

Single Day Event

NEST 2.0 and experiment with AI

Joe Zhu
Roche



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Overview

- NEST project history from 0.1 to 2.0
- Documents creation
 - Docx
 - Autoslider
- AI integration



The End-to-End clinical reporting open-source projects



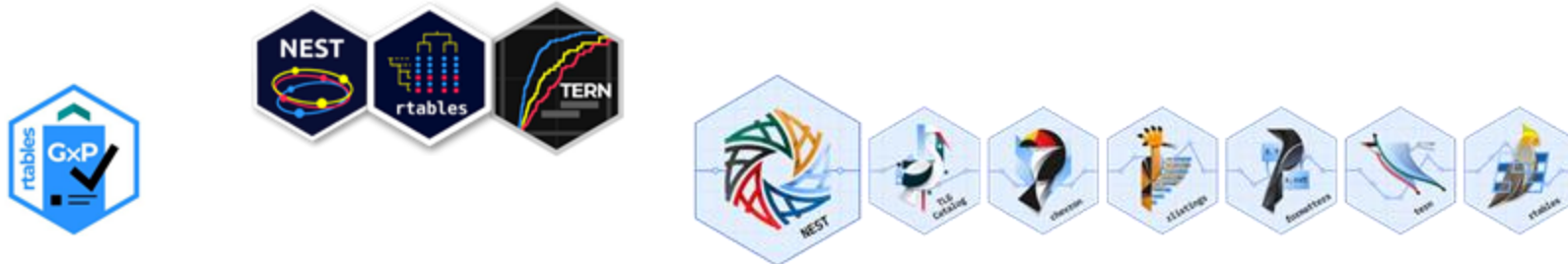


The End-to-End clinical reporting open-source projects





NEST v0.1 to v1.0 workflow



	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)	All Patients (N=400)
Age (yr)	-	-	-	-
n	xx.	xx.	xx.	xx.
Mean (SD)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)
Median	xx.x	xx.x	xx.x	xx.x
Min - Max	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x
Continuous Level Biomarker 1	-	-	-	-
n	xx.	xx.	xx.	xx.
Mean (SD)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)
Median	xx.x	xx.x	xx.x	xx.x
Min - Max	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x

	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)	All Patients (N=400)
Age (yr)				
n	134	134	132	400
Mean (SD)	33.8 (6.6)	35.4 (7.9)	35.4 (7.7)	34.9 (7.4)
Median	33.0	35.0	35.0	34.0
Min - Max	21.0 - 50.0	21.0 - 62.0	20.0 - 69.0	20.0 - 69.0
Continuous Level Biomarker 1				
n	134	134	132	400
Mean (SD)	6.0 (3.6)	5.7 (3.3)	5.6 (3.5)	5.8 (3.4)
Median	5.4	4.8	4.6	4.8
Min - Max	0.4 - 17.7	0.6 - 14.2	0.2 - 21.4	0.2 - 21.4



NEST 2.0

```
1 library(gtsummary)
2 library(tidyverse)
3
4 trial %>%
5   select(trt, age, grade, response) |
6
7
```

I

537 (Top Level) : R Script





NEST 2.0+? Streamline the workflow with upstream and downstream teams





Pharmaverse examples

- <https://pharmaverse.github.io/examples/>

pharmaverse examples



Introduction

SDTM	>
ADaM	>
TLG	>
Documents	▼
Slides	
Documents	
Interactive	>
Logs	>

pharmaverse examples

The true beauty of pharmaverse (and open source in general) is when efforts from various different developers are combined to create something whole greater than the sum of the individual parts. By design in R, no single package will ever completely cover all use cases, but we can make complex tasks increasingly simple.

This book contains end-to-end examples of using pharmaverse packages together to achieve common clinical data analysis tasks: Tables/Listings/Graphs. The examples use consistent source test raw datasets from `{pharmaverseraw}`, `{SDTM}`, `{pharmaverseadam}` respectively.

We'll endeavour to include a selection of examples here over time, e.g. to help users when trying out the packages for the first time (such as Oncology or Vaccines) analyses.

Note that this examples book should only be used to show how collections of packages can be used in conjunction. Specific package usages would always be covered in the package site vignettes and no need to repeat here.

