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SELECTION OF DEMOGRAPHIC ASSUMPTIONS

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Panelists: STEPHEN C. GOSS
MARILYN MILLER OLIVER
Recorder: JOSEPH A. APPLEBAUM

The first of the minimum funding seminar sessions will focus on the "forgotten assumptions" of pension valuation: rates of termination, retirement, disability and mortality. This session will be broken into small groups to ensure lively discussions. Audience participation is essential. The Society of Actuaries Pension Section Council's research project on rates of termination will be discussed, as well as the new mortality tables, but the focus will be on how to select various rates of decrement. Participants are encouraged to bring copies of sample turnover rates, identified by size and type of client.

MR. JOSEPH A. APPLEBAUM: My remarks reflect my own views and not necessarily those of my employer.

MS. MARILYN MILLER OLIVER: The first area that we're going to talk about is withdrawal rates. There are two approaches that are commonly used to establish withdrawal rates for a particular client: deriving a table based on the plan's experience and using standard tables that best fit the plan's experience. As far as I'm aware, the only standard tables that are available to the profession as a whole are the Sarason tables, which were derived back in the 1950s. The Retirement Plans Experience Committee is currently conducting a project to develop new tables. There also has been some research done by Roger Vaughn with Booke & Company in this area.

How many of you use standard tables for withdrawal that were derived by your firm?

FROM THE FLOOR: Wyatt.

FROM THE FLOOR: Hewitt.

FROM THE FLOOR: Towers Perrin does, too.

FROM THE FLOOR: A study was done a few years ago in Ontario. Three papers were published and are widely used in Ontario. They're called Ontario Heavy, Ontario Medium, and Ontario Light. I don't have the numbers here, but they are very widely used in Canada.

FROM THE FLOOR: We have experience tables for some of our larger clients, and consultants will apply them as they see fit, for instance to clients in a similar type of business.

MS. OLIVER: Roger Vaughn at Booke & Company did a study based on 1987-89 experience that can be found in the August 1992 *Pension Forum*. He studied the withdrawal experience in the manufacturing, hospital, and financial industries on a three-year select and ultimate basis, leaving out the experience for the first year to allow for a one-year pension coverage requirement. His first observation was that the ultimate were

concave upward, unlike the T5 and T9 Sarason tables that he was using for comparison, which were concave downward.

FROM THE FLOOR: We used multipliers of the T tables during the select period. I found that multipliers of the ultimate table were a good predictor when I got above 200 lives because of sensitivity to duration. I also found that my New York City clients had a much higher turnover than the rest of the country, certainly the West and the Midwest.

MS. OLIVER: Roger Vaughn's hypothesis was that the shape of the ultimate withdrawal rate curve by age is consistent. Thus the plan's ultimate experience can be used to derive a fixed multiplier to apply to a standard set of ultimate withdrawal rates to produce the ultimate withdrawal rates for a particular case.

He found that by industry (banks versus hospitals) there was very little difference in the shape of the ultimate withdrawal rate curve. He also checked by time period—the late 1970s versus late 1980s—and found very little difference. This was interesting because his experience was from the southeast U.S., where the economic climate was much less favorable in the later 1970s than in the late 1980s.

Steve and I talked quite a bit about the impact of different types of economies and withdrawal rates. Would you like to expand?

MR. STEPHEN C. GOSS: Yes. We don't have a lot of experience with withdrawals at the Social Security Administration. It's hard to withdraw; you must either emigrate out of the U.S. and in that sense, withdrawals are reflected in our population projections, or you must become employed at one of the state or local governments that is not participating in Social Security.

The primary consideration I have in working with a very large plan that is influenced mainly by factors affecting the general population, like many of you who work on large public plans, relates to all the assumptions that we're talking about. This consideration is the basis upon which we develop the assumptions, especially for those of you who are developing your assumptions based on plan experience. We have found over the years at Social Security that an understanding of the circumstances that have contributed toward the experience that we actually measure, in particular past periods, is critical in determining whether the past experience is likely to be replicated in the future. Will those circumstances of those past periods be replicated in the future? Will they be different? If they're different, what implications does that have in terms of the future experience relative to the past?

I have one question in the area of withdrawal. Do you find that business conditions, expansions, and contractions in the economy have any influence on withdrawal rates? It would seem that in times when there might be an expansion in the economy, two factors might affect withdrawal rates. There might be more voluntary terminations in an expansion because people are more able to start moving to jobs with other employers, and there might be less involuntary termination from layoffs or downsizing. Now, I don't know to what extent you deal with plans in which you actually do have involuntary terminations and if that is reflected in your withdrawal assumptions. Has anyone noticed fluctuations that appear to be based on the economic cycles, and have you made adjustments to assumptions on this basis?

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FROM THE FLOOR: In the California Public Employees' Retirement System, we found a big drop in the withdrawal rates over a four-year recession.

MR. GOSS: Yes, then there is evidence that economic cycles affect withdrawal. Does anyone base withdrawal assumptions on past experience with adjustments on the fact that conditions over the measurement period were different from what is expected in the future? Or does anyone make adjustments to standard tables to reflect anticipated periods of unusual activity, such as layoffs or economic upswings or downswings? If not, this may be something that is worth thinking about.

FROM THE FLOOR: I have two comments. First, you get some movement in my medium-sized plan experience, but the pattern is fairly consistent. In other words, layoffs, in most places, are seniority driven. Short service and young age are out the door.

MR. GOSS: Maybe prior to vesting. So it's not a big issue anyway.

FROM THE FLOOR: In good times there's still a pattern, you'll get some random variations. Still you get the same kind of pattern. The person who will turn over the most in good times is still the younger person with short service. I'm not saying the levels will be the same as what gain and losses were reflecting, but the pattern seems to be the same. Now, again, my experience is New York City regions for the most part, so I may be very bound by my own experience.

MR. GOSS: In other words, maybe there is some sort of offsetting the good times versus the bad times, the voluntary-versus-involuntary layoff. Does it tend to be more consistent than one might have otherwise expected?

FROM THE FLOOR: I'm not so sure about the level. Most Americans think that New Yorkers are different than the rest of the country. People who don't come from the New York area may not see the same patterns. There may be unique things about our job market.

