Global Drug Development

Show me the question:
Putting the questions front and centre

Andrew Wright

RSS Conference, September 2019

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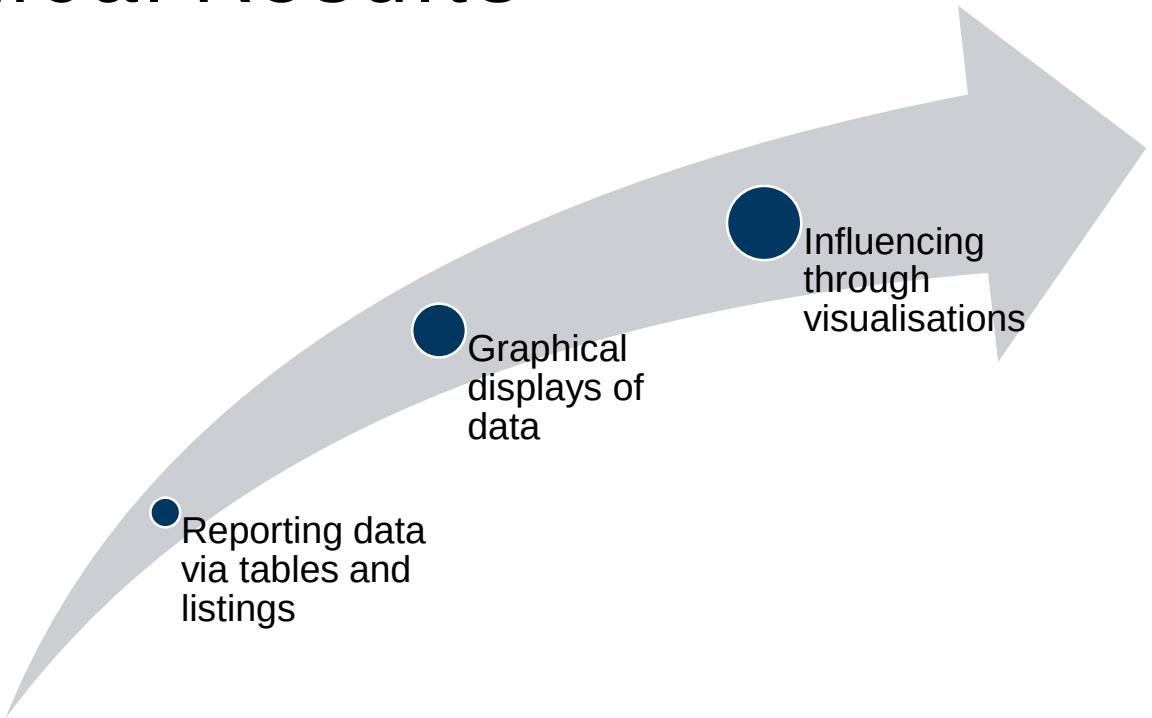
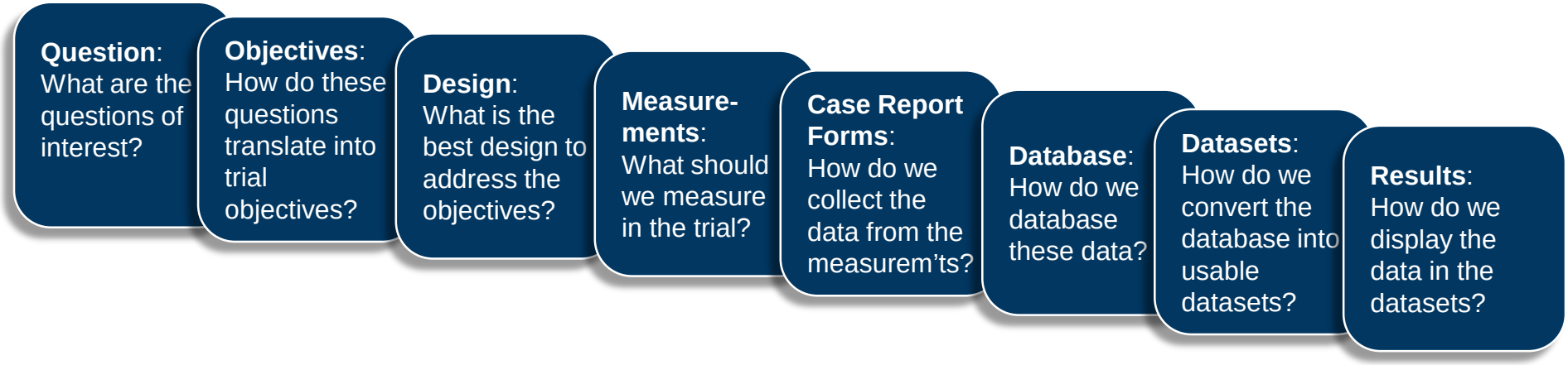
Evolution in the Communication of Statistical Results



Current Flow from Questions to Results in Clinical Trial Setting



At the end of this chain, do we still remember the question we started from?

