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MEDICO-ACTUARIAL SYMPOSIUM

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This was the latest in a series of such meetings hosted alternately by the Assurance Medical Society and the Institute of Actuaries. Held at Staple Inn, it provided a forum for doctors, actuaries and others to discuss medical and statistical topics related to life and disability insurance. The programme consisted of presentations by speakers followed by some time for questions and discussion.

IMPAIRED LIVES MORTALITY—MODELS AND RESULTS

Professor Steven Haberman, Head of Actuarial Science and Statistics, City University, outlined the traditional methods, as used in the United States of America and in this country, where actual deaths have been compared with those expected according to a standard table or other suitable control population. The result is then expressed as an additional mortality ratio, or sometimes as an additional mortality rate. The choice of a standard table or control population is sometimes difficult if valid conclusions are to be drawn from the results. Such methods have been used in the papers produced by Dr T. W. Preston and R. D. Clarke and most recently by M. Leighton (*J.I.A.* **114,** 19) setting out the results of one office. The same methods are used in the CMI Impaired Lives Investigation, as detailed in *CMIR* **11**.

He went on to describe a new methodology based on multiplicative hazard models and generalised linear models. This produces a mortality ratio expressed as a regression type formula involving several covariates together and their possible interactions. This type of analysis was first introduced by Sir David Cox in a 1972 paper in the *Journal of the Royal Statistical Society, Series B*. Some of this methodology has already been described by Professor Haberman in his earlier contribution to *J.I.A.* **115,** 271, and also by A. E. Renshaw in his contribution to *J.I.A.* **115,** 299. Applied to hypertension the covariates were age at entry, year of entry, policy duration, blood pressure levels, weight and family history of cardiovascular disease. The new approach enables comprehensive statistical analysis, including model building, significance testing of model covariates and residual analysis and allows the association between excess mortality and interactions between the covariates to be assessed.

PERMANENT HEALTH INSURANCE: MODELS, RESULTS AND ISSUES

Mr Robert Plumb described the work of the PHI Sub-Committee of the CMI and its search for a methodology which would bring together the two approaches

to the analysis of sickness or disability data, the Manchester Unity method and the use of inception rates with disability annuity values. The result of the Sub-Committee's work is set out in detail in *CMIR* **12** published in 1991. Mr Plumb contrasted the strengths of the Manchester Unity method with its stability for short deferred period business and the emergence of surplus, and the alternative with its greater ability to deal with longer deferred periods and actual claim levels, both important in modern conditions. Group business, in particular, needs the latter approach for relevant costing and valuation purposes.

The second part of the presentation was concerned with the experience by cause of disability, illustrated by some otherwise unpublished experience relating to the years 1979/82. Table 1 shows the distribution of claims for individual business by various causes.

Table 1. *Cause of disability, individual males* 1979–82

Cause	Deferred period (weeks)				
	1	4	13	26	52
Neoplasms	2	3	7	7	7
Circulatory	8	10	19	26	28
Respiratory	24	5	3	3	4
Injuries	6	29	19	11	7
Mental	6	9	15	25	26
Musculoskeletal	11	17	17	14	7
Infections	11	4	3	1	4
Other	32	23	17	13	17
Total	100	100	100	100	100
Number of claims	6,261	3,600	1,041	462	180

The preponderence of respiratory claims at the shortest deferred period contrasts with those for circulatory and mental causes at the longer deferred periods. For group business, where only a minority of lives is medically examined, a comparison for a 13-week deferred period showed an even greater proportion of claims due to circulatory causes. Without disclosing any details, the speaker mentioned that one of the problems of collecting and interpreting claims data is that experience varies between offices to a considerable extent, anything up to 50% of standard experience. This reflects, not just differences in the underlying morbidity of different groups, but also differing policy wordings and attitudes to claims control.

Mr Plumb closed his presentation with a plea for more offices to contribute data to the CMI investigation, so that more reliable and representative results could be produced.

NEW DRUGS AND TREATMENT FOR AIDS

The talk by Dr Janet Derbyshire, Head of the Medical Research Council's

HIV Clinical Trials Centre, Royal Brompton National Heart and Lung Hospital, reviewed progress in developing new drugs to meet the AIDS epidemic, and was divided into two sections: firstly, a review of anti-retroviral drugs which attack the HIV virus itself; and secondly, drugs for the treatment and prevention of opportunistic infections resulting from the virus.

Since the virus was discovered in 1983, intensive efforts have been made to develop drugs which are effective against the virus. The first drug to be developed and used extensively is AZT, which has reduced mortality and morbidity in patients with AIDS or severe ARC, but has only prolonged survival temporarily. It has also had serious side effects on a significant proportion of patients. A number of other drugs are at various stages of development, but all so far have side effects on patients. Drugs which look promising under laboratory conditions do not necessarily prove to be clinically effective and safe. A major issue is to decide which drugs to take into clinical trials, with the hope that they prove to be more effective, or at least less toxic, than AZT.

