

# **RECORD, Volume 29, No. 1\***

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Washington, D.C., Spring Meeting  
May 29–30, 2003

## **Session 51PD**

### **Preferred Underwriting: Survey Says?**

**Track:** Product Development

**Moderator:** MARY J. BAHNA-NOLAN

**Panelists:** RICHARD L. BERGSTROM  
ANNA HART†  
MARK SWANSON

*Summary: This session presents the results of the recently completed Society of Actuaries Preferred Underwriting Survey. Panelists discuss survey methodology, results and implications for product design and pricing.*

**MS. MARY BAHNA-NOLAN:** I am the chair of the Preferred Underwriting Survey Subgroup of the Society of Actuaries Mortality and Underwriting Survey Committee. The three panelists with me today are also members of that same subgroup. I'm going to go ahead and introduce all the speakers right away in the order that they will be speaking.

Rick Bergstrom has over 30 years of experience in the insurance industry. He's currently a consulting actuary with Milliman USA based in Seattle. He works closely with clients designing life and health insurance products, analyzing general pricing and risk assessment issues, helping determine appropriate underwriting requirements for achieving required mortality levels and assessing life expectancies for impaired risk individuals, and quantifying the protective value of various underwriting tests and requirements. Rick is a frequent speaker at Society of Actuaries seminars and industry underwriting meetings. He is a member of the Planning and Programming Committees of the Third International Underwriting Congress. Rick is also a member of the Association of Home Office Underwriters,

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chairman of the Society's Mortality and Morbidity Liaison Committee, vice chair of the Society's Individual Life Experience Studies Committee and a member of the Task Force on Preferred Underwriting in Large Amounts.

Our second speaker will be Anna Hart. Anna is principal of A. R. Hart Consulting Company in Eastland, Texas, where she specializes in analyzing and assessing mortality in different areas of the life insurance market. She has worked closely with Milliman USA for the past four years on a variety of life insurance research including mortality assumption assessment, application review and analysis. Her projects include determining life expectancy for legal and medical consideration, developing underwriting standards and a training manual for a dread disease policy of an international insurance company and contracting with reinsurance companies to provide direct analysis of underwriting practices and quality of work. She is working with clients on structured and impaired annuities and working with the biomedical technology field evaluating medical technologies for application in the life insurance industry and other markets. Anna is a member of the Gerontological Society of America, a member of the Association of Home Office Underwriters and a member of the Society's Mortality and Underwriting Survey Committee. She is also a member of Society's Mortality and Morbidity Liaison Committee, a member of the Society's Individual Life Experience Studies Committee and a member of the AHO Underwriting Experience Studies Committee.

Our final speaker will be Mark Swanson. Mark has worked in the life reinsurance industry since 1993. His experience is mainly in pricing, most recently for ERC. In March 2003 he began working in the alternative markets department at Transamerica Reinsurance where he helps client companies develop products using innovative underwriting techniques. Mark has been a member of the Survey Committee for about two years.

Today we'd like to go over some background information regarding the survey and then present the preliminary results from both the direct writer survey and the reinsurance survey. This was the third preferred underwriting survey conducted by the Society of Actuaries. Prior surveys were conducted in 1995 and 1997. The 1995 and 1997 surveys focused primarily on direct writers. In August or September of last year, we conducted the 2002 study. This is the first time that we actually did two separate surveys—one focused on the reinsurance community and the other focused on the direct writers. The information and data that we collected were based on companies' most popular 10-year level term product. If companies did not have a 10-year level term product, then they indicated which product was the most popular level term product, and information was collected on that. We based the information or data collection on experience and criteria in place through the second quarter of 2002.

Regarding the status of the surveys, the analysis for the reinsurance survey is complete. The final report is still in the process of being drafted and it should be complete by the end of June or beginning of July 2003. The direct writer results are

still preliminary. We're still in the process of doing some of the data analysis and we have not completed the comparisons to the information collected in the 1995 and 1997 surveys. We are in the process of working on that and we expect that a final report should be published some time during the summer of 2003.

For the direct survey, we had 54 companies participate: 40 stock, eight mutual, and six fraternal. Many that participated in the direct survey also participated in either one or both of the prior surveys. Eleven of the respondents participated in both the 1995 and 1997 survey. So, we believe we're going to have some good information. We hope to do some comparisons to see actual trends within the same company. I'm going to let Mark cover all the details and background of the reinsurance survey.

We wanted to be able to analyze the data and experience for companies with like class structures, so we asked companies to give us a description of the current risk class structure and how it compared to the risk class structure that they had in place at the end of 1999, just prior to XXX going into effect. You can see on Chart 1 that the most prevalent risk class structure was the three non-tobacco, two-tobacco category, which had 43 percent of the respondents. In the prior surveys the most prevalent risk class structure was the two non-tobacco, one-tobacco category, which only had 12 percent of the respondents in the 2002 survey. It's interesting to note that 65 percent, or about two-thirds of the respondents, had four or more non-tobacco classes in this survey, and closer to 70 percent in the 2002 survey had at last two tobacco classes.

Chart 2 shows a comparison to the risk class structures from the previous survey, and you can definitely see the trend toward an increasing number of risk classes. It's interesting to note that when we take a look at how the risk class structures compared to what was in place at the end of 1999; 60 percent on the non-tobacco side and 81 percent on the tobacco side had the same number of classes and only 35 percent had actually increased their number of non-tobacco classes since the end of 1999. What that tells me is that there was a lot of activity that took place between the time of the last survey, the 1997 survey, and the end of 1999. Since that time, while we have seen some restructuring take place and even some companies eliminate some risk classes, for the most part the number of classes has been stable over the past couple of years.

We also asked companies to give us a definition for the tobacco cessation use for respondents' preferred classes. We actually collected this data on all of their non-tobacco classes. Chart 3 really just shows for the best preferred class the definition used for no tobacco usage.

In 1997, 50 percent used a 12-month no tobacco usage definition and 25 percent used 36 months. You can see that there definitely has been a shift toward a longer definition of no tobacco usage for the best preferred class, with 36 months at 38 percent and 60 months at 36 percent. In the 1997 survey, we only had one

company respond that they used the 60-month definition, so we've definitely seen a shift.

We also wanted to see if there had been a shift in the maximum issue ages or minimum issue amounts for respondents' best preferred class. The majority uses an issue age limit of 70 or 75. This is fairly consistent with what we saw in the 1997 survey where we had 75 percent of the respondents use either 70 or 75—but what's interesting to note is that we definitely had an increase in the number of respondents using a maximum issue age to qualify for a best preferred class over age 75. In the 1997 survey, only 4 percent of the respondents actually had an issue age limit above age 75. I think this is consistent with the expansion in the term market to the older ages that we've been seeing over the past couple of years.

We also took a look at the minimum issue amount limits and, consistent with the prior surveys, \$100,000 was the most prominent minimum issue amount limit for the best preferred risk class. We did see, however, a shift toward higher minimum issue amount limits. We had 19 percent with an issue amount limit of \$250,000 or higher. In the prior survey we only had 7 percent with a minimum face amount at \$250,000, and no respondents in the prior surveys had minimum amounts above \$250,000.

That covers the general background behind the survey. I'm going to ask Rick Bergstrom to come up to discuss our findings on companies risk class expectations and experience.

**MR. RICHARD L. BERGSTROM:** In the survey we asked respondents for each risk class. They were asked to provide the percentage of policies they expected to qualify for each risk class, the expected and actual non-tobacco/tobacco ratios or splits, and whether qualification percentages varied by issue age and/or gender. As illustrated in Chart 4, for the best preferred class, some companies expected 65 percent to qualify; for the worst preferred class, some companies expected 69 percent to qualify; and for the third best, 85 percent were expected to qualify. I can't address each individual company, and the lows are even more interesting. But, it's roughly between 20 and 30 percent for each class, on average. We asked what the companies expected their percentage of non-tobacco was to be, and between 72 to 98 percent were expecting non-tobacco versus tobacco, with a mean of 90 percent. The actual amounts vary between 68 and 99.5 percent. The actual by face amount was 71 to 99.6 percent, interestingly.

