

RECORD OF SOCIETY OF ACTUARIES 1990 VOL. 16 NO. 2

RISK CLASSIFICATION TRENDS

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- o This session will include a discussion of the trends in risk classification and selection criteria used for underwriting risks for individual life insurance. Preferred and standard nontobacco use classifications will be covered. Use of various laboratory tests based on analyses of blood and urine samples will be covered. Examples of current risk classification systems used for individual life insurance will be cited.

MR. JAMES W. PILGRIM: Gregg Sadler, who is Executive Vice President of Home Office Reference Laboratory (HORL), will give a presentation. Following him will be Dave Jeggle, Vice President and Chief Actuary-Products with the Midland Mutual Life Insurance Company in Columbus, Ohio, and last, but not least, Mel Young will give us a presentation of some of the things that he has been doing in the consulting role with Tillinghast/Towers Perrin. Jack Paddon, who was unable to attend, had planned to give a slide presentation on risk classification that was produced by the AAA. I will give that presentation instead.

RISK CLASSIFICATION -- The Science and the Fiction

It sounds a little like we're here for a science fiction retrospective. Not so. But I would like to direct your attention to an early "sci-fi" story going back some 50 years entitled "Life Line" by Robert Heinlein. Now, Mr. Heinlein was not an actuary, nor was he ever associated with the insurance industry. But he was a gifted writer. He tells a tale about a man who invents a machine. It is an early computer, and for a fee, it will compute a person's date of death. The inventor makes a fortune, and the life insurance industry collapses in short order. It's a well-crafted story. But, it's science fiction. In the real world, there is no way to predict life's contingent events with such certainty. Instead of Mr. Heinlein's futuristic machine, we rely on actuaries.

Actuaries must make use of the powerful tool known as risk classification so that insurance companies can properly evaluate the risks they underwrite. And that brings us to our topic -- risk classification.

As actuaries, we believe that no topic in our domain is more misunderstood and more in need of explanation than risk classification. Much more than an equation or symbol that gets lost in the mathematical shuffle, risk classification is a basic, underlying principle of actuarial science. Let's start with a definition. Risk classification is the process of grouping risks with similar risk characteristics so as to appropriately recognize differences in costs. This process is an integral part of the insurance business, and as such, if it is misunderstood or misapplied, it can lead to adverse consequences. Risk classification,

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or, to be more accurate, inappropriate risk classification, has been a significant factor in insurance company insolvencies in the United States. With apologies to Mr. Heinlein, let's delve into nonfiction and look at a real world example of how one insurance company collapsed.

Prudence Mutual Insurance Company was a moderate-sized casualty insurer located in Chicago. The company had originally specialized in individual disability income policies. In the early 1970s, new management took over the company and decided to use its casualty authority to write auto insurance. The new management believed that people who lived in Chicago's blue-collar neighborhoods were being unfairly discriminated against because they were being charged auto insurance premiums that were too high. So, based on this belief, management ignored the actuarial evidence and wrote auto insurance for drivers in these Chicago neighborhoods at rates that would have been right for a population with far fewer auto accidents.

The result: Prudence Mutual went belly-up. And everyone involved got hurt. All the company's lines of business were affected, including its disability income line. Many disabled individuals who had long depended upon income payments from Prudence Mutual lost those benefits. This is not just a story about mismanagement and its sad human consequences. It's also a story about the dangers of ignoring appropriate risk classification.

Risk classification is a powerful analytical tool that must be clearly understood by all involved in the management and regulation of voluntary insurance programs. It is a concept, furthermore, about which there is a good deal of confusion in the media and in the public policy arena. Much of the confusion related to risk classification revolves around a single word that is often treated as synonymous with risk classification: *discrimination*. In today's world, this word often has very negative connotations. But it's a word with several meanings -- some negative, some positive. There is both fair and unfair discrimination. To an actuary, unfair discrimination creates inequity. It represents an unfair charge to one individual or group to subsidize another individual or group. Not all people are alike. Not all cars are alike, when they are running or when they are not. One residence is quite unlike another and treating them both the same for insurance purposes is inequitable. Systems of risk classification permit insurers to respond fairly to valid costs and experience-related differences among persons or property.

To help guide actuaries in developing these systems, the actuarial profession, through the Actuarial Standards Board, has recently adopted a risk classification standard of practice. This standard enumerates three basic requirements for an appropriate risk classification system. Risk classification must be fair. Risk classification must permit economic incentives to operate and thus encourage widespread availability of coverage in the marketplace. And, risk classification must do its part to keep the insurer solvent.

To achieve these ends, a sound risk classification system should be based on four principles which are also spelled out in the actuarial standards literature. First, this classification should reflect cost and experience differences. An example is employers of coal miners will pay more for unemployment insurance than employers of computer

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technicians, because coal miners historically have much higher rates of unemployment. The system should be applied objectively and consistently. By this principle, males of the same age with similar health histories should be charged similar rates for life insurance. Third, the system should be practical, cost-effective and responsive to change. This means there are limits on how much effort and money can be spent to classify a given risk. And, risk classification systems are dynamic; for example, when polio was eliminated as a public health hazard, the system changed to reflect that development. Fourth, and perhaps most crucial, antiselection should be minimized.

