

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

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## 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.

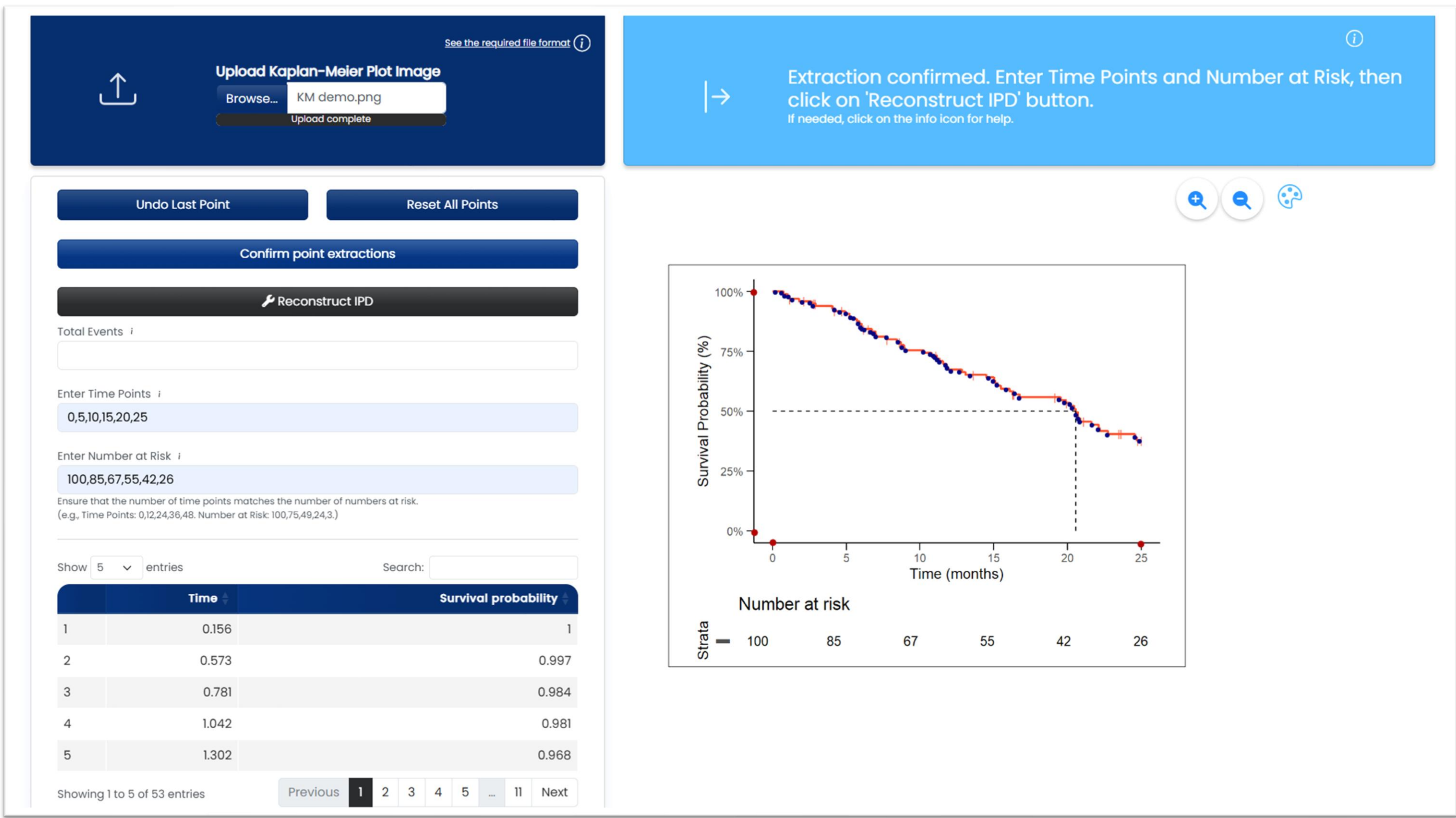


Figure 1: Kaplan–Meier figure digitized in the app

## 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.

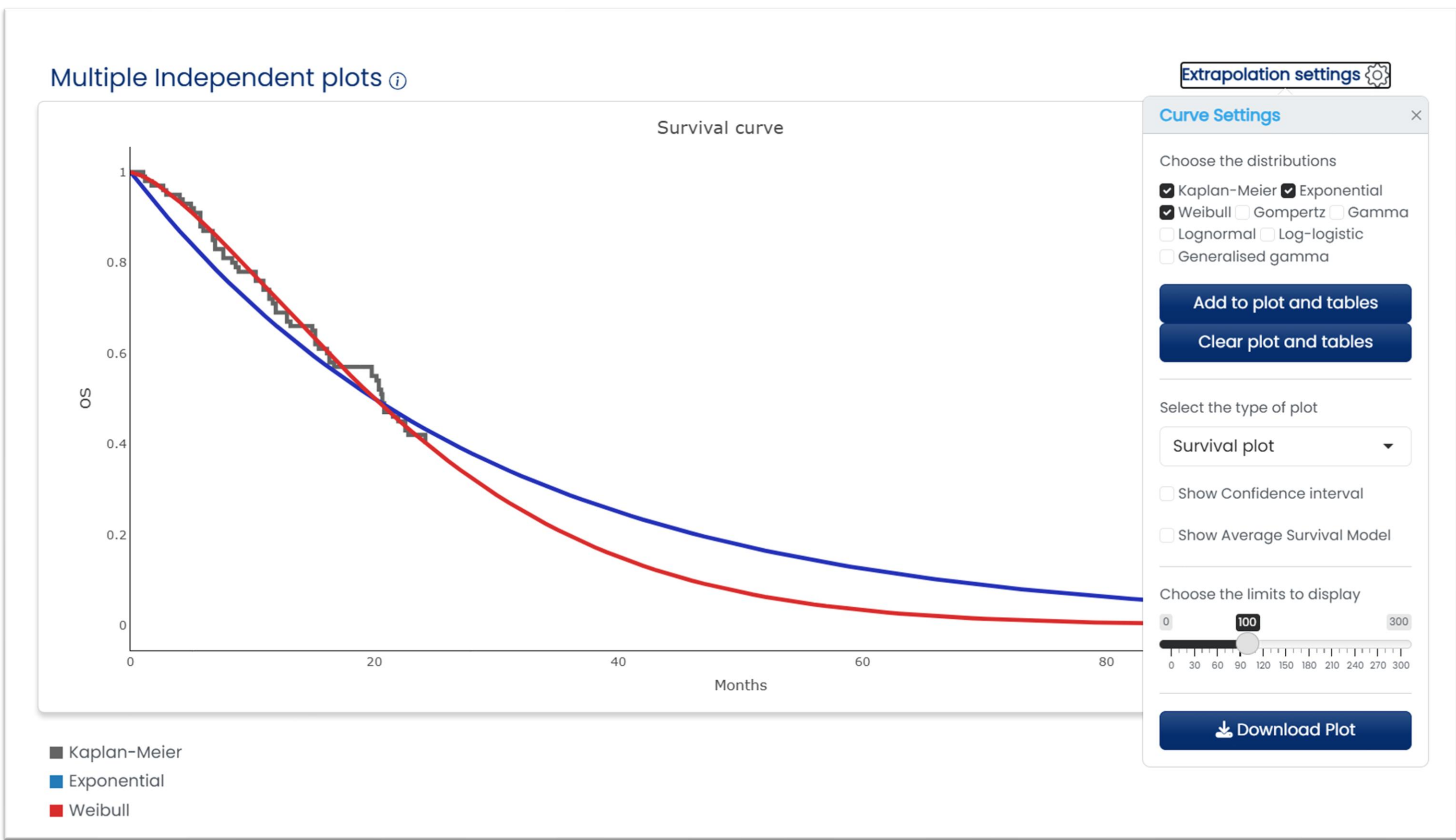


Figure 2: Independent survival extrapolations and available settings

Goodness of Fit table

Distribution	AIC	Δ AIC (vs Weibull)	BIC	Δ BIC (vs Weibull)	LogLikelihood	Δ LogLik (vs Generalised gamma)
Weibull	518.55	0.00	523.76	0.00	-257.28	0.01
Gamma	518.59	0.04	523.80	0.04	-257.30	0.03
Log-logistic	519.59	1.03	524.80	1.03	-257.79	0.52
Gompertz	520.08	1.53	525.29	1.53	-258.04	0.77
Generalised gamma	520.54	1.99	528.35	4.59	-257.27	0.00
Lognormal	521.37	2.81	526.58	2.81	-258.68	1.41
Exponential	525.39	6.83	527.99	4.23	-261.69	4.42

Restricted Mean table

Distributions	Restricted mean (AUC) up to 100	Median	LCI (Median)	UCI (Median)
Kaplan-Meier	17.48	NE	NE	NE
Exponential	27.94	19.99	15.57	25.69
Weibull	23.36	20.02	16.84	23.60

NE = Not estimable.

