The Effects of Primary and Secondary Education on Communities in Victorian Local Government Areas (LGAs)

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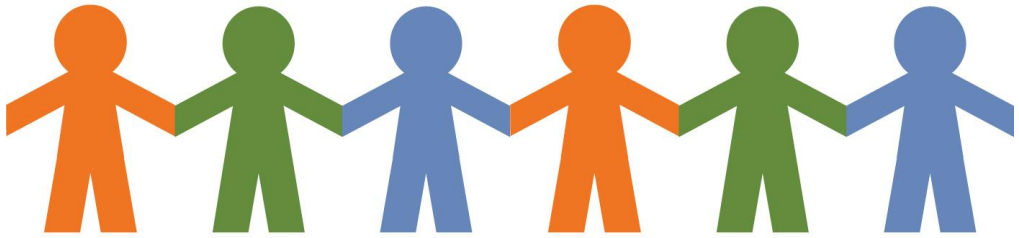


Research Questions

- How increased access to education affects the lives of people in local communities.
  - How does the number of schools in an LGA relative to its population, and the types of schools, change the impact made on surrounding communities?
  - How do changes to education availability in LGAs effect local community well-being and economic/physical quality of life?

Motivation

- The results of this study could be used by policy makers or authorities such as the Victorian Government to benefit residents in each LGA by achieving goals pertaining to LGA communities through increased spending education, or changes to the education system.

- This is because improvements to citizens' quality of life, and by extension how close-knit local communities are, will always be an area of investment that garners government attention.

- Families (particularly those with young children) could benefit from an improved understanding of how individual LGAs' communities function. Prospective families as well.

Datasets

- **Local Government Area (LGA) profiles data 2015 for VIC**

  Social conditions of each LGA, as well as factors that influence quality of life, such as employment, transport and social engagement. Collected from AURIN and attributed to the Government of Victoria – Department of Health and Human Services.

- **ERP by LGA (ASGS 2016), 2001 to 2016**

  Contains the most recent Estimated Resident Population (ERP) by LGA, and is the official measure of the Australian population. Collected from the Australian Bureau of Statistics

- **School Locations – 2017**

  Details the information collected as part of the ongoing registration of schools in Victoria, which includes the name, school type, school sector, address, phone number, co-ordinates and local government area name. From the Victorian Government Data Directory.

AURIN
Australian Urban Research Infrastructure Network

Australian Bureau of Statistics

data.vic.gov.au

Data Wrangling - 1

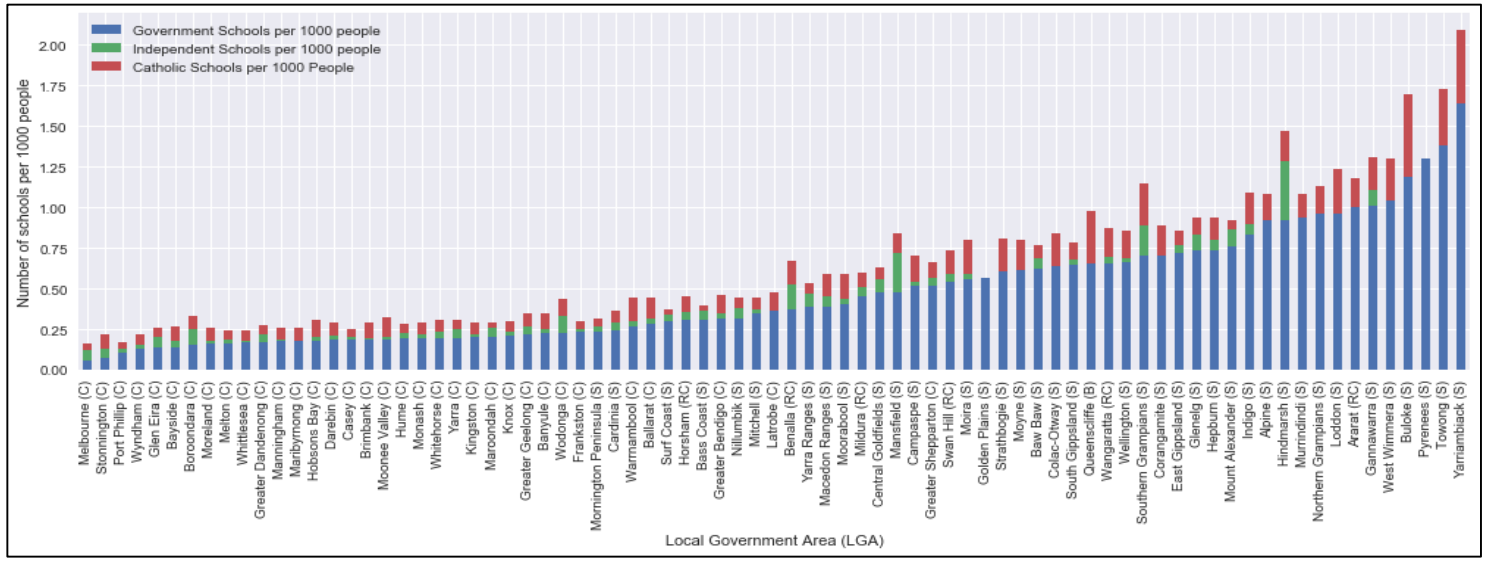
- **LGA Profiles** required little cleaning – AURIN User Interface allowed for easy selection from the 402 available attributes
  - Restricted choices to relevant and complete data, since there are only a small number of total LGAs (79)
  - Used as basis for the final, clean dataset
- **ERP by LGA**
  - Some LGA names were adjusted for easier integration later (e.g. “Latrobe (C) (Vic.)”)
  - Used for finding population to school ratios
- **School Locations**
  - Data on different school types was taken to be integrated into the final clean dataset.
  - This was required to answer the first research question

