

BOOK REVIEWS AND NOTICES*

* B. Aaron, *Legal Status of Employee Benefit Rights under Private Pension Plans*, pp. xiii, 130, Richard D. Irwin, Inc., Homewood, Illinois, 1961.

This book is the second in the Pension Research Council's projected 5-volume study of benefit expectations under private pension plans.¹ In this slim volume, Professor Aaron and his 7-member task force have given us a scholarly report on the statutes and court decisions affecting an employee's right to benefits. Although of primary interest to lawyers, the book will be very helpful to actuaries who operate in the pension area, particularly those engaged in drafting pension plans or reviewing plans drafted by others.

After a brief introductory chapter setting forth the purpose and organization of the study, the author discusses three legal theories which attempt to define the nature of pension benefits under plans established unilaterally by an employer: the gratuity theory, which holds that pensions are mere gratuities and confer no rights on the recipient; the theory that a pension plan is a unilateral contract, binding on the employer; and the familiar theory that pensions are deferred wages. To the nonspecialist, this chapter is probably the most interesting in the book. Its conclusion may be stated in the words of the author:

Indeed, it is no exaggeration to say that the one legal principle upon which employees may reasonably rely for protection of their pension benefits is that the typical modern pension plan is an enforceable contract. It follows that employee rights in specific situations will almost invariably be determined by the terms of the plan itself, and not in accordance with the theory that pensions are deferred wages.

Chapter three deals with negotiated pension plans and discusses briefly the extent to which arbitration and court decisions have a part in the interpretation of collectively bargained plans. This chapter seems somehow incomplete, owing, no doubt, to the paucity of decisions on the respective rights of unions, employers and employees under negotiated plans.

Chapters four and five, comprising more than half the book, examine the employee's rights under a pension plan in circumstances which involve either a change in his own status or a change in the conditions of the employer's business. Examples of the former are voluntary or compulsory retirement, resignation, layoff, discharge for cause, disability, death, expulsion from the union, and prolonged leave of absence. The latter situations include the bankruptcy, merger or sale of the business, and the employer's delinquency in, or repudiation of, his pension obligations. Legal rights in these areas are, in general, defined by judicial precedent rather than statute, and Professor Aaron discusses and compares the decisions handed down in pertinent lawsuits in many jurisdictions.

* Books and other publications noted with an asterisk (*) may be borrowed from the library of the Society of Actuaries under the rules stated in the *Year Book*.

¹ The first volume is reviewed in *TSA XIII*, 45.

Actuaries will probably be most interested in the section on the termination of a pension plan which discusses, in addition to various legal decisions, the influence of the Internal Revenue Code and Treasury Regulations on the employer's right to terminate a plan. Further discussion of the different types of wording used in pension plan termination clauses and their influence on employee rights would have been welcome, but the author may have felt that this was outside the scope of his study.

The next to last chapter summarizes federal and state legislation regulating pension plan administration and discusses such questions as the rights of the union and the individual employees to sue under the Taft-Hartley Act to enforce their rights and the choice of a forum in which to bring suit. In some places the author's concise style is tantalizing. For example, analyzing the defects of the Welfare and Pension Plans Disclosure Act, the author states:

No one has yet been prosecuted for violating its terms, and the prospect of any such case arising is remote; only an administrator of extraordinary contumaciousness and persistence could manage to bring himself within the scope of the criminal sanctions of the Act. Moreover, it is doubtful that the law presents formidable impediments to continued skulduggery of the more flagrant variety which investigations have revealed in the administration of some health and welfare plans. It should be noted in this connection, however, that the new Labor-Management Reporting and Disclosure Act of 1959 may be considerably more effective in stamping out these abuses.

Unfortunately, he is content to refer us to his *Harvard Law Review* article on the latter act, instead of telling us, in this book, what the 1959 Act does and why he believes it may be more effective.

The last chapter contains a brief statement of the author's conclusions from the evidence presented, notably that:

. . . poor drafting of the plan instrument, inadequate funding, and unwise investment policies are far greater threats to the benefit rights of covered employees than is the dishonest or negligent administration of pension funds

and

. . . further governmental regulation of private pension plans will be neither desirable nor practicable except in a few limited areas.

The author then makes three specific recommendations for governmental action: that a covered employee be given the right to sue an employer who is delinquent in his pension payments, that the Bankruptcy Act be amended to give welfare and pension contributions the same priority as wages, and that pension rights be fully vested for employees laid off because of a merger. The author then concludes with two paragraphs on the pros and cons of compulsory vesting, which barely introduce the issue and which seem quite unrelated to anything that has gone before. A more extended treatment of this topic, perhaps in a separate chapter, would have been of great interest to actuaries.

Professor Aaron and his colleagues have performed a valuable service to those interested in pension plans by gathering, summarizing and criticizing the statutes and court decisions which bear on employee pension rights. As more

pension questions reach the courts, it is hoped that this book will be expanded and kept up to date so that the latest legal decisions, dissected by Professor Aaron's keen mind and explained in his lucid prose, will be available to lawyers, actuaries, and other students of pension plans.

ALLEN L. MAYERSON

E. C. Hammond and L. Garfinkel, "Smoking Habits of Men and Women," *Journal of the National Cancer Institute*, vol. 27, p. 419, August 1961.

E. C. Hammond, "Smoking in Relation to Physical Complaints," *Archives of Environmental Health*, vol. 3, p. 146, August 1961.

E. C. Hammond, "Prospective Studies on Smoking in Relation to Death Rates," *Bulletin de l'Institut International de Statistique*, 33 Session, Paris, 1961.

In the fall of 1959 the American Cancer Society launched a massive epidemiological investigation of approximately 1,100,000 persons in an effort to learn more about the early symptoms and factors associated with cancer.² Only family groups with at least one individual over 45 years of age were included in the study, and in such families every person over 30 was requested to fill out a detailed questionnaire covering family history, personal medical history, occupation, environmental exposures, habits, and a host of other characteristics. Many of the questions resemble closely those asked on applications for Ordinary life insurance. The three papers cited above report on the preliminary findings of the investigation, drawn from a sample of about 43,000 questionnaires.³

The first paper indicates that exposure to cigarette smoke products is much smaller in the female than in the male population. More specifically, a smaller proportion of women than men are regular cigarette smokers; the proportion of heavy cigarette smokers is distinctly less among women than men; among current regular cigarette smokers, women generally begin cigarette smoking at an older age than men; women tend to inhale cigarette smoke to a lesser degree than do men; and a far larger proportion of women than men smoke cigarettes with a low nicotine and tar content. An examination of men's smoking habits confirms earlier findings that cigar and pipe smokers tend to inhale tobacco smoke much less than do cigarette smokers.

