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THE NEW MEDICAL IMPAIRMENT STUDY

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This session will present highlights of the 1983 Medical Impairment Study. 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.

MR. DONALD L. GAUER: The panel today represents three/sevenths of the Medical Impairment Committee. This committee, formed in 1978, is a creation of the Liaison Committee of the Society of Actuaries and the Association of Life Insurance Medical Directors of America - A.L.I.M.D.A. The committee is composed of three actuaries and three medical directors, in addition to a chairman, Mr. Harry A. Woodman who, in management language, serves as our conflict resolution mechanism, as well as doing ninety percent of the work. Dr. Donald C. Chambers* is the only one of the original medical directors who is still on the committee. His two original colleagues, Dr. John G. Rafter and Dr. Robert G. Wood have been replaced by Dr. Brian H. McCracken and Dr. Theodore E. Plucinski. The other actuary on the committee is Mr. James L. Compere.

While we are still in the process of tabulating and analysing the data, we do have some preliminary results on a selection of impairments that are among the most significant in terms of volume of data and underwriting importance. I propose to give you some background information regarding the way the study was put together; my two associates will then comment on the preliminary results of the study.

Most of you are probably familiar with the history of studies jointly undertaken by the Society of Actuaries and A.L.I.M.D.A. The last impairment study (the 1951 study) was published in 1954. Since then there have been two studies of build and blood pressure, one in 1959, and the latest in 1979.

This study, like the 1979 build and blood pressure study, was compiled by the Centre for Medico-Actuarial Statistics (C.M.A.S.), a division of the Medical Information Bureau. The team from M.I.B., led by Mr. John R. Avery and Mr. William McDonald, that did the pioneering work on the 1979 build and blood pressure study, and applied much of the same planning methodology and programming to this study. The same format for submitting data was used with only minor modifications.

* Dr. Chambers, not a member of the Society, is Second Vice President and Medical Director of Lincoln National Life Insurance Company.

This study is long overdue. Although in general, ninety percent of all applicants for life insurance qualify for standard coverage, underwriters are always hungry for information about mortality experience on substandard risks. This information is particularly important today as underwriting decisions are being questioned and we are being asked to produce supporting mortality data; and when medical advancements in the treatment of disease are so numerous. As often happens with studies of this kind, the committee is not fully satisfied with the length of time that the study has taken to be completed, nor with the utility of the output. One of our most significant initiatives, once we have finished the investigation and published the results, will be to recommend changes to enable us to produce results of more homogenous cells and on a more timely basis in the future.

Table "A" gives a display of the sixteen major contributing companies. Eight other companies contributed a relatively minor amount of data due to their size or limited exposure periods, or as part of a special request for data on handicapped risks.

Four large northeastern companies, Prudential, New York Life, John Hancock, and Metropolitan, contributed more than sixty percent of the data on substandard risks. The three Canadian companies in the study, Manufacturers, London Life, and Sun Life, added another thirteen percent.

TABLE A
CONTRIBUTING COMPANIES

COMPANY	Exposure by Policies		YEARS OF ISSUE
	STD	SUBSTD	
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, New York	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.

Table "B" compares some of the basic characteristics of the new 1983 study with the 1951 study. In the new study, which is about four times the size of the earlier one, not only were standard and substandard policies studied separately, but the substandard policies were split into sub-groups according to the severity of the rating. The sub-groups were "mildly substandard", which is a rating up to 175%, "moderately substandard", which is 175% to 250%; and "highly substandard", which is over 250%. A fourth sub-group called "other" includes risks with flat extra premiums, alone or in combination with other table ratings.

The 1983 study also differs from the earlier study in that it does not include data with minor impairments. If the build and blood pressure study is any guide, the inclusion of minor impairments might increase mortality ratios by about ten percent.

In the 1983 study, males and females are studied separately; although most of the data which you will be seeing today refers to males only.

TABLE B

	<u>1983 Study</u>	<u>1951 Study</u>
Issue-Expos. Yrs.	1952-76 between 1962-77	1935-49 between 1935-50
Exposure Units	Number of policies	Number 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
Number of Companies	24	27
Entrants (Policies)	2,400,000	725,000
Deaths	72,400*	18,300

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

Because the new study covered an exposure period of fifteen years, it was felt that some adjustments were needed to the 1965-70 basic mortality tables before using them as the basis for calculating the expected deaths. Table "C" shows the adjustments which were made. These adjustment factors were derived from the Society's regular annual studies of medically-examined standard risks, and thus are a reflection of the improvement in mortality over the period. On average, the mortality rates in the modified 65-70 tables, obtained by applying these factors to the basic tables, are about ten percent lower than those in the basic tables.

TABLE C

PERCENTAGE MODIFICATIONS OF MORTALITY RATES IN 1965-70 BASIC TABLES

<u>EXPERIENCE YEARS</u>	<u>POL. YRS. 1-15</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

While the modified tables are a reasonable measure of the experience on standard policies of the companies contributing to this study, they are not a completely satisfactory measure for two reasons. Firstly, the companies who contributed to the impairment study and the size of each contribution are somewhat different from the companies and proportions in the annual studies. Secondly, the mortality ratios shown today, and to be published in Volume I of the impairment study, are based on numbers 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 expected rates used in the previous study.

The difference in the expected tables between the two studies would have an impact of about thirty percent on the ratios which you will see today, i.e. if the current investigation had been done using the older higher mortality table as a basis for the expected deaths, the ratios would have come out about thirty percent lower.

TABLE DCOMPARISON OF BASIC TABLE MORTALITY RATES IN THE 1983 AND THE 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

Table "E" which I do not propose to discuss in detail is simply a short list of caveats which apply to the consideration of any study of this sort. The first item is the most critical, and we have to admit that many of the impairment categories are not homogeneous.

TABLE ECONSIDERATIONS 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.