As far as expecting to qualify, 31 percent of the companies that responded vary their expectation by issue age and 18 percent vary by gender; 68 percent of the companies monitor their percentages and 53 percent noted taking some action when actual varies from expected. So, if they were off on their assumptions, that means is that about half of the companies would make some kind of an adjustment, whether it be repricing or whatever.

We also asked if the respondents allow substandard risks into their preferred classes. This is an interesting question: Do you allow substandard risks in your preferred classes? And if you do, what the basis for a one table substandard rating is. Of those who answered this question, —and there were 15 companies that actually said, "Yes, we do allow substandard into our preferreds, and these are the reasons why." Thirteen of the 15 said we do permit flat extras. Flat extras on a non-medical basis could be for an aviation rating or something like that, so medically we'll allow you to qualify, but then we add on a flat extra because of some occupation or avocation. Seven companies said that they do so with exclusion riders, an exclusion rider could be like an aviation rating. Four companies said we will allow flat extras for the medical rating—no explanation. Two companies said they do allow table ratings, with preferred.

We asked companies, "What is the basis for a one-table substandard rating?" Meaning, if you have three or four classes, how do you rate one table for substandard? These were the responses: Twenty-one companies, which is about half, said 25 percent of the residual standard class. If you have preferred and residual standard, about half of the companies said a one table rating is 25 percent of the residual standard. Three companies said 25 percent of some of the aggregate standard class. The aggregate would be before we split out the preferreds. Two companies said 25 percent of some intermediate class, and one company said other than 25 percent. One company said they use the standard class, and 7 percent said "other" without any explanation.

For each risk class, we asked each company to express its expected mortality assumption as a percentage of the 75-80 basic select and ultimate table, age nearest birthday. Chart 5 illustrates the expected mortality assumption for male, issue age 45, best non-tobacco class. We asked them for the assumptions for durations 1, 3, 6 and 10; remember, this is expected. What's interesting about this chart is that the low is 5 percent. I went back and looked at the tables and 5 percent of 75-80 is about 20 percent of the accidental death rates. So I'm not exactly sure what they're expecting people to die of down here, if at all. You might as well use zero, actually. Seriously, this is for the best non-tobacco class; the high was in the upper 40s. The median is in the upper 20s of the 75-80. There were four companies that responded.

Chart 6 shows the range of expected mortality by class for three non-tobacco class systems (two preferreds and a standard). The lowest was about 16 percent for duration one and that obviously goes up as the classes get worse in mortality. The medians were 27 percent, 35 percent and 47 percent for Class 1, Class 2 and Class 3, respectively. Anybody not use 75-80 as some kind of a comparison or standard?

**FROM THE FLOOR:** We use Canadian tables.

**MR. BERGSTROM:** Thank you. We also devised, as shown in Chart 7, the ratio of expected mortality for non-tobacco risks meaning we looked at Class 2 compared to

Class 1; and Class 3 compared to Class 2; and Class 4 compared to Class 3, that type of thing. We wanted to see what the increments in mortality were between the various classes. This chart shows the results for a three-class system, issue age 45. The median was about 1.2 percent, so 120 percent was the ratio of Class 2 to Class 1; and 140 percent from Class 3 to Class 2, on an average basis for age 45. That seems very reasonable to me.

As shown in Chart 8, we asked companies what basis they use for determining expected mortality. Half of the companies are still using the old 75-80 table. There was a variety of answers given. Twenty-five percent of the companies said they use their own experience. Again there was a variety of answers there. I think one company used the Bragg table, but 48 companies did respond to this question.

We asked companies to indicate whether their overall experience, when compared to prior mortality studies, improved, stayed about the same or worsened. Here are their answers in Chart 9. For the 27 companies who responded, a little over one-third said it was too early to tell, which makes sense. Some said it was better than expected, some said about the same as expected. Only 7 percent, which is probably about four companies, said it was worse than expected; and four companies said they didn't know.

Chart 10 shows actual to expected results. We asked companies, "How are your results?" (We had a hard time putting this slide together.) When it says zero percent the company simply had no claims there, so it was just probably too early for them to tell. They had too little experience to really know. But, otherwise, the medians were as illustrated in the chart. See the bottom area for the various classes. Class 1 is the best class; Class 4 is the worst class. Class 4 would only be for companies that had at least four classes, so best, next best, third best, and fourth best. Compared to 75-80, the median was about 25 percent, 39 percent, 51 percent and 44 percent respectively. I cannot explain that, other than the fact that there were only eight companies that responded there, which is different than the 20 or so that responded that had at least three classes. In other words, this slide is not surprising to me. These numbers here just indicate that there's probably very little experience out there.

We also asked about the tobacco classes, as illustrated in Chart 11. I think there were 16 companies that actually had two tobacco classes, with a preferred tobacco and a non-preferred tobacco class. These were their actual/expected ratios. A number of companies said they had no experience, so there were no claims. The median was about 91 percent of the 75-80 for the best class and about 107 percent for the standard tobacco class. Again, we asked companies to compare their experience with prior mortality studies, and there were about 42 companies that responded to this; 50 percent indicated their experience stayed about the same; 38 percent had improvement and 12 percent said it had worsened.

We asked the companies to describe how they divided their standard mortality into multiple preferred classifications. In other words, how did you start out? What did you do initially to break up your standard class? We asked them to indicate whether any mortality improvement was incorporated into the pricing assumptions. The results are indicated in Chart 12. Not surprisingly, 91 percent indicated that they had some reinsurer input into how to split their class out. That's not surprising considering that the reinsurance companies own at least 90 percent of the risk. Obviously there were some companies that used more than one method to do this because the figures add up to more than 100 percent. Fourteen percent of 44 companies indicated "educated guess." So Six companies used an educated guess. Anybody else use educated guesses?

The survey also asked whether respondents use mortality improvement in their pricing. Chart 13 outlines these results. There were actually only seven companies that responded to this. Two companies said yes, but they didn't tell us what or how. There were four companies that varied mortality improvement by duration, three companies that varied it by age, two companies that varied by sex and one company indicated "other (reinsurer)," whatever that means.

At this point I'm going to let Anna Hart explain to you what the underwriting implications were in the study.

**MS. ANNA HART:** We spent probably 150 hours just putting this data together. There are a lot of findings in here. We had so much data from the underwriting and the reinsurance survey that we could not put all the results into this presentation. I'm highlighting some of the things that I think are most important. I have a history of working 12 years with a reinsurer, so I have vested interests in some of these things.

On the underwriting criteria, we identified 10 of the most common screens and tools. We had a long list of things like medical exam, urine testing, personal history interview (PHI), etc. We asked companies to identify what requirements they used at age 25, 45 and 65 and for face amounts of \$50,000, \$100,000, \$200,000 and \$1 million. This was a slight change from the previous surveys where the amounts were lower, so we increased the maximum. I think on the 1997 survey the maximum was \$500,000, so we increased that to \$1 million. The majority of the companies used both paramedical exams and blood profile with the HOS as their basic screen for preferred.

The first category we focused on was personal history. We asked participants what criteria were used in consideration for a best preferred class. Forty of 43 companies answered portions of this question. Some of the underwriting questions were very difficult to answer, and not all companies answered all parts of them so the numbers will vary on most of these. Chart 14 illustrates what companies used for preferred class. It's in decreasing order, from 100 percent downward in terms of usage. One hundred percent used internal cancer, and as you can see, most people

used diabetes (both types), heart disease, melanoma, stroke and hypertension, then you get down to other skin cancers; 65 percent of companies used that in consideration for their preferred.

