

RECORD OF SOCIETY OF ACTUARIES 1982 VOL. 8 NO. 4

REPORT OF THE COMMITTEE TO RECOMMEND NEW DISABILITY TABLES FOR VALUATION

Moderator: WILLIAM J. TAYLOR. Panelist: W. DUANE KIDWELL

Panel members will briefly review the collecting and analyzing of the data and the status of the tables. They will describe special characteristics of the proposed tables and compare the results with the CDT table and the most recent data published in the 1979 Reports of Mortality and Morbidity Experience.

MR. WILLIAM J. TAYLOR: The program promised you five things from our Committee regarding our Disability Tables. That we would report on (1) the collection and analyzing of the data, (2) the status of the tables, (3) special characteristics of the tables, (4) comparisons to the '64 CDT table, and finally some comparisons to the '79 report on intercompany morbidity experience. Most of our presentation is going to be on the comparisons to the '64 CDT and will be covered by our Vice-Chairman Duane Kidwell. I will cover the other areas very briefly.

I would characterize the status of the tables as incomplete and still in need of refinement. Therefore, we are not yet ready to recommend a valuation table. We are going to discuss the experience table based on the experience of all companies combined. Most of the discussion will regard the parts that are complete. Hopefully, the remaining refinements will not make much difference in the numbers at the experience table level. The question of margins is another matter.

We have made extensive comparisons to the '79 reports and we compare quite closely on the incidence rates and average duration of claims in the first year.

While the panel today consists of only Duane Kidwell, our Vice-Chairman, and me, we have several Committee members, as well as others, who have helped with the multiple tasks and extended time and effort required here and we will call upon them if necessary. We have Jim Olsen, John Miller, Frank Knorr and Pete Marion in the audience and Bob Shapland and Frank O'Grady on the other panel.

For those interested in some of the details involved, I refer you to the Record (V6.N4.P1225-1244) for the annual meeting two years ago in Montreal where we had a full panel and described the various data bases that we were using quite extensively. Our major data base is the Disability Termination Study (DTS) originated by John Miller. John turned the DTS over to our Committee and we expanded both the number of contributors and the exposure years. To give you an idea of the problems we faced in analyzing the 15 variables in the DTS, let me repeat a comment by Frank Knorr at that Montreal meeting. If you took all of the combinations of the variables and spread those cells equally distant between New York and Los Angeles, then proceeded to put the 100,000 cells on the New York end that had data in them and the zero cells on the other end, you would travel five meters down that path before you ran into the zero cells. That is essentially our data base for termination rates at the early durations.

We had enough data there to produce termination rates for three years if we were forced to. We chose to use it for only two years. Moving to the other extreme on the termination rates for a moment, as you know, the '64 CDT after the first year goes back to the '52 study, but we did not wish to use that. John Miller, with his subcommittee, looked at all of the available data, developed an ultimate table, and came to the conclusion that we should adopt a ten-year select period of termination rates. It is a Gompertz table that is broken down between deaths and recoveries and is a judgmental, empirical type of table, taking all the various data sources into account. For a description see Record (V6.N4.P1239).

We have relied on group LTD data for durations starting in the third year of disability, but no experience is published after eight years. What we did was to blend our data into the LTD data at the end of the second year and blend the LTD data into the ultimate table of terminations. We have monthly termination rates for the first 24 months and annual rates thereafter, and that is what you will be seeing here today. We have tables for 0, 7, 14, 30, and 90-day elimination periods. We did not have enough data for any other eliminations. However, we do not have incidence rates for all of those waiting periods so, in terms of complete continuance tables, we are limited right now to 7, 14, and 30 days. Today we will be showing only the 7 and 30-day tables.

On the incidence rate side, which we attacked at a later point in time, we have a multiplicity of data bases and some problems we are dealing with. For example, we are short on data for the 90-day elimination period and for females on other than the best occupation class. Also, the massive termination rate table is expressed as a Gompertz table for the ultimate part and as a log linear table for the select part. This enables us to represent this massive table in terms of a relatively small group of variable values so you can generate it on the computer quite readily. We intend to do something of this nature with incidence rates, but we have not successfully done it yet. Although we have a multiplicity of data bases, we have continued to refer to the whole project as DTS. I might point out in closing that, after we finally got a good handle on the technical problems, we were very pleased to find that the variables that we thought were important in the first place were, in fact, the most important variables. These include sex, accident vs. sickness, occ. class, elimination period, age, and duration of disability.

