

From the Book Review Editor

IN THIS ISSUE of the Journal, several reviewers have done an excellent job in providing you with an assessment on a number of “technical” books that would be useful to health policy makers, researchers and managers. At the moment there appears to be a wealth of excellent texts to assist health managers and researchers and we offer here three reviews on the issues and concepts of measuring health and health operations research. Additionally, there is a review on the third edition of a popular health economics text. Happy reading!!

Gary E Day

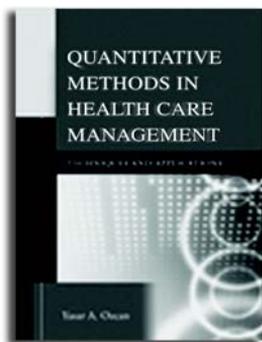
Book Review Editor
Australian Health Review

Quantitative methods in health care management

Ozcan YA

Jossey-Bass, 2005

ISBN: 0 7879 7164 2. RRP: \$102.48. xx + 412 pages



MANY PROBLEMS in contemporary health care lend themselves to quantitative analysis. How can we improve patient flow in the emergency department? How many nurses will Australia need in 2020? Where should we locate a new MRI facility in our

state? This text book describes methods that might be used to address such questions.

Thus, the book deals with the application of methods in management science to health care.

Dr Yasar A Ozcan is the founding Editor-in-Chief of the journal *Health Care Management Science* and hence is well qualified to write this book.

Topics covered include forecasting, decision analysis, project management, quality control, simulation, and others. This review will focus on two of the 15 chapters.

Chapter 2 (39 pp) deals with forecasting. A hospital administrator could use the techniques in this chapter to predict electricity usage in the hospital for each of the quarters in the following

year. A public servant in the Department of Health could use these ideas to get a better appreciation of forecasts developed by the Department. A graduate student might find the chapter illuminating as an introduction to time series analysis.

As in most chapters of the book, Ozcan makes considerable use of the computer package *Win-QSB*. In fact, having ready access to this package is essential to get the most benefit from the book. The author does not presume any knowledge of forecasting methods. However, a basic knowledge of statistical methods would be useful to the reader. The chapter concludes with a number of exercises that are well chosen practical problems.

Chapter 14 (28 pp) deals with applications of queueing theory. Queueing theory was created about 100 years ago by a Danish mathematician AK Erlang. It is a mathematical approach to describing queues, waiting lines, and congestion. It sounds like an ideal tool for contemporary health care.

The theoretical side of the subject has grown much more rapidly than its applications. However, recently, we have seen concerted efforts to apply these ideas to health care, especially in patient flow management.

In this chapter, the author presents a gentle introduction to queueing theory and indicates how it could be applied to capacity planning. For example, if a hospital were introducing a short stay unit in the emergency department, how many beds should be in the new unit? The

chapter contains exercises, most of which require the use of *WinQSB*.

Let me close with some general remarks on the book. It is a good length for a one-semester course. The presentation is pleasing; there are not too many mathematical formulae; the soft binding is satisfactory; the price is reasonable. The book is also available as an e-book.

Numerate professionals in health care might find new approaches to problems in this book. Experts in management science might become aware of applications of their craft to health care. I would recommend the book for any library in a university that offered courses in health services research or management science.

Reviewer rating: ★★ ★

Terry Mills*

Operations research and health care: a handbook of methods and applications

Brandeau ML, Sainfort F and Pierskalla WP (eds)
Dordrecht: Kluwer, 2004
ISBN: 1402076290. RRP: \$297.15. viii+872 pages



OPERATIONS RESEARCH is the mathematics of efficiency. It is a subject that deals with finding the best way to organise a system. The editors of this work tell us (p. 9): “This book covers applications of operations research in health care, with particular emphasis on health care delivery”.

The book consists of 32 chapters that are organised into four parts. The first part contains an introductory chapter. The second part comes under the heading “Health care operations management” (Chapters 2–8); the next part deals with “Public policy and economic analysis” (Chapters 9–22); the final part is headed “Clinical applications” (Chapters 23–32).