Antiselection is an actuarial term that requires some further explanation. Applicants for insurance often know much more about their own risk factors than the insurer can learn in the application and underwriting process. However, a sound risk classification system should limit the ability of the applicant to take an unfair financial advantage at the expense of the insurance company or other insureds. This unfair advantage, in essence, is what we mean by antiselection.

So far, I've talked about some of the concepts underlying appropriate risk classification. Let's move on to some specifics of how risk classification is actually used by actuaries.

Actuarial evidence is a term that frequently appears in state and federal legislation -- but what does it really mean? What is the nature of actuarial evidence? As you can see, there are essentially two types of objective evidence. The best evidence is statistical analysis of information from actual insurance claims -- how many claims were filed, and for how much? Unfortunately, reliable claims data are frequently the last information available, especially when conditions are changing like where there have been significant innovations in auto safety. In some areas, however, there is better information available. For example, there is a large volume of insured claims data showing that experience is not the same for men and women either for life or health insurance, annuities, or for auto insurance.

A second type of actuarial evidence may be drawn from engineering, clinical, or other types of studies. AIDS is a case in point. AIDS develops slowly and kills relatively quickly; but because it has emerged fairly recently, we don't have a large volume of insured data yet, but we do have substantial clinical evidence that indicates the likely extreme adverse affect of AIDS on future insurance claims. Of course, there are occasions when it's necessary to rely on subjective evidence -- by which we mean informed actuarial judgment and common sense. Even in the absence of insured data, common sense would dictate higher casualty insurance premiums for fireworks manufacturers than for dairy farmers.

You'll notice that in discussing actuarial evidence, we haven't said anything yet about causation. Some had suggested that establishing causation should be a requirement for classifying risks. Let's consider whether or not knowledge of causation is necessary for sound risk classification. Sometimes we know that one event causes another. This man's aim at the hammer caused that problem with his thumb. That is causation. However, the inability to establish cause and effect is sometimes improperly equated with the lack of evidence for the relationship. We might not know exactly how smoking leads to cancer, but the relationship is very well-documented, and it is certainly very clear

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because of the high degree of correlation between the two. Another example: it's obvious that females have lower mortality than males, but the cause for this is a source of argument. The lack of specific causation has led some to advocate unisex insurance pricing, despite the substantial actuarial evidence of the validity of the gender distinction. But ignoring this evidence does not change it.

With unisex pricing, one group would be charged more to subsidize the other group. If the actual cause for this mortality difference were to be found, and it were practical to do so, we could then use this cause instead of gender in risk classification. What we have here is an example where the actuarial foundation of risk classification may be at odds with a public policy decision.

In recent years, classification factors like gender, age, marital status, and physical handicap have received a lot of attention -- by the news media, federal and state legislators, and by insurance companies themselves. In some cases, actuarial evidence, although clear, has been disregarded in an effort to improve perceived social inequalities, as in the unisex example. In other situations, actuaries are being asked to resolve social issues on the basis of actuarial evidence that is fragmentary, or inconclusive, at best. For example, some states have enacted statutes or regulations requiring that actuarial evidence be supplied before handicapped individuals can be charged different life insurance premiums. There is, however, a dearth of actuarial evidence to support many of these requirements, however worthy or noncontroversial they may be. These mandated requirements may be viewed as manipulations of risk classification. In essence, the actuary is being put in the position of justifying a predetermined public policy without sufficient data. If the social issues are complex, the risk classification issues are equally so. And mingling these two sets of issues makes for even greater complexity. However, there is one distinction that is central to nearly every public policy debate that involves systems of sound risk classification.

That distinction is whether equality is more important than equity. In the context of insurance and risk classification, equality means charging the same price to all buyers, regardless of differences in the value or underlying cost that the benefits provided; while equity means charging each buyer a price that is commensurate with the value of the benefits to that buyer. In this context, imposing equality apart from equity leads to cross-subsidizing between groups. This tends to drive away those buyers who believe they are paying too high a price. The result is increased cost, reduced coverage, or perhaps no coverage at all for those remaining in the system. The assessment spirals, which bankrupted a number of life insurance organizations in the 1800s and early 1900s, are a vivid example of the process at work. Costs increased dramatically, claims could not be paid, and finally, all coverage was lost. Providing equity within the system through appropriate risk classification, maximizes the opportunity for insurance by making lower and more equitable prices more readily available to lower risks. Our risk classification standard of practice defines equitable as "appropriately reflecting differences among the costs of identifiable risk characteristics." In other words, it is an honest reflection meaning impartial and fair. Now, would it be equitable to charge the buyers of insurance on these cars the same rate? Or would it be a case of unfair equality? Increased equality is frequently a goal of social policy and, appropriately, is a major concern of our legislators and regulators. As actuaries, we do not oppose equality in and

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of itself. However, the means by which it is increased can have unanticipated consequences and, in some cases, results quite opposite of those intended.