MR. W. DUANE KIDWELL:

CDT and DTS Compared

The charts and graphs shown here compare results of the Disability Termination Study material (DTS) with those of the 1964 Commissioner's Disability Table (CDT). Rough graphs are used, rather than more preciseness, because the actual numbers have not been finalized.

DTS incidence rates, varying by decennial age group, sex, occupation class, elimination period and cause, will be regraduated when the table is completed.

Final incidence rates will be expressed as a set of polynomials for interpolation convenience.

Rates of termination from disablement, including both death and recovery, were used in monthly form for the first 24 months in preparing this material. Termination rates have since been calculated on a weekly basis for the first

13 weeks of disablement and they are now being validated and graduated. The effect of using weekly rates of termination, rather than monthly, would be to increase the average duration of claim slightly over the results included in this report.

The final DTS tables may be reinforced with some element of conservatism and to reflect more recent trends, but this need has not yet been fully evaluated. Nevertheless the values used here are expected to be sufficiently close to the final results as to make these observations real. Although preliminary data was reviewed by both policy count and amount of indemnity, we have concentrated on count to minimize distortion in the analysis. Morbidity selection by amount of indemnity must therefore be recognized outside the DTS.

Rather than generate masses of results for many combinations, we will use essentially class 1 males and females and class 3 males to give us a range for comparison. Class 1 in the DTS includes the top two classes (lowest morbidity) of a five-class manual. Class 3 is the second highest morbidity cost group. As we look at the charts and graphs, you will observe patterns or characteristics that will support our conclusion that active life reserves will be much lower on the DTS tables with claim reserves much higher.

Figure 1 - Incidence rates on the DTS are substantially lower and flatter than on CDT. For a 30-day elimination period the class 1 male incidence is only about 1/4 the CDT at age 27 and is less than 1/2 at the higher ages. Class 1 female rates are more than two times the corresponding male rates at the younger ages, crossing to below the male rates by age 60. Class 3 male rates are about the same as CDT at the younger ages and about 2/3 the CDT at age 62.

Since accident rates are relatively flat by age, the steepness in the curves in Figure 1 arise almost entirely from sickness causes.

Figure 2 - This graph does not compare CDT to DTS but, rather, illustrates the convergence of termination rates between DTS data and Group LTD. Group LTD is more voluminous and more consistent than the sparse DTS data on claims older than two years. LTD termination rates are significantly lower than DTS during the first two years. We have blended the DTS into the LTD during the second year and used LTD as the source data for years 3 through 8. These were projected through year 10, the end of the select period. Ultimate rates were developed on a formula basis with resulting values consistent with intercompany waiver and OASDI.

Group LTD has very low incidence rates and very low recovery rates in the first few months of disability. You can judge from Figure 2 that Group LTD claim reserves are much higher than individual claim reserves in the early months of disablement.

Figure 3 - Rates of termination from disablement are much higher for the CDT early months and in the third and later years. The DTS rates appear slightly higher for most of the second year. The DTS termination rates actually vary by occupation class, age, elimination period, accident vs. sickness, and sex during the first 13 weeks. At that point, the elimination period and class significance disappears. Accident vs. sickness termination rates converge at the end of one year.

Figure 4 - Shows the ratio of the number disabled in a DTS continuance table to a comparable CDT number. The DTS number of persons disabled for a given exposure, starts lower than the CDT, quickly becomes greater than the CDT, and remains higher throughout except for the slight dip noted in class 1 during the second year. The fact that ratios drop during the second year will prompt us to review the graduation, just to be sure.

Note the very high degree of selection by elimination period in both classes 1 and 3. The average claim benefit during the first year of disability is about two times the CDT. It is slightly less than the CDT for class 1, 30-day elimination period males. Aggregate benefits for longer durations are higher on DTS for both elimination periods.

Figure 5 - Expresses the ratio of accident to sickness claim cost. Of particular significance is the very high ratio at the class 3 lower ages where accident claim cost is nearly two times the sickness claim cost. Accident costs for class 1 females is only 1/3 of the sickness cost at younger ages and about 1/6 at the higher ages. As expected, the ratios decrease steeply with increasing age.