Showing 1 to 3 of 3 entries

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.

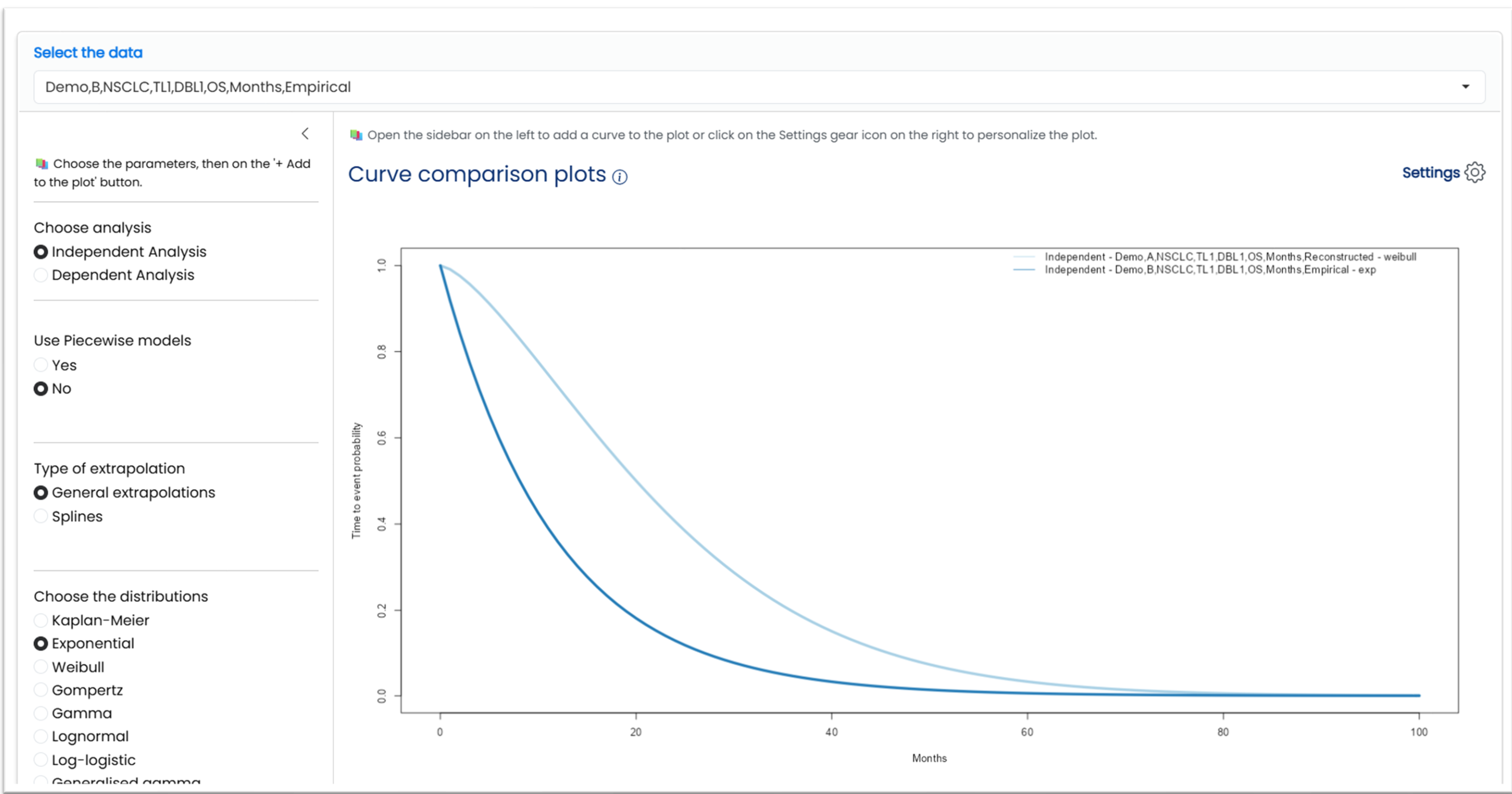


Figure 3: Advanced modelling options of stored datasets

Scan to see more!



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