



SOCIETY OF ACTUARIES

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Environment

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poisoning is well known, but others representing real or potential hazards include nickel, cadmium, beryllium and mercury. It is stated that in North America since 1923 the automobile has added about 5,000 million kilograms of lead to the atmosphere from which it eventually reaches man. Some of the metals are released as or are eventually converted to volatile, organic forms and hence more active in the biological and genetic sense.

The problems are the long term effects as hereditary changes, cancer induction and degenerative cellular effects leading to poor health and the production of abnormalities. The ability of certain chemicals to alter hereditary material has been known for three decades, but even geneticists were reluctant to appreciate the consequences. Only in recent years has general recognition been given to the danger. In the U.S.A. the *Environmental Mutagen Society* was founded. The dissemination of relevant knowledge should be beneficial.

Mankind has always been exposed to toxic agents naturally present in the environment, including foods. However, advances in science and technology have led to their extraordinary growth. Further, unlike earlier eras, the fraction of the total population being exposed has approached 100% because of easier communications.

One of the sections of the report is headed, "The Relation of Cancer Induction and Genetic Damage." The following quotations are from this section. (1) "It seems likely that exposure to environmental chemicals is the determining factor in the causation of many types of human cancer." (2) "... chemicals which modify genetic material may cause a variety of diseases of unknown etiology, such as chronic degenerative diseases and congenital abnormalities."

The difficulties of research in this area is illustrated by the following quotation: "... it is difficult to predict with confidence the genetic effects of chemical exposure by man. Some uncertainty will always remain unless observations are made on man himself. Human metabolism is different in many details from metabolism of other mammals ..."

This report is in the *Society Library*. Copies can be obtained from *Svenska Försäkringsbolags Riksförbund, Att.: Olle Grönstedt, Strandvägen 5 B, S-114 51 Stockholm, Sweden.* □

TO BE CONTINUED

Editor's Note: This is another in the series of articles from the Committee on Continuing Education and Research. Comments will be welcomed by the Committee and the Editor.

Social Security Approval Rates

by Richard C. Murphy

In the development of a group long term disability (LTD) premium scale it is necessary to consider the level of credit that should be given for offset of Social Security benefits. The amount of the Social Security award and the proportion of LTD payments that will be made while the individual is receiving that award should be considered. In this article I will describe how a study of Aetna Life experience was made to determine the percentage of LTD payments made during the time of Social Security receipt and will present some of the results of that study.

The study analyzed 8,000 claims incurred under contracts that reserve the right to offset the amount of the Social Security benefit being received. The Social Security benefit that is considered is usually both the disability benefit (primary and family) and the early retirement benefit (primary and family). While the right of early retirement offset is used infrequently, it appears that there may be a considerable number of individuals first disabled between ages 60 and 64 who are applying for this early retirement benefit after their disability application has been denied by Social Security. In some cases there is a financial incentive for the individual to apply for this benefit since some LTD contracts may not offset the Social Security benefit until the sum of the LTD and Social Security benefit exceeds a high percentage of salary.

The available claim records did not include the Social Security effective date and so it was not possible to directly determine the approval rates. Analysis of individual claim records showed that in better than 95% of the cases examined the Social Security award amount reflected retroactive payment to the 6th month of disability regardless of the point in time at which the award was actually made. Each claim was examined as of a particular point in time on a retrospective basis so as to reflect the frequency and importance of the retroactive Social Security award. The procedure used examined claims as of the duration attained in December of year Y-1 by capturing the Social Security approval status from the claim records available in March of year Y+1. Claims terminated before March of year Y+1 received the Social Security status effective at the time of claim termination.

Claims were grouped in intervals according to their attained duration as of December 31, Y-1. The duration intervals are 6-9 months, 9-12 months, and so on to 48 months and over. For each of these duration intervals the ratio of approved claims to total claims was calculated for age at disability brackets—less than 40 years, 40-44 and quinquennially to 60-64. Finally, financially effective approval rates used for the Social Security offset credits were developed from the formula:

$$\begin{aligned}
 & {}_{6-9}k_x \frac{N_{x+6\text{mos.}} - N_{x+9\text{mos.}}}{N_{x+6\text{mos.}} - N_{65}} + \dots \\
 & \dots + \frac{{}_{30\text{mos.}}k_x}{\text{over}} \frac{N_{x+30\text{mos.}} - N_{65}}{N_{x+6\text{mos.}} - N_{65}}
 \end{aligned}$$

In this formula k_x represents the proportion of approved claims for duration interval y and age group x . The N_x functions were taken from the Aetna LTD reserve basis. They can be closely approximated by a reserve basis developed from the intercompany LTD experience presented in the 1972 Reports.