ADDITIONAL CONSIDERATIONS IN COMPARING DATA TO POPULATION EXPERIENCE

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

The format in which the results will be presented shows the mortality ratio from the 1983 study for standard risks which nonetheless had an impairment code; the three categories of substandard; and an "other" category, which is a basket clause. A total substandard mortality ratio is also shown which can be compared to the 1951 mortality ratio where available. For some impairments for which there is extensive data, the results are broken down by sex, issue age and policy year.

It should be noted that we have used a code to indicate the size of the cell and hence the credibility of the resulting mortality ratio. A ratio that is underlined is based on a hundred or more policies terminated by death. If the ratio is in parentheses, it means that there are between ten and thirty-four deaths. A ratio which is neither underlined nor in parentheses is based on between thirty-five and ninety-nine deaths.

MR. DENIS W. LORING: The data that we are sharing with you today covers approximately 60 impairment categories, which are the most important in terms of volume of data and significance of results. These impairments are divided into eight groups. We will proceed in the approximate reverse order of underwriting significance, the impairments of least concern will come first and those of greatest interest last.

While the tables include mortality ratios from the 1951 Impairment Study, 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 were little or no data in the 1951 study for some impairments then considered uninsurable, such as coronary disease, diabetes, and most malignancies.

Dr. Chambers and I will go through each table in turn. I will comment on the significant results, pointing out where the mortality ratios are not consistent with the underwriting classification and also where there have been significant changes in results between the current study and the 1951 study. Dr. Chambers, from the Medical Director's perspective, will then offer some comments as to why certain results seem to differ from expected.

In this study, individual lives remain in their original rating category determined at issue, even though actual ratings may be reduced or removed over time. Many of the flat extras included in the "other" category are temporary.

DR. DONALD C. CHAMBERS: As a Medical Director, my role on this panel is to comment or react to certain study findings and to do so from either a clinical and/or a medical-underwriting viewpoint. The kinds of questions I will try to address are: Is there some reasonable medical explanation for results that deviate significantly from expected? What is the significance of current results that differ a great deal from those of the 1951 study? Where can we take heart from favorable results? Which findings suggest a need for greater underwriting caution?

In general, the performance of the underwriters and medical directors has been extraordinarily good. Most of the numbers that you will see today will attest to the fact that the classification process really is working, with most of the results being in line with those anticipated. Unfortunately those results that are not in line with anticipated results are the ones

that get most of the attention as with the news media who report on those things that are bad and avoid those things that are good. We are obligated to highlight the results that deviate significantly from what we expected.

Transient, Treatable Conditions

MR. LORING: At one time this group of impairments had 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 suggested by the particular underwriting category.

For tuberculosis in Table 1, the ratio in the standard group was 99%, 125% in the mildly substandard group, and 177% in the moderately substandard group. These ratios are consistent with the 1951 study experience. Looking at further breakdowns of the substandard group, you notice higher ratios in the middle issue ages and in the middle durations.

DR. CHAMBERS: The overall favorable substandard experience coupled with improvement since 1951 is almost certainly due to the steady improvement over the last 30 years in both early detection and treatment of chronic infectious diseases of all kinds, including pulmonary tuberculosis. Relatively few people in North America now develop tuberculosis and those who do are at far less risk both in terms of death and disability than was once the case.

TABLE 1

TRANSIENT, TREATABLE CONDITIONS

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
TUBERCULOSIS	<u>99</u>	<u>125</u>	177	(170)	180	<u>144</u>	<u>86</u>	<u>155</u>

TUBERCULOSIS - SUBSTANDARD

ISSUE AGE	1983		1951 MEN & WOMEN	POLICY YEAR	1983		1951 MEN & WOMEN
	MEN	WOMEN			MEN	WOMEN	
15-29	(98)	-	(153)	1-2	-	-	(130)
30-39	127	(148)	187	3-5	(120)	(244)	160
40-49	169	(99)	165	6-10	148	-	170
50-59	156	(326)	(131)	11-15	163	(230)	142
60-69	(105)	-	-	16-25	139	(133)	-
TOTAL	<u>144</u>	157	<u>155</u>	TOTAL	<u>144</u>	157	<u>155</u>

MR. LORING: Looking now at Table 2, you will notice that among the three categories of ulcer, the only figure that stands out is the standard ratio for gastric ulcer (131%), which is slightly high. Gastric ulcer was also high in 1951 (134%) in the standard group. The further breakdowns on duodenal ulcer for the substandard group show that the highest age group ratio for men is 152% for ages 50-59, whereas the younger women exhibit the higher results. The policy year data shows fairly flat ratios except for an elevation at durations 3 to 5.

TABLE 2

TRANSIENT, TREATABLE CONDITIONS

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	MEN & WOMEN	
ULCER								
Duodenal	103	125	174	107	131	129	111	144
Gastric	<u>131</u>	<u>150</u>	(184)	(90)	<u>171</u>	<u>161</u>	<u>134</u>	<u>153</u>
Peptic	<u>116</u>	123	(218)	-	<u>170</u>	<u>161</u>	N.S.	N.S.
KIDNEY STONE	<u>95</u>	<u>126</u>	(126)	(128)	87	<u>108</u>	<u>105</u>	<u>130</u>
GOUT	<u>108</u>	<u>125</u>	(218)	-	-	<u>128</u>	-	-

DUODENAL ULCER - SUBSTANDARD

ISSUE AGE	1983		1951	POLICY	1983		1951
	MEN	WOMEN	MEN & WOMEN	YEAR	MEN	WOMEN	MEN & WOMEN
15-29	131	-	220	1-2	127	(104)	176
30-39	131	(165)	162	3-5	154	(155)	139
40-49	118	147	143	6-10	126	144	145
50-59	<u>152</u>	125	109	11-15	<u>119</u>	(115)	(94)
60-69	<u>85</u>	(156)	-	16-25	<u>126</u>	(169)	-
TOTAL	<u>129</u>	<u>138</u>	<u>144</u>	TOTAL	<u>129</u>	<u>138</u>	<u>144</u>

DR. CHAMBERS: Gastric or stomach ulcer carries a higher mortality risk than duodenal ulcer, a fact demonstrated both by the 1951 data as well as by the present results. Fortunately, underwriters have long recognized this fact, and substandard rating practices for gastric ulcer have proven to be reasonably adequate. The relatively poor standard experience, both in 1951 and currently, possibly indicates a need to adopt a somewhat more inquisitive attitude as to the reliability of the diagnosis and how the lesion has responded to treatment. In particular, the signs and symptoms of stomach cancer can mimic those of a gastric ulcer, and one needs to keep this fact in mind when evaluating the diagnostic and therapeutic aspects of these cases.

