Using Statistical Software Efficiently and Effectively in PBRN Quality Improvement

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INTRODUCTION

Quality improvement (QI) projects rely on data to support decision making. Often in QI initiatives, data is pulled and compiled at regular intervals in order to describe changes within a population. This requires similar or identical analyses and reporting throughout the project duration.
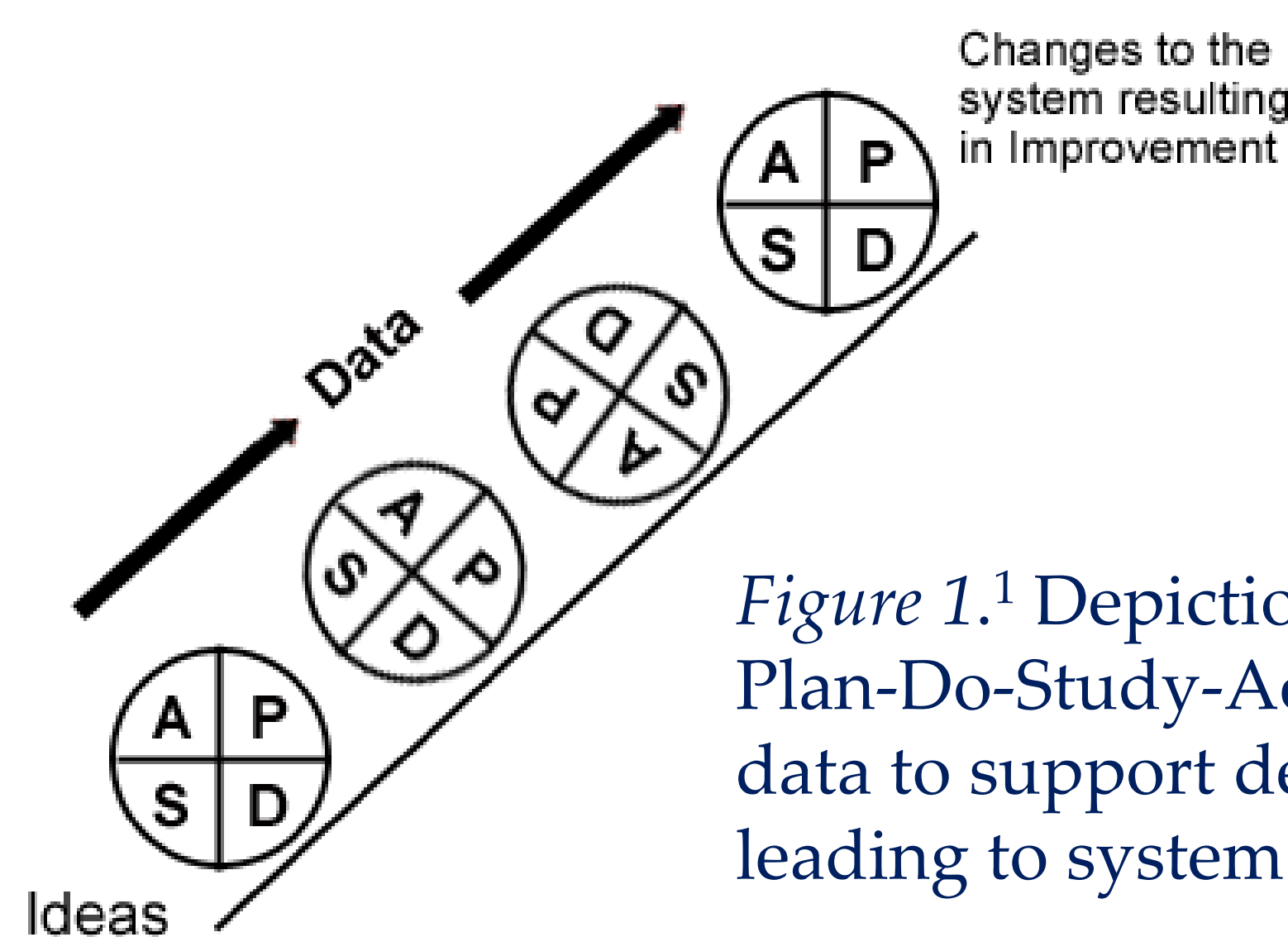

Figure 1.[1] Depiction of multiple Plan-Do-Study-Act cycles, using data to support decision making, leading to system improvement.

