



R(ise) & Shiny

Taking steps to utilise R packages in Shiny applications

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17th June 2024

I Overview

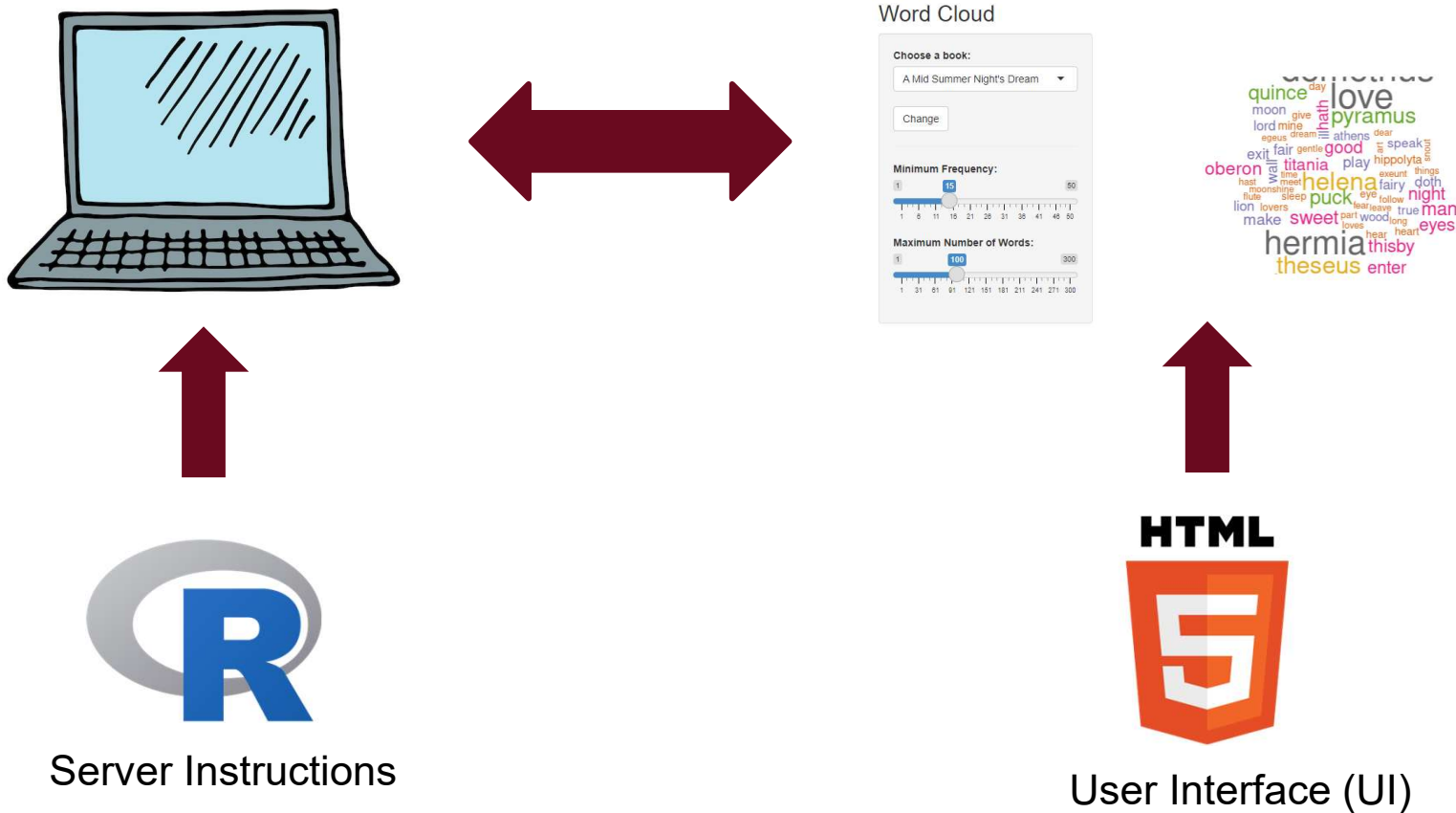
1. What is RShiny and why use it?
2. Applications in Statistics and beyond
3. Elicitation software showcase

What is RShiny and why use it?



What is RShiny?

