Smarter research with R

Tools to save time and boost impact

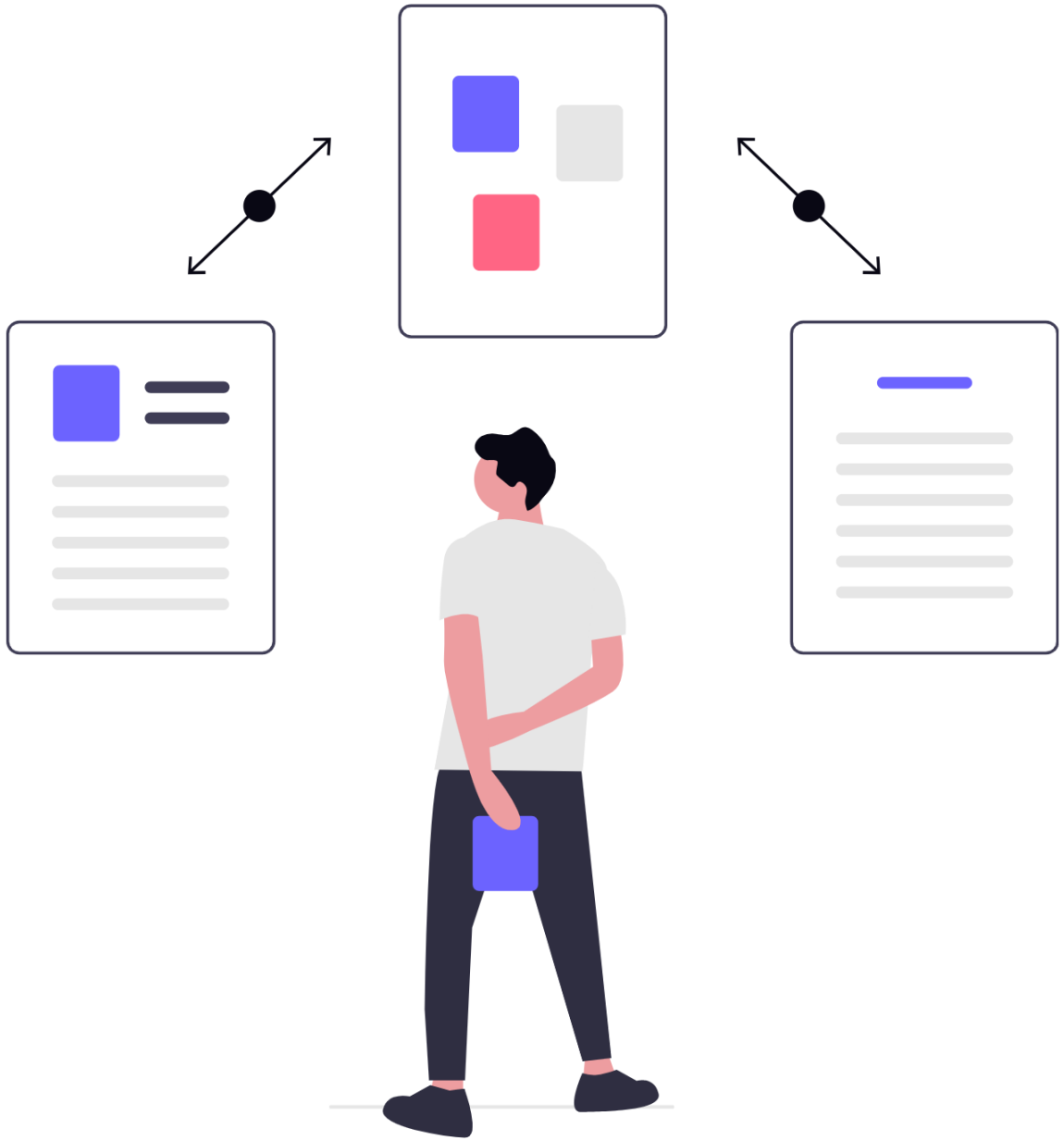
Presentation to *R Exchange*,
National Library of New Zealand,
Wellington,
Thursday 7 May 2026

