Comparison of methods and programs for calculating health life expectancies

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Outline

- Methods used to calculate health expectancies
- Data
  - CFAS Data
- Some preliminary results
  - ELECT
  - IMaCh
  - SPACE
- Future directions...?

inHALE Workstream on methodology

- Evaluates the different methods for calculating healthy life expectancy from both cross-sectional and longitudinal data sources.

inHALE Workstream on methodology

- Which methods for cross sectional and longitudinal data are most robust in the presence of (i) missing data (ii) unequal time intervals?
- Which hypotheses can be reliably tested using cross sectional methodology?
- How large, how often and for how long? Study design issues for measuring HLE.

Implementation

- Collation of methods for longitudinal and cross-sectional HALE
- Collecting some exemplar datasets to test methods
- Investigate similarities and differences

Methods used to calculate health expectancies

- Cross-sectional
  - The Sullivan method
- Repeated cross-sectional
  - The intercensal method
- Longitudinal
  - Discrete multi-state models
  - Continuous multi-state models
  - Increment decrement life tables

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  - **Continuous multi-state models** $\rightarrow$ ELECT
  - Increment decrement life tables

Scenarios

Scenario:	Software:			
	IMaCh	SPACE	ELECT	DD Life-table
Rare disorder				
Common disorder				
No recovery				
Rare recovery				
Acceleration with age				
Uneven covariate structure				

