

RECORD, Volume 23, No. 3*

Washington Annual Meeting

October 26–29, 1997

Session 142OF

Committee on Life Insurance Research Update

Track: SOA Research/International

Key words: Research

Moderator: ROBERT J. JOHANSEN

Panelists: FAYE ALBERT

KLAUS O. SHIGLEY

IRWIN T. VANDERHOOF

Summary: This session is an open meeting of the SOA Committee on Life Insurance Research. The status of key existing research projects is reviewed and suggestions for new projects are discussed.

Mr. Robert J. Johansen: I thought it might be useful for me to tell you how the committee works. The committee decides on projects which can come to the committee from many sources. Some of the projects are dreamed up by the members of the committee, some come to us from sections or other committees, and some come to us from members of the Society. The committee may set up a project oversight group (POG) which decides what has to be done. It will then write a request for a proposal. The existence of a request for proposal is made known to people who are thought to be interested, and when we have several proposals and we have reached the deadline for submission, the POG decides on which proposal to accept.

Sometimes the project may use a task force. For example, we now have a Task Force on Mortality Guarantees in Variable Products which was set up rather quickly a couple of years ago when the various state insurance departments, Connecticut in particular, was making their own rules as to how one should reserve for these minimum guaranteed death benefits. We had to proceed quickly, so we just set up a task force and started on our way. Sometimes we will work with another committee in cosponsoring a project. Cosponsoring means we and the other committee provide funds.

We have three members of our committee as panelists. There's Faye Albert who is vice chair person, Klaus Shigley, and Irwin Vanderhoof who used to be chairman of the committee and has, fortunately for all of us, decided to remain on the committee.

One of the projects that has subsequently been transferred to the experience studies areas that will, from now on, be an experience studies project, was a project to develop the Generally Recognized Expense Table (GRET). It was originally done for 1997, and a new one has been produced for 1998 which has been submitted to the NAIC. It's for use in connection with the NAIC Life Insurance Illustration Model Regulation and the Standard of Practice of the Academy. Tim Harris, who was running the GRET project, had hoped to get a lot of data from the 250 companies that he wrote to, but unfortunately, he didn't get the detailed data he needed to analyze what was going on with this expense table. So he produced the 1998 table in the same way as the 1997 table, and there were some differences in the factors. Unfortunately we were not able to explain them.

The second project that was completed was a study of mortality rates as they are affected by the lapse rates experienced by a particular company. When I was being educated as an actuarial student, it was a given that if a company had high lapse rates, its mortality got worse and worse every year until finally I suppose everybody died off or lapsed. But now the thought is that as people lapsed, you were losing your better risks and your poorer risk was staying on until the very end. So the study was done by Faye Albert and John M. Bragg Associates, Inc. It was a little different from what we had always expected.

Ms. Faye Albert: First of all, I want to tell you that if you want to see copies of this total report, it's on the Society's Web site.

I have the advantage of having the report in front of me. Differences between select-and-ultimate mortality are generally explained first because of aging, and second because antiselection is expected to occur as some policyholders allow their policies to lapse. The unexpected result that we came up with, the punch line for this whole report, is that although companies that suffer poor persistency, also suffer poor mortality, this appears to be concentrated in the earlier duration, and, as the policies approach their ultimate period in the later durations, the mortality converges between both groups.

So let me explain how we did our study. First, the data were taken from Jack Bragg's database, and this is a fairly extensive database. This is business issued on the smoker and nonsmokers' basis, and the companies were grouped. We had 11 companies in our study. That was all that we had for 15 durations consecutively so

that we could study the lapses or we could isolate the lapse's duration by duration. We segregated them into low-lapse, medium-lapse and high-lapse companies. There are fairly evenly distributed at about \$1.3 trillion in exposures, which is fairly substantial amount of data.

The lapse experience was directly available, and the companies were assigned to one of the three categories: low, medium, and high. We were able to isolate companies into categories of lapse that appear to be different. The first duration lapse rates, as you would expect, were higher than the subsequent duration lapses. We compared the results, which we had using Bragg's data to what we were able to determine from this. We created an algorithm to try to check on the reasonableness of our results.

So, the meat of our report lies in the actual-to-expected mortality. We did the actual-to-expected based on the 1991 Bragg tables, which Jack has been doing directly from the data. We compared it to the 1975–80 select basic tables and the 1975–80 ultimate basic tables. Remember that this is all smokers, nonsmoker's data and that's the reason why we didn't have much information at the ultimate durations and we didn't really concentrate on analyzing that. There wasn't enough to really look at. The results are consistent among the three basic tables. The Bragg table comparison, shows that, in the first duration and in the second duration, we have lower mortality for the low-lapse companies, and sort of a surprising result, that the middle lapse companies have lower mortality than the lowest lapse companies. In addition the high-lapse companies have the highest mortality. So this is by duration. You have to keep in mind that this is all ages combined. As you go through durations one, two, three, 6–10 and 11–15, the mortality for all the different lapse categories merges. I think that the graphical description shows it fairly dramatically.

