JIA 106 (1979) 289-297

SICKNESS EXPERIENCE 1972–75 FOR INDIVIDUAL POLICIES

ABSTRACT OF THE DISCUSSION OF *CMIR* 4 AT THE INSTITUTE, 23 APRIL 1979

Mr J. A. Cairns: I am here to represent the P.H.I. sub-committee of the C.M.I. and would like to thank the Institute for giving us this opportunity to present the results obtained so far in respect of individual business. A considerable amount of work has been undertaken since November 1969 when the Committee was formed and the present sub-committee would like to express their thanks to those Fellows of the Faculty and Institute who have previously served on the Committee and without whose effects the investigation might never have got under way. I refer to Messrs Biggs, Bond and Eschrich, the late Mr White, and also the original Secretary, Mr Clarke. We are also indebted to the Working Party that helped us on the graduation, namely, Messrs Garden, Hertzman and Orros, and we are particularly indebted to Mr Hamilton Jones: we are very disappointed that he is unable to be here tonight.

There have been difficulties in interpreting the results of the investigation, due in part to the rapid increase in the volume of business reported. During the investigation period, the number of policies rose from 138,000 to 202,000 or by about 45% over the 4 years without taking lapse rates into account. However, as will be seen from the paper, this increase in business was not the only underlying influence which created problems.

I should like to draw attention at this stage to Table Se 1.1.4 which shows the differences between the contributing offices: the classification between heavy, normal and light morbidity is probably clear enough. However, to examine consistency within an office the ratio of actual to expected was calculated for each calendar year and these results were then compared within each office. The range of actual to expected ratios at the foot of the table, however, is an inter-office comparison, each office having had a single value of actual to expected calculated for the 4-year period. The offices were then compared and the ranges are shown in the table. This demonstrates that the practising actuary must exercise caution in deriving premiums or effecting a valuation and that it is essential to use his knowledge of his own office's type of business.

At an early stage it had been considered that graduated results might be produced in due course, and the earlier parts discuss some of the problems experienced and how they were tackled. One basic problem was the limited knowledge about the distribution and variance of sickness and this is discussed in Part 1 of the paper. Considerable variability is demonstrated and may perhaps be inevitable in a type of insurance which is influenced by human intervention.

With regard to the graduation itself, the main aim is probably that the profession should have a useful working tool and at an early stage it was considered that a fairly simple Makeham-type formula should be looked at using the method of least squares in order to find its constants. It was considered that the method of maximum likelihood was inappropriate because of our lack of knowledge about the distribution of sickness and for similar reasons the χ^2 test was also thought inappropriate. Unfortunately, the age range in most graduations has to be limited, because of lack of data, to the ages 30-65 and the sub-committee has its doubts about the shape of the curves below age 30.

Perhaps as important as arriving at a formula to be adopted is the question of tests to decide whether the resulting graduations are successful or not, if χ^2 is inappropriate. Two tests were adopted. First a test was applied to the number of changes of sign between actual and graduated rates and, secondly, a comparison of the net premiums using the observed and graduated sickness rates. These tests were applied to the graduations derived using both quinquennial and individual age groupings. Normally the graduation using individual groupings was employed, unless there were good grounds for preferring the results of the tests for the quinquennial groupings. Much practical judgment is

required in the use of the graduations and the sub-committee would welcome comments not only on the graduations themselves, but also on their possible uses.

Parts 4 and 5 detail the results of the investigation by certain attributes. It may be felt that the results are of doubtful value and the sub-committee has some sympathy with this point of view. However, it was felt that there was a duty to report the results even though certain sections may at present have little value, as this report is intended to be the first in a series which it is hoped will appear at 4-yearly intervals. Even where results might be statistically unjustifiable it is interesting to see if a general pattern emerges, but we would again draw attention to the correlation that can occur as a result of single long-term claims influencing the results, particularly at the longer durations of sickness.

