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The Statistical Analysis of Interval-censored Failure Time Data Elsevier

This is a book about regression analysis, that is, the situation in statistics where the distribution of a response (or outcome) variable is related to - planatory variables (or covariates). This is an extremely common situation in the application of statistical methods in many ?elds, andlinear regression,- gistic regression, and Cox proportional hazards regression are frequently used for quantitative, binary, and survival time outcome variables, respectively. Several books on these topics have appeared and for that reason one may well ask why we embark on writing still another book on regression. We have two main reasons for doing this: 1. First, we want to highlight similarities among linear, logistic, proportional hazards, and other regression models that include a linear predictor. These models are often treated entirely separately in texts in spite of the fact that all operations on the models dealing with the linear predictor are precisely the same, including handling of categorical and quantitative covariates, testing for linearity and studying interactions. 2. Second, we want to emphasize that, for any type of outcome variable, multiple regression models are composed of simple building blocks that are added together in the linear predictor: that is, t-tests, one-way analyses of variance and simple linear regressions for quantitative outcomes, 2×2 , $2 \times (k+1)$ tables and simple logistic regressions for binary outcomes, and 2- and $(k+1)$ -sample logrank tests and simple Cox regressions for survival data. This has two consequences. All these simple and well-known methods can be considered as special cases of the regression models. On the other hand, the effect of a single explanatory variable in a multiple regression model can be interpreted in a way similar to that obtained in the simple analysis, however, now valid only for the other explanatory variables in the model "held ?xed".

Biopharmaceutical Applied Statistics Symposium Statistical Models Based on Counting Processes

This book collects and unifies statistical models and methods that have been proposed for analyzing interval-censored failure time data. It provides the first comprehensive coverage of the topic of interval-censored data and complements the books on right-censored data. The focus of the book is on nonparametric and semiparametric inferences, but it also describes parametric and imputation approaches. This book provides an up-to-date reference for people who are conducting research on the analysis of interval-censored failure time data as well as for those who need to analyze interval-censored data to answer substantive questions.

Statistical Models World Scientific

Modern survival analysis and more general event history analysis may be effectively handled within the mathematical framework of counting processes. This book presents this theory, which has been the subject of intense research activity over the past 15 years. The exposition of the theory is integrated with careful presentation of many practical examples, drawn almost exclusively from the authors' own experience, with detailed numerical and graphical illustrations. Although **Statistical Models Based on Counting Processes** may be viewed as a research monograph for mathematical statisticians and biostatisticians, almost all the methods are given in concrete detail for use in practice by other mathematically oriented researchers studying event histories (demographers, econometricians, epidemiologists, actuarial mathematicians, reliability engineers and biologists). Much of the material has so far only been available in the journal literature (if at all), and so a wide variety of researchers will find this an invaluable survey of the subject.

Probability and Statistical Models with Applications John Wiley & Sons

David A. Freedman presents a definitive synthesis of his approach to statistical modeling and causal inference in the social sciences.

Oxford University Press

Contains additional discussion and examples on left truncation as well as material on more general censoring and truncation patterns. Introduces the martingale and counting process formulation which will be in a new chapter. Develops multivariate failure time data in a separate chapter and extends the material on Markov and semi Markov formulations. Presents new examples and applications of data analysis.

Statistical Analysis of Counting Processes John Wiley & Sons

This book presents research work into the reliability of drinking water pipes. The infrastructure of water pipes is susceptible to routine failures, namely leakage or breakage, which occur in an aggregative manner in pipeline networks. Creating strategies for infrastructure asset management requires accurate modeling tools and first-hand experience of what repeated failures can mean in terms of socio-economic and environmental consequences. Devoted to the counting process framework when dealing with this issue, the author presents preliminary basic concepts, particularly the process intensity, as well as basic tools (classical distributions and processes). The introductory material precedes the discussion of several constructs, namely the non-homogeneous birth process, and further as a special case, the linearly extended Yule process (LEYP), and its adaptation to account for selective survival. The practical usefulness of the theoretical results is illustrated with actual water pipe failure data.