Then, as shown in Chart 15, we asked the participants whether they always precluded from a preferred risk class any of those same criteria for personal history. Ninety-three percent of the respondents said if they had diabetes Type I they preclude them from their best preferred class. Interestingly enough, as you get further down the list, some of the things that you think that people would preclude for, they actually included, such as mental and nervous disorder, where only 34 percent precluded from their best preferred class.

We also asked about family history, which is very important in preferred schemata. We asked participants if they considered the following criteria for inclusion in the family history section, some of these are the same things you see in the personal history. We had family heart disease, diabetes Type I and II, cancer, stroke, hypertension, alcohol and drug abuse, and non-accidental early death.

We also asked the participants if there was a cardiovascular or cancer death in any parent or sibling prior to age 60, whether they considered that, and then how many of the siblings or parents were considered.

We then looked at the criteria used for consideration in family history, which is shown in Chart 16. Again, 100 percent used family history of heart disease for consideration; 72 percent used diabetes Type I; 59 percent, diabetes Type II; 49 percent, cancer; and 44 percent, stroke.

We also asked them in family history whether participants used death and/or diagnosis in their consideration, which is shown in Chart 17. These were the top five: heart disease, diabetes Type I, diabetes Type II, cancer and stroke. There were several other criteria that were used and we concentrated on those. As you can see, 71 plus 46 does not equal 100. There is a difference because several companies used both death and diagnosis, so there was an overlap. Seventy-one percent used death as their criteria for considering for family history; 46 percent used diagnosis, and then 17 percent used both. Then there's a decreasing variation on the others.

We also asked if they considered age when they looked at family history of heart disease. Eighty-five percent of the companies, or 41 of the 46, considered age when they applied that history. Prior to what age—there's always a cutoff, is it 60 or 65? Thirty-five of the companies used age 60 as their cutoff and family history for heart disease; four at 65; one actually at age 70, and then there was one company that said all ages; in other words, "We just don't want anybody with that."

A lot of times I've looked at applications where actuaries (and I'm an underwriter) have asked me to look at the wording of the question, for example, "Do you ask

whether it's death or diagnosis?" Most of the actuaries that I've talked to have said it's really important that when you use death and diagnosis in considering heart disease that there's a different reasoning for doing that; death has, of course, different mortality implications, but why? Because if you ask only diagnosis of heart disease, you'll definitely get more prevalence, but you'll miss some of the early deaths that occur under age 60 or 65. So if you're actually developing the question, asking about death and diagnosis is very protective.

We ask in family history whether cancer was used; 28 percent said yes, 11 said no, and seven just did not answer that question. We asked about family history of stroke, which is an unusual one. I don't see that very often on applications, and 23 percent said, yes, they do consider a family history of stroke; 16 companies said no. But, of the 23 companies that considered it, all utilized age 65 as their cut-off for considerations.

We went from personal history through family history and then we concentrated on lifestyle considerations. We asked the companies if the criteria were used in consideration for any preferred class. So we've gone from best preferred to any preferred, and that if any would preclude from inclusion. We had 46 companies that responded. Chart 18 illustrates lifestyle criteria: Forty-five companies said they considered alcohol abuse and illegal drugs. There was a long list of other criteria in this particular lifestyle category and we took the more prominent and prevalent ones to include: Hazardous occupation, avocations, aviation, and we actually put in foreign residence and foreign travel in light of the things that are going on today in the world.

Then, as illustrated in Chart 19, we asked if any of those criteria in lifestyle precluded from preferred, and 35 of the respondents said alcohol abuse was a preclusion while 10 said no; for illegal drugs, 37 said yes, but eight said no. So there are some people that are offering some preferred. It goes down to the last one, foreign travel, 15 respondents said they precluded that, while 23 said no.

We went to driving record, and we asked if the driving record was included as a consideration of inclusion into any preferred class. Forty-four companies said yes and one said no.

Chart 20 is a little busy, just because trying to put in the number of violations that were allowed and considered meant there were a lot of variation extremes. Forty-one of the 46 said two violations or less are allowed to qualify for the best preferred, non-tobacco class. There were findings from tobacco class, but they're not included in this particular presentation. Then we asked them also about the number of violations and the time since the last violation. One company had nine months; 35 of the companies had three years or less; there were actually nine companies that said five years, and then one did not answer.

We went from driving record to number of DUIs. This was actually really interesting. Some of the people would allow drug abuse, but they won't let you have a DUI and get preferred. Forty-one companies said no DUIs were allowed, and four said one. After that we asked how long is the waiting period before someone can get into a preferred class if they had a DUI. Four companies said three years, and the majority of the companies said five years, so that was a consistent finding. Actually, it was an increase from 1997 because eight companies actually said 10 years and then there were a couple that said, "We just don't want you ever in our preferred class if you've had a DUI."

We've gone through the personal history, the lifestyle, the family history; and we concentrated on what the qualification was for no tobacco. So companies were asked the basis of what "no usage" is, and there has always been a lot of controversy. Is it non-tobacco? Or is it non-cigarettes? Or an occasional cigar? Forty-three of the 46 companies indicated that no usage meant to them no tobacco or cigarettes, so it's "no usage." Three companies did not answer.

As illustrated in Chart 21, we concentrated on the best preferred of each of these four non-tobacco classes. Of those companies that had four non-tobacco classes, 12 said any tobacco would not be considered. Of the companies that had three non-tobacco classes, 24 companies indicated any tobacco would not be considered. Then, of the companies with two non-tobacco classes, seven indicated any tobacco would not be considered.

Of no tobacco usage, roughly half of those allowed an occasional cigar for their best preferred class. So is it one cigar a month or an occasional one at a party; and I've seen the question. Usually you would ask someone, and it would be in a PHI that you would validate that information. Only three companies allowed occasional use of other tobacco, which were things like snuff, pipes or chewing tobacco, things like that.

**MR. BERGSTROM:** Can I ask you a question? Does that mean the occasional cigar would still be a negative nicotine test on the urine?

**MS. HART:** It could be; it doesn't have to be. That's not what we asked. We did not ask them whether they tested or if it showed up as a finding on a nicotine test. We just asked if they included that and would allow it as usage.

Regarding tobacco usage, the time since the last usage was also up for consideration in the best preferred class; the answers varied a lot. We had 12 months by seven companies. I think Rick touched on this, that the majority of the companies had increased up to five years, which is a change from what we've seen in the past. It used to be that a lot of companies would concentrate on three years, and it's moving toward a longer non-usage period. Then there were actually two companies that said a lifetime; it may be the same two companies that are never on the other side.

The survey then asked if companies varied their preferred criteria by age; 44 responded. Sixteen said some of their criteria differed, while 28 said there was no variation at all. Regarding total cholesterol, respondents were asked to provide the maximum total cholesterol reading that would qualify for their best preferred risk consideration. Forty-three companies responded.

You can see, in Chart 22, for the four non-tobacco, three non-tobacco, two non-tobacco; and the two tobacco classes these were the low, high and median maximum readings allowed for a male, age 45. The low was 200 and the high was 250. I know that from a medical perspective some of those individuals would be on statins or are being treated. We actually asked later if respondents allowed some of those individuals that were being treated to be in a preferred class as well.

Chart 23 shows data for the total cholesterol to HDL-C ratio. (HDL is the good stuff, you want that high .) Here we show the maximum level allowed for the best preferred non-tobacco class for a male age 45. The lowest ratio was under four: (there was one company that gave us 3.99) and there was a wide range of responses. Again, these are actually, I consider, quite high from a perspective of the ratios, so if you're in a four non-tobacco class, under four is probably a really tight consideration; the high of 5.5 is a little bit high. Then there's a median for each class as well, ranging from 4.5 to up to 6 for your two tobacco class.