- Shiny is an R package (Chang et al. 2019) that enables building interactive web applications that execute R code behind the scenes.



Interactivity

Word Cloud

Choose a book:

A Mid Summer Night's Dream

Change

Minimum Frequency:

1 15 50

1 6 11 16 21 26 31 36 41 46 50

Maximum Number of Words:

1 100 300

1 31 61 91 121 151 181 211 241 271 300



Interactivity

Word Cloud

Choose a book:

A Mid Summer Night's Dream ▼

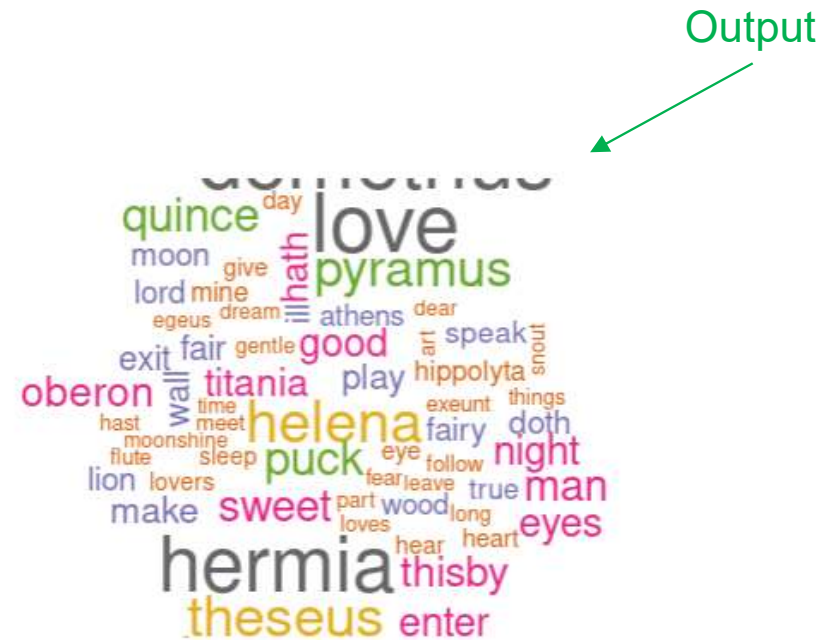
Change

Minimum Frequency:

1 15 50

Maximum Number of Words:

1 100 300



| Why use RShiny?

"Shiny gives you the ability to pass on some of your R superpowers to anyone who can use the web."

Hadley Wickham, Mastering Shiny, Preface (0.1)



Applications in Statistics and beyond...



RShiny Applications

- Statistics

- Network meta-analysis
- Prior elicitation
- Teaching tool



- Wider applications

- Data Science/Data Management
- Data Visualisations
- Administrative

[Shiny Gallery](#)

