

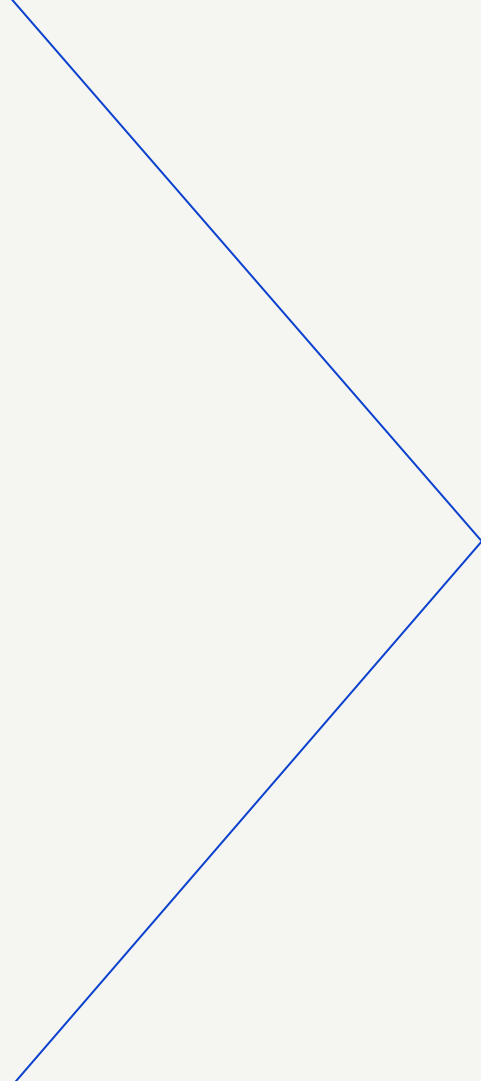


Empowering Clinical Data Review with Interactive Patient-Level Visualisations in {teal}

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March 24, 2026
@PHUSE US Connect

Agenda

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- A large blue arrow shape pointing to the right, formed by two diagonal lines meeting at a point on a vertical line that runs down the center of the slide.
1. What's new with {teal}
 2. Challenges in Clinical Data Review Workflow
 3. Needs from Clinical Scientist
 4. Interactive Patient-Level Visualisation: What We Aim to Enable
 5. Why Open-Source Tools?
 6. Demo
 7. Piloting, Validation, and Early Feedback
 8. Next / Future Plans

What's new with {teal}

V1.0 Release!



teal v1.0 Release!



Install from

CRAN

What's new with {teal}

teal got a new look!

Before

example test module

Choose a dataset

iris

Show R code

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width
1	5.1	3.5	1.4	0.2
2	4.9	3.0	1.4	0.2
3	4.7	3.2	1.3	0.3
4	4.6	3.1	1.3	0.2
5	5.0	3.6	1.4	0.2
6	5.4	3.9	1.7	0.4
7	4.6	3.4	1.4	0.3
8	5.0	3.4	1.5	0.2
9	4.4	2.9	1.4	0.2
10	4.9	3.1	1.5	0.1
11	5.4	3.7	1.5	0.2
12	4.8	3.4	1.6	0.2
13	4.8	3.0	1.4	0.1
14	4.3	3.0	1.1	0.1
15	5.8	4.0	1.2	0.2
16	5.7	4.4	1.5	0.4
17	5.4	3.9	1.3	0.4
18	5.1	3.5	1.4	0.3
19	5.7	3.8	1.7	0.3
20	5.1	3.8	1.5	0.3
21	5.4	3.4	1.7	0.2
22	5.1	3.7	1.5	0.4
23	4.6	3.6	1.0	0.2
24	5.1	3.3	1.7	0.5
25	4.8	3.4	1.9	0.2
26	5.0	3.0	1.6	0.2
27	5.0	3.4	1.6	0.4
28	5.2	3.5	1.5	0.2
29	5.2	3.4	1.4	0.2
30	4.7	3.2	1.6	0.2
31	4.8	3.1	1.6	0.2
32	5.4	3.4	1.5	0.4
33	5.2	4.1	1.5	0.1
34	5.5	4.2	1.4	0.2
35	4.9	3.1	1.5	0.2
36	5.0	3.2	1.2	0.2
37	5.5	3.5	1.3	0.2
38	4.9	3.6	1.4	0.1
39	4.4	3.0	1.3	0.2
40	5.1	3.4	1.5	0.2