We couldn't figure out why the middle-lapse companies had lower mortality than the low-lapse companies, so we investigated what the average-sized policies were. We found that the middle-lapse companies had a higher average size. We theorized that perhaps those companies had a little bit better underwriting or they had a higher socioeconomic class so that, for some reason, not directly related to the lapses, the mortality would be better.

Because our results were so counter intuitive, when we sent our results to our oversight group members, they all thought we must have done something wrong. They thought we should go back and check the results, and at it and maybe do a regression analysis. We don't show the individual company information because that's confidential information. We did a regression analysis and obtained a ratio of the later to the earlier duration—the actual-to-expected ratios compared to the

lapses. For durations up through ten, all of our companies were included in the study. For durations 11–15, some of our experience ran out and we excluded some companies. We didn't have enough deaths to make it seem credible so we kicked those companies out. We have them segregated for durations six through ten versus one through five for all 11 companies in the study. As far as the R-squared is concerned, I couldn't have planned it better. It doesn't look like there's any relationship between the ratio of the mortality by duration to the lapses. For the companies where we did have longer duration data, the R-squares are 26, 12 and 22, so there might be some connection, but it's not a strong connection. This corroborates the belief that high lapse rates go along with overall poor mortality, but it is the result of poor early duration mortality. It doesn't look like it really is because of anything that's happening at the later durations.

Mr. John M. Bragg: There's an awful lot of thinking about why it would be this way. To repeat the finding, the mortality is worse if the lapses are worse. That has been everyone's general belief for years, so it is true. The corollary belief that it would continue to be bad in the high durations, is not true. It's in the early durations that the mortality is higher. So the explanation appears to be that every company has a mix of business by socioeconomic group, from poor to good socioeconomic groups, and it's well known that mortality differs by socioeconomic groups. It appears that the lower socioeconomic segment is lapsing in early durations, and so you are left finally with the better socioeconomic group. These are the people that can afford the premiums, want the coverage and they are generally a stable kind of a group of people. They're the ones you end up having in your high durations. Now of course your lower socioeconomic people, many of them actually die before they lapse, and so that is what is bringing on your high early duration mortality. So is that a pretty good summary of what we put in the paper?

Ms. Albert: I would say so. I would say that the idea that everybody always had that as coverage stays in effect longer and longer, people that are substandard or get conditions that would make them think that they might be dying pretty soon, would keep their coverage in force. We don't know what those people are thinking of.

From the Floor: My question concerns the mix of business in the mortality study. Did this include both permanent and term business?

Ms. Albert: Yes.

From the Floor: Was any analysis done to try to separate out term mortality from permanent mortality?

Ms. Albert: Very little of this is in an annual renewable term. Mostly, it's longer level-premium terms. The data do not include information specifically about the plans although we could surmise that based upon our knowledge of the participating companies. We could perhaps do an additional study based on a company by company mix, but that still would not be by plan.

From the Floor: There is a belief in my company that long-term insurance has a higher mortality rate for much the same reasons that are a common belief in the industry and are borne out in the early durations. If anyone has further comment, I'd be interested.

Mr. Bragg: I think the paper says, and we believe, that the data bank is probably about 60% term. We point out that the word *term* is very blurred these days. What does it mean? There is such a thing as universal life term. It is very low, yet they would call it permanent. We believe that the very large majority of it would be a level premium term, the five-year term, ten year terms. We do know quite a lot about the issue patterns of all the companies. So there's a lot of terms in there that are mostly level premiums. We are unable to identify an annual renewable term(ART). Hasn't much of the thinking in the industry been based on annually renewable term? There's some in there all right, but we don't know how much. All we could do is study the overall results. It is very high term but it's not ART in particular.

Incidentally, another question that always comes up is what about the reentry term phenomenon? Did that bring on lapses? How did it get treated upon reentry? Was it a lapse or whatever? The answer to that is that the reentry term phenomenon didn't really start up until 1988 or 1987. Do you think that's right, Irv or Tom?

Mr. Johansen: I thought it was earlier than that, perhaps in the 1970s.

Mr. Bragg: Anyway, it was long before our 15 durations. None of our terminations would have been the result of reentry term just because of the fact that the phenomenon itself didn't develop until late.

From the Floor: I have a follow-up question on the level premium term. I could understand being a larger percentage of business in the early durations, but wouldn't the later durations contain significant amount of ART and the ultimate?

Mr. Bragg: You think it might become more ART later possibly. Well, that's possible. My belief, based on knowing the companies involved, I don't think they really were issuing all that much ART. They're big on five-year terms and ten-year

terms. In any case, might it get more proportionately higher but we couldn't separate it. All we know is what the results are.

Mr. Irwin T. Vanderhoof: I think this study should be reviewed in the light of the fact it's the only one that has ever been done on this subject. The arguments against doing this sort of a study are that the federal government will come in on antitrust charges and put everybody involved in jail. This was done so that there are no direct company involvements. The Society could have done it, but it didn't. Now this is the only study that has been done. What we have on one side is how, people who are healthy should be the ones who are terminating; therefore, we're going to assume that's true. However there is literally no evidence that is taking place. I'm sure sometimes it takes place, and I'm sure in some blocks of business it takes place, but the only evidence we have is it actually is not important. The first select table was probably done in 1898, is that right? The same belief has been held on ever since then. It's 100 years, and it seems like it is not universally true at least.