MS. OLIVER: I have just a few comments, and then we'll move on to disability. Roger Vaughn's study was based on a relatively small amount of experience. His results will be further explored in the current SOA study.

Looking at withdrawal rate experience in general, select tables and ultimate tables mirror actual experience more closely than do age-based tables. In some cases, use of select-and-ultimate rather than age-specific rates impact contribution levels significantly. Another approach used by some actuaries is to weight by accrued benefits.

I've also noticed in looking at the results of experience studies for public employer plans that turnover rates for women have been decreasing over the years and at some ages are the same as or less than those of men.

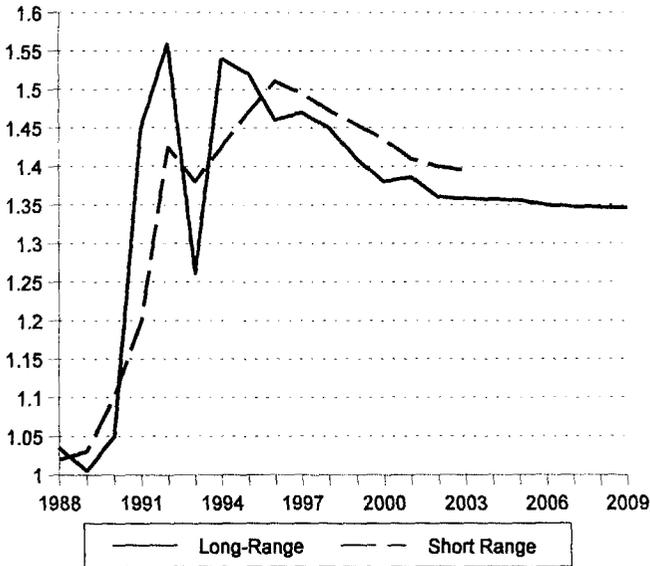
FROM THE FLOOR: I've seen it a few times, using rates strictly by duration, not by age. Most commonly it is by age, but a few very large plans will use duration. I am aware of some.

FROM THE FLOOR: We certainly have at least one client in which select rates are mostly based on service, and I think our analysis is a much greater factor than age. Perhaps there's a combination as you get older, but if you look at people in year one—you can look at ages—you would see very high rates all across. That's something that we don't historically see.

MR. GOSS: I'd like to share some information about the disability insurance (DI) program administered by the U.S. Social Security Administration (SSA). Some of the trends in recent experience have been interesting. I would be interested in any feedback you might provide about what you've been seeing. The LTD people I've been talking to have certainly indicated that they've been seeing increases in their incidence rates lately, and that's consistent with what we've seen at Social Security.

For example, Charts 1 and 2 show the rates of an incidence of disability experienced under the Social Security DI program in recent years. We at Social Security make both long-range and short-range projections, and because of differences in the definition of exposure and timing of an incidence, calculated incidence rates can be slightly different for time periods. But since 1988, you can see that the incidence rates have risen dramatically, more than 50% above where they had been previously. Increases in incidence rates have been somewhat greater at younger ages and for women than they have been for men. The other observation about increases in incidence rates is that they seem to have been fairly heavily driven by mental impairments.

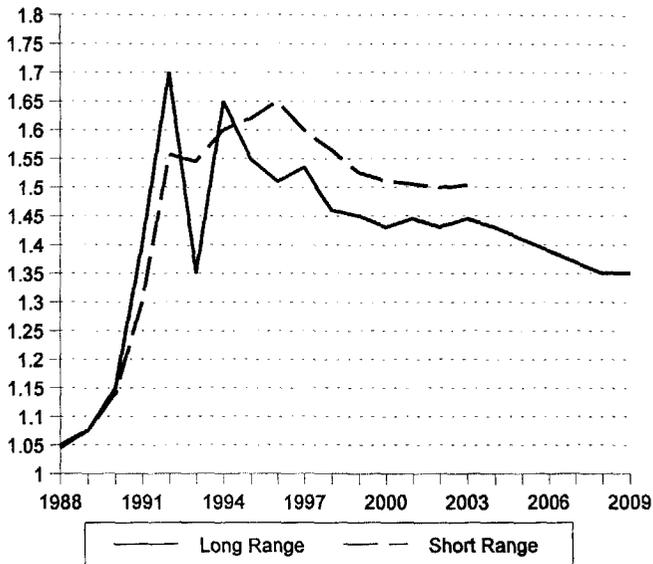
CHART 1
SSA DISABILITY INCIDENCE FACTORS FOR MALES
BASE PERIOD 1984-86*



*Projections based on the 1994 Trustees Report alternative II assumptions.

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CHART 2
SSA DISABILITY INCIDENCE FACTORS FOR FEMALES
BASE PERIOD 1984-86*



*Projections based on the 1994 Trustees Report alternative II assumptions.

FROM THE FLOOR: Did politicians change the definition of disability during that time frame, or is this based on a consistent definition? When I say politicians, I include the courts.

MR. GOSS: The definition of disability for Social Security has been based on the total inability to work for at least 12 months or until death. From time to time, though, the precise interpretation of regulations governing the interpretation of the definition can differ somewhat.

FROM THE FLOOR: Doesn't it also differ by state? Don't you crack down on certain states, periodically, and get some implementation problems?

MR. GOSS: Yes, the Social Security Administration constantly monitors the states that actually perform the initial disability determinations. In a case in which a state may be making inappropriate determinations too often, the administration may provide guidance, and in an extreme case it may take over the determination process on a temporary basis. The administration does keep an eye on the states and tries to keep them fairly consistent.

FROM THE FLOOR: But anybody who believes 50 American states can be kept consistent must have had something strange for lunch. Wasn't there some kind of case that made you jiggle your interpretation, during that rising period, and during the recession?

During the time you went from 105 to 155 in the short range, which I believe was 1988–93, didn't a court case cause you to change your interpretation?

MR. GOSS: In terms of the DI program, a court decision in the 1980s had the effect of increasing the number of disability allowances based on mental impairments. Do you recall the timing of that decision, Bruce?

MR. BRUCE D. SCHOBEL: Yes, a New York City Supreme Court case relating to the mental impairment listings was decided in about 1987. That would cause some of that rising incidence.