Active Filter Summary

Data Name	Obs
iris	150/150
mtcars	32/32

Active Filter Variables

iris

mtcars

After

Module (1) Report

example test module

Choose a dataset

iris

Show R code

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
1	5.1	3.5	1.4	0.2	setosa
2	4.9	3.0	1.4	0.2	setosa
3	4.7	3.2	1.3	0.3	setosa
4	4.6	3.1	1.3	0.2	setosa
5	5.0	3.6	1.4	0.2	setosa
6	5.4	3.9	1.7	0.4	setosa
7	4.6	3.4	1.4	0.3	setosa
8	5.0	3.4	1.5	0.2	setosa
9	4.4	2.9	1.4	0.2	setosa
10	4.9	3.1	1.5	0.1	setosa
11	5.4	3.7	1.5	0.2	setosa
12	4.8	3.4	1.6	0.2	setosa
13	4.8	3.0	1.4	0.1	setosa
14	4.3	3.0	1.1	0.1	setosa
15	5.8	4.0	1.2	0.2	setosa
16	5.7	4.4	1.5	0.4	setosa
17	5.4	3.9	1.3	0.4	setosa
18	5.1	3.5	1.4	0.3	setosa
19	5.7	3.8	1.7	0.3	setosa
20	5.1	3.8	1.5	0.3	setosa
21	5.4	3.4	1.7	0.2	setosa
22	5.1	3.7	1.5	0.4	setosa
23	4.6	3.6	1.0	0.2	setosa
24	5.1	3.3	1.7	0.5	setosa
25	4.8	3.4	1.9	0.2	setosa
26	5.0	3.0	1.6	0.2	setosa
27	5.0	3.4	1.6	0.4	setosa
28	5.2	3.5	1.5	0.2	setosa
29	5.2	3.4	1.4	0.2	setosa
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40	5.1	3.4	1.5	0.2	setosa