The second paper, on smoking habits in relation to physical complaints, relates to such conditions as coughing, hoarseness, shortness of breath, pain or discomfort in chest, loss of appetite, nausea, pain in stomach or lower abdomen, loss of weight, easy fatigue, insomnia, nervous tension, and several other complaints. Each was found to be associated with smoking habits; the highest degrees of association were noted for coughing, shortness of breath, and loss of appetite. Cigarette smoking showed a much greater degree of association with physical complaints than did cigar or pipe smoking; also, the frequency of most

² For details, see E. C. Hammond, "Cancer Etiology: New Prospective Epidemiological Study," *CA Bulletin*, vol. 9, p. 177, September-October, 1959.

³ Earlier reports on smoking and lung cancer have been discussed by J. Cornfield *et al.*; see *TSA XI*, 307.

physical complaints increased with amount of cigarette smoking. Coughing was reported relatively less frequently by people who smoked cigarettes with a low tar and nicotine content.

Whereas earlier studies have usually focused on the greatly increased death rate from lung cancer among heavy cigarette smokers, the third paper emphasizes that the important finding really is that the *total* death rate increases significantly with the amount of cigarette smoking. The pattern was established in previous follow-up studies as well as in the 10.5 months follow-up of the persons in the current preliminary investigation of the American Cancer Society. In both the current and the earlier study by the American Cancer Society,⁴ more than half of the excess deaths were attributed to an increased death rate from coronary artery disease, while only about 10 percent of the excess deaths were assigned to an increased mortality from lung cancer, and another 10 percent to other forms of cancer.

New data in the current study suggest that the increased death rate among heavy smokers is related to the degree of pulmonary exposure to tobacco smoke—that is, to the depth of inhalation—no less than to the amount of smoking. This is indicated in the table below:

MORTALITY RATIOS BY AMOUNT OF SMOKING AND BY
DEGREE OF INHALATION FOR CURRENT CIGARETTE SMOKERS

Number of Cigarettes per Day	Do Not Inhale	Inhale Slightly	Inhale Moderately	Inhale Deeply	Total
1-9 cigarettes.....	1.19	1.26	1.63	1.75*	1.39
10-19 cigarettes.....	1.41*	1.84	1.89	2.40*	1.86
20 cigarettes.....	1.42*	1.37	1.79	2.32	1.77
21+ cigarettes.....	1.38*	1.88*	1.86	2.11	1.92
Total.....	1.33	1.53	1.81	2.21	1.76

* Based upon fewer than 50 expected deaths.

The finding that cigarette smokers tend to inhale far more deeply than pipe and cigar smokers appears to account for the marked differences observed in the death rates for the two groups. Similarly, the finding that women tend to inhale less deeply than men, as well as the factors cited above, go a long way towards accounting for the even wider differences in the extra mortality between men and women cigarette smokers.

EDWARD A. LEW

* D. L. Bickelhaupt, *Transition to Multiple-Line Insurance Companies*, pp. xx, 226, Richard D. Irwin, Inc., Homewood, Illinois, May 1961.

"Multiple-Line Insurance" is the writing, by a single carrier, of two or more of the usual casualty, fire, or marine lines. It does not include life insurance.

⁴ E. C. Hammond and D. Horn, "The Relationship Between Human Smoking Habits and Death Rates," *Journal of the American Medical Association*, vol. 155, p. 1316, August 7, 1954.

Multiple-line insurance should not be confused with the recent development known as "All Lines Insurance," which is, in effect, multiple-line insurance plus life insurance.⁵ The book contains a very good review of the history of mono-line insurance in the United States and brings out particularly the extraterritorial effect of the Appleton Rule in New York, which required out-of-State companies to conform to the regulations of New York with respect to all of their business, regardless of the jurisdiction, in order to write business in New York State.

In 1949 the New York Law was amended, permitting multiple-line insurance to be written by a single carrier. This meant that casualty companies could now write fire and marine, whereas previously it had been necessary to maintain separate corporate entities for such purposes. The scope of the book is limited to a detailed consideration of the legal problems and financial effects of the transition of a mono-line company to a multiple-line company. It does not go into other problems, such as marketing and sales. About a fourth of the book consists of appendixes with the details of the financial requirements prescribed by the various state jurisdictions for the organization of new companies, together with a comparison of the assets and liabilities of 35 large multiple-line companies. There is also a rather extensive bibliography.

In brief, the book is a text dealing with the legal, financial, and administrative techniques involved in a company's changing to multiple-line, and is not, as might appear at first glance, a discussion of multiple-line insurance as a developing trend.

J. B. GARDINER

SELECT CURRENT BIBLIOGRAPHY

In compiling this list, the Committee on Review has digested only those papers which appear to be of direct interest to members of the Society of Actuaries; in doing so, the Committee offers no opinion on the views which the various articles express. The digested articles will be listed under the following subject matter classifications: 1—Actuarial and other mathematics, statistics, graduation; 2—Life insurance and annuities; 3—Accident and sickness insurance; 4—Social security; 5—Other topics.

References to allied subjects will be found in the following publications: *Mathematical Reviews*, published by the American Mathematical Society—Subjects: Probability, statistics, econometrics, various other mathematical topics; *Monthly Labor Review*, published by Bureau of Labor Statistics—Subjects: Cost and standards of living, employment and employment services, fringe benefits, handicapped, industrial hygiene, industrial relations, labor organization and activities, manpower, older workers and the aged, personnel management, social security (general); *Population Index*, published by Office of Population Research, Princeton University, and Population Association of America—Subjects: Mortality, fertility, marriage, divorce, the family, various other demographic topics; *Social Security Bulletin*, published by Social Security Administration—Subjects: Retirement and old age, employment, maternal and child welfare, health and medical care, various other topics in social security; *Journal of the Institute of Actuaries*—The review section contains digests in English of articles appearing in foreign actuarial journals.

⁵ See *TSA XII*, 848.

LIFE INSURANCE AND ANNUITIES

"Finances of Employee-Retirement Systems of State and Local Governments in 1959," pp. 24, Bureau of the Census, Washington, May 5, 1960.