Running the examples



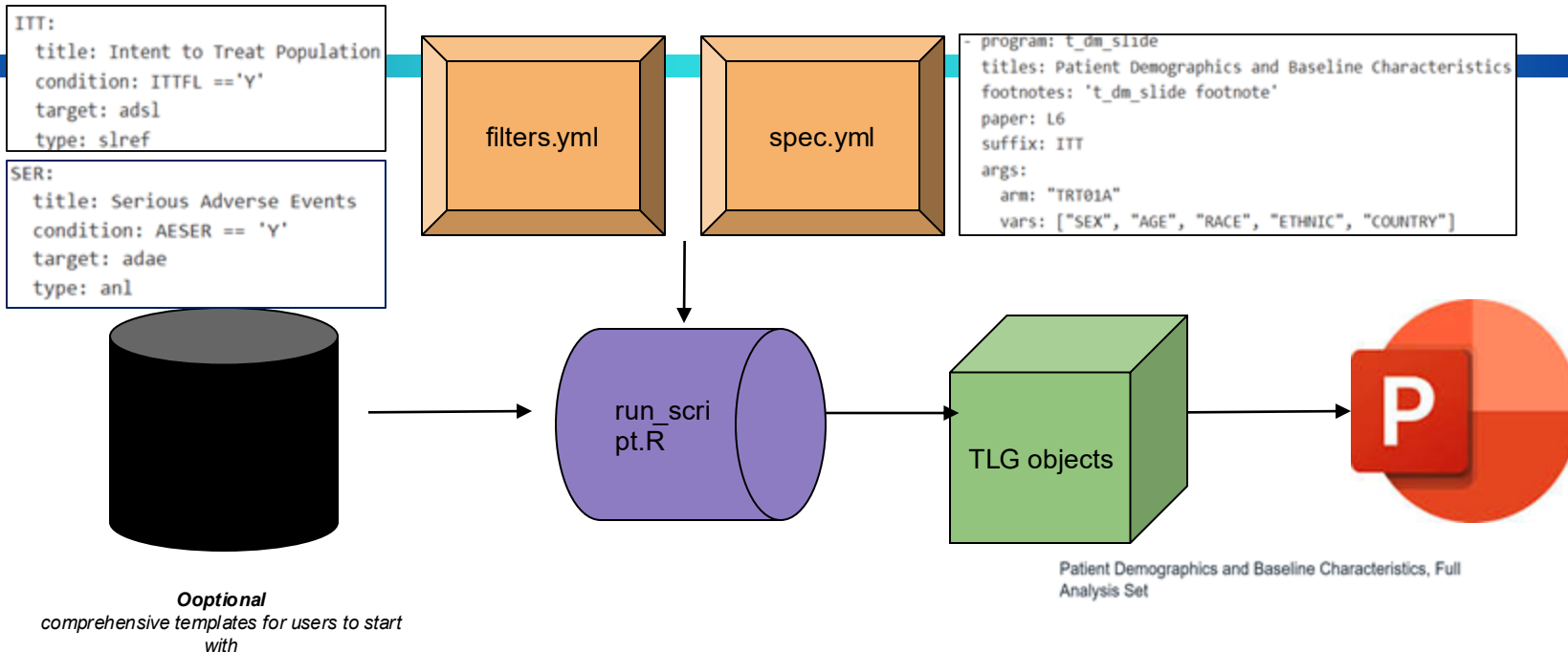
Rtables word document output

- export_as_docx

Parameter Code	Visit		
Visit	NCI CTCAE Grade at Visit		
	Baseline NCI CTCAE Grade	A: Drug X (N=154)	B: Placebo (N=154)
C: Combination (N=152)			
CRP			
WEEK 1 DAY 8			
Next Low (n)	116	110	101
Next Low	103 (88.8%)	91 (82.7%)	88 (87.1%)
1	3 (2.6%)	5 (4.5%)	6 (6.0%)
2	4 (3.4%)	9 (8.2%)	2 (2.0%)
3	3 (2.6%)	4 (3.6%)	4 (4.0%)
4	3 (2.6%)	1 (0.9%)	1 (1.0%)
5	0	7	5
6	3 (2.6%)	7 (7.00%)	4 (4.0%)
7	1 (0.9%)	0	1 (1.0%)
2 (n)	5 (100%)	6	11
Next Low	5 (100%)	5 (83.3%)	8 (72.7%)
1	0	0	1 (9.1%)
2	0	0	2 (18.2%)
3	0	1 (16.7%)	0
4	0	0	0
5	0	0	0
6	3 (100%)	7 (87.5%)	5 (100%)
7	0	1 (12.5%)	0
4 (n)	3	3	10
Next Low	2 (66.7%)	3 (100%)	7 (70.0%)
1	0	0	2 (20.0%)
2	1 (33.3%)	0	0
3	0	0	1 (10.0%)
WEEK 2 DAY 16			
Next Low (n)	105	111	116
Next Low	93 (88.6%)	93 (83.8%)	100 (86.2%)
1	3 (2.8%)	4 (3.6%)	8 (6.9%)
2	2 (1.9%)	7 (6.3%)	3 (2.6%)
3	2 (1.9%)	5 (4.5%)	6 (5.2%)
4	3 (2.8%)	2 (1.8%)	0
5	0	0	0
6	12 (10.9%)	8 (8.9%)	1 (0.9%)
7	0	1 (1.1%)	0
8	2 (1.9%)	0	0
9	0	0	1 (0.9%)
2 (n)	3	3	4
Next Low	3 (100%)	3 (100%)	4 (80.0%)
1	0	0	1 (20.0%)
2	0	0	1 (20.0%)
3	0	0	1 (20.0%)
4	0	0	0
5	0	0	0
6	7 (100%)	7	6
7	0	0	5 (83.3%)
8	0	1 (14.3%)	1 (16.7%)
9	0	0	1 (16.7%)
10	0	0	2
11	0	4	3
12	3 (100%)	3 (75.0%)	2 (100%)
13	0	1 (25.0%)	0
WEEK 3 DAY 22			
Next Low (n)	110	110	114
Next Low	104 (94.5%)	92 (83.6%)	94 (82.5%)
1	3 (2.7%)	4 (3.6%)	9 (7.9%)
2	5 (4.5%)	7 (6.4%)	2 (1.8%)
3	4 (3.6%)	5 (4.5%)	7 (6.1%)
4	2 (1.8%)	2 (1.8%)	2 (1.8%)
5	0	0	0



AutoslideR Workflow



	A: Drug X	B: Placebo	C: Combination	All Patients
Sex				
F	79 (39%)	82 (41.2%)	79 (39%)	231 (57.8%)
M	95 (41%)	92 (38.8%)	82 (47%)	169 (42.2%)
Age				