In recent years there have been significant improvements with respect to a more precise clinical diagnosis and with respect to medical therapy. These advancements should translate into a more favorable mortality experience in future years.

MR. LORING: The results in the kidney stone category are in the expected ranges, much as they were in the 1951 study. The substandard ratios are especially low.

DR. CHAMBERS: A favorable substandard experience and an improvement since 1951 are both consistent with the knowledge that a primary complication of stones, namely infection, can be more effectively treated with newer antibiotics than was possible a couple decades ago. Better diagnostic and surgical techniques have also helped.

In the last few years, the underwriting profession, anticipating this kind of mortality, has liberalized its rating to the extent that current underwriting practices are quite in line with what we see here.

MR. LORING: The results for gout are well within the expected ranges.

DR. CHAMBERS: Favorable substandard mortality is apt to be due, in part, to overzealous coding practices when there is merely an elevated uric acid level instead of true gouty arthritis. We have no specific code for hyperuricemia, and there is no need for one.

Signs or Symptoms

MR. LORING: Let us look now at Table 3. Indicated here are symptoms of a possible impairment, where no specific impairment was reported. Uniformly favorable mortality experience is exhibited. The only impairment that is slightly on the high side is pyuria, and even those ratios are within the expected ranges. The results for these impairments are consistent with the 1951 study.

DR. CHAMBERS: Mortality is remarkably favorable in all rating categories for chest pain. I would suspect this reflects a high degree of underwriter caution when dealing with such cases, including conservative coding practices and insistence on obtaining reassuring comments or data from the attending physician. Liberal use of electrocardiograms, including stress tests, helps the underwriter to do an effective job of selecting those whose chest pain is not due to coronary heart disease.

There is no data in 1951 because prior to that time, most companies declined those applicants with known or suspected coronary disease.

Under the colitis category, I should point out that we refer to simple or spastic colitis, diarrhea and dysentery. We do not refer to ulcerative colitis which is a serious chronic disease and for which there is a specific code to be discussed a little later.

TABLE 3

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	SUBSTANDARD RATING:						MEN & WOMEN	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
HEADACHE	<u>91</u>	(119)	-	-	-	(116)	73	(121)
DIZZINESS	<u>84</u>	109	-	-	-	121	94	(116)
CHEST PAIN	<u>88</u>	<u>93</u>	160	(129)	(194)	<u>114</u>	N.S.	N.S.
INDIGESTION	84	122	-	-	116	121	N.S.	N.S.
COLITIS	<u>63</u>	(162)	-	-	-	<u>163</u>	N.S.	N.S.
HEMATURIA	<u>94</u>	117	(189)	-	-	131	<u>105</u>	(122)
PYURIA	<u>116</u>	158	(175)	-	-	162	<u>96</u>	135
GLYCOSURIA	114	131	(176)	(255)	-	158	<u>111</u>	<u>148</u>

Nervous System Disorders

MR. LORING: Turning now to Table 4, the ratios for Grand Mal epilepsy are not noteworthy. By issue age the data for men and women is rather similar exhibiting decreasing ratios with age. The experience by duration shows a slight hump in the middle durations.

DR. CHAMBERS: Grand Mal epilepsy is a more serious entity than Petit Mal as indicated by the differences in number of deaths and by the total mortality ratios.

Newer radiological and non-invasive diagnostic techniques to detect underlying brain tumor and vascular anomalies, along with some newer antiseizure drugs, will almost certainly help to improve selection capabilities and future experience.

Standard mortality for Petit Mal appears worse than that for Grand Mal. A possible explanation for this is that underwriting rules and practices dictate greater caution for Grand Mal and this translates into lower mortality. Perhaps a greater degree of caution is needed in the selection of those with Petit Mal epilepsy, particularly on the marginally standard risk.

Finally, I should say that I have no profound comments to make in reference to the definite downward trend in mortality with advance in age nor can I explain why female experience is somewhat worse than male experience. There are a number of other impairments for which the same observations apply, and in most such cases I can only say that age, and to a lesser extent sex, are risk variables that deserve careful attention by those who establish underwriting practices.

MR. LORING: Note the high standard ratio of 134% for cerebral concussion.

TABLE 4

NERVOUS SYSTEM DISORDERS

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	SUBSTANDARD RATING:						MEN & WOMEN	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
EPILEPSY								
Grand Mal	(96)	135	218	359	(394)	223	-	(365)
Perit Mal	(156)	(108)	(193)	-	-	164	-	-
CEREBRAL CONC.	134	-	-	-	(273)	(230)	113	(114)
MENT. RETARD.	-	(193)	-	-	-	(218)	N.S.	N.S.

EPILEPSY - GRAND MAL - SUBSTANDARD

ISSUE AGE	1983		1951 MEN & WOMEN	POLICY YEAR	1983		1951 MEN & WOMEN
	MEN	WOMEN			MEN	WOMEN	
15-29	306	(310)	-	1-2	202	-	-
30-39	200	(236)	-	3-5	243	(300)	-
40-49	171	(182)	-	6-10	248	(301)	-
50-59	(162)	-	-	11-15	219	-	-
60-69	-	-	-	16-25	166	-	-
TOTAL	223	247	(365)	TOTAL	223	247	(365)

MR. LORING: The experience for psychosis and psychoneurosis in Table 5 is all within the expected ranges. The sub-standard psychoneurosis data is worse than the 1951 study (167% versus 106%), and by issue age demonstrates higher ratios in the younger issue age groups. There is also a downward trend in ratios by duration.