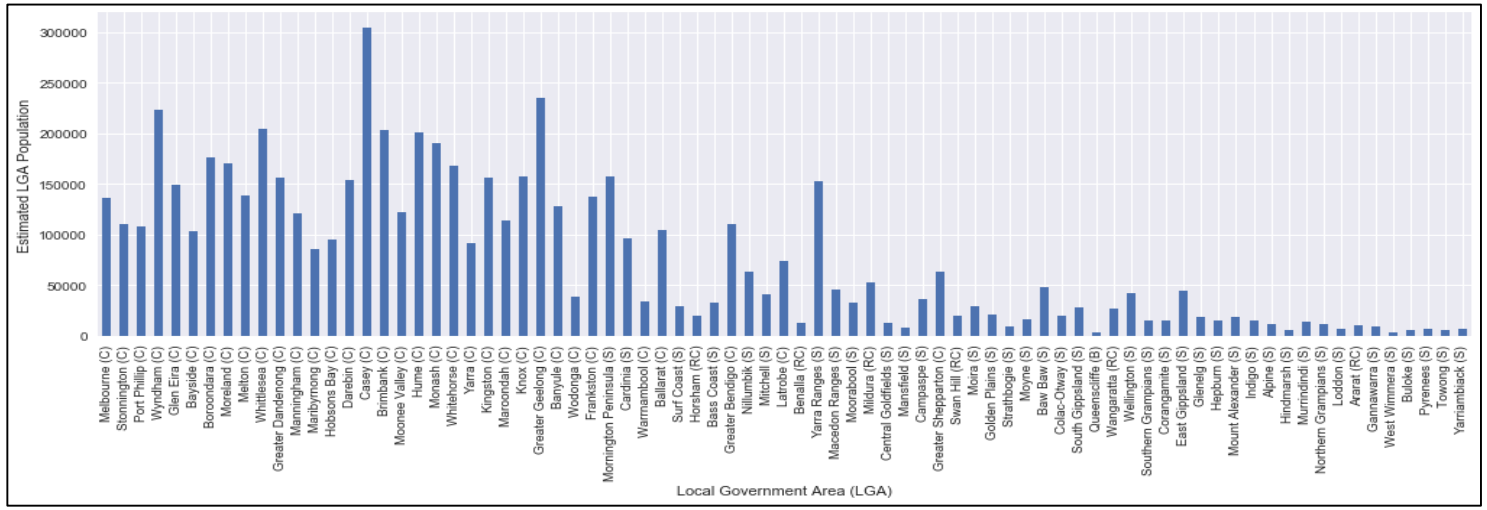
Data Wrangling - 2

- **7 Community Indicators:**
  - Total offences per 1000 **(crime)**
  - Homeless Rate **(economy)**
  - People with low English proficiency
  - People who help as volunteers
  - People who believe multiculturalism makes life better
  - People who rated their community as active
  - People who attended a local community event

- **Types of Schools:**
  - Government Schools
  - Independent Schools
  - Catholic Schools
  - Primary, Secondary, Primary/Secondary Schools