Some of the results were expected; for example, the experience of lives rated up on account of occupation is heavier than average. What is perhaps surprising was the absence of pattern when this experience was analysed by amounts of benefit. A number of approaches were attempted in order to discover a pattern, but without success. It is perhaps unfortunate that this particular analysis could not be effected by amount of benefit per life, rather than by policy or as a percentage of previous earnings, but this has to be accepted as one of the restrictions imposed on the investigation.

In spite of the fact that select morbidity rates appear to be higher than the ultimate ones at the younger ages, this must not be interpreted as suggesting that the sub-committee recommends abandoning medical selection! Part 5 also contains the comparison between male and female sickness rates.

We invite comments on the paper and would also welcome suggestions regarding further developments. We hope to be able to report in more detail on the experience of Group P.H.I. schemes soon; data has also been collected on the cause of sickness, which will be analysed in due course. In the longer term it is intended to look into the question of calculating disability annuities which, together with the inception rates, would enable calculation of premium rates and liabilities by the traditional American approach rather than in the 'Manchester Unity' style.

Mr G. C. Orros (opening the discussion): Table Se 1.1.2 provides a useful summary of the sickness experience over the period 1972–75. It is curious that the deferred 4 weeks, 13 weeks and 52 weeks sickness experience appears to indicate a worsening trend in morbidity, whereas the deferred 1 week and 26 weeks experience appears to indicate an improving trend. One would normally suspect that this may be partly due to a changing age-mix over the period. It appears, however, from § 1.1.2 that the age factor was not material.

§ 1.1.3, Table Se 1.1.3, and Tables 13 and 14, deal with the claim inception rates. With hindsight it seems a pity that the claim inception rates for deferred periods 13, 26 and 52 weeks were not computed per 10,000 exposure years, in order to produce at least two significant figures for each cell. Consequently, it is difficult to comment on the deferred 26 weeks section of Table Se 1.1.3.

§§1.2.3 and 1.2.4 provide a summary of the central moments of sickness rates. It is important to note that the data system truncates claims at the end of the calendar year. This has the effect of reducing the values of μ_2, μ_3 and μ_4, and thereby the usefulness of Table Se 1.2.3. The comparison of central moments for different sickness periods is also made difficult by the different number of weeks sickness to which each sickness period relates. For example, the ratios μ_2/z in Table Se 1.2.4, are related to number of weeks sickness counting towards each sickness period. One can correct for this by dividing μ_2/z by the relevant number of weeks sickness. The average of the high and low results for all deferred periods combined then becomes ·70 for sickness period 1/3, ·72 for period 4/9, ·79 for period 13/13, ·73 for period 26/26 and ·62 for period 52/52. It is likely that values for the longer sickness periods may have been understated as a result of the truncation of claims at the end of each calendar year.

In Part 4, the amount bands were not inflation-linked, it is worth bearing in mind that in 1975 the pound was worth considerably less than in 1972. A large volume of data has been presented here, but it seems difficult to draw any firm conclusions. I support the view in § 4.2.5, that a clearer picture might have been presented had benefits been analysed as a percentage of earnings. The table relating to analysis according to various attributes appear to be more useful. The sample of claims for some of these attributes is, however, small and it may be premature to draw firm conclusions at the present

time. It is, perhaps, worth noting that the *medical* and *non-medical* categories are dwarfed by the *unknown medical evidence* category. Again, the claim inception rates for deferred periods 13, 26 and 52 weeks would have been more usefully expressed per 10,000 exposure years.

§ 5.1.1 comments that the select experience for the age range 30–44 appears to be heavier than the ultimate experience, and then refers to American experience. It may be worth considering a sample survey approach in the UK to investigate the causes of lapse at younger ages. Perhaps one or two of the contributing offices might consider sending questionnaires to holders of lapsed policies. The proportion of female to male policyholders is increasing rapidly. The future female experience may be quite different from the past. I agree with the main conclusion of the paper that the deferred period has such a dominant influence that one has to regard each set of rates as a separate experience. Although each deferred period represents a different mix of offices, there must also be other factors causing the different experience of each deferred period. These factors will include the mix of risk attributes for each deferred period, such as rated-up occupations and policies subject to medical exclusions.