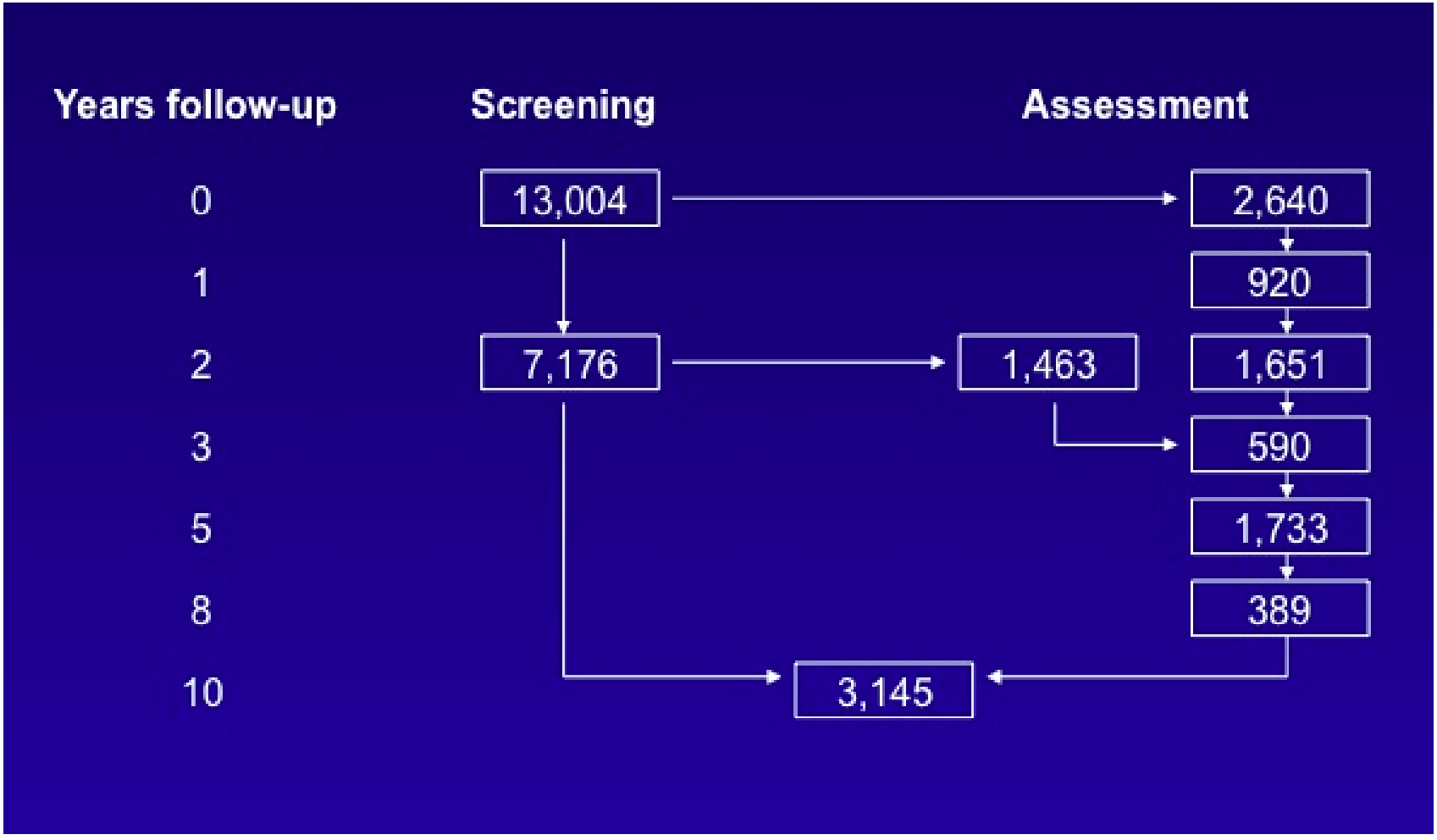
Scenarios

Scenario:	Software:			
	IMaCh	SPACE	ELECT	DD Life-table
Rare disorder	✓	✓	✓	
Common disorder	✓	✓	✓	
No recovery	N/A	✓	✓	
Rare recovery				
Acceleration with age				
Uneven covariate structure				

Methods to date

- 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



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

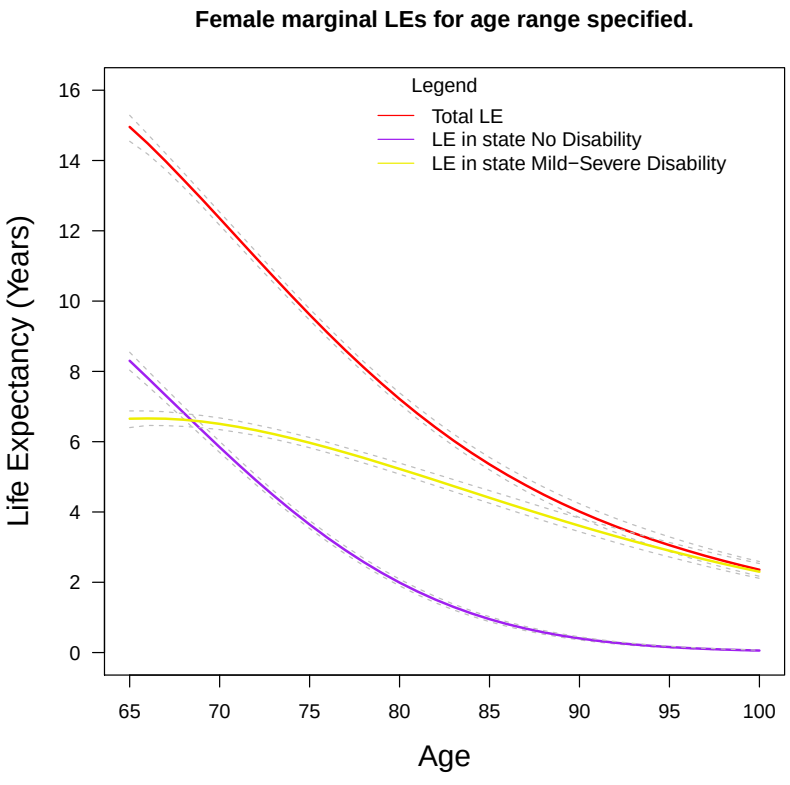
For comparing software:

- No missing states at baseline
- No two events in same month
- Data right-censored at 12/2005

Disability

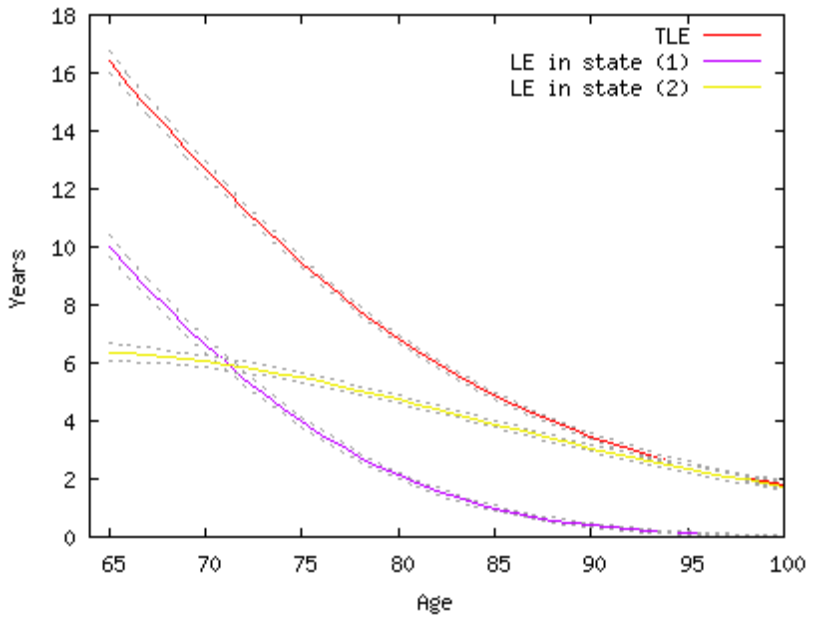
ELECT:

Estimation of Life Expectancies using Continuous-Time multi-state models



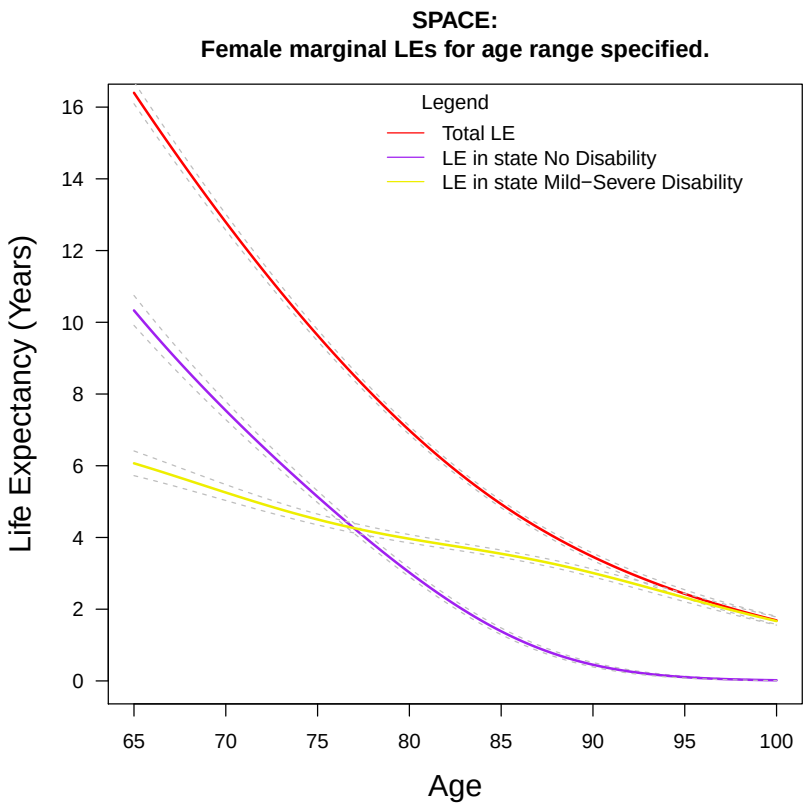
IMaCh:

