
Total Permanent Disability Benefits in Relation to Life Insurance

Hunter Arthur

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ACTUARIAL STUDIES

NO. 5

TOTAL PERMANENT DISABILITY BENEFITS
IN RELATION TO LIFE INSURANCE

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GENERAL INTRODUCTION.

In view of the fact that, with the exception of a very few modern text books, the literature of Actuarial Science is contained in scattered original papers, The Actuarial Society of America proposes to issue a series of small volumes upon important actuarial subjects. Each volume is intended to bring together, as far as space permits, the more important points of information on the subject discussed. The objects in issuing the series are twofold: (1) to assist students of Actuarial Science, and (2) to furnish a means of ready reference for Actuaries. The various subjects are allocated to Fellows of the Society by the Committee in Charge; and, associated with the principal contributor, who is primarily responsible for the matter included and the views expressed, are one or more "Associate Contributors." These are appointed for the purpose of aiding and criticizing the work before publication. It is proposed to avoid discussing subjects already covered in the Text Book of the Institute of Actuaries except as continuity of thought may make occasional references necessary. The title chosen to represent the character of this series is "Actuarial Studies."

The thanks of the Society and of the Committee in Charge are due to all the contributors who have freely given of their time and labor, with the sole purpose of helping others—especially students.

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PREFACE.

The first draft of this study was completed more than six years ago. As there has been such a great liberalization and expansion in the last three years in Permanent Total Disability Benefits it is fortunate that the study was not then published. During 1918 it was accordingly necessary to rewrite this study and to extend it greatly. The associate contributors for the original study were Franklin B. Mead and Sidney H. Pipe. Owing to warfare conditions they have not been able to help with the revision.

Arthur Coburn, William Macfarlane and Adolph A. Rydgren have rendered valuable services in the preparation of this study.

As few companies, none of large size, had any form of disability benefit in their policies prior to 1910 the amount of experience on this valuable adjunct to life insurance is limited. It is accordingly recognized that some of the information in this study may be found to be out-of-date in a few years, if the companies give their experience to the actuarial profession.

A. H.

15th April, 1920.

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TOTAL PERMANENT DISABILITY BENEFITS IN RELATION TO LIFE INSURANCE.

This study deals with benefits to the insured in the event of his becoming totally and permanently disabled, and does not consider total disability of a temporary nature or partial disability of a permanent kind. As examples of these three we might consider incurable insanity as total and permanent disability, typhoid fever as total disability of a temporary nature, and the loss of a hand as partial disability of a permanent nature. Provisions regarding the first mentioned are frequently made a part of life insurance policies, and are not usually covered by separate contracts. The first policies containing this form of insurance appear to have been granted in Germany in 1876 and by American fraternal orders in the succeeding year, but were not adopted by any regular life insurance company in the United States until 1896, and not generally until 1907 and thereafter. Germany has been the principal exponent of this feature, a majority of the companies granting it in one form or another. In Russia a number of companies grant it, while in Britain a very few companies make use of the feature. It is not the intention to give a history of disability in the various countries in Europe, because the conditions are rapidly changing and a statement of the facts at this time would probably be of little value. References to the history may be found in the contributions to the *Transactions of the Actuarial Society* by C. W. Jackson (X, 490), and F. B. Mead (XI, 304). We shall have occasion to refer to these papers in other connections and also to those of S. H. Pipe (XI, 172 and XIII, 20), Arthur Hunter (XII, 44 and XIX, 219), F. B. Mead (XII, 75), E. B. Fackler (XII, 241), J. F. Little (XIV, 55), G. Bohlmann (XV, 77), E. B. Morris (XV, 98), Mervyn Davis (XVII, 211) and J. B. Gibb (XVIII, 122). The notation and formulæ were first developed by E. Hamza in a paper delivered before The Third International Congress of Actuaries (p. 154 of the *Transactions*).

Hereafter, when the word "disability" is used, it will cover total and permanent disability unless otherwise specified.

DISABILITY PROVISIONS IN LIFE INSURANCE POLICIES.

PRINCIPAL TYPES OF DISABILITY BENEFITS.

The following are the principal types of disability benefits appearing in the policies of life insurance companies:

1. Waiver of future premiums only.
2. Waiver of premiums and payment of the sum insured in equal instalments over a period of 10, 15 or 20 years with the balance of the insurance payable in one sum if death occur before all the instalments have been paid.
3. Waiver of premium and payment of an annuity, usually 10 per cent. annually or 1 per cent. monthly, of the sum insured, during the lifetime of the insured while disabled or to the maturity of the contract, and payment of the face of the policy at maturity or death.