Mr H. A. R. Barnett: I disagree with the remark in the introduction that the time is not ripe for a well-authenticated standard table. If sickness rates are improving, there is no overriding need to project into the future, although some projection may be considered for competitive reasons. If sickness rates are worsening, it is still better to have a standard table based on current experience even if the user should tread warily. The latest standard table is based on a period of observation which expired over 80 years ago, was published over 75 years ago, and was based on the experience of just one society over 5 years. The present data have been collected from ten to thirteen offices each with an experience of 4 years. The sub-committee were right to collect data with many subdivisions and to publish many tabulations but they should not have fragmented the data into so many different cells. The graduation produced is on the right lines and should be the basis for a standard table, even if in a further 10 years it will be possible to produce a more sophisticated one. Can the sub-committee state that it will be more ready to produce a standard table after a further 4 or 8 years than they are now? If not, ought the profession to be kept waiting until the 1990s?

The sub-committee were not wholly satisfied with their graduation in Part 2. If they had had less trees in front of them, they might have been more successful in graduating the wood. The features in the commentary which stand out are, first, in § 2.6 that the inception rate is more amenable than the sickness rate to graduation by mathematical formula and, secondly, in § 2.4 that each deferred period needs to be treated as a separate experience. The inception rate is similar to the proportion sick within the first payment period, as confirmed by the similarity between the figures in the end column of Table Se 1.1.3 for deferred period 1 week, and the comparable figures in Se 1972–75 Table 13. The sub-committee might have had more success had they removed the proportions sick for each period of payment and each deferred period, and the average weeks of sickness per claim in each subdivision. Multiplying these two elements gives the sickness rate, and it is easier to operate on the two components separately than on their product.

Furthermore, the graduated average weeks of sickness could easily lead to calculation of disabled life annuity values, and a study of the two components separately could be a useful source of comparison between individual and group policies. If more data had been published, dividing the average sickness rates from Se 1972–75 Tables 1 to 12 by the inception rates from Se 1972–75 Table 13 produces a table of average weeks of sickness for the first period after the deferred period.

Dr S. Courant (a visitor): Tables 2.7.1(a) and 2.7.2(b) confirm the results of other studies in that even long after the end of the deferred period, policies with shorter deferred periods showed much higher claim costs than those with long ones.

The claim incidence rates do not greatly depend upon age for the shorter deferred periods. This is illustrated by Table Seg 3.4.4(b) where for deferred period 1 week there are only 54% more claims at age 60 than at age 30. However, for deferred period 26 weeks, the graduated incidence rate at age 60 is 19 times the one at age 30. At the younger ages, terminations, which are largely recoveries, are much higher. Consequently, any continuance table will show that the dependency on age increases with increasing duration of disability. However, the difference is particularly pronounced in this study.

The flatness of the curve at duration 1 week is surprising. The sad experience of very high mortality around age 20 is repeated in morbidity. Not only accidents cause this experience but also anti-selection and lower motivation to work.

Such observations could be arguments to advocate selling policies with long deferred periods. There is more cover per £1 premium under the long-deferred period policies, not only so because there are less expenses but also because there are less costs for claims where the ability to work is not beyond doubt.

As a visitor from abroad, I am struck by how low the published figures are: incidence rates compare very favourably with the Continent. Comparisons of sickness statistics from different countries should be made cautiously as policy conditions may be different. On the Continent most policies cover only the inability to perform the insured's own occupation or any similar occupation. Almost all offices in UK cover the insured's own occupation although usually with the restriction that the insured is not actively engaged in any other occupation. It would appear that the low rates experienced are not the result of more restrictive conditions. Undoubtedly a large number of factors contribute to the favourable situation, but I think that there are two main reasons, which are connected. One is the limited extent of social security coverage and the other is the avoidance of over-insurance.