Because of our expertise, we believe that we have a responsibility to encourage those who make public policy to understand the impact of a proposal or a decision on the insurance system as a whole. Because of our mathematical training, this symbol is meaningful to us. It is associated with a rate of change. Change is the one constant in today's world. Because we all operate in a dynamic, changing, and endlessly challenging environment, insurers, actuaries, and regulators must work together to keep these three basic requirements of risk classification from being lost. Accordingly, they are worth repeating once again. Risk classification must be fair. It must let economic incentives work and so encourage widespread availability of coverage. And, it must keep the insurer solvent. We may not have Mr. Heinlein's futuristic machine available to us but we have, nonetheless, a powerful tool. With risk classification understood and applied as it should be, we have a means for helping insurance companies properly evaluate the risk they underwrite -- ensuring that policyholders are safe and secure.

MR. GREGG R. SADLER: One of the tools that your companies have for measuring the risk of various policy applicants is laboratory testing. With the increase in interest in laboratory testing, I thought I would share with you what some of those tests are. I know a lot of people, when they think of laboratory testing, think of AIDS and cocaine, and certainly those are two of the more important tests that are done in the industry today, but there are a number of other tests that are important.

LABORATORY TESTING

Introduction

Currently, the top five causes of death (ages 35-54) in the United States are heart disease, cancer, accidents, liver disease, and diabetes. The focus of insurance underwriters is to use the best available underwriting tools to assess these and other risks posed by policy applicants.

Increasing use has been made of paramedical exams, blood chemistry profiles, and urinalyses. The more an underwriter knows about each applicant's health status, the better able he or she is to make an accurate evaluation of the risk involved in insuring that applicant. This is where laboratory testing can help.

Blood Chemistry Profiles

The most common tests performed in a blood chemistry profile are in Table 1.

Urinalysis

The most common tests performed in a urinalysis are in Table 2.

HIV Antibody Testing

Another major area of concern for underwriters is the AIDS epidemic and its impact on insurance companies. Testing accuracy is essential in HIV antibody testing. The current tests most often used are the HIV antibody ELISA (enzyme-linked immunosorbent assay), confirmed by the Western Blot and recombinant DNA tests.

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TABLE 1

Type of Test	Test Name(s)	
HIV Antibody	ELISA Western Blot Recombinant DNA	Detects antibodies to the virus responsible for AIDS
Liver Enzymes	GGTP (GGT) SGOT (AST) SGPT (ALT) Bilirubin Alkaline Phosphatase	Could be abnormal for many reasons, including hepatitis, cirrhosis, other liver disease and excess alcohol consumption
Cholesterol/HDL	Total Cholesterol HDL LDL Cholesterol/HDL ratio Triglycerides Apolipoprotein A-1 Apolipoprotein B-100	Indicative of risk for coronary heart disease
Blood Sugar	Fructosamine Hemoglobin A1c Serum Glucose	Indicative of diabetes, glucose intolerance and other diseases
PSA	Prostate Specific Antigen	Indicative of prostate cancer
Renal Function Tests	BUN Creatinine Uric Acid	Indicative of impaired kidney function or other medical problems

TABLE 2

Type of Test	Test Name(s)	
Nicotine Screen	Cotinine (a metabolite of nicotine)	Detects tobacco use
Cocaine Screen	EMIT RIAH GC/MS Confirmation	Detects cocaine use
Protein, Glucose, Microscopic Analysis, etc.		These tests may be indicative of possible medical problems
Prescription Medications	Diuretic Agents Oral Hypoglycemic Medication Beta Blockers	Several medications commonly prescribed for hypertension, heart disease or diabetes
HIV Antibody Screen	ELISA	Screen for presence of HIV antibodies -- follow up with blood specimen request for confirmation testing

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A positive result means that the applicant's specimen was reactive on two of three separate ELISAs and met the criteria for positive on Western Blot confirmation. Using Bayesian mathematics, the predictive value of a laboratory test can be shown by the following formulas:

$$\text{Predictive Value} = \frac{P \times Se}{(P \times Se) + (1 - P) \times (1 - Sp)}$$

P = Prevalence; Se = Sensitivity; Sp = Specificity

The predictive value of ELISA only in a 10% prevalence population (Sensitivity = 100%, Specificity = 99.8%) would be 98.2%. However, the prevalence of the same test in a 1% population drops to 83.5%, illustrating the need for Western Blot confirmation. The predictive value of ELISA and Western Blot confirmation is 99.99+ %.

The value of HIV antibody testing is shown dramatically in Table 3.

TABLE 3

Ages	Actual 1989 HORL Results	Prevalence of HIV Infection in the Insurance Buying Public*
20-29	1.0	5.0
30-39	1.0	4.0
40-49	0.7	2.9
50-59	0.5	1.7
All Ages	0.8	

* Milliman & Robertson Study, August 1989

Of course, the main reason for the large difference in the last two columns is that most individuals who know or suspect that they are HIV positive will probably not submit to a blood test for insurance purposes. I believe, from my own experience and from talking to many underwriters and medical directors, that most of these positive results are on individuals who don't know they are positive. I would love to know, but by definition can't know, the HIV positive rate on untested business.

In 1989, the areas with the highest HIV antibody positive results for the 20-39 age group are listed in Table 4.

Cocaine Testing

Cocaine abuse is also of great concern to underwriters, and 1989 HORL cocaine positive test results (Table 5) indicate that they have reason for concern.

