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## THE NEW MEDICAL IMPAIRMENT STUDY

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This session will present highlights of the 1983 Medical Impairment Study, a joint effort of the Society of Actuaries and the Association of Life Insurance Medical Directors of America. The Study examines experience on nearly 2,400,000 policies and over 72,000 deaths. Some of the underwriting implications of the Study will also be discussed.

(Editor's note: The charts referred to on the following pages may be found in *Record* Vol. 9 No. 3 beginning on page 1279)

**MR. HARRY A. WOODMAN:** The purpose of this session is to present highlights of the 1983 Medical Impairment Study. We are still in the process of tabulating and analyzing, but we have some results today, in limited and provisional form, on the impairments that are most significant in terms of volume of data and underwriting importance.

I will open with some background information regarding the way the study was put together. Then my two associates will comment on the preliminary results of the study. After their presentation, we expect to have time for questions so we urge you to take notes as we go along.

Most of you are probably familiar with the history of studies jointly undertaken by the Society of Actuaries and the Association of Life Insurance Medical Directors. The last Impairment Study (the 1951 Study) was published in 1954. Since then, there have been two studies of Build and Blood Pressure, 1959 and 1979. The joint committee responsible for the 1983 Study consists of this panel plus Donald Gauer and Denis Loring from the Society and Dr. Donald Chambers and Dr. Brian McCracken from ALIMDA.

The 1983 Study was compiled by the Center for Medical - Actuarial Statistics (CMAS) of MIB, Inc. as was the 1979 Build and Blood Pressure Study. The same team from MIB, led by John Avery and William McDonald, that did the pioneering work on the 1979 Build and Blood Pressure Study, applied much of the same planning, methodology and programming to this Study. The same format for submitting data was used with only minor modifications.

This study is long overdue. Although 90% of our applicants qualify for

standard insurance, we have needed more information about mortality experience on substandard risks. This need is particularly important today when our underwriting decisions are being questioned and we are being asked to produce supporting mortality data. This study was launched in 1978 and those of us on the Committee have been eagerly awaiting the results for five years. Our Committee, as part of our assignment, hopes to make changes to facilitate future studies on a continuing basis that can be completed in much less time.

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As shown in Table A, a total of 24 companies participated in the 1983 Study. Sixteen, including 14 of the 21 contributors to the annual Society studies of standard mortality, were major contributors but not all were able to contribute data for the full exposure period. Of the remaining 8 companies, 5 contributed as part of a special request for data on handicapped risks, and 3 companies contributed only a small amount of data because of their size and limited exposure periods.

TABLE A

## CONTRIBUTING COMPANIES

<u>Company</u>	<u>Exposure by Policies</u>		<u>Years of Issue</u>
	<u>Std</u>	<u>Sub</u>	
Prudential	20.7%	26.5%	1960-76
Massachusetts Mutual	16.3	4.5	1952-76
Northwestern Mutual	13.3	4.1	1956-76+
New York Life	1.5*	14.9	1954-76
Sun Life	13.1	2.8	1952-76
Lincoln National	8.6	4.2	1952-75
Mutual Benefit	9.8	2.3	1952-76
John Hancock	1.4*	10.3	1952-76
London Life	6.1	4.7	1952-76
Metropolitan	1.5*	9.4	1961-73
Manufacturers Life	.6*	5.1	1952-76
Equitable	1.6	2.8	1952-76+
Aetna	-	4.1	1952-76
Mutual of New York	1.6	1.9	1964-76+
Connecticut General	2.4	.5	1960-76+
Phoenix Mutual	1.2	1.3	1953-76
Other 8 Companies	.3	.6	-

\*Standard sample only

+Exposure period shorter than 1962-77

Four large northeastern companies - Prudential, New York Life, John Hancock and Metropolitan - contributed more than 60% of the data on substandard risks. This was quite similar to the proportion of data contributed by those companies to the 1951 Study but is somewhat more than the 45% that they contributed to the data underlying the 1965-70 Basic Table (the basis, after modification, of expected deaths for the 1983 Study). However, it is unlikely that this difference has had any significant effect on the results.