MR. GOSS: Yes, this increase in allowances based on mental impairment criteria had some effect, but it was not the primary factor contributing to the 50% increase in incidence rates. Also, in the late 1980s, the government started an "outreach" program to identify individuals eligible for benefits under the supplemental Social Security Income (SSI) program. It appears that a large part of the increase in DI applications was associated with this effort.

FROM THE FLOOR: But at least with respect to the mental impairments that you've identified as a factor, a standard used to be applied to the mentally impaired that was really more strict, I guess you'd say, than what was applied to the physically impaired. The pendulum probably has swung back in the other direction, and the mentally impaired have an advantage.

MR. GOSS: There's a lot of discussion about the whole disability adjudication process now at Social Security and in other forums, such as a special commission under the National Academy of Social Insurance. Based on this study, there will be some recommendations for changes in the future. But it's really in the discussion stage at this time. Our expectations are that there will be some retrenchment and some reduction in levels of recent incidence rates to lower rates in the future.

FROM THE FLOOR: Was there any problem there, too, with the cities encouraging their welfare recipients to apply for Social Security disability?

MR. SCHOBEL: They're actually required by law. It's not a question of encouraging. To apply for welfare benefits in the U.S., you have to apply for any and all public benefits for which you might be eligible.

MR. GOSS: Anybody who applies for supplemental Social Security income, the national program that provides "welfare" or means-tested benefits for disabled and elderly persons, automatically applies for any eligible Social Security benefits.

FROM THE FLOOR: I recollect that during this time frame the city of New York made a major push. It happened after that court decision that you talked about. The way you get the underclass to apply is to say that, if you don't apply, the people's welfare will be cut off. That's the message. I believe that's part of the increase. I don't know what the spill back was for the rest of the country.

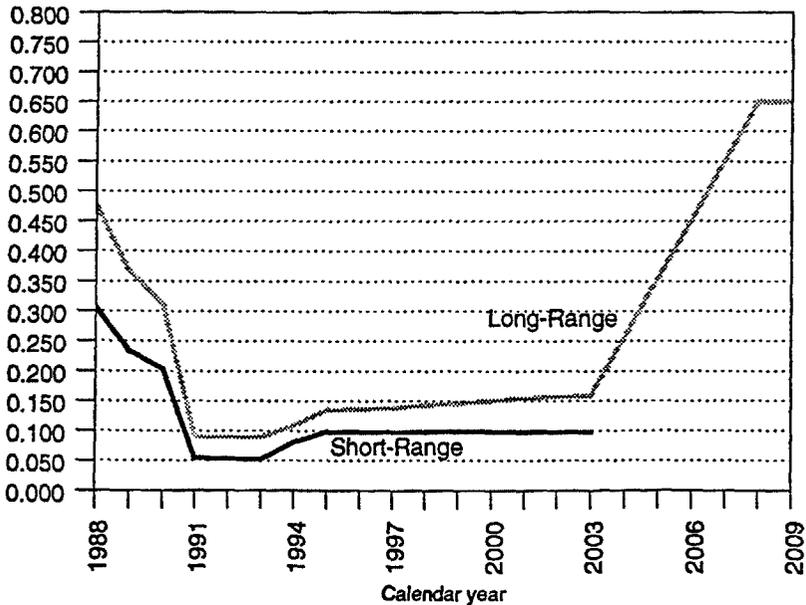
MR. SCHOBEL: We were talking about the DI program here. Much of the welfare population is not eligible.

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MR. GOSS: That is right; Charts 1 and 2 relate to data for the DI program only. Now, another factor that has really contributed to the increase in the number of people on the DI rolls is the recovery rates that we've experienced. Recovery rates in Charts 3 and 4 are on a 1977-80 level-equals-100 basis and it is age-adjusted. You can see what our recoveries have done over time. Our recoveries have dropped to extremely low levels. A big part of the reason for this is that, although the law requires the administration to perform what we refer to as continuing disability reviews (CDRs) every three years for nonpermanent cases, there unfortunately has not been adequate funding to provide these CDRs. They haven't all been done, and, therefore, we aren't capturing all the potential recoveries. In our longer-range projections we do project that eventually there will be funding. We project that recoveries will move back up to higher levels. We have our 1994 projections going back up to 65% of the level experienced in the base period 1977-80. We've changed that assumption for the 1995 report. It's only projected to go up to 50% of the 1977-80 level. We are going to have to keep an eye on our experience to see if the funds become available eventually to be able to make this happen.

MR. GOSS: No. Federal budgets.

**CHART 3
SSA DISABILITY RECOVERY FACTORS FOR MALES
BASE PERIOD 1977-80***



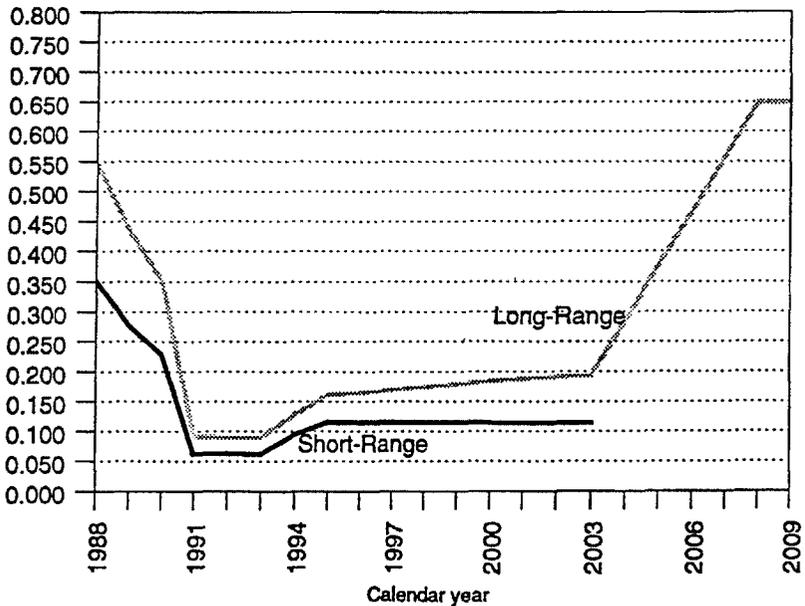
*Projections based on the 1994 Trustees Report alternative II assumptions.

