Predicting Return to Work after Traumatic Brain Injury
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STUDY DESIGN

Pre-injury factors
- (Post-)injury factors (< 3 mo post-TBI):

Outcome at one year post-TBI:
- Full return to work
- Non-return to work
- Return to work, but changed responsibilities/FTE/employer

PREDICTION MODEL

Elastic net logistic regression
Tree-based models: random forest, gradient boosting

RESULTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Accuracy</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistic Regression</td>
<td>0.721</td>
<td>0.818</td>
</tr>
<tr>
<td>Random Forest</td>
<td>0.748</td>
<td>0.835</td>
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SENSITIVITY ANALYSIS

CONCLUSION

• Binary employment outcomes can be predicted with a median accuracy of about 82%

• Predictions are mainly driven by a combination of:
  - Pre-TBI factors: age, employment/job class, people living with
  - Acute TBI factors: injury severity, length of stay, vitals
  - Early post-TBI factors: general functioning, employment, mobility

ACKNOWLEDGMENTS

Our gratitude goes to the CENTER-TBI researchers. Without their extensive data collection efforts, this study would not have been possible! Many thanks to FWO and King Baudouin Foundation / Fund BENEVERMDEX for funding this study. Poster icons: Flaticon.

ABBREVIATIONS

FTE = Full-Time Equivalent
(n-RTW) = (non-)Return To Work
AUC = Area Under the Curve
GOSE = Glasgow Outcome Scale Extended
QOL = Quality Of Life
PHQ = Patient Health Questionnaire
GAD = General Anxiety Disorder
SF = Short Form (36 or 12)
QOLIBRI = Quality Of Life after Brain Injury
RPO = Rivermead Post-Concussion Questionnaire

RESEARCH OBJECTIVE

This study aims to make accurate individualized predictions on employment outcome one year after Traumatic Brain Injury (TBI).

For individual cases, these can help to inform patients and enable adequate goal setting.

For society, more targeted intervention can reduce the societal costs of nonreturn to work.

STUDY DATASET AND POPULATION SELECTION

This study used the CENTER-TBI dataset:
- which included 63 centers in 18 European (+Israel) countries,
- with data collected between 2014 and 2017,
- aiming to improve disease characterization and identification of effective clinical interventions.

Data up until 3 months post-TBI were included in the predictor set.

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