Because three of these four major companies contributed only a sample of their data on standard risks, 70% of standard risk data was contributed by companies that write a high percentage of their business on persons with above average income and generally have better than average standard experience. This may account for the rather favorable mortality rates for some impairments in the standard experience. There are also differences

among companies in the characteristics of the standard risk data that they submitted. Some companies included only borderline standard whereas others included any risk that had a history of an impairment regardless of whether or not there was currently any expected extra mortality.

Some of the basic characteristics of this 1983 Study are shown in Table B together with characteristics of the 1951 Study.

TABLE B

	<u>1983 Study</u>	<u>1951 Study</u>
Issue-Expos. Yrs.	1952-76 betw. 1962-77	1935-49 betw. 1935-50
Exposure units	No. of policies	No. of policies
Substandard	By rating Class	In total only
Minor impairments	Without	With and without
Males & Females	Separately	Combined
Expected deaths	1965-70 modified	1935-50 Basic Table
No. of companies	24	27
Entrants (pol.)	2,400,000	725,000
Deaths	72,400*	18,300

\*63,000 Men; 9,400 Women  
 33,100 Std; 39,300 Substandard

Standard and substandard were studied separately and, because level of rating is an important factor in measuring impairment severity and in determining whether underwriting produced the desired results, the substandard permanent table rating cases were subdivided into slightly (up to 175%), moderately (175% to 250%), and highly (over 250%) substandard permanent table ratings. A fourth rating category includes primarily risks with flat extra premiums alone or in combination with table ratings. This approach differs from the 1951 Impairment Study and earlier studies where substandard experience was studied only in total.

The 1983 Study also differs from the 1951 Study in that it does not include data with minor impairments. A comparison of 1979 Build and Blood Pressure Study data with and without minor impairments suggests that inclusion of data with minor impairments might increase the mortality ratios by about 10%. I might add that, although data without minor impairments are a better measure of an impairment's significance, data with minor impairments gives a broader data base and may add to the validity of the results.

Although data for women were tabulated separately (i.e., not combined with males as in the 1951 Study), only the data for men from the 1983 Study are shown in most of the data which you will see today. However, in making comparisons with the 1951 Study, keep in mind that the 1951 Study mortality ratios are not much different than they would have been if solely male data had been used because they are based on the 1935-50 combined male-female mortality table.

You will note that the number of entrants was about 3 1/3 times that in the

1951 Study and the number of deaths about 4 times, reflecting the much greater proportion of data in the 1983 Study on substandard risks.

Because the data in this Study included only impaired risks, it was not possible to derive basic tables from the data. The 1965-70 Basic Tables adequately reflect mortality in the years 1965 to 1970. In an attempt to estimate mortality rates in years beyond 1970 and years prior to 1965, a percentage factor was applied to the mortality rates for each anniversary year of experience as shown in Table C. These percentage factors were obtained by relating medically examined standard risk data in each of the Society's 15 annual mortality studies between 1962 and 1977 (the study period) to the average for the period between 1965-70 (the basic table period). Due to mortality improvement, this resulted in percentage factors slightly higher than 100% being applied in the earlier years decreasing to well below 100% in the later years. On the average, the mortality rates in the modified 1965-70 tables, obtained by applying these factors to the unmodified tables, are about 10% lower than those in the unmodified tables.

TABLE C

PERCENTAGE MODIFICATIONS OF MORTALITY RATES  
in 1965-70 BASIC TABLES

<u>Experience Years</u>	<u>Pol. Yrs. 1-5</u>		<u>Pol. Yrs. 16-25</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
1962-63	105%	103%	105%	106%
63-64	104	102	104	105
64-65	103	101	103	104
65-66	102	100	102	103
66-67	101	100	101	101
67-68	100	100	100	100
68-69	99	100	99	99
69-70	98	100	98	98
70-71	96	100	96	97
71-72	93	98	93	95
72-73	89	96	90	92
73-74	86	93	88	90
74-75	84	90	86	88
75-76	80	87	84	86
76-77	76	84	81	84

The modified 1965-70 tables are a reasonable, but not completely satisfactory, measure of the experience on standard policies of the contributing companies to this Study because:

1. As previously indicated, the contributing companies and extent of contributions to this study are somewhat different than the contributing companies to the annual studies.
2. The mortality ratios shown today and to be published in Volume I of this study are based on number of policies whereas those in the annual studies are based on amounts of insurance.