When analyzing large data sets at repeated intervals, using statistical software efficiently and effectively is essential for optimal data management and analysis. Though each software package offers different features and has its own advantages and disadvantages, most allow researchers to log commands in a dialogue box, such as:

- R script file
- SAS text editor
- SPSS syntax editor
- Stata do-file (*Figure 2*)

These dialogue boxes minimize additional time and effort needed to clean and prepare data, allow for the replication of previous work, keep a log of all work throughout the project, and produce quality graphs and tables quickly and easily.
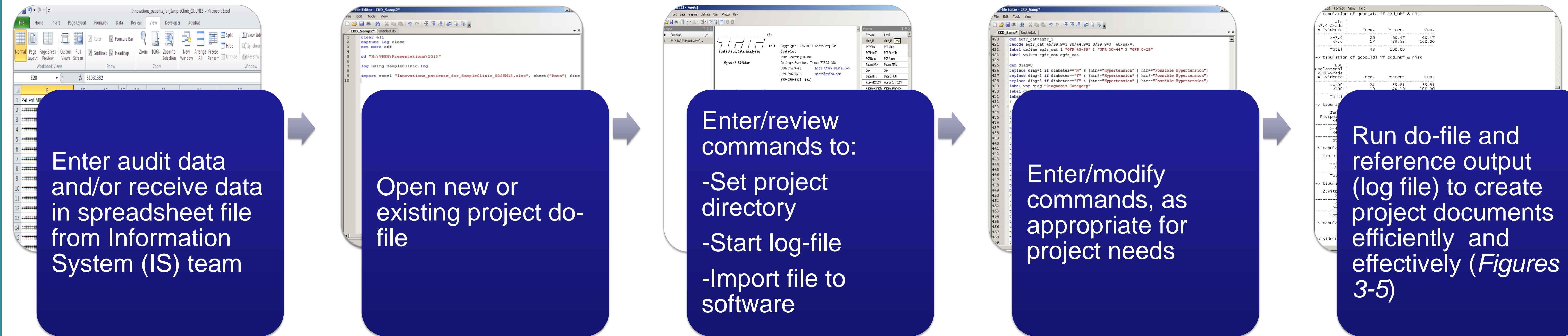
CASE STUDY

In a recent QI initiative, evaluation of the intervention strategies included a baseline retrospective chart review and monthly prospective chart reviews of patients who had office visits in the previous month.

With the advancement of data warehouse platforms, one-third (6/18) of participating clinics were able to send spreadsheet files (Excel) containing project variables that allowed coordinators to bypass that manual chart audit step.

Because each monthly chart audit required the same or similar reporting of summary statistics, using the log of commands (do-file) to reproduce work expedited the report preparation. Similarly, data-related problems have been easy to uncover, troubleshoot, and correct through the log of work established in the project do-file.

PROCESS

Enter audit data and/or receive data in spreadsheet file from Information System (IS) team

Open new or existing project do-file

Enter/review commands to:
-Set project directory
-Start log-file
-Import file to software

Enter/modify commands, as appropriate for project needs

Run do-file and reference output (log file) to create project documents efficiently and effectively (*Figures 3-5*)