Mr. Klaus O. Shigley: If you controlled for the large amount policies, would you get the conclusion that everybody thinks they should have. If you restricted the sample to let's say high amount, high economic class policies, would you then get the results that we anticipate? You implied that it was the mix of business that polluted the results from the intuitive result.

Ms. Albert: Much of it has to do with the fact that if you have large amount issues, many of those are high persistency or low persistency policyholders; they are people that allow their coverages to lapse. This is done by lapse category. If somebody buys a million dollar policy, I don't think they're going to let it lapse.

Mr. Bragg: We simply could not segregate companies that were strictly high amount, but even then, I would say that they would have a socioeconomic mix among their high averages. Faye and I eventually became pretty comfortable with the theory that the better socioeconomic people can keep their policies and can pay for them and all that. That's the bunch you end up with, and it's good business.

Ms. Albert: There is one other thing that I wanted to mention that I didn't make too clear before. Although we didn't have this segregated by age category, if you look at the overall results by duration, it doesn't look like there's a very convincing argument for having a long select-and-ultimate period.

From the Floor: That would be an entirely different study that could be made to try to figure out what select period is really appropriate.

Mr. Johansen: This study is available on the Web, and I would like to see a lot of discussion on it. Perhaps some of those discussions might give us some leads as to follow up studies that might be made.

We have another completed study that was cosponsored with Life Insurance Marketing and Research Association (LIMRA). It's another study of lapse rates, but it is of annuities. I think the study is available through the Society or through LIMRA. If you're into deferred individual annuities, I think you might be interested.

Let's discuss ongoing projects now. Irwin Vanderhoof will tell us about a study brought to us by a little insect.

Mr. Vanderhoof: This is a study of Lyme disease. You might wonder why our research committee is talking about Lyme disease? Originally this committee was a committee on research and covered all sorts of topics.

Mr. Johansen: I hope it still is.

Mr. Vanderhoof: Yes, but now this committee is more focused on life insurance, there are some projects that were sort of left over from the old days. This may be the longest running research project we have. There is a specific reason for my interest in the Lyme disease, my daughter has it, and she started the Lyme Disease Foundation in Hartford. My grandson died of it, so that's the reason I'm interested.

The argument for being part of the SOA research program is that it could demonstrate that actuaries can do something besides calculate, costs and premiums. This study has been based on a questionnaire. The questionnaire was designed by a group of physicians who work with the Lyme Disease Foundation. Its four pages long, and it goes into treatment protocol, symptoms and all the rest of it.

Now I promised Bob that this particular project was going to end. I lied for an interesting reason. I have presented pieces of this study at scientific conferences on Lyme disease, primarily medical conferences. I've recently found out that Smith, Klein and French and Kant are interested in funding a continuation of the study. What has proceeded from this so far in the way of publication is one article in *The Wall Street Journal* and an article on Lyme Disease in a 1991 *Contingencies*. Copies of that article were distributed at a recent meeting of the Centers for Disease Control (CDC) in Washington. The time may have come for this project. There's going to be an article on the symptoms of Lyme disease in the *Journal of Spirochetal Tick-borne Diseases*, and then there are going to be a series of several other articles that Smith, Klein and French are interested in helping me get published. Now let talk a little bit about this study because it's interesting. It's interesting because I

think it's the kind of thing that actuaries will do. I start off not knowing anything much about the methodology used in the medical profession. I start only with a questionnaire, and we can look at what we have. I have a total of 1,000 questionnaires of whom 771 people have been diagnosed with Lyme disease. This actually constitutes the largest database. I put it on Paradox. Its largest database of this sort around because it takes a certain amount of money and a lot of time and effort to just contribute it and code it and put it on the computer. There are three interesting things about it. The majority of Lyme disease patients are female. Nobody is sure why, but women do seem to be more severely impaired by Lyme disease.

Lyme disease is transmitted by ticks. It is very rarely transmitted by other kinds of vectors. It's almost always transmitted by one of two or three species of ticks. There is apparently a large variance of the Lyme disease spirochete and there are photographs that show the Lyme disease spirochete actually going into a white blood cell. It kills the white blood cell and comes out coated with material from the white blood cell so that the immune system will think it's still a white blood cell. It can apparently cloak itself with this material.

Among our 771 cases we know 208 were reported to the CDC and 203 are not reported. We don't know if the other 360 were reported. As far as we can tell, the figures from the CDC reflect about 10% of the actual total number of cases. The CDC now agrees with those findings. Originally they thought they were under reported by only a factor of three or four. Now they'll accept that the cases are under reported by ten times. Many people remember getting a bite, some of them remember getting a rash.