Dr. Steve Thomas

Senior Advisor

Food Science and Risk Assessment

New Zealand Food Safety



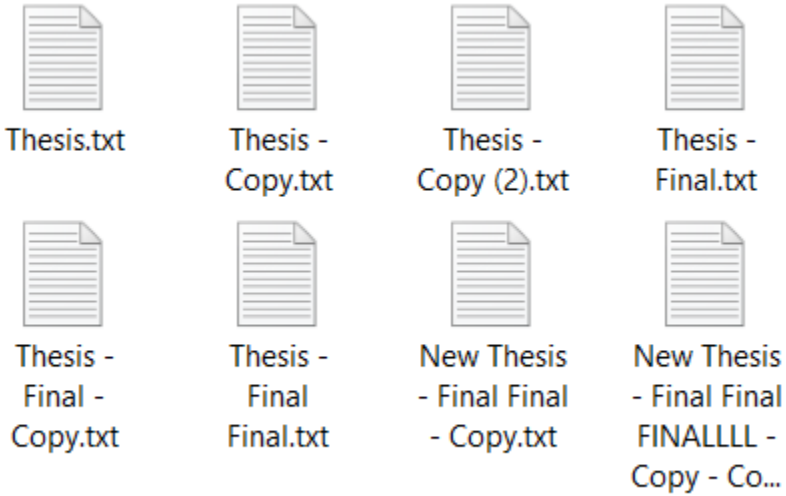
The recurring problem

Programming has helped with **making sense** of complex questions, and **communicating** findings well.

The **problem** wasn't the analysis.

It was **revision**, **duplication**, and keeping work **current**.

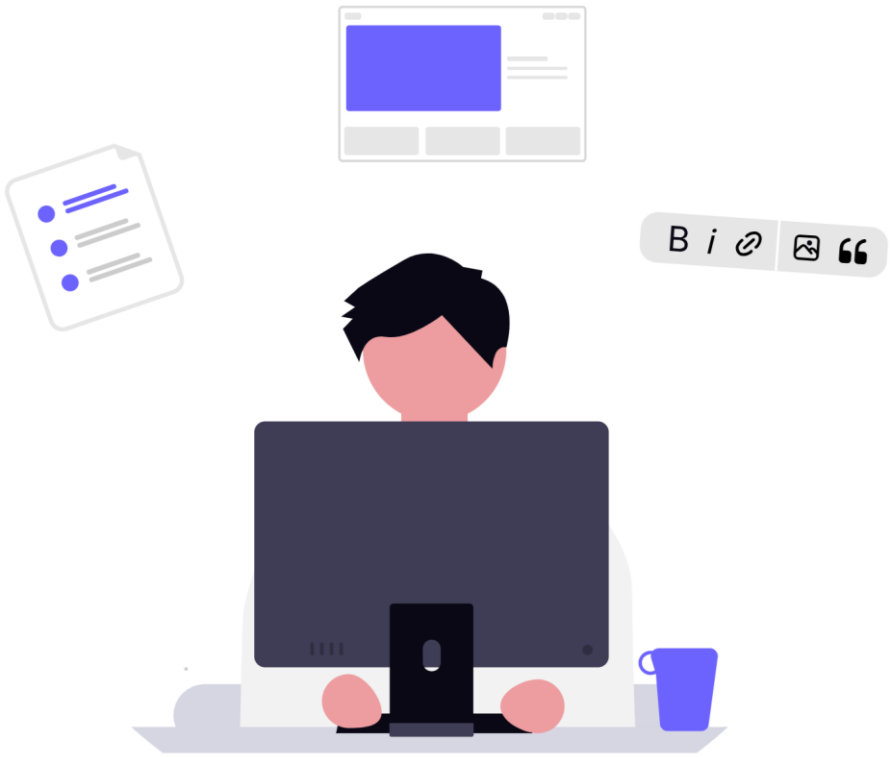
'Final' rarely means final!



A turning point: R Markdown

One **place** for:

- **data**;
- **analysis**; and
- **writing**.