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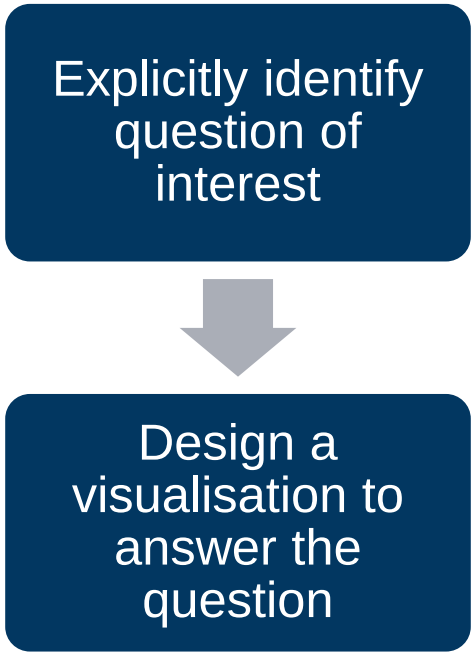
Question-Based Visualisations (QBV) A Top-Down Approach



This approach encourages:

- Clear **alignment** on the purpose of each visualisation **before** it is produced
- Clear **understanding** of the purpose of each visualisation **after** it is produced

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Three Applications of QBVs

Replacement for tables, listings and figures in static reports

Structure for interactive Shiny apps

Framework for exploratory data analyses

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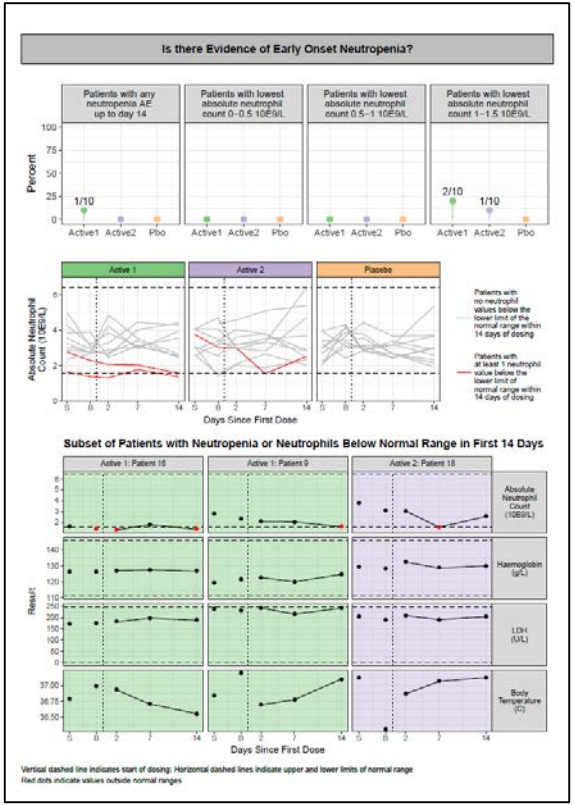
QBVs in Static Reports



