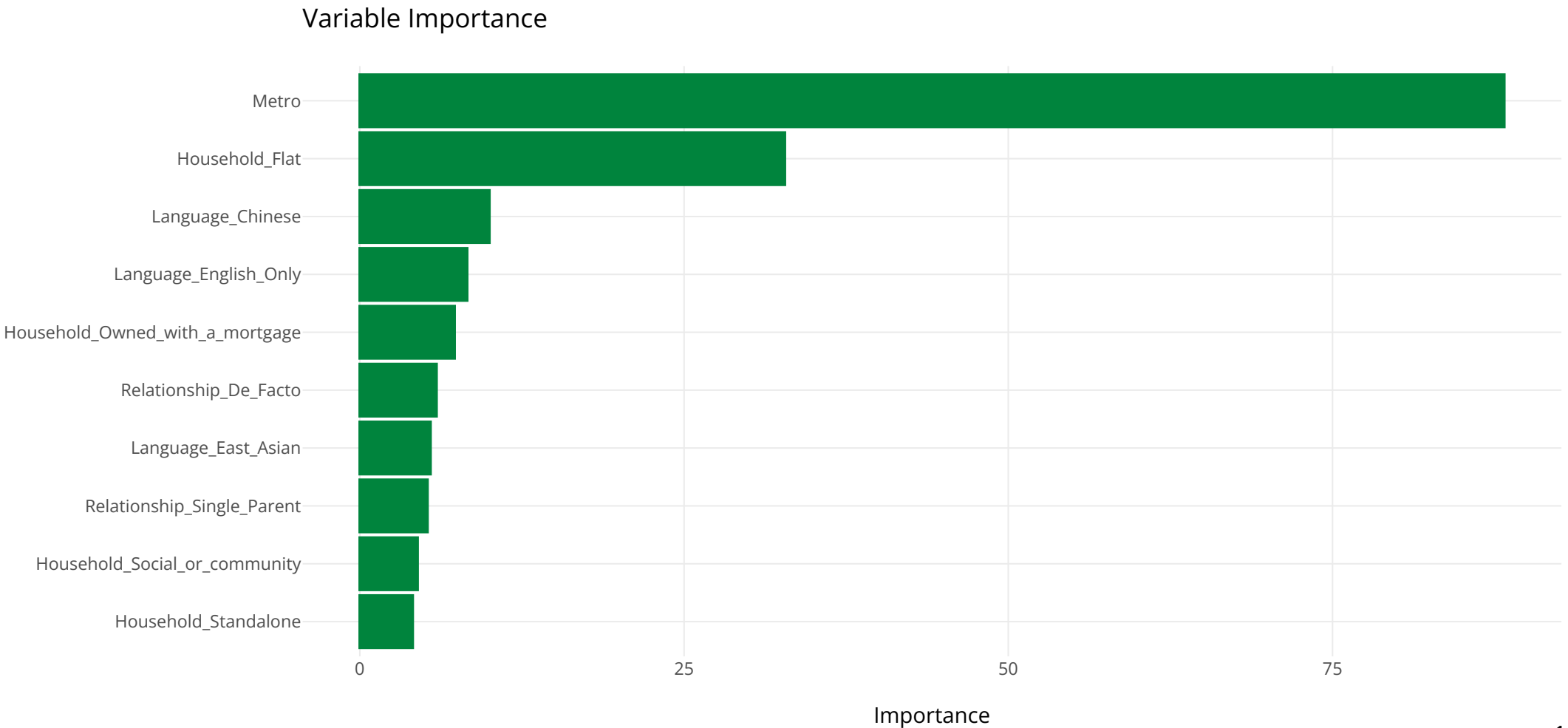
- Outer suburban electorates can be diverse.
- Residential growth and densification can alter results, in addition to generational renewal.