The low claim costs for P.H.I. policies are very desirable for insurance offices, and there are equal advantages to the active policyholders. They can purchase their cover for reasonable premiums. The most striking counter-example is in the Netherlands, where claim costs are 10 to 20 times those shown in the paper, but so also are the premiums. Only a fraction of those receiving benefits are disabled according to policy conditions. Others are unemployed, enjoying an early retirement or are just unwilling to work. Insurance companies have suffered severely from this development but their position is safer as the premiums correspond to the claim costs, and most P.H.I. policies are sold on the guaranteed renewable adjustable premium basis. The good risks must ask themselves whether it is worth paying such an exhorbitant premium to cover a risk which they feel to be small.

It is of greatest importance to avoid such developments and there is only one way to ascertain that claim costs for P.H.I. remain low; those who work must be better off than those who do not do so.

Mr D. J. Bond: A major problem with the Manchester Unity tables was the wide fluctuation in experience. There it was largely between occupations. Now we have variations in the experience between offices, by deferred period, by rated occupations, by acceptance terms, by amount of benefit and by sex.

Despite all the reservations related to this experience, we ought to use the new graduations straightaway. If only the deferred period 1 week graduated rates and Table Seg 3.3.6 are used, we can produce net premiums close to those based on the actual ungraduated experience. The graduated rates in Table Seg 3.3.5 show that with the exception of the uncharacteristic features of deferred period 4 weeks, the Manchester Unity rates do not increase sufficiently with age. A flat percentage of AHJ for all ages in not appropriate. With the new graduated rates and the relative experience of their own office to the overall experience, actuaries have a better tool than the Manchester Unity AHJ table. Due to the extent of the variations in the overall experience a substantial margin for fluctuations should be taken.

I hope we shall have sufficient data to produce disability tables showing the proportion of claims commencing at age x recovering after duration t. At that time, graduated disability tables coupled with graduated claim inception rates can be used to calculate equivalent z tables so that offices can use either z rates or disability annuities and know that the two figures are consistent. They may use the disability annuities method for premium calculation and the z method for valuation. The attempt to graduate z itself is only a short-term expedient. We should concentrate on graduating claim inception rates and draw up and graduate disability tables.

Selection is much easier to deal with in claim inception rates than in z rates. Disability tables are partially select in that they start at claim duration *zero*. z rates are much more difficult to apportion between select and ultimate, partly because a claim in a select period can carry over into the ultimate period. Tables SA 5.1.1 and SA 5.1.3(b) are not helpful in that *like* is not compared with *like*. The ultimate rates include incapacity of duration 3 years and more, and there are few claims of 1 year's

duration in the select experience. A select period of 3 or even 5 years is inadequate if we are concerned with z rates. It is best to leave the consideration of selection until claim inception rates and disability annuity rates are available.

Lapses are a minor problem when dealing with level premium business. They could be significant with increasing premium business. The healthy 60 year old may not renew because of the size of his premium.

Mr R. H. Daw: The graduation formula used is an extension of Makeham's formula. In view of the comments in § 3.2.2. regarding the possible unsuitability of this formula, and the fact that I have not seen much evidence of pattern in the graduation constants in Table Seg 3.2.3(b), I wondered how a simpler formula might perform. The paper makes no mention of Makeham's formula, so I made two rather crude attempts to fit this formula to the 1972–75 experience for all periods of sickness with deferred periods of 1 week and of 13 weeks. I had to use ungraduated sickness rates for age groups as the figures for individual ages are not given. This also meant that no meaningful tests of these graduations could be made. However, the results suggest that Makeham's formula would be worth trying, but we must not forget the basic heterogeneity of the data.

Methods and tests for dealing with mortality data have been devised. We have to consider whether these can be applied to sickness data or whether they need to be modified or replaced. In § 3.3.4 doubts are expressed about the value of the runs test in view of the lack of complete independence in the crude sickness rates at adjacent ages. There is a similar interdependence between mortality rates at adjacent ages when the experience covers more than 1 year, since a proportion of the same lives are included in the exposed to risk at consecutive ages.