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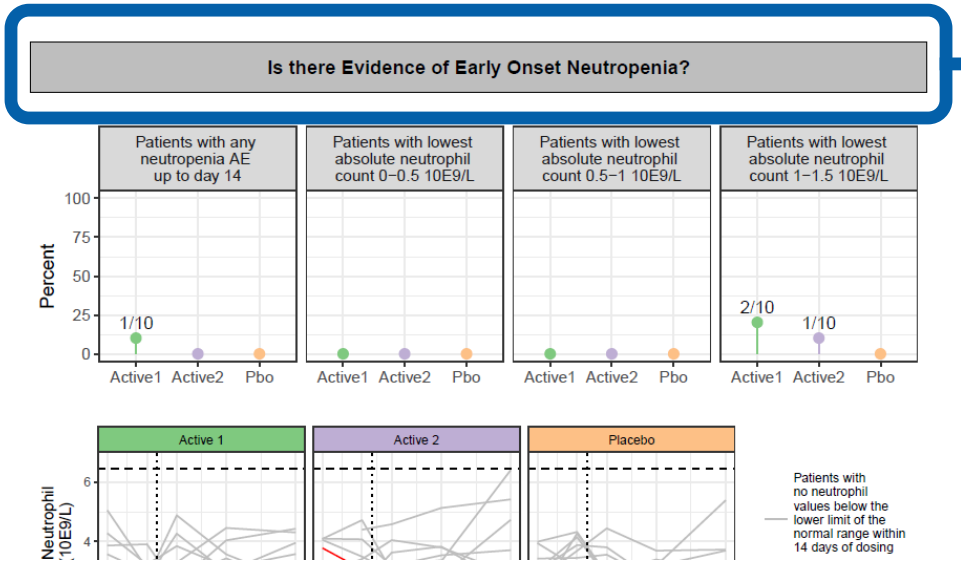
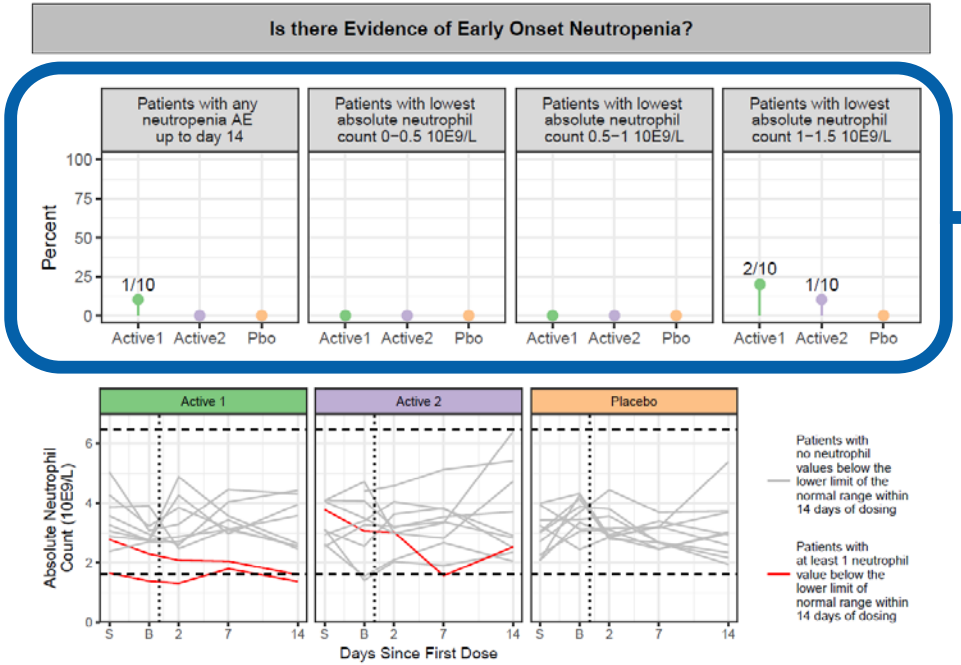
QBVs in Static Reports



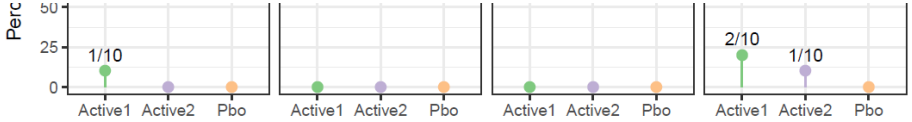
This visualisation is designed to address the question of whether there is evidence of a known potential safety concern: early onset neutropenia

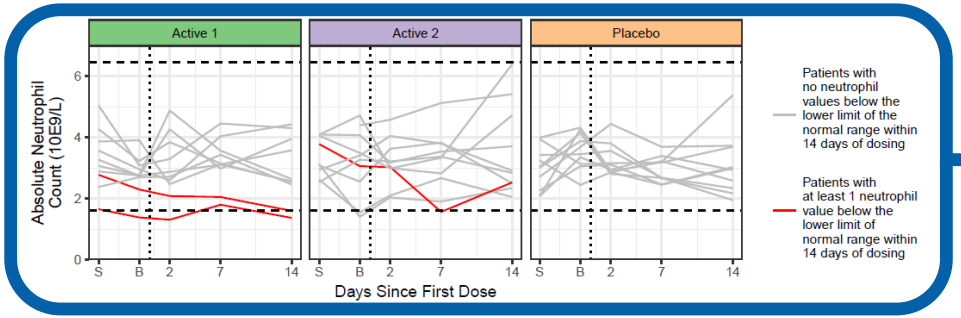
QBVs in Static Reports



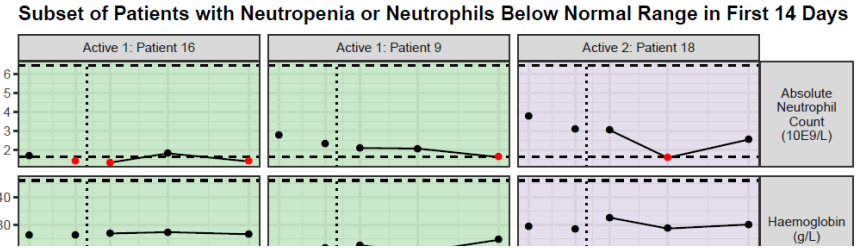
The first part of the visualisation provides a high level summary of whether there are any clear signals in the data

