Sample Size Calculations for Clustered and Longitudinal Outcomes in Clinical Research

Chul Ahn 2014-12-09

Accurate sample size calculation ensures that clinical studies have adequate power to detect clinically meaningful effects. This results in the efficient use of resources and avoids exposing a disproportionate number of patients to experimental treatments caused by an overpowered study. Sample Size Calculations for Clustered and Longitudinal Outcomes in Clinical Research explains how to determine sample size for studies with correlated outcomes, which are widely implemented in medical, epidemiological, and behavioral studies. The book focuses on issues specific to the two types of correlated outcomes: longitudinal and clustered. For clustered studies, the authors provide sample size formulas that accommodate variable cluster sizes and within-cluster correlation. For longitudinal studies, they present sample size formulas to account for within-subject correlation among repeated measurements and various missing data patterns. For multiple levels of clustering, the level at which to perform randomization actually becomes a design parameter. The authors show how this can greatly impact trial administration, analysis, and sample size requirement. Addressing the overarching theme of sample size determination for correlated outcomes, this book provides a useful resource for biostatisticians, clinical investigators, epidemiologists, and social scientists whose research involves trials with correlated outcomes. Each chapter is self-contained so readers can explore topics relevant to their research projects without having to refer to other chapters.

Downloaded from guidebook.ihep.org on November 23, 2021 by guest
in Clinical Research-Chul Ahn 2020-06-30 Accurate sample size calculation ensures that clinical studies have adequate power to detect clinically meaningful effects. This results in the efficient use of resources and avoids exposing a disproportionate number of patients to experimental treatments caused by an overpowered study. Sample Size Calculations for Clustered and Longitudinal Outcomes in Clinical Research explains how to determine sample size for studies with correlated outcomes, which are widely implemented in medical, epidemiological, and behavioral studies. The book focuses on issues specific to the two types of correlated outcomes: longitudinal and clustered. For clustered studies, the authors provide sample size formulas that accommodate variable cluster sizes and within-cluster correlation. For longitudinal studies, they present sample size formulas to account for within-subject correlation among repeated measurements and various missing data patterns. For multiple levels of clustering, the level at which to perform randomization actually becomes a design parameter. The authors show how this can greatly impact trial administration, analysis, and sample size requirement. Addressing the overarching theme of sample size determination for correlated outcomes, this book provides a useful resource for biostatisticians, clinical investigators, epidemiologists, and social scientists whose research involves trials with correlated outcomes. Each chapter is self-contained so readers can explore topics relevant to their research projects without having to refer to other chapters.

Sample Size Calculations in Clinical Research-Shein-Chung Chow 2017-08-15 Praise for the Second Edition: "... this is a useful, comprehensive compendium of almost every possible sample size formula. The strong organization and carefully defined formulae will aid any researcher designing a study." -Biometrics "This impressive book contains formulae for computing sample size in a wide range of settings. One-sample studies and two-sample comparisons for quantitative, binary, and time-to-event outcomes are covered comprehensively, with separate sample size formulae for testing equality, non-inferiority, and equivalence. Many less familiar topics are also covered ..." - Journal of the Royal Statistical Society Sample Size Calculations in Clinical Research, Third Edition presents statistical procedures for performing sample size calculations during various phases of clinical research and development. A comprehensive and unified presentation of statistical concepts and practical applications, this book includes a well-balanced summary of current and emerging clinical issues, regulatory requirements, and recently developed statistical methodologies for sample size calculation. Features: Compares the relative merits and disadvantages of statistical methods for sample size calculations Explains how the formulae and procedures for sample size calculations can be used in a variety of clinical research and development stages Presents real-world examples from several therapeutic areas, including cardiovascular medicine, the central nervous system, anti-infective medicine, oncology, and women’s health Provides sample size calculations for dose response studies, microarray studies, and Bayesian approaches This new edition is updated throughout, includes many new sections, and five new chapters on emerging topics: two stage seamless adaptive designs, cluster randomized trial design, zero-inflated Poisson distribution, clinical trials with extremely low incidence rates, and clinical trial simulation.
medicine, the central nervous system, anti-infective medicine, oncology, and women’s health. Provides sample size calculations for dose response studies, microarray studies, and Bayesian approaches. This new edition is updated throughout, includes many new sections, and five new chapters on emerging topics: two stage seamless adaptive designs, cluster randomized trial design, zero-inflated Poisson distribution, clinical trials with extremely low incidence rates, and clinical trial simulation.