Median	33.00	35.00	35.00	34.00
Min - Max	21.0 - 90.0	21.0 - 92.0	20.0 - 89.0	20.0 - 89.0

1. 3m, slide footnote
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Integrating AI & LLM prompting

Deploy local/remote LLM models and uses a prompt.yml file to generate insights for tables and graphs.

```
prompt_list <- get_prompt_list("example_study/prompt.yml")

# Generate the initial outputs
outputs <- spec %>%
  filter_spec(program %in% c("t_tte_slide")) %>%
  generate_outputs(datasets = data) %>%
  decorate_outputs()

# Get AI notes using Deepseek
outputs_ai <- get_ai_notes(
  outputs = outputs,
  prompt_list = prompt_list,
  platform = "deepseek",
  base_url = "https://api.deepseek.com",
  model = NULL,
  api_key = "xxxxxxxxxxxxxxxxxxxxxxxxxxxx"
)

outputs_ai %>%
  generate_slides(outfile = "My_AI_Presentation.pptx")
```

prompt.yml

```
- output: t_tte_slide_PFSINW_FAS
  prompt: "
```

```
{table_text}
```

```
Compare the 'Median' of A: Drug X, C: Combination, and B: Placebo in this table
with the Arm A, B and C data of study Impower131.
-I
```




An example for AI-speaker notes

Time to Event Summary for Progression Free Survival by
Investigator, Full Analysis Set

	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)
Patients with event (%)	79 (59.0%)	84 (62.7%)	96 (72.0%)
Median (Months, 95% CI)	8.6 (7.7, 9.1)	8.4 (7.9, 8.8)	7.6 (7.2, 8.2)
Stratified HR (95% CI)	0.89 (0.65, 1.21)		1.26 (0.94, 1.69)
p-value (log-rank)	0.4519		0.1210
6-month event free rate (%)	72.4	72.4	68.2
95% CI	(64.8184, 79.9577)	(64.8184, 79.9577)	(60.2361, 76.1275)
12-month event free rate (%)	NA	NA	NA
95% CI	NA	NA	NA

1. Comparison of Median Progression-Free Survival (PFS)

Provided Table (Investigator-Assessed):