Two hundred and eight had positive blood tests, the key thing for a physician. 104 had only negative blood tests. Unfortunately, the tests aren't any good because 382 had both positive and negative tests. When the physicians are relying upon the blood test rather than the clinical manifestations, it's easy to say, "The blood test came back negative, you don't have it, go home." There is almost an obscene tendency for physicians to say, "It's a woman; she's complaining about all sorts of things, let's give her some Librium or something like that because the blood test said no." There are a lot of very sick women who are being dismissed by physicians. In addition, it took an average of five physician visits before a diagnosis of Lyme disease was made.

They said "We don't know what's the matter. We'll give you some pain killers, and maybe it will go away." It took average of five physicians and 21 months before these cases were diagnosed.

The disease is an interesting one. About half the people have a rash, and the rash is diagnostic. If you have the rash, you have Lyme disease, and you don't need a blood test. If you were treated within a period of a month or two of being bitten, the spirochetes are still in the blood stream. In that case, the antibiotics work, and you can forget about it and go back out and play in the woods again. If you allow it to go for a long period of time, the disease might not be curable. My daughter has had it for 11 years now, and she goes back for periodic treatments of antibiotics. Now her legs swell up, she'll get antibiotics intravenously for three months, the legs go down, and everything's fine. Then she'll go on for another year, and it will recur again. It may not be curable; it's not clear. It's clear, however, that symptom-free months till diagnosis is 8.6. So the people who have responded to this questionnaire, who had the disease and are now symptoms free, took eight months to get a diagnosis. The overall average was 21 months. The ones who were not diagnosed for longer periods don't get better.

You hear many urban legends or medical legends. One medical legend is that it's a different disease in different parts of the country. Let's discuss the symptoms broken down into systems. General symptoms not relating to specific systems include things like profound exhaustion, recurrent sweats and fever, and unusual weight changes. The frequency can run from one to five and the severity can run from one to five. If the product is more than nine, you got something that's more than occasional and it's more than just a little troubling. The percentage of the 771 cases that have a reading in this category more than nine means it's more than a little troubling. The percentage that are more than 15 have debilitating symptoms that occur fairly frequently, or these people have things that aren't quite so bad but occur all the time.

We have a profile of symptoms for different systems of the body. We also have the percentage where the symptoms occur in each of these general categories. In the neurological summary, we see 83 patients with some kind of severe neurological problems. It's not just causing a problem of the joints or rheumatism.

From the Floor: What do I multiply to get the information?

Mr. Vanderhoof: Patients fill in two things. They fill in something for each of these symptoms. First, they are asked, how often does the symptom occur?

From the Floor: The frequency.

Mr. Vanderhoof: Frequency can be: one, it never happens; two, it happens rarely; three, it happens occasionally; four, it happens frequently; five, it's persistent. Then you have the severity. One means it doesn't bother me at all; three means it's

troubling; five means it's absolutely debilitating. You multiply the two of those together and that gives you an intensity number. If the product is more than nine that might mean you had something that was totally disabling, but it recurred rarely. You should mention that to your doctor. If it's more than 15, you're going to mention it to your doctor whether you should or not because it is ruining your life.

When I have a profile, I can compare it with different situations. I can compare it with subgroups. Is this profile of symptoms different from the group that has positive tests or the group that had negative tests?

From the Floor: Is this your methodology or is this a common methodology?

Mr. Vanderhoof: It's mine.

From the Floor: What kind of feedback have you received?

Mr. Vanderhoof: The CDC said it was clever; they hadn't seen it before. This is something any actuary would have thought of. Any of you would probably end up with something similar because we actuaries like to play with numbers, that's what we do.

From the Floor: Incidence and severity are common measures.

Mr. Vanderhoof: I bought a book, it cost me \$125 on the statistical methodology used in medicine. I remembered my freshman course in statistics 50 years ago was on the same level. There's a lot we can contribute to this, and not just in terms of the money. Look at the numbers, look at the symptoms, see what they mean, and start putting it together. I'm not doing anything that you couldn't do.

From the Floor: Are you still collecting data?

Mr. Vanderhoof: We stopped about three years ago, but we're going to start up again. Smith, Klein kind of want to support a continuation so they're going to fund the data collection. We do have some follow up data to allow us to distinguish this from chronic fatigue syndrome.

Mr. Bragg: I wonder why it is so predominantly female?

Mr. Vanderhoof: It could be that it's simply prejudice. There's a suspicion on my part that there is some kind of an autoimmune element to this because women are more subject to all the autoimmune diseases. I think it's just because they have a more active immune system.

From the Floor: We have many cases of Lyme disease where I live. Women have more exposure to it because they do more gardening and spend more time in the yard. We aren't necessarily getting it from going in the woods.

Mr. Vanderhoof: Actually the worst place to get it is not in the deep woods. You can get it there, but the worst place is right on the edge of your lawn. That's where the ticks like it. I have looked at the bad cases. I wonder if doctors are telling women to take three pills, go home, and stop complaining?

From the Floor: Is this adults and children?

