extRpolateS: A Shiny-Based Interactive Platform for Time-to-Event Data Modeling in Health Technology Assessments

Máté Szilcz, Parissa Naghipour, Mark Clements

Conclusions

extRpolateS is a comprehensive solution for time-to-event analysis, accessible to both analysts and non-experts. It generates robust outputs for health economic models while ensuring ease of use. With its advanced modeling capabilities, extRpolateS improves decision-making in HTAs. Future enhancements, including the integration of health economic modeling, could further expand its impact.

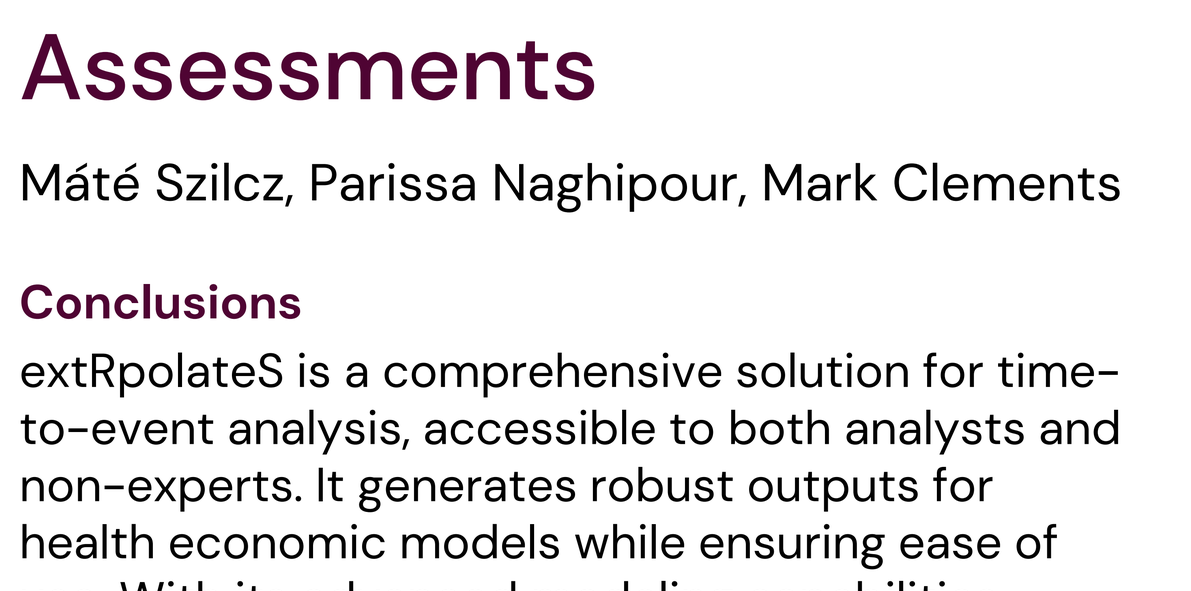

Figure 1: Kaplan–Meier figure digitized in the app

Aim

We aimed to develop extRpolateS, an interactive R-Shiny application that pairs advanced survival-extrapolation methods with an intuitive interface, enabling analysts to generate reliable extrapolations for HTA without the need for coding.

Table 1: Goodness of fit and restricted mean tables

Methods

extRpolateS is a cloud-based platform developed in R Shiny, leveraging the survival, flexsurv and survHE packages for time-to-event modeling, and plotly/ggplot2 for interactive visualizations. The modular interface includes an input module that accepts 3 types of data: a KM figure, digitized KM data or empirical trial data. The output module provides descriptive analytics (e.g., Kaplan–Meier curves, proportional hazard checks) and supports a range of modeling approaches, including general parametric (e.g., Weibull), spline-based (normal, hazard, or odds scale), mixture and non-mixture cure, relative survival and piecewise models. All modeling follows the guidelines outlined in the NICE Technical Support Documents 14 and 21.