A maximum likelihood computer program using Interpolation of Markov Chains



Disability

SPACE:
Stochastic Population Analysis for Complex Events



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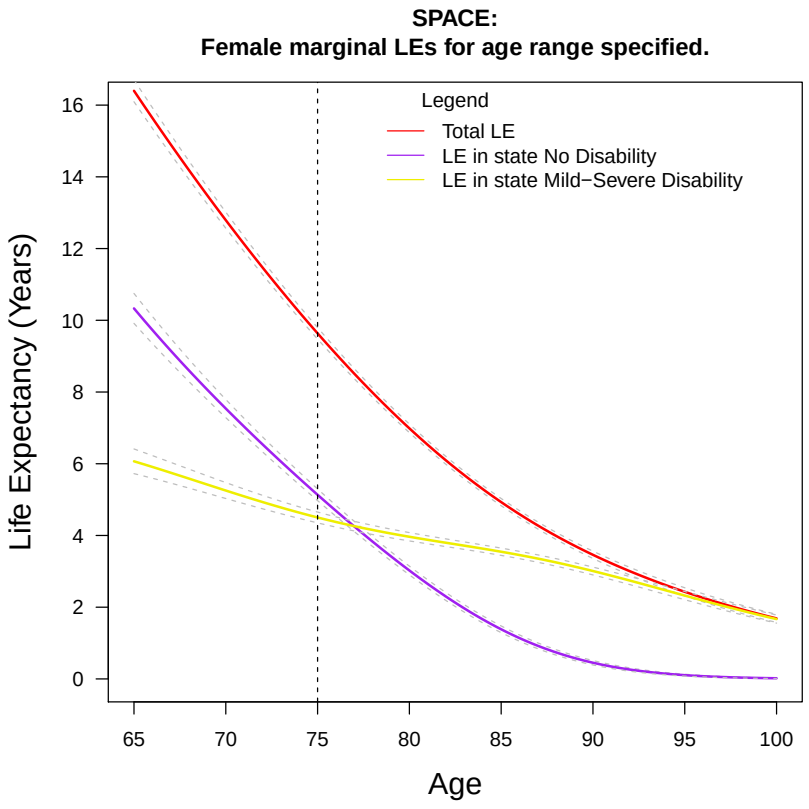
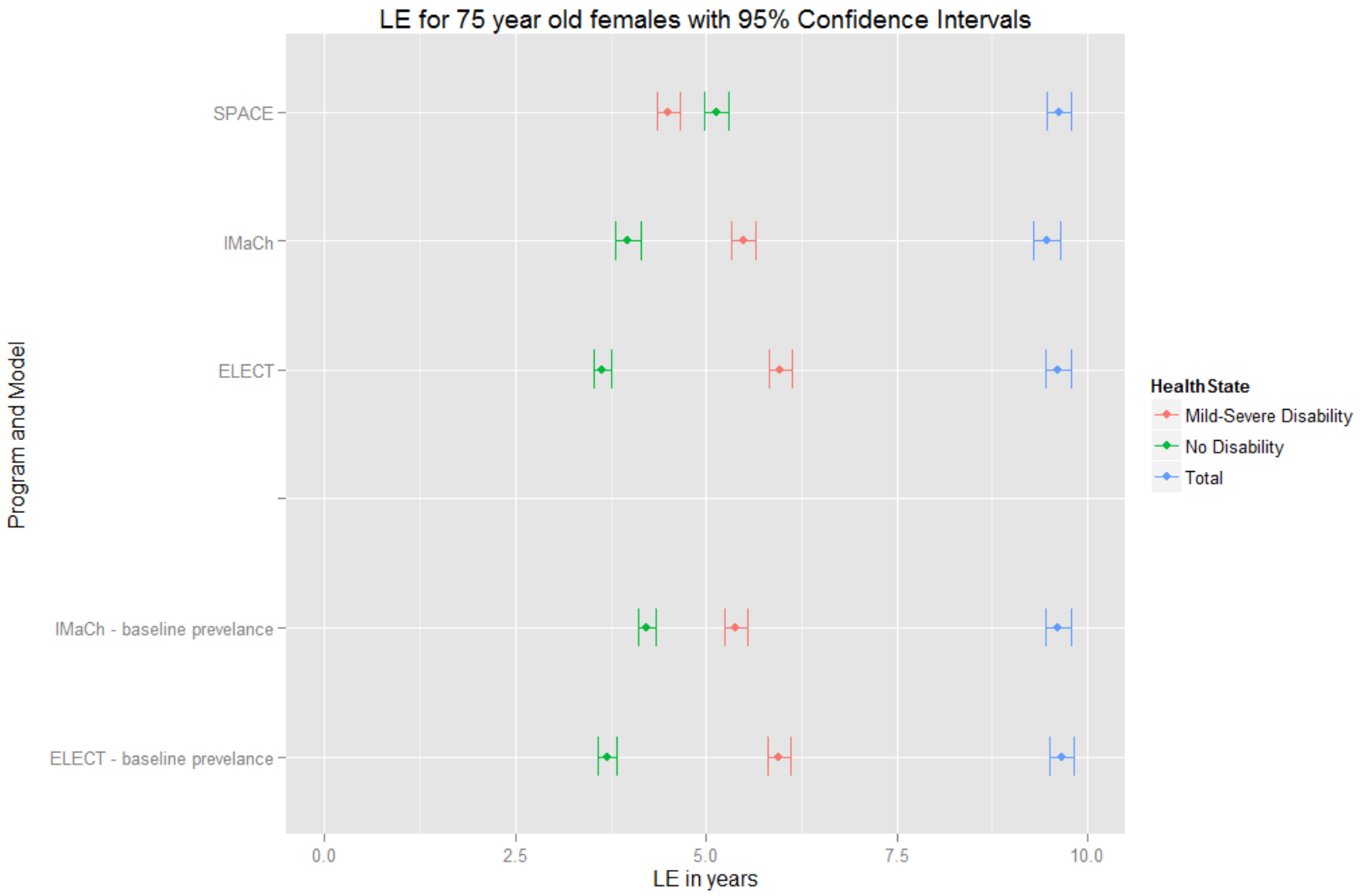


Disability: Comparison



Cognitive Impairment

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Estimation of Life Expectancies using Continuous-Time multi-state models

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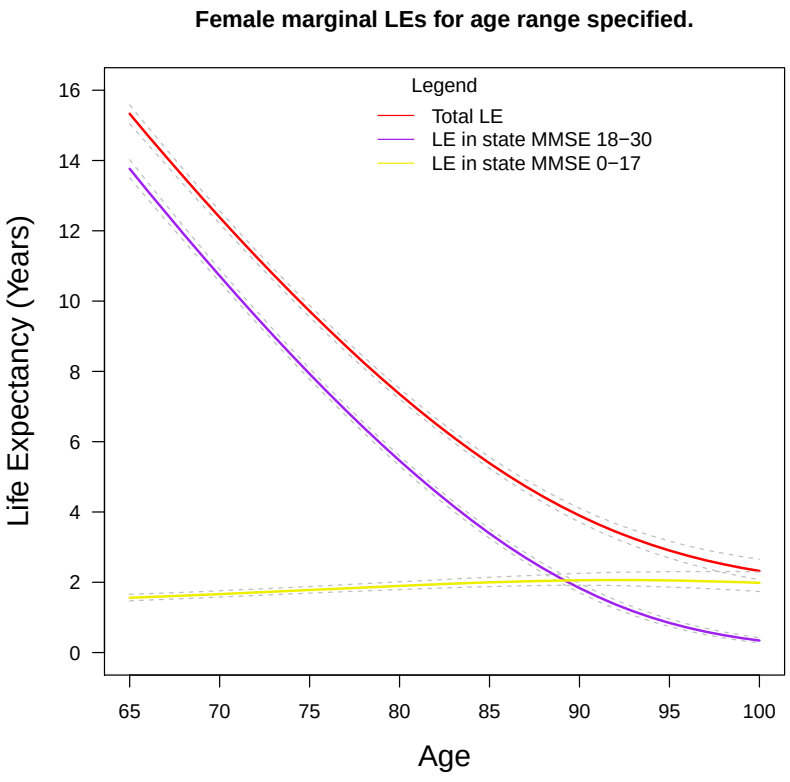

