

Life Expectancy Issue

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The theme of this issue is life expectancy. The term "life expectancy" can have a variety of connotations, from the very specific life table variable definition "years of remaining life," to the projection of individual life expectancy performed for annuities and settlements, and the prediction of the population longevity by demographers. In this issue, we have articles that cover a spectrum from the theoretical modeling of population longevity to the practical calculation of life expectancy and preparation of reports that communicate such estimates for "real" cases. The *Journal* is privileged to have contributions from global experts in the field of individual and population life expectancy, both within and outside the insurance industry.

Life expectancy "leads off" with the population perspective. Drs. Cebrat and Łaske-wicz have simulated changes in human life expectancy related to somatic gene mutations using the "Penna model" based on Monte Carlo methods. I asked them to summarize detailed work published elsewhere¹ in the form of a mini-review, so that their ideas and this approach are known to insurance medicine. Their approach provides a conceptual basis for the mathematical modeling of changes in population life expectancy from the accumulation of effects of somatic mutations. The complexity of the human genome would necessarily lead to far more complex models to fully translate human genetics into mathematical representations.

In the past decade or so, we have witnessed

a prolongation of population life expectancy to a degree that has not been seen in prior human history. Social and economic developments, as well as breakthroughs in medical care, are responsible for extension of the human life span in much of the developed world. The availability of medical care, especially new and effective therapies for "acute" diseases (eg, infections), is responsible for much of this improvement. However, treatments for the chronic diseases that these "survivors" can now acquire (eg, cancer, heart disease) may also be responsible for sustaining and continuing the improvements in longevity that have been seen. If new technologies and treatments can reduce or eliminate these chronic diseases as major causes of death, what impact would they have on longevity?

Somerville and Francombe provide an overview of modeling performed to assess the effect of "disease elimination" on longevity. They provide an overview of the concepts involved in modeling a relatively simple two-disease model and provide us with an illustration of the results. "Relatively simple" is a misnomer in this situation. The mathematics of this approach, especially if more than two diseases are considered, are prohibitively complex.

We then turn to the topic of predicting individual life expectancy for purposes of administering cases for annuity calculations, structured settlements, and more recently for purposes of life insurance investment vehi-

cles. Dr. Strauss and his colleagues present an overview of the existing methods for the computation of life expectancy in chronic medical conditions and at advanced ages using data readily available to us in medical literature, or general and insured population life tables. I expect this contribution to become a primary reference for those involved in this activity. Drs. Anderson and Marion contribute an overview of proportional life expectancy. This is Dr. Anderson's contribution to the field of life expectancy computation, which he has described in detail elsewhere.²

Finally, Dr. Singer presents his approach to the calculation of life expectancy by going point by point through a sample case, and preparing a report that presents the work, results and conclusions that are needed for adjudicating a settlement or claim.

Dr. Pokorski contributes a mortality article analyzing coronary heart disease in the elderly, based on studies identified in a search of the medical literature. This is a valuable contribution that will be very useful to those involved in the risk assessment of elderly life insurance applicants.

This issue is also ECG "rich." The ECG case studies include Dr. McKenzie's review of poor R-wave progression, and Dr. Ferrer's classic Interesting Electrocardiogram demonstrating LBBB during exercise testing. In a Letter to the Editor, Dr. Cumming makes us aware of artifact that may be seen when ECGs are transmitted to life offices telephonically.

Our case study by Dr. Lee involves a case

of osteopetrosis, with an overview of this serious bone disease and its risk implications. Our Graphics Section includes Dr. Williams' description and illustration of the findings in cutaneous lupus, and Dr. Davis' description and illustration of the atherosclerotic process.

The *JIM* Reading List includes citations and capsule summaries of recent articles in the medical literature that should prove useful in your daily risk assessment work. Dr. Nowlan provides us with a review of a recently published book, *Genetics and Life Insurance: Medical Underwriting and Social Policy*, edited by M.A. Rothstein, which should be of considerable interest to everyone in insurance medicine.

Finally, we recognize those individuals who have met the requirements of the Board of Insurance Medicine in the past year and acknowledge those who have provided their time, effort and very thoughtful comments by contributing to the *JIM* peer review process. Any success that we may have achieved in the past year is in large part a reflection of these reviewers' efforts.

We welcome Dr. David Williams to the *Journal* staff. A regular contributor to the *Journal*, Dr. Williams will now serve as Associate Editor, Graphics Section, providing direction for this regular feature.

REFERENCES

1. Laszkiewicz A, Szymscak Sz, Cebrat S. Prediction of the human life expectancy. *Theory Biosci.* 2003; 122:313-320.
2. Anderson TW. *Life expectancy in court: a textbook for doctors and lawyers.* Vancouver, Canada: Teviot Press; 2002.