Figure 2. *Sample dialogue file.* Set of Stata commands typed in a plain text file, called a do-file. Red font is used to annotate the file. The majority of commands contain work to recode and summarize data from the abstractions.
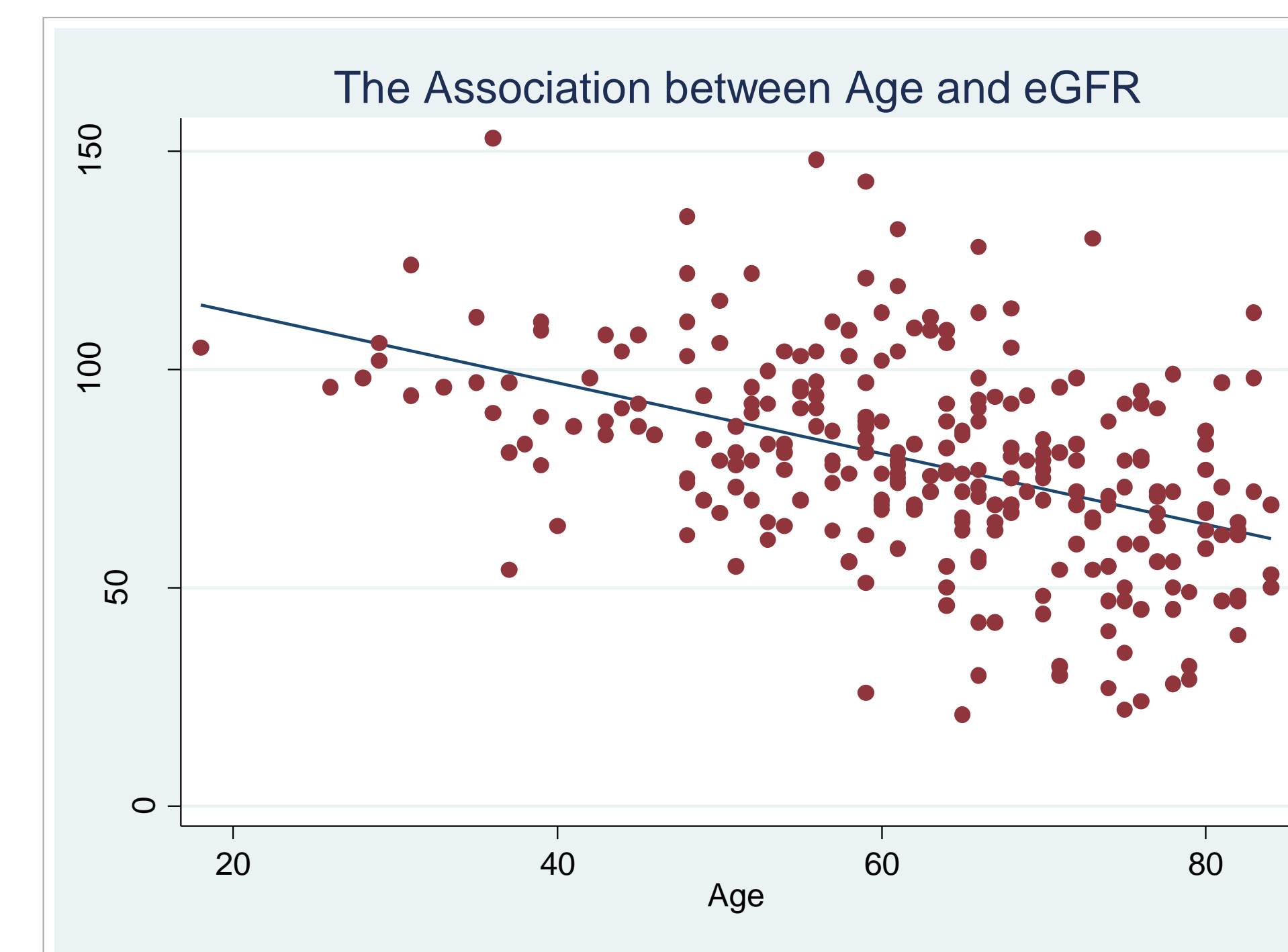

Figure 3. *Example scatterplot with line of best fit.*

The use of statistical software for analysis has enabled the efficient creation of study documents, such as *Figures 3 & 4.*

Figure 4. *Sample monthly one-page report for clinic.*

Figure 5. *Sample chronic kidney disease registry.* Filtered list of patients requested by participating clinicians, regularly reproduced and exported to project folder through a single command.

CONCLUSION

At WREN, using statistical software for repeated tabulations and analyses in QI projects has enabled consistency in reporting data in multi-site QI projects, decreased the time spent on repeated analysis due to documentation of previous work, and permitted rapid troubleshooting.

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