The r_x test devised by Redington and Michaelson has been used to test whether the variation of mortality rates follows the binomial distribution (*J.I.A.* **101**, 415). I should like to see whether a similar test can be applied to the sickness data. Table Se 1.2.3 could be used for this purpose, but again the sickness data at individual ages would be needed.

The only statistical test applied to the statistical graduation is one for the randomness of the runs of signs of deviations. This test takes no account of whether the numbers of positive and negative deviations found are reasonable. A further test of whether these numbers are satisfactory is needed, but again the nature of the data may make it of doubtful value. § 3.3.4 is not clear as to what departures from randomness need to be considered. As we are graduating with a mathematical formula which is perfectly smooth, we need not be concerned by too many runs. That would be due to features of the data, not of the graduation. We must, however, ensure that there are not too few runs, which could mean that the graduated rates departed too far or too systematically from the observed rates.

In applying the χ^2 approximation, high values of χ^2 arise from both too few and too many runs. If it is agreed that we need only test whether there are too few runs, high values of χ^2 arising from too many runs should be ignored. Thus the percentage significance levels given in Table Seg 3.3.4 need to be halved, so that $\chi^2 = 2{\cdot}71$ is taken as the 5% level, not the 10% level stated.

The runs test described in the paper is objectionable as a graduation test because it considers only the number of runs of positive deviations and ignores the number of runs of negative deviations, which can be either the same or differ by one. Were the test to be applied to negative deviations instead of positive, a different result would usually be obtained. When testing a graduation there is no reason for considering one kind of deviation rather than the other. Both should be brought into account. A test described by David (*Biometrika* **34**, 299) uses the total number of runs, and counts runs of both positive and negative deviations. For any number of deviations over about 20, the total number of runs can be treated as a Normal deviate with mean

$$\frac{2n_1n_2}{n_1+n_2}+1$$

and variance

$$\frac{2n_1n_2\,(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2\,(n_1 + n_2 - 1)},$$

where n_1 and n_2 are the respective numbers of positive and negative deviations, provided n_1 and n_2 are not too far from equal.

Mr J. H. Miller (a visitor): The principal investigation in the USA is the 1952 study of the experience of 1930–50 on ordinary disability benefits contained in life policies. Before the report was assembled, the companies had virtually all abandoned this business. Most were out of it by 1935. There was a long hiatus during which only four relatively small companies in Massachusetts wrote disability in life insurance or non-cancellable disability insurance.

After the last war other companies wrote the business but chose individual non-cancellable policies, although they followed the Massachusetts companies by generally including a benefit period. The benefit period is a limit on the length of time for which benefits will be paid for one continuous disability. There is a recurrent clause which distinguishes between a recurrence of what appeared to have been a completed disability or another occasion of the same cause. Over 90% of current business is with benefit periods of 2 years or less and elimination periods of 30 days or less. Hardly 10% is comparable to the P.H.I. with longer deferment periods and benefits payable at age 65.

The Manchester Unity tables have been used in the U.K. for over 80 years. This is preferable to what has happened in the United States. We have had a number of tables which have nearly all been obsolete before publication. In my judgment it is better to stick to a known table and modify it as experience indicates, rather than adopt a new table that may be little better than the old.

The two-contingency system of the inception rate and the annuity has many advantages. However, it can obsure much and for the purpose of analysing statistics it is safer to use a one contingency function.

I was interested in the plans to develop claim rates which will involve the disability termination rates. Mr E. E. Cannock converted the Manchester Unity table into a form similar to the C.P.T. table (*Casualty Actuarial Society* VII). A committee of the Society of Actuaries is developing new tables, but only on disability termination rates. Later we shall deal with inception rates. We see advantages in taking them separately, because in developing termination rates you can start from this point and work backwards. Even so we find the data beyond the second year of disability is scanty. Although this is individual policy business, we shall probably use the group long-term disability experience to achieve a larger volume. This experience, for which there is a good volume of 3 months and 6 months deferment business and a slight volume of 12 months, exhibits the same characteristic of deferment period selection. It is harder to explain in group insurance than individual policies, but it is there. There is no strong evidence in our 8 years of published experience of any convergence. As a practical matter we think we could converge the termination rates after about 5 years of disablement.