QBVs in Static Reports

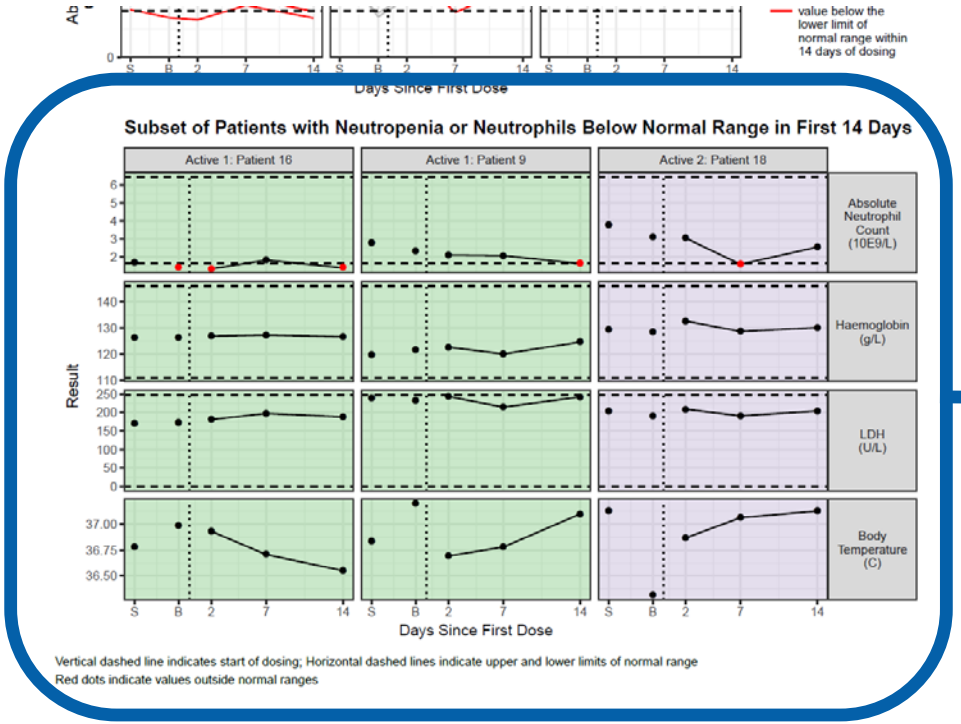




The second plot highlights potential patients of concern and contrasts them with other patients in the study

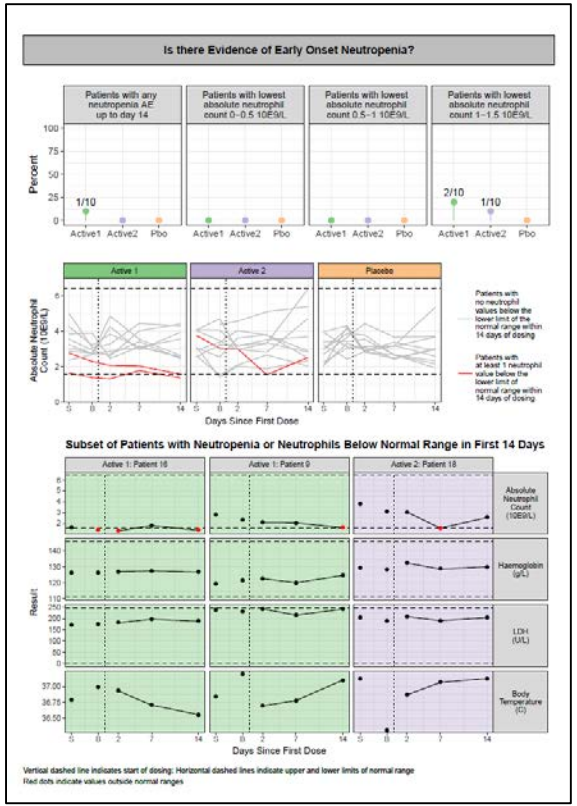


QBVs in Static Reports



The last plot focuses on the patients of concern to address whether neutrophil changes are consistent with other markers of a compromised immune system

Key Attributes of QBVs



- Title **explicitly** states the question of interest
- All information required to answer question are presented on **one page**
- Combination of summary statistics and individual data, descriptive and inferential statistics
- Data from many data domains displayed together

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Replacement for tables, listings and figures in static reports (e.g. CSRs)