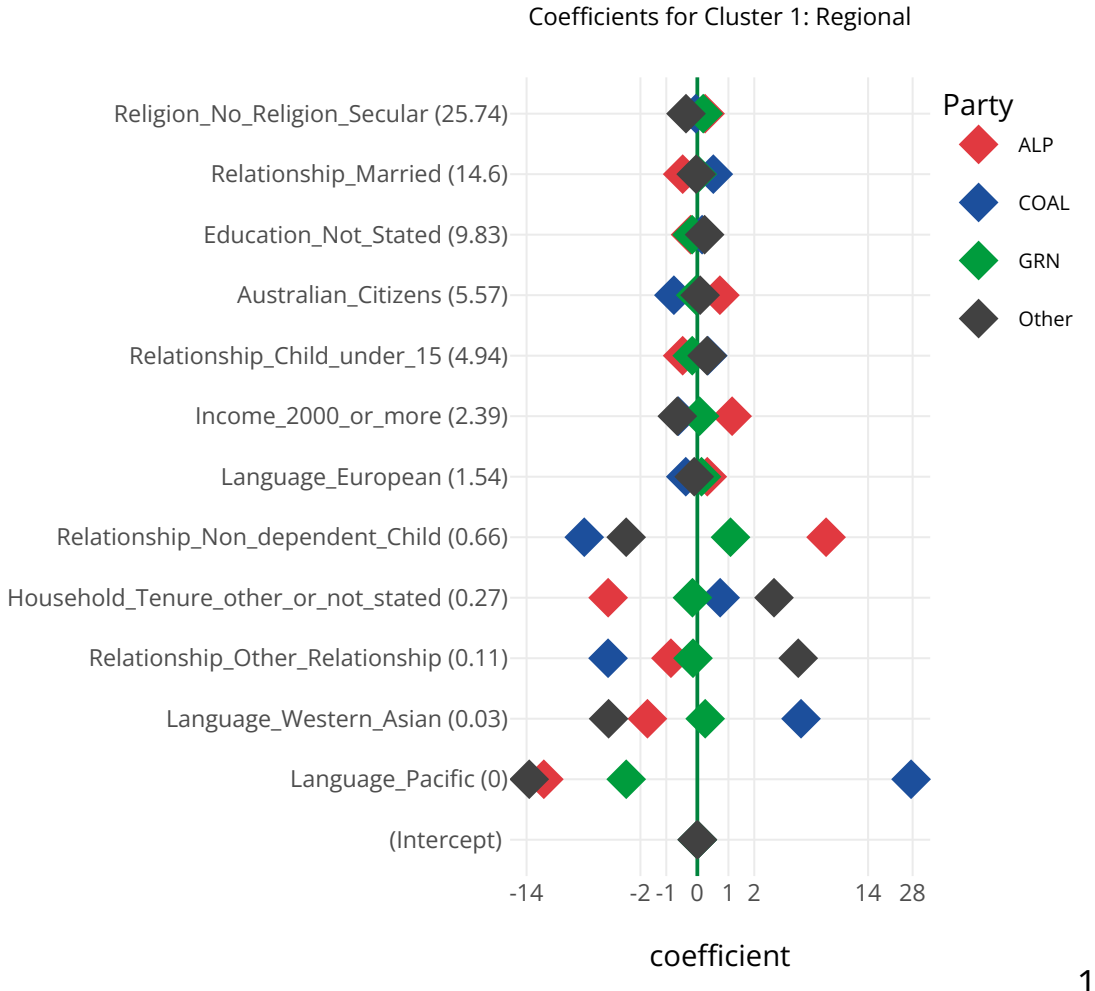
Additional slides

Random forests Importance plot



Elastic Net Regression

- Multivariate regression model - $Y = \beta X$. Y represents difference from mean primary voting. X difference against average values.
- Lasso Regression to reduce number of variables for each cluster.
- Elastic net fitted, one model per cluster, producing distinct results:
  - In inner-city electorates, religiosity (or lack of) and income are the most relevant factors.
  - In suburban electorates, there are similar dynamics, plus houselhod ternure.
  - In regional and rural electorates, higer incomes tend to prefere Labor vote.