Then we asked if a higher reading always precluded an applicant from a best preferred class, as shown in Chart 24. Again, we divided the responses into 4 NT, 3 NT, 2 NT, and then the two tobacco classes. For total cholesterol, five of the companies with four non-tobacco classes suggest that a higher reading precludes you from any consideration, while six said no. It was interesting. For respondents with three non-tobacco classes, 18 companies said yes, that a higher reading does preclude an individual from consideration into the best class. Then we also asked on the total cholesterol/HDL ratio and again for the three non-tobacco class system; 19 companies said yes, we preclude an individual, if from our best class if they have a higher ratio.

We asked about blood pressure, and respondents were asked about the maximum treated and untreated blood pressure readings that allowed a male to qualify for their best preferred risk classification at issue ages 25, 45 and 65. Chart 25 is a really busy slide. I'm going to focus on age 45, but you do have all ages included. They're in a reverse order from everything else, so if you concentrate on the three non-tobacco classes, your maximum level for age 45 would be 140/90—that's treated blood pressure and Chart 26 shows data for untreated blood pressure. The maximum would be 140/85. It was interesting, again. There was a wide spread with the lowest for age 45 at 120/75, ranging up to 150/90, which is definitely treatable.

Respondents were asked for the maximum build that would qualify a 45-year-old male for best non-tobacco preferred class. For 5'6", 5'10", 6'2" and 6'5", there were

a higher readings than from the last survey, when we actually cut-off at 6'3" in the 1997 survey, so we have a higher maximum now. Weights ranged from 153 to 220 and up to 310 at 6'5". On your best tobacco, it went from 170 to 314 in their best tobacco class. It actually got up to 405. I thought that was kind of high. Even at 6'2", 375 is ratable in most people's books.

The final question in the survey, and again we've consolidated 50 pages with underwriting criteria into very small amounts, so there are a lot of things missing from this, but the final question in the underwriting survey asked respondents what other criteria would they like to see to qualify a risk for a preferred that we do not commonly use today. As shown in Chart 27, we got a slew of answers ranging from body mass index (BMI), which has a lot of interest these days. A lot of people are using it, and should be using it, because of all those heights and weights that you saw. If you include their BMI, they'll all be way off the scale in obese or heavily overweight. It was interesting; most of the weights that are in the preferred category today are not within the guidelines.

Also, exercise and fitness, which would be a question obtained in a PHI, most likely; seven companies would like to see that. Asthma was one response as was liver function measurements. We asked a lot of questions in the last survey about gamma-glutamyl transpeptidase (GGT) and serum glutamic oxaloacetic transaminase (SGOTs), but we did not concentrate so much on the liver functions in this particular survey. History of depression should be on your application. We included frailty index, waist-to-hip ratio, which kind of goes to the BMI and really controlling the weight issue, C-reactive protein, which is up and coming, and if you're really a hot hitter, you'll be using that for heart disease or a marker for it.

Then there's lifestyle. We combined a lot of these because there were some various answers about positron emission tomography (PET) and things like that, but these were the most prevalent of all of the ones that we've seen. I'm going to turn it over to Mark now.

**MR. BERGSTROM:** I'm going to ask a question of the audience. How many companies up there, if you know, use body mass index as the criterion other than just build? I saw one, is there more than one? Okay.

**MR. SWANSON:** I have a question, too. How many of you work for a professional life reinsurer? Quite a few; about half it looks like.

That's what I'm here to talk about—what the reinsurers think of all this. I think you'll find some of the results interesting. Here's where I'm going to cover. What is the reinsurer's evaluation of broad categories of criteria? It'll be clearer what that means when I get to that. Then we also gave them some criteria—not actual criteria of any specific company, but some fictitious made-up criteria that are plausible and asked them to evaluate them. We also asked them some questions about setting

assumptions for preferred classes and a lot of these will match up (not all of them), but some questions will match up with questions from the direct survey.

Here's some background on the survey: We did send it only to reinsurers and only reinsurers working in the U.S. market. We specifically asked them to answer with respect to the U.S. market just in case they also did Canadian business. Actually, most of the people in the reinsurance subcommittee are Canadian, but it's a larger market and we thought we'd limit it to that. It also is based on 2001 activity, so you can see how long ago we actually started this. We didn't want to send out another questionnaire and ask them to do it all over again for 2002.

One nice thing about the compactness of the reinsurance market is that we were able to get respondents that represented 76 percent of new business market share. So it's a very good representative sample, which is pleasing. In general, I wanted to point out that the reinsurers have a very different task when thinking about preferred underwriting classes. The direct companies construct preferred classes; they construct the criteria based on their best judgment and their market needs. The reinsurers are provided with finished works, and they have to evaluate what they're given. So it's really a different set of questions and a different set of considerations. Let me point out, too, that excludes the activity that some reinsurers have when they do product development for client companies where they might actually function as a product development shop and construct preferred criteria; so that's excluded. This is strictly in the role as reinsurers.

Here's the first main grouping that I'm going to cover—categories. What do you consider when we talk about which categories reinsurers consider important? The next thing we asked after that is, how do you consider it? But at first we're asking, what do you find important? Categories like blood pressure, build and driving record. Here's how we asked the question (See Chart 28.): We gave them a table and it listed what we called categories. We said take 100 points and assign 100 points to each of these categories where the points correspond to the importance that you give to that kind of criteria when you're doing your evaluations. We asked that separately for tobacco and for non-tobacco, mainly because there's one difference there. For non-tobacco, criteria will include how long has it been since you used, for example, 60 months, 36 months. For tobacco sometimes, if there is anything, it will be something about the intensity of usage, so we wanted to ask the question separately. See Chart 29 for the importance of categories, results for non-tobacco.

Here are the results. For this result table, all we did was add up the points that were assigned across the reinsurers, and you can see that clearly there are two kinds of criteria that were thought most important: lipids and blood pressure. Going down the list, there are no big discontinuities other than those two that I would set aside as being most important. They were all close together in importance until you get down to some items that most companies gave little or no points to.

Of those 13 categories, the average reinsurer looked at 10 of the 13 categories. So three of the 13 they gave no points to, by which they meant, "I don't care what the direct company does with respect to, for example, felonies, bankruptcies and credit reports. I don't care what their criteria are. I don't give any thought to it." One reinsurer actually gave some points to every one of the 13 categories. Exactly one reinsurer considered only seven, and that was the smallest number of categories. The one reinsurer that considered all 13 was the only one who checked fitness and exercise as having some importance. Every reinsurer considered some of these categories. . After that broad ranking of kinds of criteria, we went in and asked yes/no questions within each of those groupings. For example, within personal history, "Do you as a reinsurer care about cholesterol? Do you care about the ratio? Do you care about triglycerides and so forth?" I'm just going to show some highlights here. There are obviously a lot of possible criteria and a lot of results came out of it.

Under the grouping of personal history, I pulled out not only what reinsurers said they considered, but what reinsurers generally said they didn't consider. Most reinsurers did not consider direct company practice for liver enzymes, prostate-specific antigens, (PSAs), activities of daily living (ADLs), chronic obstructive pulmonary disease (COPD), skin cancer other than melanoma, mental/nervous disorders or asthma.

In family history it was a little more compact. Heart disease and cancer in family members were considered by every single reinsurer, not a big surprise. Not every, but most reinsurers, considered stroke or diabetes in family history. Most reinsurers did not consider hypertension, nonaccidental early death (a general question about early death), or alcohol or drug use on the part of family members.

The next grouping was lifestyle considerations. I just pulled out again what most reinsurers didn't consider. See Chart 30 for lifestyle criteria that reinsurers did not consider. The reinsurance industry doesn't consider these things as important as the other criteria that you've seen.