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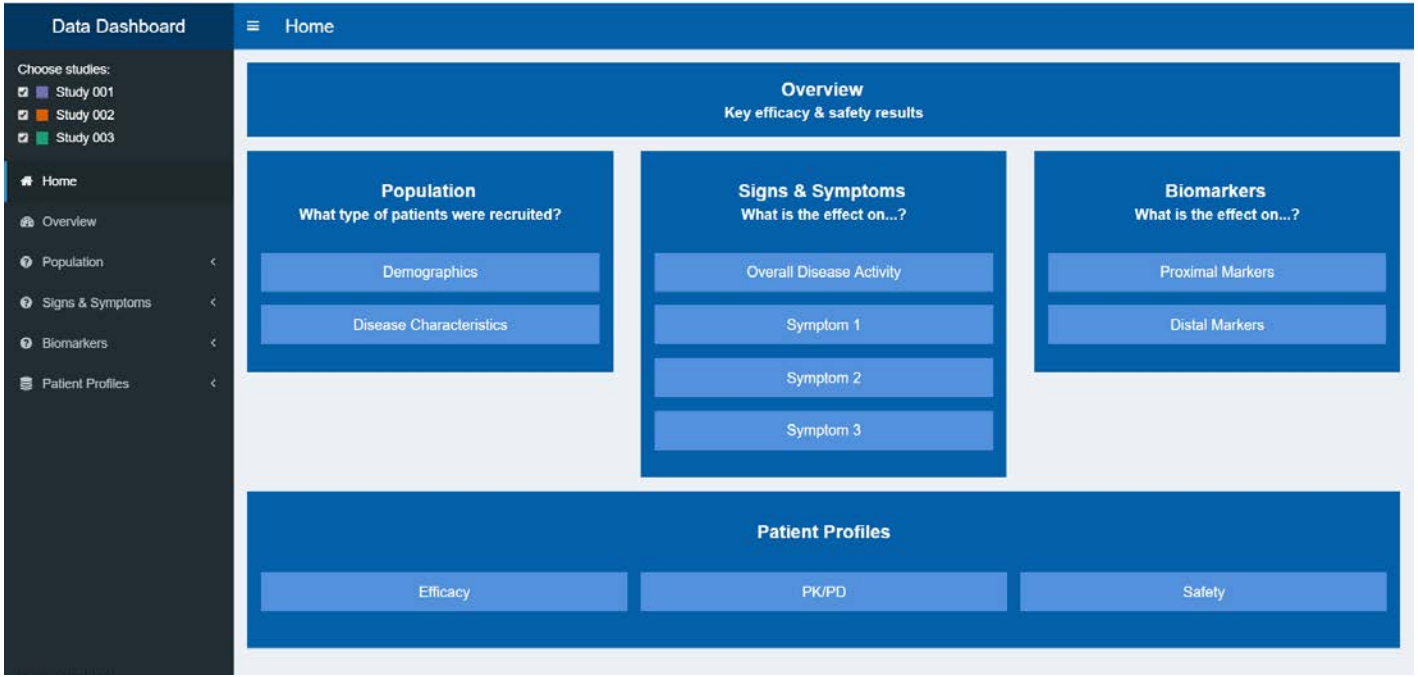
Framework for exploratory data analyses

Interactive Shiny App Structured around Questions



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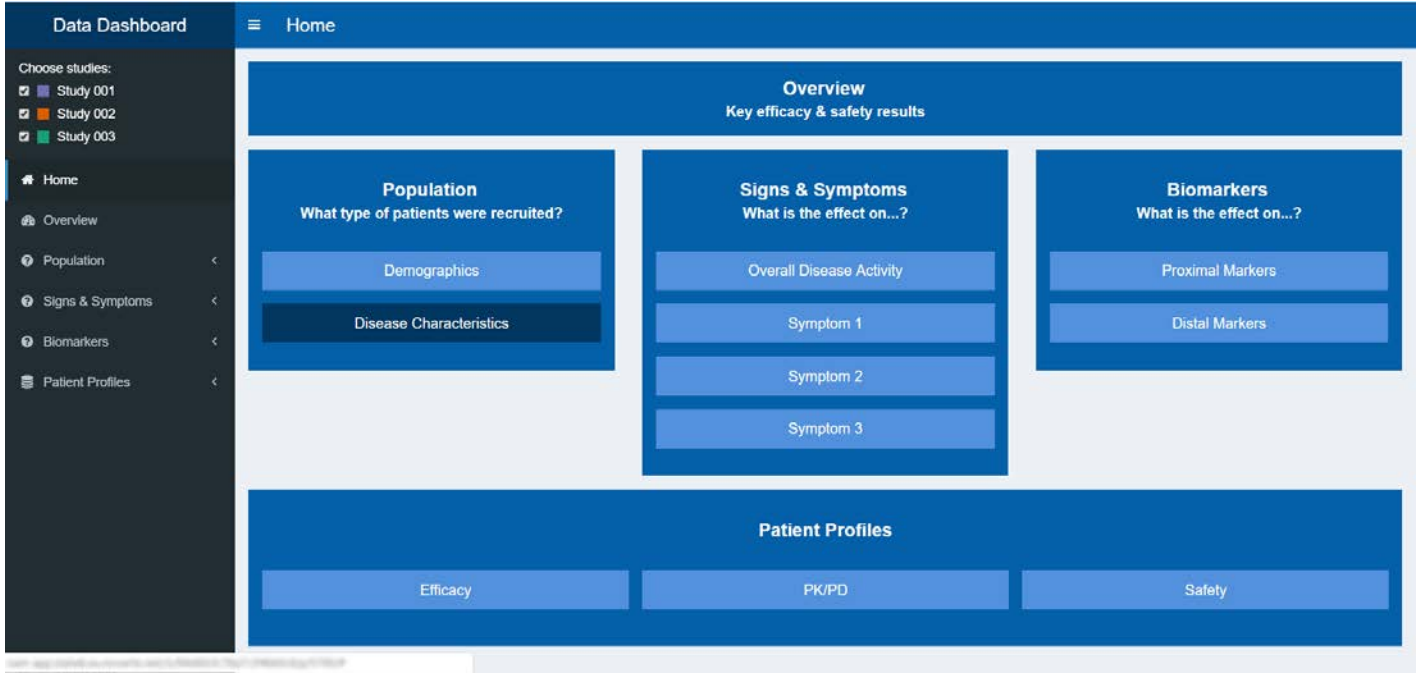