Table D shows the relationship of the male mortality rates in the 1965-70 Basic Tables to the combined male-female mortality rates used in the 1935-50 Basic Tables used in the 1951 Study.

TABLE D  
COMPARISON OF BASIC TABLE MORTALITY RATES IN 1983  
AND 1951 STUDIES

<u>Issue Ages</u>	<u>Policy Years</u>			
	<u>1-2</u>	<u>3-5</u>	<u>6-10</u>	<u>11-13</u>
15-19	103%	96%	96%	93%
20-24	86	82	78	96
25-29	72	71	75	89
30-34	88	76	80	87
35-39	72	76	78	85
40-44	85	81	84	90
45-49	75	86	84	88
50-54	72	75	90	93
55-59	58	74	85	94
60-64	73	90	75	103

If the 1983 Study results were based on the same basic table used in the 1951 Study, the mortality ratios would be about 30% lower - 20% because the 1965-70 Male Basic Table is lower than the 1935-50 unisex table and the remaining 10% because the modified 1965-70 male table is lower than the unmodified table upon which the comparison in Table D is based.

MR. JAMES L. COMPERE: The data which we will share with you today covers approximately 55 impairment categories, the most important in terms of volume of data and significance of results. Those impairments are divided into eight groups and we will proceed in the approximate reverse order of underwriting significance. That is, the impairments of least concern will come first and those of greatest interest last. For some impairments where there is extensive data, we will also present data broken down by sex, issue age and policy year.

These charts will also include mortality ratios from the 1951 Impairment Study. As you can well imagine, significant changes have occurred in the years since the 1951 study was published. Thus, direct comparisons with data from that study are limited. For example, there was little or no data in the 1951 study for some impairments considered uninsurable; for example, coronary disease, diabetes, and most malignancies.

Now a final word about our approach in discussing these results. I want to stress that these charts are marked "provisional." It is always possible that changes may occur as we continue to review and check the results. Therefore, the material that appears in the published volume may vary occasionally from the numbers in the charts.

I will comment on the significant results of each chart, pointing out where

the mortality ratios are not consistent with the underwriting classification and also where there have been changes in results between the current study and the 1951 study. Dr. Plucinski will follow me, offering some comments to explain why certain results differ from expected--at least from the medical director's perspective.

You will see arrays of mortality ratios on these charts and note that they are coded to indicate the number of deaths involved. My comments will focus only on the significant ratios--those involving 35 or more deaths. In this study, companies were asked to shift the exposure to a new category whenever the rating was reduced or removed. However, not all companies were able to do so. Most of the flat extras included in the "Other" category are temporary.

Charts 1A & 1B. TRANSIENT, TREATABLE CONDITIONS

At one time this group of impairments had more significant mortality implications, but in recent years they have been fairly well controlled through medication and improved surgical techniques. Generally, the ratios are well within the percentages implied by the particular underwriting category. These lower numbers suggest that our underwriting practices were a bit conservative and consequently we have modified our standards. For example, for tuberculosis the ratio for standard was 99%, 125% in the minimally rated group below 175%, and 177% in the moderately rated group. The tuberculosis ratios are also consistent with the 1951 Study experience. Looking at further breakdowns for the substandard group (Chart 1B-1), we note higher ratios in the middle issue ages and in the middle durations.

DR. THEODORE E. PLUCINSKI: The overall favorable experience for tuberculosis in the substandard area and improvement since 1951 can be explained in part by the fact that, in the later 1940's treatment of tuberculosis had changed dramatically with the advent of chemotherapy. Surgery was no longer required to produce an arrest, with isolation, and extended bed rest. Sterilization of the sputum early in treatment prevents dissemination and produces early cure. As a result, the incidence of tuberculosis has reduced remarkably and mortality is very low. The underwriting practices have been appropriately liberalized in the last 20 years in recognition of these therapeutic trends.

MR. COMPERE: Looking now at ulcers, we have three categories and the only figures that stand out are the standard ratios for gastric ulcers (131%) and peptic ulcers (116%), which are a bit high. Gastric was also high in 1951 (134%) in the standard group. Chart 1B-2 gives further breakdowns on duodenal ulcer for the substandard group. The highest age group ratio for men is 152% for 50-59, whereas the younger women, particularly 30-39, exhibit the higher results. There is no significant variation by sex for this impairment. The policy year data does not demonstrate much of a trend, with fairly flat ratios.