Data for this report were "obtained mainly by a mail survey covering all State-administered systems and a stratified random sample" of local systems. A table shows for each state, separately for state-administered and locally administered systems, the amounts of receipts according to source; the benefits, withdrawals and other payments; and the cash and security holdings at the end of the fiscal year. Another table presents corresponding data for selected individual employee-retirement systems.

J. Krislov, "Characteristics of Persons Separating and Withdrawing Contributions from the Federal Civil Service Retirement System," pp. 18, *Analytical Note No. 6-61*, Bureau of Old-Age and Survivors Insurance, Social Security Administration, Washington, June 1961.

Characteristics of 4,206 separated Civil Service employees (not including immediate-annuity retirements or deaths) whose records were processed during a week in May 1960, are tabulated and discussed. Most of the 12 tables are in the form of cross-classifications of the number of separations by age and by years of service, or by age and by salary ranges. The tables do not indicate absolute rates of turnover, and no exposure data are given, since the primary purpose of the study was to obtain information "useful in evaluating the need for OASDI coverage of Federal employees." Application to private pension plan studies was considered, however, in designing special tabulations showing characteristics by years of service unbroken by prior refunds, since it is believed that few private plans allow redeposits for service credit upon reemployment.

Relative numbers of employees separated are analyzed in the discussion according to such characteristics as age, sex, years of service, and salary. For purposes of the study, separate tabulations are given for employees who had had one or more prior refunds, and for employees who elected refunds in preference to vested rights to deferred annuities. Only about one-third of all separations had a vested right to a deferred pension at age 62, and of this group 77% elected refunds in preference to vested rights, which usually have a larger actuarial value.

A Study of the Military Retired Pay System and Certain Related Subjects, pp. 283, Committee Print, Senate Committee on Armed Services, Government Printing Office, Washington, July 6, 1961.

This report, prepared by a Study Committee of the University of Michigan headed by Carl H. Fischer, F.S.A., brings together for convenient reference a mass of historical, procedural, and statistical data concerning the military retirement program. The comprehensive Kaplan Committee Projects of 1953-54 (updated in 1958) and source material made available by the Department of Defense were utilized, both for summary and as a basis for recommendations.

The following are among the recommendations:

(1) Adjustments in retired pay to meet changes in social and economic circumstances should be based on a cost of living concept rather than being related to modification of the military pay scale. The latest change in retired pay was a percentage increase.

(2) To alleviate the initial burden of transition to civil life, the option to elect a reduced monthly payment and a lump-sum commutation of the remainder of the retired pay is recommended. No mention was made of the antiselection which would undoubtedly prevail in the exercise of this option, particularly by disability retirees.

(3) Fundamental research and periodic reassessment of the military retirement program is considered important in view of the changing concept of the military service.

(4) Expanded services to assist the military personnel in their transition to civilian life is urged.

The Committee considered the military retirement program from the perspective that it represents a cost of recruitment and retention (a form of deferred pay), as well as a readjustment allowance necessary for transition from military to civilian life. This perspective grew out of the Committee's assumption as to present and future defense needs.

* "A Summary Report of the Ontario Committee on Portable Pensions," pp. 23, addressed to the Honourable L. M. Frost, Q.C., Prime Minister of Ontario, by G. E. Gathercole and D. C. Macgregor, Joint Chairmen of the Special Committee on Portable Pensions, Toronto, February 10, 1961.

This Report is a summary statement of the work of the Special Committee on Portable Pensions set up by the Legislature of the Province of Ontario to explore methods of extending the portability of pension benefits. The Special Committee reviewed the provisions of existing pension plans that affect the preservation of pension benefits when a member of a plan leaves his job, particularly

- a) vesting of pension benefits;
- b) withdrawal in cash of employee contributions;
- c) compulsory membership by employees;
- d) eligibility of employees to participate; and
- e) machinery for transferring pension benefits.

Also studied were the effect of these provisions on the employment of older workers and the need for effective supervision of pension plans. The Committee proposed that a vesting standard, coupled with restrictions on cash withdrawals of employee contributions, be established. This standard should not be too stringent initially and it should not be retroactive, *i.e.*, in computing the vested pension only the contributions in respect of service after the date on which the new vesting standard comes into force would be included. The suggestion is made that it might be feasible to try to attain, over a short period of years, a position where all pension plans would at least include graduated vesting beginning at age 30 and becoming complete or nearly so by age 34, such vesting being subject to the completion of two years of service. It is also recommended that similar restrictions on the cash withdrawal of employee contributions should apply from the same age at which vesting of pension benefits begins.

Vesting is favored in the form of a deferred single life annuity to begin at the normal retirement age. If the plan does not specify a normal retirement age, or if the retirement age is over 70, the vested annuity should begin at age 70. The Committee rejects the idea of requiring only that pension plans provide a minimum vested benefit and also rejects the exclusion of earnings over a stated maximum in applying the proposed vesting standards.

In view of the range of costs of its proposals when applied to various pension plans, the Committee indicates that it may be desirable to postpone for two or three years the effective date on which any proposal may be brought into force. A recommendation is made that membership in pension plans should be compulsory for new employees from the age at which the vesting standard and cash withdrawal restrictions begin to apply. Above this age, all employees should have to become members, subject to whatever

waiting period is required for entry into the plan. Because of its possible adverse effect on the employment of older workers, the Committee suggests that this proposal should not be compulsory for employees of age 55 and over until the new vesting standard and cash withdrawal restrictions have been in effect for ten years. The Committee believes that the establishment of the proposed vesting standards and restrictions on cash withdrawals should, in the long run, encourage the hiring of older workers. There is also a discussion of methods that might be adopted to bring its proposals into effect, including tax incentives and a direct imposition of standards for the strengthening of pension plans and means of providing pensions for workers who are not covered by pension plans.

The Committee concludes with some comments on a suggestion that a Central Pension Agency be established to which the value, if below a stated minimum, of pension benefits of workers moving from one job to another could be transferred and on the need for adequate government supervision of pension plans.

End Results and Mortality Trends in Cancer, pp. vi, 350, National Cancer Institute Monograph No. 6, Public Health Service, Bethesda, Maryland, September 1961.

