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# Demographic Methods For The Statistical Office

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An Introductory Textbook

Demographic Forecasting

Population Aging, Mortality and Data Analysis

Mathematical Demography

Report on the United Nations European Seminar on Demographic Statistics, Ankara and Istanbul, 11-19, October 1971

Concepts, Methods and Practical Applications in Applied Demography

Statistical Methods and Applications from a Historical Perspective

Modeling Demographic Processes in Marked Populations

Analytical Theory of Biological Populations

Insights from a Statistical, Demographic and Epidemiological Perspective

Advanced Techniques of Population Analysis

Problems and Methods of Building a System of Demographic Statistics and Compiling the Required Data; Report on the United Nations

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*Demographic Methods For The  
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## **MYLA BISHOP**

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*An Introductory Textbook* Elsevier

This book provides an up-to-date overview of demographic analysis and methods, including recent developments in demography. Concepts and methods, from the nature of demographic information through data collection and the basics of statistical measures and on to demographic analysis itself are succinctly explained. Measures and analyses of fertility, mortality, life tables, migration and demographic events such as marriage, education and labour force are described while later chapters cover multiple decrement tables, population projections, the

importance of testing and smoothing demographic data, the stable population model and demographic software. An emphasis on practical aspects and the use of real-life examples based on data from around the globe make this book accessible, whilst comprehensive references and links to data and other resources on the internet help readers to explore further. The text is concise and well written, making it ideally suited to a wider audience from students to academics and teachers. Students of demography, geography, sociology, economics, as well as professionals, academics and students of marketing, human resource management, and public health who have an interest in population issues will all find this book useful.

*Demographic Forecasting* OUP Oxford

Late in a career of more than sixty years, Thomas Burch, an

internationally known social demographer, undertook a wide-ranging methodological critique of demography. This open access volume contains a selection of resulting papers, some previously unpublished, some published but not readily accessible [from past meetings of The International Union for the Scientific Study of Population and its research committees, or from other small conferences and seminars]. Rejecting the idea that demography is simply a branch of applied statistics, his work views it as an autonomous and complete scientific discipline. When viewed from the perspective of modern philosophy of science, specifically the semantic or model-based school, demography is a balanced discipline, with a rich body of techniques and data, but also with more and better theories than generally recognized. As demonstrated in this book, some demographic techniques can also be seen as theoretical models, and some substantive/behavioral models, commonly rejected as theory because of inconsistent observations, are now seen as valuable theoretical models, for example demographic transition theory. This book shows how demography can build a strong theoretical edifice on its broad and deep empirical foundation by adoption of the model-based approach to science. But the full-fruits of this approach will require demographers to make greater use of computer modeling [both macro- and micro-simulation], in the statement and manipulation of theoretical ideas, as well as for numerical computation. This book is open access under a CC BY license.

**Population Aging, Mortality and Data Analysis** Springer Nature

Provides a unique introduction to demographic problems in a

familiar language. Presents a unified statistical outlook on both classical methods of demography and recent developments. Exercises are included to facilitate its classroom use. Both authors have contributed extensively to statistical demography and served in advisory roles and as statistical consultants in the field.

Mathematical Demography Springer Science & Business Media  
Mathematical demography is the centerpiece of quantitative social science. The founding works of this field from Roman times to the late Twentieth Century are collected here, in a new edition of a classic work by David R. Smith and Nathan Keyfitz.

Commentaries by Smith and Keyfitz have been brought up to date and extended by Kenneth Wachter and Hervé Le Bras, giving a synoptic picture of the leading achievements in formal population studies. Like the original collection, this new edition constitutes an indispensable source for students and scientists alike, and illustrates the deep roots and continuing vitality of mathematical demography.

