



## Institute and Faculty of Actuaries

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The Analysis of Mortality and other Actuarial Statistics (second edition) by B. BENJAMIN; J. H. POLLARD

Review by: J. J. McC

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## REVIEW

*The Analysis of Mortality and other Actuarial Statistics*

by

B. BENJAMIN, Ph.D., F.I.A., and J. H. POLLARD, Ph.D., F.I.A.

[Pp. xiv + 466. Heinemann, London, 1980. (second edition)]

This is the second edition of the work, originally by Benjamin and Haycocks, published for the Institute and the Faculty in 1970. For this revision Professor Benjamin has collaborated with Professor Pollard of Macquarie University, Sydney. The general form of the new edition is similar to that of the original. However the book has been thoroughly updated and several chapters have been extensively rewritten. An interesting addition is a new chapter, in which the life table and its related functions are considered from the viewpoint of stochastic processes. This additional chapter reflects the development of recent research over the past decade or so. The new material and the many revisions combine to increase the size of the book by some seventy pages. Length *per se* is not always desirable, but most of the additional material will add to the value of the book for both students and practical workers. The Authors have obviously made a considerable effort to incorporate in the book as many recent developments as possible. This is reflected in the expanded index and the numerous references given at the end of each chapter.

As before, the first chapter contains a general discussion of measures of mortality and a brief reference to sickness rates. The material is presented within a demographic context, not limited to a strictly actuarial viewpoint, and should be of fairly wide general interest.

The next four chapters develop in some detail the basic "exposed to risk" formulae and related material. The exposition is clear and the terminology helpful. Lexis diagrams, used to illustrate certain of the underlying ideas, are new to this edition and may prove of assistance to some students. The development of exposure to risk follows traditional lines, but it is perhaps a pity that at this stage there is little mention of other methods (such as maximum likelihood) of parameter estimation.

The chapter on sickness rates is very similar to that of the original edition, but now includes a discussion of the recently instigated Permanent Health Insurance investigation of the Continuous Mortality Investigation Bureau.

Chapters 11 to 16 cover the important subject of graduation. The basic principles are discussed in chapter 11, which has been rewritten in a clearer form than before. The subsequent treatment of the main methods of graduation is very detailed and reference is frequently made to recent developments and published papers. In particular there is a discussion of spline functions (used for the ELT 13) and of the curve-fitting methods adopted in recent CMI publications.

Many readers may be unfamiliar with the material of chapter 17, which considers some of the basic actuarial functions within a stochastic framework (rather than by the classical deterministic models). The chapter is necessarily rather short, but should provide interested readers with food for thought. Several of the references in this chapter are well worth further study.

Chapter 18 provides a discussion of the principal mortality tables currently in general use in the U.K. In addition to the material of the first edition, brief descriptions are given of the main features of all the tables published since 1970.

The chapter on social and economic factors in mortality is basically unchanged, but the final chapter (on non-life investigations) has been considerably extended. Examples are given to illustrate the application of exposure-to-risk methods in the non-life area and there is a discussion of several of the problems peculiar to general insurance.

Two features of the book are perhaps worth further comment. The "contents" pages have been given in much greater detail than before, so that—in conjunction with the extended index—it is easier to refer to particular topics. More importantly, each chapter now contains numerous exercises which should prove of great assistance to students.

This revised edition should prove to be of considerable general interest. As before the style is vigorous and the clarity of expression high.

J. J. McC.