Then we also asked the question, "What would you like to see used in preferred criteria that you don't see used by direct companies? What would you suggest? What do you pitch to your clients? What do you think about?" This is what came up: See Chart 30 for the other criteria suggested by reinsurers. Some of them are lab tests; some of the up-and-coming lab tests like C-reactive protein (CRP). Some other criteria mentioned aren't lab tests. The one I'll mention is activities of daily living for older insurers. That's one that four separate times a reinsurer said they think that direct companies ought to be using it and they don't see it being used.

The next thing I'll talk about is the specific criteria. This was an interesting question. We gave them fictitious sets of concrete criteria. We gave them a four non-tobacco set, a three non-tobacco set, a two non-tobacco set, and then a two tobacco class set; so four different times they had to go through this iteration and

evaluate the criteria. We asked them two questions: the qualification rate and the pricing mortality that they would use. That looks simple, but it was complicated because we asked for different issue ages and different durations, and we asked the respondents to phrase their answer in terms of the 75-80. So if they used the 75-80, we asked them to just put down the percentage they used. If they do not, we asked them to just find the actual qx that they use and divide it by the corresponding qx in the 75-80 table for us and report to us the percentage.

I'm only going to talk about one specific set of criteria and this was what we called in the write-up, "underwriting guideline 2," that was with three non-tobacco classes: a standard, a preferred, and a preferred plus or super-preferred, whatever you want to call it. Chart 31 illustrates Underwriting Guideline 2 criteria. These were the exact criteria we gave them. I think personal history was just medically not ratable and not ratable for aviation or avocation. For build, we gave them a build table that we thought was representative. And I think no foreign travel might have been the criteria there in the ones that were listed.

Then we asked, "What percentage will qualify and what are your mortality assumptions?" Here are the qualification rates in Chart 32. I report just the medians here and it's roughly a one-third, one-third, one-third split by just looking at the median. But digging a little bit deeper, there was a very wide range of opinion and you can see it right there: The super preferred rate ranged from, a company that said 25 percent were qualified to another company that said 61 percent would qualify. That's a huge difference of opinion—one that the subcommittee found kind of puzzling, frankly. The 61, was it an outlier? Kind of. Number 2 was 42 percent, which is still a strong difference of opinion from a company that said 25 would qualify. You see the same thing on the other two. Obviously, mathematically they added to 100, so they're going to disagree on all three if they disagree on one.

Chart 33 shows the expected mortality percentages as a percentage of 75-80. Seven of the 13 reinsurers reported a level percentage of the 75-80, and the other six reported some sort of a varying percentage. We don't know. We didn't dig into whether that meant they used the 75-80, but they used some kind of a graded percentage or did they use some kind of table when they went through the procedure of dividing by the 75-80 pointed scale for us? If you want to wait for the report to come out, and it should be the next month or two, you'll see the other preferred criteria evaluated and the results compared; it's pretty interesting.

The next grouping is setting assumptions and this is where the questions tended to match up a little more with the direct side. Do qualification percentages vary by age or sex? Most reinsurers said they did, both by issue age and by sex.

This is an interesting question exhibited in Chart 34. How do reinsurers arrive at their mortality assumptions for preferred classes? We gave them a long list of possibilities and they could say as many as they wanted. By far, the two most

important were "talking to the reinsurers' own underwriters about their evaluation" and also "experience from mortality studies." Unfortunately, you find out when you look at the results of a survey, how you wish you had asked the question. We didn't distinguish between internal mortality studies or client-provided mortality studies. That would have been an interesting question to ask. We'll ask that next time. Wherever the mortality studies come from, they're obviously very important: mathematical formulas, educated guess, client assumptions; they all have some interest.

Here, in Chart 35, I took the same answers and I expressed it as a percentage, "How many of the respondents said that they used this" and compared it to the results that Rick went over. There are some interesting things here. One interesting thing is you see a lot of big numbers underneath the reinsurer. Remember, they could check as many as applied, obviously, because it adds up to much more than 100. What that tells me is that the reinsurer just uses more things. As a matter of fact, four of the possible answers there were checked by over half of the reinsurers; and the other two that are listed, they are client assumptions, and industry experience got a very good percentage. So the reinsurers, as you would expect, are pulling out all the stops using whatever they can. They're also much more likely to admit to using educated guesses.

This I found interesting. About half of the reinsurers said they use, to some extent, client assumptions, but most of the clients say they use reinsurer input, so there's definitely some circularity there, which is a little disturbing the more you think about it. Fascinating results there, I think. Then you see in the direct side, much lower percentages and far greater reliance on the reinsurers for those mortality assumptions.

We asked the reinsurers, do you use in your pricing future mortality improvements, not mortality improvement taking some study up to the present day, but do you think there's some future improvement from the pricing date going forward? This is shown in Chart 36. By far, most reinsurers admitted to using future mortality improvement. I went back to the study that was just published a couple of months ago by the mortality improvement survey committee. Only 25 percent of direct companies reported using future mortality improvement. I think that report called it durational improvement, but that's not surprising. Ceding companies are laying off so much risk, there must be a reason for it. It's because the reinsurers are being aggressive, obviously, and this is one way to be aggressive.

If you use future mortality improvement, how did you vary your rate of improvement? This is shown in Chart 37. Most reinsurers varied it by duration and by sex; a lot also varied it by age, issue age, and by smoking status. I give the direct numbers for comparison there in the chart.

Then we asked, "When you're looking at a client's mortality experience, what tools do you use to evaluate it?" This is illustrated in Chart 38. gave them only five

possible answers and they had to rank them one through five. It's a little tricky to get a composite result for that, but we think we had a way that worked pretty well. According to our methodology, those top two were virtually tied: reinsurer's internal information and the quality of the client's underwriting.

In last place, least important, somewhat surprisingly maybe, were audits of the client. But I wouldn't read too much into that. There was a lot of diversity of opinion on this and that's what I tried to say in the box there. For every single option, there is at least one reinsurer who said it was their most important criterion. So at least one said audits were most important to them. It was just that more companies tended to say that reinsurer internal information and quality of underwriting was important. There might be some double-counting there, and how do you separate quality of clients underwriting from audits? How do you know really about the quality of the client's underwriting other than through audits? There's a little ambiguity there.

We looked at that second one, quality of client's underwriting. We dug a little bit deeper: How do you evaluate the quality of the client's underwriting? We gave them four answers and asked them to rank them and "published underwriting requirements" was the most important. They looked at the age and the amount requirements and the preferred criteria. Last important was the manual. Again though, at least one reinsurer, I don't remember off the top of my head how many, but at least one said the manual that the client uses was the most important. At least one reinsurer said published underwriting requirements were the least important. The answers were really all over the place.

One overriding conclusion that came out of the reinsurer survey was that on almost every question there was a wide range of actual answers given by the responding reinsurers, which tells me that's very good for ceding companies. That means no matter who you are and no matter what you do, there's some reinsurer out there who is going to like you because you do it the way they think it ought to be done. I don't think that comes as a surprise to any of you that there's a lot of competition and this is part of it. Anything goes for at least one reinsurer on any given criteria.

That's it for the reinsurance survey, so now I'll turn it back to Mary, who will wrap it up.

**MS. BAHNA-NOLAN:** Are there any questions on what we just presented? I know there's a lot of data there.

**MR. NICK SIMODELI:** Do you have any insight into the number of direct writing companies that have a list of criteria for acceptance to their preferred underwriting criteria and use it regularly?

**MS. BAHNA-NOLAN:** I'm just going to repeat the question to make sure. The question is "Do we have a feel for on the direct writing side, the number of

companies that had published exception criteria or a list of exception criteria that they use on a regular basis?"

