



SOCIETY OF ACTUARIES

Article From:

The Actuary

November 1987 – Volume No. 21, Issue No. 9



The Newsletter of the
Society of Actuaries

VOL. 21, NO. 9
NOVEMBER 1987

THE Actuary

The Impact of AIDS on the Insurance Industry

by David M. Holland

Acquired Immune Deficiency Syndrome (AIDS) will have a tremendous impact on the insurance industry in North America. In "AIDS, HIV Mortality and Life Insurance," Michael Cowell and Walter Hoskins project that, for business currently in force, life claims will amount to \$50 billion over the remainder of this century. Assuming Human Immunodeficiency Virus (HIV) infection decreases to zero by 1997, AIDS claims on individual business currently in force will rise to around 18% of total claims in 1997 (assuming no AIDS claims from issues after 1986.) If HIV testing is not permitted and insurance sales increase at a 5% annual rate, an additional \$20 billion of individual AIDS claims are projected by year-end 2000. These projections do not include AIDS-related claims for disability and health insurance, which would also be substantial.

AIDS is devastating. As of August 31, 1987, 41,366 AIDS cases have been reported to the Centers for Disease Control (CDC); of these, 23,884, or 58%, have resulted in death. Cowell and Hoskins modeled mortality for someone with AIDS by death rates of 45%, 45%, 35% and 25% for years 1, 2, 3, and 4 on, respectively. The resulting life expectancy from diagnosis of AIDS is only about 2.1 years.

A key challenge in measuring the impact of AIDS has been to develop a model to estimate the number of people infected with HIV and to measure the progression from infection through development of AIDS to ultimate death. The Cowell-Hoskins

Continued on page 3 column 1

The Future of the Actuary/ The Actuary of the Future

by Gary Corbett

The future of the actuary has been a subject of active discussion within the Society for at least the past five years. The March 1982 *Actuary* carried an article by Bill Poortvliet summarizing the conclusions from a survey of actuarial employers conducted in 1982 by the Career Encouragement Committee. One of the conclusions was, "Employers are not focusing on numbers alone; they appear to be looking for actuaries with a broader bent, going well beyond the traditional technical skills."

In an early discussion of the Committee on Planning, actuaries were characterized as being in one of two groups. One group consisted of multi-disciplinary individuals with high communication skills; the other comprised the more traditional numbers-oriented actuaries. During these early discussions, the Committee identified a hypothesis which seemed to supply a common root for the many issues being examined. This hypothesis was: "In a world of increased change, actuaries as a group need to increase their abilities to deal with change. We need greater competence

in such skills as: problem identification, dealing with unstructured situations, applying inter-disciplinary approaches, communications and conceptualization."

Employers were described as wanting people who could sort through a mass of information to identify key problems and who were willing and able to operate within ambiguous, unstructured situations. Problem-solving in such an environment requires analytical skills, which must be combined with the ability to weigh risks and to make decisions. Management and communication skills were also deemed important if an actuary were to advance past the technical level.

As a means of increasing their nontechnical skills, current FSAs can participate in various continuing education activities, and the Society's continuing education program has been responding to this need in recent years. With regard to the development of future Fellows, selection, recruiting and education can play an important role. It is with this in mind that the

Continued on page 2 column 2

In this issue:

The Future of the Actuary/ The Actuary of the Future Gary Corbett	1	Changes in Course 150 Curtis E. Huntington	8
Impact of AIDS on Insurance Industry David M. Holland	1	Single-Premium Whole Life Gary E. Dahlman	9
The Canadian Institute and Its President	4	Health Reserve Standards Robert Shapland	11
New Funding Rules in Canada Michael Cohen	5	Ordinary Mortality Studies Harry A. Woodman, Jr.	13
"Travel Time" under FES M. David R. Brown	6	Wave Nature of TSA Douglas A. Eckley	13
Universal Life Reserves Douglas C. Doll	7	Letters to Editor	14
		Actucrossword: Actucrostic	15, 16

Future of Actuary Cont'd.

annual meeting in Montreal. Jim Curtis, Jim Hickman, Bob Shapiro and I had a discussion of The Actuary of the Future, receiving significant audience input. The task force is interested in your views as well. Please direct comments to its chairperson, as shown in the 1988 *Yearbook*. Alternatively, you can send your thoughts to me at my address, and I'll see they are forwarded. (Mr. Gary Corbett, Tillinghast/Towers Perrin, One Atlanta Plaza, 950 E. Paces Ferry Road, Atlanta, GA 30326.)