DR. PLUCINSKI: In this study and the one in 1951, gastric (stomach) ulcer carries a higher mortality risk than duodenal ulcer. The probable reasons are that ulcer of the stomach occurs at a later age than duodenal ulcer - 45 to 55 years. It is chronic, responds poorly to treatment, and there is a significant incidence of cancer with this illness. Despite the improvement in radiography and endoscopic techniques there continues to be higher mortality for gastric ulcer as demonstrated in this table, requiring a more

inquisitive attitude when underwriting this impairment. Of interest, the peptic ulcers (gastric and duodenal) have reduced in frequency in the last 10 years - probably due to improvement in the life style of the population - such as reduced smoking, exercise, or the use of Valium and related tranquilizers for stress control, and the use of Tagamet.

MR. COMPERE: Kidney stone exhibits results in the expected ranges as they did pretty much in the 1951 Study. The substandard ratios are especially low. Finally, the results for gout are well within the expected limits.

DR. PLUCINSKI: The primary complication of kidney stones is infection. The prognosis is much better in this impairment due to the increased number of broad spectrum antibiotics available to the physician in the last 30 years to control these infections. The newer diagnostic, therapeutic, and surgical techniques also have had a favorable effect on this impairment. Again, liberalizations in underwriting have followed the improvement in mortality.

The favorable mortality for gout may be due to the over zealous diagnosis and reporting in the presence of a high uric acid without symptoms of a gouty arthritis.

#### Chart 2A. SIGNS OR SYMPTOMS

MR. COMPERE: These are symptoms of possible impairment, but where there is no report of a specific impairment. Generally favorable mortality experience is exhibited. The results on these impairments track well with the 1951 study.

DR. PLUCINSKI: In chest pain cases, the liberal use of electrocardiograms and exercise tests (Master's 2 step and stress) most often rule out those cases with questionable and significant coronary artery disease. To a large degree these tests explain the favorable mortality in this table. We certainly also must recognize the high degree of caution the underwriter exercises in dealing with the history of chest pain. We have no comparable data from 1951 because suspected or known coronary disease was then declined.

#### Charts 3A & B NERVOUS SYSTEM DISORDERS

MR. COMPERE: For grand mal epilepsy, the ratios are within the expected ranges. By issue age (Chart 3B-1), the data for men and women is rather similar, exhibiting decreasing ratios with age. The experience by duration is relatively level with a slight hump in the middle durations. Cerebral concussion has a high standard ratio of 134%.

DR. PLUCINSKI: The total substandard mortality for grand mal epilepsy is considerably higher than for petit mal, as we would expect clinically. The newer radiological and non-invasive diagnostic techniques, for a more definitive diagnosis of brain tumor and vascular anomalies, and more effective medication, other than Dilantin and Phenobarbitol, to control seizure activity may be an explanation for the improved substandard mortality since 1951.

MR. COMPERE: With psychosis we find the experience all within the expected ranges. For psychoneurosis, the ratios are all relatively favorable. The substandard data is worse than the 1951 study (167% versus 107%) and by

issue age (Chart 3B-2) demonstrates higher ratios in the younger issue age groups. Likewise, there is a downward trend in ratios by duration.

DR. PLUCINSKI: The similarity in mortality for psychosis and psychoneurosis is very surprising and difficult to explain. One reason may be the high selectivity of the underwriter when issuing coverage to individuals with a psychotic history. One other thought I have is the probability of a high lapse rate in the psychotic individual due to the economic burden this illness places on the individual in terms of employment, and the high cost of medical care and disruptive family life.

Chart 4A. PHYSICAL HANDICAPS

MR. COMPERE: Substandard spinal curvatures has improved over the 1951 study 169% versus 216%. There appears to be some additional mortality associated with amputation in the standard group (117%).

DR. PLUCINSKI: I would suspect the substandard cases with blindness in one or both eyes and the ones with amputations are those with multiple impairments. Although not reported, it is likely that a systemic illness had to be the underlying cause of the impairment to account for the unfavorable mortality experiences. The reporting companies should have identified the underlying disease to not leave the impression these disabilities were single impairments.