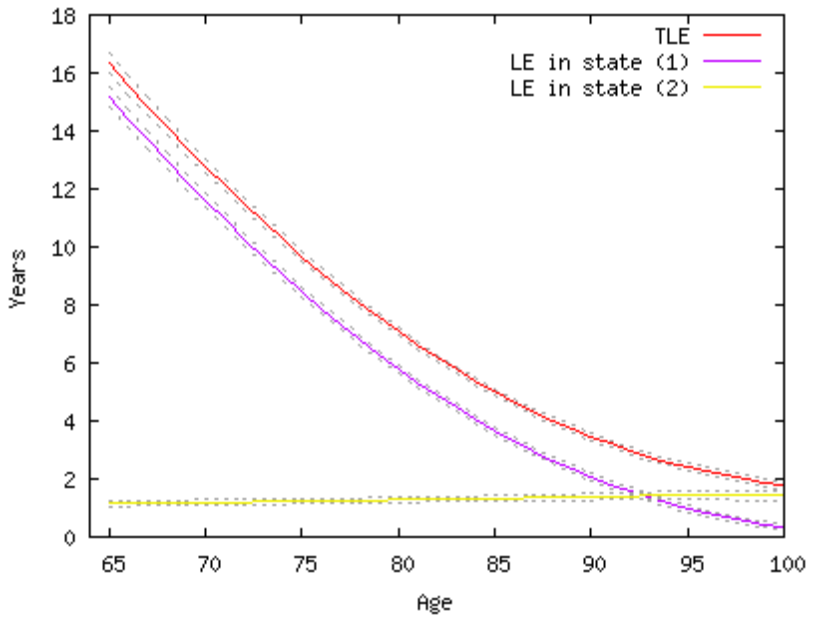

Cognitive Impairment

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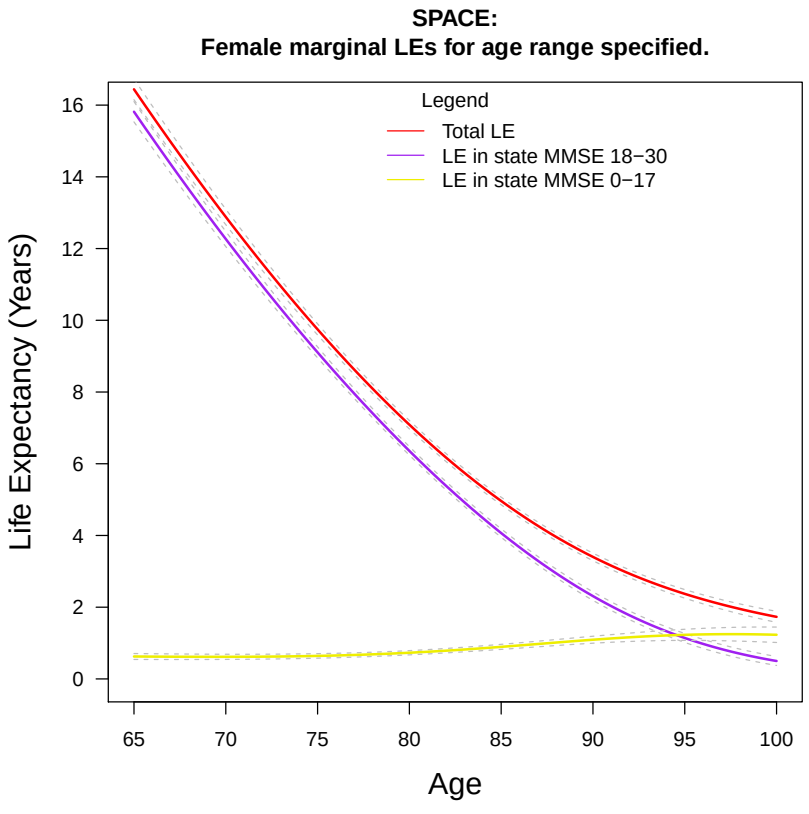