If the need for actuaries is indeed shrinking either because the need for what we do is declining or because others, be they professionals or general managers, can do the job better, the actuarial profession should not attempt to stem the tide. However, many of us do not accept that society's need for actuarial skills is decreasing; rather, we see many areas that would be better served by an expanded actuarial presence.

Here's to our future. It will be what we make it.

Gary Corbett is with Tillinghast/Towers Perrin. He is the SOA President for 1987-88.

AIDS Cont'd.

model used for financial projections shows a cumulative 900,000 people infected in 1987, rising to 2.5 million by the year 2000. By 2000, the cumulative number of AIDS cases is projected to be 1.6 million, of which 1.3 million would have died.

Compared to the 1980 CSO Basic Male Non-Smoker Table rates, the mortality of someone who currently tests positive for HIV would be in excess of 5,000% of standard. Although the underlying patterns of mortality for someone who is HIV positive are so different from those of someone who is standard that mortality ratios may be questionable, it is clear that the level of mortality is far beyond what is considered insurable, even at the highest substandard rating.

Another expression of the impact of the high mortality to be expected for someone who is HIV positive is to look at the present value of future claims. Cowell-Hoskins determined:

[P]rogression to AIDS and death under the slower SFCC[San Francisco City Clinic]/CDC assumptions produces death claims that, discounted at 6%

AIDS Cont'd.

interest, would require a net single premium of \$515 per \$1,000 issued to an HIV infected individual.

The Cowell-Hoskins paper is a landmark in actuarial literature. Actuarial techniques of numerical analysis, life contingencies and survival models have been combined with tools from biostatistics and epidemiological modeling. From this, the authors have derived practical information about the projected impact of this disease. You are encouraged to study this paper in detail; if you have not received a copy, contact the Society Office Research Department.

In spite of the tremendous advance represented by the Cowell-Hoskins paper, certain factors which should be kept in mind when considering its results are:

1. The model is based on an assumed population at-risk of AIDS of 3 million male homosexuals and bisexuals, plus 750,000 IV drug abusers. These groups represent approximately 90% of the adult AIDS cases reported to date in the U.S.
2. Additional information is needed on the spread of AIDS in the heterosexual population. Reported cases of heterosexual transmission account for approximately 4% of the AIDS victims overall, but 30% of the female cases. Because the heterosexual population is so large, a spread at even a much reduced rate could still result in a large infected population.
3. The model for estimating the number of people infected has been fitted to CDC data of AIDS cases and deaths. Although this is thought to be the most reliable information available, there are problems with underreporting and with delays in reporting to the CDC. A 20% increase in cases has been cited as a possible adjustment for underreporting. In its December 29, 1986, report, CDC showed 29,003 cases had been reported through that date, but from its August 31, 1987, report, 33,475 cases are shown as having been incurred by the end of 1986.
4. As of September 1, 1987, the CDC revised the definition of AIDS to include dementia and emaciation. These cases were previously considered AIDS Related Complex (ARC) rather than AIDS and were not in

the AIDS tabulations. The revised data from the CDC should be carefully studied. (This new information was not available when this article was being prepared.)

5. Although the Cowell-Hoskins model is consistent with other models, such as the one by Jeffrey Harris at M.I.T., some other models have produced significantly different results. For example, a report prepared by the RAND Corporation states that the CDC:

figure is now thought by many to be too low, particularly because it employs a very conservative estimate of HIV (Human Immunodeficiency Virus) incubation or latency, which determines how many seropositives convert to symptomatic AIDS over a period of time. Others think that underreporting of AIDS cases is even more egregious than the official corrections would suggest and that the extent of heterosexual transmission has been underestimated. Thus, although 220,000 cases might serve as a low-range estimate, case load numbers of 400,000 and 750,000 in 1986-1991 are more credible mid- and high-range estimates.

There appear to be little hard data supporting the RAND report; until more data become available, the CDC estimate must be considered more reliable.

Major research facilities outside the insurance industry are developing a number of models. These facilities have tremendous resources and support; with additional and more refined data, we hope that more sophisticated and accurate models can be developed.

6. The Cowell-Hoskins financial models were fitted to AIDS experience collected by the ACLI/HIAA for 1986. Data received after publication indicate actual experience may have been higher than previously thought.
7. The financial numbers are based on a model which assumes that the rate of infection will decline to zero by 1997. This reduces the ultimate

Continued on page 4 column 1

AIDS Cont'd.

risk group by approximately one-third. The model is further based on the assumption that the insured population which is HIV positive will ultimately grow to only 58% of the total risk group (around 40% of the infected population, assuming infection remains constant).