Online resources – [video series](#) by Garrett Grolemond

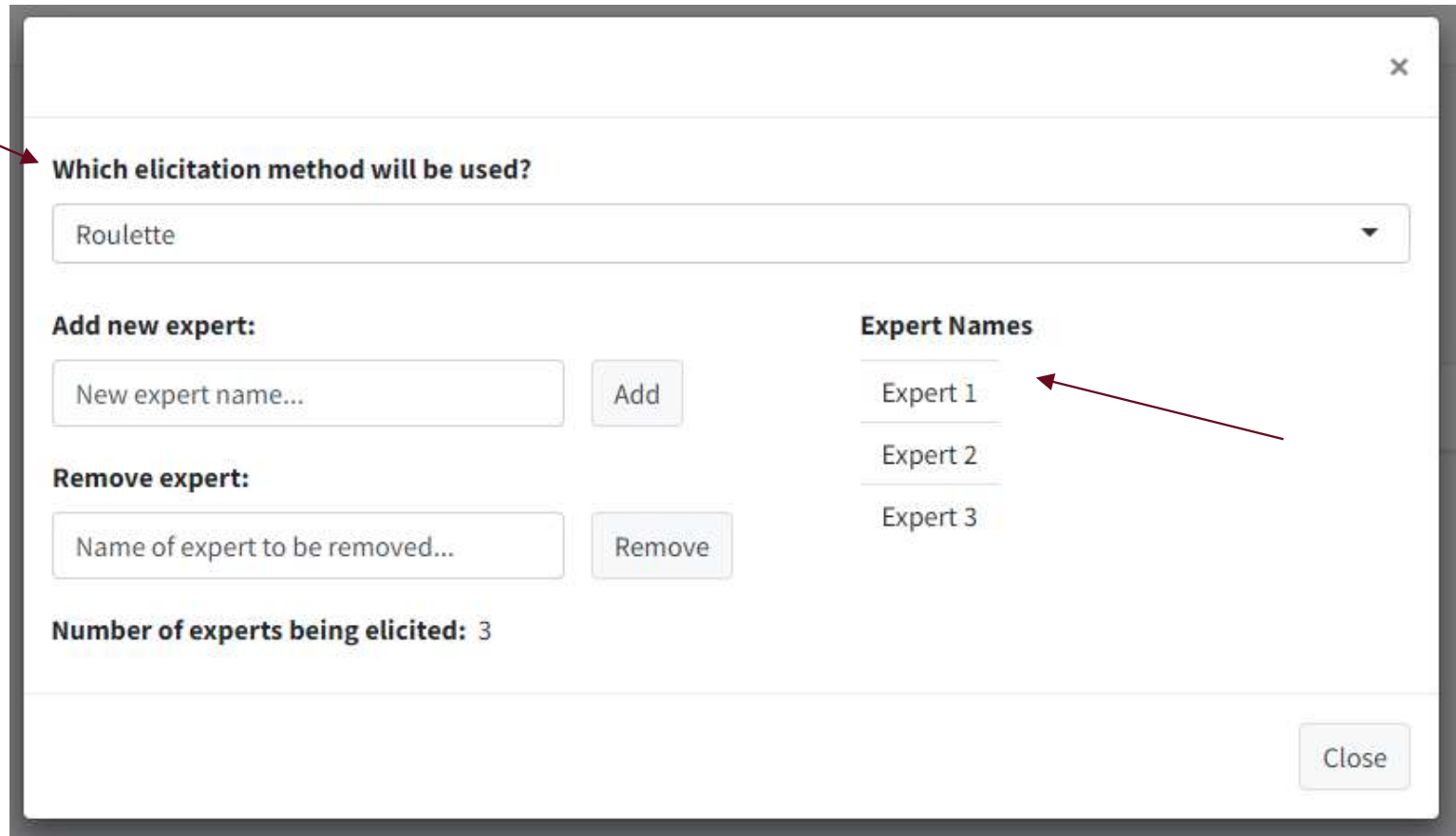
Elicitation software showcase



I Motivation

- Based on experiences at Phastar, we noticed a gap in our processes in being able to provide elicitations to our clients.
- Utilising the expertise within the company we decided to develop an elicitation app to provide end to end Bayesian capabilities.
- Elicitation tool to get experts together to give information about trial characteristics
 - First they give their own individual opinions
 - Then they combine them to create a group consensus
 - This will then be used as the prior for a Bayesian trial

| Elicitation software (1)



Which elicitation method will be used?

Roulette

Add new expert:

New expert name... Add

Remove expert:

Name of expert to be removed... Remove

Expert Names

Expert 1

Expert 2

Expert 3

Number of experts being elicited: 3

Close

Elicitation software (2)

Prior Elicitation App

Home

Training

Elicitation

Aggregation

Debug

Setup

phastar

Roulette Method

We wish to elicit your opinion on the average number of children in UK households. [Reset](#)

First, provide values that represent your belief of the minimum and maximum number of children in UK households, and the number of bins you would like to use. For example, if you were to choose 10 bins, you would provide values for the minimum, maximum, and 10 bins (e.g. (0-1], (1-2], (2-3], (3-4], (4-5], (5-6], (6-7], (7-8], (8-9], (9-10]).

Minimum: Maximum:

☒ 10 bins ☐ 20 bins

Warning

Lower limit is less than zero - consider whether this is plausible (i.e. can you have a negative number of children?)