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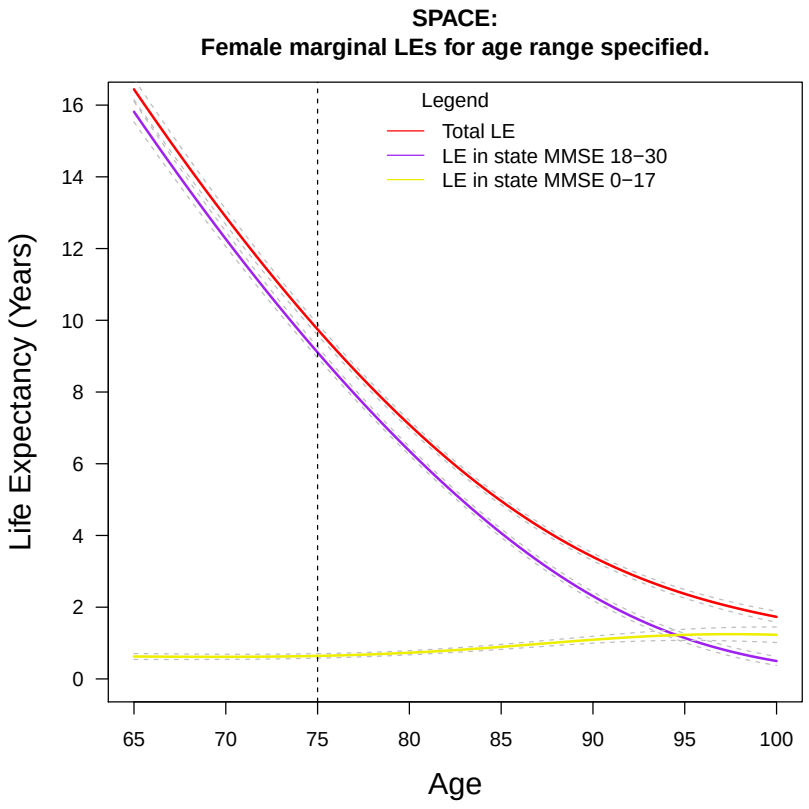