8. The emergence of AIDS-related claims will be affected by the extent to which insurance companies are able to test applicants for HIV infection. Limitations in risk selection may result in substantial increases in claims.
9. In addition to claims from AIDS itself, increased claims can be expected for people who have the HIV infection and who will incur claims for sickness and death from complications of this infection without necessarily having reached full clinical AIDS.
10. Further developments in treatment may affect the course of the disease. Although somewhat advantageous from a life insurance point of view, such treatments may increase claims for health and disability insurance.

Overall, the Cowell-Hoskins assumptions could have been more pessimistic in a number of areas. From the point of view of human compassion as well as concern over financial impact, it is hoped that events will be more favorable than the projection indicates. However, my impression is that Cowell and Hoskins were striving for as fair a presentation as possible and these projections should be considered as a likely scenario.

Although the Cowell-Hoskins paper represents the opinion of the authors only, the Society of Actuaries AIDS Task Force encouraged and supported this work and is pleased to have Mike Cowell as a Task Force member. However, this is only one phase in our review of the impact of AIDS on the insurance industry, and further deliberations will take place. The Task Force would like to receive your comments on either the Cowell-Hoskins paper or any aspect of projecting the impact of AIDS on the insurance industry. Please send them to me at my *Yearbook* address.

David M. Holland is Executive Vice President and Chief Actuary at Munich American Reinsurance Company. He is chairperson of the SOA AIDS Task Force and a member of the Board of Governors.

The Canadian Institute and Its President

Deborah Poppel, features editor of *The Actuary*, recently interviewed J. Dickson Crawford, who is beginning his term as President of the Canadian Institute of Actuaries.

Poppel: What is the major role of the CIA?

Crawford: The chief role of the CIA is to make sure that the public receives high quality actuarial services in Canada. We focus on three areas: providing consistent admission procedures, defining acceptable standards of practice, and monitoring compliance with these standards. The CIA also provides opportunities for actuaries to meet and discuss different areas of practice, new developments, and research.

Poppel: Does this mean the CIA is similar to the American Academy of Actuaries?

Crawford: Yes, it carries out a similar role in standards development and interacting with the public. However, the CIA has been able to achieve unique recognition of the FCIA in statutes for both pension and insurance valuations. In the U.S., the Academy has achieved recognition of the MAAA, but it is not a unique position.

Poppel: How does one become a member of the CIA?

Crawford: There are three requirements: (1) affiliation—nearly all Fellows of the CIA are Fellows in the SOA, the CAS, or the Faculty or Institute in Great Britain; (2) education—for example, completing the Canadian specialty under the SOA or CAS syllabus; and (3) experience—a three-year period of Canadian experience is required.

Poppel: What are the main differences between U.S. and Canadian actuarial practices?

Crawford: The main differences in practice are driven by legislative and regulatory differences. For example, ERISA means that pension actuaries face a different set of rules in the U.S. In Canada, each province sets its own pension regulation. The growing body of legislation in both our countries has been following increasingly divergent tracks, which would make it difficult

for an actuary to practice competently in both countries.

Poppel: Do you think there is the appropriate level of interplay between actuaries in the U.S. and Canada?

Crawford: Yes, we cooperate to a great extent on the education and examination process. We have joint seminars and symposia, for example, for valuation actuaries, casualty actuaries and consultants. We share results of research studies.

Poppel: The unification of the U.S. actuarial profession, specifically, of the multitude of actuarial bodies, is currently under discussion. Does such an issue exist in Canada?

Crawford: We are participating in the task force established by the Council of Presidents. We have been fortunate in Canada to have had a unified profession since 1965 when the CIA was created. We believe it has been of great benefit to Canadian actuaries.

With unification goes the responsibility to ensure that all actuaries in Canada see the CIA as responsive to their particular needs, whether they are French or English: life, casualty or pension; employed by an institution or in private practice. One practical example of this thinking is found in our second guiding principle on education, which states that an FCIA shall be examined on the basic theory, concepts, and standards required for all the major areas of actuarial practice. To accomplish this we are working actively with the SOA and CAS to ensure both the content and flexibility to enable a Canadian actuary to meet this goal, whichever society is chosen as the route to Fellowship.

Poppel: What are the big issues currently facing the Canadian actuary?

Crawford: The biggest issue is the trend toward increasing explicit standards of actuarial practice.

Poppel: What are the forces behind this trend?

Crawford: More competition in recent years has thinned our profit margins and increased risk to insurance companies. In a broader context, some trusts and regional banks have failed, resulting in a general concern over the

Continued on page 5 column 1