Active Filter Summary

Data Name	Obs
iris	150/150
mtcars	32/32

Active Filter Variables

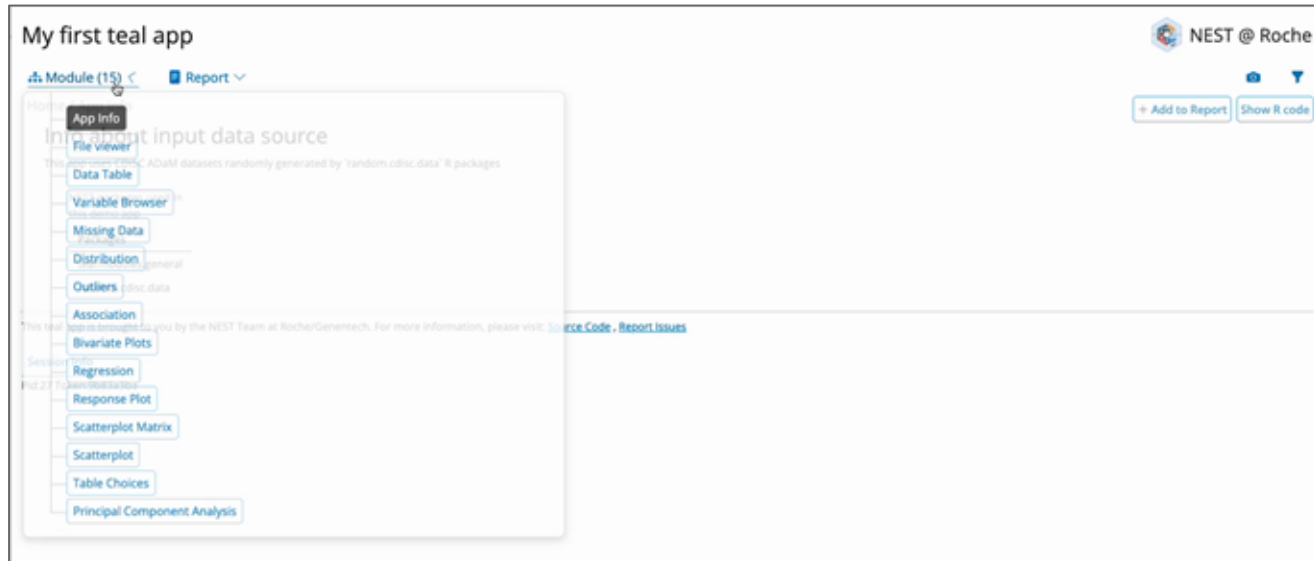
iris

mtcars

What's new with {teal}

teal got a new look!

- Improved the layout and appearance of the app using **bslib** components.
- Using bootstrap 5 by default
- Better navigation menu to handle many teal modules
- Modern and minimalist feel



Challenges in Clinical Data Review Workflow

- Interactive review platforms are widely used, but flexibility for customization can be limited
- Adapting analyses or visualisations to study-specific questions may require additional development effort
- Customization often involves non-trivial changes to existing configurations
- Review workflows must balance standardization, consistency, and efficiency across studies
- Incorporating frequent or iterative changes can be challenging within predefined setups
- As study designs become more complex, exploratory needs may evolve faster than standard workflows

Needs from Clinical Scientist

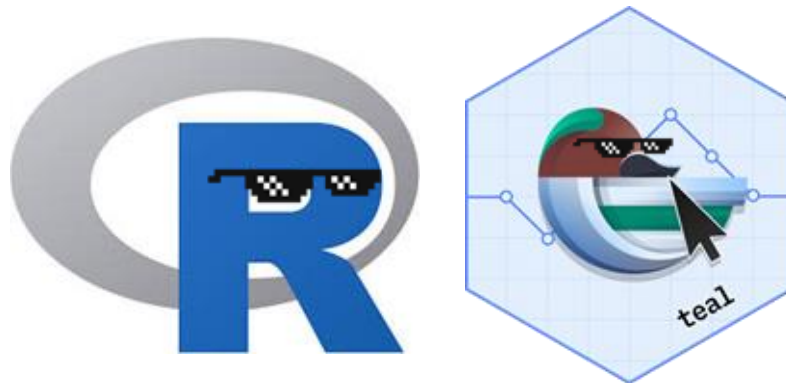
- Faster response to emerging safety and efficacy questions
- Greater ability to explore patient-level data independently
- Reduced reliance on manual review steps and offline analyses
- More integrated and holistic review workflows across data views
- More time available for interpretation, insight generation, and decision-making

Interactive Patient-Level Visualisation

What We Aim to Enable

- Interactive review of clinical trial data at summary and patient level
- Flexible and customizable views that adapt to study-specific questions
- Ability to modify analyses and visualisations without extensive rework
- Support for rapid iteration as new review questions emerge
- Designed to empower clinical scientists, not slow them down
- Focused on improving efficiency, transparency, and insight generation

