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Multilevel and Longitudinal Modelling Using Stata

3-Day Professional Development Workshop

East Asia Training & Consultancy Pte Ltd invites you to attend a three-day professional development workshop reviewing statistical methods used in Biostatistics and Public Health and using Stata to analyze the course databases. Stata is the well-known statistics and econometrics software package developed by StataCorp (USA). Stata is a statistical software package that offers a broad range of statistics to professional researchers in many disciplines. Stata is particular useful to professionals working in areas of biostatistics, epidemiology, medical research and economic research.

Course Programme

The aim of this workshop deals with the analysis of data that typically arise in biostatistics. The emphasis is practical so that participants should understand both the principles of analysis and how to carry them out. Participants should, by the end of the workshop, be able to use Stata for carrying out their own analyses for the most common types of problem encountered in biostatistics and public health analysis. Readings and data sets from the medical and public health literature will be used as case studies and in practical exercises wherever possible, using the Stata® statistical package. Participants are encouraged to bring their own datasets if they wish.

Who should Attend

Researchers, physicians, clinicians, public health professionals, students and lecturers in biostatistics, statistics and biomedical sciences, from public and private institutions who wish to increase their familiarity with quantitative methods in the principles of biostatistics, or statistics applied to health care planning and

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evaluation, so they can more effectively address problems in health research and use computational tools to solve practical problems.

Fee and Registration

The fee for this three-day specialized and professional workshop includes extensive course materials, data-sets, lectures, lunches, morning and afternoon coffee/tea breaks, receptions and the opportunity to network with medical researchers, health care practitioners and biostatisticians across the various industries in Asia. This is a "hands-on" workshop. Participants are required to bring their own laptops.

The number of participants is restricted. Please register early to guarantee your place. Please complete the official registration form and fax to (65)-62506369 or email it to us at stata@eastasiatc.com.sg to reserve your place. Confirmation will only be made upon receiving full payment. Further instructions will be sent to confirmed participants.

Course Outline

General outcome for each Session
~ 15 minute discussion of topic (e.g. method used for comparison of means, etc)
~ 15 minute discussion of the Stata commands
~ 60 minutes hands on practice using commands on example data sets

	Day 1 Review of Regression analysis	Day 2 Longitudinal data analysis	Day 3 Multi-level model
9.00-10.30	**Introduction** • Students background, student objectives for the course; • Outline of course, • Introduction to Stata Windows, help, etc. • Introduction to datasets, inputting and outputting data	**Data structure of longitudinal data.** **Related analysis:** • Repeated measure ANOVA. (balance structure) • Split plot design. • Response profile analysis. • Polynomial trends in time.	Data structure for multi-level model. **Similarity** to longitudinal data model. **Difference** from longitudinal analysis. (cluster correlated data) **Two level model**
10.30-11.00	**Morning Tea**		
11.00-12.30	**Exploratory data analysis and Graphs** • univariate graphs • bivariate graphs • graphing subsets of variables saving, opening, combining graphs printing graphs • growth curve graph	**Addressing the correlation structure** • compound symmetry • auto-regressive • unstructured • other covariance patterns • estimation techniques. • Population average (marginal) model and subject specific model.	**Three level model** • Model fitting, • likelihood ratio tests, • model comparison. • Calculation of variance • partition coefficients (intra-class correlation); • hierarchical variance structure.

Time			
12.30-1.30	**Lunch**		
1.30-3.00	**Linear regression** • analysis commands • use of continuous and categorical variables • interpretation of coefficients • tests for significance of variables • confidence intervals	**Linear mixed effects model** • random effects and fixed effects • estimation methods: ML vs REML • significance test: Wald test and likelihood ratio test. • interpretation of the fitted model • degrees of freedom	**Generalized linear model for multi-level data** • Binary outcome: models (link function, canonical parameters), • regression coefficients estimation, • significance tests, • interpretation. **GEE and MLE.**
3.00-3.30	**Afternoon Tea**		
3.30-5.00	**Regression diagnostic** • residual plots • linearity assumption • constant variance assumption • normality assumption • cooks distance and influential points **Efficiency** • statistical properties: unbiased, consistent, efficient, and robust.	**Model comparison and diagnostic** • AIC and BIC criteria. • Raw residuals, standardized residuals and normalized residuals • checking assumptions • semi-variogram	**Generalized linear model for multi-level data** • Poisson outcome • Models (link function, canonical parameters), • regression coefficients, estimation, • significance tests, • interpretation. **GEE and MLE.**