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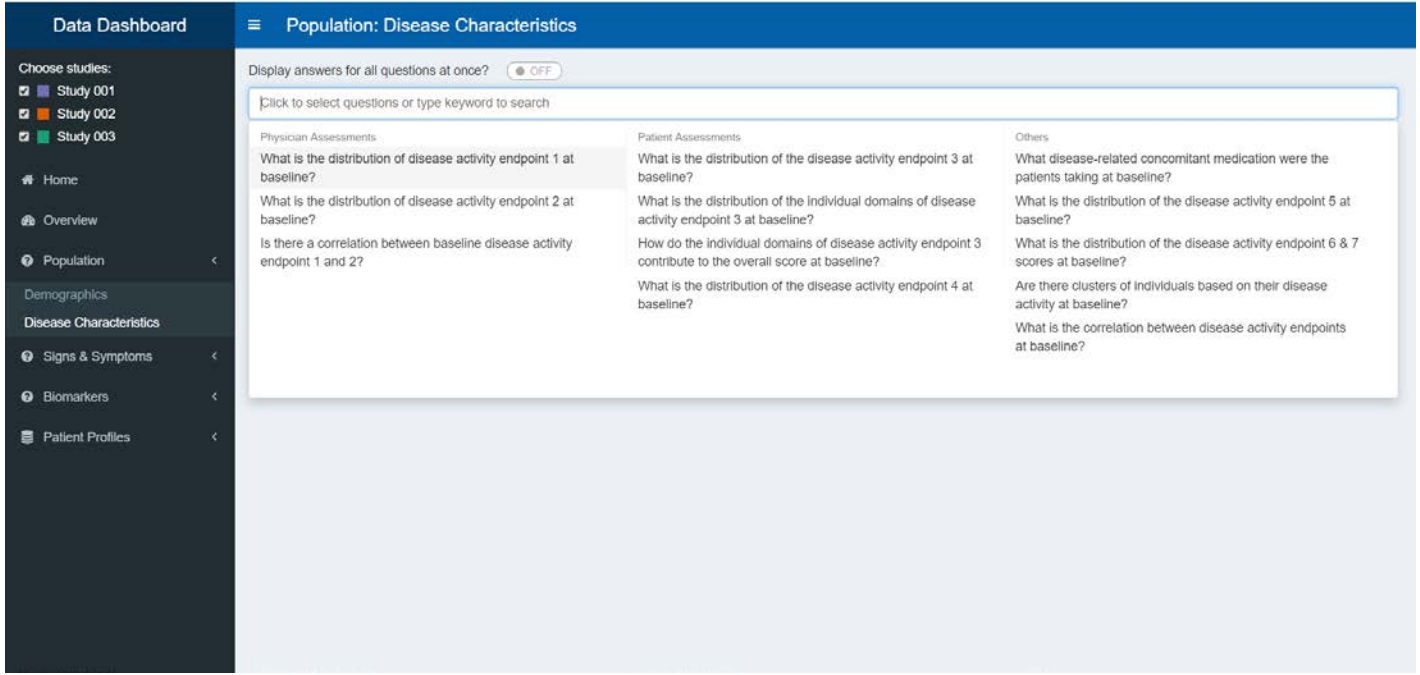
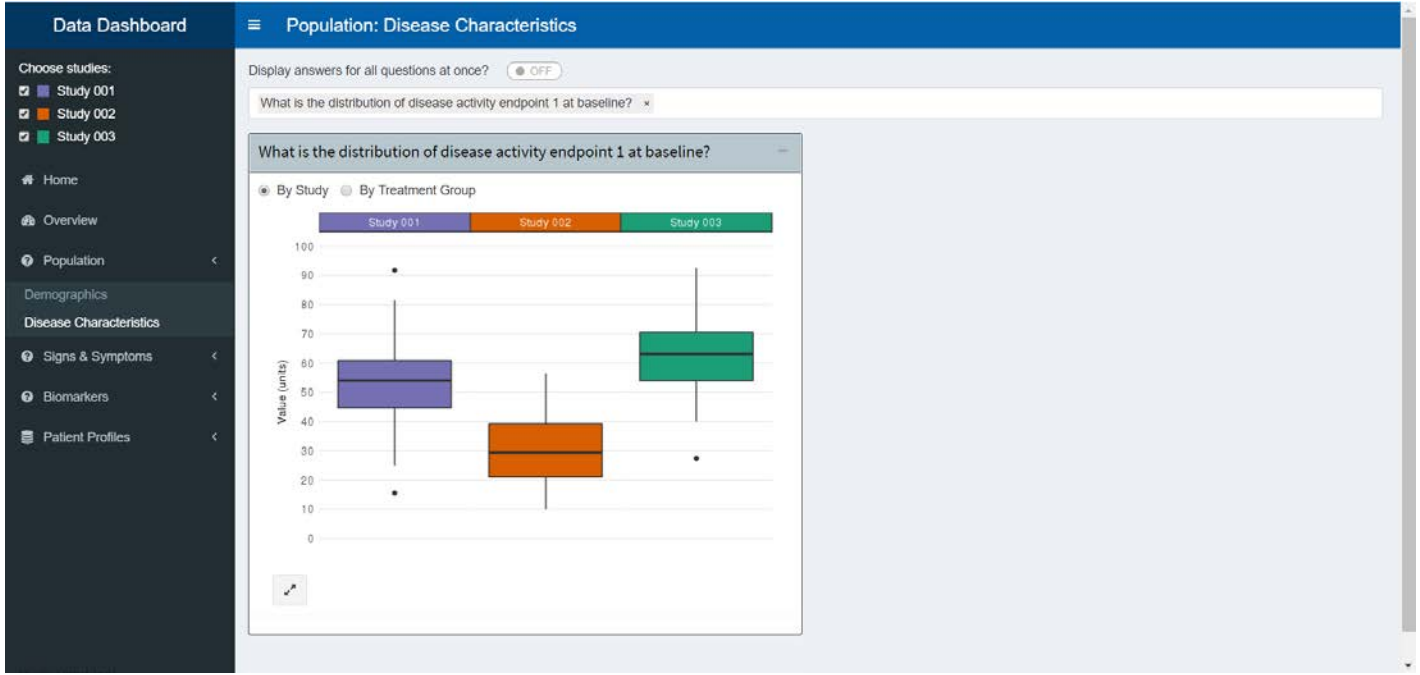