MR. SCHOBEL: It is very interesting to note that in the base period, 1977-80, there were no required CDRs, yet the recovery rate was much higher than it had been during the period in which they were required.

MR. GOSS: Well, requiring CDRs is one thing. Providing the funds to actually perform the CDRs is another.

FROM THE FLOOR: Is that because the funds for these reviews comes out of state budgets?

CHART 4
SSA DISABILITY RECOVERY FACTORS FOR MALES
BASE PERIOD 1977-80*



*Projections based on 1994 Trustees Report alternative II assumptions.

FROM THE FLOOR: Do they come from the general revenue budget or from the DI trust fund?

MR. GOSS: The DI trust fund. But the money must be allocated in the budget.

FROM THE FLOOR: Could the economy have had anything to do with the drop in the recovery rates?

MR. GOSS: The last recession was around 1990-91, and that had some influence. But, by the time we get to 1993-94, we're at essentially full employment. We technically recovered from any problems we were having with the economy at that time. However, as we are all aware, the pace of change in our economy has accelerated, and retraining is necessary on a more frequent basis than in the past. Many of those who do not get this retraining drop out of the labor force as "discouraged workers" and then do not contribute to the unemployment rate. These workers may, however, become disability beneficiaries and may be less likely to recover than in the past.

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TABLE 1
SUMMARY OF DI UNDER AGE 65
WORKER AGE-ADJUSTED PREVALENCE, INCIDENCE, AND TERM*

Year	1/1 Prevalence Rate			Incidence Rate			Death Rate			Recovery Rate			Total Dth. & Rec. Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1970	18.75	13.79	16.79	4.69	3.27	4.13									
1971	19.69	14.42	17.61	5.16	3.61	4.54									
1972	21.47	15.54	19.00	5.84	4.23	5.20									
1973	22.32	16.46	20.40	6.29	4.65	5.47									
1974	23.32	18.46	22.61	7.25	5.33	6.81									
1975	27.38	20.53	24.72	7.11	5.28	6.39									
1976	27.81	21.09	26.09	6.78	5.13	6.13									
1977	28.41	21.73	26.09	6.78	5.13	6.13									
1978	31.18	23.08	29.58	7.56	5.90	7.23									
1979	33.15	24.78	29.85	5.07	3.47	4.33									
1980	32.70	24.07	29.30	4.66	3.14	4.18									
1981	32.66	24.04	29.30	4.66	3.14	4.18									
1982	31.09	22.20	27.56	3.77	2.53	3.20									
1983	28.53	20.09	25.20	4.12	2.63	3.53									
1984	28.08	19.12	24.54	4.32	2.90	3.76									
1985	28.03	18.84	24.40	4.56	3.07	3.96									
1986	28.41	18.84	24.63	4.58	3.07	3.98									
1987	28.90	19.05	25.01	4.62	3.03	3.93									
1988	29.13	19.16	25.19	4.62	3.12	4.02									
1989	29.14	19.15	25.20	4.52	3.28	4.02	50.17	37.10	46.63	8.25	7.37	7.96	58.50	46.65	56.59
1990	29.29	19.32	25.36	5.20	3.40	4.57	51.65	37.61	47.10	5.44	4.72	5.23	57.11	43.34	52.82
1991	29.74	19.81	25.82	5.87	4.28	5.24	56.87	41.57	51.91	1.68	1.27	1.55	58.77	44.57	53.92
1992	30.73	20.71	28.19	6.96	5.11	6.23	56.78	40.10	51.37	1.68	1.27	1.55	58.77	44.57	53.92
1993	31.07	20.85	28.46	6.96	5.11	6.23	56.78	40.10	51.37	1.68	1.27	1.55	58.77	44.57	53.92
1994	33.89	23.53	29.80	5.67	4.38	5.24	53.48	37.95	49.79	1.71	1.30	1.58	57.18	39.25	51.79
1995	34.71	24.62	30.93	6.59	4.95	5.94	56.83	38.03	50.73	2.20	2.00	2.14	59.03	40.03	52.87
1996	35.04	25.03	31.09	6.03	4.47	5.41	59.71	38.13	50.68	2.17	1.98	2.11	58.88	40.11	52.79
1997	34.78	24.79	31.84	6.06	4.68	5.42	57.46	38.85	51.42	2.22	2.14	2.22	59.79	40.99	53.69
1998	34.78	24.79	31.84	6.06	4.68	5.42	57.46	38.85	51.42	2.22	2.14	2.22	59.79	40.99	53.69
1999	38.53	28.43	34.54	6.02	4.48	5.41	57.57	39.41	51.68	2.39	2.21	2.33	59.93	41.30	53.91
2000	39.38	29.08	35.25	5.89	4.44	5.44	57.26	39.45	51.49	2.46	2.28	2.40	59.73	41.74	53.89
2001	39.69	29.35	35.62	5.96	4.44	5.44	57.26	39.45	51.49	2.46	2.28	2.40	59.73	41.74	53.89
2002	40.24	29.97	36.18	5.90	4.41	5.31	57.06	39.28	51.39	2.45	2.27	2.39	59.51	41.85	53.78
2003	40.54	30.21	36.46	5.92	4.45	5.33	56.21	39.20	50.82	2.51	2.34	2.49	59.29	42.10	53.85
2004	40.98	30.55	36.87	5.90	4.44	5.33	56.21	39.20	50.82	2.51	2.34	2.49	59.29	42.10	53.85
2005	41.42	30.91	37.27	5.99	4.45	5.36	56.31	39.19	50.82	2.51	2.34	2.49	59.29	42.10	53.85
2006	41.80	31.46	38.01	6.07	4.51	5.39	55.30	38.19	48.43	3.66	3.13	3.48	57.76	41.90	52.62
2007	42.95	31.61	38.01	6.15	4.31	5.42	52.75	37.74	47.88	5.77	4.48	5.35	58.51	42.90	53.92
2008	42.34	32.13	38.51	6.24	4.28	5.46	51.85	37.09	47.06	6.85	5.12	6.29	58.71	42.51	53.56
2009	42.56	32.36	38.53	6.34	4.23	5.51	51.21	36.58	46.47	7.96	5.77	7.25	59.17	42.34	53.71
2010	42.67	32.46	38.64	6.34	4.25	5.51	50.96	36.37	46.22	7.96	5.71	7.23	58.92	42.08	53.46

*Rates per 1,000 insured, exposed, or in current pay; rates also adjusted to the January 1, 1980 under-65

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FROM THE FLOOR: Is the 1994 value an actual, or is that a projection?