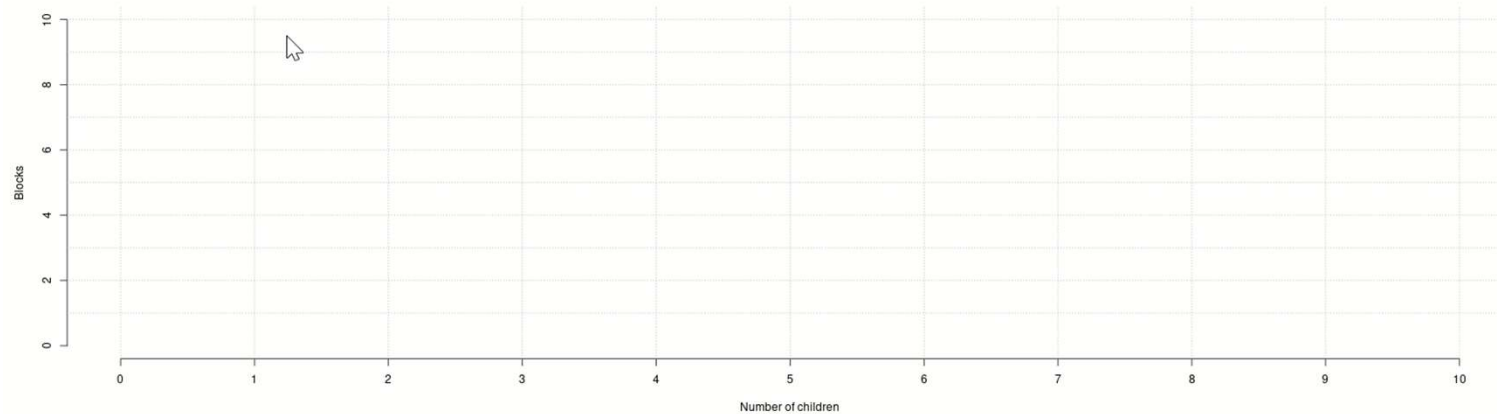
Elicitation software (3)

Now you have 20 blocks to use to quantify your belief, with each block representing a 5% chance that the average number of children in UK households lies in the given interval.

The more strongly you believe that the average number of children lies in a particular interval, the more blocks you should add. If you believe it impossible that the average number of children would lie in a particular interval, then add no blocks to that interval. If you are certain that the average number of children would lie in a certain interval, all blocks should be in that interval.

(0, 1]	(1, 2]	(2, 3]	(3, 4]	(4, 5]	(5, 6]	(6, 7]	(7, 8]	(8, 9]	(9, 10]

You have 20 block(s) remaining



Elicitation software (4)

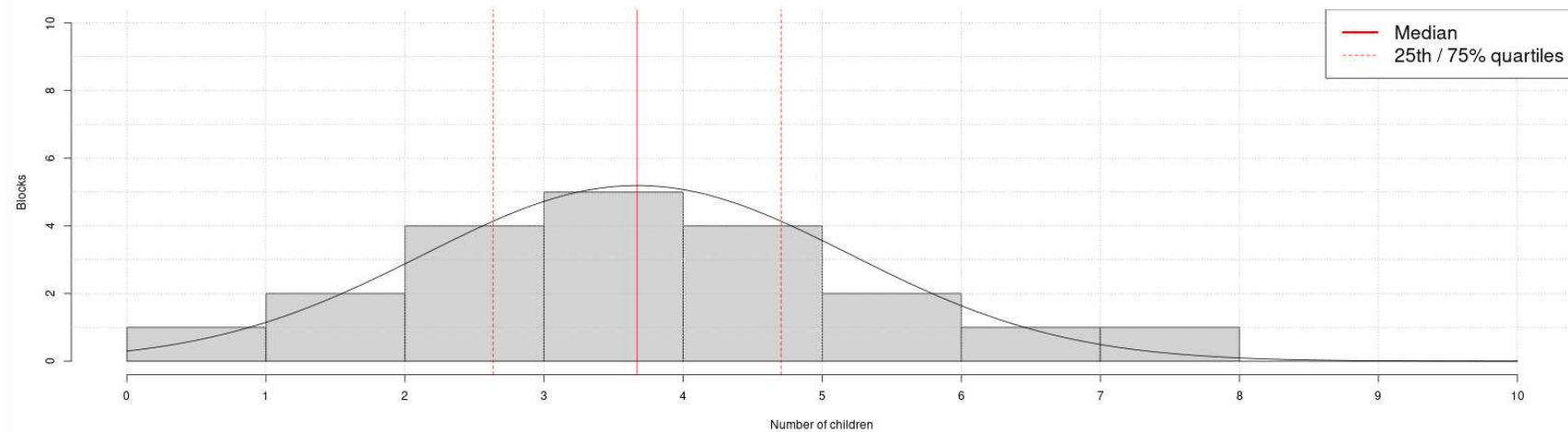
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(0, 1]	(1, 2]	(2, 3]	(3, 4]	(4, 5]	(5, 6]	(6, 7]	(7, 8]	(8, 9]	(9, 10]
1	2	4	5	4	2	1	1		