Mr. Vanderhoof: This is primarily adults. There's one case that claims the total medical expenses were \$2 million and that was on a child. I used to say that was impossible but I can no longer say that. My grandson approached a million dollars before he died. In these cases, the biggest thing is getting treated fast.

Let's discuss the number of systems involved, by state. The percentage of people in my over-nine criteria who report cardiac symptoms, is pretty much the same in New Jersey, New York and, California. California looks a little bit different there, but mostly the states show the same patterns. From a point of view of symptomology, it's the same disease. I thought it would be fun to look at the diagnosing specialties. Does it make a difference in what kind of a doctor you go to for diagnosis? Not much. The same symptoms are being reported by people who are diagnosed by different specialists.

What are the total costs for the patient? The total cost includes the salary lost, medical expenses, and other expenses. I also have the average number of doctors and the average diagnosis months. The total cost is \$67,000 for these bad cases. For a light case, that's treated within a month, the cost is \$200 for antibiotics and it goes away, you can forget about it. If it takes 21 months to get diagnosed then it's going to cost \$67,000 and you're probably not going to get over it. Note that, as I've said, the rash is diagnostic. If you have the rash, you do not need a blood test. People who have the rash had to see almost six doctors and took 23 months to be diagnosed which implies that many doctors are incompetent when looking at this disease.

After the last presentation, which included that particular observation, a number of physicians came up to me and said that they liked it very much. They believed it was important that I was not a physician, and that I was connected with a business school. These doctors said, "My HMO will not allow me to prescribe antibiotics unless the tests come back positive, and we need somebody like you to tell the HMOs that the cost of not treating or putting off treatment is much greater than the

cost of going ahead and treating properly in the early stages.” This is my original argument for the SOA being interested in this sort of thing. There is something we have to contribute, aside from our normal focus on money, in terms of what the HMOs and the medical providers should be doing to improve the efficacy of their treatments.

From the Floor: I don’t mean to trivialize, but let me just add something. My daughter felt it was for everybody and I’m sure it’s true. Dogs are forever getting bitten by ticks. Is this in veterinary circles? Is there such a thing for animals?

Mr. Vanderhoof: Oh, sure, yes. Dogs get it and dogs are often considered a sentinel for Lyme disease. If the dogs start limping around all the time, then you know they’re being bitten by infected ticks and you better be careful. There is a vaccine out for dogs, which is fairly successful. There’s a vaccine out for human beings, but there are problems with it. Biologically, the spirochete has an outer surface protein, called OSP-A. The vaccines are designed to stimulate the immune system with respect to recognition of OSP-A, but there apparently are cases where the bacteria enters a human host and sheds the OSP-A covering and puts on something else called OSP-B. The worst thing about animals, is that they will bring ticks into the house. The ticks are tiny. The tick that will infect you is about the size of a dot or a period at the end of a sentence. You may not notice it. Ticks can ride into the house on the dog’s fur and drop off and catch you. It’s not very common that dogs have it on them.

From the Floor: What areas are bad?

Mr. Vanderhoof: Connecticut, New Jersey, and Westchester are bad. They seem to like moist areas, so that’s why Wisconsin and Minnesota are bad.

Mr. Johansen: The clock is continuing to tick so I think we better move on. Some additional studies that are underway, one is actuarial modeling. If you were at Session 78 on Actuarial Modeling, you are up to date on what was produced so far and where we’re going or where we hope to be going.

Mr. Johansen: Irv, would you want to submit an article for *The Actuary* on the Lyme disease study?

Mr. Vanderhoof: I will submit another article for *The Actuary*. The first thing I have to do is get this symptom thing finished because the medical profession is suddenly very interested in this kind of quantitative information. As soon as I finish that, I’ll do an article for *The Actuary*.

Mr. Johansen: We have another project on gender-based mortality. The objective is to find out whether women actually live longer than men, if everything else is equal. So far, we have had a problem in getting someone to chair the POG so we're looking for a volunteer to take over that study to see whether it can be done. My own opinion is that it's probably not possible to make sure that the factors for men and women for such a study are exactly equal. I think there are just too many things in there, but we have to follow the motto of the Society and investigate. So if anyone wants to be a chair of the POG or knows someone who might be willing to be the chair, we'd be very happy to hear from him or her.

We have been consulting with the Mexican Actuarial Society. A couple of years ago, because of the North American Free Trade Agreement (NAFTA), Sam Gutterman thought the SOA should get involved with the Mexican Actuarial Society. Actuaries from the U.S. who are properly qualified can practice in Mexico, and properly qualified actuaries from Mexico can practice in the U.S. or Canada. Of course Canadian actuaries can certainly practice in the other countries. We have been working with them, and we reviewed some of the work that they had done for their own social security system, and they have asked us for assistance in helping them design an intercompany study of Mexican life insurance mortality along the lines of our own experience studies.

We have a study underway of variable annuity mortality experience during the deferred period. This study is needed to test the 1994 minimum guarantee death benefit (MGDB) mortality table, and instructions have been mailed to the companies. So far, I know of one company that is contributing. We have a total of 17 companies. We are involved as a cosponsor of a symposium to study mortality improvement and its effects on social security in Canada, Mexico, and the U.S. A symposium is going to be held after this meeting so we'll see what happens there.

