

## **Clinical Graphs using ODS Graphics** Garage Malarga, SAS Institute, Cary, NC

### **ABSTRACT**

Safety data for clinical trials is often collected in tabular form. The process of interpretation and analysis that we make using software for the design of graphical display of this data starts with the statistical approach. Graphs such as Line Plots, Forest Plot Plots and Matrix, Scatter Plots, Hazard Plots, Advanced Forest Plots, Life Table for Event Occurrence and Mortality are commonly used in the Health and Life Sciences domain. Many of these graphs are easy to do using one of the many tools available in the ODS Graphics tool set. This paper will describe in detail how to create these standard graphs for the Health and Life Sciences industry using ODS Graphics.

### **INTRODUCTION**

High quality graphs are essential for analysis of data in the Health and Life Sciences domain. Large volumes of such data are generated in the duration of a clinical trial, and visualizing the data along with the derived statistics is essential for the analysis of such data. Some of the key features of the graphs include:

- Display of the raw data and the statistics in the same display.
- Display of other indicators such as identifiable events, adverse events, etc.
- Comparison of the results for a drug with the corresponding results for other drugs or placebo.
- Classification of the results by multiple variables.
- Display of the results over time.

The goal of this paper is to show how to create graphs commonly used in the Health and Life Sciences domain using ODS Graphics. In this paper, we will take various graphs commonly used for analysis of safety data for Clinical Trials, Patient Profile graphs, graphs for various laboratory tests, etc., and show the code needed to build such graphs in detail. These graphs have been developed by professionals in the field who have the necessary domain expertise to design the right graphs. It is not the intent of this paper to substitute the effectiveness of such graphs. So, the design of the graphs used is beyond the scope of this paper. In this paper, we will cover various techniques that can be used to build such graphs that providing the information you need to customize them to your needs.

### **GRAPHS FOR HEALTH AND LIFE SCIENCES**

We will review and build some common graphs that have been frequently used in the Health and Life Sciences domain. We will start with some graphs discussed in the paper "Graphical Approaches to the Analysis of Safety Data from Clinical Trials" (John Aron, et. al., Pharmaceutical Statistics, SAS). Additionally, we will cover other popular graphs in the field. These are:

1. Empirical distribution function for maximum change in QTc.
2. Box Plot of change from baseline in QTc by time and treatment.
3. Mean change from baseline in QTc by time and treatment.
4. Distribution of AARF by time and treatment.
5. Distribution of maximum LFT values by treatment.
6. Forest of LFT data from baseline to maximum by treatment.
7. Matrix display of Maximum LFT values.
8. LFT Patient profiles.
9. Mean frequency on therapy adverse events sorted by relative risk.
10. Cumulative distribution (with 95% CI) of time to first AE of special interest.
11. Kaplan-Meier for AE's of special interest (with 95% CI).
12. Adverse event profiles.
13. Line Plots Over Time.
14. Mortality Profile by Treatment.

Let us review each graph along with the code needed to create the graphs using the Statistical Graphics (SG) Procedures or the Graph Template Language (GTL).

# Clinical Graphs Using Ods Graphics Analysis Of Safety

**Jeffrey A. Klein**



## **Clinical Graphs Using Ods Graphics Analysis Of Safety:**

### **Producing High-Quality Figures Using SAS/GRAPH and ODS Graphics Procedures** Charlie Chunhua

Liu,2015-02-06 This book demonstrates how to create commonly used figures and plots with SAS GRAPH and ODS Graphics procedures It provides all the details on selecting the right figure formats options and fonts In depth instructions and SAS programs using procedures in both SAS GRAPH and ODS Graphics show how to generate sample figures in listing graphics formats and ODS document files Each chapter includes practical examples and SAS programs Readers can easily modify the SAS programs to develop high quality figures to meet their own needs *Clinical Graphs Using SAS* Sanjay

Matange,2016-03-21 SAS users in the Health and Life Sciences industry need to create complex graphs to analyze biostatistics data and clinical data and they need to submit drugs for approval to the FDA Graphs used in the HLS industry are complex in nature and require innovative usage of the graphics features *Clinical Graphs Using SAS* provides the knowledge the code and real world examples that enable you to create common clinical graphs using SAS graphics tools such as the Statistical Graphics procedures and the Graph Template Language This book describes detailed processes to create many commonly used graphs in the Health and Life Sciences industry For SAS 9 3 and SAS 9 4 it covers many improvements in the graphics features that are supported by the Statistical Graphics procedures and the Graph Template Language many of which are a direct result of the needs of the Health and Life Sciences community With the addition of new features in SAS 9 4 these graphs become positively easy to create Topics covered include the usage of SGPLOT procedure the SGPANEL procedure and the Graph Template Language for the creation of graphs like forest plots swimmer plots and survival plots

*Tumescent Technique* Jeffrey A. Klein,2000 TUMESCENT TECHNIQUE is the definitive reference on all aspects of the tumescent technique of anesthesiology used in liposuction Written by the inventor of the tumescent technique this resource explains the pathophysiology complications pharmacology and the different methods used to achieve great cosmetic results Step by step instructions demonstrate how to perform this procedure on all areas of the body Complications and postoperative care are also addressed Written by Dr Klein a leading expert in the field and the physician who invented and perfected the technique Provides step by step instructions for administering the local anesthesia with a practical easy to follow approach Discusses tumescent liposuction techniques for each body region addressing procedures guidelines and complications for each Covers complications and how to avoid them preventing problems before they arise Provides detailed illustrations of techniques and before and after photographs to allow you to see expected results **International Labour**

**Documentation** International Labour Office. Central Library and Documentation Branch,1994 **Library Literature & Information Science** ,2005 An index to library and information science literature *Journal of the Missouri State Medical Association* Missouri State Medical Association,1925 **Environment Abstracts Annual 1989** Bowker Editorial Staff,R R Bowker Publishing,Bowker,1990 **Government Reports Announcements & Index** ,1985 *Environment Abstracts*

*Annual*, 1992 This database encompasses all aspects of the impact of people and technology on the environment and the effectiveness of remedial policies and technologies featuring more than 950 journals published in the U S and abroad The database also covers conference papers and proceedings special reports from international agencies non governmental organizations universities associations and private corporations Other materials selectively indexed include significant monographs government studies and newsletters **Collier's**, 1910 *The New International Year Book*, 1911 **New International Yearbook**, 1911 The New International Year Book Frank Moore Colby, Allen Leon Churchill, Herbert Treadwell Wade, Frank H. Vizetelly, 1911 The Engineering Index Annual, 1992 Since its creation in 1884 Engineering Index has covered virtually every major engineering innovation from around the world It serves as the historical record of virtually every major engineering innovation of the 20th century Recent content is a vital resource for current awareness new production information technological forecasting and competitive intelligence The world s most comprehensive interdisciplinary engineering database Engineering Index contains over 10 7 million records Each year over 500 000 new abstracts are added from over 5 000 scholarly journals trade magazines and conference proceedings Coverage spans over 175 engineering disciplines from over 80 countries Updated weekly *Cardiac Anesthesia* Fawzy G. Estafanous, Paul G. Barash, J. G. Reves, 1994 *ASTM Standardization News* American Society for Testing and Materials, 1979 Biomedical Technology & Human Factors Engineering, 1985 *Biological Abstracts* Jacob Richard Schramm, 1967 *USP DI*. United States Pharmacopeial Convention, 1982 *The Washington Post Index*, 1994

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