

forestly – An R Package to Generate Interactive Forest Plots

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Agenda

- Problem Statement
- Package Overview
- Interactive Features
- Customization & Usage
- Conclusion & Future Direction

Problem Statement

- Static forest plot can be lengthy and challenging for stakeholder to review.
- Additional tables and listings are required for review and interpretation of results from static forest plot
- Learning curve is too long for statistical programmers to create interactive forest plot using existing packages
- Lack of tools and end-to-end process to generate interactive forest plot from ADaM data

Our goal is to create a tool for generating an interactive forest plots from ADaM datasets and to enable stakeholders digest lengthy information efficiently.

“forestly” Package Overview

- Developed to generate interactive forest plots to improve user experience
- Has 4 functions to create input metadata, generate statistics, customize output layout and generate interactive forest plot

To generate interactive forest plot using forestly, following steps need to be followed.

- Step 1: construct input metadata for AE analysis from the ADaM datasets by *meta_forestly()*.
- Step 2: prepare datasets for interactive forest plot by *prepare_ae_forestly()*.
- Step 3: format output layout through *format_ae_forestly()*.
- Step 4: generate the interactive forest plot using *ae_forestly()*.

```
meta_forestly(dataset_adsl = adsl,  
              dataset_adae = adae,  
              population_term = "apat",  
              observation_term = "wk12") |>  
  prepare_ae_forestly(parameter = "any;rel;ser") |>  
  format_ae_forestly() |>  
  ae_forestly()
```

Interactive Features

“forestly” has several interactive features to help enhance user experience

- Category of adverse event(AE) can be selected to filter (i) any AE (ii) drug-related AEs (iii) serious AEs
- Filtered based on AE Incidence
- Labels can be revealed by hovering the mouse over a point and error bar
- Sorting is enabled by clicking column header
- Search bar for users to quickly perform global “keyword” search
- Source data can be downloaded as CSV file for additional analysis as needed
- Subject level information can be drilled down by clicking ►
- Pagination applied to navigate to different pages quickly

Interactive Features

Demo:

Example: <https://elong0527.github.io/forestly/articles/forestly.html#overview>

Customization & Usage

- Change colors
- Create interactive forest plot for multiple arms
- Display different columns

Customization & Usage

Tutorial:

<https://elong0527.github.io/forestly/articles/index.html>

Conclusion & Future Direction

Conclusion:

- Elegant solution to integrate a large volume of information from AE tables, listings and figures into one interactive plot
- Package design aligned with end-to-end workflow used in clinical trial A&R
- Output is a standalone HTML file without a backend server and can be easily shared

Future Direction:

- Release to CRAN
- Enable users to download R code and necessary metadata so that the output can be reproduced
- Enable users to download static forest plots

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Q&A