DR. CHAMBERS: The similarity in mortality results between these two impairments is surprising since psychosis is generally regarded as being a much more serious condition. Perhaps this is yet another tribute to the effectiveness of the risk selection process inasmuch as caution itself translates into more favorable mortality. Those with a psychosis history have been underwritten more conservatively than applicants with neurosis, and this is supported by the 1951 data where differentials between these illnesses were striking.

The fall in mortality for neurotic males after policy year five may attest to the fact that these people often do adjust or improve with the passage of time.

TABLE 5

NERVOUS SYSTEM DISORDERS

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	SUBSTANDARD RATING:					MEN & WOMEN	
		TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
PSYCHOSIS	(65)	159	(149)	(246)	-	175	(206)	169
PSYCHONEUROSIS	107	152	204	266	155	167	114	(106)

PSYCHONEUROSIS - SUBSTANDARD

ISSUE AGE	1983		1951 MEN & WOMEN	POLICY YEAR	1983		1951 MEN & WOMEN
	MEN	WOMEN			MEN	WOMEN	
15-29	212	(188)	-	1-2	183	(130)	-
30-39	170	171	-	3-5	185	162	-
40-49	165	147	-	6-10	165	173	-
50-59	156	(157)	-	11-15	159	(153)	-
60-69	(132)	-	-	16-25	138	(150)	-
TOTAL	167	158	(106)	TOTAL	167	158	(106)

Physical Handicaps

MR. LORING: In Table 6, total blindness has a favorable standard experience (82%). Both standard and substandard spinal curvature have improved over the 1951 study. There appears to be some very slight additional mortality associated with amputation in the standard group (117%).

DR. CHAMBERS: Impairments that might be presumed by their very nature to invariably yield extra mortality are shown to be compatible with standard if selection is performed with care and attention. I find it rather remarkable that total blindness, deafness, marked deformity and paralysis can show the favorable results that we see. Again, these cases are carefully selected, and it is a tribute to the selection process that these results are so favorable.

TABLE 6

PHYSICAL HANDICAPS

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY MEN & WOMEN	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
BLINDNESS								
One Eye	<u>102</u>	-	-	-	-	(146)	N.S.	N.S.
Total	<u>82</u>	(320)	-	-	(126)	(195)	-	-
DEAFNESS	<u>101</u>	-	-	-	(109)	(101)	<u>97</u>	<u>103</u>
DEFORMITY	97	(115)	-	-	-	(125)	101	149
SPINAL CURV.	87	(143)	-	-	-	169	<u>112</u>	<u>216</u>
AMPUTATION	117	-	-	-	(197)	(196)	N.S.	N.S.
PARALYSIS	(62)	(130)	(165)	-	-	153	N.S.	N.S.

Heart Murmurs and Abnormal Pulse

DR. CHAMBERS: In Table 7, the terms "apical" and "basal" refer to locations where the murmurs are heard. "Not localized" means that the murmur can also be heard in other locations, and such murmurs are said to be "transmitted". "Localized" means that the murmur is not transmitted. "Unclassified" applies to the common circumstance where the reported heart murmur does not clearly fall into any specific category.

These murmurs, with rare exception, are "systolic" murmurs meaning that they were heard during the contraction rather than the resting phase of the heart cycle. There was too little data on "diastolic" murmurs to justify our reporting on these at this time.

MR. LORING: Both the apical and basal, localized murmurs were within the ranges anticipated. The experience on these and the unclassified murmurs was similar to that for 1951. However, we find the results for the apical, not localized murmurs to be slightly high for the mildly substandard group similar to the 1951 study. The substandard data for this impairment by issue age shows relatively level and consistent ratios, whereas the ratios decreased by age in the 1951 experience. The ratios are fairly flat by duration.

DR. CHAMBERS: Mortality results are pretty much what we might have expected. Basal (aortic) murmurs are worse than apical (mitral) murmurs; not localized (transmitted) murmurs are worse than localized murmurs. The basal, not localized murmur of aortic stenosis is associated with very high mortality as was the case in 1951. We have tended to underprice this

impairment as is true also for the basal, localized murmur, a murmur that is often hard to differentiate from aortic stenosis.

Experience with apical, localized murmurs was relatively quite favorable. Today, many of these people, especially those who are younger, are said to have mitral valve "prolapse" or Barlows syndrome.

Underwriters did remarkably well with unclassifiable murmurs. Some may say that this means that underwriters are better off not knowing what they are dealing with.

TABLE 7

HEART MURMURS

MEDICAL IMPAIRMENT	1983 STUDY - MEN SUBSTANDARD RATING:						1951 STUDY MEN & WOMEN	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
HEART MURMUR								
Apical, Loc.	<u>106</u>	<u>146</u>	(151)	(189)	(182)	<u>151</u>	<u>113</u>	<u>140</u>
Basal, Loc.	(<u>98</u>)	(<u>182</u>)	(282)	-	-	<u>208</u>	-	(<u>191</u>)
Ap., Not Loc.	(100)	<u>173</u>	<u>189</u>	254	312	<u>193</u>	-	<u>230</u>
Bas., Not Loc.	-	(<u>281</u>)	<u>304</u>	286	-	<u>296</u>	-	<u>491</u>
UNCLASSIFIED	103	<u>156</u>	191	(258)	(181)	<u>176</u>	93	<u>200</u>

HEART MURMUR (APICAL, NOT LOCALIZED) - SUBSTANDARD

ISSUE AGE	1983		1951	POLICY YEAR	1983		1951
	MEN	WOMEN	MEN & WOMEN		MEN	WOMEN	MEN & WOMEN
15-29	203	(137)	328	1-2	171	(188)	252
30-39	<u>168</u>	(181)	<u>253</u>	3-5	195	(180)	<u>260</u>
40-49	<u>194</u>	(147)	<u>212</u>	6-10	<u>209</u>	196	<u>205</u>
50-59	<u>206</u>	(196)	<u>162</u>	11-15	<u>205</u>	(146)	<u>216</u>
60-69	200	(288)	-	16-25	<u>162</u>	(195)	-
TOTAL	<u>193</u>	<u>180</u>	<u>230</u>	TOTAL	<u>193</u>	180	<u>230</u>

For the apical, not localized murmur, there is a difference between the 1951 results and the current results by issue age. The distinct fall in mortality with age seen in 1951 is not present in the current findings. This may be related to a change in populations by underlying cause for this murmur. Whereas rheumatic fever was once the dominant cause of mitral insufficiency, affecting young people and leading to severe complications by middle age, it is rarely the cause today. We now often encounter applicants with this murmur who are in their 40's and 50's.