The structure of this review will mimic the structure of the book. I will select one chapter from each part and use it as a sample.

The book opens with an introduction by the three editors. In 14 pages, they present an international perspective on contemporary issues associated with the planning, organisation, and delivery of health care. It becomes clear from this chapter that operations research has the potential to make important contributions to the world-wide problems in health services. Graduate students in this field would be encouraged, perhaps inspired, by this chapter because it frames their work in a global context.

The next major section (Chapters 2–8) deals with operations management issues. Topics covered include capacity planning, simulation, supply chain management, location problems, and benchmarking.

Chapter 2 by Linda V Green is entitled “Capacity planning and management in hospitals”. The article focuses on applications of queueing theory in hospitals, especially in the emergency department. The problems discussed in the paper (and in most papers in the collection) are set in the United States. However, as was evident at the recent International Conference on Health and Social Care Modelling and Applications (HSCM 2006) held in Adelaide, the problems facing Australian hospitals are similar to those in other developed countries in spite of major differences in health systems. The discussion in Green’s paper is largely non-mathematical, which is impressive when one considers the technicalities in queueing theory. Although terms such as “M/M/s queue” are used without definition, a numerate manager or clinician could profit from reading this article by glossing over technical terms. Green’s article provides a fair description of the field in just 27 pages and includes a useful bibliography of 34 items and suggestions for further research.

The next part (Chapters 9–22) deals with the applications of public policy methods and economic analysis in health care. Topics covered include economic and planning issues associated with pharmaco-economics, drug addiction, infectious diseases, organ transplants, and children’s health.

Chapter 3 by Gregory S Zaric is entitled “Modelling the costs and effects of maintenance treatment for opiate addiction”. The article describes operations research models that can be used to evaluate methadone maintenance treatment for opioid addiction. The principal method used by Zaric is compartmental modelling. Compartmental modelling now has many applications in health care, and hence, it is very pleasing to have at our disposal an example set out in detail as in this paper. The compartmental model diagrams used by Zaric make it easy to understand the essence of his model. (In fact, it is diagrams that make compartmental modelling so appealing in the first place.) The paper has an extensive bibliography of 92 items.

The final part (Chapters 23–32) deals with clinical applications. The chapters in this part tend to be more disease specific and less mathematical than those in the preceding parts of the book. Topics covered include decision making in medicine, risk analysis, policy development for asthma, Bayesian belief methods, optimisation problems in radiotherapy treatment, models for transmissions of infection, and treatment of Alzheimer’s disease.

Chapter 26 by A David Paltiel et al is entitled “An asthma policy model”. In this interesting and very readable paper, the authors draw on wide-ranging research on asthma and its treatments with a view to developing policies for the clinical management of this illness. The main operations research method used here is simulation in developing their Asthma Policy Model. The paper is an effective example of how operations research techniques can inform the development of clinical pathways.

The book is more a collection of worked examples than a “handbook”. It will stimulate research when readers say “Hey, we could do that here!” Since there is no inter-dependence among the chapters, it is easy to dip into different parts of the book.

The articles in this collection edited by Brandeau, Sainfort and Pierskalla are interesting, informative and important. The bibliographies are particularly useful. I recommend the book for

the library in any university, government department or research institute where there is interest in health services research or operations research.

Reviewer rating: ★★★★★

Terry Mills*

Measuring health: a guide to rating scales and questionnaires

McDowell I

3rd edition, Oxford University Press, 2006

ISBN: 0195165675. RRP: \$130. xvi+748 pages



Measuring health provides a detailed discussion of 104 health measures. The author, Ian McDowell, is Professor in the Department of Epidemiology and Community Medicine at the University of Ottawa.