Report on the United Nations European Seminar on Demographic Statistics, Ankara and Istanbul, 11-19, October 1971 Princeton University Press

This open access book shows how to use sensitivity analysis in demography. It presents new methods for individuals, cohorts, and populations, with applications to humans, other animals, and plants. The analyses are based on matrix formulations of age-classified, stage-classified, and multistate population models. Methods are presented for linear and nonlinear, deterministic and stochastic, and time-invariant and time-varying cases. Readers will discover results on the sensitivity of statistics of longevity,

life disparity, occupancy times, the net reproductive rate, and statistics of Markov chain models in demography. They will also see applications of sensitivity analysis to population growth rates, stable population structures, reproductive value, equilibria under immigration and nonlinearity, and population cycles. Individual stochasticity is a theme throughout, with a focus that goes beyond expected values to include variances in demographic outcomes. The calculations are easily and accurately implemented in matrix-oriented programming languages such as Matlab or R. Sensitivity analysis will help readers create models to predict the effect of future changes, to evaluate policy effects, and to identify possible evolutionary responses to the environment. Complete with many examples of the application, the book will be of interest to researchers and graduate students in human demography and population biology. The material will also appeal to those in mathematical biology and applied mathematics.

Routledge

This open access book presents new developments in the field of demographic forecasting, covering both mortality, fertility and migration. For each component emerging methods to forecast them are presented. Moreover, instruments for forecasting evaluation are provided. Bayesian models, nonparametric models, cohort approaches, elicitation of expert opinion, evaluation of probabilistic forecasts are some of the topics covered in the book. In addition, the book is accompanied by complementary material on the web allowing readers to practice with some of the ideas exposed in the book. Readers are encouraged to use this material to apply the new methods to

their own data. The book is an important read for demographers, applied statisticians, as well as other social scientists interested or active in the field of population forecasting. Professional population forecasters in statistical agencies will find useful new ideas in various chapters.

*Concepts, Methods and Practical Applications in Applied Demography* Springer Science & Business Media

Information on future mortality trends is essential for population forecasts, public health policy, actuarial studies, and many other purposes. Realising the importance of such needs, this volume contains contributions to the theory and practice of forecasting mortality in the relatively favourable circumstances in developed countries of Western Europe. In this context techniques from mathematical statistics and econometrics can provide useful descriptions of past mortality. The naive forecast obtained by extrapolating a fitted model may give as good a forecast as any but forecasting by extrapolation requires careful justification since it assumes the prolongation of historical conditions. On the other hand, whilst it is generally accepted that scientific and other advances will continue to impact on mortality, perhaps dramatically so, it is impossible to quantify more than the outline of future consequences with a strong degree of confidence. The decision to modify an extrapolation of a model fitted to historical data (or conversely choosing not to modify it) in order to obtain a forecast is therefore strongly influenced by subjective and judgmental elements, with the quality of the latter dependent on demographic, epidemiological and indeed perhaps more general considerations. The thread running through the book reflects therefore the necessity of integrating demographic,

epidemiological, and statistical factors to obtain an improvement in the prediction of mortality.

Statistical Methods and Applications from a Historical Perspective  
Springer

This textbook offers a comprehensive overview of applied demography by presenting both basic concepts and methodological techniques. It allows students from the social and human sciences, demographers, consultants and anyone interested in applied demography to gain an understanding of a wide range of practical applications of demographic concepts, methods and techniques to real-world problems. Featured sidebars highlight relevant terms and concepts and case studies and exercises throughout the book offer first-hand exposure to demographic applications. Charts and graphs supplement the presentation of demographic concepts and a glossary provides an inventory of relevant terms. The first section reviews basic components of applied demography as a context for understanding and addressing societal issues. It details the methods, techniques and data sources applied by demographers in a variety of areas. Coverage includes cohort analysis, data standardization, population estimation, and the use of geographic information systems (GIS). The second section focuses on the substantive areas in which demography is currently applied. The topics covered include business demography, health demography, political demography, educational demography, and applications to urban and regional planning. The book illustrates the many ways in which demographers contribute to the formulation of public policy and the resolution of societal issues.