Example 1: The pain of monthly reporting …

The case

A monthly customer satisfaction survey results report

The problems:

- **repeated** updates;
- **manual** edits; and
- **fragile** narrative.

… can be solved with conditional reporting

The solution

Build a report where the text ***reacts*** to the data …

… with logical conditions.

Workflow:

1. **import** year-to-date data;
2. **process**; and then
3. **apply conditions** to produce the report using boilerplate text.

1. Create a conditional statement in a code chunk

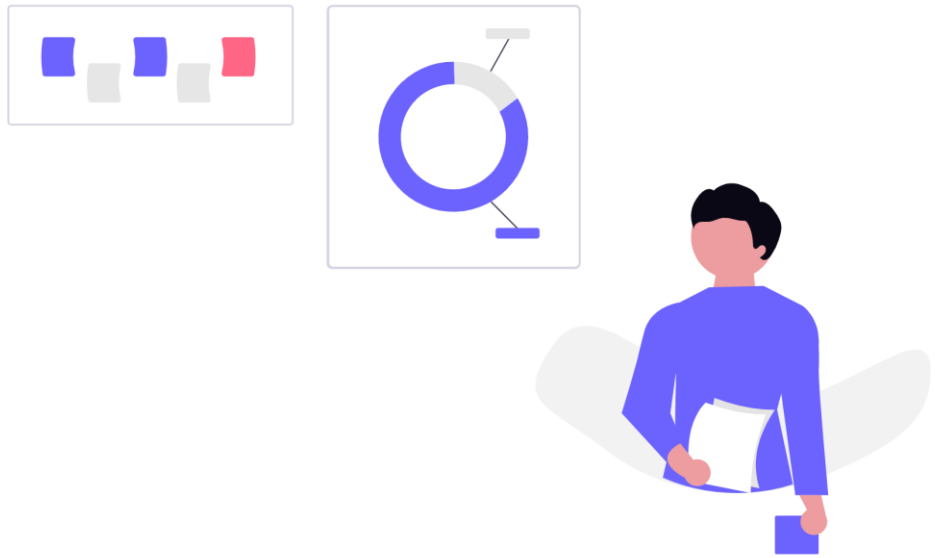
````
```{r SatTargetMet, eval = TRUE, include = FALSE}

if (!sat.target.met) {
sat.explanation.statement <-

"Food Safety Reporting will ask you to explain
how you will meet your target next month."    }

else { sat.explanation.statement <- ""
  }

```
````

2. Then, in the Markdown file text, print:

```
`r sat.explanation.statement`
```

Example 2: When analysis gets more complex …

The problem



Small changes in analysis can **ripple** downstream.

The case

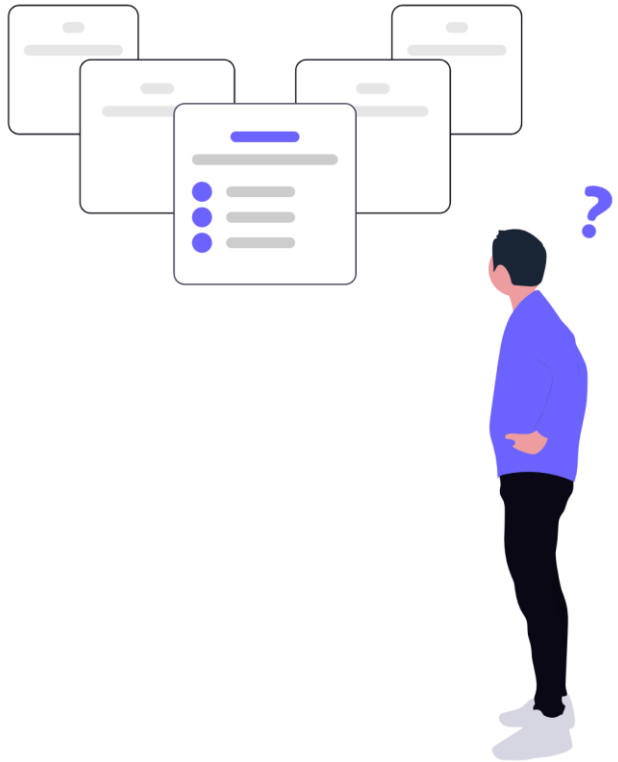
How can we create **repeatable summaries** from complex data – of quantities of trace elements in seafood?