I'm also proposing that the committee authorize me to go forward to organize a symposium on the nonmortality factors that are used in our U.S. Social Security forecast. You recall what Robert Reich talked about Monday morning. I have some of those factors here for 1995, 1996, and 1997. These are factors used in the Social Security lowcost, intermediate, and high-cost estimates. When you looked at those figures for gross domestic products up until the year 2075, you have to raise questions. So I would like to have a symposium of economists and perhaps some actuaries who are in the field to study these various factors that are used. Perhaps they can come up with some critiques and recommendations.

We have some other projects here. The symposium is phase two that's being presented tomorrow, and phase three would be a study using stochastic variations in mortality rates to see what happens on that kind of a basis. One of our problems

has been our budget limitations because we're fully committed out to the end of 1998 and our research budget has been cut. If the Society has y dollars and then everything has to fit into the y dollars. Another idea that came up in a previous meetings, was to organize an international symposium on the shape of the mortality curve around age 100 and beyond. They're trying to establish some very solid mortality rates at ages more than 100. The 1989–91 U.S. decennial life tables go up to age 109, and they're based on Medicare data. We know people live beyond age 109, but the problem lies in getting accurate data.

So there are some articles on tracing mortality at ages more than 100. The British data system for population is very extensive and is believed to be very accurate. A couple of British actuaries have used the system of extinction of generations, using all the deaths up to age 110, and they to built a population going backwards. Then they need to analyze those data. It is believed that there is fairly accurate data in the Scandinavian countries, and there was an old article on the French mortality at very high ages. We're going to try to write to a number of people. We have a number of people who are interested, such as the actuaries of U.S. and Canadian Social Security systems, and an expert at National Center for Health Statistics.

Another project which we have not discussed as a committee, and I think maybe we should go ahead with it is the 1980 CSO table. It is outdated. It is also inconvenient because it stops at age 99. It's inconvenient for a number of reasons. If you read the discussion of how the 1980 CSO table was produced, you'll notice that essentially the high ages (over 65) were essentially a simple mathematical formula. It was a cubic curve from the early sixties up until age 99. So it would seem that what we do is extend the table to, perhaps age 120 or 125, and regrade it from the early 60s. What we're doing is extending it. We still keep the same CSO table. The tests that were made by the people who designed the 1980 CSO table, essentially looked at differences in reserves for policies issued below age 65. At the time, companies did not generally issue policies at ages over 65 except, in cases of group conversions. We're in a different era now. There's a lot of interest in second-to-die policies and policies to be issued at high ages to cover estate taxes, so I think we have good reason to extend the 1980 CSO table. It may be that we can do something that will not markedly change reserves for policies issued at ages 55 and under. That's just my guess. It will not be easy to regrade it because of the shape of the curve. I think that's a project or something to be taken care of by the people who do it.

Several years I did sort of a preliminary study to see whether or not it could be regraded. I actually did some regrading and there were problems with what developed as a bump in the table because the table goes up like this and then if you want to extend it out, you have a bump. So the problem is how to handle that, but I

think it's worthwhile and I would like some comments on it and perhaps some volunteers to get to work on it.

Mr. Vanderhoof: It occurs to me that it would be neat if the industry funded this because the industry would be a beneficiary. The nice way to do it would be for the foundation to solicit the funding and not tell the people at the Society, who are doing the work, who in fact provided the funding or who provided most of it or something like that.

Mr. Johansen: That would be a good idea.

Mr. Vanderhoof: So it would be totally clean from the argument that it was being controlled by the companies.

Mr. Johansen: In fact, I think the group that produced the 1980 CSO table was an industry committee.

Mr. Vanderhoof: I don't think that goes so well anymore. There's so much reaction against the industry doing anything directly, and the Foundation could cleanse the money, before it comes to us.

Mr. Johansen: Yes. That might be a good idea. I think that if there's a project in which a group will be benefited, it should pay the bill. I'm inclined to agree with that. Jack, you were going to say something?

Mr. Bragg: I believe it would be better to do this, but to do it on a new block of recent data and create a brand new CSO table based on very recent data. It sounds to me like you're proposing to modify that very ancient data that went into the existing CSO tables. Bragg Associates are in this mortality study game, so we have offered, some time ago, to provide our data block to be added to Society's data block, cutting out the duplicates. They did it for durations five and up. They totally eliminated the early durations. We have offered to do that, and we have written letters saying we'd be interested in plotting our data. The offer still is on the boards. Nobody has ever done anything about it. My main message is I think it should be based on recent data.

Mr. Johansen: I think there are problems with coming up with a new table. One is should a new set of valuation tables vary by preferred risk and by term or whatever. It would require quite a bit of doing to get people to agree on what set of tables should be used and what data should go into them. I also think that there is a certain fondness among companies for the 1980 CSO. I've talked to a few nonscientific group of people and they would like to keep the 1980 CSO. They

would also like to see it extended beyond age 99. I would be very happy to accede to their wishes. I can see that they like the old, familiar tables.