American statistics demonstrate that in the first year of disability women have a higher termination rate of lower average duration than men, but the ratio diminishes after 1, 2 or 3 years and then seems to level out. Thereafter the termination rates for women are considerably lower than those of men. This is partly because women's mortality is better among disabled as well as healthy women. In the first few years recovery is the dominant factor and the balance changes once mortality becomes dominant. Obviously women have a higher recovery rate in the early years, and this appears to be the case in European statistics also.

Mr A. E. J. Jefferies (a visitor): P.H.I. started in South Africa 10 years ago. It has grown rapidly and has run an extraordinarily favourable course even weathering the recent recession. The legislative background is favourable as premiums are fully deductible from taxable income, all benefits are fully taxable as earned income, and social security benefits are means-tested. The insurer knows where he stands when he sets maximum benefit in relation to earnings prior to disablement.

Every company in South Africa has followed the principle that there should be a limit of 2, and in

one case 3, years after a claim commences during which 'own occupation' is the criterion for determining disability. After that any reasonably suitable occupation becomes a criterion, which has given offices the opportunity to control otherwise intractable long-term claims. Morbidity experience has been universally favourable, although expenses have been very high. The principal preoccupation of the sub-committee in the U.K. has been to deal with problems of over-insurance created by a large market in lump sum acceleration-type disability benefits payable on permanent and total disablement. The interaction between P.H.I. and P.T.D. benefits is creating seemingly insoluble problems.

The paper has shattered an illusion about P.H.I. I imagined that the selective effect of underwriting this class of business would be greater in relative effect and last longer than for ordinary life insurance. We underwrite the business more severely than life assurance, and our underwriting procedures are better geared to picking up the chronic health problems which figure prominently as causes of disability claims. A medical examination should pick up incipient heart and circulatory problems, and the private medical attendant's report should show nervous and mental problems, two great factors in disability insurance. Accidents and incipient cancer are major causes of death but they are not readily discoverable by medical examination. They are not in the long-run significant causes of disability, as the duration of claim tends to be short.

Which factors have caused the initial selection process to be not only neutralized but apparently defeated? The paper suggested that people with lapsed policies are the less prudent ones, and that those who retain their policies are the more prudent and are more subject to personal discipline when there is the opportunity to stay away from work for trivial reasons.

Selective lapsing may be a reason for the effect that has been demonstrated, but I offer two other possible reasons. The first is inflation. It has been established from American experience that benefit levels in relation to income prior to disablement affect claim ratios. The higher the replacement ratio the greater is the claims ratio. This is based on experience under group insurance, but I suspect that a similar relationship exists in individual business. In inflationary times the replacement ratios are likely to be higher just after a policy is effected, and then to fall steadily in real terms until the benefit becomes such as to impose a severe restraint on the marginal claimant. If all else were equal this would lead to a higher initial claim ratio, and a steady fall in the ratio of actual to expected with increasing policy duration. This is bad news for P.H.I. insurers if ever we get back to non-inflationary conditions and reflects the feeling that inflation is on our side in P.H.I. business.

The second reason is positive anti-selection by the client wearing off with time. There appears to be a class of insured who becomes a claim very quickly, and an underwriter might kick himself for not having spotted a tell-tale sign of incipient trouble. There is one simple underwriting tool which would eliminate anti-selection namely to ask the proposer whether he sought the insurance himself or was talked into it. Impracticable though it is, it would be wise to instruct underwriters to decline all proposers seeking this insurance without having been 'sold' the cover. I suspect that some adverse selection may be attributable to a group of proposers who are more enthusiastic about this type of cover than insurers would like.