**Design and Analysis of Cluster Randomization Trials in Health Research**-Allan Donner 2010-05-17 A cluster randomization trial is one in which intact social units, or clusters of individuals, are randomized to different intervention groups. Trials randomizing clusters have become particularly widespread in the evaluation of non-therapeutic interventions, including lifestyle modification, educational programmes and innovations in the provision of health care. The increasing popularity of this design among health researchers over the past two decades has led to an extensive body of methodology on the subject. This is the first book to present a systematic and united treatment of this topic; it contains distinctive chapters on the history of cluster randomized trials, ethical issues and reporting guidelines.

**A Practical Guide to Cluster Randomised Trials in Health Services Research**-Sandra Eldridge 2012-02-20 Cluster randomised trials are trials in which groups (or clusters) of individuals are randomly allocated to different forms of treatment. In health care, these trials often compare different ways of managing a disease or promoting healthy living, in contrast to conventional randomised trials which randomise individuals to different treatments, classically comparing new drugs with a placebo. They are increasingly common in health services research. This book addresses the statistical, practical, and ethical issues arising from allocating groups of individuals, or clusters, to different interventions. Key features: Guides readers through the stages of conducting a trial, from recruitment to reporting. Presents a wide range of examples with particular emphasis on trials in health services research and primary care, with both principles and techniques explained. Topics are specifically presented in the order in which investigators think about issues when they are designing a trial.

Combines information on the latest developments in the field together with a practical guide to the design and implementation of cluster randomised trials. Explains principles and techniques through numerous examples including many from the authors own experience. Includes a wide range of references for those who wish to read further. This book is intended as a practical guide, written for researchers from the health professions including doctors, psychologists, and allied health professionals, as well as statisticians involved in the design, execution, analysis and reporting of cluster randomised trials. Those with a more general interest will find the plentiful examples illuminating.

**Power Analysis of Trials with Multilevel Data**-Mirjam Moerbeek 2015-07-01 Power Analysis of Trials with Multilevel Data covers using power and sample size calculations to design trials that involve nested data structures. The book gives a thorough overview of power analysis that details terminology and notation, outlines key concepts of statistical power and power analysis, and explains why they are necessary in trial de

**A Comparison of Sample Size Calculations for Cluster Randomized Crossover Trials with a Binary Outcome**-Erin Case 2014 A simplified sample size calculation for a cluster randomized crossover trial with a binary survival outcome (the "T-BOSS" method) was compared to the closed form equation and simulation methods currently available from Connolly, et. al. (2013, Canadian Journal of Cardiology, 29, p.652) and Reich, et. al. (2012, PLoS ONE, 7(4), p.E35564), respectively. When there was no period effect present, the T-BOSS method was consistently conservative with a sample size that is 11.4%, 14.8%, and 37.8% larger than the closed form sample size for intracluster correlations of 0.01, 0.04, and 0.20, respectively. When there was a period effect present, T-BOSS was nearly always anti-conservative unless the period effect was small or the average cluster size was very small (less than 20 patients at most for the settings we explored). The simulations were fairly close to the closed form equation, though showed more variability.
Sample Sizes for Clinical Trials - Steven A. Julious 2009-08-26 Drawing on various real-world applications, Sample Sizes for Clinical Trials takes readers through the process of calculating sample sizes for many types of clinical trials. It provides descriptions of the calculations with a practical emphasis. Focusing on normal, binary, ordinal, and survival data, the book explores a range of trials, including superiority, equivalence, non-inferiority, bioequivalence, and precision for both parallel group and crossover designs. The author discusses how trial objectives impact the study design with respect to the derivation of formulae for sample size calculations. He uses real-life studies throughout to show how the concepts and calculations can be employed. This work underscores the importance of sample size calculation in the design of a clinical trial. With useful calculation tables throughout, it enables readers to quickly find an appropriate formula, formula application, and associated worked example. Watch the author speak about this book at JSM 2012 in San Diego.