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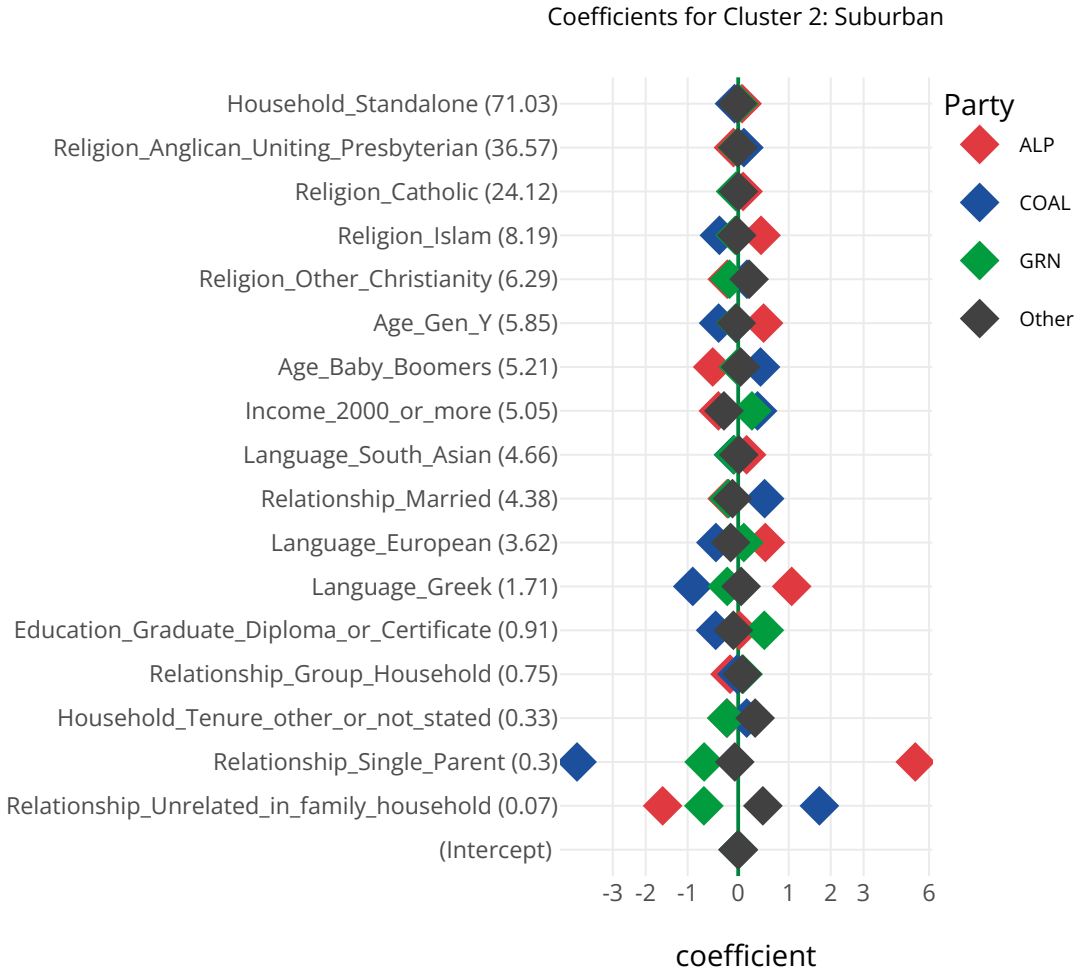

