Software packages, data structures and examples tested

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Longitudinal software

Most are available on Reves website.
http://reves.site.ined.fr/en/resources/computation_
online/imach/

- IMaCh
- SPACE
- ELECT
- GLSMT
- LXPCT 2

Longitudinal methods

- Discrete multi-state models

- Continuous multi-state models

- Increment decrement life tables

Longitudinal methods

- Discrete multi-state models $\rightarrow$ IMaCh, SPACE, GLSMT

- Continuous multi-state models $\rightarrow$ ELECT

- Increment decrement life tables $\rightarrow$ LXPCT 2

IMach

- http://euroreves.ined.fr/imach/

- Latest version 0.98k

- Available for Windows, Mac and Linux

- Standalone package

- Designed for flexibility and simplicity

- Data - one line per person

- Multiple living states, multiple absorbing states (not attempted!)

- Needs recovery

ELECT

- http://www.ucl.ac.uk/~ucakadl/indexELECT.html

- Version 0.1.1

- Builds from MSM in R

- Designed for Continuous time multi-state models

- Data - multiple lines per person, one per state

- Two living states and one death state (Elect only, MSM more flexible)

- Flexible covariates, both stratification and adjustment

SPACE

- http://www.cdc.gov/nchs/data_access/space.htm

- Wrapper available from authors

- Runs from within SAS

- Designed for complex population sampling

- Can do semi-Markov Models (dependent on time in state)

- Data - Multiple lines, one per time point

GLSMT

- http://www.ined.fr/fichier/t_telechargement/
  25787/telechargement_fichier_en_lynch_brown_
  gsmltmanual.pdf

- Request programme from Authors

- Runs from R (also then another package to sort out results)

- Designed to undertake Bayesian MSM

- Data - One line, two waves only, one per transition (start, end)

- Lots of covariate flexibility (stratification)

- Question mark over restricted to two waves

LXPCT 2

- http://ideas.repec.org/c/boc/bocode/s453001.html
- Stata ADO file
- Needs age specific transitions
- IMach or MSM can provide these
- Flexible number of states (both living and absorbing)
- Covariates handled by stratification
- No confidence intervals
- Results not really understood at the moment

Dates

- Continuous age (any measure)

- Month and year

- Age (single years)

- Age (months)

- One year or five year intervals

Dates

- Continuous age (any measure) → ELECT

- Month and year → IMaCh

- Age (single years) → SPACE, LXPCT 2

- Age (months) → SPACE work ongoing

- One year or five year intervals → GLSMT

Software comparison

	Software:				
:	IMaCh	SPACE	ELECT	GLSMT	LxPct 2
Common disorder					
No recovery					
Rare recovery					
Uneven observations					
Right censored data					
Two waves, lots of covariates					
Flexibility					
Useability					

Software comparison

:	IMaCh	SPACE	ELECT	GLSMT	LxPct 2
			Software:		
Common disorder	★★	★★	★★	★	★
No recovery	−	★	★★	★	★
Rare recovery	★	★	★★	★	★
Uneven observations	★★	★	★★	★	★
Right censored data	★★	−	★★	−	★
Two waves, lots of covariates	★	★★	★★	★★	★
Flexibility	★★	★	★	★★	★
Useability	★★	★	★	★	★★

- MRC Cognitive Function and Ageing Study

- Scenarios
  - Cognitive impairment free life expectancy
  - Disability free life expectancy
  - Stroke free life expectancy

MRC Cognitive Function and Ageing study

Years follow-up	Screening	Assessment	
0	13,004		2,640
1			920
2	7,176	1,463	1,651
3			590
5			1,733
8			389
10		3,145	

CFAS
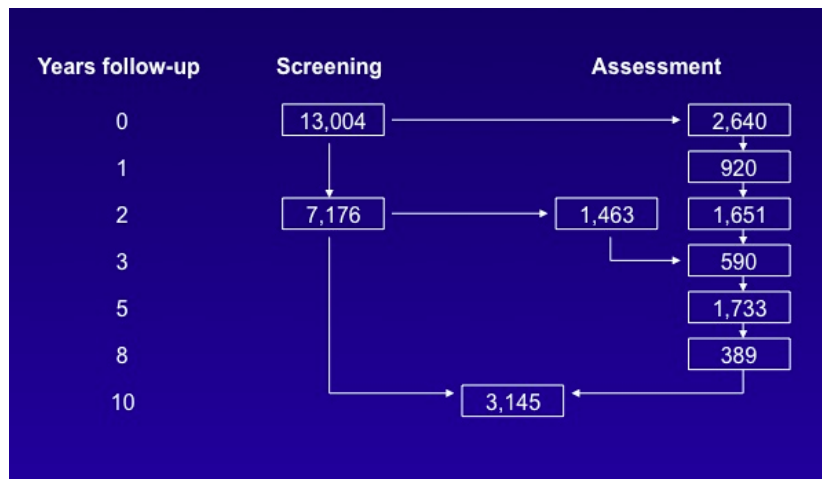
Data summary:

- Sample size: 13,004
- Classifications of Disability:
    - State 1: No Disability
    - State 2: Mild to Severe Disability
    - State 3: Death
- Classifications of Cognitive Impairment:
    - State 1: MMSE $18 - 30$
    - State 2: MMSE $0 - 17$
    - State 3: Death
- Stoke (no recovery):
    - State 1: No stroke
    - State 2: Stroke
    - State 3: Death

CFAS

Data summary:

For comparing software:

- Females
- Sample size: 6842
- Youngest age at baseline 64, oldest 103
- Interval in months between two states (min 1 max 171 months)
- No missing states at baseline
- No two events in same month
- Data right-censored at 12/2005

Software comparison

:	IMaCh	SPACE	ELECT	GLSMT	LxPct 2
			Software:		
Common disorder	★★	★★	★★	★	★
No recovery	−	★	★★	★	★
Rare recovery	★	★	★★	★	★
Uneven observations	★★	★	★★	★	★
Right censored data	★★	−	★★	−	★
Two waves, lots of covariates	★	★★	★★	★★	★
Flexibility	★★	★	★	★★	★
Useability	★★	★	★	★	★★