Sample Size Tables for Clinical Studies - David Machin 2011-08-26 This book provides statisticians and researchers with the statistical tools - equations, formulae and numerical tables - to design and plan clinical studies and carry out accurate, reliable and reproducible analysis of the data so obtained. There is no way around this as incorrect procedure in clinical studies means that the researcher's paper will not be accepted by a peer-reviewed journal. Planning and analysing clinical studies is a very complicated business and this book provides indispensable factual information. Please go to http://booksupport.wiley.com and enter 9781405146500 to easily download the supporting materials.

Methods and Applications of Sample Size Calculation and Recalculation in Clinical Trials - Meinhard Kieser 2020 This book provides an extensive overview of the principles and methods of sample size calculation and recalculation in clinical trials. Appropriate calculation of the required sample size is crucial for the success of clinical trials. At the same time, a sample size that is too small or too large is problematic due to ethical, scientific, and economic reasons. Therefore, state-of-the art methods are required when planning clinical trials. Part I describes a general framework for deriving sample size calculation procedures. This enables an understanding of the common principles underlying the numerous methods presented in the following chapters. Part II addresses the fixed sample size design, where the required sample size is determined in the planning stage and is not changed afterwards. It covers sample size calculation methods for superiority, non-inferiority, and equivalence trials, as well as comparisons between two and more than two groups. A wide range of further topics is discussed, including sample size calculation for multiple comparisons, safety assessment, and multi-regional trials. There is often some uncertainty about the assumptions to be made when calculating the sample size upfront. Part III presents methods that allow to modify the initially specified sample size based on new information that becomes available during the ongoing trial. Blinded sample size recalculation procedures for internal pilot study designs are considered, as well as methods for sample size reassessment in adaptive designs that use unblinded data from interim analyses. The application is illustrated using numerous clinical trial examples, and software code implementing the methods is provided. The book offers theoretical background and practical advice for biostatisticians and clinicians from the pharmaceutical industry and academia who are involved in clinical trials. Covering basic as well as more advanced and recently developed methods, it is suitable for beginners, experienced applied statisticians, and practitioners. To gain maximum benefit, readers should be familiar with introductory statistics. The content of this book has been successfully used for courses on the topic.

Adequacy of Sample Size in Health Studies - Stanley Lemeshow 1990-01-14 Practical rather than theoretical, it provides epidemiologists and other health workers with a good basic knowledge of sampling principles and methods and their potential in the medical field. Focusing on the determination of adequate sample sizes under different situations, the book is divided into two parts; the first provides solutions to typical problems of various survey and study designs, and the second offers a clear, concise exposition of the theory behind the processes of determining sample size. Features many reference tables.

Field Trials of Health Interventions - Richard H. Morrow 2015-06-11
Before new interventions can be used in disease control programmes, it is essential that they are carefully evaluated in "field trials", which may be complex and expensive undertakings. Descriptions of the detailed procedures and methods used in trials that have been conducted in the past have generally not been published. As a consequence, those planning such trials have few guidelines available and little access to previously accumulated knowledge. In this book the practical issues of trial design and conduct are discussed fully and in sufficient detail for the text to be used as a "toolbox" by field investigators. The toolbox has now been extensively tested through use of the first two editions and this third edition is a comprehensive revision, incorporating the many developments that have taken place with respect to trials since 1996 and involving more than 30 contributors. Most of the chapters have been extensively revised and 7 new chapters have been added.

**Clinical Trials** - Duolao Wang 2006
This book aims to demystify clinical trials. It is divided into five sections: fundamentals of trial design, alternative trial designs, basics of statistical analysis, special trial issues in data analysis, and reporting of trials. Using simple language the book explains with illustrations of numerous trial examples, the conceptual and methodological issues that occur at all stages of clinical trial covering trial design, conduct, analysis and reporting. The book is an educational and approachable reference in a difficult area of medicine where clinicians often feel uncertain and this material helps them review, appraise and publish trials and clinical evidence.