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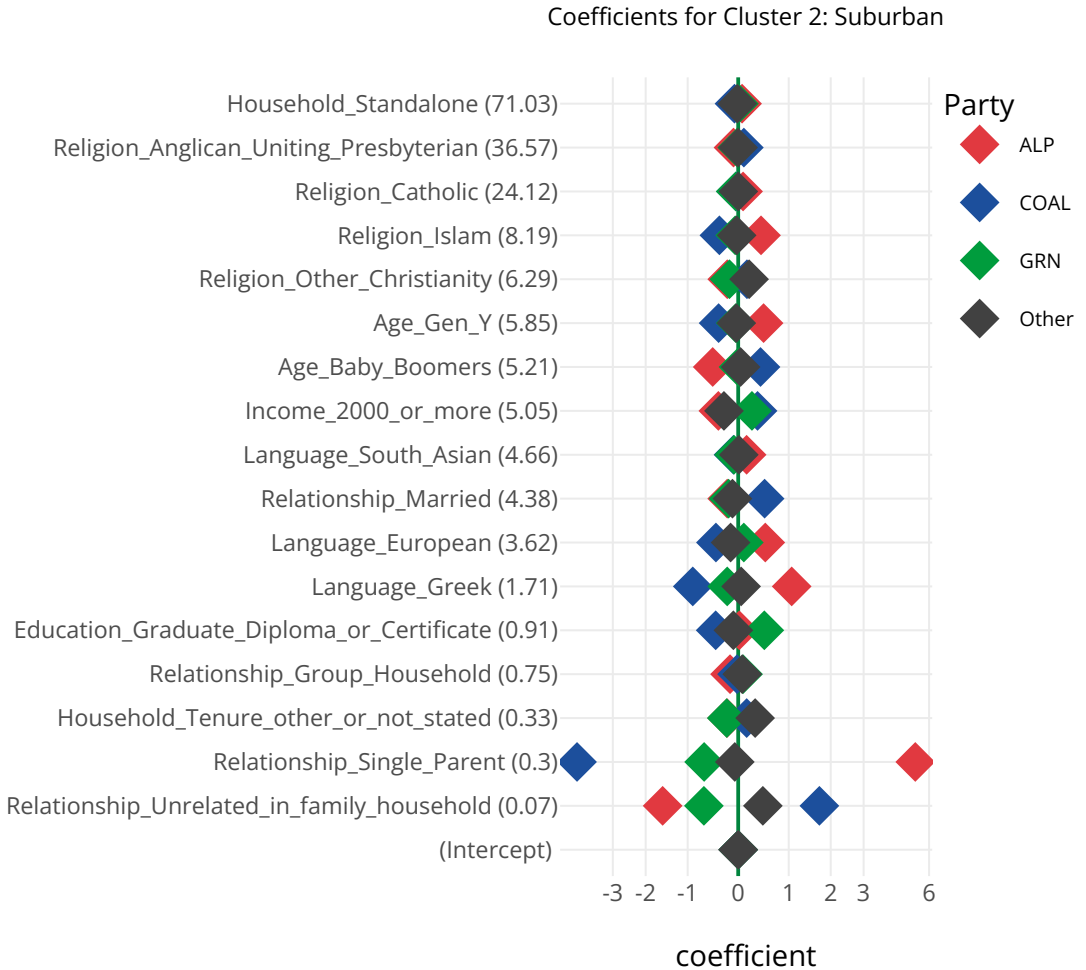

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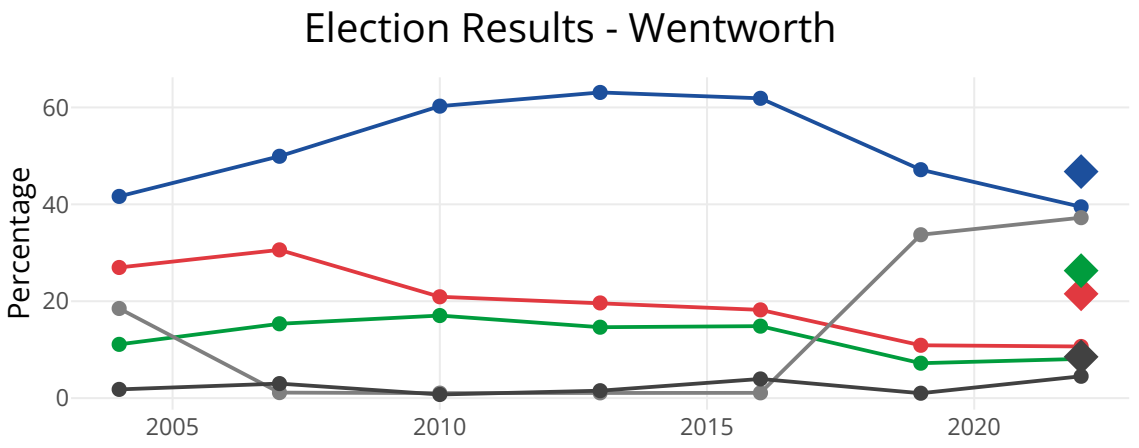