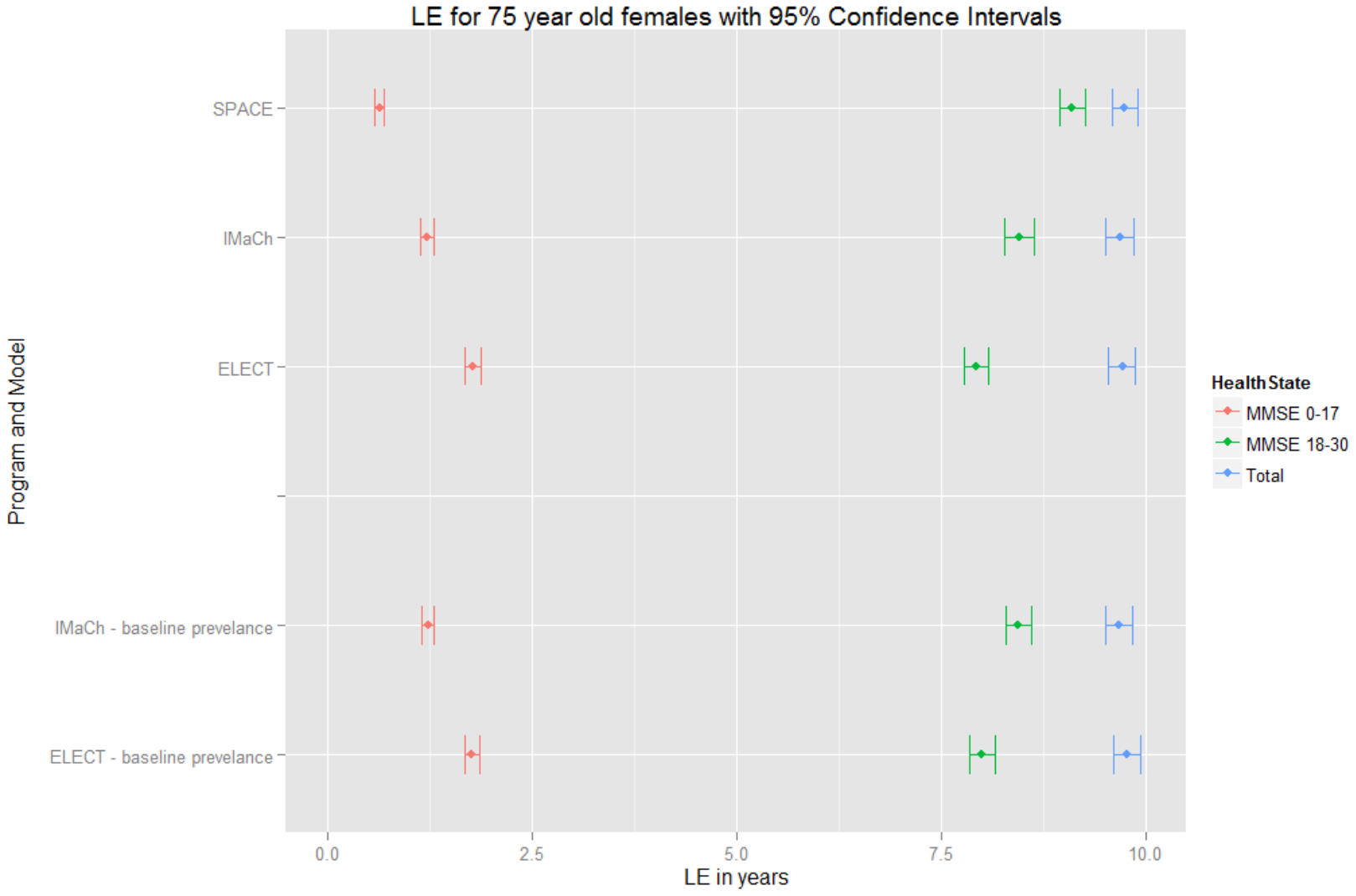
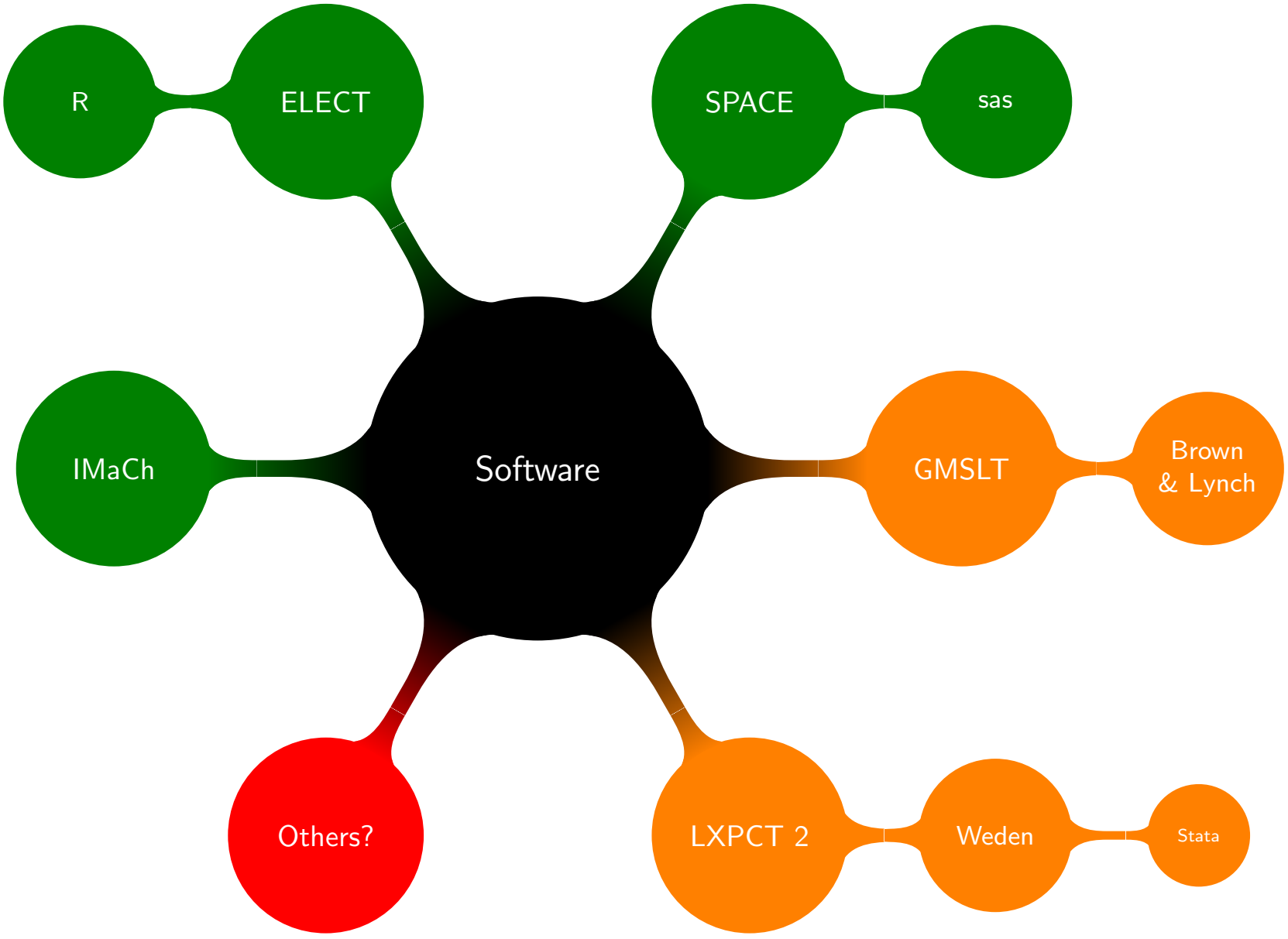


