

## **Course Proposition and Executive Summary**

In the year of 1999, a young British women by the name of Sally Clark was sentenced to life imprisonment for the murder of not one but two of her baby sons, aged 11 weeks and 8 weeks respectively. Pediatrician Sir Roy Medow, who played the role of the expert witness in what was one of the worst violations of the use of basic statistics in a court trial, statistically proved – though wrongly -- that the probability of two babies dying of cot death was 1 in 73 million, swaying the panel of jury and subsequently led to her prosecution. Sally Clark was subsequently released on appeal in 2003 where she was found innocent. However, she died tragically in 2007, aged 42.

Staton, A Glantz, Professor of Medicine from the University of California, San Francisco, wrote that most health care professionals depended on the use of medical journals to keep themselves abreast of current updates on treatment of patients but few in the biomedical research community are actually qualified or even conversant in the use and interpretation of biostatistics. Starting from the 1950s, critical reviews of existing publications found that more than half of these medical literature used inappropriate statistical methods.

This course therefore seeks to walk participants through the correct and appropriate use of biostatistics models and its interpretations. Participants will also be taught how to test the assumptions of each models rigorously and to adopt best practices in dealing with biostatistics, together with the avoidance of statistical pitfalls. Covering the essentials of salient bio-statistical tools from assessing impact and differences in the use of ANOVA models, to the detection of trends and prediction in regression and the study of survival data in survival modeling, this 2-day workshop will equip those who are new to the space of biostatistics with the relevant training to start their journey into analyzing their data appropriately.

### **Who is this course for?**

This course is specially designed for data analysts, researchers and executives who are interested to learn the essential techniques and applications of biostatistics. Aimed at equipping participants with biostatistics techniques ranging from description of simple data summarization to topics involving ANOVA models and logistic regression modeling, this 2-day workshop offers participants the plethora of important statistical tools and models to analyze their data.

Participants who may not have the relevant training will find this course useful and enriching, while those who may have some training or working experience in this area will find this course offering fresh insights into the arena of biostatistics.

Participants should ideally possessed a tertiary qualification and be generally comfortable with quantitative discussions, applications and working with models and algorithms.

## Course Content

- Introduction to biostatistics
  - Sample size, power and its significance
  - Biostatistics and clinical practices
- Descriptive and exploration analysis
  - Summarising data
  - Graphing data
  - Difference between descriptive and inferential statistics
- Analysis of Variance (ANOVA) modeling
  - Repeated measures ANOVA
    - Multiple repeated-measures ANOVA
  - 2-Way ANOVA
  - ANCOVA
  - MANOVA
- Testing for trends in data
  - Regression
    - Logistic Regression
  - Hierarchical linear modeling
- Analysing ranked data
  - Kruskal Wallis test
- Analysing survival data
  - Graphing survival curve
  - The Kaplan-Meier statistic
- Ethical guidelines for bioscience research
  - Bioethics and guidelines involving human subject research

\*Software will be provided during training and participants will be taught how to use them during the course

## **Course Objectives**

At the end of this course, Participants will be able to:

1. Differentiate amongst the various biostatistics tools and models,
2. Evaluate and assess the strengths and weaknesses of various biostatistics modelling techniques,
3. Describe and be able to validate the assumptions of each biostatistics tool and model,
4. Design and propose the use of relevant analytical models and statistical solutions in addressing research problems,
5. Describe best practices and ethical considerations of biostatistics and analytical pitfalls to avoid

## **Pre-requisite**

Participants should have attended the course "Introduction to Statistics and Quantitative Data Analysis", or possessed knowledge of the content to the above course before signing up for this course.

Participants should generally be comfortable with quantitative discussions, applications and working with models, testing of assumptions and algorithms.

## **Mode of Assessment**

Participants are required to sit for an open-book quiz where participants will be graded in accordance to the course objectives to ensure they are met in a practical way.

## **Price Schedule**

\$990/pax (Subjected to prevailing GST)

## **Certificates/Awards**

Certificate of Performance will be awarded if participant satisfies the course criteria.

## Profile of Trainer

Mr. Ng Jinsheng joined IBM SPSS in 2008 as an Executive in Training and Consulting after his graduation from the National University of Singapore (NUS) with a Degree in Statistics and Applied Probability. During his stay in IBM SPSS, he has trained hundreds of participants from the public service and private sector in statistical and data mining concepts, tools and applications in solving business problems. He has also led consulting projects and worked with C-level executives in addressing pressing business issues during which he received numerous praises and testimonies. During his working with IBM SPSS, Mr. Ng Jinsheng also completed his Masters of Science in Knowledge Management [M.Sc(KM)] from the Nanyang Technological University (NTU) and graduated one of the top in his cohort with a Dean's List award in academic excellence. He later joined SAS Institute as an Education Specialist in the Training department, and thereafter as a Senior Associate in professional Consulting services.

An academic paper he has co-authored was nominated for the Best Paper Award in the 20th International Conference on Computers in Education (2012). He is currently a founding member of AnaVantage Management Consultancy LLP, and lectures and trains at Tertiary Institutions in Singapore in the area of business statistics, data mining and analytics, and develops analytics courses for undergraduate programmes in Singapore. He is also an IBM Business Analytics Certified Specialist in IBM SPSS Modeler (Professional) and IBM SPSS Statistics, as well as SAS Certified Predictive Modeler using SAS Enterprise Miner and SAS Certified Business Analyst using SAS 9: Regression and Modeling.

Professionally as a Trainer, Jinsheng possessed an Advanced Certificate in Training and Assessment (ACTA) conferred by the Workforce Development Agency of Singapore (WDA) and a proud recipient of the prestigious "Excellence in Teaching" Award (EIT) conferred by the Singapore Polytechnic (SP) during the Annual Excellence in Teaching and Training Convention 2015. He is also conferred the title of an *Associate Adult Educator* by the Institute of Adult Learning (IAL) in 2016, an Adult Educators' Professionalisation recognition which awards pedagogical and professional excellence.