Preliminary prediction methodology for FrData
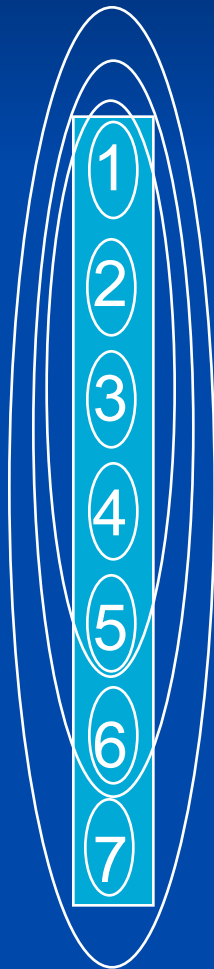
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Objective of prediction step

- To test the ability of the candidate domains, individually and in combination, to predict adverse outcomes

Baseline independent variables

- Predictors
    - Fried's 5
    - Fried's 5 + cognition
    - Fried's 5 + mood
    - All 7 domains
- Confounders
    - Demographics (age, sex, education)
    - Baseline ADL
    - Number of comorbidities (likely variability across studies)
- Other risk factors where available
    - Sensory
    - Social (likely variability across studies)

Outcome variables

Outcome	SIPA	UN	CSHA
Mortality	Yes	No	Yes
Incident ADL disability	Yes	Yes	Yes
Institutionalization	Yes	No	Yes
Hospitalization	Yes	Yes	No
Falls/Fracture	Yes	Yes	Yes
Utilization of health care	Yes	Yes	No
Utilization of home care services	Yes	Yes	No

Statistical analyses (1/2)

- Test whether domains predict adverse outcomes, individually and in combination
    - Longitudinal data analyses for repeated measures, if more than one follow-up point
    - Exact model will depend on nature of outcome variable
        - Survival analysis
        - (Repeated measures) logistic regression (GEE)
        - (Repeated measures) ANOVA (for continuous outcomes)
- Test whether addition of cognition and/or mood better predicts the outcomes
    - Interested in both model <u>prediction</u> AND <u>explanation</u>
    - Prediction: Choose best prediction models, use of c-statistic, AIC, BIC
    - Explanation: Assess statistical significance of domain variables

Statistical analyses (2/2)

- Assess relative importance of each significant domain based on model coefficients
- **Major issue**: Multicollinearity among domains
  - Will need to be dealt with on a database by database basis
  - Assess correlation through
    - Regressing each domain on all others predictors
    - Rule of thumb for bivariate correlations > 0.90
  - Recommend combining domains that are too highly correlated

Other exploratory analyses of interest?