**MS. HART:** I think I can address that. We did ask whether exceptions were allowed within the preferred criteria and who made those exceptions. The direct companies allow the underwriters quite a bit of leeway in making exceptions, but they also include the medical directors as a control for the direct underwriter. It was a difference from 1997 where it was a long list of who made the exceptions and it seemed to be consolidated in this survey to where there were fewer allowances allowed by the direct underwriter, and that may be a result of some really bad experience that came from one particular company allowing their underwriters to make slews of exceptions in the preferred category. But it tended to be very controlled. They said they controlled the direct underwriter in connection with a medical director when they allowed those exceptions.

**MR. SWANSON:** In some of the work that I've done with clients, the exception ratio impacts mortality tremendously for companies that have six, seven, eight percent exceptions. Exception meaning a class that should have been classified into a better class. Five or six percent is not too bad, but for companies that have 15 to 20, in some cases 25 percent exceptions, the mortality actually goes up about 30 percent. For companies who think they're helping their agents out by granting exceptions, you're helping your agents out, but you're not helping your mortality out.

**MS. HART:** That's a good point. In some of the audits that I've done recently on direct companies, we see exceptions. There's not good documentation of what they are; often they're very agent-driven.

**MR. SWANSON:** I want to say one more thing on that topic, just a pitch for the final report when it comes out. In the survey, one question was asked that said "Please describe the three most common exceptions from published requirements." You'll see that in the published result, so watch for that and also yes/no questions are written, internal guidelines used to determine when exceptions are made and are exceptions allowed based on underwriting judgment.

**MS. CRYSTAL HAMBURG:** I noticed that 87 percent of the reinsurers use some type of mortality improvement, but only 25 percent of the direct company. In the reinsurance session yesterday, they talked about more and more first dollar quarter share. Do you think there's any connection between that and the illustration regulation and the need to be more competitive? I'd like your opinion on that.

**MR. SWANSON:** Yes, I think you're right. I think it's a combination of illustration reg and being able to lock in your mortality experience, making it not related contingent event any more but an accounting item basically.

**MS. BAHNA-NOLAN:** I know that there has been discussion regarding the illustration reg and the assumptions that companies are using and if they can use reinsurance, does that mean because essentially you are incorporating mortality improvement into that assumption if you're using reinsurance as a cash flow item? But, at least to this point, I don't think that companies have done anything differently regarding that.

**MR. ROB SELL:** I'm curious as far as tobacco usage is concerned. Are most companies throwing people into a tobacco underwriting class if there's any cotinine that shows up in the urine? I'm also kind of curious. Some of your charts address the issue of whether any tobacco usage is allowed in your best preferred class, and I'm taking that to mean then that there's going to be quite a bit of latitude about where you land as far as other category classes based on these facts.

**MR. BERGSTROM:** It was kind of difficult to put all the information onto a slide so we chose to pick only the best class, but the answer to your question is for those companies, for example, whom had four classes of non-tobacco, there was quite a bit of latitude as to what was considered at least in the worst class would be considered for tobacco usage. In fact, some companies said we actually allowed some cigarette smoking in not a preferred class, but in a non-tobacco class. The difficulty in actually policing that, though, is how do you know when somebody has quit smoking three years ago, five years ago, never smoked? You can ask the question, but what's the efficacy of the answer?

**MR. DAVID CARLISLE:** A couple of times during the presentation we talked about responses or answers that seemed out of the norm, which seems surprising, and I'm just wondering, from a survey standpoint, did you circle back and ask, did we ask that question appropriately, or maybe the respondent didn't quite understand the question and could that have led to some of those responses?

**MS. BAHNA-NOLAN:** That's part of what we're still doing with the data analysis right now. We did go back and identify areas that seemed a little out of the norm or different than what we would have expected to see. We did have the Society go back to the respondents and verify answers, make sure they understood the questions. We did take some companies out that responded, where it just was pretty clear to us that they didn't understand the way the question was asked. When we do the final report, we'll try to identify those. We just didn't have the ability to do that up here.

**MR. BERGSTROM:** In fact, I'll throw that back to Jack Luff. There were a number of questions for you to ask back to the companies, and Jack's come back to us with "No, this is the way they answered the question, this is the way they understood it," and it still doesn't make any sense to us.

**MS. BAHNA-NOLAN:** When we verified that they understood the question, that was their answer, it wasn't our job to judge whether that was reasonable or not, that was their answer.

**MR. BERGSTROM:** There was one company that said they expected 3.5 percent of the people to qualify for the best preferred class. What did that mean? There was a company with a four-class system that 69 percent was going to qualify for their worst class. What does that mean?

**MR. SWANSON:** We saw some of the same anomalies on the reinsurance side and it was the same procedure. Jack, to protect the anonymity of the respondents, he went back and asked, "Did you really mean this?" There was one case where someone actually transposed some percentages. That's not reflected, and it won't be reflected in the written report, but by far most of the apparent anomalies were verified.

**MS. HART:** The same thing occurred in the underwriting criteria. There were some anomalies that we also saw and Jack validated the answers and in the final survey made specific comments. This happened particularly when it seemed to be an odd answer. We included the specific comments from the company that responded so there would be some explanation to some of the odd numbers.

**MR. JACK LUFF:** I would say that on about half of the ones that you asked me to go back to had some changes that should be incorporated.

**MR. CRAIG TOPHAM:** On the used for preferred risk class slides, first of all, I was curious that 100 percent asked about internal cancer but only 1 percent automatically precluded it.

**MS. HART:** Are you on personal history or family?

**MR. TOPHAM:** Personal history. For the other internal cancer, I was curious about that one respondent. Most of those are percentages, but there were only 40 respondents as I recall.

**MS. HART:** 100 percent used it, but only 1 percent precluded it.

**MR. TOPHAM:** I was curious about the 1 percent, since I think he said there were 40.

**MR. SWANSON:** Don't get technical on us.

**MS. HART:** I had an actuary that checked all the numbers.

**MR. SWANSON:** It might have been rounded up because otherwise you say zero and it wasn't zero.

**MR. TOPHAM:** If one used it, one out of 40 would be at least 2 percent. I guess I'm curious also on the full report, does it go into anything about other factors? You only automatically included what you looked for with other internal cancer. Is it other internal cancer plus, does that make sense with this?

**MS. HART:** I'm not sure that we asked that question. I think the question asked was with respect to other internal cancers did they use it? Did we get more detail regarding that?

**MR. TOPHAM:** What are they looking for when they ask for other internal cancer? I used to work on some supplemental cancer insurance at a prior company and I guess I know there are certain types of cancer that might be really important than other cancer.

**MS. HART:** If there were, we would probably ask them differently, looking back at some of the confusion in the way they were answered. Particularly because there was so much data to respond to, but if there was a specific comment the company made, it would be included in the final.

**MS. BAHNA-NOLAN:** The way the question was actually asked was a list of criteria. It listed melanoma, other skin cancer, and then other internal cancer, so that's how it was listed.

**MR. TOPHAM:** Other cancer.

**MS. HART:** Yes, it didn't give detail into what type. Although there was a question we specifically asked about breast cancer and prostate cancer and lung cancer and the difference between male and female and whether that would be a preclusion for one or the other in a preferred class and that is detailed.

**MR. BERGSTROM:** That was a family history question. Mary, are we actually going to publish the survey questions when we publish the results? Have we talked about that?

**MS. BAHNA-NOLAN:** We haven't gotten that far. Yes, it wouldn't hurt to do that, so people could see exactly how the questions were asked.

**MS. HART:** I didn't list all these that I probably should mention in the basic preferred underwriting criteria that we ask the companies to respond to. I said the majority included a paramed and a blood profile. We asked things like oral fluid, dried blood spot sampling (DBS), urine, electrocardiogram (EKG), motor vehicle records (MVR), teleunderwriting, a personal history interview, and then we also had blanks for what other testing is used. It's just too much data for us to present here. So it's a lot of information that will really be useful. It's overwhelming.