Some of these are a carry-over from the rheumatic fever era, patients who sustained minimal valvular damage and/or have benefited from improved medical care. Others that we now see with mitral insufficiency and who are somewhat older have developed their murmur as a result of non-rheumatic causes, often coronary disease. Past experience with this particular impairment may therefore not be a very helpful guide for the future.

MR. LORING: Turning to Table 8, rapid pulse is slightly high in the standard category (122%) as was true in the 1951 study (123%). The mildly substandard category (196%) is also higher than expected. Note also that the total substandard mortality ratio of 196% is significantly higher than the 148% figure in 1951. The date by issue age demonstrates no real pattern by age, but does show higher ratios for women than men (243% versus 196%). By policy year, there is a decreasing slope. The experience for arrhythmia is well within expectations, though again the overall substandard ratio of 153% is higher than it was in 1951 (119%).

DR. CHAMBERS: For M.I.B. purposes, rapid pulse refers to a resting heart rate of 95 or more. As in 1951, we see that rapid pulse is associated with extra mortality. So often explained away as simply a reflection of anxiety or nervousness, we know it tends to be a marker of poor physical conditioning or underlying illness. These current results suggest a need for greater caution when appraising such cases.

TABLE 8

ABNORMAL PULSE

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	SUBSTANDARD RATING:					STD	SUB
		TO 175%	175- 250%	OVER 250%	OTHER	TOTAL		
ABNORMAL PULSE								
Rapid	<u>122</u>	<u>196</u>	(220)	(193)	(157)	<u>196</u>	<u>123</u>	<u>148</u>
Arrhythmia	<u>94</u>	<u>140</u>	188	(188)	(190)	<u>153</u>	<u>90</u>	<u>119</u>

RAPID PULSE - SUBSTANDARD

ISSUE AGE	1983		1951	POLICY	1983		1951
	MEN	WOMEN	MEN & WOMEN	YEAR	MEN	WOMEN	MEN & WOMEN
15-29	-	-	(188)	1-2	(214)	-	(168)
30-39	173	-	(137)	3-5	248	(299)	138
40-49	<u>221</u>	(147)	149	6-10	206	(266)	138
50-59	<u>186</u>	(347)	138	11-15	167	-	(166)
60-69	(162)	-	-	16-25	178	-	-
TOTAL	<u>196</u>	243	<u>148</u>	TOTAL	<u>196</u>	243	<u>148</u>

Cardiovascular and Related Disorders

MR. LORING: In Table 9, we find higher than expected ratios in nearly all of the groupings. The issue age experience for this impairment starts with a very high ratio in the 30-39 age group which decreases with age. There is also a slightly decreasing slope by duration.

DR. CHAMBERS: A history of coronary disease prior to 1951 resulted in a declination, thus there is no 1951 data. As coronary disease is primarily a male disease, there is little or no exposure for females.

Mortality was higher than expected in every rating category, consistent with the fact that this is the leading cause of death among middle aged and older insured lives. The fall in the mortality ratio as age increases is quite understandable in that those who develop coronary disease at a premature age are at significantly added risk.

Although these coronary heart disease results are discouraging, revolutionary advancements in both diagnostic and therapeutic medicine are occurring and allow us to say that (a) past experience may not be too meaningful, (b) more equitable means of appraising these risks are now available, and (c) our opportunities for realizing satisfactory mortality results are probably greater now than ever before. This is a serious disease and carries a high risk, but our knowledge of this disease and our professional capabilities to underwrite these cases has improved dramatically, and I do not feel these poor results should discourage us too much.

MR. LORING: The mortality experience for electrocardiograms (ECG) is quite good. In particular, the overall ratio for total substandard (125%) is almost within the limits for standard.

DR. CHAMBERS: Results are tantalizingly favorable, suggesting too great a degree of conservatism in the past. Companies have, however, eased their underwriting practices in recent years, and most of us may be at the point we should be at the present time. The committee needs to analyze this ECG data more thoroughly and by specific code before we can draw any practical conclusions.

MR. LORING: Also in Table 9, elevated blood pressure exhibits ratios all within the expected ranges.

DR. CHAMBERS: This data is on treated hypertensive applicants. Since there continues to be some controversy as to the effect that treatment should have in the underwriting process, we are of course interested in these results. They are relatively favorable and lend some support to those who say that anti-hypertensive therapy has a beneficial effect on mortality.

MR. LORING: Build experience is shown for the two categories of weight loss and overweight. While both categories experienced mortality ratios within the expected ranges, overweight had lower than anticipated mortality. This is supported by the new tables recently published by the Metropolitan.

DR. CHAMBERS: Results for weight loss data are close to those anticipated, implying that traditional practices which assume such people are apt to regain at least part of the weight that they have lost within the last year, is a realistic assumption and one that should be continued.