… consider developing a pipeline!

The solution

Deliberately structure work as **explicit steps**:

- **inputs**;
- **transformations**; and
- **outputs.**



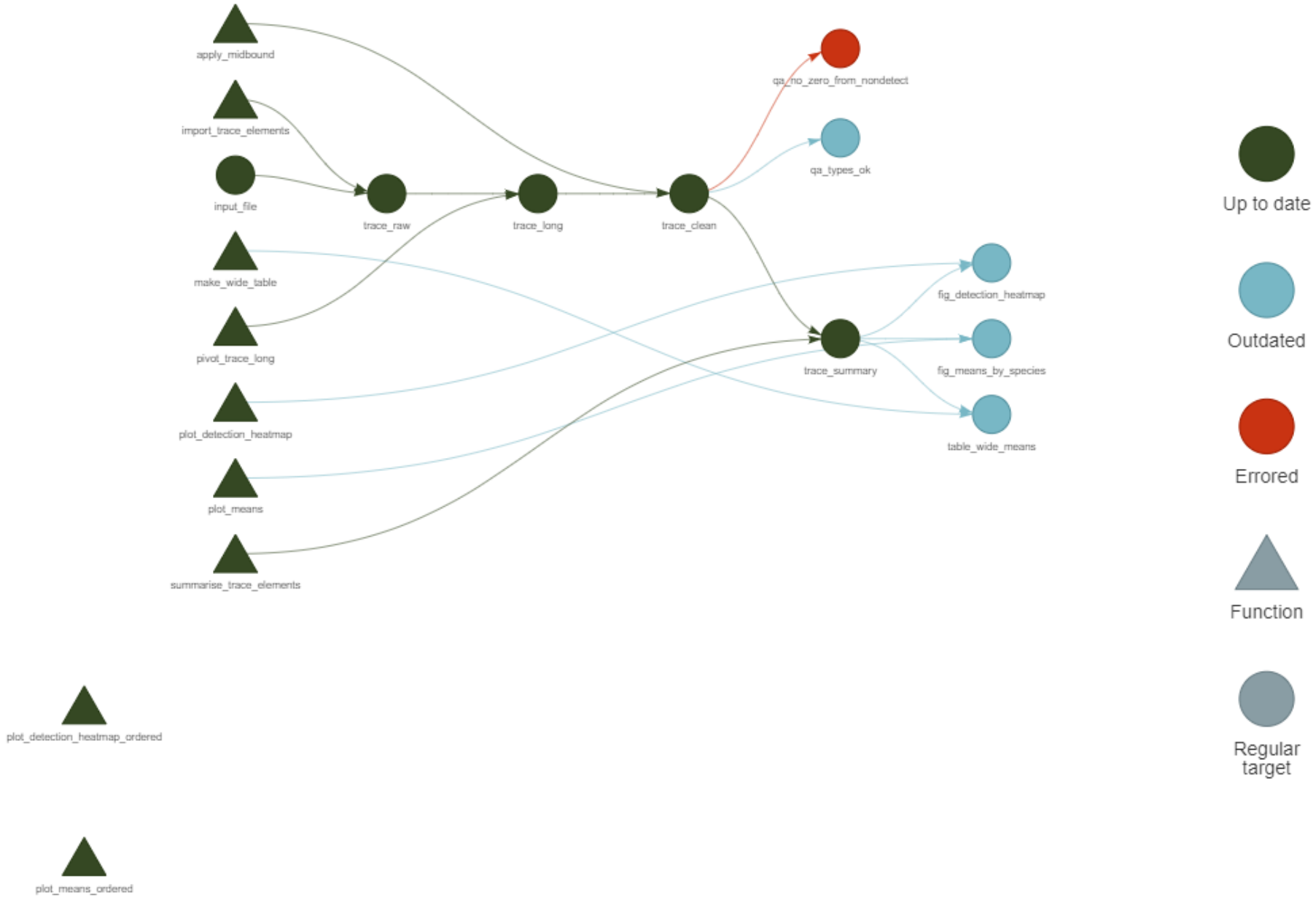
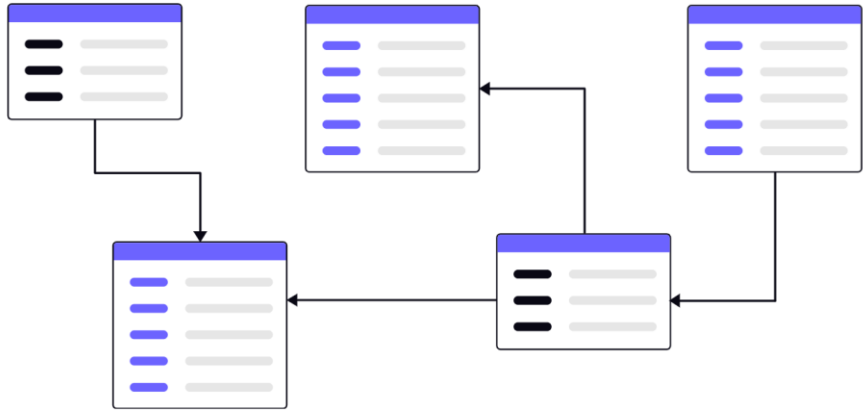