The first part, dealing with end results in cancer, was edited by S. J. Cutler and F. Ederer. Data were collected from central tumor registries maintained in California, Connecticut, Massachusetts, by the Veterans Administration, and by 10 individual hospitals. Although the contributing institutions have a broad geographic distribution, it is not known to what extent they are representative of all hospitals and clinics in the United States treating cancer patients. On the basis of this combined experience for 1950-57, five year survival rates are presented for white cancer patients, by primary site, age, first course of therapy, stage of disease at diagnosis, and sex. The observed survival rates are also shown relative to those expected for the corresponding general population, together with standard errors. A similar table with one year survival rates is presented for five malignant neoplasms with especially low five year survival rates.

The first part also has three papers with special analyses: "Trends in survival rates of cancer patients: Connecticut and California," "Survival experience of patients with malignant melanoma of the skin, 1950-57," and "Survival experience of patients with cancer of the tongue, 1950-57." There are, in addition, two papers dealing with method: "The relative survival rate: A statistical methodology," and "A note on follow-up of lost patients."

The second part, edited by T. Gordon, M. Crittenden, and W. Haenszel, brings together, from published reports and unpublished tabulations in the National Office of Vital Statistics,⁶ detailed cancer mortality data for specific sites. The period covered is 1930-55, with data presented for every fifth year. Trend data by age are shown for cohorts of lives as they pass in time, in addition to the conventional calendar year basis. The text is principally expository. Although the qualifications to the data are discussed, there is no detailed analysis.

H. R. Warner, A. F. Toronto, L. G. Veasey, and R. Stephenson, "A Mathematical Approach to Medical Diagnosis: Application to Congenital Heart Disease," *Journal of the American Medical Association*, vol. 177, p. 177, July 22, 1961.

The authors present a mathematical formula for arriving at the most probable diagnosis of a pathological condition based upon the presence or absence of specific

⁶ The name of this office has been changed to National Vital Statistics Division, National Center for Health Statistics.

clinical findings. They describe the adaptation of the formula to electronic data processing machinery, using the machine's memory to make assembled medical statistics promptly available. An example illustrates the method.

HEALTH INSURANCE

M. Lerner, *Hospital Use by Diagnosis: A Comparison of Two Experiences*, pp. 48, Health Information Foundation, Research Series 19, New York, 1961.

"Hospitalization by diagnosis, age, and sex under Blue Cross Hospital Service in Indiana during 1956 was compared with the much higher level of hospitalization under the Saskatchewan Hospital Services Plan in Canada during 1957."

"The relatively high level of hospitalization in Saskatchewan is generally attributed to a number of 'social,' i.e., non-medical, factors. For one thing, Saskatchewan provides hospital care under a government insurance plan financed through various forms of taxation. Thus the total cost of hospital care is spread over the population, and direct cost barriers to use for the individual are removed. Also, Saskatchewan is primarily rural, and hospital use among insured populations in rural areas has been noted elsewhere to be higher than among insured populations in urban settings. Still another factor: Utilization in Saskatchewan has risen since the inception of the Plan, along with a corresponding increase in hospital beds and facilities.

"Each of these factors, and no doubt others as well, is relevant to the explanation of higher use in Saskatchewan than in Indiana. And it is possible that these factors do affect substantially, not merely the volume, but also the patterning of illness and medical diagnoses leading to hospitalization. However, the purpose of this study was not to examine these non-medical factors closely. Rather, taking them as given, it was to explore in detail the patterns of medical diagnosis, total and by age and sex, associated with the large differences between the two experiences in volume of hospitalization."

"In the two experiences compared here, hospital use was much higher in Saskatchewan than in Indiana. A small part of the higher use in Saskatchewan resulted from differences in the age-and-sex compositions of the two populations. But no one single age-and-sex group was crucial in this matter, and higher use was spread throughout the entire population.

"Also, hospital use was higher among nearly all major diagnostic categories and among most of the sub-categories. This was true when the entire population was considered, but also for each age-and-sex group. The two leading contributors among the major diagnoses to higher use in Saskatchewan were obstetrical care and respiratory diseases."

"But these two major diagnostic categories were important in both experiences alike. In general the diagnostic patterns in the two experiences were remarkably similar. What differed primarily was the volume or level of use."

By way of comment, the report states, "... the comparison itself by no means fully answers the broader question to which it was addressed: Is the variation in volume of hospitalization associated with some corresponding variation in the *pattern* of illness, and therefore of the medical diagnoses leading to hospitalization? These were only two hospital experiences which were being compared, hardly representative of the enormous range of variation in hospital use. Also, it was unfortunate that 1957 was the year to which the Saskatchewan data applied, because the Asian influenza epidemic of that year may have influenced the Saskatchewan data to some extent."

H. A. Weeks, *Family Spending Patterns and Health Care*, pp. vi, 140, Harvard University Press, 1961.

This study of approximately five hundred families in Hackensack, New Jersey, developed from previous surveys sponsored by the Health Information Foundation. Family spending patterns are examined, together with the effects of these patterns upon the portion of family incomes allocated for all types of health care. The data show the utilization of health services and the amounts spent for physicians' and dentists' services, optical services, hospitalization, nursing care, and for pharmaceuticals. A chapter concerned with family saving for health care describes the health insurance coverage, relationship between medical expenses and general expenditures, and attitudes toward health insurance. A final section discusses family attitudes in relation to health care. This includes the rationalization for putting off needed health care, the interrelationship between utilization of health services and other aspects of family behavior, a family's estimate of its general health picture in relation to that of its nearest neighbors, and parents' judgments of the relative importance of adequate health care for themselves as opposed to that of their children.

E. Shanas, *Family Relationships of Older People*, pp. 64, Health Information Foundation, Research Series 20, New York, 1961.

The subtitle reads: "Living arrangements, health status, and family ties of those aged 65 and over, as reported by the aged, the persons to whom they would turn in a health crisis, and the general public." Altogether, 95 percent of the older people named an individual to whom they would turn for help in an extended illness. Almost two-thirds named a daughter, son, daughter-in-law, or son-in-law. Almost one-tenth named a brother or sister, and a like proportion named a friend or neighbor.

"Responsible individuals reported that the great majority of older people were paying routine medical bills from their own resources, and that at least two-thirds of them recently hospitalized or experiencing serious illness had paid the attendant costs themselves. While only a small fraction of the older population was said to be without medical or dental care because of lack of funds, as many as two older persons in every five were reported as unable to pay a medical bill as large as \$500 without help from sons, daughters, other relatives, or charitable organizations."

U.S. National Health Survey, *Reporting of Hospitalization in the Health Interview Survey*, pp. 71, Public Health Service, Washington, May 1961.

The report states, "There were three major objectives underlying this research.