Figures 6 and 7 - Illustrate claim costs for a short (two-year) benefit and for a long benefit period (to 65). Claim costs for a maximum two-year benefit on class 3 are more than two times CDT at age 25, converging to about the same as we approach age 62. Class 1 is roughly 2/3 of the CDT throughout. Female costs are about two times corresponding male costs at age 25, crossing under male costs at about age 60. Female costs become lower than the CDT after age 50.

Note particularly, for this benefit to 65, the high claim cost of class 3 and the steepness of the curve vs. the CDT. Class 1 is slightly lower than CDT at the younger ages and becomes relatively lower with increasing age. Female claim costs are about two times class 1 males at age 25 to 45, then converging to and becoming lower than male claim costs by about age 57.

Figures 8 and 9 - Are the net level premiums for the same two benefits. Net premiums for females on the two-year benefit are quite flat with age, implying very low active life reserves. Class 1 males are flatter in younger ages, then steepen sharply and will lead to lower early active life reserves. The real significance of this pattern appears on the benefit to age 65, where the pattern differences from CDT will be amplified by the benefit period growing shorter as the ages approach 65. Class 3 rates on the benefit to 65 are included for comparison purposes, even though long-term class 3 benefits are rarely offered. The net premiums are nearly three times class 1 males at the younger ages. At the higher ages, due largely to the folding over pattern, the class 3 premiums are two times the class 1. Female class 1 premiums are lower than corresponding male premiums after about age 55.

The slope of the net premium curve is quite different from the CDT at ages beyond 40. The DTS curve starts dropping for the class 3 males and the class 1 females at about age 50. The class 1 male rates, while still increasing, are beginning to flatten out at that point. You can reason that the active life reserve pattern will be quite different from the CDT, and generally lower, since the curves are flatter.

Figure 10 - Illustrates that active life reserves on the DTS table will be much lower on most cells than the CDT. The DTS net premium curves, as we earlier observed are generally flatter, and since the reserves are based upon the difference in premiums, they will usually be lower and sometimes negative.

On the higher age females, the premiums actually decrease with advancing age, and the reserves are negative.

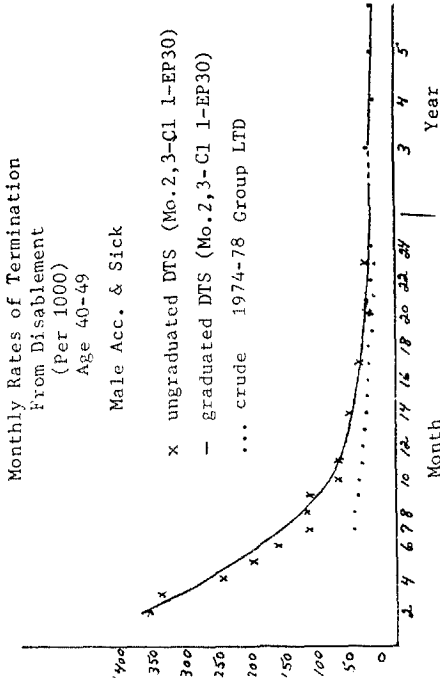
Figure 11 - Shows the claim reserves which, as we expected from reviewing the previous charts, will be much higher on the DTS. This is consistent with our own company experience on which we hold 112% of the CDT factor for claims less than one year old. Many companies currently hold 3½% claim reserves and use multiples of the CDT varying by duration to assure conservatism. While the DTS table is stronger, the use of a higher interest rate will, of course, help to hold down the longer benefit reserve needs substantially.

Summary: Incidence rates on the DTS are much lower than on the CDT, particularly at the higher ages. DTS incidence varies by age, sex, cause, class, and elimination period. Termination rates are much lower on DTS in the early months and lower in the third and later durations. Heavy selection is observed on termination rates by elimination period and by class during the first few weeks of disablement.