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TABLE 4

	HORL Positives per 1,000 Test
1. Washington, D.C.	9.3
2. Puerto Rico	2.4
3. Florida	1.9
4. New York	1.6
5. New Jersey	1.5
6. Georgia	1.4
7. Maryland	1.3
8. California	1.2
9. Texas	1.1
United States Total	1.0

TABLE 5
1989 HORL Cocaine Results (Ages 20-39)

	Positives Per 1,000 Tests
1. Puerto Rico	15.3
2. Washington, D.C.	14.1
3. New York	12.9
4. Hawaii	12.9
5. Alaska	11.4
6. Nevada	11.2
7. Florida	11.0
8. California	10.8
9. Connecticut	10.4
10. Rhode Island	10.3
11. New Jersey	10.2
United States Total	8.4

Value of Laboratory Testing

There has been a large increase in insurance testing as a result of the AIDS epidemic and increased cocaine use. The other tests that are done routinely as a part of blood/urine chemistry profiles also have significant protective value. In 1989, HORL sponsored a study conducted by the actuarial consulting firm of Milliman & Robertson, Inc. This study combined HORL's large database with the underwriting value of various laboratory results to determine the protective value of laboratory testing.

The 1988 HORL test results that were used in the Milliman & Robertson study for some of the major tests are shown in Table 6.

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TABLE 6

1988 HORL Test Results Per 100,000 Applicants

	20-29	30-39	40-49	50-59
HIV Antibody positive	126	99	71	42
Cocaine positive	1,483	921	385	145
Cholesterol > 350 mg/dL	129	270	454	561
GGT plus another liver function test abnormal	992	2,153	3,106	3,145
Glucose > 200 mg/dL & Hemoglobin Alc > 6%	295	382	1,030	2,167
Total	3,025	3,825	5,046	6,060

The present value of mortality savings, then results produced, is listed in Table 7.

TABLE 7

Present Value of Mortality Savings
Per \$100,000 of Insurance

	20-29	30-39	40-49	50-59
Paramed + Urinalysis	\$ 32	\$ 64	\$144	\$257
Blood Chemistry Profile	16	52	179	465
Cocaine Screen	18	18	15	9
HIV Antibody Test	193	152	110	65
Total	\$259	\$286	\$448	\$796

The Milliman & Robertson study found that a very high return on investment (ROI) from laboratory testing and paramedical examinations is achieved when comparing projected mortality savings to the total testing costs. In addition, it indicated that a company can achieve a substantial ROI by lowering existing thresholds.

Assuming the cost of testing to be \$75 (paramedical exam = \$40-\$50, laboratory testing = \$25-\$35), the policy amount at which the insurer breaks even is given in Table 8.

TABLE 8

ROIs With Lower Testing Thresholds

Testing Limits		ROI on Additional Dollars Invested
Old	New	
\$150,000 & Over	\$100,001 & Over	75%
100,001 & Over	50,001 & Over	49%
100,001 & Over	25,000 & Over	40%

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Future Tests

There are a number of promising tests that may be utilized by the insurance industry in the future. Some of these include better markers for excessive alcohol consumption, expanded illegal drug testing, cancer tumor markers, new HIV tests, and genetic testing. The value of laboratory testing to the insurance industry has been growing for many years and will most likely continue to grow in the future.

MR. DAVID A. JEGGLE: Jim has asked me to describe my company's system of four standard risk classes. We were among the first companies to introduce a system of select and standard for both nonsmokers and smokers, so perhaps the information we have accumulated will be of some value to you.

My comments relate to the term products we have offered since early 1987. We have used the same approach for our universal life products, but the database is a lot larger and more accessible for the term business. In total, we have paid for some 45,000 term policies during this period -- a drop in the bucket for some of you, but we had fewer than 10,000 term policies in force when we introduced the first of these products.

The Products

First, let me describe the products, to give you a frame of reference.

Level premiums are guaranteed for an initial period of 5, 10 or 15 years. After the level premium period, premiums increase annually based on attained age. Reentry is offered at the end of the level premium period, subject to full evidence of insurability. Conversion is permitted up to age 85.

We will use "PLUS" to identify our first product of this type. It was introduced in early 1987 and sold through early 1989. Two level premium periods were offered -- 5 and 10 years. The minimum size was \$100,000; issue ages were 18 through 80.

Our second product goes by the name "GT." We introduced it in late 1988, and it is still on the market. Level premium periods of 5, 10 and 15 years are available. The 5-year version has a minimum size of \$250,000 and is not available below age 30. The 10-year plan has a minimum size of \$150,000 and the same minimum age. The 15-year plan has a \$100,000 minimum and is sold between ages 18 and 70.

Although we had an 80 year history as a relatively conservative career agency company, roughly 95% of our term sales have come from brokers. I guess that means this product isn't too conservative! We have been conservative in one sense -- since February 1988, we have required a blood test and a urine specimen for all policies of \$100,000 or more.

Before I go on, let me clarify one piece of terminology. I will probably say "smoker" and "nonsmoker" more often than I should. Since 1978 we have classified insureds by whether or not they have smoked cigarettes within the past 12 months. But with the introduction of our GT product, we changed to whether or not the insured has used tobacco in any form. Somehow, "nontobacco-user" doesn't roll off the tongue like "nonsmoker" does. I'll try to emphasize this difference when I feel it's significant.