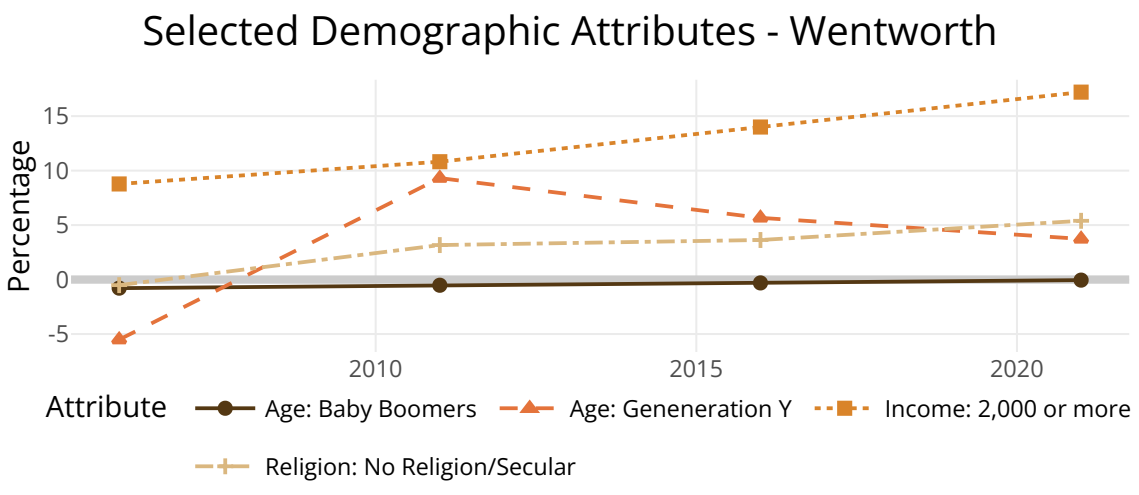

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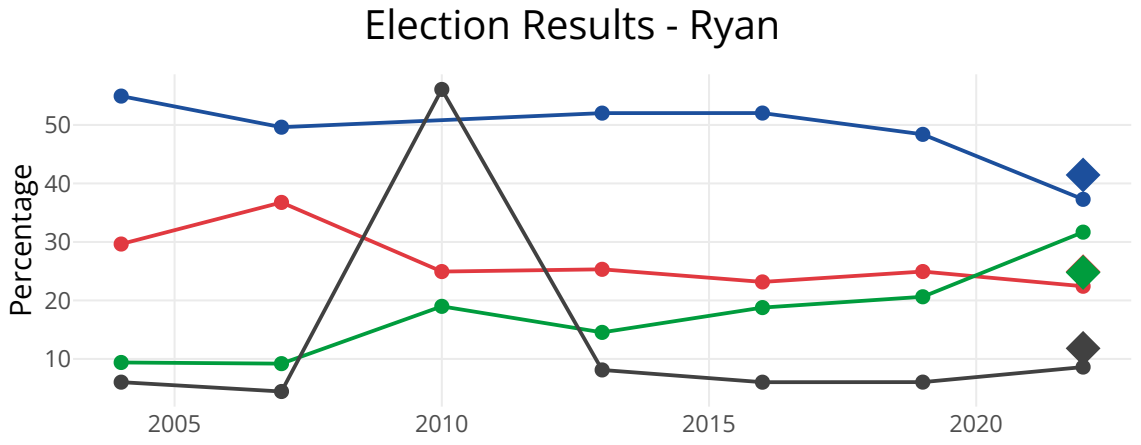
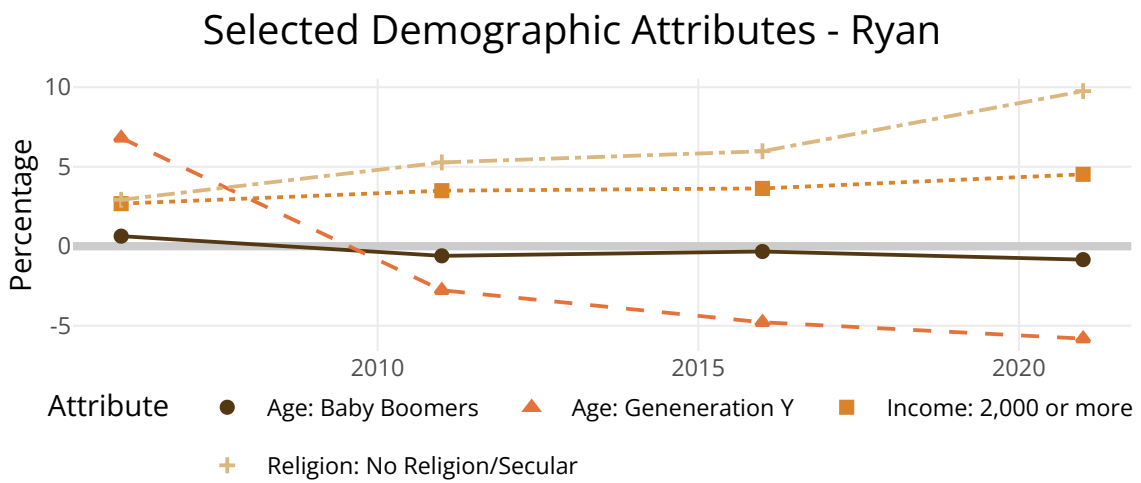