Charts 5A & 5B. HEART MURMURS AND ABNORMAL PULSE

MR. COMPERE: Both the apical and basal, localized, murmurs were within the ranges anticipated. The experience on these and the unclassified murmurs were similar to that for 1951. However, we find the results for the apical, not localized, murmurs to be somewhat high for the minimally substandard group (173%) with the overall substandard experience similar to the 1951 Study. The substandard data for this impairment by issue age (Chart 5B-1) shows relatively level and consistent ratios whereas the ratios decreased by age in the 1951 experience. The ratios are fairly flat by duration.

DR. PLUCINSKI: First, the standard apical systolic, localized murmurs and the standard unclassified murmurs are benign and probably many of them fit into the diagnostic group of mitral valve prolapse or Barlowe's Syndrome, which is a common diagnosis for a heart murmur found on routine examination in young people today.

On the other hand, the apical and basal murmurs not localized continue to be the more severe valvular lesions. These two lesions are more commonly caused by arteriosclerotic calcification of the aortic or mitral valves complicated by coronary artery disease. Of the two - the basal murmur (aortic stenosis) has the poorer mortality experience.

Now, I call your attention to the issue age data on Chart 5B-1, showing a distinct fall in mortality with age seen in the 1951 study that is not present in the 1983 results. This reduction at the younger ages reflects the significance of the advent of many antibiotics for the treatment of rheumatic fever in childhood over the last 30 years. Rheumatic fever has become an uncommon illness today and the cardiac complications of mitral insufficiency is a rare occurrence. Those at the older ages who survive with mitral insufficiency are living longer due to the introduction of the



many diuretic drugs on the market for the treatment of cardiac decompensation and the success of surgical prosthetic valve replacement.

Diastolic murmurs are not shown in this data. However, the experience with mitral stenosis and aortic insufficiency is similar to the basal systolic murmurs, not localized. The small number of cases in this group are indicative of the high not-taken rate in the high substandard premium cases issued in our companies.

MR. COMPERE: Moving to pulse, we see that rapid pulse was high in the standard category (122%) as was also true in the 1951 study (123%). The minimally rated category (196%) was also a bit higher than expected. Note also that the total substandard mortality ratio of 196% was higher than the 148% figure in 1951. The data by issue age in Chart 5B-2 evidences no real pattern by age, but higher ratios for women (243% versus 196%). By policy year, there is a decreasing slope. The experience for arrhythmia is well within expectations and shows that the overall substandard ratio of 153% is once again fairly low as it was in 1951 (119%).

DR. PLUCINSKI: The rapid pulse mortality is somewhat surprising, but if you will accept pulse rate as a simple index for state of physical fitness, it becomes more acceptable. We know a person with a low pulse (up to 60) is in far better health than another with a high pulse (80-90). These results suggest that it may not be wise for the underwriter to explain a rapid pulse on the basis of an anxiety state during the process of underwriting.

#### Charts 6A & 6B. CARDIOVASCULAR AND RELATED DISORDERS

MR. COMPERE: For coronary artery disease we find higher than expected ratios in nearly all of the substandard groupings. The issue age experience for this impairment (Chart 6B-1) starts with very high ratios in the 30-39 age grouping and then decreases with age. There is also a slightly decreasing slope by duration.

DR. PLUCINSKI: A history of coronary artery disease generally called for a declination in 1951.

These numbers corroborate the high mortality of this disease which we all do accept. In Chart 6B-1 note the precipitous fall in mortality with age. This fall is consistent with the knowledge that the individuals at the younger ages experience more severe disease than people at the older ages.

It should be pointed out that this mortality study does not reflect the advent of coronary bypass surgery and the newer drugs introduced at the end of the 1960's and early 1970's. These advancements in medicine should have a significantly more favorable effect on the mortality in coronary artery disease at the present time.

MR. COMPERE: One of the most important figures in the study is the high standard ratio (188%) for family history of cardiovascular disease and that was also relatively high in the 1951 experience (141%). The ratio for the minimally rated category (226%) is also excessive. The breakdown by sex for the standard risks finds that women have considerably lower mortality (126% versus 188%). There is a decreasing trend by issue age as shown in Chart 6B-2. By duration, there appears to be a slight hump in the middle durations.

