Study on Good Programming Practices in Health and Life Sciences

Steering Board for Good Programming Practices in Health and Life Sciences (GPP Board)

Arthur Collins, Biogen Idec, Inc., Cambridge, MA

Mark Foxwell, Cmed, Horsham, UK

Beate Hientzsch, Accovion, Germany

Cindy Song, Sanofi, Bridgewater, NJ

ABSTRACT

Most organizations with programming personnel have a document where they describe their best practices for developing high quality and efficient code. This document typically provides guidance on programming techniques such as code design, naming conventions, appropriate use of macros, hard coding restrictions, defensive programming strategies, maximizing efficiency, etc. The Steering Board for Good Programming Practices in Health and Life Sciences (GPP Board) is an industry group with representatives from a diverse array of health and life sciences organizations working to develop common good programming practices applicable to programs developed by statistical programming for the analysis and reporting of clinical trial data as well as for data integration or preparation of clinical data for e-submissions. One of our goals is to create a consolidated guideline which potentially could replace those documents created and maintained by each organization. This poster presents background on the GPP Board and discusses some of the basic tenets of GPP. It will also describe a study that we are conducting to collect data on current programming practices in health and life sciences organizations.

BACKGROUND ON THE GPP BOARD

The Steering Board for Good Programming Practices in Health and Life Sciences (GPP Board) is a voluntary industry group with representatives from a diverse array of health and life sciences organizations working to develop common good programming practices applicable to programs developed by statistical programming for the analysis and reporting of clinical trial data as well as for data integration or preparation of clinical data for e-submissions. The GPP board was formed in 2008 with membership from several leading European and US pharmaceutical companies and clinical research organisations following discussions at a PhUSE conference which highlighted a need for sharing and encouraging best practices in clinical trials programming. This is particularly the case for new hires and those with non-programming backgrounds who may need to quickly learn practices that may be second nature to experienced programmers. The board was instrumental in setting up a wiki at sascommunity.org to capture comments, ideas and draft guidance and is currently moving that content to the PhUSE wiki (http://phusewiki.org). This is an open wiki site and contributions and comments are welcome from all with an interest in improving programming in clinical trials. The GPP board has also supported conference presentations on the background of GPP to PhUSE 2009 and on aspects of robust programming to Pharmasug 2011.

GOALS OF THE GPP BOARD

The GPP Board will eventually tackle all aspects of good programming practices and will make an effort to address issues specific to each of the different programming languages and environments commonly used in the health and life sciences. We are initially focusing on the use of SAS® because it is by far the most widely used programming platform and will have the greatest impact. We believe that GPP can benefit programming organizations by reducing duplication of effort, speeding up development and improving quality. Typically, good programming practice addresses layout and organization of code and programs, use of macros, defensive programming and improving efficiency in both programmers and processing time. We also know that most organizations already document good programming practices within local guidance and believe that we can improve GPP by encouraging sharing and standardization of these ideas.

Our goals include

- Use of standard header

- Promotion and development of good programming practices within health and life sciences

    - For example through wiki and online discussion

- Maintaining awareness of GPP

    - For example by a study on the use of GPP

- Development of a consolidated GPP guideline with consensus agreement

    - This could be used to support or replace existing organizational guidelines

STUDY ON GOOD PROGRAMMING PRACTICES IN HEALTH AND LIFE SCIENCES

As well as collating best practices, the GPP board believes that it would be useful to understand the prevalence and usefulness of GPP across the health and life sciences industries. As a start, the GPP Board is conducting a study to assess the state of programming practices and we would love to have your participation. The study will initially consist of two modules; a registration and a SAS code review and will focus on a basic list of widely agreed upon good SAS programming practices.

- Use of standard header

- Descriptive comments in each section of the program

- Consistent use of appropriate spacing between statements and sections

- Consistent use of appropriate indentation on each line

- Consistently placing only one statement per line

- Breaking lines in a neat and logical way

- Consistently ending steps with run and quit where appropriate

- Consistently explicitly referencing input dataset in each step or procedure

- Program is logically organized

- Standard naming convention for temporary datasets

- Standard naming convention for variables in temporary datasets

- Standard naming convention for formats

- Standard naming convention for macros

- Explicitly code character to numeric and numeric to character conversions

- Explicitly code to handle missing data

- No overwriting temporary datasets within a program

- Check log for errors and warnings

- Clean-up work area after each program when running interactively

- Clean-up work area before each program when running interactively

The registration will establish a platform from which we can launch additional modules to collect data on areas of interest based on input from study participants. The results of the study will be kept strictly confidential but will be presented in summary form at conferences, on discussion boards, and the GPP Board wiki on the PhUSE website. We look forward to opening a robust dialogue on good programming practices in health and life sciences so please join us on this exciting initiative.

To register for the Study on Good Programming Practices in Health and Life Sciences, please go to the url below:

https://www.surveymonkey.com/s/GPPSURVEY

GPP BOARD MEMBERS

Co-Chair – Mark Foxwell (Cmed)

Co-Chair - Greg Nelson (ThotWave)

Jennifer Chin (Covance)

Art Collins (Biogen Idec)

Beate Hientzsch (Accovion)

Paul OldenKamp (Seattle Children's Research Institute)

Syamala Ponnapalli (ICON)

Cindy Song (Sanofi)

Jay Zhou (MAP Pharmaceuticals, Inc.)

REFERENCES

Foxwell, Mark. 2009. "Industry Standard Good Programming Practice for Clinical Trials (Using SAS)". Proceedings of the PhUSE 2009 Conference. Available at http://www.phuse.eu/Conference_2009.aspx.

Nelson, Gregory S. and Zhou, Jay. "Good Programming Practices in Healthcare Creating Robust Programs". Proceedings of the PharmaSUG 2011 Conference. Available at http://www.pharmasug.org/2011-proceedings.html.

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Name: Art Collins
Enterprise: Biogen Idec, Inc.
Address: 10 Cambridge Center
City, State ZIP: Cambridge, MA 02142
E-mail: Arthur.Collins@BiogenIdec.com

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.