Counting Processes and Survival Analysis John Wiley & Sons

Statistical Models and Methods for Reliability and Survival Analysis brings together contributions by specialists in statistical theory as they discuss their applications providing up-to-date developments in methods used in survival analysis, statistical goodness of fit, stochastic processes for system reliability, amongst others. Many of these are related to the work of Professor M. Nikulin in statistics over the past 30 years. The authors gather together various contributions with a broad array of techniques and results, divided into three parts - **Statistical Models and Methods**, **Statistical Models and Methods in Survival Analysis**, and **Reliability and Maintenance**. The book is intended for researchers interested in statistical methodology and models useful in survival analysis, system reliability and statistical testing for censored and non-censored data.

Statistical Models Based on Counting Processes John Wiley & Sons

Praise for the First Edition "An indispensable addition to any serious collection on lifetime data

analysis and . . . a valuable contribution to the statistical literature. Highly recommended . . ." -

Choice "This is an important book, which will appeal to statisticians working on survival analysis problems." - *Biometrics* "A thorough, unified treatment of statistical models and methods used in the analysis of lifetime data . . . this is a highly competent and agreeable statistical textbook." - *Statistics in Medicine* The statistical analysis of lifetime or response time data is a key tool in engineering, medicine, and many other scientific and technological areas. This book provides a unified treatment of the models and statistical methods used to analyze lifetime data. Equally useful as a reference for individuals interested in the analysis of lifetime data and as a text for advanced students, **Statistical Models and Methods for Lifetime Data, Second Edition** provides broad coverage of the area without concentrating on any single field of application. Extensive illustrations and examples drawn from engineering and the biomedical sciences provide readers with a clear understanding of key concepts. New and expanded coverage in this edition includes: * Observation schemes for lifetime data * Multiple failure modes * Counting process-martingale tools * Both special lifetime data and general optimization software * Mixture models * Treatment of interval-censored and truncated data * Multivariate lifetimes and event history models * Resampling and simulation methodology

A Dialogue with the Social Sciences CRC Press

The Wiley-Interscience Paperback Series consists of selected books that have been made more accessible to consumers in an effort to increase global appeal and general circulation. With these new unabridged softcover volumes, Wiley hopes to extend the lives of these works by making them available to future generations of statisticians, mathematicians, and scientists. "The book is a valuable completion of the literature in this field. It is written in an ambitious mathematical style and can be recommended to statisticians as well as biostatisticians." - *Biometrische Zeitschrift* "Not many books manage to combine convincingly topics from probability theory over mathematical statistics to applied statistics. This is one of them. The book has other strong points to recommend it: it is written with meticulous care, in a lucid style, general results being illustrated by examples from statistical theory and practice, and a bunch of exercises serve to further elucidate and elaborate on the text." - *Mathematical Reviews* "This book gives a thorough introduction to martingale and counting process methods in survival analysis thereby filling a gap in the literature." - *Zentralblatt für Mathematik und ihre Grenzgebiete/Mathematics Abstracts* "The authors have performed a valuable service to researchers in providing this material in [a] self-contained and accessible form. . . This text [is] essential reading for the probabilist or mathematical statistician working in the area of survival analysis." - *Short Book Reviews, International Statistical Institute Counting Processes and Survival Analysis* explores the martingale approach to the statistical analysis of counting processes, with an emphasis on the application of those methods to censored failure time data. This approach has proven remarkably successful in yielding results about statistical methods for many problems arising in censored data. A thorough treatment of the calculus of martingales as well as the most important applications of these methods to censored data is offered. Additionally, the book examines classical problems in asymptotic distribution theory for counting process methods and newer methods for graphical analysis and diagnostics of censored data. Exercises are included to provide practice in applying martingale methods and insight into the calculus itself.