Cognitive Impairment: Comparison



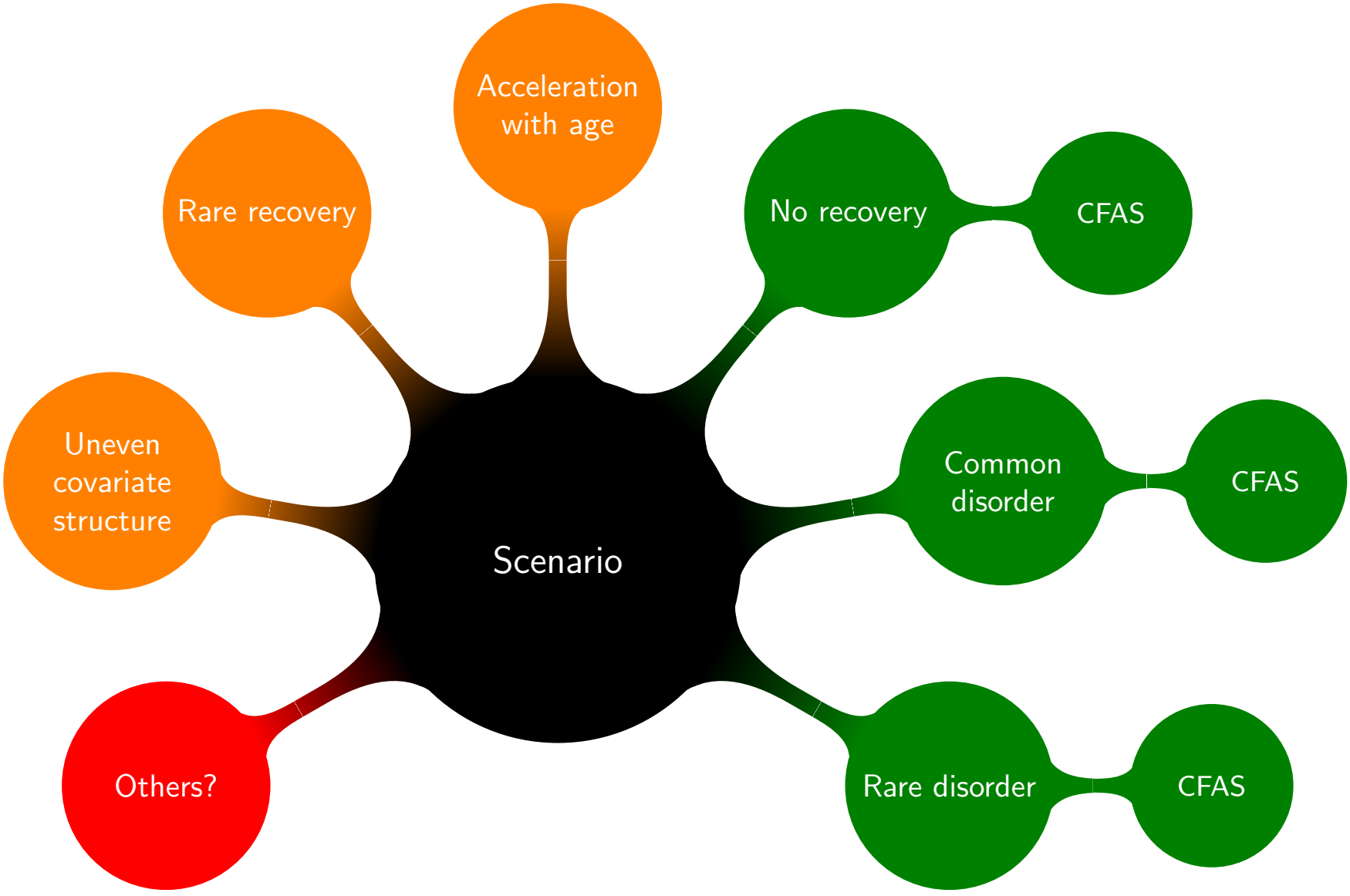
Future software



Future

- New datasets to replicate results
- Investigate differences
- New scenarios to test the programs
- Search for other packages
- ? Differences with cross-sectional methods
- Study design issues

Future scenarios (and data?)



Dissemination

- Ultimately run a workshop at Reves in Edinburgh
- Write a guide on the different methods