1. To obtain estimates of the amount of underreporting of hospital episodes in household interviews in order to provide a rough approximation to underreporting in the U.S. National Health Survey.
2. To analyze the types of hospitalizations which were underreported and to investigate some of the factors relating to underreporting.
3. To study some response errors and to explore factors associated with these errors for hospitalizations which were reported."

One phase of the survey is concerned with underreporting based upon a comparison of interview reported and hospital record episodes. Data are presented with regard to the type and demographic characteristics of respondents, who might be the person experiencing the hospital episode or a family member replying on his or her behalf, as in the case of children. Account is also taken of the family relationships between the

person sampled and the respondent, as well as age and sex differentials. Health characteristics constitute another variable in this survey of underreporting.

A second phase of the survey is based upon an analysis of "those episodes of hospitalization reported in the household interview which could be matched with hospital records." This phase is studied with regard to length of stay, diagnostic and operation categories, and time interval between interview and hospital discharge.

For the third phase, "A special follow-up interview was conducted with respondents who failed to report one or more hospital episodes of the sample person, and a random sample of respondents who correctly reported the episodes." The data were studied with regard to the characteristics of the respondents, reaction to the illness and the hospital episode, and reaction to the interview and the interviewer.

U.S. National Health Survey, *Distribution and Use of Hearing Aids, Wheel Chairs, Braces, and Artificial Limbs, United States, July 1958-June 1959*, pp. 24, Public Health Service, Washington, June 1961.

The data are based upon household interviews of the civilian noninstitutionalized population. The number of special aids per 1,000 population was 6.8 for hearing aids, 1.5 for wheel chairs, 1.2 for leg or foot braces, 2.9 for other types of braces, and 0.8 for artificial limbs. For hearing aids, detail is presented with regard to age, sex, residence, family income, and major activity. Limited detail is presented for other types of aids.

U.S. National Health Survey, *Health Interview Responses Compared with Medical Records*, pp. 74, Public Health Service, Washington, June 1961.

"This methodological study is largely concerned with the relationship between information obtained from two sources on chronic illness in a defined population: (1) reports from physicians of the Health Insurance Plan of Greater New York (H.I.P.) on their patients who sought care during a period of 12 months, and (2) reports on chronic illness made at the end of this 1-year period by respondents to household interviews of these patients and their families by the National Health Survey (NHS). The comparison between the data from these two sources is directed in the main toward examining which of the conditions diagnosed by physicians are reported by the respondents on household interview."

"The results of the current study illustrate the complex problem posed by attempts to interpret data on chronic diseases collected through the household interview process. They suggest strongly the survey information does not conform even moderately well to the universe of conditions inferred from physician reporting."

"There is reason to conclude from this study that the lack of conformity does not result from an extreme reluctance on the part of the respondent to talk about illness."

U.S. National Health Survey, *Attitudes Toward Co-operation in a Health Examination Survey*, pp. 45, Public Health Service, Washington, July 1961.

This study reports on research carried out by the National Opinion Research Center of the University of Chicago under contract with the U.S. National Health Survey. The objective was to determine, if possible, "in preparation for initiating a health examination survey of a nationwide sample of the adult population," the factors which indicate willingness to participate. The study indicated "that the following types of people are more willing to co-operate in a free health examination: the nonwhite, younger, and middle-aged, veterans, and lower income groups. In addition, people are more apt to commit themselves to co-operate in a health examination than to commit other members of their family."

U.S. National Health Survey, *Disability Days, United States, July 1959-June 1960*, pp. 50, Public Health Service, Washington, September 1961.

The National Health Survey uses disability as a general term "to describe any temporary or long-term reduction of a person's activity as a result of an acute or chronic condition." Also, "A day of restricted activity is a day when a person cuts down his usual activities for the whole of that day on account of an illness or an injury." For males, the restricted-activity days per person per year ranged from 7.7 at ages 15-24 years to 41.5 at ages 75 and over; averages for females were somewhat higher. At ages 45 and over, the averages were highest in rural farm areas and lowest in urban places. In the case of bed-disability days per person per year, the averages for males rose from 2.9 at ages 15-24 years to 17.6 at ages 75 and over. The pattern with regard to sex and urban-rural residence was very much like that for restricted-activity days. Corresponding data are also presented on the basis of income, region of the country, and major activity.

U.S. National Health Survey, *Persons Receiving Care at Home, United States, July 1958-June 1959*, pp. 30, Public Health Service, Washington, October 1961.

The survey questions were: "Is there anyone in the family who requires constant help or nursing care? Is there anyone in the family who requires help or nursing care only part of the time, such as help in dressing, eating, toilet activities, etc.?" The rates per 1,000 population receiving constant care were 3.8 for all ages, 10.4 for ages 65-74 years, and 52.7 for ages 75 and over. For part-time care, the corresponding rates per 1,000 were 2.8, 11.5, and 35.0. Among those receiving care at home, either constant or part-time, for persons of all ages the distribution by length of time such care was received was 27.1 percent under 1 year; 38.0 percent 2-4 years; 30.5 percent 5 years or more; the rest were of unknown duration. At ages 65 and over, the corresponding proportions were 26.4, 44.1, and 23.1 percent.

U.S. National Health Survey, *Proportion of Hospital Bill Paid by Insurance, Patients Discharged from Short-Stay Hospitals, United States, July 1958-June 1960*, pp. 50, Public Health Service, Washington, November 1961.

"The data . . . refer to persons discharged from short-stay hospitals who reported the proportion of their hospital bill that was paid for by some insurance plan." This report differs from an earlier one which presented estimates on the number of persons in the population who had hospital insurance.⁷

The present report discusses the reasons for the differences between its findings and those of the earlier report. Qualifications of the data are also described. "For example, for approximately 32 percent of the hospital discharges it was reported that there was not any insurance payment for the hospital bill. It should be noted that this does not mean that for almost one third of the hospital discharges these individuals had to pay for the entire hospital bill out of their own or their family's funds. Sources other than insurance are used to help finance the cost of hospital care. In addition to the hospital care provided for veterans by the Veterans Administration, which was mentioned earlier, the Federal government provides care for other groups such as dependents of members of the Armed Forces, merchant seamen, and American Indians. State and local governments, health agencies, and charitable organizations spend large sums to help finance the cost of hospital services. And, finally, friends, neighbors, relatives, and em-

⁷ See *Interim Report on Health Insurance, United States, July-December 1959*, digested in TSA XIII, 63.

ployers on many occasions help to share the burden of a large hospital bill." It is also pointed out that the survey data refer only to persons who were alive at the time of interview.