Mr C. S. S. Lyon (closing the discussion): Izaak Walton wrote in *The Compleat Angler*: 'Look to your health; and if you have it, praise God, and value it next to a good conscience; for health is the second blessing that we mortals are capable of; a blessing that money cannot buy.' Lack of money during sickness can greatly increase the suffering. P.H.I. compensates for loss of earnings when sickness strikes, and so it should be more popular. Saving for retirement, and insurance against premature death, are but two legs of a three-legged stool. Protection against loss of earnings through disability is the third leg. Without it the stool is deficient as a means of support. The family of a breadwinner who becomes incapacitated for a lengthy period may suffer greater financial hardship through lack of P.H.I. cover than if he died well-protected.

Because P.H.I. has been such a narrow market, the data for establishing the experience has not existed in sufficient quantity. This has deterred many life offices from entering the field, thus preventing the broadening of the experience. The problem is made more difficult by the many variables involved. Mattson and Unneryd (*Proc. 18th International Congress of Actuaries*, **2**, 528) wrote that: 'Experience shows that the probability of falling ill and staying ill in the sense of the general insurance conditions strongly varies not only with age, sex and occupation but also with

income, degree of compensation, social status (employer, employees, wage earners, housewives). It is not only the risk of contracting a disease or being subject to an accident that varies but also the consequences of a disease or an accident on the insured's ability or will to work.' The paper under discussion states that 'The root of the problem is that we are dealing with events involving human intervention at every stage.' It adds that different offices intervene differently, as is apparent from the *Policy Holder's* annual P.H.I. review. This provides at least part of the explanation for the variations in morbidity from one office to another as shown in Table Se 1.1.4. We must not overlook the geographical as well as the occupational variations in sickness experience shown by our national statistics. The sources from which an office draws its new business dictate the severity of its subsequent morbidity experience, and the advent of new offices with different distributions of new business could well affect the overall experience and induce a secular trend.

Nor can the disparities in claims handling be overlooked. Here the definition of disability is clearly important. Beaudelaire wrote that 'it is necessary to work, if not from inclination, at least from despair'. Samuel Butler put it differently: 'I reckon being ill as one of the great pleasures of life, provided one is not too ill and is not obliged to work till one is better.' When disability is severe, permanent and degenerative the definition of incapacity matters little, but what variations in sickness durations are caused in other cases by the difference between 'own occupation' and 'any occupation' as the criterion for incapacity to return to work?

Another important factor is the availability of rehabilitation services. International studies have shown that the earlier a proper course of rehabilitation is begun, the more likely it is that the victim will be able to maximize his residual potential. Offices in the United States transacting disability insurance pay greater attention to rehabilitation than those operating in the U.K. M. Courant expressed surprise at the lightness of our experience and thought it resulted from the limited extent of social security and the avoidance of over-insurance. Could it not also be that our social security system does not pronounce people to be permanently disabled?

Although the sub-committee did not have data for analysing the 1972–75 experience according to the definition of disability they have made some special studies. One is by size of benefit, bedevilled though this is by the effect of inflation. Mr J. H. Miller, in a paper to the 1972 Congress in Oslo wrote: 'We may surmise that the level of benefits, both in absolute amount and in relation to earnings . . . exerts an important influence. The only known published data bearing on this point are from a limited experience of one company, indicating that, except for risks that were superior in every respect, the claim cost rose markedly as the benefit level increased.'

For non-permanent incapacity, Swedish national statistics showed that the incidence of sickness claims was substantially greater for the middle ranges of benefit than for either the lower or the higher ranges of benefit. However, for individual P.H.I. policies in the U.K., the sub-committee provisionally conclude, at least for males, that there is no particular tendency for sickness rates to vary with size of policy. Nor is this conclusion changed when inception rates are examined. Is the heterogeneity of the data masking the effect or are individual policies in the U.K. really different?

The sub-committee's analysis of the experience by other attributes is interesting. Sickness experience in the Republic of Ireland is considerably heavier than in the U.K. underlining that there are probable geographical variations within the U.K. itself.

Non-medical experience emerges as more favourable than medical except at the older ages, and the sub-committee suggest that, at the younger ages, it is the lives who appear less healthy that are asked to attend for medical examination.