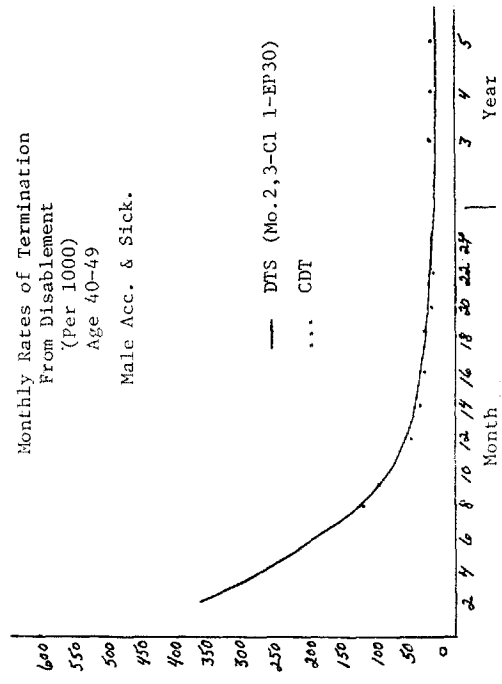
In spite of the lower incidence, the average duration of claim is higher on the DTS for all classes and elimination periods.

Based upon this preliminary table, active life reserves on a predominantly class 1, male, long-term benefit block would be at least 25% lower on the DTS than on the CDT.

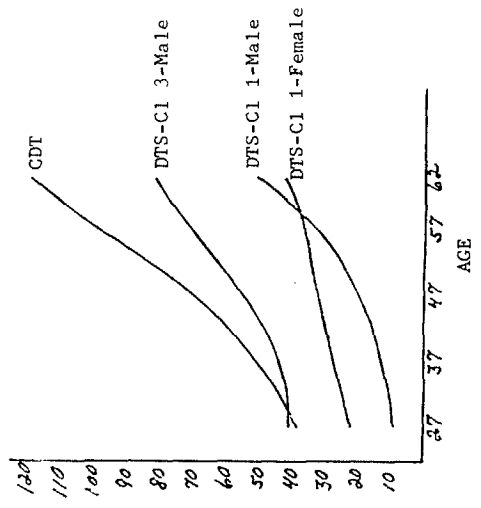
Claim reserves would be about 30% higher on DTS than on CDT for long-term benefits and about 15% higher for short-term benefits.



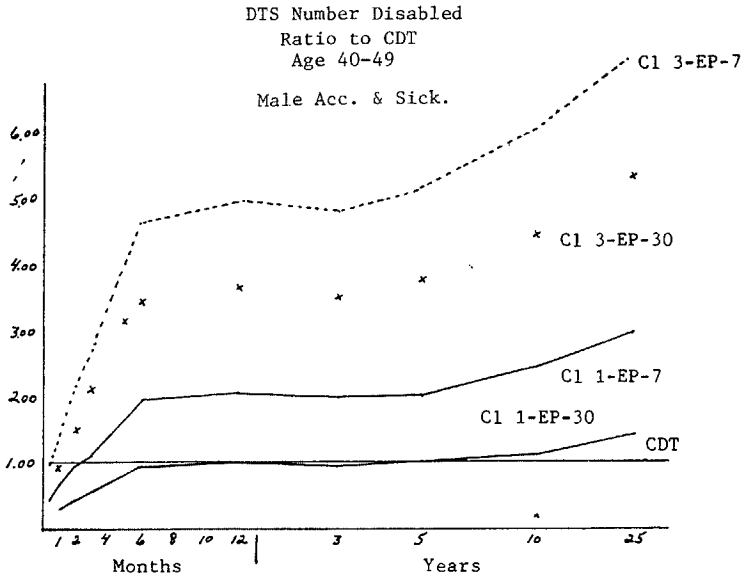
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INCIDENCE RATES
 Per 1,000 Lives Exposed
 EP 30 Days
 Acc. & Sick.