- * **A: Drug X** 8.6 months (95% CI: 7.7, 9.1)
- * **B: Placebo + Chemo (Control Arm)** 8.4 months (95% CI: 7.9, 8.8)
- * **C: Combination (Atezolizumab + Chemo)** 7.6 months (95% CI: 7.2, 8.2)

Published IMpower131 Results (Blinded Independent Central Review (BICR) Assessed):

- * **Arm C: Atezolizumab + Carboplatin + nab-Paclitaxel** 6.3 months**
- * **Arm B: Atezolizumab + Carboplatin + Paclitaxel** 6.2 months**
- * **Arm A: Carboplatin + nab-Paclitaxel (Control)** 5.6 months**

Analysis and Interpretation:

1. **Absolute Value Difference:** The median PFS values in the provided table are **higher across all arms** compared to the final published results. This is a well-known phenomenon and expected. **Investigator-assessed PFS** often results in longer median survival estimates than **BICR-assessed PFS** because investigators may be more conservative in calling progression in a non-blinded setting, especially when they know the patient is on an experimental therapy.
2. **Relative Relationship is Key:** Despite the difference in absolute values, the **relative relationship between the arms is the same** and tells the true story:
 - * In both datasets, the **experimental arm (C: Combination)** shows a **numerically longer median PFS** than the control arm (B: Placebo).
 - * **Provided Table:** Combination (7.6 mo) > Control (8.4 mo) → **1.2-month improvement**
 - * **Published Data:** Experimental (6.2/6.3 mo) > Control (5.6 mo) → **0.6-0.7-month improvement**
 - * This consistency confirms the presence of a treatment effect.



Why AI Excels at Understanding DOCX Tables

- **Explicit Hierarchy and Relationships**
- **Rich Metadata and Properties**
- **Standardization and Predictability**
- **Separation of Content and Presentation**

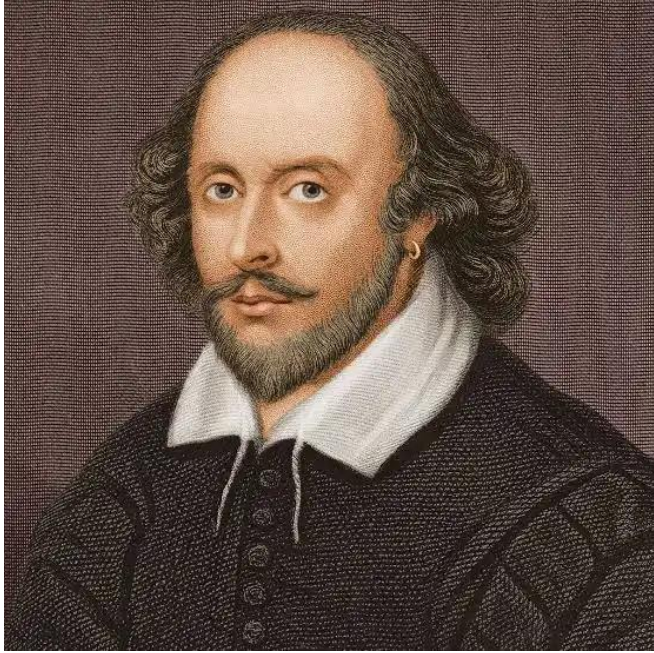


Summary

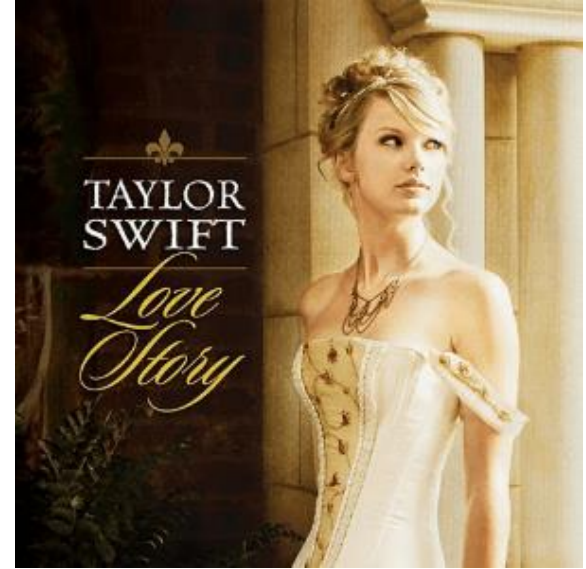
- NEST team contributes 11 R packages towards pharmaverse initiative, and continuously working closely with other project teams shaping the future of clinical reporting using R
- NEST 2.0 workflow streamlines the work process without creating a table shells, and use analysis result data
- We extend the TLG creation process downstream to document generations in docx and pptx
- The documents can interact with AI for insights generation