There is a case for regarding the deferred period as an attribute. As Mattson and Unneryd remarked, 'the probability of falling ill is greater for those with policies with shorter waiting periods. This is statistically very clearly observed and is mainly explained by the fact that persons from different risk groups choose different waiting periods . . . thereby it has been possible to tackle one of the differences between the risk groups that it is otherwise difficult to get at.' But M. Courant pointed out that the extent of the difference between the deferred periods in the U.K. experience is startlingly large. What differences in the risk group could possibly explain it?

What can I say about female P.H.I. experience after having heard the Chairman of the Equal Opportunities Commission holding forth on this subject at great length but with little reason? I should perhaps remind you of the Spanish proverb 'The fear of women is the basis of good health',

which doubtless fully explains the more favourable experience that the sub-committee attributes to men, and to draw attention again to Mattson and Unneryd who said that a loading of 30% was added to inception rates in the premium basis for women. This was probably too low, but the loading of 50% used in earlier bases had come to seem prohibitive. They wrote that: 'The question hereof has even been raised in the women's rights discussions.'

The sub-committee had great difficulty in putting the sickness experience into a form susceptible to graduation. Although the deferred period is an important factor influencing the rates, each component period of sickness mixes business of very different durations.

They reported that inception rates are more consistent than the sickness rates, and that the inception of a claim is less influenced by subjective reactions than are subsequent events. However, Mr Miller wrote in his Oslo paper that 'whether analysed by economic cycles, occupational hazard, or early claim experience, the variation is greater in the claim rates than termination rates. Since the rate of recovery from disability is related to the duration of disability even more than to age, select rates of recovery should be used. It therefore takes years for the complete unfolding of the experience as to recoveries, which is required for the claim evaluation.'

Mr Miller has now disclosed that this method could conceal as much as it revealed, and feels that single-statistic methods have advantages. Here he echoes Rolf Sand of Norway who, writing for the Munich Congress, was particularly concerned about the difficulty of obtaining reliable estimates of termination rates based on experience. 'Even if a long period of observation is used . . . the number of insured lives still disabled after, say, three or more years of disablement is frequently too small to give a significant estimate. . . . In practice, therefore, the rates of termination for durations (greater than 3) in a premium basis have as a rule been based more or less on hypothesis.' He declared himself in favour of an approach adopted in Norway which is similar to our sickness rate approach or, at least, proportion-sick approach although it groups all periods of sickness together. Because of that a select period of something like 10 years has to be used.

The Senior Vice-President (Miss M. C. Allanach) proposed a vote of thanks to all those who had been involved in the preparation of the paper.

Mr Cairns replied briefly, and subsequently wrote as follows:

During the discusssion Mr Barnett suggested that the sub-committee might have found it simpler to graduate the proportion sick for each period of payment and each deferred period, and the average weeks of sickness per claim for each subdivision. The information to do so was not available as it was always the intention that the early reports would concentrate on reporting the cumulative experience by Manchester Unity type methods and at a later stage adding an investigation on a disability annuity basis. Mr Barnett's suggestion is noted and the disability annuity statistics that are being accumulated at the moment will certainly enable such a method to be considered in more detail.

He also drew attention to the anomaly in the age group 18–19, deferred period 4 weeks and sickness period 4/9 where the actual sickness divided by the number of claims arising exceeded 9 weeks. This phenomenon can appear when the number of claims is small, however, if short-term claims are in existence when the investigation period commences. The corresponding inceptions are then not included in the investigation as they did not occur during the period of the review.

Mr Daw made a number of interesting comments and asked whether the basic data could be made available. In general, the sub-committee is prepared to consider releasing the basic information to anyone wanting to do such further research and Mr Daw suggested certain lines on which further research might be carried out by anyone so interested. In the meantime the sub-committee is trying out some further formulae in an attempt to improve on the graduation presented in *C.M.I.R. 4* and at the same time reconsidering the validity of the tests. In due course it is hoped that it will be possible to offer guidance to offices which currently base premium calculations and valuations on the Manchester Unity table, the shape of which is no longer appropriate without adjustments.