

Quick Review of Model System Research

Long-Term Survival After Traumatic Brain Injury Part I: External Validity of Prognostic Models¹

What is the study about?

This study developed statistical models for predicting long-term survival in adults with traumatic brain injury (TBI). This was the first study that tested the external validity (the degree to which the conclusions are generalizable, or would hold for other persons in other places and at other times) of the models.

Who participated in the study?

This study developed the model by analyzing data from two groups of study subjects: the Traumatic Brain Injury Model Systems (TBIMS) cohort and the California Department of Developmental Services (CDDS) cohort. The TBIMS cohort comprised 7,365 persons admitted to a TBIMS facility with moderate to severe TBI at the age of 16 or older, and were assessed at least 1 year post-injury to follow-up on functional skills. The CDDS cohort included 5,116 persons who sustained a TBI and received long-term services from the CDDS. The vital status (whether the subjects were still living) of TBIMS and CDDS cohorts was ascertained through the Social Security Death Index (SSDI) and the California Department of Public Health, respectively.

How was the study conducted?

All persons were classified into 4 comparison groups on the basis of their walking and feeding skills: (1) does not walk, fed by others; (2) does not walk, self-feeds; (3) some walking with a handheld device or unsteadily alone; and (4) walks well alone. Researchers modeled mortality rates in each group as a function of age, sex, and the 4 walking-feeding skills' groups. Model predictions were validated against actual survival outcomes in both the TBIMS and CDDS cohorts.

What did the study find?

Older age, male sex, and severity of functional disability in walking and feeding are simple but powerful predictors of increased long-term survival in persons with TBI. The statistical models for mortality rates derived from each cohort accurately predicted survival in the other; thus, researchers find strong support for clinicians to use this as a tool for predicting long-term survival in adults with TBI.

The contents of this quick review were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90DP0012-01-00). However, these contents do not necessarily represent the policy of Department of Health and Human Services, and you should not assume endorsement by the Federal Government.

¹ Brooks, J.C., Shavelle, R.M., Strauss, D.J., Hammond, F.M., & Harrison-Felix, C.L. (2015). Long-term survival after traumatic brain injury part I: External validity of prognostic models. *Archives of Physical Medicine and Rehabilitation*, 96: 994-999.