RMSTSS: A New Tool for Planning Better, Faster Medical Studies

Arnab Aich

University of Tennessee Health Science Center

What is RMST?

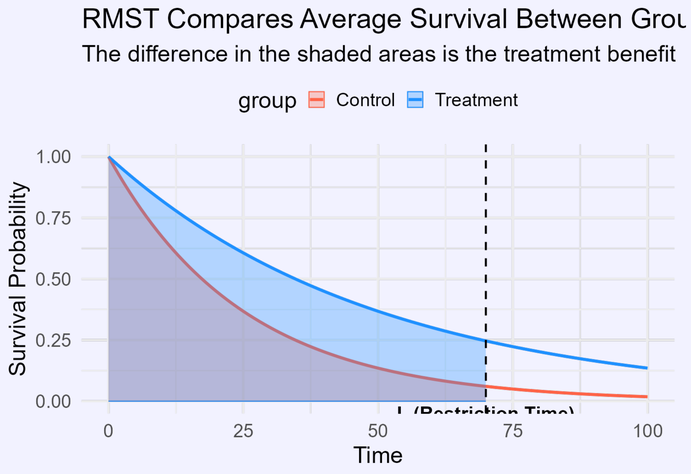
RMST stands for **Restricted Mean Survival Time**. It measures the average "event-free" time for patients up to a specific follow-up time.

Why is it a good measure?

✓ It is easy for doctors and patients to understand.

✓ It provides a clear, direct measure of treatment benefit.

✓ It avoids relying on complex statistical assumptions.



Our Solution: The RMSTSS Tool

Planning studies with RMST has been difficult. We made it easy. 'RMSTSS' is a free tool that helps researchers properly plan modern medical studies. It is available as both an R package and an easy-to-use web application.

How to Access Our Tool

For R Users

Install our R package to use these calculations in your code.

```
remotes::install_github(
  "UTHSC-Zhang/RMSTSS-Package"
)
```

For Everyone Else

Use our web application. No installation or coding needed!

Scan to use the web app

Features & Capabilities

A Full Suite of Modern Models

Our tool handles many real-world research scenarios:

- **Linear Model**: For standard clinical trials.
- **Stratified Models**: For studies run at many different hospitals.
- **GAM Model**: For studies where factors like patient age have complex effects.
- **Dependent Censoring**: For studies with competing outcomes, like transplants.

Choose Your Goal

- **Power Calculation**: Find the chance of success for a given study size.
- **Sample Size Search**: Find how many patients you need to succeed.

Choose Your Method

- **Quick Check (Analytical)**: A fast answer for exploring ideas.
- **Deep Dive (Bootstrap)**: A powerful simulation for a more accurate result. Our tool can run these simulations in parallel to be faster!

How the App Works

The web application guides you through the process in a few simple steps.

1. Upload Data

↓

2. Choose Your Model & Goal

↓

3. Get Instant Results!

The app provides interactive plots, summary tables, and downloadable PDF reports.

Learn More & Get in Touch

Future Scope

We are always improving the ‘RMSTSS‘ tool, with plans to add more bootstrap methods and advanced diagnostic tools.

Project Page

Visit our GitHub page for the source code and documentation.

Scan for the GitHub Project

Key References

Royston & Parmar (2013), Tian et al. (2014), Uno et al. (2014), Wang et al. (2018, 2019), Zhang & Schaubel (2024).