Figure 1. Workflow pipeline for analysing trace elements in seafood

Example 3: When you need to communicate more than once …

The problems

- One **analysis.**
- Different **audiences.**
- Many **outputs.**



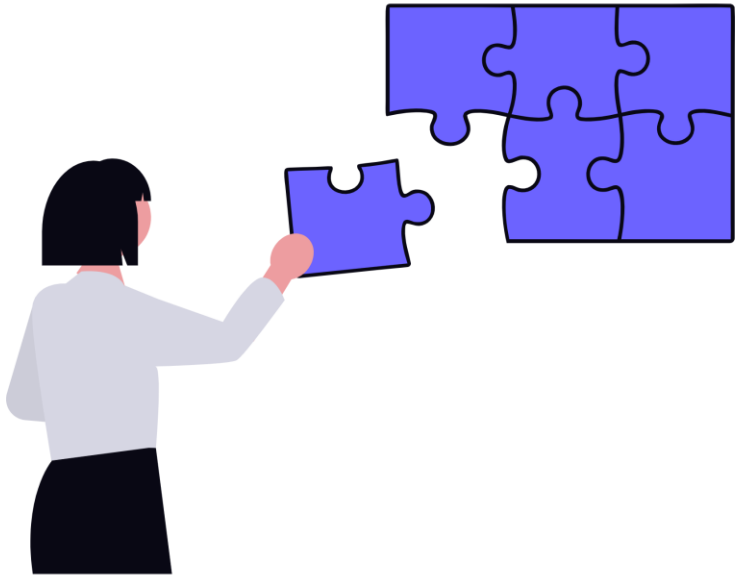
The case

- Consumer food safety behavioural research.

… consider using an R Project with Markdown or Quarto reports

The solution

Dynamic reporting using **R Projects** and **Markdown** or **Quarto** files.



- **No more** producing Figures and Tables **separately**.
- One **source** of truth.
- Revisions become **routine**, not **risky**.