**Design and Analysis of Group-randomized Trials** - David M. Murray 1998
This text provides the most comprehensive treatment of the design and analytic issues involved in group-randomized trials. GRTs are comparative studies conducted to evaluate the effect of a health promotion intervention in which the units of assignment are identifiable groups (e.g., schools, worksites) and the units of observation are members of those groups (e.g., students, workers). The book reviews the underlying issues, the most widely used research designs, and analytic strategies. There is an emphasis on mixed-model regression, with two chapters illustrating the analytic methods in SAS PROC MIXED and GLIMMIX. There is also a detailed chapter on power analysis and sample size calculation.

A complete guide to understanding cluster randomised trials
Written by two researchers with extensive experience in the field, this book presents a complete guide to the design, analysis and reporting of cluster randomised trials. It spans a wide range of applications: trials in developing countries, trials in primary care, trials in the health services. A key feature is the use of R code and code from other popular packages to plan and analyse cluster trials, using data from actual trials. The book contains clear technical descriptions of the models used, and considers in detail the ethics involved in such trials and the problems in planning them. For readers and students who do not intend to run a trial but wish to be a critical reader of the literature, there are sections on the CONSORT statement, and exercises in reading published trials. Written in a clear, accessible style Features real examples taken from the authors' extensive practitioner experience of designing and analysing clinical trials
Demonstrates the use of R, Stata and SPSS for statistical analysis
Includes computer code so the reader can replicate all the analyses
Discusses neglected areas such as ethics and practical issues in running cluster randomised trials
How to Design, Analyse and Report Cluster Randomised Trials in Medicine and Health Related Research provides an excellent reference tool and can be read with profit by statisticians, health services researchers, systematic reviewers and critical readers of cluster randomised trials.

**Encyclopedia of Survey Research Methods** - Paul J. Lavrakas 2008-09-12
In conjunction with top survey researchers around the world and with Nielsen Media Research serving as the corporate sponsor, the Encyclopedia of Survey Research Methods presents state-of-the-art information and methodological examples from the field of survey research. Although there are other "how-to" guides and references texts on survey research, none is as comprehensive as this Encyclopedia, and none presents the material in such a focused and approachable manner. With more than 600 entries, this resource uses a Total Survey Error perspective that considers all aspects of
possible survey error from a cost-benefit standpoint.

**Sample-Size Determination in Quantitative Social Work Research**
Patrick Dattalo 2008-01-11

A researcher's decision about the sample to draw in a study may have an enormous impact on the results, and it rests on numerous statistical and practical considerations that can be difficult to juggle. Computer programs help, but no single software package exists that allows researchers to determine sample size across all statistical procedures. This pocket guide shows social work students, educators, and researchers how to prevent some of the mistakes that would result from a wrong sample size decision by describing and critiquing four main approaches to determining sample size. In concise, example-rich chapters, Dattalo covers sample-size determination using power analysis, confidence intervals, computer-intensive strategies, and ethical or cost considerations, as well as techniques for advanced and emerging statistical strategies such as structural equation modeling, multilevel analysis, repeated measures MANOVA and repeated measures ANOVA. He also offers strategies for mitigating pressures to increase sample size when doing so may not be feasible. Whether as an introduction to the process for students or as a refresher for experienced researchers, this practical guide is a perfect overview of a crucial but often overlooked step in empirical social work research.

**Cluster Randomised Trials**
Richard J. Hayes 2017-07-06

Cluster Randomised Trials, Second Edition discusses the design, conduct, and analysis of trials that randomise groups of individuals to different treatments. It explores the advantages of cluster randomisation, with special attention given to evaluating the effects of interventions against infectious diseases. Avoiding unnecessary mathematical detail, the book covers basic concepts underlying the use of cluster randomisation, such as direct, indirect, and total effects. In the time since the publication of the first edition, the use of cluster randomised trials (CRTs) has increased substantially, which is reflected in the updates to this edition. There are greatly expanded sections on randomisation, sample size estimation, and alternative designs, including new material on stepped wedge designs. There is a new section on handling ordinal outcome data, and an appendix with descriptions and/or generating code of the example data sets. Although the book mainly focuses on medical and public health applications, it shows that the rigorous evidence of intervention effects provided by CRTs has the potential to inform public policy in a wide range of other areas. The book encourages readers to apply the methods to their own trials, reproduce the analyses presented, and explore alternative approaches.

