R package SocEpi

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Motivation

Research on health inequalities

- ▶ Crating small-area deprivation measures
- ▶ Calculation of standardized rates
- ▶ Measuring socio-economic inequalities in health

Brown, D., Allik, M. , Dundas, R. and Leyland, A. H. (2014) *Carstairs Scores for Scottish Postcode Sectors, Datazones and Output Areas from the 2011 Census.* Technical Report. MRC/CSO Social and Public Health Sciences Unit, University of Glasgow, Glasgow.

Allik, M., Brown, D., Dundas, R. and Leyland, A. H. (2016) *Developing a new small-area measure of deprivation using 2001 and 2011 census data from Scotland.* Health and Place, 39, pp. 122-130.

Allik, M. Brown, D., Dundas, R. and Leyland, A. H. (under review) *Differences in Ill Health and Health Inequalities among Ethnic Groups: Population Study using 2011 Scottish Census*

Other packages

Roughly 150 packages related to "public health", "health inequalities", "social epidemiology", "epidemiology", "demography", "mortality rate", "mortality".

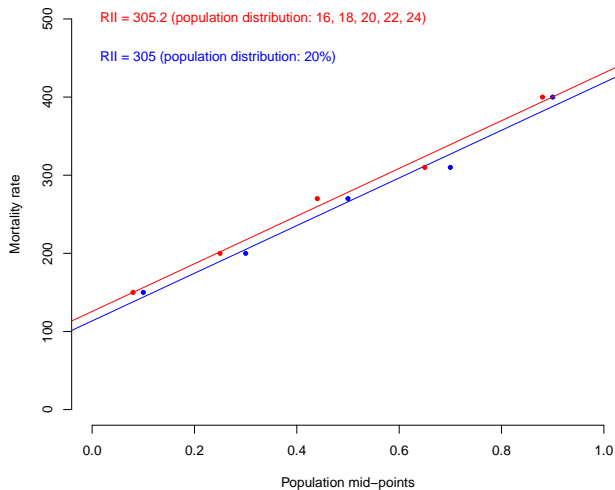Only four more closely related to this work: *popEpi*, *epiR*, *Epi*, *epitools*

- ▶ Overlap: calculation of standardized rates, rate ratios and SE/CI for these
- ▶ Differences: scope/flexibility of these functions, methods for SE/CI
- ▶ Gap: not many tools specific to health inequalities research

Calculating RII/SII - formula

```
rii(data, health, population, ses, age, ...)
```

- ▶ Standardized rates (ESP 2013 default)
- ▶ Linear regression: $y = \alpha + \beta x$
    - ▶ SII is β coefficient
- ▶ RII is SII divided by mean health
- ▶ Weighted regression an option

Calculating RII/SII - population mid-points

Confidence intervals

- Usually either not shown or based on *S.E.* from regression
- Based on simulation
    - Lumme et al (2015) *A Monte Carlo method to estimate the confidence intervals for the concentration index using aggregated population register data.* Health Services & Outcomes Research Methodology, 15(2), 82-98.
    - Wider CIs

Where to get it?

Google "R package SocEpi"

https://github.com/m-allik/SocEpi

Future plans

- Testing
  - Researchers' needs
  - Bugs, idiosyncrasies
- Enhance functions
  - different methods for CI
- New functions
  - Other measures of inequalities
- Review of public health packages/functions in R