You have 0 block(s) remaining

Maximum number of blocks reached



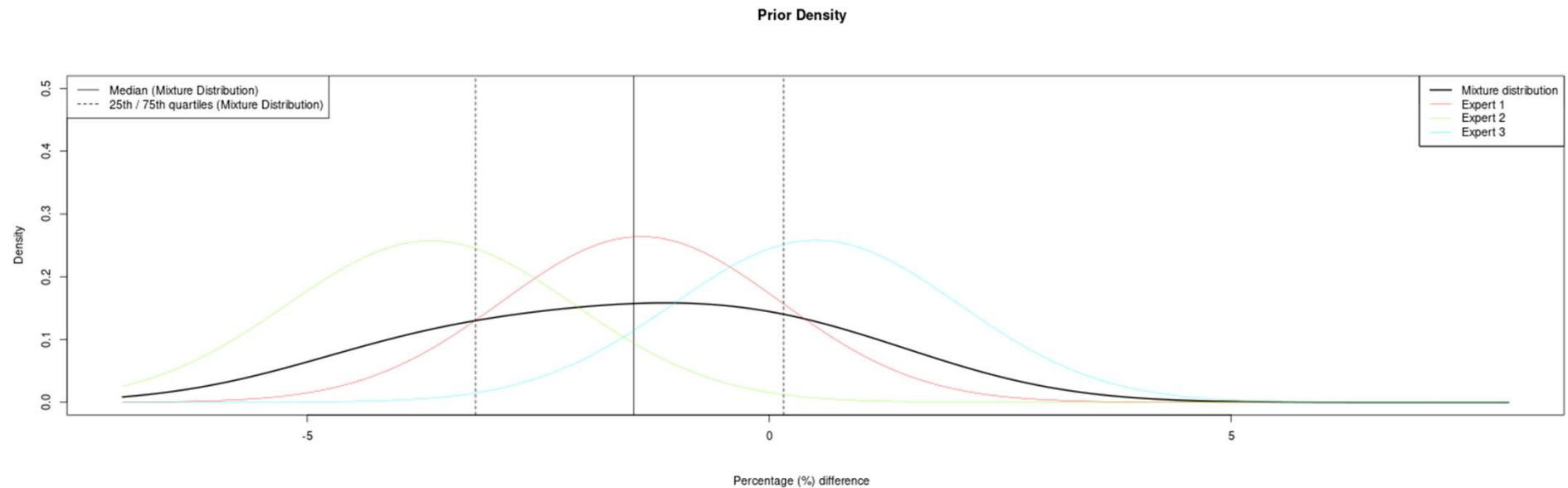
Choose distribution:

Normal

☒ Show density

☒ Add fitted quantile lines

Elicitation software (5)



☒ Show individual elicitations

☒ Add mixture distribution quantiles

Weighting Options



Fit distribution



Download

Elicitation software (6)

