Population Science in R

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2020-08-13

Contents

Chapter 1

Introduction

Introduction to the book

Chapter 2

Demographic Theories

F-DP to write

Introduce core theories of demography / why important for policy development. Based on lecture and small group discussion. Readings available from Monday with instruction to come prepared for discussion (timetable contact time for Thursday)

Chapter 3

Describing Populations

F-DP to write

Introduce age-sex, population pyramids and thinking about this in context of different processes / stages of population change a. Could also introduce example of data science approaches here, e.g. machine learning to predict demographic attributes such as gender would also give space to talk about ethical issues around these approaches? i. E.g. Cesare et al. How well can machine learning predict demographics of social media users? [good overview] https://arxiv.org/pdf/1702.01807.pdf

Chapter 4

Population Change

F-DP to write

3. Describing components of population change: rates / ratios / indicators of components of population change:

a. Fertility rates

b. Migration rates

c. Standardised mortality rates

d. Life expectancy

e. Then, another example as final set of notes on data science approaches in this area, e.g. machine learning to predict life expectancy: https://towardsdatascience.com/what-really-drives-higher-life-expectancy-e1c1ec22f6e1 [and code: https://github.com/gussie/Springboard_data_science/tree/master/Predicting_Life_Expectancy]; or https://www.datasciencesociety.net/using-machine-learning-to-explain-and-predict-the-life-expectancy-of-different-countries/; or (but this is Python) – https://towardsdatascience.com/data-science-which-public-health-factors-have-the-greatest-impact-on-life-expectancy-52d024ee3d27; or with data mining techniques https://www.scielo.br/scielo.php?script=sci_abstract&pid=S1413-81232018001103745&lng=en&nrm=iso

Chapter 5

Describing Population using New Forms of Data I

Using World Pop / FB to measure the level of and local population structures by age and sex - focus on level and structures

Chapter 6

Describing Population using New Forms of Data II

Using World Pop / FB to population processes eg. ageing, and pop decline

Something around ageing (changing dependency / welfare? Need to do some more exploring re data science aspects here)

Chapter 7

Fertility

This could be used as an example of how data science approaches can be used when introducing methods such as sentiment analysis

Chapter 8

Mortality

F-DP to write

Pandemics and mortality (could have additional one on mental health / well-being, or add an additional one for migration thinking about forced versus voluntary or some other relevant dichotomy)

Chapter 9

Migration

Migration (internal / international) / Population displacement (e.g. post disaster?)

Chapter 10

Life Course

F-DP to write

Transitions over the lifecourse (e.g. to young adulthood might be particularly good in respect of recession(s), global pandemics…)

Sequence analysis

Chapter 11

Behaviours

Changing behaviours / attitudes to demographic events

Chapter 12

Population Projection

F-DP to write