Predicting Sojourn Times by Dementia Stages: Evidence from 76,747 Patients

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Conclusions
The study utilizes a novel framework with a single data source to predict the time spent in disease states. The large dataset allows segmentation by baseline characteristics. The model is easily extendable to include other biomarker data and to model cost-effectiveness of disease-modifying treatments. We found that patients progressed faster in institutional care.

<table>
<thead>
<tr>
<th>State</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Inst. Mild</th>
<th>Inst. Moderate</th>
<th>Inst. Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td>860.6</td>
<td>383.5</td>
<td>407.7</td>
<td>122.4</td>
<td>202.2</td>
<td>396.06</td>
</tr>
<tr>
<td>Females</td>
<td>825.9</td>
<td>386.3</td>
<td>365.5</td>
<td>137.1</td>
<td>243.9</td>
<td>472.0</td>
</tr>
<tr>
<td>Males</td>
<td>869.1</td>
<td>357.7</td>
<td>260.4</td>
<td>107.5</td>
<td>164.8</td>
<td>222.3</td>
</tr>
</tbody>
</table>

Approach
- A multi-state model with 7 disease states
  - Mild, Moderate, Severe, Institutionalized-Mild, -Moderate, -Severe, Death
- 15 Wrapped Cox Survival models
  - States determined by MMSE and clinical diagnosis
  - Covariates: Age, Sex
  - Covariates can be removed or added in any transition model
- Benefits for multi-state modelling
  - All possible transitions are modelled, inherently accounting for competing risks
  - Very few assumptions, no parametric specifications.

Aim
Determine sojourn time by stages of disease severity and care setting.

Introduction
Alzheimer’s disease is expected to grow to 152.8 million cases globally in 2050. A common concern for patients and caregivers is the time until disease severity onset. Predicting the time in each disease stage can be beneficial for clinical and policy decisions around disease-modifying therapies.

Population
Swedish National Register for Cognitive Disorders (SVEDEM)

Scan using your phone’s camera to see more results from the study

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