**Statistical Analysis of Microbiome Data with R**
Yinglin Xia 2018-10-06

This unique book addresses the statistical modelling and analysis of microbiome data using cutting-edge R software. It includes real-world data from the authors’ research and from the public domain, and discusses the implementation of R for data analysis step by step. The data and R computer programs are publicly available, allowing readers to replicate the model development and data analysis presented in each chapter, so that these new methods can be readily applied in their own research. The book also discusses recent developments in statistical modelling and data analysis in microbiome research, as well as the latest advances in next-generation sequencing and big data in methodological development and applications. This timely book will greatly benefit all readers involved in microbiome, ecology and microarray data analyses, as well as other fields of research.

**Longitudinal Data Analysis**
Donald Hedeker 2006-05-12

Longitudinal data analysis for biomedical and behavioral sciences This innovative book sets forth and describes methods for the analysis of longitudinal data, emphasizing applications to problems in the biomedical and behavioral sciences. Reflecting the growing importance and use of longitudinal data across many areas of research, the text is designed to help users of statistics better analyze and understand this type of data. Much of the material from the book grew out of a course taught by Dr. Hedeker on longitudinal data analysis. The material is, therefore, thoroughly classroom tested and includes a number of features designed to help readers better understand and apply the material. Statistical procedures featured within the text include: * Repeated measures analysis of variance * Multivariate analysis of variance for repeated measures * Random-effects regression models (RRM) * Covariance-pattern models * Generalized-estimating equations (GEE) models * Generalizations of RRM and GEE for categorical
outcomes. Practical in their approach, the authors emphasize the applications of the methods, using real-world examples for illustration. Some syntax examples are provided, although the authors do not generally focus on software in this book. Several datasets and computer syntax examples are posted on this title's companion Web site. The authors intend to keep the syntax examples current as new versions of the software programs emerge. This text is designed for both undergraduate and graduate courses in longitudinal data analysis. Instructors can take advantage of overheads and additional course materials available online for adopters. Applied statisticians in biomedicine and the social sciences can also use the book as a convenient reference.

Oxford Handbook of Medical Statistics-Janet L. Peacock 2020-06-11 A good understanding of medical statistics is essential to evaluate medical research and to choose appropriate ways of implementing findings in clinical practice. The Oxford Handbook of Medical Statistics has been written to provide doctors and medical students with a comprehensive yet concise account of this often difficult subject. Described by readers as a 'statistical Bible', this new edition maintains the accessibility and thoroughness of the original, and includes comprehensive updates including new sections on transitional medicine, cluster designs, and modern statistical packages. The Handbook promotes understanding and interpretation of statistical methods across a wide range of topics, from study design and sample size considerations, through t- and chi-squared tests, to complex multifactorial analyses, all using examples from published research. References and further reading are included, to allow deeper understanding on specific topics. Featuring a new chapter on how to use this book in different medical contexts, the Oxford Handbook of Medical Statistics helps readers to conduct their own research and critically appraise others' work.

Fundamentals of Clinical Trials-Lawrence M. Friedman 2010-09-09 The clinical trial is “the most definitive tool for evaluation of the applicability of clinical research.” It represents “a key research activity with the potential to improve the quality of health care and control costs through careful comparison of alternative treatments” [1]. It has been called on many occasions, “the gold standard” against which all other clinical research is measured. Although many clinical trials are of high quality, a careful reader of the medical literature will notice that a large number have deficiencies in design, conduct, analysis, presentation, and/or interpretation of results. Improvements have occurred over the past few decades, but too many trials are still conducted without adequate attention to its fundamental principles. Certainly, numerous studies could have been upgraded if the authors had had a better understanding of the fundamentals. Since the publication of the first edition of this book, a large number of other texts on clinical trials have appeared, most of which are indicated here [2–21]. Several of them, however, discuss only specific issues involved in clinical trials. Additionally, many are no longer current. The purpose of this fourth edition is to update areas in which major progress has been made since the publication of the third edition. We have revised most chapters considerably and added one on ethical issues.