With regard to 2, when disability benefits were introduced in America, a number of companies granted a somewhat similar benefit, the insured upon disablement being required to select one of two options:

- (a) Waiver of premiums during permanent and total disability, the sum insured to be paid in full at death or maturity; or
- (b) The policy to mature at once and the proceeds to be payable in instalments for 10, 15, or 20 years, the aggregate amount of such instalments being the sum insured.

The values of these options at disability vary in relation to the death rate amongst disabled lives. If the insured upon disablement selected Option (b) and died soon after, the beneficiary would only get the instalments or their present value, whereas under Option (a) the full sum insured would be payable; consequently Option (b) led to dissatisfaction. There is no proper basis for the calculation of premiums and reserves for this type.

With regard to (3), if the proportion of the sum insured which is payable as an annuity be taken as d , the rate of discount, it follows that the benefit is equivalent to maturing the policy, because provision is made for interest in advance annually to death or end of endowment period. Maturity of the policy therefore appears as a particular case of benefit (3), and the formulae developed for (3) may be applied by taking an annuity of d times the sum insured and considering it payable annually

in advance from the date provided for maturity, generally six months after the filing of proof of disability. It should be noted, however, that the case of term insurance furnishes an exception. Here the loss to the company at the disability of the insured must also comprise the pure endowment required at that time to mature the policy at the end of the term as that is not provided in the original contract.

There are many variations of the three foregoing principal types, and a number of special types, but these are generally confined to single companies. Several companies in Europe agree that in the event of the insured being totally incapacitated for two or more months, they will waive such proportion of the next premium as the period of total incapacity bears to the period covered by the premium. This may include either temporary or permanent disability, and so far as it partakes of the nature of the former will not be considered in this study.

With few exceptions the wording of the clauses in the policies covers the inability to follow *any* business or profession, because a slight injury might prevent carrying on a particular occupation, but permit engaging in an equally advantageous business. This does not mean that the companies rigidly refuse to allow the benefit because *some* occupation could be followed, if the insured fitted himself for it, but is intended to prevent a claim under inability to follow one occupation when the insured has changed to another, which he can follow successfully. In Europe where there are much greater difficulties in the way of changing one's vocation, the policies occasionally specify inability to follow the occupation in which the insured was engaged at the time disability occurred. While this would increase only slightly the cost to the company in Europe, it would be of greater moment in the United States or Canada, and more likely to cause controversy with the insured.

It is customary to provide in the policies that the full benefit will accrue only if the disability occur before a certain age, usually 60 or 65. This is advisable, not only because the rate of disability due to disease increases greatly at the higher ages, but because of the difficulty of differentiating between sickness and the effects of old age.

Examples are now given of clauses covering the three foregoing types of disability benefits.

Type No. 1. Waiver of Premiums.

The premium payable by the terms of this policy includes an additional premium of dollars, payable for full years, or until the prior death of the insured, and in consideration of the payment of such additional premium the Life Insurance Company hereby agrees to the following waiver of premium in the event of permanent total disability. If the insured, after payment of premium for one full year and before default in the payment of any subsequent premium, and before attaining the age of sixty-five years, and while this policy is in full force, shall furnish due proof to the company, at its home office in the city of, that he has become wholly disabled by bodily injury or disease so that he is and will be permanently and continuously prevented from performing any work for compensation or profit or from following any gainful occupation, the company will waive payment of each premium as it thereafter becomes due during the continuance of such disability. The premiums so waived shall not be deducted from the sum payable under the policy, and the values provided for under "Non-Forfeiture Provisions" and in the "Table of Loan, Cash, Paid-up and Extended Insurance Values" shall be the same as if the premiums had continued to be paid in cash to the company regularly when due. Provided that, notwithstanding proof of disability may have been accepted by the company as satisfactory, the insured agrees that any medical examiner appointed by the company shall be allowed opportunity, not oftener than once a year thereafter, to satisfy himself by examination of the person of the insured as to the continuance of the disability, and if it shall appear to the company that the insured is able to perform any work or to engage in any occupation whatsoever for compensation or profit, no further premiums will be waived and all premiums thereafter falling due shall be paid by the insured in conformity with the terms of the policy. Irrespective of any other cause of disability the entire and irrecoverable loss of the sight of both eyes, or the severance of both hands at or above the wrists, or of both feet at or above the ankles, or of one entire hand and one entire foot, shall be considered as total and permanent disability within the meaning of this agreement, and the