**Background/Motivation**

Healthcare researchers need to repeatedly generate statistical summary tables and conducting exploratory analysis. Many of our collaborators eagerily want to make sense of their data, move faster with their studies. However, as many of us know that research involove a lot of repeated work, such as fine tune the cohort definition, combining two variables into one composite variables, change the order of the data, etc cera, which involves a lot of steps of works, which reproducibility and productivity burdensome.

Hurdles: When researches start to explore their data or do some preliminary analysis by themselves, they come across many hurdles such as:

- Find the right packages for certain tasks can be challenging.

- Syntax across packages vary dramatically.for example: summary statistics table generator packages table 1 vs tableone vs gtsummary.

- Typo and variable name cases can cause confusions. Many former SAS user will confused with the variable name conventions since R is case sensitive while SAS is NOT.

- Not all output has the right file formats. Even if you get the right packages to generate a table, there are additional steps needed to get the generated results output to the correct formats. This can be frustrated since many packages only provided one type of file format.

Possible solutions:

- Incorporate many commonly used packages into one.

- Skip model building syntax.

- Remove the need to type data entries.

- One place for repeated analysis to avoid version control concerns.

- Provide output in various file formats, mostly popular format in spreadsheet, word and PDF etc.

Shiny app: We developled a R shiny app to propose one of the solutions, to address the hurdles and concerns we just mentioned.

The apps left side provide interactive user interface for user to control their summay and analysis. Data upload session, data entry with click-select session and analysis control session.

Highlighted features:

- A click and choose UI, no typing is needed.

- Supports commonly used R packages for generating tables and figures.

- Provide download buttons for commonly used file formats (Excel, PDF etc).

- Interactive explanatory analysis within the app.

- Consistency of analysis make reproducible possible.

Demo:

The demo server is hosted in R studio, so we want to make sure that analytic data should be HIPPA compliance. I’m going to use a mock data for demonstration purpose.

First, make sure the data uploaded in the right format and right structure. For example, if you are doing the cohort demographics, the data should be in unique person level.

Second, make sure you understand your data even thought this app does help preselect possible variables.

Third, basic understanding of the analysis, will help understand the output results.

There are no hassles of writing formula, typing variables of interest, by clicking the list of variables based on analytic data set uploaded, the app can provide researchers almost instantaneous summary table with P-values. Furthermore, the app can identify appropriate regression (logistic or linear) be conducted based on outcome variable researcher selected. A univariable and multivariable analysis results will be presented side by side for easy exploring and a result-related graph will be generated for identifying statistical significance. All the tables can be downloaded in multiple file formats including Excel, PDF, etc. Researcher can easily adjust their variables of interest based on output tables and graph, which dramatically reduces their efforts of data exploring and exploratory analysis, help move the analysis faster and more efficiently.

Achnoledgement

This app is not possible without the amazing Rstudio Shiny and all those incredible helpful R statistics analysis packages developers. I also want to thank Startup fund from CHOP and Uppen, NIH for their

**Future work:** This app currently only accepts CSV file as data source, we are considering accept other file formats.  Other than regression analysis, and survival analysis, we are working on adding other widely used statistical analysis in clinical/healthcare field to our next version.