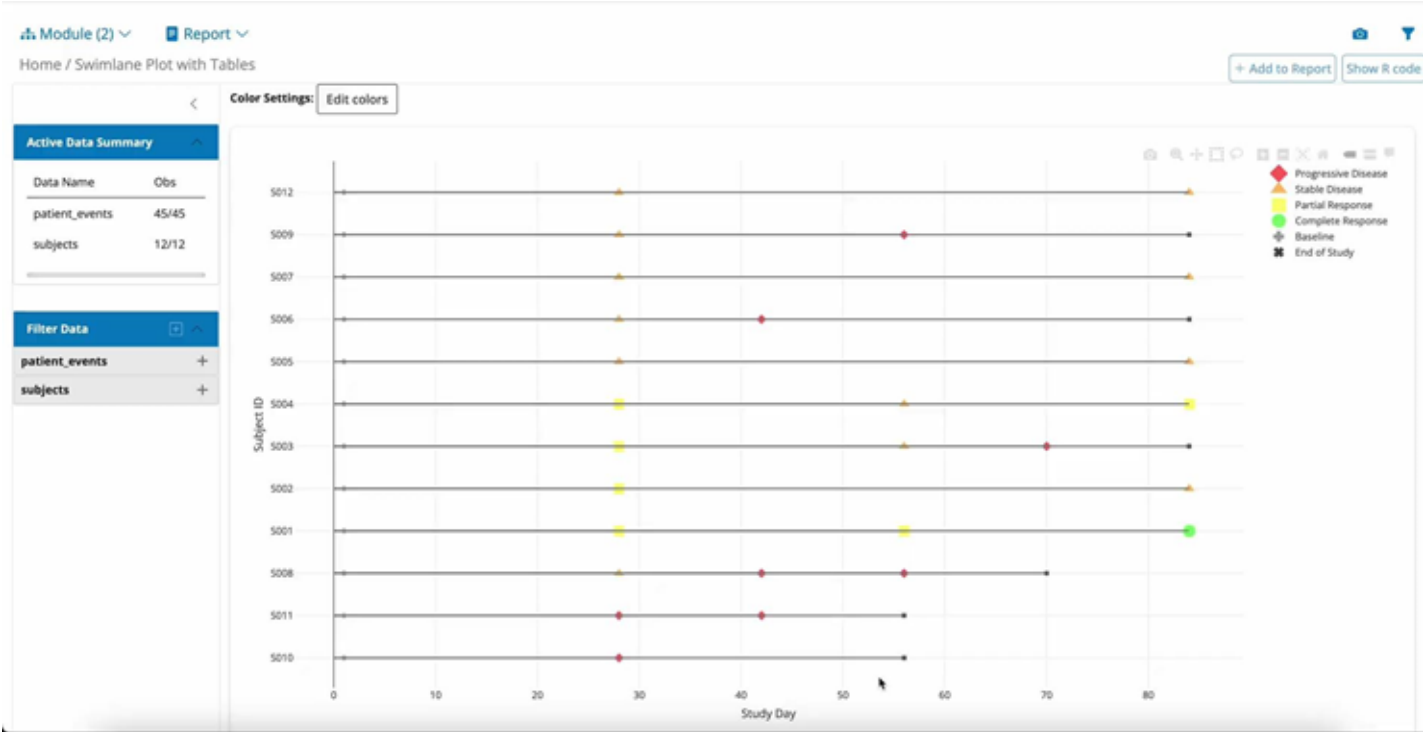
WE THINK OPEN-SOURCE SOLUTION CAN SOLVE THIS PROBLEM!



Why Open-Source Tools?

- Built on R, a widely used language in clinical data science
- Leverages open-source R packages such as plotly, reactable, and bslib
- Supports flexible extension as clinical review needs evolve
- Encourages customization of analyses and visualisations
- {teal} provides a modular framework to integrate these capabilities consistently

DEMO



Piloting, Validation, and Early Feedback

- Piloted across multiple clinical studies and therapeutic areas
- Applied to CRF-based data to support medical data review
- Used during safety and efficacy assessment, not for submissions
- Conducted feedback sessions with clinical scientists
- Received positive feedback on usability and review efficiency
- Applied within existing software validation and governance processes

Next / Future Plans

- Expand the library of patient-level modules for safety and efficacy review
- Incorporate additional feedback from clinical scientists to refine usability
- Explore broader applicability across study designs and therapeutic areas
- Continue aligning interactive review workflows with existing governance processes
- Share learnings and patterns with the wider clinical data science community

Doing now what patients need next