Statistical Modeling and Analysis for Complex Data Problems-Pierre Duchesne 2005-12-05 This book reviews some of today’s more complex problems, and reflects some of the important research directions in the field. Twenty-nine authors – largely from Montreal’s GERAD Multi-University Research Center and who work in areas of theoretical statistics, applied statistics, probability theory, and stochastic processes – present survey chapters on various theoretical and applied problems of importance and interest to researchers and students across a number of academic domains.

Encyclopedia of Biopharmaceutical Statistics - Four Volume Set - Shein-Chung Chow 2018-09-03 Since the publication of the first edition in 2000, there has been an explosive growth of literature in biopharmaceutical research and development of new medicines. This encyclopedia (1) provides a comprehensive and unified presentation of designs and analyses used at different stages of the drug development process, (2) gives a well-balanced summary of current regulatory requirements, and (3) describes recently developed statistical methods in the pharmaceutical sciences. Features of the Fourth Edition: 1. 78 new and revised entries have been added for a total of 308 chapters and a fourth volume has been added to encompass the increased number of chapters. 2. Revised and updated entries reflect changes and recent developments in regulatory requirements for the drug review/approval process and statistical designs and methodologies. 3. Additional topics include multiple-stage adaptive trial design in clinical research, translational medicine, design and analysis of biosimilar drug development, big data analytics, and real world evidence for clinical research and development. 4. A table of contents organized by stages of biopharmaceutical development provides easy access to relevant topics. About the Editor: Shein-Chung Chow, Ph.D. is currently an Associate Director, Office of Biostatistics, U.S. Food and Drug Administration (FDA). Dr. Chow is an Adjunct Professor at Duke University School of Medicine, as well as Adjunct Professor at Duke-NUS, Singapore and North Carolina State University. Dr. Chow is the Editor-in-Chief of the Journal of Biopharmaceutical Statistics and the Chapman & Hall/CRC Biostatistics Book Series and the author of 28 books and over 300 methodology papers. He was elected Fellow of the American Statistical Association in 1995.

Textbook of Clinical Trials in Oncology - Susan Halabi 2019-04-24 There is an increasing need for educational resources for statisticians and investigators. Reflecting this, the goal of this book is to provide readers with a sound foundation in the statistical design, conduct, and analysis of clinical trials. Furthermore, it is intended as a guide for statisticians and investigators with minimal clinical trial experience who are interested in pursuing a career in this area. The advancement in genetic and molecular technologies have revolutionized drug development. In recent years, clinical trials have become increasingly sophisticated as they incorporate genomic studies, and efficient designs (such as basket and umbrella trials) have permeated the field. This book offers the requisite background and expert guidance for the innovative statistical design and analysis of clinical trials in oncology. Key Features: Cutting-edge topics with appropriate technical background Built around case studies which give the work a "hands-on" approach Real examples of flaws in previously reported clinical trials and how to avoid them Access to statistical code on the book's website Chapters written by internationally recognized statisticians from academia and pharmaceutical companies Carefully edited to ensure consistency in style, level, and approach Topics covered include innovating phase I and II designs, trials in immune-oncology and rare diseases, among many others

Sample Size Calculations (Study Design Based) Using PS Software and Sampling Selection (Penerbit USM) - Wan Muhamad Amir W Ahmad 2019-08-09 What is the minimum sample size required in my study? How do we select a sample? This book was prepared based on the basic and important questions which are commonly voice out by the undergraduate or postgraduate students and research officers. With the best solution, this book will help them in managing their dilemma in determining the accurate sample size and selection sampling method before commencing any applied research. Sample size determination for each study design is discussed in a simple yet compact way by using a free and readily downloaded software, Power and Sample software. Suitable to those who want a quick revision, this book is the best help among all as it is also comes with example of studies. Sampling methods and summary of data analysis are also being included to fulfill the purpose in conducting the research. The best part of this book is it provides interesting illustrated presentation in some chapters that made this handy book more irresistible to read.
Sample Size Determination in Health Studies - S. Kaggwa Lwanga 1991