Table I shows the December, 1971 approval proportions for duration 12-14 months and 24-29 months as well as the financially effective approval rates developed from all the claim intervals.

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TABLE I Social Security Approval Proportions

Age	12-14 Mos. Duration	24-29 Mos. Duration	Financially Effective
<40	52%	64%	73.0%
40-44	54%	70%	78.6%
45-49	68%	82%	83.7%
50-54	75%	82%	87.6%
55-59	80%	88%	89.2%
60-64	86%	95%	88.8%
Total	73% (802 claims)	84% (1260 claims)	

Although the number of female claims does not justify development of financially effective approval rates differentiating by sex, the approval proportions for females were separately calculated and are shown in Table II. Table II shows the relative approval proportions by industry, by case average monthly salary and by employee contribution status. With the exception of the sex approval proportions and the aggregate year end rates, which are taken from 1971 data, Table II presents a summary of claims categorized as of the claim duration in December, 1970.

TABLE II Aggregate Approval Proportions

Sex	12-14 Mos. Duration	24-29 Mos. Duration
Male	78% (573 claims)	86% (771 claims)
Female	57% (185 claims)	75% (271 claims)
<i>Industry</i>		
Manufacturing	70% (480)	86% (588)
Financial	66% (77)	77% (145)
<i>Case Average Salary</i>		
\$700	68% (133)	68% (204)
\$700-\$1000	68% (82)	78% (83)
\$1000	71% (51)	82% (66)
<i>Employee Contributions</i>		
Employee Pay All	71% (82)	72% (152)
Employee Pay All	71% (356)	86% (487)
Both Pay	68% (455)	79% (514)

The study examined the approved Social Security claims under these cases having the right to offset family, as well as primary benefits, to determine the frequency with which family awards vs. primary-only awards were made. Table III presents these results for male and female claimants. This table also shows the number of claims with family offsets. For females, this number is quite low and it is questionable whether any significance should be given to it. In any case, it should be remembered that many of these family offsets may revert to primary-only offsets as the children attain the limiting Social Security age, and this fact must be reflected in development of the family offset credit.

TABLE III Proportion of Claimants With Social Security Benefits Receiving Family Benefits (6-41 Mon. Duration)

Age	Male	Female
40	66% (with Family Benefits)	40% (41 with Family Benefits)
40-44	55 (102)	30 (20)
45-49	42 (150)	14 (18)
50-54	30 (177)	10 (11)
55-59	15 (137)	5 (9)
60-64	13 (89)	— (0)

"What's in a Name?"

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only one of the first twenty numbers that is not a surname. There are 1,186 persons named Man but only 60 "Men" — some of them women; 1,065 persons are named Lady, including many men. Anything can turn up as a surname, including two named Anything and 181 named Thing. Others are named Other, Once, Only, Odear and Oboy, which may lead you to say Ostop or Ohno, both of which are surnames.

Pi and Mo are probably what is left of longer names. But what about Noodle, Charm, Smile or Liver. Some are burdened with names like Oaf, Cheap, John, Moron, Ape, Skunk, Ghoul, Frumpy, Ghost, Boob, Slob, Lout and Goon. You can say "We have more family names in this country than you can shake a stick at" and not have used a word that is not someone's surname.

Remembering that many surnames identify the occupation of the bearer, the reader can, from the offbeat names on the list, construct mythical firms with appropriate occupations. For example:

Double (2,472) & Trouble (582) —
Income Tax Assistance
Hell (426) & Back (7,024) —
Travel Agency
Head (28,615) & Tail (82) —
Medical Clinic

Mr. Hutchi concluded with novelty full names including John 5/8 Smith, Queen Victoria, Merry Christmas and Earnest Truelove. And now you know, if you noticed, why the last letter is missing from your reporter's surname. □

Claremont

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Professors Melvin Henriksen and John Greever, and two representatives of the Los Angeles Actuarial Club, John Tiller and Walter B. Lowrie. The many actuarial alumni in the Los Angeles area have been most gratified that their colleges have given this recognition to actuarial careers. They have shown their approval by actively supporting the program. □