Investigation Conclusions

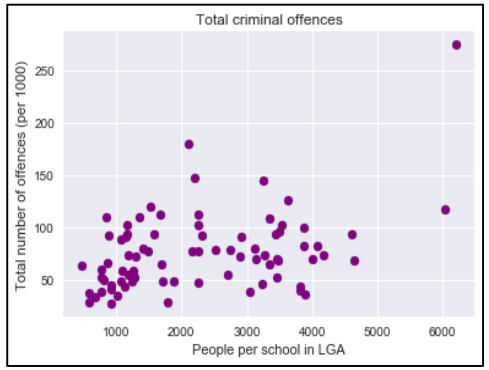


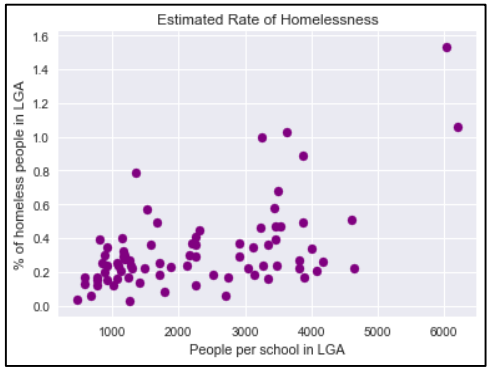


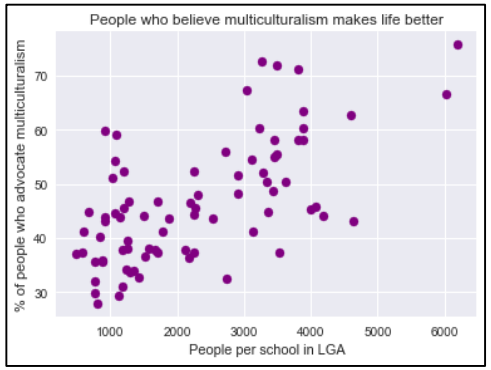
The figures have an almost inverse trend, in that LGAs with lower total populations tend to have more schools per 1000 people. This suggests closer-knit communities in low population areas, which allows us to progress to the analysis of community indicators and how they relate to this.

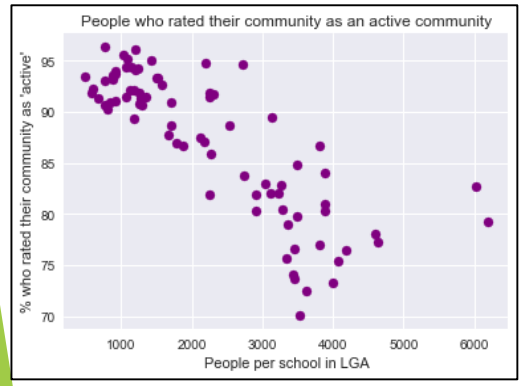
$$People\ per\ school\ in\ LGA = \frac{Estimated\ LGA\ Population}{Total\ Schools\ in\ LGA}$$

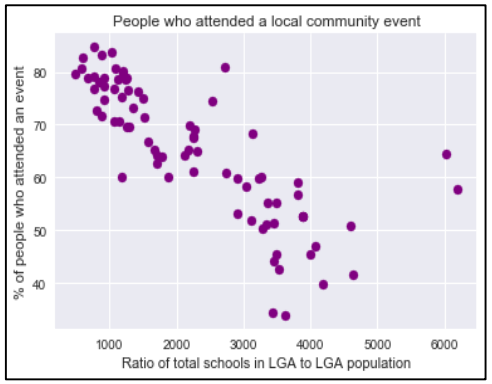
- Number of people per school -> **higher ratio = fewer schools**

