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The life table and its applications

Author: Chiang CL

Source: Malabar, Fla, Robert E. Krieger Publishing, 1984. xix, 316 p.

Abstract: Recent advances in probability and statistical theory have made it possible to see life tables from a purely stochastic point of view and to provide the subject with a theoretical foundation. The life table is now used for survival analysis and it is possible to make statistical inference about the elements in the table and about other parameters underlying the mortality pattern of a study population. Life table analysis is unique in the statistical field in that given the survival experience of a sample of individuals, there is a sequence of sample means in the expectations of life and sequences of sample proportions which are maximum likelihood estimators of the corresponding mathematical expectations and probabilities with optimum properties. This book presents the theory and application of life table methodology from a statistical perspective. The concept of probability involves: 1) a random experiment, 2) possible outcomes of that experiment, and 3) an event of interest. The normal distribution is a probability distribution of a continuous random variable symmetrical with respect to the mean; its values extend from minus infinity to plus infinity. The exact shape of a normal distribution depends on the values of the mean and the standard deviation of the distribution. Statistical inference about population means and population proportions fall into the categories of estimation and hypothesis testing. In identifying the age-specific probability of death, the number of deaths in the interval divided by the number of individuals living at the beginning of the interval is the methodology used; this is the basic quantity in the construction of life tables and the ultimate measure in studies of the mortality pattern of a population in determining mortality trends, in comparing survival experience of different communities, and in computing insurance premiums. Adjustment of rates can be made with respect to age, sex, occupation, and other variables. There are 2 principle forms of the life table, the cohort, which records the actual mortality experience of a particular group of individuals, and the current, which gives a cross-sectional view of the mortality and survival of a population

during a current year. Medical follow-up studies and life testing have as their common immediate objective the estimation of life expectancy and survival rates for a defined population at risk. A new life table methodology is presented to accommodate density function, distribution function, and the maximum likelihood estimators of the parameters involved. Also included are computer programs for construction of complete and abridged life tables.

Language: [English](#)

Year: [1984](#)

Region / Country: [Global](#)

Keywords: [Life Tables](#) | [Life Table Method](#) | [Statistics](#) | [Demographic Analysis](#) | [Data Analysis](#) | [Mortality](#) | [Mathematical Model](#) | [Theoretical Models](#) | [Probability](#) | [Age Specific Death Rate](#) | [Cohort Analysis](#) | [Population Theory](#) | [Follow-Up Studies](#) | [Survivorship](#) | [Diseases](#) | [Teaching Materials](#) | [Surveys](#) | [Life Expectancy](#) | [Computer Programs and Programming](#) | [Research Methodology](#) | [Population Dynamics](#) | [Demographic Factors](#) | [Population](#) | [Statistical Studies](#) | [Studies](#) | [Death Rate](#) | [Demography](#) | [Social Sciences](#) | [Science](#) | [Sociocultural Factors](#) | [Length of Life](#) | [Sampling Studies](#) | [Computers](#) | [Information Communication Technology](#) | [Information](#)

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