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Table 9 shows the extent of our rate reduction for select lives. For our PLUS product, the select rates were in the neighborhood of 20% lower than the standard rates. When we developed the GT, we increased the spread to about 30%. This reflected a marketing decision to target the select market, but it was accompanied by a tightening of our select criteria.

TABLE 9

Select Premiums as a Percentage of "Standard" Premiums
\$250,000 Death Benefit
Male: Weighted by Age

	Nonsmoker	Smoker
Plus 5 year	80%	77%
10 year	83	79
GT 5 year	68	68
10 year	68	71
15 year	67	73

Underwriting Criteria

In brief, here's a rundown of how we apply each of these criteria.

- o Blood pressure and build do not require a superman/woman, but there should be no history of treatment for hypertension.
- o Family history generally requires no incidence prior to age 60 of cardiovascular disease among natural parents and siblings, but occasionally exceptions are made.
- o Cholesterol, etc., must be within traditionally normal limits.
- o U.S. or Canadian residence is required, except for certain military personnel. No travel is expected to occur in areas where the state department has issued a travel advisory.
- o The usual hazardous recreational activities and avocations are not permitted. We're pretty tough on moving violations and driving while intoxicated (DWI) convictions, as well as felony convictions during the past 10 years.
- o And last -- but certainly not least -- the insured must be standard in all respects. For example, a history of diabetes will preclude a select classification, whether or not the insured uses tobacco.

Probably the smartest change we made in this whole area was to change from "smoker/nonsmoker" to "tobacco user/nontobacco user." For one thing, it was one of several changes that justified making a modest reduction in premiums for GT. But by far the biggest impact is that we no longer argue with applicants and producers about why the proposed insured failed the nicotine screen. We realize we can't use the screen to tell exactly how many cigarettes he or she smokes every day -- the limit of 10 gets

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across an impression, but for the most part, we use the other selection criteria to separate tobacco users between select and standard.

The total history of our PLUS product shows that about 80% of all paid-for policies were issued in the select nonsmoker class. Another 7 or 8% were select smokers. All told, roughly seven out of eight policies sold met our select criteria.

When this data began to emerge, I reacted as any self-respecting corporate actuary would -- boy, are we giving away the business! The product managers must be paying off the underwriters!

But I'm here to tell you that's not the case at all. Careful audits -- both internally and by reinsurers -- have confirmed that the underwriters are applying our select criteria as planned.

What we have learned is that we are seeing a disproportionately high percentage of select business for three reasons.

- o We intentionally made our select nonsmoker rates relatively more competitive. They met our profitability objectives, but with less to spare than we built into the other classes.
- o The "invisible hand" surely does exist. Many brokers have access to -- or even feature -- computerized rate bases. They know which companies are among the five most competitive, for any combination of age, sex, face amount and underwriting classification that you care to name. If your rates are hot, they'll find them.
- o Our select criteria seem to be tougher than those of some other high quality, competitive companies. When we classify someone other than standard, it's not uncommon for us to lose the case to another company that will take him or her as a select risk. Sometime their rates are higher, sometimes lower, but they're select.

With the GT product, we decided to target the select market. With this product, 91% of the business has been classified select -- either tobacco user or nontobacco user. And this is with underwriting standards that everyone agrees are tougher than those used for the PLUS product. This provides further proof that it's not necessarily bad that this distribution is far from a cross-section of the population.

Let me make a brief digression here to illustrate another characteristic of this business. The average policy size does not seem to vary between select and standard, but it does vary significantly between smoker and nonsmoker (Table 10). I had to break this down by plan (the length of the level premium period), because the shorter-term periods invariably were sold for larger amounts. For the most part, we attribute this to the reason for the sale -- the shorter-term periods are more likely to be used for business insurance.

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TABLE 10

Relative Average Size by Underwriting Class

For each product, average size for all paid-for = 100

		5 Year	10 Year	15 Year	Total
Plus	SNS	114	98		102
	NS	120	92		101
	SS	92	72		81
	S	113	64		86
		112	95		100
GT	SNS	155	126	78	102
	NS	131	136	66	98
	SS	150	96	48	76
	S	185	92	51	88
		153	126	76	100

Actual Average Size for All Classes Combined

PLUS \$237,577

GT \$338,089

Table 11 takes you through the underwriting process. The first two lines don't really show anything striking, but I wanted to show that our performance in these categories has been representative.

TABLE 11

Classification and Disposition by Underwriting Class (By Number of Policies in Percentages)

	Non smoker	Smoker	Total
Postponed/incomplete	2	2	2
Declined	3	4	3
Select	81	65	79
Standard or rated	19	35	21
Select			
Withdrawn	3	3	3
Not taken	5	8	5
Paid for	92	89	92
Standard or rated			
Withdrawn	24	25	24
Not taken	18	22	19
Paid for	58	53	57

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The next two lines are interesting in that we have used the select classification a lot less for smokers than for nonsmokers. What keeps a number of smokers from being select is primarily the result of their smoking habits -- they simply aren't as healthy as people who smoke fewer than 10 cigarettes a day.

Now it gets really interesting! For the great majority who are classified select, the placement rate is in the low 90% range. But for those who are not so fortunate, almost 50% decide they're not interested -- at least they're not interested in us. One out of four tell us that as soon as they know the underwriting decision. This seems to confirm our feeling that the producer is calling the shots in many of those cases.