The findings in this report show that among the total discharged patients, 68 percent had some portion of the bill paid by insurance, 51 percent reported that about three quarters or more of the bill was paid, about 11 percent reported from half to three-quarter coverage of the bill, and 5 percent reported that less than half of the bill was paid for by insurance. The last does not include cases for which no part of the bill was paid by insurance. Data are presented with regard to age, sex, race, place of residence, income, surgical cases, and type of hospital ownership.

SOCIAL SECURITY

R. J. Myers, "Mortality of Workers Insured Under OASDI, 1955," *Social Security Bulletin*, July 1961.

The mortality experience of insured workers under the OASDI program is studied in relation to that of the nation's total population for the year 1955 in order to explore the possibility of a broad analysis covering an extended period. The article includes a discussion of the various technical problems and difficulties involved in the classification of OASDI data by age, sex, occupation, and earnings of insured workers for the purpose of mortality measurement. In particular, study is made of the 1955 mortality experience of insured workers, not only by age and sex but also by whether or not an insured individual had covered earnings in the year. A technical note describes the basic data and the methodology.

The results of the study indicate that the mortality of insured male workers corresponds rather closely to that of the total male population at the younger ages. This close correspondence will become even more marked in the future as the insured male population tends to become identical with the total male population and the two will then have the same mortality experience. On the other hand, the mortality of insured females follows a pattern of lower mortality than that of the total female population. While it is likely that the proportion of women who are fully insured will continue to increase in the future, the insured female population is never likely to become identical with the total female population. For both sexes, those with earnings in the year of death naturally had lower mortality than nonearners.

J. A. Lazerson and N. S. Arce, "Present Value of OASI Benefits in Current Payment Status, 1960," pp. 13, *Actuarial Study No. 51*, Division of the Actuary, Social Security Administration, Washington, February 1961.

This study is the fifth in a series presenting a valuation of OASI benefits in current payment status on December 31 of various years through 1960. The method followed is similar to that used in the valuation of private retirement plans, with some differences arising from the provisions in the law regarding continuation of benefits, such as the retirement test. It is recognized that this type of analysis is more of academic interest than of practical importance in connection with the financing of a long-range social insurance system.

A table showing the monthly amount of OASI benefits in current payment status by type of benefit is first presented. On the assumption that such amounts continue to be paid into the future, a table of present values is constructed by discounting at the end of specified years on the basis of assumed rates of interest, mortality, and other pertinent contingencies. For the 1960 estimates, use was made of mortality from the U.S. White

Life Tables for 1949-51 and interest rates at 3% and 0%. The second table was used to prepare a percentage distribution of the calculated present values by type of benefit. The trend in these percentages shows the shifts in the relative importance of the various types of benefit with the passage of time.

The present values are then used to prepare a table of average valuation factors. For monthly benefits, these factors represent the lump-sum present value of \$1 per month payable until termination of benefits (by death, remarriage, etc.). These average valuation factors show the effect of the changes in average age of beneficiaries and the effect of changes in mortality.

Finally, a comparison is made of the OASI Trust Fund with the present value of benefits in current payment status on December 31 of various years. The Trust Fund is shown to be only 23% of the liability in respect to benefits in current payment status at the end of 1960. Valuation of disability benefits in current payment status will be made in a separate actuarial study, but it is estimated that the Disability Insurance Trust Fund at the end of 1960 is roughly 36% of the present value of the benefits then in current payment status.

B. Oppal, "Estimated Amount of Life Insurance in Force as Survivor Benefits under OASI 1959-60," pp. 22, *Actuarial Study No. 54*, Division of the Actuary, Social Security Administration, Washington, October 1961.

As an integral part of the OASDI program, survivor protection is available to millions of American families in the form of monthly benefits to survivor beneficiaries and lump-sum payment at the death of the insured worker. These benefits may be considered to have a face value analogous to the amount of insurance in force under private insurance contracts. Thus, it becomes possible to make broad comparisons of "life insurance equivalent" of survivor protection available under the OASDI system and the amount of insurance in force on the lives of policyholders in private insurance organizations. Any such comparison, however, would necessarily be crude and full of pitfalls, since the component elements of "life insurance equivalent" as survivor benefits under OASDI are necessarily complex and subject to uncertain variations. In general, the amount of insurance under private contract is definitely known or easily determinable, while under the OASDI system conditions for receipt of benefit are not based solely on life contingencies but also on elements more readily under the control of the individual beneficiary such as marriage, employment, retirement, etc. Consequently the concept of insurance in force under the OASDI system is open to several interpretations, and any single set of estimates, no matter how meticulously calculated, needs to be accepted with reasonable caution.

With such shortcomings of the concept of "life insurance equivalent" in view, this Actuarial Study, which is the seventh in the series on this subject, presents estimates of life insurance in force as of January 1, 1959 and 1960, respectively, for the provisions of the 1958 Amendments. The text of the Study is divided into six sections. In Section A the concept of life insurance in force as survivor benefits under the OASDI system is examined. An illustrative example with a chart helps to clarify this concept.

Section B provides an insight into the complex of factors and assumptions underlying the estimates. In particular, in delineating the retirement test it indicates that the effect of employment on benefit receipt is variable and depends to a great extent on the business activity in the economy. It distinguishes between the "gross" and "net" sets of estimates. The "gross" estimate does not take into account the effect of employment on current benefit receipt nor does it allow for the possible "forfeiture" of the widow's bene-

fits in cases where she receives old-age benefits in her own right. Thus, this set of estimates provides the maximum potential amount of survivor protection. The "net" estimate concept, on the other hand, corrects for major duplications involved in the "gross" estimate.

Section C is devoted exclusively to the methodology involved. The concept of the "cost of insurance" in relation to the survivor benefits is also described and its method of computation is indicated.

Section D presents an analysis of the numerical results. The "net" amount of insurance in force as of January 1, 1960 was \$503 billion. The male insured workers carried about 92% of the "net" insurance in force. By type of benefit, the percentage distribution of the "net" amount of insurance was approximately 21% for widow's benefits, 17% for mother's benefits, 58% for child's benefits, and about 4% for lump-sum death payments. The present value of benefits arising from deaths during 1960 (based on the provisions of the 1958 Amendments) was \$4.3 billion. The corresponding OASI contributions made by employees and self-employed (*i.e.*, excluding employer taxes and all taxes in respect to the disability benefits) were \$5.7 billion, or over 30% higher than the "cost" of the survivor benefits.