DR. PLUCINSKI: This data shows that mortality for family history of CVR disease is even worse now than it was in 1951. Like the impairments alcohol and rapid pulse, it is hard for the underwriter to rate an applicant for a poor family history when there is nothing else in the file to support his substandard rating.

I wonder whether the full effects of the public's awareness of the coronary risk factors have had the full impact on family history in this study. The control of diet and stress, exercise, non-smoking, low lipid diets, and treatment for high blood pressure only began in the early 1960's.

It is hard to believe that family history still plays such an important role in our longevity.

MR. COMPERE: The mortality experience for ECG is quite good, in particular, the overall ratio for total substandard (125%). Companies were asked to contribute data only for treated blood pressure. However, some companies were unable to do so. The elevated blood pressure data submitted exhibits ratios all within the expected ranges.

DR. PLUCINSKI: These numbers suggest we are overly conservative in underwriting changes noted in the electrocardiogram. The favorable substandard experience suggests that some ECG abnormalities may not be as significant as previously thought. Further analysis may clarify this point.

MR. COMPERE: Finally, for build we have the two categories of weight loss and overweight. Although companies were not asked to submit data on policies rated for overweight, some submitted their data and this data is compared with the data for weight loss. Both experienced mortality ratios within the expected ranges.

DR. PLUCINSKI: One wonders why the mortality ratios are more favorable for the overweight when compared with the individual with a history of weight loss. I would suspect the weight loss insured population has chronic impairments to reflect the worse mortality. I don't believe this population includes some who are on a weight reduction diet, as there are no studies published to show that weight reduction diets produce a higher than standard mortality. It will be interesting to learn the causes of death in this group.

#### Charts 7A & 7B. PROGRESSIVE OR CHRONIC DISEASE

MR. COMPERE: Rheumatoid arthritis shows favorable mortality among the standard risks, but definitely excess mortality in the minimally (203%) and moderately (390%) rated groups. The overall ratio for all substandard (222%) is considerably higher than the 122% figure for the 1951 study. The substandard mortality ratios by issue age (Chart 7B-1) are fairly level in both studies. There is a slightly increasing slope by duration.

DR. PLUCINSKI: Rheumatoid arthritis is associated with surprisingly increased mortality in the slightly and moderately substandard areas. I would conclude the underwriting process was more selective and a number of cases of osteoarthritis and other non-rheumatoid cases were included in the standard group to give such favorable mortality. Unlike osteoarthritis, rheumatoid arthritis is an autoimmune disease. It is a chronic, progressive, multiple organ disease whose cause is unknown and therefore the

treatment, though helpful is non-specific. These conditions lead to the unfavorable mortality.

MR. COMPERE: In the chronic respiratory grouping we also find asthma with excess mortality ratios for the minimally (179%) and moderately (294%) rated groups. The overall substandard ratio of 205% is above the 1951 result of 153%. Turning to the asthma substandard experience by sex in Chart 7B-2, we note that women are considerably higher than men (297% versus 205%). The experience by policy year is relatively level, whereas it decreased by duration in the 1951 study.

Bronchitis exhibits a higher than anticipated mortality ratio for standard (136%) and this was true with the 1951 Study as well (168%). In addition, the minimally rated (237%) was in excess of expected. Emphysema is even worse, with all three of the rated groupings above the norms. This suggests that we have not done a very good job of underwriting emphysema.

DR. PLUCINSKI: In chronic respiratory disease, we also have to underwrite more selectively. Mild asthmatics are favorable and have a favorable mortality.

Bronchitis and emphysema, more often referred to as chronic obstructive pulmonary disease (COPD), have had an unfavorable mortality for many years as demonstrated by the two mortality studies. It has a direct correlation with chronic smoking and therefore is a preventable impairment. Like chronic asthma, there are no long-term cures but palliative therapy. The pathology is progressive. Here we can improve our experience by increasing the use of the test for Timed Vital Capacity, rather than X-ray of the chest, which is of little or no value in the earlier and moderate stages of COPD.

MR. COMPERE: Ulcerative colitis shows higher than expected mortality ratios in the minimally (210%) rated category. In the albuminuria grouping there are excess mortality ratios in the standard categories, with the single specimen standing out at 168%. In the constant category, we see that the minimally rated (193%) group is somewhat high. The higher standard mortality ratios for albuminuria were also present in the 1951 Study.