Regression Methods in Biostatistics - Eric Vittinghoff 2012-03-06 This new book provides a unified, in-depth, readable introduction to the multipredictor regression methods most widely used in biostatistics: linear models for continuous outcomes, logistic models for binary outcomes, the Cox model for right-censored survival times, repeated-measures models for longitudinal and hierarchical outcomes, and generalized linear models for counts and other outcomes. Treating these topics together takes advantage of all they have in common. The authors point out the many-shared elements in the methods they present for selecting, estimating, checking, and interpreting each of these models. They also show that these regression methods deal with confounding, mediation, and interaction of causal effects in essentially the same way. The examples, analyzed using Stata, are drawn from the biomedical context but generalize to other areas of application. While a first course in statistics is assumed, a chapter reviewing basic statistical methods is included. Some advanced topics are covered but the presentation remains intuitive. A brief introduction to regression analysis of complex surveys and notes for further reading are provided.

Medical Statistics - Filomena Pereira-Maxwell 2018-05-15 This invaluable, jargon-free guide to essential medical terminology in an accessible A-Z format is ideal for medical, allied health and biomedical science students and researchers, clinicians and health care practitioners. Avoiding the complex language that is so often a feature of statistics and research methodology, this text provides clear and succinct explanations, clarifying meaning and showing the interdependencies between important concepts. This edition includes enhanced explanations of statistical concepts and methods—including more illustrative content—for greater accessibility. The book makes frequent use of examples from the medical literature, with reference to landmark studies, ensuring clinical relevance. It remains an ideal aid to accompany the reading and critical appraisal of medical and health care literature, now widely recognized to be a practical lifelong skill required by all health professionals throughout undergraduate and postgraduate studies and during clinical practice.

A Concise Guide to Market Research - Marko Sarstedt 2014-07-29 This accessible, practice-oriented and compact text provides a hands-on introduction to market research. Using the market research process as a framework, it explains how to collect and describe data and presents the most important and frequently used quantitative analysis techniques, such as ANOVA, regression analysis, factor analysis and cluster analysis. The book describes the theoretical choices a market researcher has to make with regard to each technique, discusses how these are converted into actions in IBM SPSS version 22 and how to interpret the output. Each chapter concludes with a case study that illustrates the process using real-world data. A comprehensive Web appendix includes additional analysis techniques, datasets, video files and case studies. Tags in the text allow readers to quickly access Web content with their mobile device. The new edition features: Stronger emphasis on the gathering and analysis of secondary data (e.g., internet and social networking data) New material on data description (e.g., outlier detection and missing value analysis) Improved use of educational elements such as learning objectives, keywords, self-assessment tests, case studies, and much more Streamlined and simplified coverage of the data analysis techniques with more rules-of-thumb Uses IBM SPSS version 22

The SAGE Handbook of Multilevel Modeling - Marc A. Scott 2013-08-31 In this important new Handbook, the editors have gathered together a range of leading contributors to introduce the theory and practice of multilevel modeling. The Handbook establishes the connections in multilevel modeling, bringing together leading experts from around the world to provide a roadmap for applied researchers linking theory and practice, as well as a unique arsenal of state-of-the-art tools. It forges vital connections that cross traditional disciplinary divides and introduces best practice in the field. Part I establishes the framework for estimation and inference, including chapters dedicated to notation, model selection, fixed and random effects, and causal inference. Part II develops variations and extensions, such as nonlinear, semiparametric and latent class models. Part III includes discussion of missing data and robust methods, assessment of fit and software. Part IV consists of exemplary modeling and data analyses written
by methodologists working in specific disciplines. Combining practical pieces with overviews of the field, this Handbook is essential reading for any student or researcher looking to apply multilevel techniques in their own research.