In fact, the difference between select and nonselect placement rates is even greater than the preceding table shows. Most applications come in with the rate class shown as select. There is a significant -- but unknown -- number of cases where the application is withdrawn as soon as the underwriter tells the producer that select rates will not be available. The withdrawal occurs so fast that we don't have a chance to change its classification in our database. These show up as select cases that were withdrawn, but actually they should be under the standard category.

I would like to bring my presentation to a close by showing mortality and persistency experience for each of these four classes. Unfortunately, I can't -- at least in an actuarially satisfying way. But I'll do the best I can.

Our term product manager tortures himself (and sometimes our underwriters and claims people) by looking at every claim that's reported, but so far the only mortality experience we have quantified is a broad actual-to-expected ratio over the entire product line. So far, so good -- actual amounts paid net of reinsurance have been 82% of what we expected based on pricing assumptions.

On the persistency front, I have to give you my caveat before I show you the numbers. My source was a standard internal report prepared by an eager, but inexperienced, MBA graduate in our term product group. The report made sense to him and to his boss, but they were unaware that it couldn't be compared directly to the persistency rates used in pricing. You might call this (Table 12) "12-month persistency." The number of policies in force at the end of the first policy year, as a percentage of the number paid for.

TABLE 12
Relative Persistency by Underwriting Class
(Number in Force at End of First Year -- Number Paid For)

	5 Year	10 Year	Total
SNS	94.3%	95.4%	95.1%
NS	92.2	93.7	93.3
SS	91.2	91.8	91.6
S	86.3	87.5	87.2
	93.4	94.9	94.5

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I decided to show you these numbers because of their remarkable consistency. As the rate class progresses from select nonsmoker to standard smoker, the persistency gets worse. This is relatively immature data, but the results make sense -- which means they confirm what we thought we knew all along. Maybe that MBA graduate is pretty smart after all!

MR. MELVILLE J. YOUNG: Some years ago, the comic Mort Sahl made some of us laugh with the philosophical query "Have you ever heard the sound of one hand clapping?"

I would like to pose a similar question. Have you ever heard the sound of someone listening? Our topic deals with risk selection, but first I would like to talk about communications. If you are married, you've probably been living with the same person, sharing the same bed for many years. If you are honest, you probably will admit to frequent, perhaps severe, breakdowns in communication. And yet, often, despite little effort to achieve better results, we are surprised when communications with our coworkers break down. Since joining Tillinghast, I have been asked several times to assist companies that perceive they have underwriting problems. And the situation has intensified in recent years due to a combination of factors: margin squeeze -- mortality and expense control vital; squeezes on gain sources more visible; struggle for quality production sources; breakdown of affinity between company and its people; capital crunch -- less room for errors.

There is nothing on that list that is very surprising to anybody. We have products that are earning less money, and as margins get squeezed, it becomes more important to achieve good mortality and good expense control. Our products make the margins more visible. We are having more and more difficulty getting quality production sources so that those that we have are perhaps a little squeakier when there are problems. Because of a combination of factors, we don't have the closeness between people in the companies, and as you are all aware of by now, it seems like every other week there is a seminar on the capital crunch. Our companies have less capital and, therefore, less luxury for errors.

The underwriting and operations review projects that we have done usually begin with an extensive interview process. It is not uncommon to find no clearly stated market objective, or focus, or product, and/or to find a staff ill-suited to successfully compete in the company's target market. Very often there isn't even an awareness of what that target market is. For example, one recent project involved the company trying to sell to an older age market. The company's underwriters were afraid of this market, and they overunderwrote every case resulting in high withdrawn rates, high substandard rates, high declination rates, low issued rates and a very high level of dissatisfaction among the field. To compound the problem, the company's reinsurers clearly did not feel comfortable with older age issues, and that came up very clearly in their actions on facultative cases. In addition, the company's products really weren't geared to the older age marketplace. And we had been hired to solve an underwriting problem.

The situation had deteriorated to be something beyond a communications problem. There was lots of shouting, lots of bad feelings, no listening and no teamwork. I am

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talking about one particular situation, but we have done half a dozen of these type of projects in the last year and a half, and that is common throughout. What began as a perceived problem in underwriting resulted in the reorganization of the underwriting function and some staff changes, but also resulted in extensive product changes, a reexamination of reinsurance relationships, but perhaps most important of all, a mechanism to encourage better communication among the actuaries, the underwriters and the marketing people. In other words, some very loud listening.

This type of project that we have been involved in typically starts with interviews. We go on and do interviews, not only with home office staff, but also with the field. We do some survey work, and that is where I am going to spend most of my time and give you a sample of what some of the questions you might be interested in reviewing at your own company. I think it is a good idea to compare yourselves to other companies and see if you fall within industry norms. We have also done interviews as part of the process, not only with peer companies, but also with the company's reinsurers to see how the reinsurers felt about that company's underwriting compared to the underwriting of its peer companies. The process involves either bringing in independent outside underwriters or bringing in the company's automatic reinsurers who will usually do a free underwriting audit. It involves reviewing some statistics and reviewing products, pricing assumptions and comparing the pricing assumptions to the company's actual results. To get the process moving and to replace impressions with facts, when we do these audits, we do surveys. I thought that some of the questions and some of the answers might be of interest to you. These are not in any special order. The first question was, Through what cumulative debit assessment does your company routinely issue standard insurance? (See Table 13.)