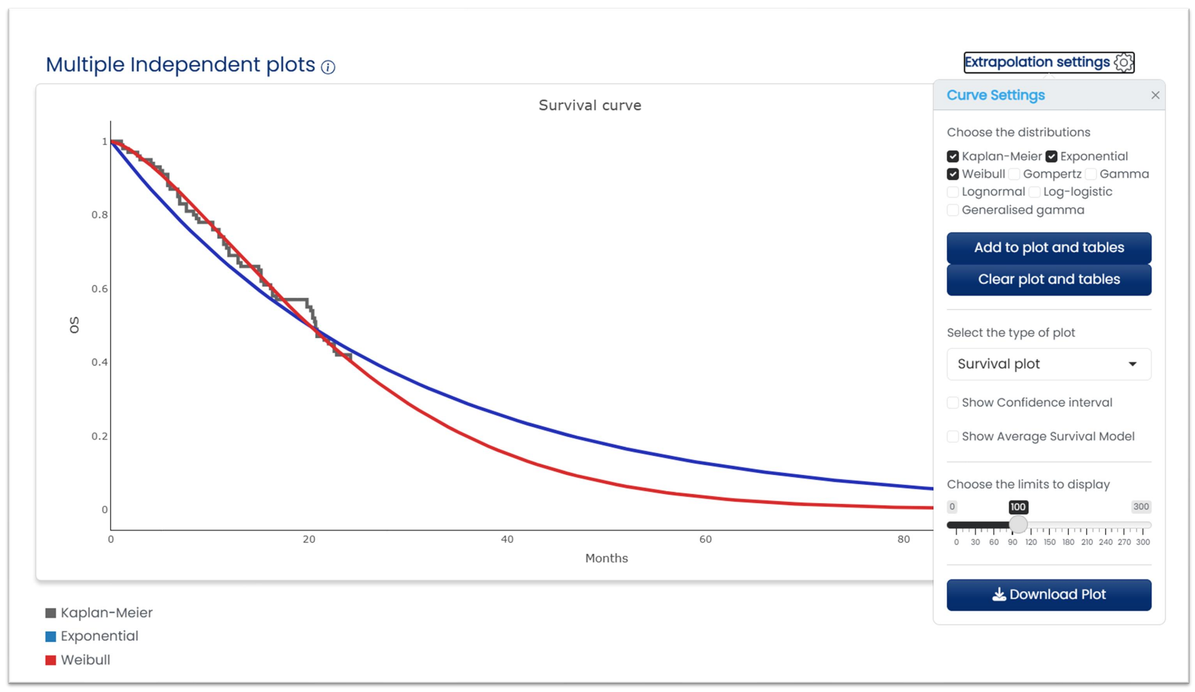

Figure 2: Independent survival extrapolations and available settings

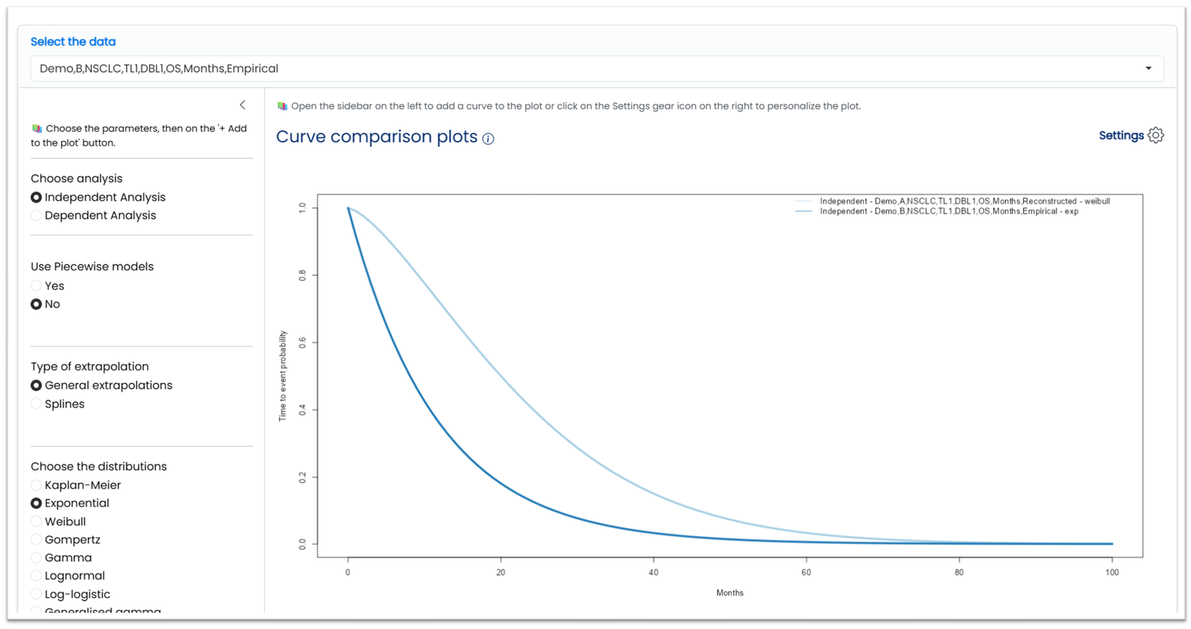

Figure 3: Advanced modelling options of stored datasets

Scan to see more!

Máté Szilcz, PhD
CEO & Founder | Postdoc

Viti Science DATA ANALYTICS

Karolinska Institutet