Sample Sizes for Clinical, Laboratory and Epidemiology Studies - David Machin 2018-05-29 An authoritative resource that offers the statistical tools and software needed to design and plan valid clinical studies. Now in its fourth and extended edition, Sample Sizes for Clinical, Laboratory and Epidemiology Studies include the sample size software (SSS) and formulae and numerical tables needed to design valid clinical studies. The text covers clinical as well as laboratory and epidemiology studies and contains the information needed to ensure a study will form a valid contribution to medical research. The authors, noted experts in the field, explain step by step and explore the wide range of considerations necessary to assist investigational teams when deriving an appropriate sample size for their planned study. The book contains sets of sample size tables with companion explanations and clear worked out examples based on real data. In addition, the text offers bibliography and references sections that are designed to be helpful with guidance on the principles discussed. This revised fourth edition: Offers the only text available to include sample size software for use in designing and planning clinical studies. Presents new and extended chapters with many additional and refreshed examples. Includes clear explanations of the principles and methodologies involved with relevant practical examples. Makes clear a complex but vital topic that is designed to ensure valid methodology and publishable results. Contains guidance from an internationally recognised team of medical statistics experts. Written for medical researchers from all specialities and medical statisticians, Sample Sizes for Clinical, Laboratory and Epidemiology Studies offers an updated fourth edition of the important guide for designing and planning reliable and evidence-based clinical studies.

Quantitative Methods for Health Research - Bruce 2017-12-06 A practical introduction to epidemiology, biostatistics, and research methodology for the whole health care community. This comprehensive text, which has been extensively revised with new material and additional topics, utilizes a practical slant to introduce health professionals and students to epidemiology, biostatistics, and research methodology. It draws examples from a wide range of topics, covering all of the main contemporary health research methods, including survival analysis, Cox regression, and systematic reviews and meta-analysis—the explanation of which go beyond introductory concepts. This second edition of Quantitative Methods for Health Research: A Practical Interactive Guide to Epidemiology and Statistics also helps develop critical skills that will prepare students to move on to more advanced and specialized methods. A clear distinction is made between knowledge and concepts that all students should ensure they understand, and those that can be pursued further by those who wish to do so. Self-assessment exercises throughout the text help students explore and reflect on their understanding. A program of practical exercises in SPSS (using a prepared data set) helps to consolidate the theory and develop skills and confidence in data handling, analysis, and interpretation. Highlights of the book include: Combining epidemiology and biostatistics to demonstrate the relevance and strength of statistical methods. Emphasis on the interpretation of statistics using examples from a variety of public health and health care situations to stress relevance and application. Use of concepts related to examples of published research to show the application of methods and balance between ideals and the realities of research in practice. Integration of practical data analysis exercises to develop skills and confidence. Supplementation by a student companion website which provides guidance on data handling in SPSS and study data sets as referred to in the text. Quantitative Methods for Health Research, Second Edition is a practical learning resource for students, practitioners and researchers in public health, health care and related disciplines, providing both a course book and a useful introductory reference.

An Introduction to Medical Statistics - Martin Bland 1999-06-01

Human Variation - C.G. Nicholas Mascie-Taylor 2010-03-17 The transition in anthropological and biomedical research methods over the past 50 years, from anthropometric and craniometric measurements to large-scale microarray genetic studies has resulted in continued revision of opinions and ideas relating to the factors and forces that drive human variation. Human Variation: From the Laboratory to the Field brings together the contributions of 22 scientists working in four continents to identify and address challenges imposed by variability. It reviews the way we examine and analyze human variation, paying specific attention to genetics, growth and development, and physiology. In presenting new evidence and findings, it also discusses current developments in methodology and analytical techniques, detailing both field and laboratory approaches, and looking at how the two perspectives complement each other. In bridging that gap between laboratory trials and studies of the human in context, this book covers a number of interesting research areas including — Human adaptation to natural and artificial light, including variations in circadian photosensitivity and effects of light on GI activity Cold tolerance and lifestyle in modern society Genetics of body weight and obesity Human adaptability to emotional and intellectual mental stresses Geography, migration, climate, and environmental plasticity as contributors to human variation Impact of natural environmental stressors including pollution on physiological and morphological processes This book is the latest volume in a series of works from the Society for the Study of Human Biology (SSHB), which for half a century has advanced and promoted research in the biology of human populations in all of its branches including human viability, genetics, human adaptability, and ecology, and evolution. It holds two scientific meetings a year. This volume represents work presented during its most recent gathering.