MR. GOSS: The 1994 data are actual. Table 1 provides an analysis of disability rates under the DI program for a long time frame. We saw incidence rates over a shorter period of time before. Now you can see that the incidence rates that we have currently are not quite as high as the peak we had back in the mid-1970s.

We're projecting that the incidence rates will drop somewhat from the current level into the future. So that's the good news. The bad news is that the ultimate average level that we expect in the future will be higher than the rates for any sustained period in the past and, also, the recovery rates will be higher than current levels. But they still are at historically relatively low levels. The result is that our projected prevalence rate, that is, the proportion of the total insured population that is receiving benefits at any given time, is projected to be rising to historically high levels. You can see the prevalence going up to about the 38th percentage level. Currently, we're only at about 31%, and we have not been even as high as that in any of this historical period.

MR. SCHOBEL: Are these projections affected by the change in the normal retirement age?

MR. GOSS: That's a very good point. We're actually going to more talk about that when we get to the retirement rate assumption. The incidence rates for Social Security disability that we have been talking about being age-adjusted cover ages only up to 64. Rates at ages 60–64 are assumed to be affected by the increases in the normal retirement age from 65–67 after the turn of the century. Currently, incidence rates rise by age up to about 61, and very much level off in the years approaching age 65 because of the alternatives available to people. The primary alternative is to take the reduced retirement benefit. As Bruce was suggesting, when we get out past the year 2000, and the normal retirement age under Social Security begins to increase, we'll still retain age 62 as the earliest eligibility age for retirement, but the level of benefit will be reduced because the normal retirement age will be higher, and there will be greater actuarial reduction for early retirement at ages 62–64. We anticipate that this will result in somewhat higher incidence rates at ages 60–64 under Social Security and that we will, of course, see fewer people taking retirement at that time.

FROM THE FLOOR: Do you have a sense for whether the current rates would be linear multiples of the 1982 rates? Are we saying that maybe the 25–29 group today might be as high as 39 in the past? Would that be three times?

MR. GOSS: Well, the current prevalence rates reflect a greater increase at the younger ages than at the older ages. I don't have the age-specific values with me, but these increases could be expressed in an age-equivalent basis as you suggest. However, the number of years of change would likely not be constant across the range, so it is not clear that this approach would be useful.

FROM THE FLOOR: It might be a factor of three at the younger ages and a factor of one-and-a-half at the older?

MR. GOSS: I don't think it's that dramatic, but it's very much in that direction.

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FROM THE FLOOR: Would these changes be combined with much lower recovery rates?

MR. GOSS: That's right. Have you all in your large and medium plans been seeing similar experience, an increase in disability? Some yes; some no. Mixed results. California, no.

FROM THE FLOOR: I expected it to go up in California because of the economy, but it actually went down, possibly because of the cities being aware of the cost, or because we make the last employer pay the full cost of the disability.

MR. GOSS: That's a very interesting approach. I know that many European countries have something that looks a lot more like an unemployment insurance but it is called disability. You seem to have found a very effective way to avoid that by making the last employer pay the bill.

FROM THE FLOOR: Regarding Charts 1 and 2 and incidence, do you have a reason, or any suspicion about what caused that? Do you have some idea of why there's such a dramatic increase?

MR. GOSS: The primary factor we've been able to isolate is an increase in an incidence due to mental impairments across all ages, but primarily at younger ages. We know, however, that the SSI outreach program of the late 1980s contributed, and we suspect that this may have had the largest effect through increasing public awareness of the SSI and DI programs. In addition, the changing labor environment may be causing some workers to pursue disability benefits because their former jobs have become obsolete. Finally, surveys suggest that at least one person is working and has a qualifying impairment for every person who is currently receiving benefits. Any number of factors might contribute toward more or less of these individuals filing for benefits at different times.

FROM THE FLOOR: There are also many more applications.

MR. GOSS: Yes. The proportion of applications that have been allowed have stayed relatively constant over time. More applications have been filed, and perhaps this reflects what's going on in the economy with layoffs and the need for retraining. But remember that the definition of disability is quite strict, so people really must have significant medical impairment to qualify.

FROM THE FLOOR: I would point out that during this time frame, the younger workers have moved from being a boomer generation to a reactive generation, and there are all sorts of undesirable social entities in a reactive generation. The last time we had a reactive generation in this age group was in about 1915 and into the 1920s. Look at the upheaval we had in this country when the older generation attempted to change the younger generation's morals by prohibition. Now, there wasn't anything such as DI in that time frame. I think that all the antisocial indicators rise in a reactive generation so the taking of disability or welfare is more acceptable. Therefore, I think to some extent, when we look back as far as we have rates for the boomers, we will move from a boomer generation of idealists in the making to a reactive generation, comparable with the World War I generation, and things such as this happen. You need to move to a very tight, strict constraint if you want to do anything.

MR. GOSS: Interesting theory.

MS. OLIVER: The disability table should be based on the definition of disablement in your plan. If you have a Social Security definition, a standard table, based on Social Security experience, is appropriate. If you have inability to perform "your own job," then a different table should be used. There are not many standard tables available. One table is the long-term disability plan valuation table in the 1987 *Transactions*, which has separate results for 3-month, 6-month, and 12-month elimination periods. There is also a disability table based on the Civil Service Retirement System (CSRS) experience. In that case the definition of disablement is the ability to perform "your own job." There are also disability incidence tables from the Railroad Retirement Valuations for plans primarily covering hourly workers.

Now I'll move along to retirement rates. When we think of early retirement now, the first things that come to mind are early retirement windows. To price out a program, one must first decide on the assumed incidence rates. Generally, I try to get as much input as possible from the clients since they best know their group, and I usually have the rates reviewed by the clients. Some of the factors that influence these rates are age, proximity to eligibility for Social Security benefits, replacement ratios by age, sex, and service (both before and after the window, on the theory that it's not just the total amount of retirement income that affects the choice, but also the incremental value), whether postretirement medical is going to be offered or is offered, the job market in the area, and the probability of layoff if the window offer is not accepted.