**MS. BAHNA-NOLAN:** That's why it's taking us a while to analyze it all.

Chart 1

## Current Risk Class Structure

<u>Structure</u>	<u>Percentage of Responses</u>
➤ 2NT, 1T	12%
➤ 3NT, 1T	14
➤ 4NT, 1T	4
➤ 2NT, 2T	4
➤ 3NT, 2T	43
➤ 4NT, 2T	16
➤ 5+NT, 2T	2
➤ 4NT, 3T	2
➤ 5+NT, 3T	2
Total respondents	49

Chart 2

## Risk Class Comparison to Previous Surveys

# Classes	1995 (51)	1997 (61)	2002 (49)
2 NT	51%	77%	16%
3 NT	36	16	57
4+ NT	6	7	26

Prevalent Structure	2 NT, 1TB	2 NT, 1TB	3NT, 2TB
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Chart 3

## Tobacco Cessation Requirements for Best Preferred Class

Definition for No Tobacco Usage

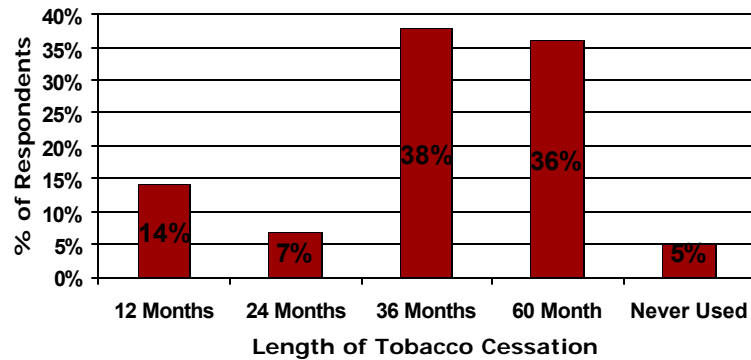


Chart 4

## Expected To Qualify

### NT Class

Risk Class	High	Low	Median
Best	65%	4%	33%
Class 2	50	3	26
Class 3	85	12	33
Class 4	69	9	20

Chart 5

### Expected Mortality Assumption for Male, Issue Age 45, Best NT Class

% of 1975-80	Dur. 1	Dur. 3	Dur. 6	Dur. 10
< 20	7%	11%	9%	7%
20-24	30	25	20	18
25-29	27	27	32	27
30-34	25	27	30	25
35-39	5	2	5	16
40+	7	7	5	7
Low	5	5	5	5
High	47	49	47	47
Mean	27	27	28	29
Median	28	27	28	30

Total Respondents: 44

Chart 6

### Range of Expected Mortality by Class for 3 NT Class Systems

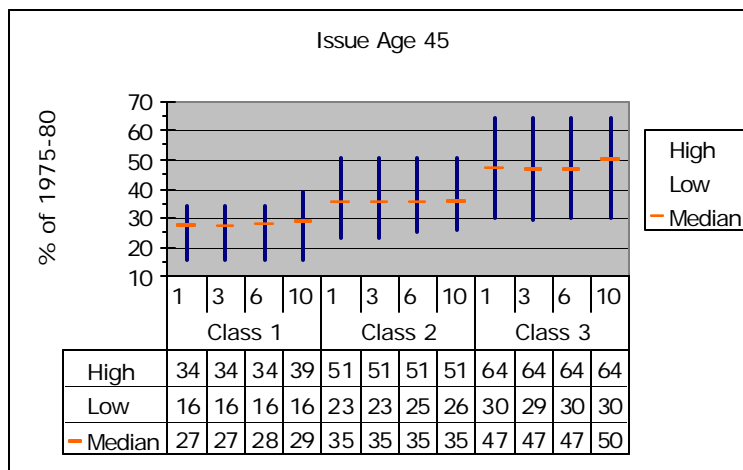


Chart 7

## Ratio of Expected Mortality for Non-tobacco Risks

Respondents with Three NT Classes  
Issue Age 45

	Class 2 to Class 1	Class 3 to Class 2
Low	1.1	1.2
High	3.2	1.5
Mean	1.3	1.4
Median	1.2	1.4
# Respondents	24	24

Chart 8

## Basis Used for Determining Expected Mortality

Mortality Basis	% of Respondents
SoA 1975-80	50%
Internally created table based on own company experience	27%
Internally created table based on industry experience	19%
Other	19%
SoA 1990-95	13%
SoA 1985-90	6%
2001 Valuation Basic Table	4%
Bragg	2%
Total Respondents	48

Chart 9

### Actual Mortality Experience v. Expected for Best Preferred Class

Experience	% of Respondents
Too early to tell	37%
Better than expected	30
About the same as expected	22
Worse than expected	7
Don't know	4
Total Respondents	27

Chart 10

### Aggregate A/E Mortality Ratios for NT Classes

% of 1975-80	Class 1	Class 2	Class 3	Class 4
0	15%	10%	5%	25%
1-19	10	10	5	13
20-29	30	5	0	0
30-39	10	24	10	0
40-49	10	20	20	13
50+	15	14	50	38
N/A	10	10	10	13

Low	0%	0%	0%	0%
High	219	247	108	78
Median	25	39	51	44
Respondents	20	21	20	8

Chart 11

## Aggregate A/E Mortality Ratios for TB Classes

% of 1975-80	Class 1	Class 2
0	15%	6%
1-25	5	0
26-50	5	13
51-75	10	19
76-100	20	13
101+	30	44
N/A	15	6
Low	0%	0%
High	153	361
Median	91	107
Respondents	20	16

Chart 12

## Methods Used to Create Preferred Classes

<u>Method</u>	<u>% of Respondents</u>
➤ Reinsurer input	91%
➤ Underwriter recommendations	43
➤ Experience from mortality studies	43
➤ Mathematical formula	39
➤ Industry experience	36
➤ Educated guess	16
➤ Other	2
➤ Results from past SoA Preferred Underwriting Surveys	2
Total Respondents:	44

Chart 13

## Variation of Mortality Improvement Factor

<u>Variation of Mortality Improvement Factor</u>	<u>Number of Respondents</u>
➤ Duration only	1
➤ Age and duration	1
➤ Age, sex and duration	1
➤ Age, sex, duration and smoking status	1
➤ Other (Reinsurer)	1
➤ Total respondents	5

Chart 14

## Used for Preferred Risk Class

<u>Criteria</u>	<u>% of Total Respondents Using</u>
Other Internal Cancer	100%
Diabetes Type I	98
Diabetes Type II	98
Heart Disease	98
Melanoma	98
Stroke	93
Hypertension	93
Treatment for Hypertension	93
History of Elevated Total Cholesterol	88
Treatment for Cholesterol	86
Mental and Nervous	66
Other Skin Cancer	65

Chart 15

## Always Preclude from Preferred Risk Class

<u>Criteria</u>	<u>% of Total Respondents Precluding</u>
Diabetes Type I	93%
Stroke	88
Diabetes Type II	88
Heart Disease	86
Melanoma	83
Hypertension	41
Mental and Nervous	34
Treatment for Hypertension	33
Treatment for Cholesterol	28
History of Elevated Total Cholesterol	24
Other Skin Cancer	24
Other Internal Cancer	1

Chart 16

## Family History - Criteria used for consideration

<u>Criteria</u>	<u>% of Total Respondents Using</u>
Heart Disease	100%
Diabetes Type I	72
Diabetes Type II	59
Cancer	49
Stroke	44

Chart 17

## Family History – Participants using Death and Diagnosis

Requirement	Death	Diagnosis	Both
Heart Disease (41)	71%	46%	17%
Diabetes Type I (20)	60	45	5
Diabetes Type II (17)	71	35	6
Cancer (28)	71	50	21
Stroke (23)	65	48	13

