# USING A SYNTHETIC POPULATION TO MODEL ACCESS TO HEALTH SERVICES AND FACILITIES IN AUSTRALIA
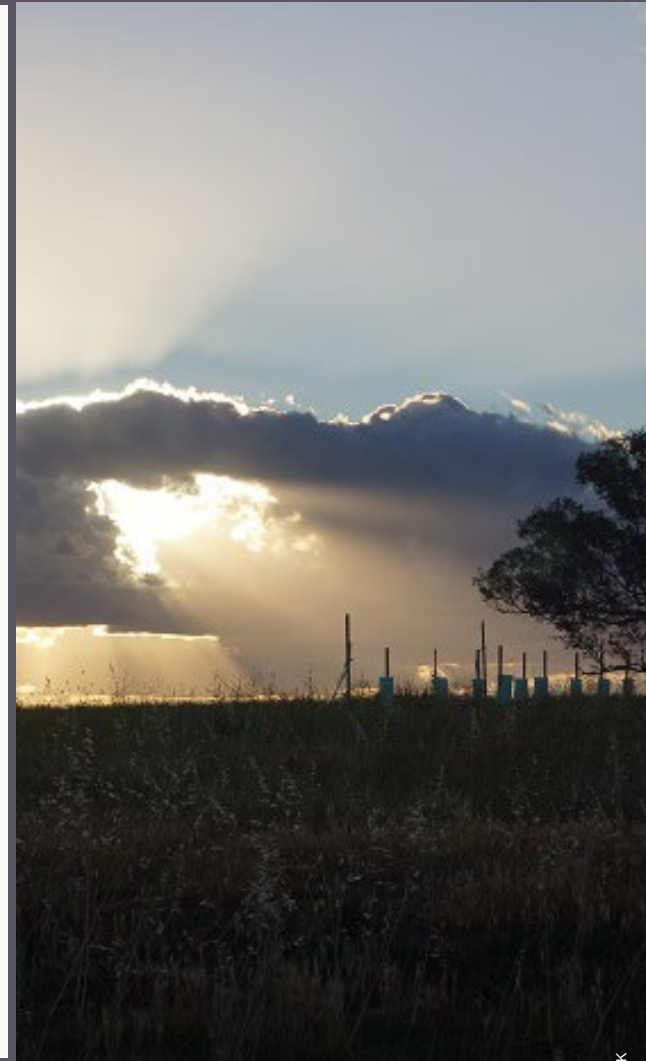
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# Outline

Objective

Data

Method

# Objective

## Linkage Infrastructure grant starting 2024

- Won in 2023 but movements from University of Canberra delayed

 – *Staff left University of Canberra and University of Melbourne*

# Objective

**To construct openly available datasets for modelling the access to different health services for the Australian population**

- Allow researchers, policymakers and industry to plan equitable Health resource allocation for the Australian population.

- Uses a synthetic population to preserve individual anonymity, while still providing detailed, geographically-located data across Australia.

# Objective

**Using geographically explicit synthetic population and data on locations of health services, able to answer how close people are to different health services; and how a new service would affect access ("what if" scenarios)**

# How? Relationships

**Formal partnership between Deakin Rural Health (a University Department of Rural Health) and Grampians Health Service**

- Link clinical datasets at address-level across geographic areas and permit the investigation of the dynamics between individual-level socio-economic status and service access, validation of synthetic populations, and scenario testing of health service use cases.

Communities
In
Numbers

# How? Relationships

**Australian Bureau of Statistics as partner**

- Individual level Census data for validation of the synthetic population

- Still negotiating what can be done

# How? Data

## Census

- Every 5 years
- Last in 2021 during COVID

## Australian Geocoded National Address File (GNAF)

- Geo-coded locations of all Australian residences

# How? Method

## Reviewing latest literature

- Have been advances in last few years

## Need to have household, person and family benchmarks

- Some methods allow this and some don't

# How? Method

### Generalised Regression Reweighting

- Allows different levels of benchmarks, but reweighted population not full synthetic

  - *Could use methods to integerise weights and create full synthetic population – Lovelace "Truncate, Replicate, Sample"*

### IPF

- Can get full synthetic population but only one level of benchmark

### Simulated Annealing

- Can get full synthetic population but only one level of benchmark

  - *Used Kirk Harland's program (FMF) to get full synthetic population in Australia*

### CO

- Can get full synthetic population and different levels of benchmarks

### Fitness Based Synthesis

- Different levels of benchmarks and full synthetic population

# Timing

**Only just signed all the multi-institutional agreements**

**Hoping to start in Feb 2024**

# Timing

## Literature Review

## Modelling

- Spatially explicit synthetic population
- Assign to GNAF households (Deakin Uni)

## Validation with ABS

# Questions?

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