

# Package: **impower133** (via r-universe)

June 11, 2026

**Type** Package

**Title** Reproduce IMpower133 Clinical Trial Results

**Version** 1.0.0

**Description** Provides functions to simulate baseline characteristics, reconstruct overall survival data from published Kaplan-Meier curves, and generate publication-ready tables and forest plots reproducing the IMpower133 clinical trial results (Horn et al., 2018, <doi:10.1056/NEJMoa1809064>). The IPD reconstruction method is based on Liu et al.(2021, <doi:10.1186/s12874-021-01308-8>).

**License** MIT + file LICENSE

**Encoding** UTF-8

**RoxygenNote** 7.3.3

**Imports** dplyr, survival, survminer, gt, forestplot, IPDfromKM, ggplot2, stats, utils, grid

**SystemRequirements** GNU make

**Suggests** testthat (>= 3.0.0)

**Config/testthat/edition** 3

**URL** <https://github.com/fanfande131/impower133>

**BugReports** <https://github.com/fanfande131/impower133/issues>

**NeedsCompilation** no

**Author** Lu Huang [aut, cre], Wenkai Nie [aut], Qingyang Jiang [aut], Qinxin Chen [aut]

**Maintainer** Lu Huang <2998785392@qq.com>

**Config/pak/sysreqs** make

**Repository** <https://cran.r-universe.dev>

**Date/Publication** 2026-06-11 16:32:52 UTC

**RemoteUrl** <https://github.com/cran/impower133>

**RemoteRef** HEAD

**RemoteSha** 334861e893f9fa030c27032d26f7cfe20f8906b2

## Contents

analyze_survival . . . . .	2
make_table1 . . . . .	2
make_table2 . . . . .	3
make_table3 . . . . .	3
plot_figure2c . . . . .	4
plot_survival . . . . .	4
reconstruct_survival . . . . .	5
rtriang . . . . .	6
simulate_impower133 . . . . .	6

<b>Index</b>	<b>8</b>
--------------	----------

---

analyze_survival	<i>Analyze survival data and print key statistics</i>
------------------	---

---

### Description

Analyze survival data and print key statistics

### Usage

```
analyze_survival(ipd_data, type = c("OS", "PFS"), times = 12)
```

### Arguments

ipd_data	Reconstructed data frame or CSV path
type	"OS" or "PFS"
times	Landmark time point in months, default 12

### Value

A list of key statistics (invisibly)

---

make_table1	<i>Generate Table 1: Baseline characteristics</i>
-------------	---

---

### Description

Create a publication-ready baseline characteristics table using the gt package, formatted to match the original IMpower133 publication style.

### Usage

```
make_table1(data)
```

**Arguments**

data                    Data frame from simulate\_impover133()

**Value**

A gt table object

---

make\_table2                    *Generate Table 2: Response rate and disease progression*

---

**Description**

Create a publication-ready table summarizing objective response rate, duration of response, and disease progression outcomes using the gt package.

**Usage**

```
make_table2(data)
```

**Arguments**

data                    Data frame from simulate\_impover133()

**Value**

A gt table object

---

make\_table3                    *Generate Table 3: Adverse events*

---

**Description**

Create a publication-ready adverse events table summarizing treatment-related adverse events by grade in the as-treated population, using the gt package.

**Usage**

```
make_table3(data)
```

**Arguments**

data                    Data frame from simulate\_impover133()

**Value**

A gt table object

---

plot_figure2c	<i>Plot Figure 2C: Subgroup forest plot</i>
---------------	---

---

**Description**

Calculate hazard ratios for each subgroup based on simulated baseline data merged with reconstructed OS data, and generate a forest plot in the original IMpower133 publication style.

**Usage**

```
plot_figure2c(data, output_path = "figure2c.png")
```

**Arguments**

data	Data frame from simulate_impower133() with os_path specified
output_path	Path to output image file, default "figure2c.png"

**Value**

No return value, saves image to output\_path

---

plot_survival	<i>Plot survival K-M curve</i>
---------------	--------------------------------

---

**Description**

Plot survival K-M curve

**Usage**

```
plot_survival(
  ipd_data,
  type = c("OS", "PFS"),
  output_path = tempfile(fileext = ".png"),
  width = 10,
  height = 6
)
```

**Arguments**

ipd_data	Reconstructed data frame or CSV path
type	"OS" or "PFS"
output_path	Path to output image file
width, height	Image dimensions in inches

**Value**

No return value, called for side effects (saves a plot to file).

---

reconstruct\_survival *Reconstruct individual patient data from K-M curves*

---

**Description**

Use `IPDfromKM` to extract coordinates from published Kaplan-Meier curves and reconstruct individual patient data (IPD).

**Usage**

```
reconstruct_survival(
  img_path,
  trisk,
  nrisk_control,
  nrisk_treatment,
  x1 = 0,
  x2 = 21,
  y1 = 0,
  y2 = 1,
  output_csv = tempfile(fileext = ".csv"),
  type = c("OS", "PFS")
)
```

**Arguments**

<code>img_path</code>	Path to K-M curve image
<code>trisk</code>	Vector of risk time points
<code>nrisk_control</code>	Number at risk for control group
<code>nrisk_treatment</code>	Number at risk for treatment group
<code>x1, x2</code>	X-axis range (actual values)
<code>y1, y2</code>	Y-axis range (actual values)
<code>output_csv</code>	Path to output CSV file
<code>type</code>	"OS" or "PFS"

**Value**

A data frame with columns `time`, `status`, `arm` (invisibly)

---

rtriang	<i>Triangular distribution random number generator</i>
---------	--

---

**Description**

Generate random numbers following a triangular distribution, useful for simulating continuous variables whose median is not at the center of the range.

**Usage**

```
rtriang(n, min_val, mode_val, max_val)
```

**Arguments**

n	Sample size
min_val	Minimum value
mode_val	Mode (peak location)
max_val	Maximum value

**Value**

A numeric vector of length n

**Examples**

```
rtriang(100, 28, 64, 90)
```

---

simulate_impower133	<i>Simulate IMpower133 complete ITT population</i>
---------------------	--

---

**Description**

Simulate 403 virtual patients' baseline characteristics, efficacy outcomes, and safety data based on published summary statistics from Tables 1-3.

**Usage**

```
simulate_impower133(  
  seed = 21,  
  os_path = NULL,  
  pfs_path = NULL,  
  method = c("risk_score", "random"),  
  output_path = tempfile(fileext = ".csv")  
)
```

**Arguments**

<code>seed</code>	Random seed, default 21
<code>os_path</code>	Path to reconstructed OS data CSV (optional)
<code>pfs_path</code>	Path to reconstructed PFS data CSV (optional)
<code>method</code>	Matching method: "random" or "risk_score" (default)
<code>output_path</code>	Path to save output CSV

**Value**

A data.frame with 403 rows and all variables (invisibly)

**Examples**

```
df <- simulate_impower133()
head(df)
```

# Index

`analyze_survival`, 2

`make_table1`, 2

`make_table2`, 3

`make_table3`, 3

`plot_figure2c`, 4

`plot_survival`, 4

`reconstruct_survival`, 5

`rtriang`, 6

`simulate_impower133`, 6