TABLE 9

CARDIOVASCULAR DISORDERS AND BUILD

<u>MEDICAL IMPAIRMENT</u>	<u>STD</u>	<u>1983 STUDY - MEN</u>					<u>1951 STUDY</u>	
		<u>SUBSTANDARD RATING:</u>					<u>MEN & WOMEN</u>	
		<u>TO</u>	<u>175-</u>	<u>OVER</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>STD</u>	<u>SUB</u>
		<u>175%</u>	<u>250%</u>	<u>250%</u>				
CORONARY DIS.	(160)	180	290	368	507	341	N.S.	N.S.
STROKE	(161)	-	(108)	(153)	-	(131)	N.S.	N.S.
ECCG	85	114	167	(116)	(93)	125	N.S.	N.S.
ELEV. BLOOD PR.	111	137	177	212	(144)	162	N.S.	N.S.
<u>BUILD</u>								
Weight Loss	98	158	(185)	(268)	(191)	166	N.S.	N.S.
Overweight	87	112	182	-	(185)	132	N.S.	N.S.

CORONARY DISEASE - SUBSTANDARD

<u>ISSUE AGE</u>	<u>1983</u>		<u>1951</u>	<u>POLICY</u>	<u>1983</u>		<u>1951</u>
	<u>MEN</u>	<u>WOMEN</u>	<u>MEN & WOMEN</u>	<u>YEAR</u>	<u>MEN</u>	<u>WOMEN</u>	<u>MEN & WOMEN</u>
15-29	-	-	N.S.	1-2	408	-	N.S.
30-39	575	-	N.S.	3-5	341	-	N.S.
40-49	431	-	N.S.	6-10	363	-	N.S.
50-59	320	(311)	N.S.	11-15	310	-	N.S.
60-69	201	-	N.S.	16-25	(159)	-	N.S.
TOTAL	341	(269)	N.S.	TOTAL	341	(269)	N.S.

MR. LORING: We now come to Table 10 and to what is possibly the single most important figure in the study: the very high standard ratio (188%) for family history of cardiovascular disease. In this study, family history refers to two or more cases of cardiovascular-renal disease at ages under 60 among natural parents or siblings. This ratio is much higher than the 1951 figure of 141%, already a higher number than expected. The ratio for the mildly substandard category (226%) is also excessive. The breakdown by sex of the standard risks shows that women have considerably lower mortality than men (126% versus 188%). There is a decreasing trend by issue age. By duration, there appears to be a slight hump in the middle durations.

DR. CHAMBERS: Mortality is even worse now than it was in 1951, and it was poor at that time. As with alcohol and rapid pulse, it is hard for the underwriter to rate an applicant for poor family history when there is nothing else in the file to support a substandard rating.

Heredity plays a role in one's predisposition toward developing coronary disease, but a positive family history is more than a matter of genetics. It reflects a learned lifestyle that bridges generations. With a new emphasis in the underwriting profession on lifestyle related factors, the importance of family history per se may conceivably decrease in years to come.

It is remarkable that even at ages 60-69, the effect of a positive family history is profound. One might assume that if no other evidence of coronary disease had surfaced by these advanced ages, a poor family history would not be predisposing toward excess death.

MR. LORING: One possible explanation for the mortality rating at the older ages deals with the way the coding is actually done in companies. Many underwriters would not code for family history on its own unless it were a blatant family history case where you have got mother, father and a couple of brothers dying of heart attacks at age 50. Thus it is possible that the ones that we see here are those where there really is a marked family history of cardiovascular disease.

TABLE 10

FAMILY HISTORY - CVR DISEASE

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	SUBSTANDARD RATING:					MEN & WOMEN	
		TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
FAM. HIST.-CVR	<u>188</u>	226	(499)	-	-	238	<u>141</u>	(185)

FAMILY HISTORY OF CVR DISEASE - STANDARD

ISSUE AGE	1983		1951	POLICY YEAR	1983		1951
	MEN	WOMEN	MEN & WOMEN		MEN	WOMEN	MEN & WOMEN
15-29	(198)	-	136	1-2	160	-	174
30-39	<u>243</u>	(137)	139	3-5	162	(115)	<u>128</u>
40-49	<u>182</u>	123	<u>157</u>	6-10	208	169	<u>145</u>
50-59	<u>161</u>	(123)	<u>128</u>	11-15	<u>201</u>	(110)	<u>129</u>
60-69	(188)	-	-	16-25	164	(107)	-
TOTAL	<u>188</u>	126	<u>141</u>	TOTAL	<u>188</u>	126	<u>141</u>

DR. CHAMBERS: It is possible but the fact that we have more than 100 deaths in the standard area suggests to me that we are not dealing with a very modest number of cases.

MR. GAUER: As we do not have any code for smoker/non-smoker, there is a possibility, in this and some of the other impairments, that smoking may be a contributing factor, that is, we may have some heavy smokers in this group.

DR. CHAMBERS: I agree; smoking might be very much an explanation for what we see here, and that certainly is the case with chronic respiratory disease which we will look at in a moment. A bad family history may well be a reflection of the smoking habits of the parents, habits which may be passed on to the siblings. It is just too bad that we do not have the smoking variable to break each of these impairments down. I suspect smoking is very important with this. Both of these are risk factors, smoking is a coronary risk factor, and a positive family history is a positive coronary risk factor. So we are dealing with risk factors here that most of us frequently talk about in this day and age.

Progressive or Chronic Disease

MR. LORING: In Table 11, rheumatoid arthritis shows favorable mortality among the standard risks, but definite excess mortality in the mildly (203%) and moderately (390%) substandard 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 are reasonably level. There is a slightly increasing slope by duration.