If you're using experience-based retirement rates in the normal valuation, you will want to look at your current retirement rates.

Does anyone have other factors they consider important in setting incidence rates?

MS. OLIVER: I mean layoffs within the age group; the anticipation is that you may be personally laid off, should you not take the retirement window offering, and then have to leave with the lower benefit. I guess the other factor here is, how many windows have there already been? Who's left?

FROM THE FLOOR: Does anybody have any rules, things such as how rich the offer is? Has anybody done enough of them to see significant variations?

MR. GOSS: Somebody has to have some idea. We were talking about this recently, about the extent of how richly the offer has to be to encourage 1% or 2% of the potential people to actually take it up and leave early.

Let me just relate a little bit of the experience we've had with Social Security. As you are perhaps aware, for Social Security the average retirement age actually has been declining over time. There has been no change yet in the normal retirement age and if anything, benefits that are offered under Social Security have declined slightly, relative to the average wage, and yet the average age at which people are filing for retirement benefits has been declining considerably during the past 15-20 years. We suspect one thing that may be contributing to this is the private pension windows. Currently, for Social Security you can't begin to receive the benefits until age 62. In many cases, people have already stopped working well before that because of a private pension, and then they're ready to

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hit the ground running and take their benefits at age 62. Something in the order of 40% of eligible people do that within the Social Security system currently. I guess some of the factors are, in addition to the windows and the private pensions available, increased wealth, people's desire for leisure, and perhaps a reduced work ethic by people over time.

As you're probably aware, the Social Security system is going to have an increased normal retirement age starting in the year 2000. It's going to go up gradually from 65 to 67, and we're waiting to see what effect that may have on the age at which people actually begin to receive benefits. Increasing the normal retirement age by those two years will effectively reduce the benefits available to individuals at any given age by about 13%. So, I was hoping some of you might have a rule of thumb about what you would expect that to do to retirement rates. What we are estimating and assuming will occur is that the average age at which people will begin receiving retirement benefits will go up by a little more than half a year as a result. Raise the normal retirement age by two years, and about 30% of that will be an increase in the average age in entitlement. Or, if you want to look at it as a 13% reduction in benefits at a given age, people would defer about six months to gain back a portion of the reduction.

There is much speculation that private employers may begin to think in terms of raising retirement ages under their plans, or at least curtail the offer of early-retirement windows. We don't seem to be seeing a lot of evidence of that yet.

One other issue that's arisen in this regard has been the changing demographics of the U.S., certainly Canada, and most of the Western societies. With an increasing number of people at retirement age as we enter the next century, and fewer people of working ages, many speculate that we're going to need more workers out of those younger ages, and we may have to ask people who are older to continue working longer. That's one theory.

Of course, there's another theory that we may not need as much employment in the future because of increased productivity or perhaps because of our ability to import not only goods but also services, maybe even actuarial services. Does anybody have any sense or feel about seeing windows increasing or declining? What have employers been talking about in this regard?

FROM THE FLOOR: I work for the public sector. We do many early-retirement studies, and one thing that seemed to be covered exactly was that many employers will petition employees to respond to certain criteria ahead of time. That's a way to identify the target group very specifically. I would say it's about 10%. If the window has some sort of variance on an age/service/eligibility reduction and an increase in the service allowed based on some sort of formula, people who would benefit most by a window typically are those who somehow manage to figure out that they are the ones benefiting, and they weigh the costs in their favor. They are the ones who accept it; I would say about 10%. So, something such as two years of service for somebody with 20 years in is what it typically takes to get somebody to make a move.

MS. OLIVER: When you value these plans, presume that 20% of the group will take the window. You can seriously underestimate the cost because you are not taking into account selection by those who benefit most from the program.

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MR. GOSS: Do any of you have experience with the effect of knowledge of the window before it's actually available? In that case, do you find that, in fact, you may not be getting all the gains that you wanted because people who might normally have retired at a given time will wait? Might the window actually be counterproductive?

FROM THE FLOOR: Of course.

MR. GOSS: Lots of nods of heads.

MR. ROGER F. RAY: We've seen that with several employers. I worked on a window many years ago, and we presumed that after the window, all the survivors would stay on longer. We reduced the retirement rates for those who had chosen to stay, and that was before the second and the third round of windows. I think that some retirees have grown to expect that they will never go out unless they can go out under some kind of program. In some firms, there are enough special programs, and a normal retirement is becoming a rarity.

MR. GOSS: Sounds like an expectation of windows forever.

FROM THE FLOOR: After you've done this drill maybe three times, doesn't it become self-defeating? I don't know enough about how the costs work out, but it sounds like sort of self-defeating numbers. There are huge losses on the financial side, and then normal retirements would decrease and you would have even more losses.

MR. RAY: You do have to be careful with the losses in the retirement plan, per se, but when the employer sees the payroll savings and other benefits savings, it's almost a no-brainer. That's why employers are doing it. I have seen a renewed interest in them again during the past few months. Many employers have been talking.

FROM THE FLOOR: Do they really work? Do they really hold their body counts down afterward?

MR. RAY: That's what's more debatable, and I don't know if you can quantify it exactly. You often have to tell the sponsors that the wrong people may take it because you're offering it on a nondiscriminatory basis, and as he said, people almost uncannily, intuitively can select the most valuable benefit. They will recognize it and take it. So windows don't work perfectly for the sponsors, but still there are many advantages for sponsors.

FROM THE FLOOR: But do you believe there are permanent body count reductions in the payroll? Doesn't it creep back up?

MR. RAY: Well, that too depends on the industries. By the way, I had a medium- to large-sized client. The company did three of them in the 1980s. There has been a great deal of inactivity, and now we're halfway through the 1990s, and many sponsors, including this one, are interested again. They see advantages.

MR. GOSS: Well, isn't the real advantage a reduction in payroll maybe more than body count? If you reduce long-tenured, high-paid people, and you bring in new people, payroll gets reduced.

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MR. RAY: If I didn't make it clear, I meant that.

FROM THE FLOOR: One thing we had happen, which I haven't heard anything about yet, is that the company gave a five-year incentive, which was generous. But we received less than we expected to, and one of the reasons for that was that it hadn't given any pay raises for about three years. Just after the early-retirement incentive there was a 13% pay increase. Some people had heard about that, so they didn't take the early retirement. This was a final average pay plan.