Weighting Options

Choose weighting value for each expert

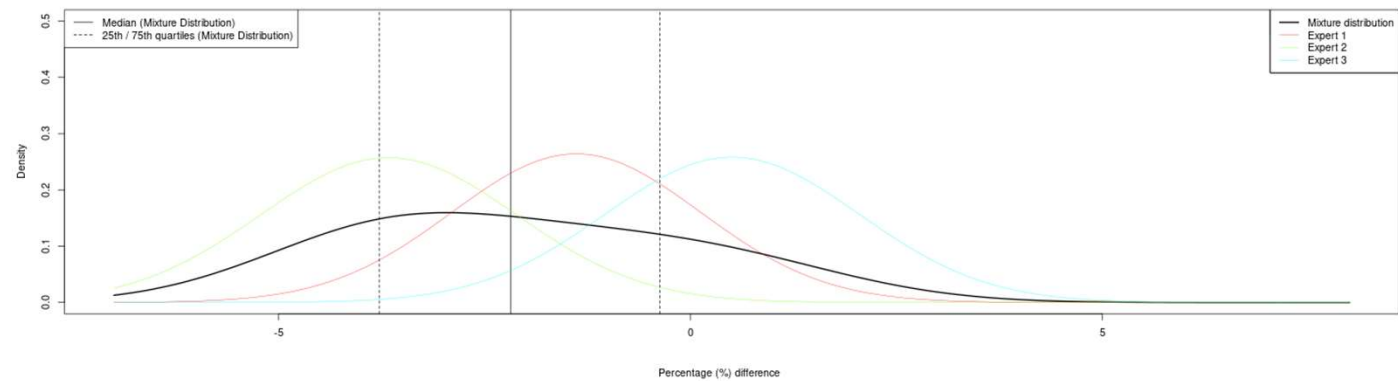
Expert 1:

Expert 2:

Expert 3:



Prior Density



- ☒ Show individual elicitations
- ☒ Add mixture distribution quantiles

Elicitation software (7)

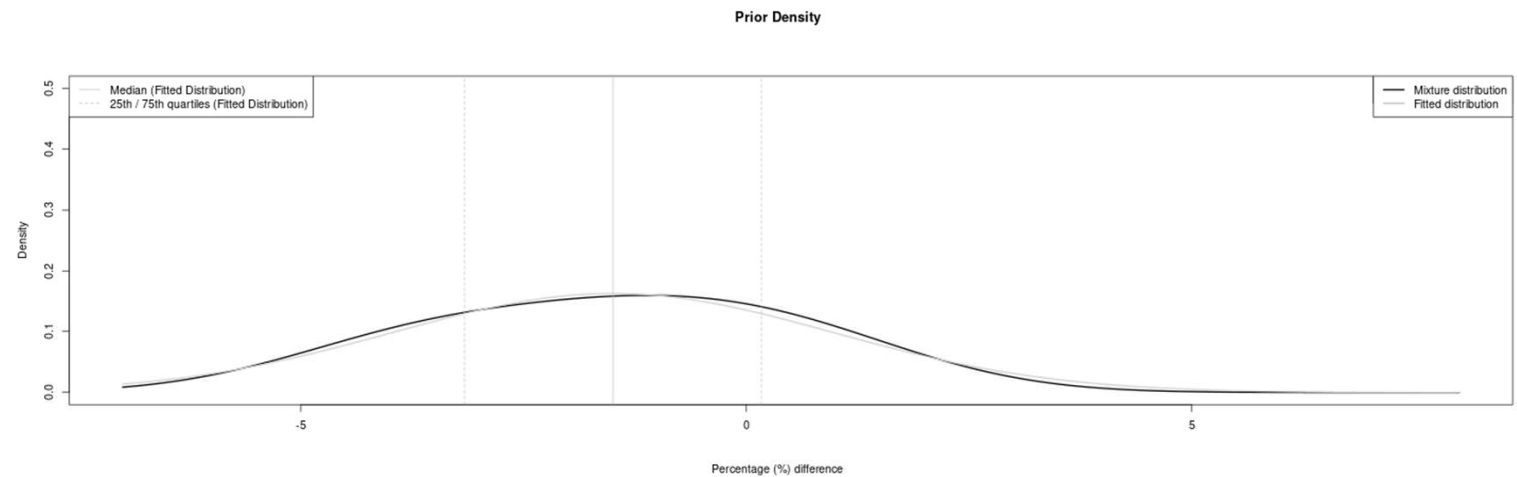
Fit distribution

Choose distribution to fit to the Univariate mixture distribution:

Normal

☒ Show fitted distribution

☒ Add fitted distribution quantiles



- ☐ Show individual elicitations
- ☐ Add mixture distribution quantiles

Thank you for listening!

Any Questions?