Mr. Bragg: There are a lot of reasons why they want to keep the old table that don't have to deal with this mortality issue.

Mr. Johansen: That might very well be true.

From the Floor: Coming out with a modified table that goes to age 120 affects all those cash values. Many of them wouldn't like the change, but it should be possible to come to grips with how it should be, presumably sticking with the four class, male/female, and smoker/nonsmoker tables.

Mr. Johansen: Yes, right. We have to split them four ways—male, female, smoker, nonsmoker—and then we have to combine the males and females in various proportions. So I'm not sure that you'd be ahead, but I would like the full committee, to discuss this. As a matter of fact, I did not mention this when I was talking about the symposium to study the nonmortality factors in the Social Security Administration forecast, but we also need to get some funding for that. As I said, we're fully committed to 1998 and we may have a bit of a problem.

Ms. Albert: The 1941 CSO tables seemed to be so old that we finally came up with the 1980 CSO tables. I mean what was the process that we went through in order to be able to accomplish that when some people may have been fond of the 1941 CSO tables?

Mr. Johansen: It was not easy. Charlie Sternhill came up with an X-17 table, and somebody else came up with a variation on that. There was a lot of discussion about going to a modern table because you would not have all of these margins, and the 1941 table had done very well for so many years. I think the regulators were not very happy about having a new table. So there was a lot of discussion and it took a lot of years before it happened.

Ms. Albert: Was there any precipitating circumstance?

Mr. Bragg: It was a practical matter. They had some problems with deficiency reserves. They wanted the new table because of their balance sheet.

Ms. Albert: So what can we do now?

Mr. Johansen: Some companies were told, "If you have a deficiency reserve problem, then you can use this experimental table," and that was perfectly fine with

the insurance commissioners. I think companies that are trying to sell insurance to the senior market are running into deficiency reserves at the older ages. I think that the project, in that sort of format, would get quite a bit of support, but we also need financial support. Are there any other comments on that idea?

Mr. Philip J. T. Cernance: I'm here as part of the Product Development Section Council. I'm kind of new to the process so tell me if this is the wrong committee to hear all these. With the industry's proliferation of underwriting categories, what does we do with all this? How do we normalize for the proliferation of categories out there? The CSO age limit problem extends into the older issue ages, particularly with regard to estate transfer, where second-to-die or multiple life products are being issued. How do we get to a point where we actually have information that we can use for valuation purposes or underwriting and pricing purposes? An issue that is kind of related to a valuation table, and which impacts pricing is, whither do we go with GRET? You indicated earlier some dissatisfaction with the 1998 table. That has been transferred over to the experience studies group so I'm not sure if this is the wrong audience. As we have tended to look at valuation tables, there has been some provision for expense variation in all of that. So that whole GRET issue and expense analysis is something that we wanted to see put out on the table for discussion.

Another areas pertaining to the older ages and product issue is impaired life annuities. I mean we certainly have the judiciary endorsed structured settlement market. We have some companies out there experimenting with substandard immediate annuities in more of a general arena right now. There's no relief from a valuation perspective with regard to any grade up in age or something like that. What light can we shed on that with some real experience that's out there?

Mr. Johansen: My feeling on impaired life annuity is that nothing improves your health like having a nice annuity payment coming in every month. Old annuitants never die.

From the Floor: They just collect their checks.

Ms. Albert: One of the things that our committee has had problems doing is specifying what kind of research would be appropriate. If the sections can help identify that, it would be very useful to this committee. That could give more direction to how to go about doing it. Bob referred to the expense study there isn't much that you can study if you don't get the information, and the companies have been less forthcoming with that. It's expensive and for a lot of reasons, it's difficult to deal with it.

Mr. Cernanec: This is more of a personal opinion rather than section opinion. I think we have a constituency in the section that is actually pretty broad-based. It would love to have the information. I'm not sure that we have found ways to muster the grass roots support that's out there. Through our section newsletter we can say we need the information and advise our members on how to support our need. Typically, in many companies, the folks that are being asked for the experience information are different than the folks that are doing the product pricing. I offer to at least take that message there, but we kind of need someone to lead and say "OK, here's the study; make sure your company participates." Our product folks are probably not the greatest in formatting the information needed for the experience study. We're great at applying the data that's out there, but we don't have that natural interest and the format for the information.

Ms. Albert: The information is the foundation, and it's maybe not the most glamorous part of it but if you think about the expense study, you would think that everybody would have been pretty well aware of how important it was.

From the Floor: I'm not looking for a debate, but if the study is coming and the request for information is going out, the folks who are doing the product work may not even be aware that the request has come into the company.

Ms. Esther H. Milnes: Let me talk a little bit about what the Society is doing on that. I'm outgoing chair of the Experience Studies Oversight Subcommittee and incoming vice president for the life practice area. I think the experience studies oversight subcommittee was formed two years ago because experience studies have been getting a little attention in the Society from a management perspective. How we can manage those studies and get better participation? The problems that you're talking about, specifically not getting to the right people in the companies, are very difficult. I know in the case of the GRET study, that request went to somebody that has nothing to do with expenses. It sat there for a month-and-a-half and it didn't reach the right person in our company.