MR. WALTER J. MCLAUGHLIN: I believe that in New York State now, when a window type of plan is offered, the state, and the localities must prove that it will be a savings before they can offer it. I don't know how well they police it. I think one thing that might have added to the early-retirement trend was downsizing. I don't believe that we mentioned that. Many middle management people were forced out. They wanted to continue working but were forced to retire.

MS. OLIVER: Also, there were technology shifts where employers would just prefer to hire a different type of employee with different skills.

MR. GOSS: That, of course, then leads to the question of, will that evolution continue in the future, or will it become even stronger? This, of course, raises further questions about the theory that there will be a greater demand for older workers in the future. Time will tell.

FROM THE FLOOR: Steve, I have a comment from my experience with New York City, when I worked for the Office of the Actuary. That office has about 45 employees, of which several had long service—35 and more years of service with the city system—and they had an inkling with the lack of raises for many employees and the tightening of the budget in New York City that something was in the works. Many of the long-service employees delayed their retirements with specific intentions of going out when they were offered the retirement incentive. Nine people retired on the incentive. Six of them had 35 and more years of service. So, I think that's strong evidence citywide that people definitely hold off their retirements until they get their retirement incentive. People are not terminating until they get the next package that employers have to give every three or four months to get the proper number of reductions in employees.

MR. GOSS: You'll similarly not be surprised to hear that at the Office of the Actuary at the SSA, we had a similar situation recently with a \$25,000 buy-out option. A number of people in our office and many elsewhere within Social Security and throughout government delayed perhaps a year, maybe even a year-and-a-half, from when they might otherwise have retired to take advantage of the window.

FROM THE FLOOR: I believe that when we were all taking exams, there was an adage somewhere in part seven. When you give people the opportunity to select against you, they will do so. They were talking about underwriting life insurance. I think it was Andy Webster's book. I think it applies in spades in the retirement plans.

MR. GOSS: We'd better move onto our last topic that we thought would take the most time, mortality.

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MS. OLIVER: What do you assume for retirement rates after the window? Some actuaries use retirement rates that are select and ultimate by year, thus lowering the probabilities of retirement temporarily.

Getting back to retirement rates in general after this rather long sojourn, it's important to value early retirement subsidies properly in your retirement rates. This may involve separate rates in cases where a substantial subsidy is payable after a certain number of years of service.

Moving on to mortality rates, two new mortality tables have recently been issued: the 1994 Group Annuity Reserving (GAR-94) and the uninsured pensioner (UP-94) tables. The GAR-94 table was developed by a special SOA Task Force chaired by Lindsay Mallkevich both the GAR-94 and the UP-94 tables have the same underlying data. It's primarily Civil Service before age 66, and starting at age 66 it's group annuity experience. The experience period was 1986-90. Both tables have been projected to 1994 based on the 1987-93 Civil Service experience.

As pension actuaries, the table that we would be interested in would be the UP-94 table for several reasons. The first is that it does not include the margins that are built into the GAR-94 table. The second is that it does not have a generational projection table built into the mortality rates. The GAR-94 table has two margins actually. One is for random fluctuations, and the other is for groups with better-than-expected mortality. There is a 5% margin designated to take care of 95% of expected random deviations for groups greater than or equal to 3,000 lives. This was not included in the UP-94 table because we felt that it might lead to systematic understatement of the mortality rates and also, in comparison to other factors that pension actuaries deal with, such as turnover, interest rates, or salary increases, it didn't seem that it was necessary to build a margin for conservatism in this one assumption. The other margin that's in the GAR-94 table is a 2% margin for groups with better-than-anticipated mortality. We felt that for pension valuations, the actuary will decide based on the demography and the mortality experience of his particular group what's appropriate in the way of a mortality table. Though we did not include Scale AA, the generational projection scale in the actual UP-94 rates, we did include it in the appendix.

There are male probabilities, age 55-74, that show that the UP-94 mortality rates are much lower than those under the UP-84. The UP-84 rates are the male rates (one year set forward on the unisex table). By the time you get to age 74, the relative differences are decreasing between the UP-84 and the UP-94.

The UP-84 table probabilities of death are much higher than those of the UP-94 table; the UP-84 table also shows what the basic rates will look like. There is a crossover point where the UP-94 rates exceed the GAM-83 and GAM-71 rates.

The UP-84 rates are based on the female (four-year setback) table. The UP-94 female mortality rates are actually higher than under GAM-83. This is because the rate of improvement in female mortality has not been too great during the 1980s, particularly between ages 55 and 70. In some cases there was actually no improvement starting at about 1982.

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FROM THE FLOOR: The GAM-83 is the female table, or is it male with a setback? Is the new UP-94 table unisex?

MS. OLIVER: It is the female table. The "UP" in UP-94 no longer stands for "unisex;" rather, it is "uninsured pensioner," and this is a sex-distinct table.

Deferred annuity values on the various mortality tables for males are compared by showing the ratio of the annuity values to those using the UP-84 table. These are deferred annuities payable at age 65 using 8% interest, and the UP-94 deferred annuities are higher than UP-84 by at least 10%. The UP-94 table values are also higher than the GAM-83 values up to a crossover point.

FROM THE FLOOR: When we say deferred, are they deferred and then payable at age 65 or thereafter?

MS. OLIVER: Yes, they are payable at age 65. They are immediate annuities for ages after 65.

Here's a comparison of deferred annuity values for females, and you can see that the UP-94 deferred annuities are lower than those based on the GAM-83.

There is a committee of the SOA that is doing a special study that your firm may have been contacted about for experience. The committee members are analyzing mortality experience to produce a report to aid the government agencies picking the mortality table to be required for current liability calculations. As part of the study, they're going to look at variations in mortality among industries.

Getting back to the projection scale issue, the committee felt that future improvements in mortality should be considered in setting the mortality assumptions for pension plans. Along with generational Scale AA in the appendix, you'll also find tables that have been projected to specific years. Rather than being generational in that for each person you're projecting the number of years between 1994 and the year the event will occur, you're projecting the entire table to a fixed year in the future. For instance, you might project the entire mortality table to the year 2000. These tables will provide an alternative if your computer software won't accommodate the use of a generational table.