*Modeling Demographic Processes in Marked Populations* Springer

This book presents both theoretical contributions and empirical applications of advanced statistical techniques including geo-additive models that link individual measures with area variables to account for spatial correlation; multilevel models that address the issue of clustering within family and household; multi-process models that account for interdependencies over life-course events and non-random utilization of health services; and flexible parametric alternatives to existing intensity models. These analytical techniques are illustrated mainly through modeling maternal and child health in the African context, using data from demographic and health surveys. In the past, the estimation of levels, trends and differentials in demographic and health outcomes in developing countries was heavily reliant on indirect methods that were devised to suit limited or deficient data. In recent decades, world-wide surveys like the World Fertility Survey and its successor, the Demographic and Health Survey have played an important role in filling the gap in survey data from developing countries. Such modern demographic and health surveys enable investigators to make in-depth analyses that guide policy intervention strategies, and such analyses require the modern and advanced statistical techniques covered in this book. The text is ideally suited for academics, professionals, and decision makers in the social and health sciences, as well as others with an interest in statistical modelling, demographic and health surveys. Scientists and students in applied statistics, epidemiology, medicine, social and behavioural sciences will find it of value.

*Analytical Theory of Biological Populations* Springer Nature

Methods of Demographic Analysis Springer Science & Business Media

Insights from a Statistical, Demographic and Epidemiological Perspective National Academies Press

Bayesian Demographic Estimation and Forecasting presents three statistical frameworks for modern demographic estimation and forecasting. The frameworks draw on recent advances in statistical methodology to provide new tools for tackling challenges such as disaggregation, measurement error, missing data, and combining multiple data sources. The methods apply to single demographic series, or to entire demographic systems. The methods unify estimation and forecasting, and yield detailed measures of uncertainty. The book assumes minimal knowledge of statistics, and no previous knowledge of demography. The authors have developed a set of R packages implementing the methods. Data and code for all applications in the book are available on [www.bdef-book.com](http://www.bdef-book.com). "This book will be welcome for the scientific community of forecasters...as it presents a new approach which has already given important results and which, in my opinion, will increase its importance in the future." ~Daniel Courgeau, Institut national d'études démographiques

*Advanced Techniques of Population Analysis* Springer Science & Business Media

Demographic Methods and Concepts makes accessible the most commonly needed techniques for working with population statistics, irrespective of the reader's mathematical background. For the first time in such a text, concepts and practical strategies needed in the interpretation of demographic indices and data are included. Spreadsheet training exercises enable students to

acquire the computer skills needed for demographic work. The accompanying free CD-ROM contains innovative, fully integrated learning modules as well as applications facilitating demographic studies.

Problems and Methods of Building a System of Demographic Statistics and Compiling the Required Data; Report on the United Nations European Seminar on Demographic Statistics. Conducted in Cooperation with the Government of Turkey Springer Science & Business Media

Although I feel honored to write a foreword for this important book, it is a task that I approach with some trepidation. The topics covered in the book summarize the current state of the art in technical demography. However, my knowledge and expertise with respect to technical demography are limited to the most fundamental and intermediate-level methods; hence, critical commentary on the contents of this volume is beyond my scope in this fore word. Since I have some understanding of the logic and substantive aspects of the methods rather than the complicated mathematics used in describing them, my comments will necessarily be restricted to the book's general organization and content. To date, most texts published on technical demography have been limited to traditional demographic methods: sources and limitations of data, life table construction and applications, standardization techniques, various methods for preparing population estimates and forecasts, etc. However, population specialists have in recent years been developing and successfully applying a variety of sophisticated techniques not covered in the more standard introductory texts. In addition, many traditional methods that are unique to the demographic

discipline have been improved and extended.

**Demographic methods for the Statistical office** United Nations

This paper illustrates how shifts in the size, composition, and distribution of racial and Hispanic origin populations between the 1970 and 2000 Censuses can be affected not only by changes in the meaning of basic concepts over time and space but also by changes in statistical methods. It is important to track changes in methods for allocation and tabulating basic demographic variables. Variation in benchmark distributions, specifically racial classifications and tabulation procedures, are an under-appreciated problem for population studies using demographic analysis.