Chart 18

## Lifestyle

<u>Criteria</u>	<u># Respondents</u>		
	<u>Yes</u>	<u>No</u>	<u>NA</u>
➤ Alcohol abuse	45	0	1
➤ Illegal Drugs	45	0	1
➤ Hazardous occupation	40	4	2
➤ Avocations/haz. sports	43	1	2
➤ Aviation (private pilot)	43	1	2
➤ Foreign residence	32	12	2
➤ Foreign travel	33	12	1

Chart 19

## Lifestyle Preclusions

<u>Criteria</u>	<u># Respondents</u>		
	<u>Yes</u>	<u>No</u>	<u>NA</u>
➤ Alcohol abuse	35	10	1
➤ Illegal Drugs	37	8	1
➤ Hazardous occupation	31	12	3
➤ Avocations/haz. sports	28	14	3
➤ Aviation (private pilot)	43	1	2
➤ Foreign residence	24	15	7
➤ Foreign travel	15	23	8

Chart 20

## Driving Record

- Maximum number of violations which would exclude from best preferred NT class.
  - 2 violations or less - 41 of 46 companies
  - 3 violations or less – 4
  - 1 company did not answer
- Time period since violation:
  - 9 months – 1 company
  - 3 years or less – 35 companies
  - 5 years or less - 9
  - 1 Blank

Chart 21

# of Non-Tobacco Classes	All Tobacco	Cigarettes Only
4 NT	12	0
3 NT	24	0
2 NT	7	0

Chart 22

## Total Cholesterol

■ Maximum levels - Age 45

	4NT	3NT	2NT	2T
Low	200	210	230	220
High	250	260	274	280
Median	220	220	250	250

Chart 23

## Total Cholesterol/HDL-C Ratio

### Maximum level (male 45)

mg. / dl.	4NT	3NT	2NT	2T
Low	<4	4	5	4
High	5.5	6.5	6.5	6.5
Median	4.5	5.0	5.9	6.0

Chart 24

### Does a higher reading always exclude an applicant from best preferred class?

	TC		TC/HDL	
	Yes	No	Yes	No
4NT	5	6	8	3
3NT	18	7	19	6
2NT	3	3	4	3
2T	12	13	17	9

Chart 25

## Blood Pressure

# Non Tobacco Class	Treated Blood Pressure			Untreated Blood Pressure		
	Age 25	Age 45	Age 65	Age 25	Age 45	Age 65
2	150/90	150/90	150/95	140/90	140/90	140/90
3	140/90	140/90	150/90	140/85	140/85	150/90
4	140/90	140/90	150/90	140/90	140/90	140/90
Low	110/70	120/80	130/75	120/75	120/75	120/75
High	150/90	150/90	150/95	140/90	140/90	150/90

Chart 26

## Maximum Untreated Blood Pressure to Qualify for Best Preferred Risk Class

Maximum Untreated Blood Pressure	Number of Respondents (44)		
Systolic/Diastolic (mm.Hg.)	Male Age 25	Male Age 45	Male Age 65
< 130/85	8	5	2
130/85 to 140/89	24	24	12
Exactly 140/90	12	12	15
141/90 to 150/90	1	3	12
> 150/90	0	1	1
Other (Mixed)	1	1	1

Chart 27

## Additional Criteria

Additional Criteria	Number of Respondents
BMI	3
Exercise/Fitness	7
ADL's for elderly	1
Asthma	1
Liver function measurements	1
History of depression	1
Frailty index	1
Waist to hip ratio	1
C-reactive protein	1
Lifestyle	2

Chart 28

## Importance of Categories

- Each reinsurer was asked to allocate 100 points among 13 different categories.
- Done separately for Tobacco and Nontobacco risks.

Category of Preferred Criteria	Non-Tobacco	Tobacco
Personal medical history		
Family history		
Time since last used tobacco (for non-tobacco only)		N/A
How often/how much use tobacco (for tobacco only)	N/A	
Foreign residence/travel/citizenship		
Occupation, aviation, avocation		
Alcohol and drug use		
Felonies, bankruptcies, credit reports		
Driving record (moving violations and DUI)		
Blood lipids		
Other blood work (PSA, liver enzymes)		
Blood pressure		
Build		
Fitness/exercise		
	100	100

Layout of table in survey

Chart 29

## Importance of Categories: Results for Nontobacco

Category	Total Points	% of Grand Total
Blood lipids	230	16%
Blood pressure	224	16%
Build	189	13%
Family history	161	11%
Time since last tobacco used	132	9%
Driving record	112	8%
Personal medical history	110	8%
Occupation, aviation, avocation	98	7%
Alcohol & drug use	54	4%
Other blood work	46	3%
Foreign residence/travel/citizenship	27	2%
Felonies, bankruptcies, credit reports	12	1%
Fitness/exercise	5	0%
Grand Total points	1400	

Chart 30

## Other Criteria

- **Other criteria suggested by reinsurers, but not commonly used by direct companies**
  - Various lab tests: LDL, timed vital capacity, CRP, homocystine, serum albumin
  - Other criteria:
    - ADLs for older insureds -- mentioned four times
    - Hospitalization, loss of spouse for older insureds
    - BMI, exercise
    - credit history

Chart 31

## Sample Preferred Criteria: Example

### Underwriting Guideline 2, Superpreferred

- No tobacco 3 years
- Chol < 220; Chol/HDL ratio < 5.0
- BP < 135/85
- No parent/sibling CAD, CAN, diabetes death prior to age 60
- No DUI past 5 years; < 3 moving violations past 5 years
- Other criteria, e.g., personal Hx, aviation, avocation, build, foreign travel, etc.

Chart 32

## Underwriting Guideline 2: Qualification rates

Class	Median Qualification Rate
SPNT	35%
PNT	29%
SNT	34%

- **A wide range of opinion:**
  - SPNT rate ranged from 25% to 61% (second highest was 42%)
  - PNT rate ranged from 17% to 45%
  - SNT rate from 22% to 50%

Chart 33

## Underwriting Guideline 2: Expected mortality

Class	Range of Expected Mortality
SPNT	25-27%
PNT	33-36%
SNT	45-48%

- 7 reinsurers reported a level % of 75-80
- 6 reported a non-level percentage

Chart 34

## How do reinsurers arrive at their mortality assumptions for preferred classes?

**15 responded and could check as many as applied.**

- Based on internal UW recommendations 14
- Experience from mortality studies 14
- Mathematical formulas 12
- Educated guess 9
- Client assumptions 7
- Industry experience 5
- Other responses included "proprietary system" and "X factor relationships".

Chart 35

## How do reinsurers arrive at their mortality assumptions for preferred classes, compared to direct companies?

	Reinsurer	Direct
Based on internal UW recommendations	93%	43%
Experience from mortality studies	93%	39%
Mathematical formulas	80%	36%
Educated guess	60%	14%
Client assumptions	47%	NA
Reinsurer input	NA	91%
Industry experience	33%	16%

Chart 36

## Use future mortality improvement?

There were 15 responses.

- Yes 13 (87%)
- No 2 (13%)
- According to March 2003 report of the Mortality Improvement Survey Committee, only 25% of direct companies reported using future mortality improvement!

Chart 37

## Factors by which future mortality improvement varies

13 responded and could check as many as applied.

- Duration 9 (69%) (18% direct)
- Sex 8 (62%) (19% direct)
- Age 5 (38%) (31% direct)
- Smoking status 3 (23%) (13% direct)
- In both reinsurer and direct company surveys, this question was answered only by companies using future mortality improvement.

Chart 38

## Tools used to evaluate client mortality experience

15 responded; forced rank.

- **Reinsurer's internal information**
- Quality of client's underwriting (virtually tied with reinsurer internal information)
- Client provided data
- Client's handling of exceptions
- Audits

Each option did have at least one respondent answer that it was the most important and that it was the least important.