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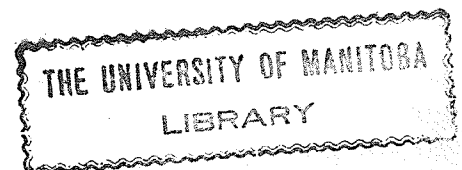
COMPILATION AND GRADUATION
of
STATISTICS RELATING TO THE DISABLEMENT
of
LIVES

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COMPILATION AND GRADUATION OF STATISTICS RELATING TO THE DISABLEMENT OF LIVES

The role of the science of statistics is becoming increasingly important, not only in the academic world, but also in the business world. This is perhaps true in the life insurance business to a greater extent than in other fields. Where insurance companies formerly carried on their operations relying upon the judgment of their officials, they are seeking more and more to base their conclusions upon the deductions to be obtained from statistical data. Such data are now being compiled and used on as nearly a scientific basis as possible.

One of the comparatively new fields into which life insurance companies have entered is that of the granting of certain benefits to their policyholders who pay an extra premium therefor, upon their becoming what may, in general, be termed "totally and permanently disabled". The definition of such disability differs from company to company, and the benefits allowed upon disability also vary. While there are differences between companies, each company does its best to obtain a homogeneous experience by treating all cases that arise in as uniform a manner as possible.

It is not the purpose of this thesis to give a history of the writing of disability benefit insurance, or of the benefits allowed, or premium rates charged, or of the difficulties experienced in this field of insurance, but rather to give illustrations of how statistical data along this line are compiled and graduated, in order to be of the most use to the company.

Specimen Disability Benefit Clause.

Nevertheless, it is essential that something be said about the disability benefit clauses inserted in life insurance contracts. A typical modern clause, issued by one company, reads as follows:

"If, after one year's premiums shall have been paid on this policy and, before default in the payment of any subsequent premiums, the insured shall furnish to the Company due proof

that, before attaining the age of sixty, he has become wholly disabled by bodily injury or disease so that he is, and thereby will be permanently and continuously unable to engage in any occupation whatsoever for remuneration or profit, and that such disability has existed continuously not less than sixty days prior to the furnishing of proof, thereupon the Company will grant the following benefits:

A. Waiver of Premium. The Company, by endorsement hereon, shall waive the payment of the premiums which thereafter may become due under this policy during the continuance of the said total disability of the insured. In making any settlement under this policy, the Company shall not deduct any part of the premiums so waived, and the non-forfeiture values of this policy shall increase from year to year in the same manner as though any premium waived under this provision had been paid in cash.

B. Annuity Payment. Furthermore, the Company will pay to the insured a monthly sum equal to one one-hundredth of the face of this policy, the first monthly payment to be made six months after receipt of due proof of the said total disability, accompanied by this policy for endorsement, and subsequent payments monthly thereafter during the continuance of the said total disability of the insured prior to the maturity of this policy. The Company will admit the age of the insured when furnished with satisfactory evidence of the date of birth, and reserves the right to require such proof of date of birth at the time proof of disability is furnished. The amount of the policy, payable at maturity as an endowment or as a death claim, shall not be reduced by any payments made under this disability provision."

(See "Total Permanent Disability Benefits in Relation to Life Insurance", by Arthur Hunter, pages 6 and 7)

In almost all cases, it is stated that the loss of both eyes, or of both hands, or of both feet, or one hand and one foot, shall be considered as total and permanent disability, even though such loss may not prevent the person from carrying on any occupation.

The above disability clause is not the most modern and liberal now in use. A more liberal clause provides that total disability shall be considered to be permanent after it

has continuously existed for ninety consecutive days, and that the benefits allowed by the clause shall commence at the end of that period, or one month later.

Principles Governing an Investigation into a Disability Experience.

The policyholders of an insurance company who are not disabled so as to be eligible to receive the disability benefit are termed "active lives". Those who are so disabled are termed "invalid lives", or "disabled lives". Two of the most important factors entering into the determination of the scientifically correct and adequate premiums to be charged by an insurance company for its disability benefits are the rate of disability among those exposed to risk of disability, and the rate of recovery and death among those disabled. "Withdrawals" among disabled lives may be defined as the sum of the deaths and recoveries among such lives. When they have sufficient data, companies are more and more investigating their experience as to their rate of disability and of withdrawal.

In making an investigation to determine the rate of disability, a company includes only those policyholders who have the disability benefit clause attached to their policies. Other policyholders would have no incentive to report their disability, and the company could not obtain accurate data in connection with them. The policyholders who have the disability clause in their policies may be relied upon to report their disability.

An investigation of a disability experience may be made by policies, by lives, or by amounts. An investigation by lives is rather laborious, as it is rather difficult to eliminate all but the first policy on each life. Such a method is also not adapted to the construction of select tables. An investigation by policies is more convenient, and usually satisfactory, but does not give the actual monetary effect of the company's disability experience, as the amounts of the policies vary greatly. An investigation by amounts, although it will quite likely present certain irregularities or distortions, will give this monetary effect in which the company is primarily interested. As far as financial effect is concerned, it makes no difference to the company whether one policy for \$10,000, or ten policies for \$1000 each, become disability claims. Below are given the details of an investigation into the rate of disability, based upon amounts insured.

If the amount of the data was at all large, it is likely that the statistics would be compiled with the help of perforated cards, and electric sorting and tabulating machines. If these aids were adopted, and if the investigation was based upon amounts, instead of upon lives or policies, a card would be perforated, by means of perforating machines, for each policy included within the investigation, and the amount of insurance, taken to the nearest hundred dollars, would be punched on the card. Illustration number one shows a blank card to be used in this connection.

A great deal of data is included on the disability investigation card. In the Illustration, the amount of insurance on which the disability benefit is based is punched in columns 15, 16, and 17. The card provides for an amount of insurance only up to one hundred thousand dollars. The policy number, which is punched in columns 9 to 14 on the card in the illustration, is necessary for identification purposes. The information punched on the card is obtained from the company records, generally from certain record cards, one of which is kept for each policy. The sex is punched in column 18, the code being, in the case of the card shown in Illustration number 1:

Male		Punch out the "0" of column 18
Single Female	" " " "1" " "	18
Married Female	" " " "2" " "	18

The agencies of the company are numbered and the code number is punched in the next three columns. The year of issue, as indicated in the next two columns, is self-explanatory. The codes for the plan and for the residence are indicated next. The age at issue comes next, and the class, whether standard or sub-standard, is indicated in column 31.

The occupation, punched in the next two columns, may be used as a basis for a further investigation of the experience in regard to occupations. These occupations are grouped into only a few broad classes. The build of the insured, that is, the relation between his height and weight, is punched on the card, as it is believed that it influences, to a certain extent, the likelihood of his becoming disabled. For example, it has long been recognized that young underweights are much more susceptible to tuberculosis than those who are older and somewhat overweight. Column 36 gives the impairments in the family history of the insured which have a bearing on the risk of disablement. The next four columns indicate the particular form of Double Indemnity and Disability Benefit clauses contained in the policy.