TABLE 11

PROGRESSIVE OR CHRONIC DISEASE

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	SUBSTANDARD RATING:					MEN & WOMEN	
		TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	STD	SUB
RH. ARTHRITIS	104	203	390	(258)	(168)	222	74	122

RHEUMATOID ARTHRITIS - SUBSTANDARD

ISSUE AGE	1983		1951 MEN & WOMEN	POLICY YEAR	1983		1951 MEN & WOMEN
	MEN	WOMEN			MEN	WOMEN	
15-29	(239)	-	-	1-2	(173)	-	-
30-39	280	-	-	3-5	209	(224)	-
40-49	193	(258)	-	6-10	253	331	-
50-59	220	268	-	11-15	269	(333)	-
60-69	(235)	(225)	-	16-25	(130)	-	-
TOTAL	222	252	122	TOTAL	222	252	122

DR. CHAMBERS: Rheumatoid arthritis is associated with surprisingly increased mortality in the mildly and moderately substandard areas, both contributing to total substandard mortality far in excess of what one might have expected, and certainly far in excess of what we see in the 1951 data. Unlike osteoarthritis, rheumatoid arthritis is a systemic disease affecting not only the joints but also vital organs such as the heart and lungs. This fact is

probably not adequately addressed in underwriting guidelines nor widely appreciated by underwriters, and hence we have the generally liberal approach to classification that has yielded results far worse than priced for. It is also a chronic progressive disease which might explain the increasing mortality with policy duration.

MR. LORING: Turning to Table 12, we find that in the chronic respiratory grouping, asthma has excess mortality ratios for the mildly (179%) and the moderately (294%) substandard groups. The overall substandard ratio of 205% is above the 1951 result of 153%. For the asthma substandard experience by sex, we note that the ratios for women are considerably higher than for 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%); this was even more pronounced with the 1951 study (168%). In addition, the mildly substandard (237%) was in excess of expected. Emphysema is even worse, with all three of the substandard groupings well above expected. These numbers suggest that we have not done a very good job of evaluating emphysema.

DR. CHAMBERS: All three forms of chronic obstructive lung disease, namely asthma, bronchitis and emphysema show unfavorable mortality. The latter two, in particular, are closely tied to cigarette smoking, and mortality results reflect what has been learned in the last 15 years or so in regard to the extremely adverse effect of cigarette smoking on health. This is an area of medicine where prevention is all-important. No dramatic breakthroughs have occurred nor are they expected in regard to the treatment of patients with obstructive lung disease.

How do we react to this data? Clearly a more conservative underwriting approach is indicated. Among other things, we can improve our performance by relying more heavily on the discriminatory capabilities of pulmonary function tests (the timed vital capacity test) which are readily available and relatively inexpensive. Yes, the technical quality of these tests provided by paramedical companies has been relatively poor, so much so that the majority of insurance companies have abandoned their use. But these tests can be done reliably, and it is up to the insurance companies to insist on high quality control standards.

MR. LORING: Ulcerative colitis shows higher than expected mortality ratios in the mildly substandard category (210%).

DR. CHAMBERS: Clinically, this is a very serious disease. For that reason, the high mortality for substandard is not surprising. Most such cases were presumably declined prior to 1951.

Why the apparent underpricing of those in the mildly and highly substandard areas? It may be that the industry has not paid due recognition to long duration of disease which is associated with an increased incidence of colon cancer. Possibly there is some confusion with other types of colitis that have little or no influence on mortality. We may also have put too much weight on the idea of "attacks", ignoring the fact that this disease persists even though clinical manifestations may come and go.

MR. LORING: 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 group is somewhat high (193%).

DR. CHAMBERS: Mortality was unfavorable in 1951 and seems to be even worse in the present study, especially in the standard area. Proteinuria, as it is more properly referred to, has long been recognized as a serious underwriting impairment, especially when found in all specimens. Generally, it is a marker for some sort of chronic progressive kidney (glomerular) disease. Most of these diseases have natural histories that run for 20 years or less.

It is true that proteinuria can result simply from postural (position) mechanisms or from exercise, especially at younger ages. Generally, however, it should be assumed to be due to a serious cause unless proven otherwise.

Intermittent findings, meaning that at least one current specimen is negative, are less apt to be due to serious underlying disease; thus the lower mortality.

TABLE 12

PROGRESSIVE OR CHRONIC DISEASE

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	MEN & WOMEN	
CHRONIC RESP.								
Asthma	101	179	294	(308)	(328)	205	99	153
Bronchitis	136	237	(294)	(189)	(238)	238	168	207
Emphysema	124	302	354	(569)	-	319	N.S.	N.S.
ULC. COLITIS	(96)	210	(239)	(380)	-	253	N.S.	N.S.
ALBUMINURIA								
Single Spec.	168	(179)	(297)	-	-	244	-	-
Intermittent	118	(144)	(446)	-	-	201	133	169
Constant	(170)	193	214	(294)	(646)	222	157	182

CHRONIC ASTHMA - SUBSTANDARD

ISSUE AGE	1983		1951	POLICY	1983		1951
	MEN	WOMEN	MEN & WOMEN	YEAR	MEN	WOMEN	MEN & WOMEN
15-29	249	(237)	173	1-2	(165)	(182)	182
30-39	187	(309)	156	3-5	251	(338)	179
40-49	193	294	163	6-10	204	343	125
50-59	236	(323)	(115)	11-15	216	(285)	(110)
60-69	(208)	-	-	16-25	158	(256)	-
TOTAL	205	297	153	TOTAL	205	297	153

Tumor, Alcohol, Diabetes

MR. LORING: In Table 13, we note a high ratio for malignant tumors in the standard group (139%). The further breakdowns for substandard malignant tumors suggest decreasing ratios by issue age and duration.

DR. CHAMBERS: There are many types of malignancies, and each should theoretically be treated as a separate impairment. Analysis of aggregate data, which is all we have, is not very useful. We can see that excess mortality extends to all policy durations. Note that significant excess mortality continues in the 11-15 year duration group and even beyond. When clinicians talk about "cures", they are really talking about 5 year or perhaps 10 year remissions.

TABLE 13

TUMOR, ALCOHOL

MEDICAL IMPAIRMENT	1983 STUDY - MEN						1951 STUDY	
	STD	TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	MEN & WOMEN	
TUMOR								
Malignant	139	(155)	(302)	(354)	226	229	-	-
Benign	92	141	(305)	-	101	133	-	-
Epithelioma	93	(151)	-	-	124	134	-	-
ALCOHOL ABUSE	199	207	284	271	271	243	N.S.	N.S.