Section E presents a comparison of "life insurance equivalent" under the OASDI system with other life insurance protection. By and large, the "net" estimate of \$503 billion at the beginning of 1960 was only slightly less than that in all private insurance organizations combined. A point to be noted in this comparison is that the amount of insurance under the OASDI system includes a large proportion of decreasing term insurance since survivor protection is concentrated where it is most needed socially, that is, at the younger ages of the insured worker where the greatest number of minor children is found. Since the "cost" of insurance is relatively low at these ages, the current annual "cost" of insurance in force under OASDI would be expected to be substantially less than that for the aggregate of all private insurance.

Section F gives tentative estimates for January 1, 1961, for the provisions of both the 1960 and the 1961 Amendments. The choice of the same base date aids in gauging the relative effect of the 1961 Amendments. For the provisions of the 1960 Amendments, an estimate of the "net" amount of insurance in force as of January 1, 1961, was \$552 billion. The operation of the 1961 Amendments would increase this figure by about \$26 billion.

R. J. Myers, "OASDI Provisions: Legislative History, 1935-61," pp. 2, Division of the Actuary, Social Security Administration, Washington, 1961.

This summarizes in outline form the changes in each of the provisions of the OASDI system that were made in the original 1935 Act by the amendments of the subsequent years. There is also a table summarizing the past and future financing provisions, in regard to the maximum taxable earnings base and the contribution rates.

M. C. Hart, "Old-Age, Survivors, and Disability Insurance: Early Retirement Provisions," *Social Security Bulletin*, October 1961.

This article grew out of the provision, in the 1961 Amendments to the Social Security Act, of retirement benefits for men upon attainment of age 62. However, it is not confined to a discussion of those provisions alone but covers the re-examination, during developments of the legislation, of the principles underlying the provision in the 1956 Amendments of similar benefits for women. The resulting major simplification and clarification of the law is explained and compared with the former provisions.

Also discussed are the basis of the actuarial reduction and the questions arising of individual equity versus ease of administration. An explanation is given of the difference in treatment between men and women in regard to benefit eligibility and computation, both currently and in the long range.

R. J. Myers, "Medium-Range Cost Estimates for Old-Age, Survivors, and Disability Insurance under Increasing-Earnings Assumption," pp. 22, *Actuarial Study No. 53*, Division of the Actuary, Social Security Administration, Washington, August 1961.

In previous years the actuarial cost estimates for the Old-Age, Survivors, and Disability Insurance system were presented in two different ways. The long-range cost estimates, extending many years into the future, have been on the basis of assumed level-earnings trends, but with demographic assumptions that, in some instances, varied over time. On the other hand, the short-range cost estimates, covering a future period of 5 years, used "dynamic" economic assumptions, both as to wage trends and as to employment conditions.

The Advisory Council on Social Security Financing, in its report of January 1, 1959, suggested that a third type of actuarial cost estimates be prepared—namely, medium-range ones for the next 15 to 20 years. It was suggested that these estimates should take into account possible variations in both economic factors and demographic developments.

This study presents two sets of medium-range cost estimates for the OASDI system for 1960–80.³ These are based on the provisions of the program as it was after enactment of the 1960 Amendments. The first set is based on the assumption that the law remains unchanged. The second set involves the assumption that the law is continuously modified to reflect the assumed changes in earnings by having the maximum earnings base rise proportionately. Under the latter assumption, benefit costs expressed in terms of payroll remain the same in each future year as in the long-range cost estimates.

As might be anticipated—because of the weighted nature of the OASDI benefit formula—under the first set of cost estimates the financial position of the OASDI system is relatively strengthened, and the balance in the Trust Funds in 1980 is some 50% higher than under level-earnings assumptions. Under the second set of estimates, the financial position of the program would not be quite as strong (because of the "dilution" of the existing assets, as measured against the increased taxable payroll), even though the size of the Trust Funds would be greater than under level-earnings assumptions.

R. J. Myers, "Actuarial Cost Estimates for Health Insurance Benefits Bill," pp. 22, *Actuarial Study No. 52*, Division of the Actuary, Social Security Administration, Washington, July 1961.

During the last several Congressional sessions, consideration was given to various proposals to provide health benefits for current and future beneficiaries of the Old-Age, Survivors, and Disability Insurance system. These proposals have been the subject of considerable controversy, both as to basic expediency and as to possible future costs.

³ See M. Lukaczer, "Economic Assumptions Underlying the Medium-Range Projections of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds, 1966–1975," Division of Program Research, Social Security Administration, August 1961.

The first section of the study is a technical discussion of actuarial methods, sources of data, and assumptions used by the Social Security Administration in deriving cost estimates for health benefits (in particular, those provided by the "King-Anderson" proposal, H.R. 4222 and S. 909 of the 87th Congress). Resulting cost figures for the King-Anderson proposal are presented in a second section of the study, where recently revised estimates are compared with the original estimates made before the 1961 OASDI Amendments and before revision of certain benefit factors, to reflect recent experience studies. A third section is devoted to consideration of the basic uncertainties and problems involved in estimating costs for health benefits proposals.

Briefly, in connection with the two most important factors affecting future costs, it has been assumed that (1) average daily hospital costs (room and board and other hospital costs) during the next four years will rise 14% more than the rise in general wage levels, before leveling off to roughly follow general wage trends thereafter; and (2) hospital utilization rates by age will approximate those experienced by current OASDI beneficiaries who are now covered by private hospital insurance plans. These rates were derived from surveys; they are not the experience reported by insurers. In regard to the first factor, hospitalization benefit costs expressed as percentages of payroll are not greatly affected by increases which merely keep pace with general wage trends, but, of course, are affected by elimination of the present "lag," estimated as about 14%. The second factor (utilization of hospital facilities) is separately derived for "high-cost" and "low-cost" assumptions; for example, in the "lost-cost" factors, an adjustment is made in admission rates for men aged 65 to 69 to reflect the fact that utilization is substantially lower among employed persons (who were not covered in the basic survey study of utilization rates of beneficiaries, but who would be considered as "eligibles" for purposes of the health benefits proposals). This adjustment is not made in the high-cost estimate. The assumption of increases in availability of facilities is inherent in the use of admission rates experienced by persons currently covered by private health insurance plans. For purposes of obtaining "level-premium" costs as percentages of payroll, current average pay levels are assumed to continue in future years.