Handbook of Statistical Modeling for the Social and Behavioral Sciences Springer Science & Business Media

This volume, representing a compilation of authoritative reviews on a multitude of uses of statistics in epidemiology and medical statistics written by internationally renowned experts, is addressed to statisticians working in biomedical and epidemiological fields who use statistical and quantitative methods in their work. While the use of statistics in these fields has a long and rich history, explosive growth of science in general and clinical and epidemiological sciences in particular have gone through a sea of change, spawning the development of new methods and innovative adaptations of standard methods. Since the literature is highly scattered, the Editors have undertaken this humble exercise to document a representative collection of topics of broad interest to diverse users. The volume spans a cross section of standard topics oriented toward users in the current evolving field, as well as special topics in much need which have more recent origins. This volume was prepared especially keeping the applied statisticians in mind, emphasizing applications-oriented methods and techniques, including references to appropriate software when relevant. · Contributors are internationally renowned experts in their respective areas · Addresses emerging statistical challenges in epidemiological, biomedical, and pharmaceutical research · Methods for assessing Biomarkers, analysis of competing risks · Clinical trials including sequential and group sequential, crossover designs, cluster randomized, and adaptive designs · Structural equations modelling and longitudinal data analysis

The Statistical Analysis of Failure Time Data Springer Science & Business Media

The book is aimed at applied statisticians, graduate students of statistics, and students and researchers with a strong interest in statistics and data analysis. This second edition is extensively revised, especially those sections relating with Bayesian concepts.

Statistical Models in Epidemiology John Wiley & Sons

This IMA Volume in Mathematics and its Applications **STATISTICAL MODELS IN EPIDEMIOLOGY, THE ENVIRONMENT, AND CLINICAL TRIALS** is a combined proceedings on "Design and Analysis of Clinical Trials" and "Statistics and Epidemiology: Environment and Health." This volume is the third series based on the proceedings of a very successful 1997 IMA Summer Program on "Statistics in the Health Sciences." I would like to thank the organizers: M. Elizabeth Halloran of Emory University (Biostatistics) and Donald A. Berry of Duke University (Institute of Statistics and Decision Sciences and Cancer Center Biostatistics) for their excellent work as organizers of the meeting and for editing the proceedings. I am grateful to Seymour Geisser of University of Minnesota (Statistics), Patricia Grambsch, University of Minnesota (Biostatistics); Joel Greenhouse, Carnegie Mellon University (Statistics); Nicholas Lange, Harvard Medical School (Brain Imaging Center, McLean Hospital); Barry Margolin, University of North Carolina-Chapel Hill (Biostatistics); Sandy Weisberg, University of Minnesota (Statistics); Scott Zeger, Johns Hopkins University (Biostatistics); and Marvin Zelen, Harvard School of Public Health (Biostatistics) for organizing the six weeks summer program. I also take this opportunity to thank the National Science Foundation (NSF) and the Army Research Office (ARO), whose financial support made the workshop possible. Willard Miller, Jr.

Basic Ideas and Selected Topics, Volumes I-II Package Cambridge University Press
Statistical Models Based on Counting Processes Springer Science & Business Media
Regression Analysis of Count Data CRC Press

The aim of this book is to bridge the gap between standard textbook models and a range of models where the dynamic structure of the data manifests itself fully. The common denominator of such models is stochastic processes. The authors show how counting processes, martingales, and stochastic integrals fit very nicely with censored data. Beginning with standard analyses such as Kaplan-Meier plots and Cox regression, the presentation progresses to the additive hazard model and recurrent event data. Stochastic processes are also used as natural models for individual frailty; they allow sensible interpretations of a number of surprising artifacts seen in population data. The stochastic process framework is naturally connected to causality. The authors show how dynamic path analyses can incorporate many modern causality ideas in a framework that takes the time aspect seriously. To make the material accessible to the reader, a large number of practical examples, mainly from medicine, are developed in detail. Stochastic processes are introduced in an intuitive and non-technical manner. The book is aimed at investigators who use event history methods and want a better understanding of the statistical concepts. It is suitable as a textbook for graduate courses in statistics and biostatistics.