-1-



-4-

RATIO
CLAIM COST
Accident/Sickness

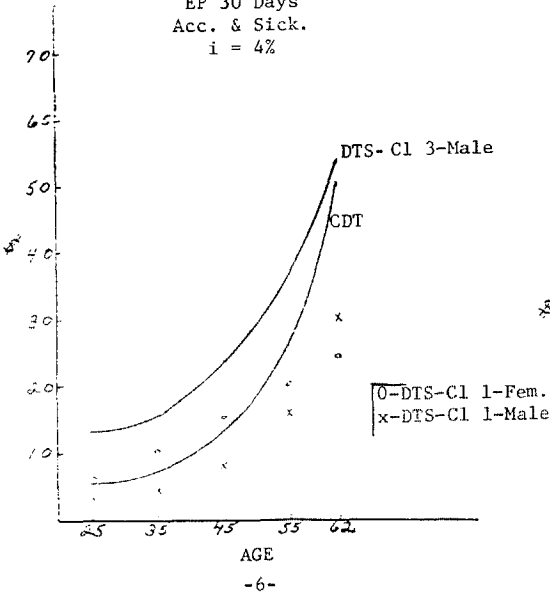
Benefit to 65 EP-30 i=4%

Age	CDT	DTS		
		Cl 1-M	Cl 3-M	Cl 1-F
25	.93	.89	1.85	.32
35	.60	.56	1.40	.30
45	.40	.25	.58	.20
55	.25	.14	.24	.16
62	.18	.07	.12	.15

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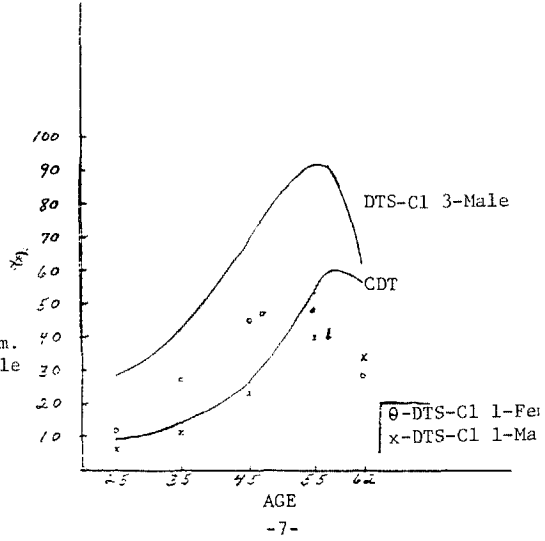
ANNUAL CLAIM COSTS

2 yr. ben. - \$100/mo.
 EP 30 Days
 Acc. & Sick.
 i = 4%



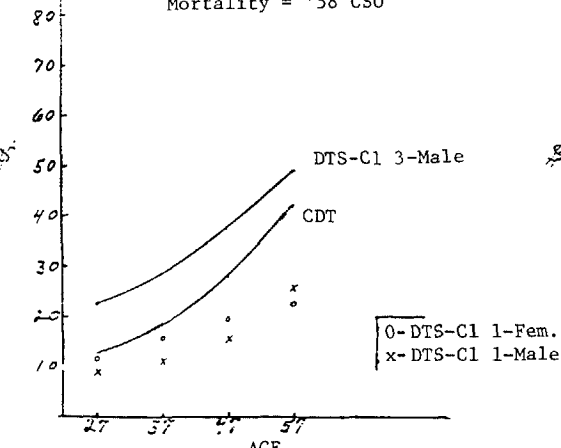
ANNUAL CLAIM COSTS

Ben. to 65 - \$100/mo.
 EP 30 Days
 Acc. & Sick.
 i = 4%



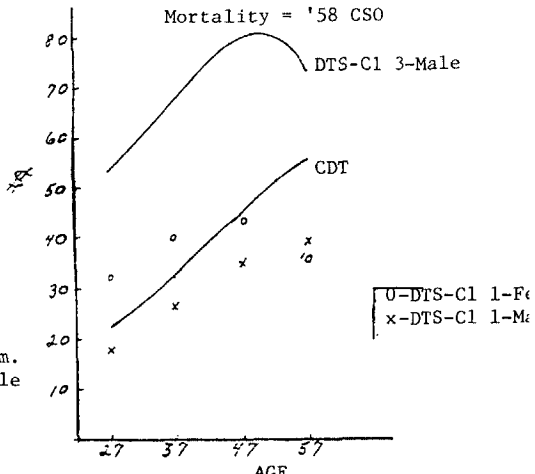
NET LEVEL PREMIUMS

2 yr. ben. - \$100/mo.
 EP 30 Days
 Acc. & Sick.
 i = 4%
 Mortality = '58 CSO



NET LEVEL PREMIUMS

Ben. to 65 - \$100/mo.
 EP 30 Days
 Acc. & Sick.
 i = 4%
 Mortality = '58 CSO



ACTIVE LIFE RESERVES
RATIO DTS/CDT

Benefit to 65 - EP 30
Acc. & Sick.