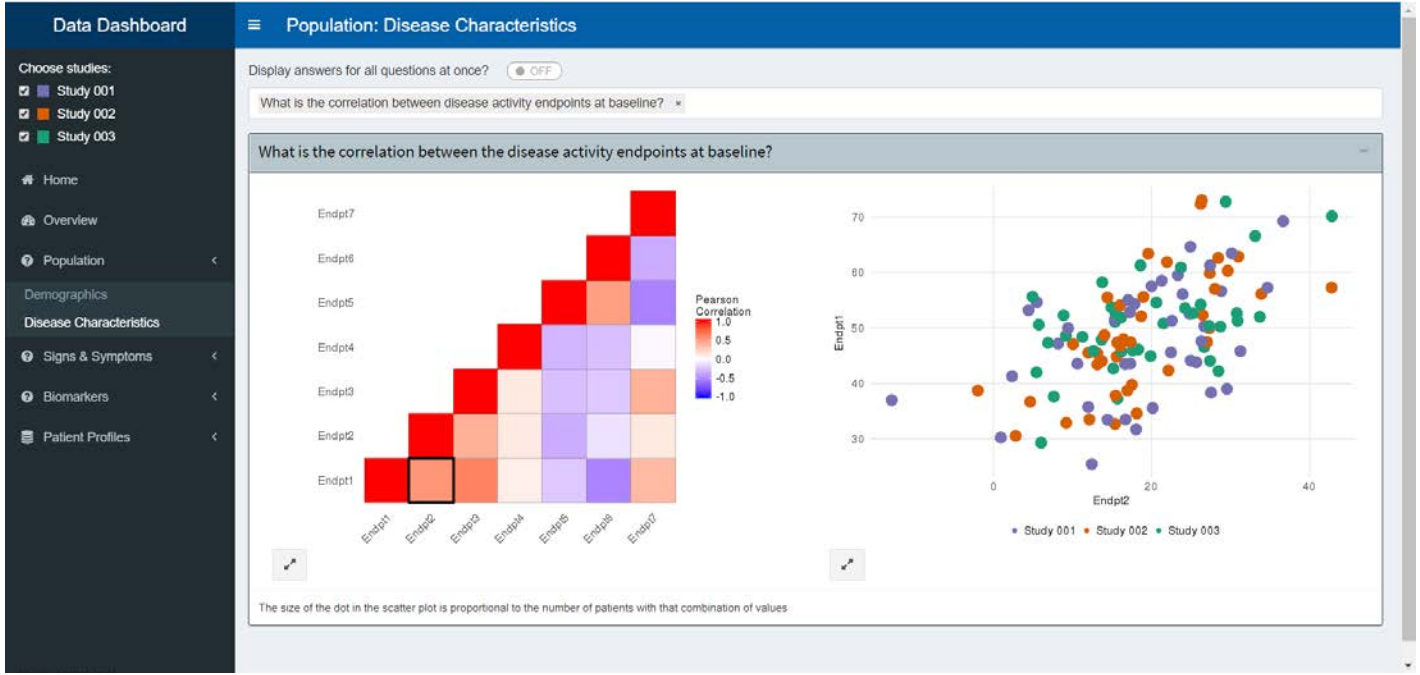
Question-Based Visualisations Are the Backbone of the App