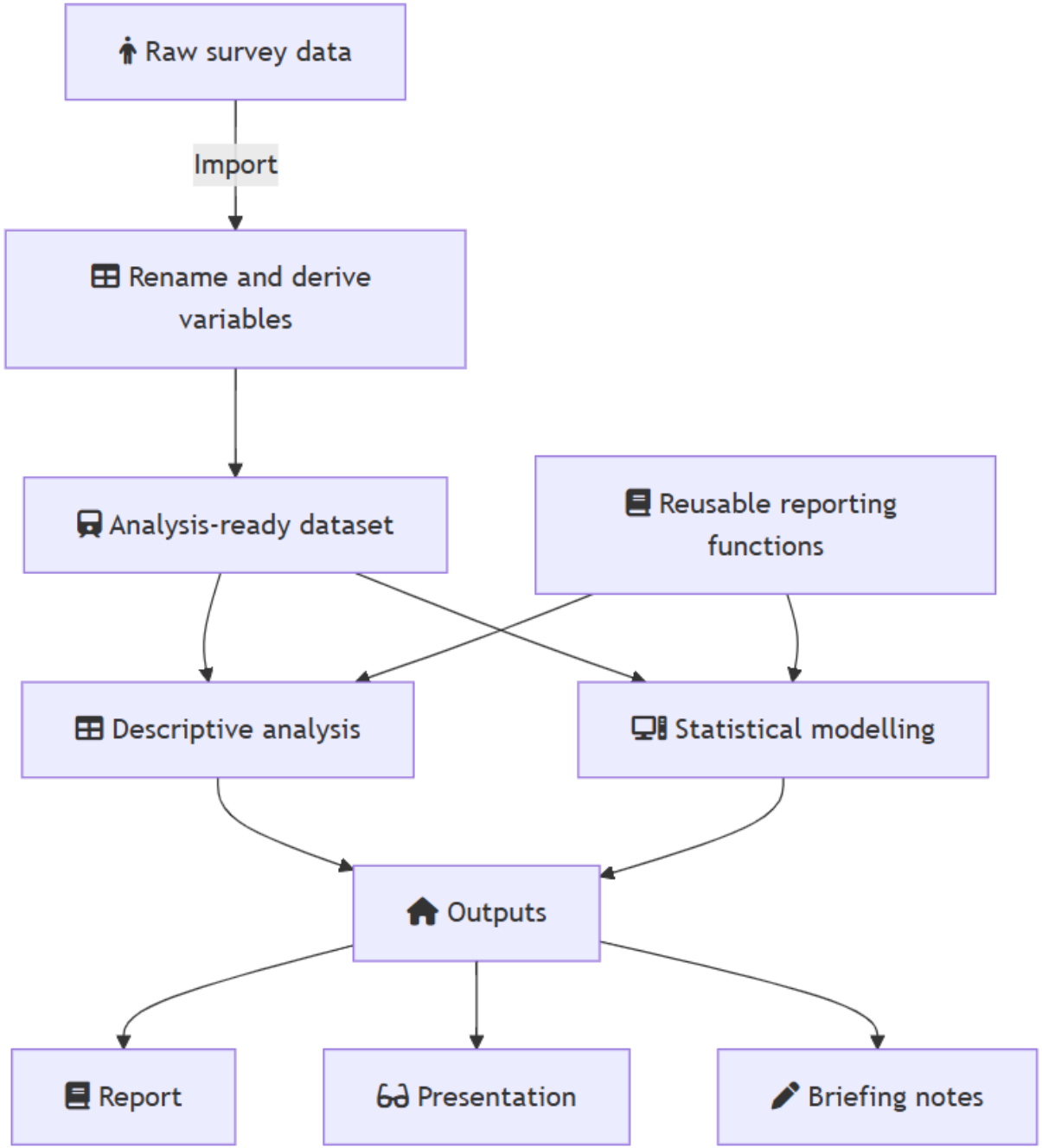


Figure 2. Example consumer food safety research R project workflow

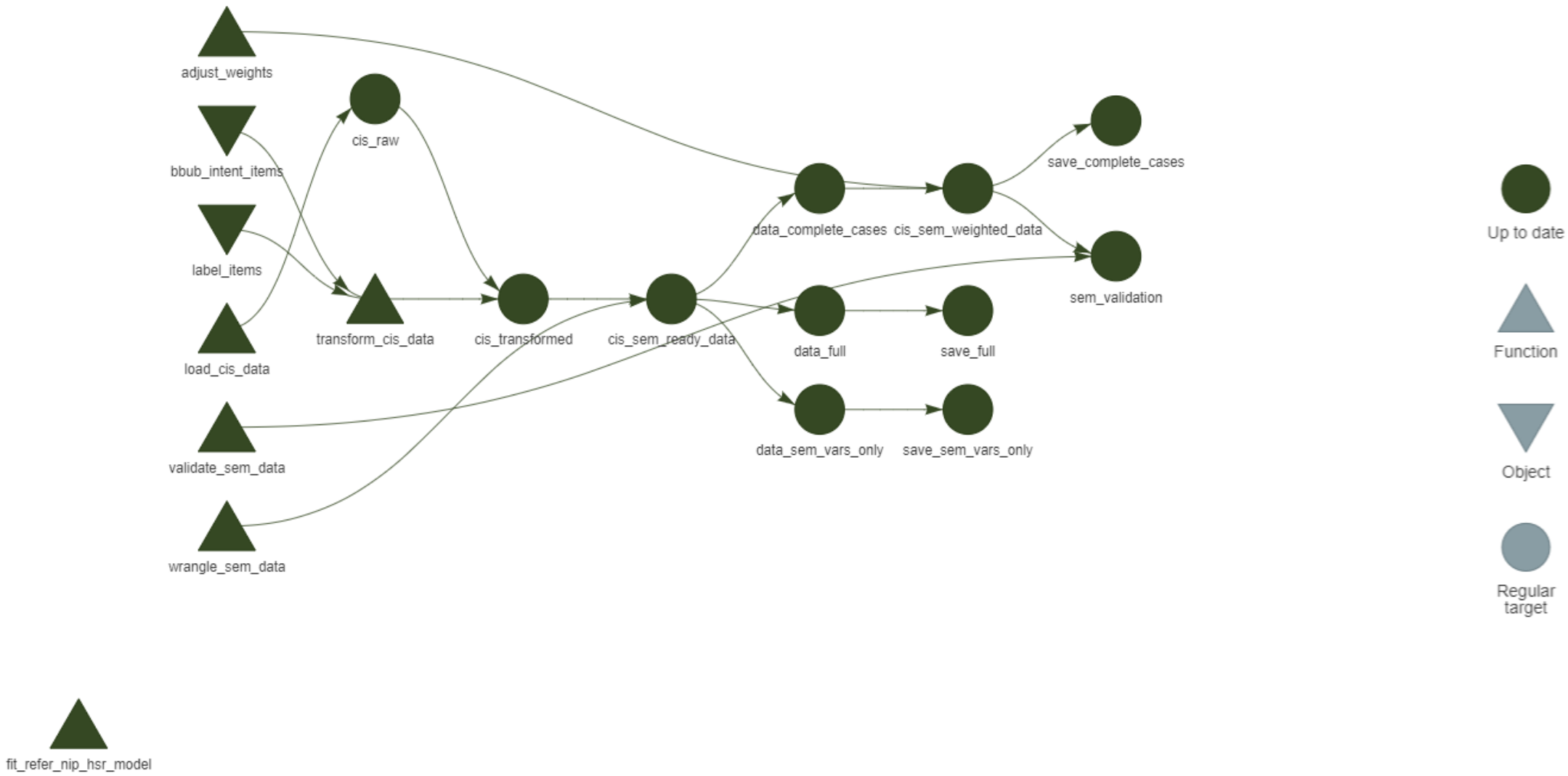


Figure 3. Workflow pipeline for constructing a consumer food safety research dataset

Looking ahead to the New Zealand Total Diet Study

Large, complex studies **amplify** workflow problems.

The report structure **lends** itself well to a reporting pipeline.

There are **multiple** datasets and contributors, and high expectations of **reproducibility**.