Chapter 1 is an introduction. Chapter 2 deals with “The theoretical and technical foundations of health measurement” (pp 10–54). The chapter describes various classes of numerical estimation, definitions of validity and reliability — and how one determines these characteristics. Some readers may regard this material as dry and uninteresting. But it is fundamental. In this chapter, McDowell provides a useful, yet compact, introduction to these theoretical ideas. The chapter has an extensive bibliography of 185 items. Graduate students embarking on research that involves scale measurements in health care (or fields such as education or management or sociology) would do well to read this chapter. It would be an excellent reference for any research methods subject. The author’s engaging style makes the theoretical ideas more palatable.

The main part of the book describes 104 instruments for measuring various health conditions. This part is organised into eight chapters, where each chapter is devoted to scales that measure a particular aspect of health. For exam-

ple, Chapter 3 deals with “Physical disability and handicap” and Chapter 7 deals with “Depression”.

Let us look at a typical chapter. Chapter 9 on “Pain measurements” (pp 470–519) opens with a summary of theoretical approaches to pain and a discussion of the biomedical model of pain where cognition and emotion are factors that are taken into consideration in the assessment of pain. Other theories of pain that are outlined include psychodynamic theories, Melzack’s gate control theory of pain, and the neuromatrix model.

The section “Approaches to pain measurement” gives a general overview of methods used to measure pain and identifies three types of pain measures: questionnaire techniques, behavioural measurements, and analogue methods. The subsequent sections describe specific instruments for measuring pain.

Nine pain measures are explained separately and in detail. These measures are: visual analogue pain rating scales, McGill Pain Questionnaire, Brief Pain Inventory, Medical Outcomes Study Pain Measures, Oswestry Low Back Pain Disability Questionnaire, Back Pain Classification Scale Self-Rating, Pain and Distress Scale, Illness Behaviour Questionnaire, and Pain Perception Profile. The description of each measure includes the conceptual basis for the measure, reliability and validity, alternative forms of the measure, a detailed bibliography that is specific to the measure, and a concluding commentary.

A table of the quality of pain scales gives an overall comparison of the scales. This table would guide clinicians in selecting an appropriate pain scale.

Thus, in 50 pages, McDowell presents a substantial summary of measures of pain.

The third edition of *Measuring health* differs from the second edition in a number of ways. There is only one author rather than two. Each chapter has been revised in light of recent developments. A new chapter “Anxiety” (56 pp) has been added.

However, the high quality of scholarship and production has not changed.

Any researcher who is involved in health measurement scales should consider buying this book. A copy of *Measuring health* should be placed in every university and medical library.

In our department library in CHERC at Bendigo Health, the second edition was borrowed so often that eventually it “walked”. We will take more care with the third edition.

Reviewer rating: ★★★★★

Kate Hyett[†]
Terry Mills*

Methods for the economic evaluation of health care programmes

Drummond M, Schulper M, Torrance G, O'Brien B and Stoddart G

3rd edition, Oxford University Press, 2005

ISBN: 019-852945-7. RRP \$99.95. 350 pages



AS THE NAME SUGGESTS, *Methods for the economic evaluation of health care programmes*, third edition, is a recently updated and revised textbook that explores the various forms of economic evaluation — applied to the health care setting. However, at first glance, the title of this book could be

slightly misleading. One might even mistake it for being yet another introductory text in health economics! Indeed, it is quite the contrary, as the authors have gone beyond merely describing methods of economic evaluation, to critically evaluating the methods per se.

The authors have managed to deliver a comprehensive text which enables its readers to reach beyond the basics of economic evaluation and ultimately prepare themselves for some “hands-on” experience when dealing with contentious or “thorny” issues in the real world.

There are currently a number of good introductory texts in health economics and this book is

clearly intended as a supplement (and not a substitute) for these.

The text comprises 11 chapters in which the following key points are covered:

- A quick introduction to the basic forms of evaluation;
- A guide to critically appraising economic evaluations;
- Four chapters discussing the methodological issues in the main forms of evaluation;
- Two chapters exploring the use of the main approaches for data collection in economic evaluation; and
- Two final chapters dealing with the presentation and use of economic evaluation results, followed by the author's own "survival guide" for evaluators.