TABLE 13

Cumulative Debit Assessment Used to Issue Standard Insurance?

<30	4
30-39	3
40-49	15
50+ Over	8

I wonder how many pricing actuaries know the answer to that question. In your standard class, if you are in one of those eight companies in the bottom, can your standard class support 50+ debits?

Do you give nonsmokers smoker credits on cases which will be issued on a nonsmoker rate basis? (See Table 14.)

TABLE 14

Nonsmoker/Smoker Credits on Cases Issued on Nonsmoker Basis?

Yes	11
No	20

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Eleven company's underwriters said they did. Are you double counting? (See Table 15.)

TABLE 15
Accounting Department Assists in Financial Underwriting?

Yes	12
Rarely	4
No	14

Do you require a proposed insurer to provide a supplemental financial statement? And if you do, or if you don't, do you get the accounting department involved in reviewing those financial statements? I'd feel that not only would I have no confidence, or very little confidence, in my underwriter's capability of reading a complicated financial statement with a multimillion dollar policy, but also I don't think I could be much help to him. And yet, it isn't very common for a company on large-size cases to bring their accounting people into the situation to help read those statements. And those people are usually trained to read them.

What is your automatic binding limit as a multiple of retention? I wonder when I know the underwriters would like it to be 50 times. I wonder if you have ever had a discussion to ask them why they want it above a certain amount. Have you thought about some of the potential negative ramifications from having it too high? Reinsurers usually will accommodate a certain amount of negative mortality if they have done the underwriting, but they are less apt to do that if it was an automatic issue. It could ultimately appear in your cost structure.

What is the average turnaround time from receipt of application to policy issue for a clean application within nonmedical limits? Jet issue programs can provide good public relations. They can reinforce the impression of superior service on a large percentage of your business. If I were to do this and the average was over five days, I'd be questioning the service that I was providing for my field force.

All of these statistics create questions. Why are we in that category? Or if you are in the top, you might want to find out why you are there. Dave showed some statistics before, but I think it is useful not only to get your statistics but also to perhaps compare yourselves with some peer companies. Then if you vary from the norm, try to find out why.

Table 16 above shows the percentage of applications declined. Most companies are under 4%, but there are some companies higher than 4%. And again, I would suspect that the agents of those last six companies probably are screaming.

TABLE 16
% of Applications Decline?

0 - 3%	12
3 - 4%	9
4 - 5%	2
5 - 6%	4

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The next question is what would you estimate the percentage of impaired driving records is that you would issue substandard? (See Table 17.) Again, I think Dave mentioned the importance of the moving violation records. I think more and more people, actuaries, and underwriters are beginning to recognize their importance and knowing what your company is doing in that area could be very relevant to the mortality assumption that you are using in pricing.

TABLE 17

% of Impaired Driving Risks Issued Substandard

0 - 10%	19
11 - 20%	2
21 - 50%	4
>50%	3

What is your current nonsmoker/smoker distribution by policy count? I think that we don't often ask the questions when we see the results.

I think that just getting statistics is really not enough. You really need to find out something behind the statistics. This one usually gets a chuckle. (See Table 18.)

TABLE 18

Current Nonsmoker/Smoker Distribution by Policy Count

Nonsmoker	
<60%	3
60 - 69%	3
70 - 79%	9
80 - 89%	10
90% + Over	2

Do you feel you are getting honest answers to your smoking questions? (See Table 19.) Most companies' underwriters don't feel they are getting honest answers. At least they don't feel they are getting them all of the time.

TABLE 19

Getting Honest Answers to Smoking Questions?

Yes	7
Most of the Time	15
No	7

How do you verify the answers? Obviously, there are more responses in the following table than the 31 companies in this particular survey. But again a good question, if you

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were in dialogue with your underwriters, would be to find out just what it is that you are doing? (See Table 20.)

TABLE 20

Means Used to Verify Answers

Urine Screen	29
Commercial inspection reports	21
In-house telephone inspection	20
Post claim	12
APS/medical questionnaire	19

Does your nonsmoker class exclude only cigarette smokers or tobacco use in all forms? (See Table 21.) I am happy to see Midland is distinguishing. There are only five companies in the survey out of the 30 that responded that were distinguishing for all tobacco use, and I question why it isn't 30 companies just for the reasons he cited. I think it is a good idea to sit down with underwriters and marketing people and find out why aren't you doing that.

TABLE 21

Nonsmoker Exclusion

Cigarette only	25
All tobacco	5

How do you handle smoking risk misrepresentation? (See Table 22.)

TABLE 22

Response to Smoking Misrepresentation

Decline	18
Revise claim amount	4
Revise premiums retroactively	3
No experience	4
Depends on state	1

Your company's practice concerning smoking misrepresentation has obvious implications on mortality and on expenses. Do you know what your company's practice is? And if you have been involved in discussions, do you ask why you are doing it in a particular way? Is there a valid reason for doing whatever you are doing? There have been some court cases.