Methods and Applications of Statistics in the Life and Health Sciences Cambridge University Press
 Volume I presents fundamental, classical statistical concepts at the doctorate level without using measure theory. It gives careful proofs of major results and explains how the theory sheds light on the properties of practical methods. Volume II covers a number of topics that are important in current measure theory and practice. It emphasizes nonparametric methods which can really only be implemented with modern computing power on large and complex data sets. In addition, the set includes a large number of problems with more difficult ones appearing with hints and partial solutions for the instructor.

Information Criteria and Statistical Modeling Springer Science & Business Media

There have been major developments in the field of statistics over the last quarter century, spurred by the rapid advances in computing and data-measurement technologies. These developments have revolutionized the field and have greatly influenced research directions in theory and methodology. Increased computing power has spawned entirely new areas of research in computationally-intensive methods, allowing us to move away from narrowly applicable parametric techniques based on restrictive assumptions to much more flexible and realistic models and methods. These computational advances have also led to the extensive use of simulation and Monte Carlo techniques in statistical inference. All of these developments have, in turn, stimulated new research in theoretical statistics. This volume provides an up-to-date overview of recent advances in statistical modeling and inference. Written by renowned researchers from across the world, it discusses

flexible models, semi-parametric methods and transformation models, nonparametric regression and mixture models, survival and reliability analysis, and re-sampling techniques. With its coverage of methodology and theory as well as applications, the book is an essential reference for researchers, graduate students, and practitioners.

Statistical Models and Causal Inference Springer Science & Business Media

This volume is the first book-length treatment of model-based geostatistics. The text is expository, emphasizing statistical methods and applications rather than the underlying mathematical theory. Analyses of datasets from a range of scientific contexts feature prominently, and simulations are used to illustrate theoretical results. Readers can reproduce most of the computational results in the book by using the authors' software package, geoR, whose usage is illustrated in a computation section at the end of each chapter. The book assumes a working knowledge of classical and Bayesian methods of inference, linear models, and generalized linear models.

Volume 1 Design of Clinical Trials CRC Press

The book is a selection of invited chapters, all of which deal with various aspects of mathematical and statistical models and methods in reliability. Written by renowned experts in the field of reliability, the contributions cover a wide range of applications, reflecting recent developments in areas such as survival analysis, aging, lifetime data analysis, artificial intelligence, medicine, carcinogenesis studies, nuclear power, financial modeling, aircraft engineering, quality control, and transportation. *Mathematical and Statistical Models and Methods in Reliability* is an excellent reference text for researchers and practitioners in applied probability and statistics, industrial statistics, engineering, medicine, finance, transportation, the oil and gas industry, and artificial intelligence.

Mathematical Statistics Springer Science & Business Media

Models and likelihood are the backbone of modern statistics. This 2003 book gives an integrated development of these topics that blends theory and practice, intended for advanced undergraduate and graduate students, researchers and practitioners. Its breadth is unrivaled, with sections on survival analysis, missing data, Markov chains, Markov random fields, point processes, graphical models, simulation and Markov chain Monte Carlo, estimating functions, asymptotic approximations, local likelihood and spline regressions as well as on more standard topics such as likelihood and linear and generalized linear models. Each chapter contains a wide range of problems and exercises. Practicals in the S language designed to build computing and data analysis skills, and a library of data sets to accompany the book, are available over the Web.

Statistical Models and Methods for Lifetime Data Herbert Utz Verlag

This self-contained account of the statistical basis of epidemiology has been written for those with a basic training in biology. No previous knowledge of the subject is assumed and mathematics is deliberately kept at a manageable level. Based on a highly successful course, this book explains the essential statistics for all epidemiologists.