The first two chapters provide a brief overview of the book, followed by a short introduction to the basic methods of economic evaluation. The authors also touch on some of the issues to be discussed in later chapters. Chapter 3 provides a comprehensive checklist for assessing economic evaluations, followed by supportive notes to each question, and critical appraisal exercises at the end of other chapters (3, 5 and 6). Chapters 4, 5, 6 and 7 are spent discussing the four main forms of economic evaluation — cost analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis — and form the main part of the book. The allocation of overhead costs and discussion on estimating productivity changes are dealt with well in Chapter 4. Chapter 5 introduces the notion of "net benefits" as a proxy for measuring the "value for money" of health care programmes. A very strong theoretical grounding for cost-utility analysis has been incorporated into Chapter 6, and this is followed by some useful exercises on calculating quality-adjusted life-years and healthy-year equivalents. Chapter 7 introduces and explores the measurement technique of "willingness-to-pay", and Chapters 8 and 9 effectively deal with analysing patient-level data and decision-analytic modelling. The remaining two chapters discuss the problems, potential and transferability of economic evaluation results to other set-

tings (Chapter 10) and, finally, the economic evaluator's "survival guide" in Chapter 11.

The text has been written by internationally recognised health economics "gurus" in a clear and concise manner and, at times, the authors have even added their own cheeky touch of humor. Moreover, the subject material has been presented in a consistent and logical manner, enhancing its readability. Tables and figures have been appropriately used throughout the chapters to simplify what would normally have been rather complex ideas.

The book is extensively referenced and the authors have even taken the initiative of pointing its readers towards other useful sources.

The greatest strength of the text lies in the author's ability to critically evaluate each of the evaluation methods. Throughout the chapters, the authors have not only recognised both the potential strengths and limitations of particular economic evaluation methods, but also proposed possible solutions to these problems.

The inclusion of exercises and tutorials for the reader to undertake are extremely helpful learning tools in merging each chapter's theory with practice. The critical appraisals of published articles, with examples of both well conducted and poorly conducted studies, are also equally helpful to the reader.

Conversely, a handful of limitations should also be highlighted. The text is intended for both practitioners and students, however, it would be better suited to people with prior knowledge and/or experience of working in the health economics field. Ultimately, this represents the greatest weakness of the text. While the inclusion of exercises and their solutions throughout the chapters are a useful learning tool to readers, the solutions would be better placed at either the back of the text or on a companion website. This would force the reader to think for him or herself before referring to the solutions. Moreover, the introduction to basic economic evaluation methods is almost too brief and could be better placed in sections at the beginning of each corresponding chapter, rather than at the beginning of the book.

The strengths of this book undoubtedly outweigh the weaknesses; however, there is always room for improvement. If the authors have the intention of making the book more “student friendly”, then the following ideas could be incorporated into future editions:

- The inclusion of a series of multiple choice and/or discussion questions at the conclusion of each chapter;
- Glossary of key terms with definitions in the back of the text; and
- Summary of key points at the end of each chapter.

On balance, the authors have produced a text which effectively balances both the theoretical and practical components of the methods of economic

evaluation in health care programmes. *Methods for the economic evaluation of health care programmes* is a superb learning tool and valuable point of reference for any health economics professional.

Reviewer rating: ★★★★★☆

Nicole Tschaut[‡]

Reviewers:

*Terry Mills, PhD. Professor of Mathematics, La Trobe University; and Hon. Visiting Professor, Bendigo Health.

†Kate Hyett, RN, BN, GradDipHSc, Project Co-ordinator in CHERC, Bendigo Health. Her current research involves using rating scales to assess the team climate of trauma teams.

‡Nicole Tschaut, BBus(Accy)/BHlthSc(HlthServMgt), United BioSource Corporation. □