Focus on the use case, not AI



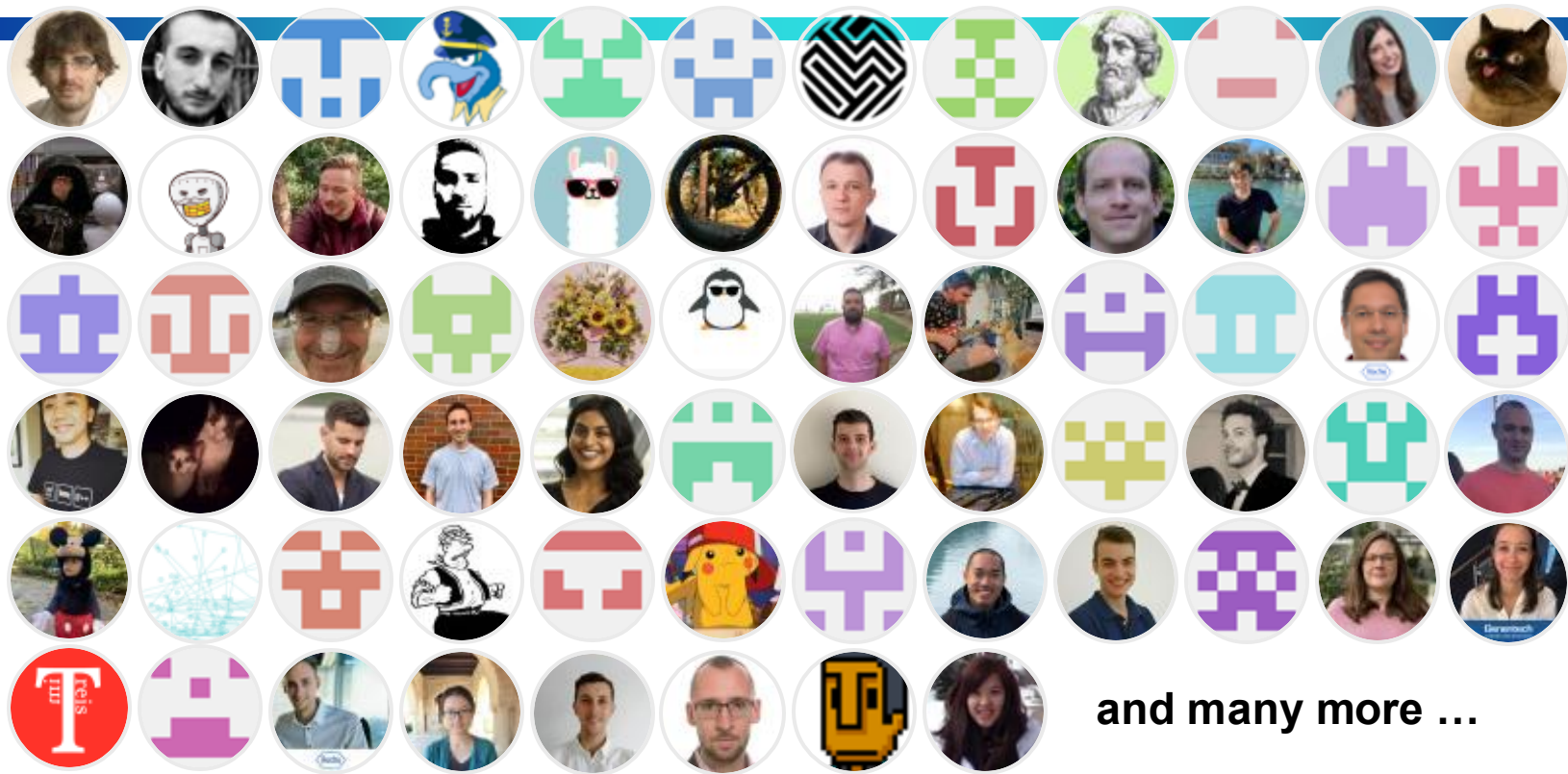
AI



use case



Acknowledgement



and many more ...



The Global Healthcare Data Science Community

Contact Channels

📞 UK +44 1843 609600
✉ office@phuse.global
🌐 phuse.global

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