The Experience Studies Oversight Subcommittee has built better relationships with the company so that we can get the data and send it to the right people in the companies. We decided that the best way to manage that is in the Society office with a regular full-time contact person. We have hired a person to work full-time contacting companies, building relationships. This person is supposed to be a higher level contact person who can help them navigate the companies to find the right people for the specific studies. You might have somebody on mortality, and somebody else on disability income. You might have somebody else on group life experience, an overall contact person and multiple contact persons in the larger companies who are contributing. They're going to keep up with them. They're

going to be contacting them on a regular, every six-month basis. They will say "Here are the multiple studies that we believe are going to come your way in the next year. Here's where things stand with these various studies; Here's what we think is coming down" We're going to start doing a lot more to build those relationships and get the data. I hope that's effective. We're not going to see that work instantaneously. It's going to take time to build those contacts and try to improve that situation. I do think it will work.

The other thing that the life practice area is going to be doing this year is establishing better ties and coordination among the sections, the life practice area committees, and the Academy. All of these areas need research. They all have research and experience study interests, and there's not good communication right now amongst all these different groups that have interests and the groups that are supposed to be actually trying to get things accomplished.

Mr. Johansen: We traditionally have tried to get people as members of our research committee who are also members of the sections. So I want to have members here from the Smaller Insurance Company Section because smaller companies have different problems. Norma Christopher pointed out to me that if we have our annual meeting in February, smaller company actuaries would be too busy to come to a meeting. I would like either a member or a liaison from the product development area, and the financial reporting, and I tried to get somebody from the Academy life committee. I will continue to pursue that so we maintain our liaison with the Academy. We have this task force on mortality guarantees in variable products. So we have excellent liaison with the Academy because there is an Academy group working on minimum guarantee death benefits in variable products. Oddly enough, the same people are on both the work group and the Society task force, so we have excellent liaison.

Mr. Vanderhoof: Within the past two days, I've heard five different calls for a method of modifying mortality tables that are using something other than experience data. One is in connection with the Social Security System. Arnold Dicke is concerned about it in terms of mortality tables for people with genetic disabilities. I heard about it today in terms of smoker/nonsmoker/healthy, lifestyle/nonhealthy lifestyle. I heard about it in terms of impaired life mortality and annuities. I think you talked about a modification of CSO after age 99. We don't have a catalog or a method to modify mortality tables to include this sort of data. Product development should be willing to put up money to help us on that, and I'm sure they will. I'm sure some of the other sections would do so.

Mr. Johansen: Regarding the expense issue, I think one of the problems was companies did not want to release sensitive, confidential data to the researcher.

Maybe that's why we should call on John Avery and his Center for Medical Actuarial Studies to acquire the data and to analyze it without it being known to anyone in the industry. So that's one solution.

From the Floor: The Life Insurance Marketing and Research Association (LIMRA) has actually made a proposal to the SOA to do the annuity and life persistency studies on an ongoing basis so that sits again with the experience studies committee. Second, there is a project, within the finance area, to look at behavioral aspects of lapse. That should also be an interesting topic.

Mr. Johansen: Zain Mohey-Deen is the hard working staff actuary for our committee. Norma Christopher is our new member of our committee.

Mr. Allan Brender: I think you might be aware that in Canada we have many universities with actuarial programs. The faculty members in these programs are people who do research for a living. So one of the things we decided to do with respect to mortality studies is to pull all these experience studies in the universities. The profession, the Canadian Institute of Actuaries, has committees for the various studies that basically are responsible for getting the data and then looking at the results. The annual mortality data goes directly to the universities doing the studies, most often the University of Waterloo. The interesting thing is that the universities keep the data. What's happened is that they have been using it to periodically update the CIA tables, without being asked to do so. They have been doing it just because they have had the data and are interested in it, perhaps in classifying it and looking at special problems. There's a lot to be said for seeding this kind of activity in one or two academic places. You do have to worry about confidentiality of the data. On the other hand, you want to let researchers use the data since they can get a lot more out of it than can committees that only periodically decide they would like to carry out more detailed studies.

There is one other topic I want to raise. The Canadian approach to valuation is very much based on gross premium type valuation methodology. We are also getting more and more into scenario testing and cash-flow work. In this work, the one assumption about which we don't know very much is lapse. Our results are incredibly sensitive to the lapse assumption. Lapse experience varies by company, by product, by the way you sell it, and so on. One thing that I do know is that a proper margin for adverse deviations in lapse rates varies all over the place. For the same policy, it can be positive or negative, depending on the duration. The effect of changing lapse assumptions is really quite variable and not understood at all. For valuation, perhaps we should get away from looking at what happens for individual policies and see what happens on portfolios. Perhaps we can only treat lapses

properly through stochastic valuation methods. I think a great deal of research has to be done on this issue, but so far no one has started to look at the problems.