The committee felt there were many factors that needed to be considered in the decision as to what extent to project mortality.

It does make a significant difference if you use the generational table, especially for deferred annuities. For males, doing a full generational projection for a retiree turning age 62 in 1994 will increase the value of the annuity by about 2.5%. If you were valuing a male turning 62 in the year 2004, 10 years from now, the increase would be about 5%. If you were valuing a 32-year-old male in 1994 using a full generational projection, then your deferred annuity value will increase by 12.5%. This is based on 7% interest and a deferred annuity payable at age 62.

There are many factors to consider in evaluating the use of a projection scale. The UP-94 table is based on experience brought forward to 1994. So, there is no margin built into this table for future mortality improvement. The UP-84 had a margin built in there to project

mortality to 1984. It's also important to consider the interplay of all your assumptions when you're considering projecting mortality and the impact of increased longevity on your other assumptions.

MR. GOSS: I want to make the pitch for the mortality improvement concept. As Mike Sze pointed out earlier in the day, we at Social Security have been projecting mortality improvement for a long time, and basically the notion that there will be mortality improvement is really not a point of debate. The real question is only how rapidly mortality will be improving in the future. Now, I understand that for pension actuaries, mortality improvement has not been extremely important because many of the other factors seem to have a lot more influence on the valuation. But I'm sure that we want to eliminate bias wherever we can from an estimate, and if you don't put in mortality improvement, you clearly will be introducing some bias into the projections. With the advent of desk-top computers, there's no reason at all not to be introducing mortality improvement into the tables we're using.

Mortality has been dropping rapidly throughout this century. But it has not been dropping at exactly the same rate through time. In fact, there have been periods in which it has been dropping very rapidly, and then other periods in which it has not been dropping very rapidly. In recent years we have had a fairly slow rate of improvement in mortality.

Mike Sze is a member of the technical panel of actuaries, economists, and demographers that is advising the Social Security advisory council on the assumptions and methods used by the Office of the Actuary. The panel is still in the process of deliberating on the expected rate of decline in mortality for the future. We from the Office of the Actuary have been talking with the members of that technical panel, and we do not have total unanimity of opinion—but then that's good. It's good to have a lot of discussion on this kind of topic.

One of the methodologies that's been widely discussed within the demographic community and on the panel concerning how rapidly mortality rates may decline in the future has been put forth by Ron Lee and a colleague of his named Carter. The Lee & Carter method basically takes the logarithm of mortality rates over a period of time, and they do this on an age/sex-specific basis, and it fits a least-square's line. This seems quite reasonable, especially when a graph of mortality rates on a semilog scale has been fairly linear so far this century.

As I mentioned when we first started, we at the SSA have for some time been trying to pay careful attention to the circumstances that have contributed to past experience and have been attempting to project the circumstances of the future.

In the period of time since 1982 and continuing through 1993, we have experienced a relatively slow rate of decline in mortality. On an age/sex-adjusted basis, mortality declined a little bit more than a percentage per year, on average, so far this century, but about five- to six-tenths of 1% since 1982. Coincidentally, the latter is the rate at which we project ultimate mortality decline. I say *coincidentally* because we have been projecting essentially the same ultimate rate of decline for well over a decade, even back when mortality was declining at nearly 2% per year prior to 1982. As I said, there's a striking difference of opinion about the expected rate of decline, but there's no difference of opinion at all about the fact that there will be mortality declines in the future.

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FROM THE FLOOR: In the 1990s, are you getting mortality declines for the working women? In our study, and our company is a large corporation, we found in the early 1980s that women had leveled off. The working women showed hardly any improvement. In the early 1990s we just did one study, indicating 1.5% a year decline.

MS. OLIVER: I've heard of that, too, that there's been a changeover in the 1990s.

FROM THE FLOOR: The men are still decreasing more than the women. They have a bigger spread, though.

MR. GOSS: The data we're getting from the National Centers for Health Statistics on an age-specific basis indicated a brief return to faster improvement in 1990-91, but slow improvement again in 1992, 1993, and so far in 1994. The Social Security and Medicare data follow the same pattern: faster improvement at the very beginning of the decade with slow improvement since 1991. But this is based on national data, and your data for working women might be different after 1991.

I'd like to focus on somewhat longer trends, relative to what is utilized in the AA scale. The AA scale should be considered and perhaps utilized. However, the UP write-up mentions the possibility of using the AA scale for a select period and using another scale for the ultimate. I would probably make somewhat of a pitch for this approach, partly because of the experience that shows up in the AA scale. Marilyn showed us earlier that at some fairly critical ages, about 55-74, the AA scale has the rate of improvement in mortality for males being about three times as fast as the rate of improvement for females. Now that was based on 1977-93 data. A portion of the data were CSRS, U.S. Civil Service, and a portion were Social Security. But if we look at national experience so far this century, if you look at the male versus the female in all various age categories, mortality improvement has been significantly slower for males than for females. Remember the increasing gap in life expectancy between men and women; that's something we've been living with so far this century. It's really only in very recent times, since 1982, that we've been beginning to get some experience in which the rate of improvement in mortality has been better for males than for females. If we look particularly at the age group 25-64, or 65 and above, males had better rates of improvement in mortality. So it's only in this very recent time that the female rates of improvement in mortality have been worse than the males. Given that as the fact, Social Security projections include a 25-year period in which we transition from recent experience, which reflects the recently faster rates of improvements for males than for females, to rates of improvement in which males and females are improving at about the same rate. I would suggest that you consider creating a similar transition to ultimate rates of improvement that are similar for males and females.

One other point is that the rates of improvement that we had at critical ages for males and females in the AA scale are about 1.5% for males and about 0.5% for females. Essentially, the ultimate rate of improvement that we are projecting at Social Security is in the order of about 0.5% for both males and females. So I would suggest an ultimate scale at about 1.5% for each. An alternative, though, that would be a somewhat more conservative projection would be to move to the AA scale for the males, which is about a 1.5% rate of improvement, and utilize that for both males and females for the ultimate period.

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MS. OLIVER: Along with the two papers presenting the UP-94 and GAR-94 tables, a third paper is being published that compares the two tables and gets into the issue of mortality projections in more detail, including the issue of the impact of increased longevity on other assumptions.