DR. PLUCINSKI: The standard exposure for ulcerative colitis must be made up of cases of single attack, non-specific, acute colitis because ulcerative colitis is a serious disease as demonstrated by our high substandard mortality. It is also an impairment which was declined prior to 1951.

This illness, too, is regarded as an autoimmune disease. It is a chronic inflammatory bowel disease, cause unknown, treated supportively and is complicated by arthritis, liver and renal pathology and cancer of the bowel.

These results suggest we should exercise more careful underwriting and perhaps instead of rating the impairment from the last attack accept the fact that it is a chronic disease even in the absence of symptoms.

The standard and substandard mortality for albuminuria was unfavorable in 1951 and seems to be even worse in the present study. The results also suggest that it doesn't make much difference whether the proteinuria is found in one specimen or is constant in several specimens. It is quite an ominous sign for chronic renal disease.

The study would also indicate that the underwriter in cases with small amounts of albuminuria has a strong tendency to grant standard if there are no other indications of renal disease.

Intermittent albuminuria, meaning that at least one current urine specimen is negative, is less apt to be due to an underlying renal disease. It is usually assumed that proteinuria at younger ages is more apt to be postural or exercise related and therefore not due to disease. However, our present substandard data suggests that this is not so when large amounts are found on urinalysis.

It should be pointed out that chronic glomerulonephritis secondary to infection has been significantly reduced in the last several years.

As is true with rheumatic heart disease, renal complications from streptococcal infections are almost non-existent today. This has significantly reduced the number of cases seen with albuminuria.

Charts 8A & 8B. TUMOR, ALCOHOL, DIABETES

MR. COMPERE: In tumor, we note a high ratio for malignant tumors in the standard group (139%). The further breakdowns for substandard malignant tumors in Chart 8B-1 suggest decreasing ratios by issue age and duration.

For alcohol abuse the standard group is particularly high at 199%, representing the highest mortality ratio for any standard risk category in the study. The minimally (207%) and moderately (284%) substandard categories are also high.

DR. PLUCINSKI: Alcoholism is a very common and very serious disease. The industry learned over 30 years ago that habits criticism translates into significant extra mortality. It has always been particularly hard for the agent to confront his applicant with a substandard offer because of a drinking criticism; consequently, it's always been hard for the underwriter to rate such cases as high as they should be. There is little other explanation for our continuing practice to underprice those individuals believed to have an alcohol problem.

MR. COMPERE: The results for diabetes are generally within the expected ranges although the standard ratio of 158% based on limited deaths is not favorable. On Chart 8B-2, further breakdown of substandard indicates that mortality ratios for women are higher (289% versus 214%) and that the younger ages with the juvenile onset exhibit higher mortality ratios. Finally, the mortality ratios increase by duration. Family history of diabetes show ratios within the expected ranges, as was also true in the 1951 study.

DR. PLUCINSKI: We have no comparison from the 1951 study as diabetes was then a decline. The standard mortality ratio in this study would indicate there is no diabetic who is a standard risk.

We should, however, be very cautious in drawing any hasty conclusions from this data. In the recent years the mature onset, obese, sedentary, individuals whose elevated blood sugar is controlled by diet alone are no longer referred to as diabetics, but rather those who have a glucose intolerance. They have a more favorable mortality as opposed to the

insulin-dependent juveniles or the ones requiring oral hypoglycemic drugs. The diabetic population of tomorrow will be a very different and a higher risk group than the population for which these current figures apply.

A final comment about trends by issue age and policy duration. As we see in Chart 8B-2, mortality falls by age and increases with duration. These distinctive trends have been noted in prior intra-company studies. They reflect the facts that insulin-dependent diabetes, which is the most severe type, is most common at younger ages, and that diabetes is a chronic degenerative disease eventually leading to premature arteriosclerotic complications (predominantly coronary artery disease). From these trends, I would conclude it is necessary for the industry to make a more meaningful differentiation in underwriting practices between the younger and the older diabetics.

MR. WOODMAN: I would like to clarify the definitions of several of these impairments.

Family History of Cardiovascular Disease is two or more deaths among natural parents or siblings under age 60.