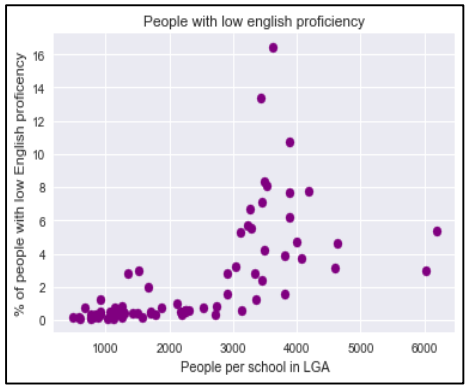


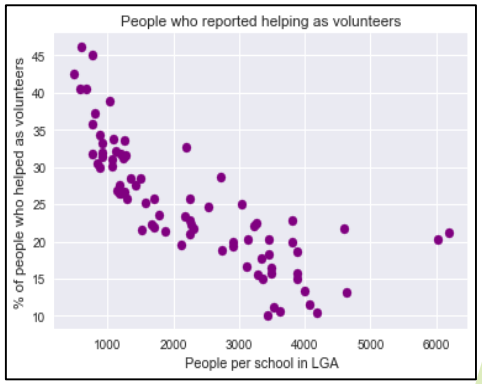








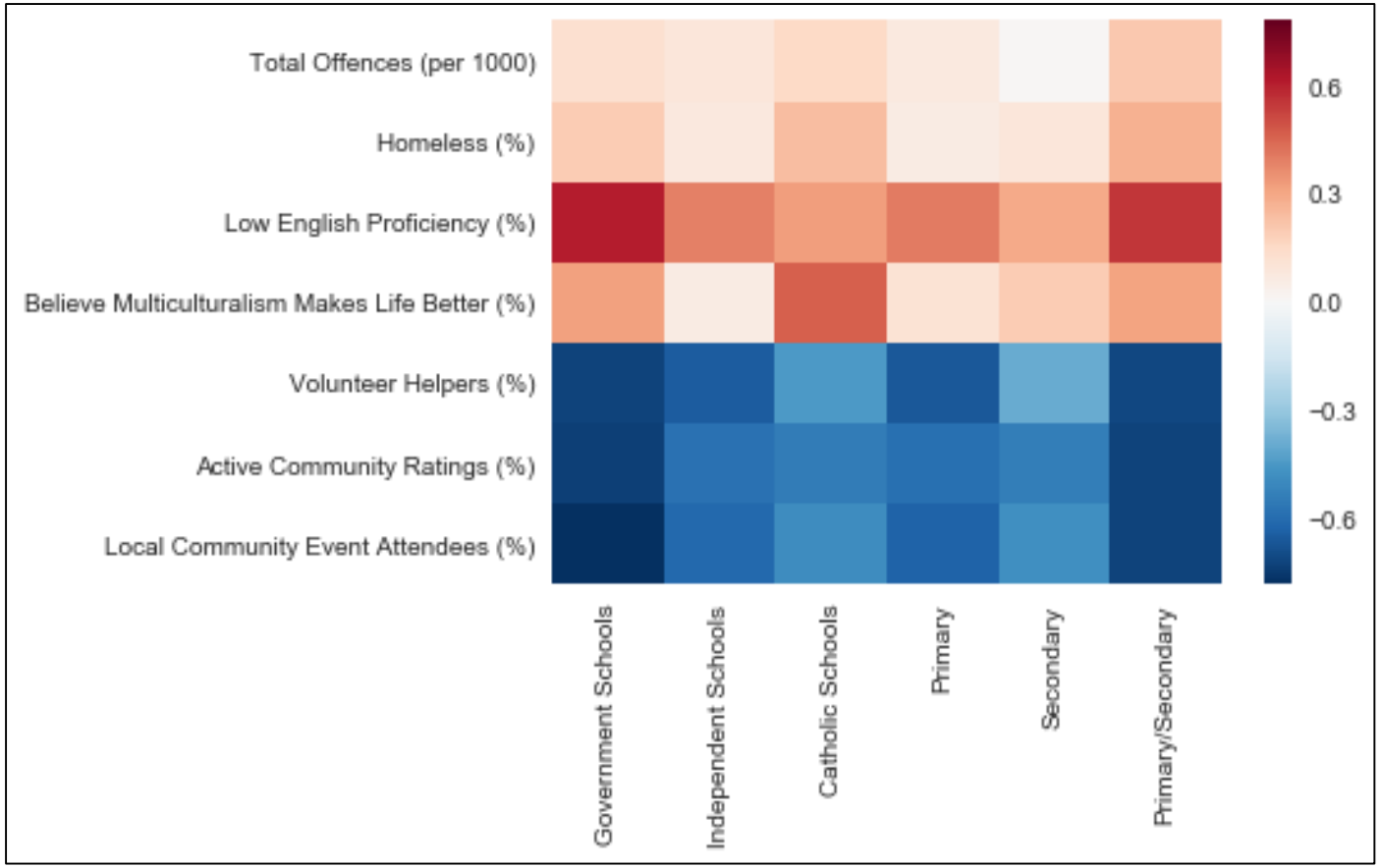




Pearson Correlations

- Low English Proficiency: 0.643019
- Rated Active Community: -0.811423
- Attended Community Event: -0.79246
- Offences: 0.404212
- Homelessness: 0.549287
- Multiculturalism: 0.643019
- Volunteers: -0.788744

Using the scatter plots above as reference, this heatmap can be used to analyse the correlations between my selected community well-being indicators and different school types. Stronger Pearson Correlations indicate a closer similarity to the trend shown above for total schools in an LGA, for that specific school type.



Government and Primary/Secondary schools have higher correlations since they are the majority of schools in Victoria. Independent and Catholic schools can be seen to change the correlation, where Catholic schools have the largest departure from total school correlations, showing the impact of school type.

Challenges & Reflections

- A significant challenge in this report was maintaining focus on answering the proposed research questions, since having an aggregation of various community-related attributes made it easy to broaden the scope of the investigation too much.
- Not have enough space to include all my desired visualization methods, including boxplots to detect outliers and exploring clustering methods. (Mostly crime rate and homelessness)
- I attempted to use VAT visualization to find clusters across combinations of my selected community indicators, however I struggled to produce any meaningful clusters.
- The decision to analyse seven different community indicators may have prevented analysis as detailed as I would have liked