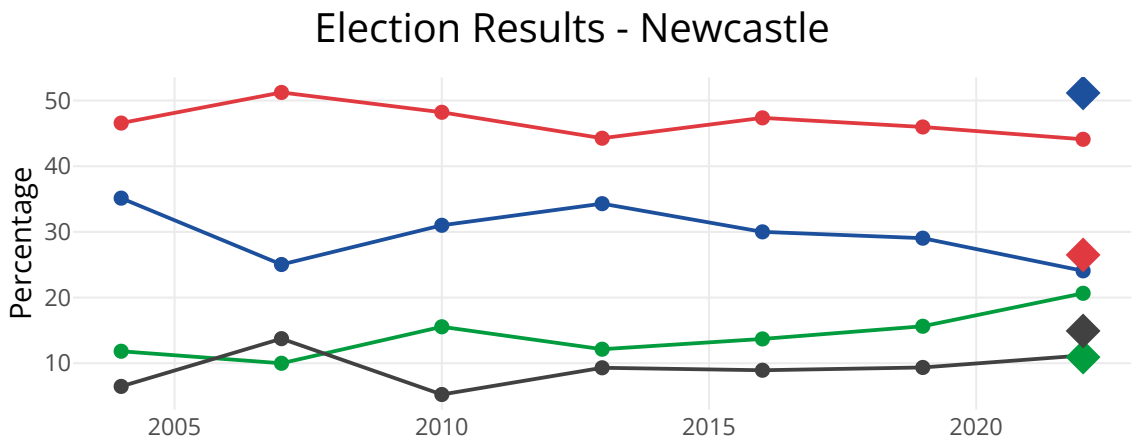
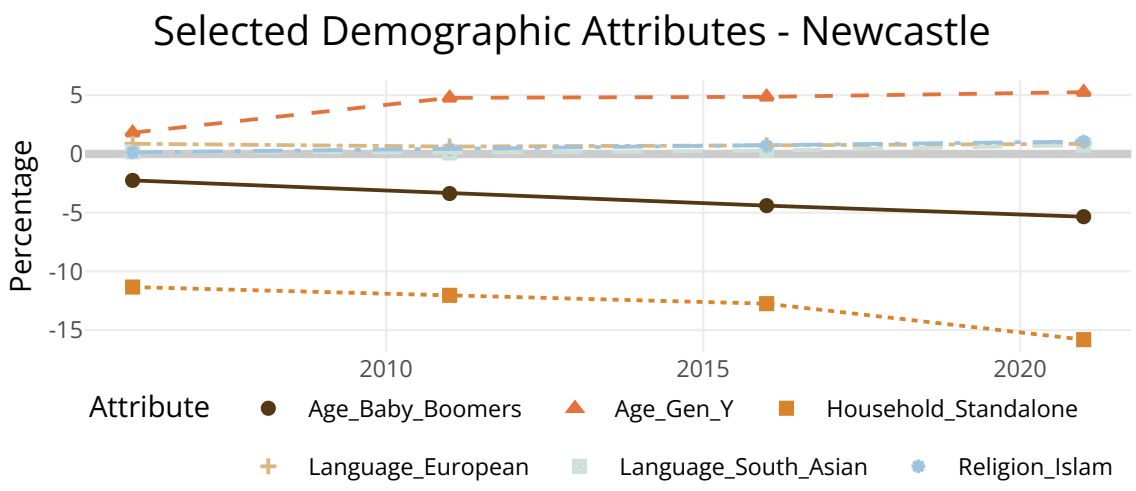




2022 Election - Newcastle?

- The model does not reflect primary voting in Newcastle.