Do you have an AIDS question on your application? Twenty-three of the responding companies do. We are going to be publishing some AIDS mortality statistics soon. We have been compiling a database on AIDS mortality among reinsurers. All the reinsurers that I am aware of in North America participate, and I think it will be the earliest

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statistics that are going to get published from 1989. The early look that I have done seems to indicate that 1989 AIDS mortality went up by about 50% over the level of 1988, which had gone up about 20% over the level of 1987. I think it is getting to the point where we have to start taking AIDS seriously, if we haven't done so already. In addition to using all the wonderful tests that Gregg talked to us about, I think there is information you could be gathering just on your own application form and through the regular underwriting process. How do you stack up to your competition? You, as actuaries, usually compare price, say if you compare credit interest rates, loads and charges. You compare compensation, but do you ever compare your company to your competitors based on the underwriting fundamentals? Knowing what the competition charges may only be half the story. Where is Paul Harvey when we need him?

What is your approach towards applicants who have a frequent replacement history? Shoddy practices might lead to higher expense, higher lapse and ultimately, higher mortality. Do you know what your company's practices are? Do you have enhanced nonmedical limits for select producers? Would you accept the current attending physician's statement (APS) in lieu of a medical exam? Compare your company's nonmedical limits to other company's nonmedical limits. Do the same with your paramedical limits. What is the amount that triggers an APS for a clean application with a check-up within a year? I believe all of these items have an impact on your mortality results. Certainly we will all agree HIV testing does. Two-thirds of the companies surveyed test at \$100,000. What amounts trigger exercise EKG and chest X-ray? What we are saying here is, compare the kind of underwriting that you are doing with the underwriting that your peer companies are doing. There are obviously expense implications, but also there are mortality implications. The exercise that we are talking about could begin with a selection of a team of people who can think and are willing to question what has been accepted without question up until now. Those questions revolve around identity: who are we; what markets do we want to be in; how well are our products geared to our markets; how well are our home office staff and field personnel prepared to compete in those markets? Strategy and planning. What are the fundamental goals? How do we get there? Are the goals team dictated, or is there one guy at the top that sets them down and says, "You all shall follow?" And how much time do we spend talking about them, and how much time do we spend living those ideals?

And lastly, communication is a two-way street up and down. One should determine how well you are communicating as an organization. Your key people in the organization should all be playing a role in the process. Again, there shouldn't be just dictation from a few up top. Having all of the people in the organization or all the key people participate leads to ownership of whatever it is you are trying to accomplish. It leads to excitement as to what the enterprise is trying to accomplish, and ultimately it will lead to success. Promoting good communication and a team-oriented atmosphere promotes success.

Now who would like to talk about risk selection?

MR. DENIS W. LORING: Mr. Sadler said that the urine HIV test seemed to have the same accuracy as far as doing the ELISA test as serum. I have seen some statistics that

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seem to say, I think it was out of 240 urine tests that turned out to be HIV positive, only 60 would have turned out to be positive under a serum test leaving 180 false positives.

MR. SADLER: I am not familiar with the statistics you are referring to, but certainly there are a number of ELISA positives because it is a particularly sensitive test that does not screen positive on the Western Blot, and it is true on serums as it is on urine. The advantage of using serum if the ELISA is positive is that we can run the Western Blot right off the serum, and it is all in the background. The agent and the underwriter, etc., don't know that is going on. Time will tell what that percentage is in the insurance business. The initial studies that we have done have not been in that ratio, but certainly there are a number of redraws that would be required.

MR. ABRAHAM S. GOOTZEIT: It seems that we are getting very good at separating out and segregating those insureds who have the best kind of mortality profile. Probably in the future, we will find that more and more of the insureds whom we are all seeking are the best risks. There will be a subset of the population who may not be able to get insurance at any price and that subset may become more pronounced. I see a corollary with life insurance to what has happened with health insurance. The health insurance industry is no longer providing health insurance adequately across the population. If we continue in this mode as we all take actions which are in our own best interest, I think that the industry in aggregate may be pursuing activity which in the long run is going to create more federal intervention. I just want some comments on how you perceive that.

MR. JEGGLE: I don't disagree with you at all. I think that is very possible because as we provide less and less availability of coverage for certain segments of the population, somebody else is going to pick it up, and it could be the government. I mean, we are going to see that in health insurance, and I foresee that is a possibility in life insurance. I agree with you that this is possible.

MR. SADLER: We have been seeing and what we may continue to see is a larger differentiation within what used to be the broad standard class. I don't really know that over the last five years that the number of declines in the industry has increased. I know it was 2 or 3% five years ago, and I suspect it is still in that range today in terms of the uninsurable population. I can remember when I started in the business 17 or 18 years ago, very few people, had nonsmoker policies, and 90% of the people were classified in one category. Now we have smokers, nonsmokers, more companies are going to preferred risk, and we certainly will have the tools in the future to break that "standard class" into more different classes. More like you look at auto insurance or home owner's insurance, there is a whole number of classes, many more classes than in individual life insurance right now, so I suspect that we may see a trend towards that.

MR. GOOTZEIT: If we believe the statistical evidence of the value of the blood test and we find that the value of the test might be for those people who might be positives, many hundreds of dollars per thousand, we have now created a segment of the population who cannot get insurance. I don't think that was possible in the past. What we are taking advantage of is new technology.