**The Follow-up Method in Demographic Sample Surveys** CRC Press

This book introduces demographic applications which employ current demographic concepts and theories and cutting-edge methods and findings, all of which have and will continue to have an impact in the broad area of social demography. Through providing an introduction to new and current developments in demography, methodological and statistical issues, data issues, issues of health, aging and mortality, and issues in social demography, this book gives new insights into data, substantive issues, and methodological approaches that will assist readers in their use of demography in their research. At the same time it shows demographers, sociologists, economists, statisticians, methodologists, planners, and marketers how they may learn and improve upon the quality and relevance of their demographic investigations now and in the future.

**Demography and Health Issues** Springer Science & Business Media

Here, biologists and statisticians come together in an interdisciplinary synthesis with the aim of developing new methods to overcome the most significant challenges and constraints faced by quantitative biologists seeking to model demographic rates.

*Bayesian Demographic Estimation and Forecasting* Springer Science & Business Media

Military operations produce a great deal of trash in an environment where standard waste management practices may be subordinated to more pressing concerns. As a result, ground forces have long relied on incineration in open-air pits as a means of getting rid of refuse. Concerns over possible adverse effects of exposure to smoke from trash burning in the theater were first expressed in the wake of the 1990-1991 Gulf War and stimulated a series of studies that indicated that exposures to smoke from oil-well fires and from other combustion sources, including waste burning, were stressors for troops. In January 2013, Congress directed the Department of Veterans Affairs (VA) to establish and maintain a registry for service members who may have been exposed to toxic airborne chemicals and fumes generated by open burn pits. Assessment of the Department of Veterans Affairs Airborne Hazards and Open Burn Pit Registry analyzes the initial months of data collected by the registry and offers recommendations on ways to improve the instrument and best use the information it collects. This report assesses the effectiveness of the VA's information gathering efforts and provides recommendations for addressing the future medical

needs of the affected groups, and provides recommendations on collecting, maintaining, and monitoring information collected by the VA's Airborne Hazards and Open Burn Pit Registry.

*Methods for Dealing with Irregular, Inadequate, and Missing Data*  
Springer Science & Business Media

This novel book provides the reader with the fundamentals of data collection, model construction, analyses, and interpretation across a wide repertoire of demographic techniques and protocols, clearly guided throughout with fully reproducible R scripts.

*Assessment of the Department of Veterans Affairs Airborne Hazards and Open Burn Pit Registry* Springer

The book showcases a selection of peer-reviewed papers, the preliminary versions of which were presented at a conference held 11-13 June 2011 in Bologna and organized jointly by the Italian Statistical Society (SIS), the Institute national Institute of Statistics (ISTAT) and the Bank of Italy. The theme of the conference was "Statistics in the 150 years of the Unification of Italy." The celebration of the anniversary of Italian unification provided the opportunity to examine and discuss the methodological aspects and applications from a historical perspective and both from a national and international point of view. The critical discussion on the issues of the past has made it possible to focus on recent advances, considering the studies of socio-economic and demographic changes in European countries.  
*C. Matthew Snipp and Juanita Tamayo Lott* Springer

Demographic Forecasting introduces new statistical tools that can

greatly improve forecasts of population death rates. Mortality forecasting is used in a wide variety of academic fields, and for policymaking in global health, social security and retirement planning, and other areas. Federico Girosi and Gary King provide an innovative framework for forecasting age-sex-country-cause-specific variables that makes it possible to incorporate more information than standard approaches. These new methods more generally make it possible to include different explanatory variables in a time-series regression for each cross section while still borrowing strength from one regression to improve the estimation of all. The authors show that many existing Bayesian models with explanatory variables use prior densities that incorrectly formalize prior knowledge, and they show how to avoid these problems. They also explain how to incorporate a great deal of demographic knowledge into models with many fewer adjustable parameters than classic Bayesian approaches, and develop models with Bayesian priors in the presence of partial prior ignorance. By showing how to include more information in statistical models, Demographic Forecasting carries broad statistical implications for social scientists, statisticians, demographers, public-health experts, policymakers, and industry analysts. Introduces methods to improve forecasts of mortality rates and similar variables Provides innovative tools for more effective statistical modeling Makes available free open-source software and replication data Includes full-color graphics, a complete glossary of symbols, a self-contained math refresher, and more

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