Alcohol Abuse is broken down into four categories:

1. Steady free use of approximately three drinks per day.
2. Moderate excess not more than twice a month.
3. Spree drinking limited to two days (weekends).
4. Spree drinking lasting more than two days.

MR. RICHARD D. ASHTON: There are two points that I want to comment on. The first is addressed to Harry. In Table B, you show the exposure as based on the number of policies. In situations where there are multiple policies on a given life, there is a mismatch between the number of deaths and the exposure. Did you adjust for multiple policies on a life?

MR. WOODMAN: There could be mismatch, in some cases a serious mismatch, however the amount of work required to adjust for mismatch was beyond the amount of work we could ask the companies to do. We are not going to adjust for the mismatch and we will caution people to be careful in interpretation of the cells where there are a particularly small number of deaths.

MR. ASHTON: The second point that I want to comment on deals with a significant change that has occurred in the rating of policies subsequent to this study. This study covers issues through 1976. Since that time, we have seen the introductions and wide scale use of substandard shopping programs. To the extent that the business written through these programs is included in future studies, we will see a deterioration in the experience as compared to the results of this study.

MR. COMPERE: In future studies, we should differentiate between business that is reinsured and business that is not. The ratings we are putting on cases are not appropriate in a study if the cases are reinsured.

MR. WOODMAN: There are a number of factors to be considered in using the

data which, for the sake of brevity, I will simply list (Table E). Many of these factors also applied to and are discussed in the text of the 1979 Build and Blood Pressure Study. However, comparison of relative mortality among impairments are not affected by these factors. Since mortality relationships among impairments can be applied to current or future mortality evaluations, they are much more useful than absolute mortality levels which are mainly of historical interest.

TABLE E

CONSIDERATIONS IN USING DATA FOR UNDERWRITING

1. Many impairment categories are heterogeneous
2. Past experience may not be a reliable indication of future
3. Individual company experience varies according to underwriting practices and markets served
4. Age and duration are significant factors for certain impairments
5. Multiple policies on one life can distort experience
6. Data underlying basic table is based on amounts and has a different intercompany mix

ADDITIONAL CONSIDERATIONS IN COMPARING  
DATA TO POPULATION EXPERIENCE

1. Comparisons to 1951 Study indicate change relative to standard risks, not in mortality rates
2. Insurance examinations, although not equivalent to clinical examinations, screen out poorest (uninsurable) risks
3. Insured lives probably receive better medical care
4. Insurance experience is adversely affected by terminations because risk who have not deteriorated are more likely to terminate.

Please keep in mind that these results are provisional and subject to change before publication of Volume I later this year. Volume I will also include data which is not yet available such as extra deaths per thousand, data by cause of death and trends by calendar year. Volume I will give more detail about impairments shown today (especially alcohol abuse, ECG, tumor and treated blood pressure) and will show other impairments that are not shown today. There are about 150 impairments plus many subdivisions for which data will be published.

Volume II will hopefully be available 12 to 18 months after Volume I and will include additional data listed in Table F.

TABLE F

## POSSIBLE ADDITIONAL DATA FOR VOLUME II

1. With specific minor impairments or minor impairment groups
2. With specific major impairments
3. By severity (e.g., multiple attacks, bleeding, surgery, etc.)
4. By time since attack
5. With normal ECG and x-ray
6. By specific issue age - policy year cells
7. By amounts of insurance

And now, before we close, a few words about sex. The 1979 Build and Blood Pressure Study was the first intercompany study of impaired risks which produced mortality ratios based on separate basic tables for men and women. This study showed that mortality ratios for the same degree of overweight and for the same levels of blood pressure elevation were lower for women than for men. However, in this 1983 Study, for the majority of impairments the mortality ratios for women are higher than those for men. The exceptions are psychiatric disorders, heart murmurs and benign tumor where the mortality ratios for women are about the same or lower than those for men. The same percentage mortality relationship between standard men and women does not extend to substandard although the reason for this is not apparent.

In summary, before we close, I would like to leave you with two of the more important conclusions that can be drawn from this study:

1. Remember the ABC's - Alcohol abuse, Breathing (respiratory) problems and Cardiovascular family history. If your company's underwriting is too liberal in these areas, you may be in trouble.
2. Trust your underwriter. His or her track record, as demonstrated by these results, has been pretty good.