Although hospitalization costs are based on a considerable body of actual experience as reported in surveys, very little experience is available for the minor benefit categories of home-health services, outpatient-hospital-diagnostic services, and nursing-home benefits. Nursing-home benefit costs introduce a further lack of precision in that the amount of assumed expansion of presently inadequate facilities is an important unknown quantity. Also, actual admission and transfer practices will be important under the proposal, which specifies that nursing-home benefits are available only on transfer from a hospital and for further treatment of the condition that resulted in the hospitalization. Estimates for the minor benefit provisions have been recently revised to recognize further experience which has become available. For example, estimated home-health service costs have been revised upward in connection with a recent study by Kansas Blue Cross and Blue Shield. Costs of outpatient-hospital-diagnostic services have been revised downward in recognition of the effect of the \$20 deductible provision to conform with recent group insurance experience.⁹ Administrative costs for health benefits were taken as 5% of the benefit disbursements, comparable with the lower range of administrative costs of Blue Cross plans.

The revised estimate of level-premium cost of the current King-Anderson bill is

⁹ S. W. Gingery, "A Reinvestigation of Group Hospitalization Expense Insurance," *TSA XII*, 564.

0.66% of taxable payroll. The bill provides for an increase of $\frac{1}{4}$ % in the combined employer-employee tax rate, plus an increase from \$4,800 to \$5,000 in the maximum earnings base. The latter provision is estimated to result in a net "gain" to the system equivalent to 0.10% of payroll. Thus according to the revised estimate, the bill is under-financed by 0.06% of payroll. Figures are also given for the cost of the different types of benefits and for the future year-by-year progress of the proposed Health Insurance Account.

R. M. Clark, "Some Reflections on Economic Security for the Aged in Canada," reprinted from *Canadian Issues: Essays in Honour of Henry F. Angus*, pp. 325-366, University of Toronto Press, 1961.

In his report to the Canadian Government in February 1959, entitled "Economic Security for the Aged in the United States and Canada," Dr. Clark presented a factual comparison of the systems to provide economic security for the aged in the two countries, but made no recommendations.¹⁰ The present essay is the first occasion on which he indicated his own views and preferences since he began his extensive studies of this subject.

A number of problems in this field are discussed. For example, for Canada he indicates that his own preference is a flat benefit program financed by graduated contributions, the system now in effect. Within an expansion of this framework, according to Dr. Clark, the country will find the most advantageous path for the direction of improving benefits. For example, he advocates survivor pensions provided without a means test on a flat benefit basis. However, he levels some criticism at what he considers to be the illogical nature of the present basis of financing old age security in Canada.

Dr. Clark endorses the decision taken in 1951 to set the age limit for old age security pensions at 70. He points out that, in his opinion, it is much more important to place emphasis on raising the amount of old age security pension than to divert the significant amount of revenue that would be needed for that purpose to reduce the age limit by two or three years. At the same time, Dr. Clark argues that there is a case for making old age security pensions available at a somewhat lower age than 70 to those who want them, provided there is no substantial increase in the cost by doing so. He believes that persons eligible for old age security should be allowed to get an actuarially reduced pension at any age between 67 and 70. It is mentioned that only Canada and New Zealand, of 26 countries studied in 1958, provide the same amount of government old age pension for a wife as for her husband. In all the other countries the wife's benefit is substantially less than a single person's benefit. The question is raised whether it is possible to change to a system of smaller pensions for wives in a country like Canada where the idea of double pensions for married couples is well established. According to Dr. Clark, the British have undergone such a transition almost unnoticed.

In spite of the argument that a flat benefit system of pensions does not take into consideration differences in living costs in various parts of the country, Dr. Clark knows of no way likely to be politically acceptable whereby the federal government can vary its flat old age security pensions to allow for such differences in living costs. Dr. Clark also comments on what he considers to be the undesirable equating of the maximum amount of old age security and old age assistance, the limitation of old age assistance to those between the ages of 65 and 69, and what he deems to be an unnecessary distinction among old age assistance, unemployment assistance, and social assistance.

¹⁰ Reviewed in *TSA* XI, 293.

OTHER TOPICS

* A. Lopez, *Problems in Stable Population Theory*, pp. ix, 107, Office of Population Research, Princeton University, New Jersey, 1961.

The author develops in several directions on the mathematical theory of population expounded by Lotka.¹¹ In the Foreword, Ansley J. Coale, Director of the Office of Population Research, writes: "In this book Dr. Lopez has made several notable and timely contributions to the mathematical theory of stable populations. He has first of all proven that Lotka's solution of his fundamental equation is valid if, as always happens in the demographic context, fertility risks are smoothly distributed over a finite span of the female lifetime. Second, he has formulated a simple, self-contained, algebraic statement of the principal theorems of stable population, adapting in especially simple form some of Feller's work on renewal theory. Third, he has proved the validity of a significant generalization of stable population theory—namely, that *any* course of fertility and mortality (whether constant or not) produces a determinate age distribution, independent of initial conditions in the remote past. Finally, he illustrates the usefulness of stable population analysis by employing it to estimate various parameters of the population of Colombia." The treatment is distinguished by mathematical rigor; where it is not attained, the author makes a note of the point.

Employment and Earnings Statistics for the United States, 1909-60, pp. x, 536, plus explanatory notes, Bulletin No. 1312, Issued 1961, Bureau of Labor Statistics, United States Department of Labor, Washington, D.C.

The report presents only national data "based on the 1957 Standard Industrial Classification system for nonagricultural industries in the economy. Statistics included are monthly and annual data on the following: Employment, production workers, weekly earnings, weekly hours, hourly earnings, overtime hours, employment of women, and labor turnover rates. In addition, there are seasonally adjusted data for some of these series, as well as indexes of aggregate weekly hours and weekly payroll. Tables on spendable weekly earnings and hourly earnings, excluding overtime, are also included.

"In a separate section on labor force statistics, historical tables of employment and unemployment data by broad demographic characteristics are presented. These statistics have been included to complete this history of labor market developments, as the labor force survey covers certain groups not reached by establishment payroll statistics, e.g., the unemployed, the self-employed, unpaid family workers, and agricultural employment."

¹¹ See M. Spiegelman, *Introduction to Demography*, Society of Actuaries, Chicago, 1955, pp. 176-180.