$i = 4\%$

Mortality = '58 CSO

	Age 37		
	1 yr.	5yrs.	10 yrs.
Class 1-Male	.78	.73	.67
Class 1-Female	.56	.39	.20
Class 3-Male	1.28	1.14	.91

	Age 47		
Class 1-Male	.53	.48	.36
Class 1-Female	-.18	-.35	-.78
Class 3-Male	.41	.12	.59

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CLAIM RESERVES
RATIO DTS/CDT

Benefit to 65
Male Acc. & Sick.
(Mos.1,2-C1 1-EP30)

$i = 4\%$

End Of	AGE	
	<u>37</u>	<u>47</u>
1 mo.	3.16	2.89
2 mo.	2.33	2.20
3 mo.	1.89	1.82
4 mo.	1.51	1.55
6 mo.	1.16	1.24
9 mo.	1.07	1.19
1 yr.	1.13	1.20
2 yrs.	1.30	1.25
5 yrs.	1.23	1.13
10 yrs.	1.13	1.05

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MR. TAYLOR: In summary, the table, as we pointed out, is a little more complex than what you have been used to seeing. Our rates of incidence vary by age, cause (accident vs. sickness), elimination period, occupation class, and sex, as do the termination rates for the first 13 weeks. At the end of 13 weeks, the termination rates do not vary by elimination period or occupational class. We found that there was still some significance in accident vs. sickness for as far out as one year. After one year, the accident and sickness factors also converged. Ultimate rates, of course, still vary by sex and age. Going one step further in wrapping up the slides you have just seen, the incidence rates on the DTS were much lower than on the '64 CDT. That was particularly true at the higher ages. You saw that the termination rates were much lower on the DTS in the early months and substantially lower during the third and later years. Remember, we had a small problem in the second year but we will iron that out. Active life reserves on the DTS would be at least 25% lower than on the '64 CDT. That was based on a model I made up representing my own company. But the claim reserves, on the other hand, would be 30% higher on the DTS vs. the '64 CDT for long-term benefits and about 15% higher for the two-year benefits which we did not show you.

MR. EDWARD W. O'NEIL: Duane, when you looked at the reserves for the active and disabled lives, you used 3%. Did you also compare them using something like 6% on the new table? What were the results in the aggregate?

MR. KIDWELL: I used a 4% basis and a 4½% basis to see what the difference would be. I found that the difference from a half percent was 3% on the claim reserve. I did not work the active life reserves on that basis, just the claim reserves.

MR. HOUGHTON: When you get a satisfactory raw experience table, do you intend to recommend margins at the upper ages for purposes of an active life valuation table?

MR. KIDWELL: We have not addressed the margins per se as yet. However, in looking at data at an earlier point in time, it was very obvious that the company differences here are very substantial. I do not know if it is practical to use margins sufficiently large to create a table that would cover the worst company.

MR. HOUGHTON: What I meant was, typically on life insurance, they will put more margin at the upper ages to get the reserves to a certain level, even though the effect on net premiums may be fairly moderate for the most of the insuring ages. I think most of the tables have deliberately done that.

MR. KIDWELL: On the termination side, we have deliberately included conservatism already, even though we are calling it an experience table. This starts in the second year of disability by grading into the LTD at the end of the second year which makes it conservative for individual policies. However, on the other side of the coin, if you wish to use this for LTD disabled life reserves, it is an experience table with no conservatism after two years of disability and it is an insufficient basis during the first two years of disability. But again, we have not really addressed the subject of margins in any detail.

MR. TAYLOR: Tony's point is well-taken because the rates we have are based on policy count rather than amount. And we know that there is a significant difference between rates that were based on amount and rates that were based on count. There is definite selection in termination rates. It may well be that a margin will have to be added to take that into account. There is another problem, a slight one, in that the data we have was mostly from the mid-1970s. Since that time, contracts have changed and the experience could be expected to change, particularly with more earlier "retirements" after age 55. It may be that we will have to make some changes to allow for that characteristic.