Most patients with AIDS are taking one or more anti-microbial drugs for treatment of acute infections, or to prevent infections in the first place. As with anti-retroviral drugs, most of these drugs are associated with serious side effects, and further work is in hand to improve the situation.

Progress in combating or curing AIDS is clearly limited so far, but the medical profession and the pharmaceutical industry are devoting considerable resources to finding effective solutions.

AIDS ISSUES—AN UNDERWRITER'S VIEWPOINT

Mr Spencer Leigh concentrated upon the conflict between the wish not to discriminate against the homosexual community in society generally, and the need of the life assurance industry to underwrite sensibly, so that each risk group pays the appropriate level of premium for the risk carried. Alternatively, the life assurance industry needs to be able to limit anti-selection, so that the savings of policyholders and the solvency of the companies are not put at risk. To this end United Kingdom life offices, for the most part, are including specific questions in proposal forms together with a supplementary life style questionnaire for those groups of people deemed most likely to be at risk. Blood tests are also required for substantial sums assured or where other information indicates. Because many life assurance policies are for mortgage purposes, such enquiries soon impinge upon wider issues. Furthermore, it is claimed that individuals who should be encouraged to take a blood test to establish whether they are HIV positive are deterred from doing so, as they believe that by so doing they will not be able to obtain a mortgage, even if they have tested negative. This last argument has been hotly contested by the Association of British Insurers as being unfounded, but the debate continues with the various pressure groups, and with considerable publicity.

Reference was made to the approach adopted by the Australian life offices

where even more direct questions have been asked of proposers. However, from comments made by Mr Kevin Pike, an Australian member who was present at the Symposium, it seems that these questions have been somewhat modified in recent times.

In conclusion, Mr Leigh said it was of the greatest importance that underwriters were allowed to continue to underwrite, and that was not synonymous with discrimination. Otherwise proposers with such impairments as a history of heart disease or cancer would also be eligible for life assurance at standard rates, and that would strike at the very core of the nature of the business.

THE FUTURE OF PRIVATE MEDICAL INSURANCE

Dr Harry McNeilly, Director of Health Services, Private Patients Plan, said that in 1990, 11·7% of the population were covered, to some extent at least, by private medical insurance, and it has been estimated that this percentage may rise to 18% over the next 10 years. Despite this growth, the industry has had to contend with claims increasing in both numbers and amount, as well as a deterioration in expense ratios. The leading company in the business had produced a loss for 1990, but this had not deterred new players from entering the market. In the ensuing discussion, Mr Rodney Barnett made a plea for some pooling of data along CMI lines, to assist in the sound development of the business, a protection for existing as well as new players.

PRODUCT DESIGN IN PRIVATE MEDICAL INSURANCE

Mr David Campbell stated that, although proper product design was important, the control of claims cost was vital if the business was to be written on a sound basis. Currently in the U.K., claims costs are rising by 20% p.a. including inflation. The use of 'preferred providers' for various medical services with contracts with lower prices for increased volumes can stem cost rises, but well-trained claims control staff are also needed. This will also help in eliminating expensive and unnecessary surgical procedures and treatment.

The other half of the equation requires adequate pricing and underwriting, both at issue and on renewal. Price elasticity may not be so readily achieved in the next 10 years, especially if Private Medical Insurance becomes a mass market.

WHO GETS A HEART ATTACK OR STROKE?

Professor Gerry Shaper, Professor of Clinical Epidemiology, Royal Free Hospital School of Medicine, outlined the preliminary results obtained from the Regional Heart Study. This study covers 7700 men between 40 and 59 years of age, drawn at random from general practice in 24 towns in 1978 to 1980. The factors being monitored are age, smoking, systolic BP, ECG evidence, current chest pain on exercise, diabetes, body mass index [weight (kg)/height^2 (m^2)],

and family history of cardiovascular disease. Nearly 60% of heart attacks have occurred in the top 20% at risk according to these factors. Smokers (including ex-smokers) have a threefold chance of ischaemic heart disease in the next 5 years. Hypertensives (SAP 160+) have a double chance and those with raised cholesterol (7·2+ mmol/L) a fourfold chance. The study has also demonstrated that ischaemic heart disease is environmental and not by place of birth. Other indicators of risk of heart attack can be determined by simple questions on pain in the chest or calves on normal exercise. The main demonstration from these preliminary results is that monitoring by relatively non-technical criteria can identify individuals at risk in a straightforward and effective manner.

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