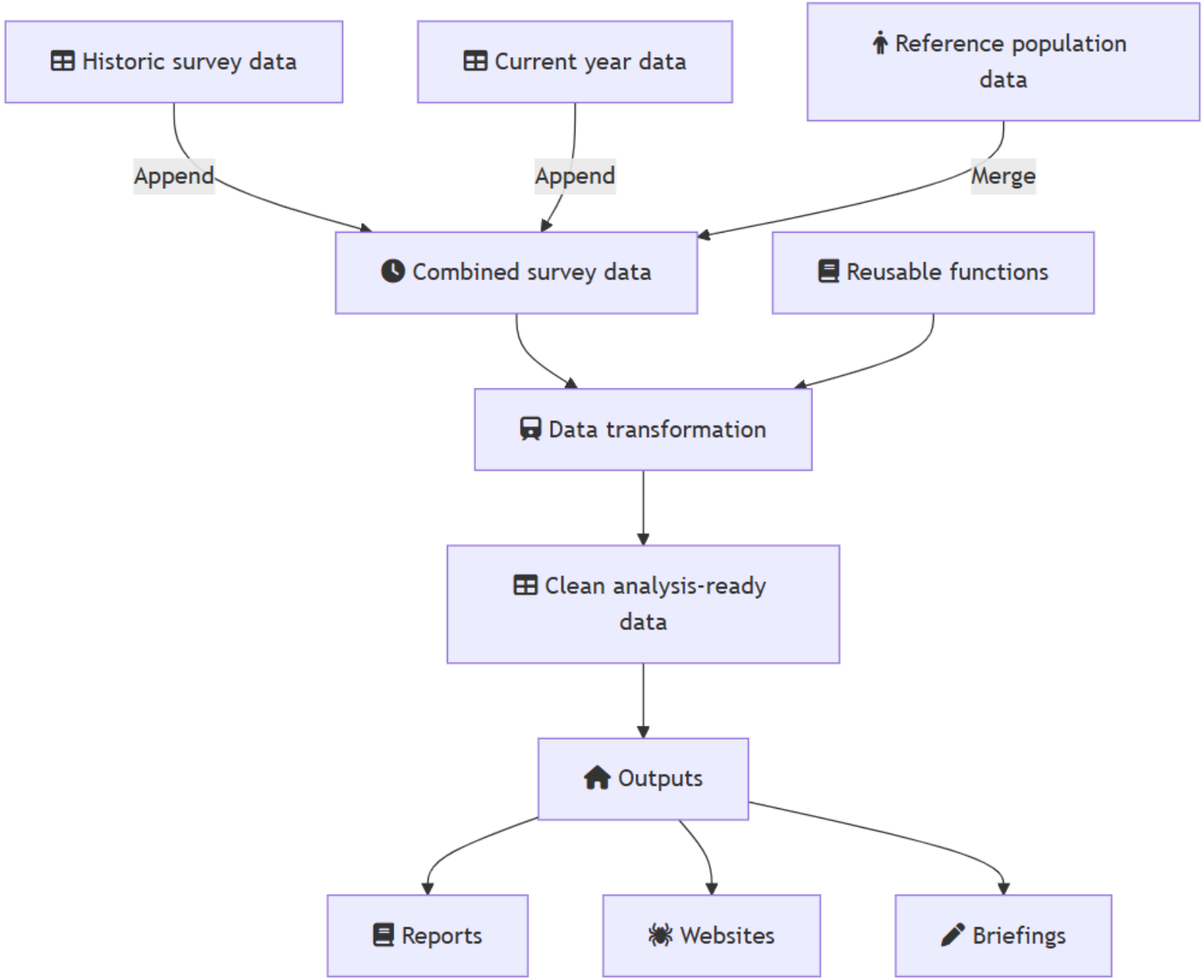


Figure 4. A hypothetical workflow pipeline for analysing New Zealand Total Diet Study data

In closing …

Key takeaways:

1. learn **tools**;
2. adopt **structure**;
3. simplify **workflow**;
4. keep work **current**; and
5. aim to produce **better quality products**.

Start **small**—and **fix** the part of your workflow that causes the most **friction**.

Smarter research with R

Tools to save time and boost impact

Dr. Steve Thomas

Email: steven.thomas@mpi.govt.nz

New Zealand Total Diet Study

Webpage: https://www.mpi.govt.nz/food-business/food-monitoring-surveillance/new-zealand-total-diet-study

Email: 2024NZTDS@mpi.govt.nz

New Zealand Food Safety

Haumaru Kai Aotearoa

Ministry for Primary Industries

Manatū Ahu Matua