Each Question is Addressed by a Visualisation



Sometimes Multiple Connected Graphs are Required to Answer a Question



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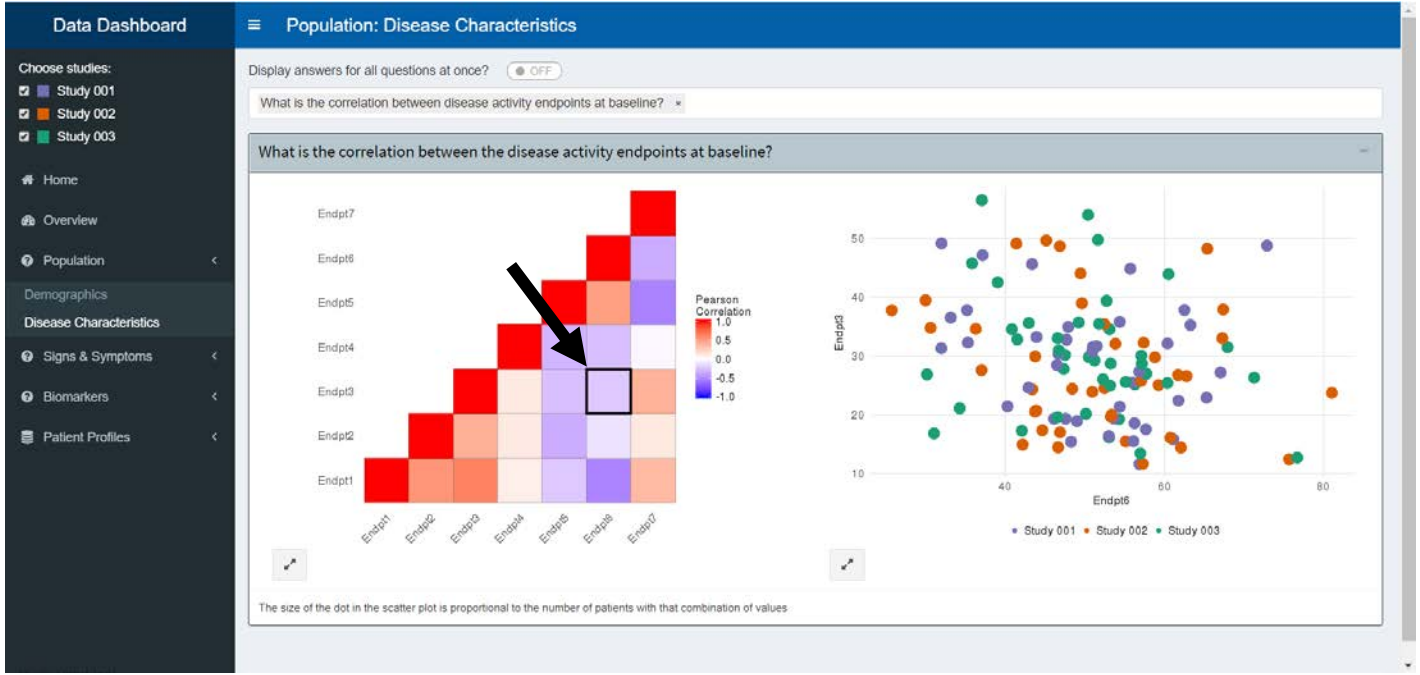

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Questions As Titles, Really?

Description

- e.g. ‘Scatter plot of X versus Y’
- Provides little additional information to your audience

Question

- e.g. ‘What is the relationship between X and Y?’
- A good starting point to design the visualization
- Allows the audience to make up their own mind

Answer

- e.g. ‘X and Y are positively correlated’
- Tells the audience how you interpret the data
- Best approach for influencing

Questions As Titles, Really?

For titles, choose from one of these two options

Question

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Put Questions Front & Centre in Your Visualisations for Maximal Impact

- Question Based Visualisations can influence by:
  - Aligning teams on the key questions of interest
  - Providing teams with a focussed, clear and concise visualisations to answer these questions

- To make an impact, use QBVs when communicating statistical results