MALIGNANT TUMOR - SUBSTANDARD

ISSUE AGE	1983		1951 MEN & WOMEN	POLICY YEAR	1983		1951 MEN & WOMEN
	MEN	WOMEN			MEN	WOMEN	
15-29	(752)	-	-	1-2	340	(276)	-
30-39	(285)	-	-	3-5	325	434	-
40-49	210	398	-	6-10	191	281	-
50-59	196	247	-	11-15	200	(137)	-
60-69	(218)	(153)	-	16-25	(131)	-	-
TOTAL	229	270	-	TOTAL	229	270	-

MR. LORING: For alcohol abuse, the standard group experience is particularly high at 199%, representing the highest mortality ratio for any standard risk category in the study. The mildly (207%) and moderately (284%) substandard categories are also high. It is common knowledge that alcohol abusers have been uniformly underrated for many years; these figures illustrate the price we pay.

DR. CHAMBERS: For alcohol we have lots of experience, and all of it is bad. The modest differences and results by substandard category suggest that we could have saved ourselves a considerable amount of time by offering all of these people the same substandard rating. The irony of this matter is that we have no good excuse for these results. The industry has known since 1950 that we needed to charge more for this impairment. Most of us have failed to do so as we can see from these results.

MR. LORING: The results for diabetes, in Table 14, are unremarkable, although the standard ratio of 158% based on limited deaths is not favorable. The breakdown of substandard experience indicates that mortality ratios for women are higher (289% versus 214%), and illustrates the well-known patterns of diabetic mortality decreasing by issue age and increasing by duration. Family history of diabetes shows very favorable standard mortality (76%), while the 1951 figure was right at 100%.

DR. CHAMBERS: Mortality was worse than priced for in the standard and "other" categories. The former would have included a significant number of people whose diagnosis was questionable, that is they were felt to be no worse than marginally diabetic. The "other" category surely includes a high percentage of insulin-dependent, youth onset patients, who are generally acknowledged to be the worst of diabetic risks.

The diabetic was generally rejected by most insurance companies prior to 1951; this, of course, is the reason why no data exists in the 1951 impairment study.

TABLE 14

DIABETES

MEDICAL IMPAIRMENT	STD	1983 STUDY - MEN					1951 STUDY	
		TO 175%	175- 250%	OVER 250%	OTHER	TOTAL	MEN & WOMEN	STD
DIABETES	(158)	<u>149</u>	<u>234</u>	<u>352</u>	434	<u>214</u>	N.S.	N.S.
FAM. HIST.-DIAB.	<u>76</u>	-	-	-	(114)	(96)	<u>100</u>	(84)

DIABETES - SUBSTANDARD

ISSUE AGE	1983		1951	POLICY	1983		1951
	MEN	WOMEN	MEN & WOMEN	YEAR	MEN	WOMEN	MEN & WOMEN
15-29	<u>402</u>	(438)	N.S.	1-2	120	(174)	N.S.
30-39	<u>292</u>	504	N.S.	3-5	149	(200)	N.S.
40-49	<u>207</u>	237	N.S.	6-10	<u>224</u>	312	N.S.
50-59	<u>184</u>	258	N.S.	11-15	<u>300</u>	415	N.S.
60-69	<u>163</u>	(194)	N.S.	16-25	<u>267</u>	(530)	N.S.
TOTAL	<u>214</u>	<u>289</u>	N.S.	TOTAL	<u>214</u>	<u>289</u>	N.S.

MR. GAUER: In addition to reminding you of the caveats, conditions, and qualifications which apply to the study and which are listed in Table "E", I should again point out that these results are provisional and are subject to change before the publication of Volume I of the study 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 also give more detail about certain impairments, such as alcohol abuse, electrocardiographic abnormalities, tumor and treated blood pressure and will show other impairments that are not shown here today. There are about 150 impairments in all, plus many subdivisions for which data will be published.

Sometime after Volume I, and it may be twelve to eighteen months after, we will be publishing Volume II, which will possibly include the additional data shown on Table "F":

TABLE F

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.

Unfortunately one of the minor or major impairments, about which we do not have any information, is smoking habits. We would have liked to split the study between smokers and non-smokers, but this was not part of our data-base. It may, however, be possible for individual insurers who have stored this data to study specific impairments and share their results with us.

MR. PAUL D. YEARY: I would like to make one comment about the decrease in mortality ratios as age increases, as well as the higher female ratios for some impairments. This could be caused by extra deaths constant at all ages being reflected in some of these figures. In other words, it may be the base mortality which is changing and causing the change in the ratios not the severity of the illness.

MR. LORING: There is a technique that one of the actuaries on the committee has developed for translating a flat extra or a mixed rating of table plus flat into the equivalent table rating which is an age dependence table rating. One of the things that we may do is try to produce numbers including the flat extra deaths translated to multiple table extras at what the equivalent rating would be, and see if that changes the data materially.

MR. TREVOR C. HOWES: I had a question and an observation along with the previous speaker about that decreasing mortality ratio by age. In the epileptic category could it be due to an accidental component that might be more constant by age as opposed to a multiple of the regular mortality rates?

DR. CHAMBERS: In addition to the extra accident hazard at younger ages with epilepsy which could be an explanation for why we see the increased mortality there, it also is possible that we are dealing with a greater chance of underlying tumors at younger ages. Another possibility is that the cause of epilepsy at older ages is different than the cause of epilepsy at younger ages.

MR. GAUER: We will have a split by cause of death in the published material, so we might be able to get some additional information and guidance on that when it is available.

MR. HOWES: Is there much difference overall between the various companies submitting data to the study in terms of underwriting standards for the types of impairments in which there was a significant amount of data submitted? Are the underwriting standards fairly uniform?

MR. GAUER: That is a very difficult question to answer. Certainly in looking at the results by individual company we did see some significant variation, whether it is simply due to the coding habits of the companies or their underwriting is a little hard to tell.