Assessing whether the whole of the 7 candidate domains of frailty is greater than the sum of its parts
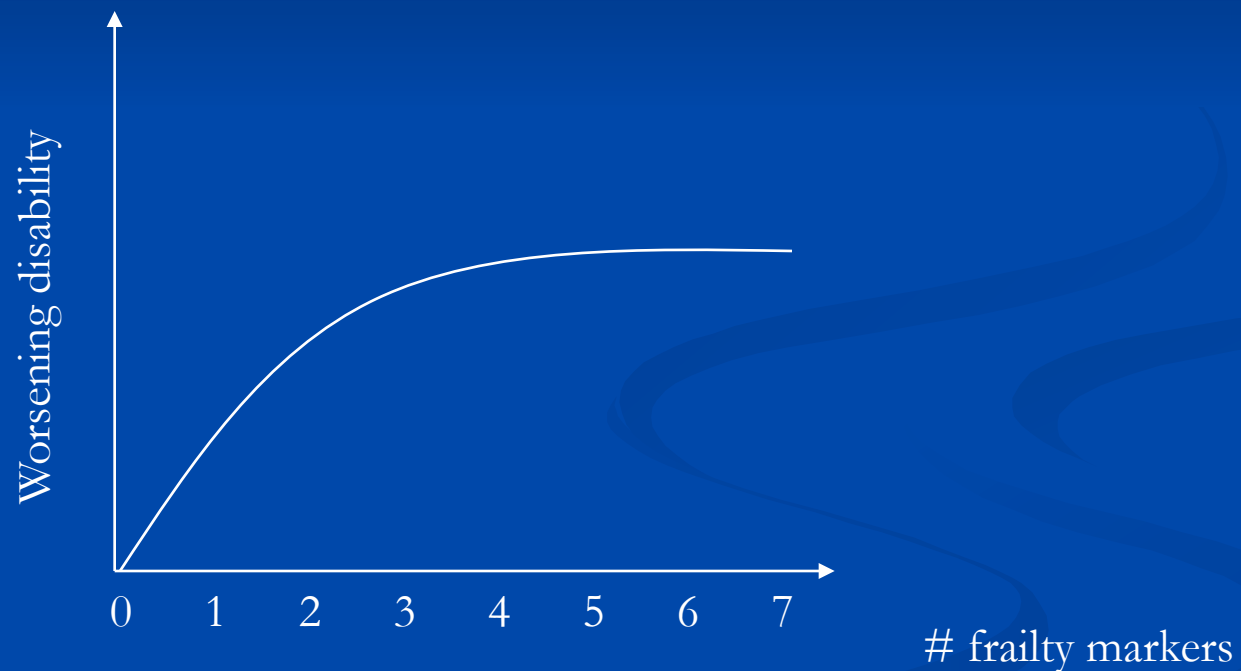
Is the whole more than the sum of its parts?
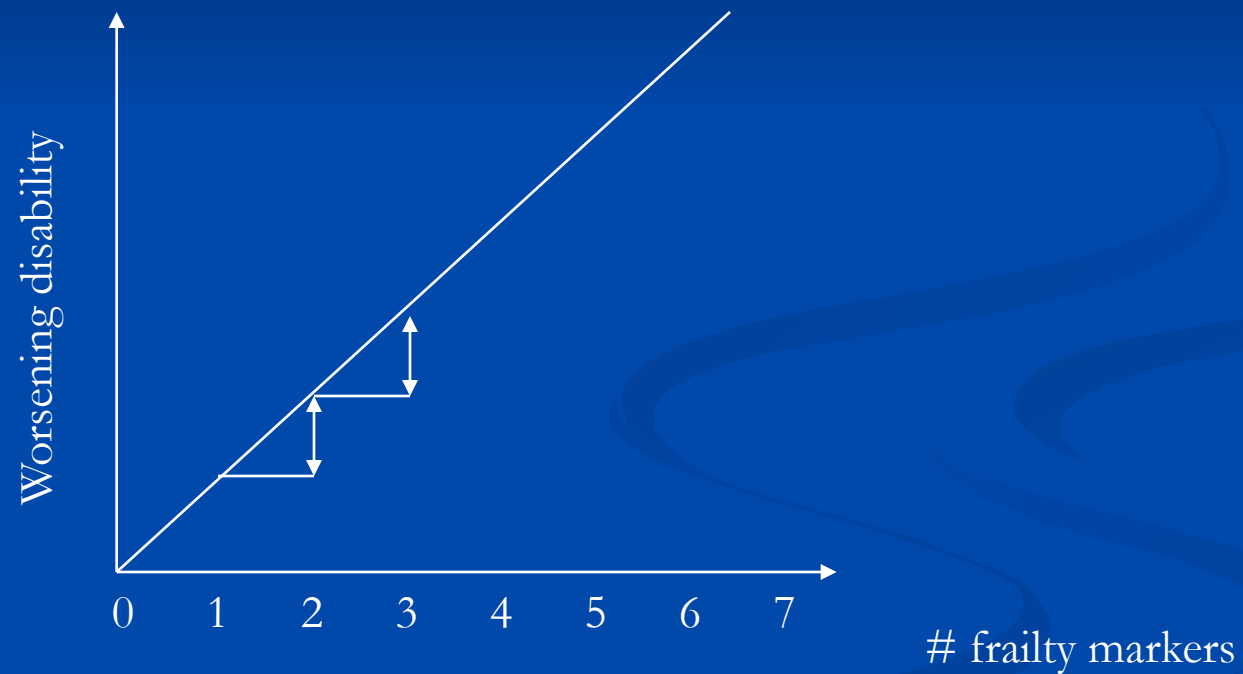
Is the whole more than the sum of its parts?

Case 2: Whole < Sum of its parts

Is the whole more than the sum of its parts?

Case 3: Whole > Sum of its parts