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LOSS RESERVING IN A CHANGING ENVIRONMENT

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Panelist: SUSAN COMSTOCK
Recorder: EMIL J. STRUG

- o Overview of the various methods of developing loss reserves.
- o Analysis of the different development patterns of the various elements of coverages
  - -- Hospital
  - -- Surgical and medical
  - -- Dental
  - -- Major medical
  - -- Comprehensive major medical

MR. EMIL J. STRUG: In selecting the agenda I searched for a topic that was of current interest to a wide audience. With a changing environment, an actuary must be capable of evaluating the impact of these changes as they apply not only to rates but also to loss reserves.

What is the environment today relative to health insurance? Health Maintenance Organizations (HMOs) have had a major impact on traditional health insurance programs. The initial thrust was for traditional insurers to develop and experiment with various forms of HMOs. In response to the buyer's concerns of multiple billings, multiple solicitations, spiraling loss ratios plus loss of business, insurers have developed multiple option programs with a uniform price. We see combinations of HMOs plus Preferred Provider Organizations (PPOs) plus traditional programs. Separately or collectively these options present a challenge in

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terms of loss reserving in a competitive environment where benefit packages and options have no historic base from which to develop completion or lag factors.

These changes impact all carriers -- commercial and Blues. The Blues, in addition, are now faced for the first time with a tax issue. Taxes do not impact loss reserves, but there is, however, the issue of overstated loss reserves which can translate into taxes. The challenge for the Blues is to estimate loss reserves that are adequate but not redundant.

The first segment of the program will be conducted by Ms. Comstock in which she will deal with factors to consider in claim reserving. The second segment, which I will present, will provide an overview of the development patterns of various types of coverage and how some of the techniques relate to Ms. Comstock's presentation.

MS. SUSAN COMSTOCK: What factors should we consider in claim reserving?

1. What are the benefits covered?
2. What is the definition of incurred date?
3. What is the definition of paid date?
4. What are claims processing procedures?
5. What exposure measures do we have available to help us in addition to the claim data?
6. What category should we group data in for reserving?
7. What are the basic mathematical techniques or methodologies we can use in claim reserving?

Before we can proceed in designing our reserve procedures we need to know what the benefits are in the contract. Sometimes we're too quick to assume we know all the ins and outs, if our responsibility is reserving instead of product design and pricing. That's our foundation.

There are also special provisions that are of interest to the reserving actuary: extension of coverage beyond the end of the contract if the claimant is totally disabled, and whether or not the benefits have changed over the time that we're collecting historical data so that we can interpret changes in the historical data in light of changes in the benefit provisions.

What is the definition of the incurred date? Now this is an area that certainly is open for discussion. Actuaries hold different opinions, even given the same contract or policy provisions, as to what the rules are for defining the incurred date. Some of the things you might be looking for might be the date of disability, date of service, date of admission to a hospital, or you might be looking for a combination of different dates depending on the circumstances. For example, some people will code their major medical claims by date of service unless the claimant is totally disabled and then it's the date of disability. If reserving is a new responsibility or you are setting up a new system, check out these above items. Don't take them for granted and assume the claims department is coding exactly the information you want.

Does the coding match the definition? You may want to occasionally do a sample audit of the coding done in the claims department to find out if indeed all parties, including the personnel in the systems area, are following the agreed upon rules.

I think it is fairly common for efficiency purposes for a collection of major medical bills that cover an extended period to be paid in one check. Often shortcuts will be designed to avoid having to individually code small dollar amounts. This may not be a problem, but on the other hand if a fair amount of money is batch coded it could cause blips in your data base for reserving.

Another item to pay attention to in designing a reserve system is the paid date. Again, this is one we might take for granted; after all what disagreement could there be in what a paid date is? But we need to keep in mind that our purpose is to make reserves mesh with the claim payments in the financial statement to give us the true incurred picture. So, is the definition in the reserve data base consistent with the general ledger? Does the amount of money balance with the amount of money shown in the general ledger? Do the various adjusting entries like reinsurance receipts, coordination of benefits, and correction of errors go through in a logical manner? Are they going through in the same way on the general ledger as they are in the reserve data base?

With regard to claims processing, one of the things that we would want to check is the magnitude of the claims pending in the claims department. I once worked with a company where the actuarial department didn't receive the count of pending claim files at year end. We asked the claims department why we hadn't received the count and they told us there were too many files to count. There had been a change from prior year-end and we attempted to adjust for that in our actuarial analysis.

Changing procedures and disruptions are something we're all aware of but sometimes forget to think about as we're analyzing our statistical data base, making sure we are communicating with the claims department. Maybe they installed the new system in the middle of the year, created a backlog but then cleaned it up two months later, and now have much speedier processing than ever before. All those things will affect our interpretation of the data that we're getting from the claims department.

Some techniques for claim reserving use only claim data but then we're vulnerable to not having a way to test for reasonableness. So whenever possible we want to have techniques that use exposure measures or simply obtain the exposure measures to test the results of a claim data reserve system for reasonableness. The two usual measures that we look for are enrollment and, if you work a lot with HMOs or the Blues, you'll often see PMPM (per member, per month) written all over everything. If we don't have enrollment data available, earned premium data can be used so that we can test the reasonability of the loss reserves with the incurred claim data produced by our reserve system.

There are two opposing forces in deciding what categories to use for subdividing our data. One is to subdivide it as finely as possible so that we have homogenous groups: exactly the same type of benefits; the same deductible level or other inside limits or maximums; exactly the same kind of business, small group or large group; or similar premium payment characteristics. But if we chop it up too small, groups will have random fluctuations distorting the pattern. The other extreme, which is one I tend to see more in self-insured corporations, is grouping everything together. Unfortunately, if your mix doesn't stay exactly the same you'll be forecasting this year's activity from last year's pattern with a different mix of kinds of claims with different payment patterns. So those are all things to take into consideration in dividing up the data base.

Now we've finally made it to choosing our reserve methodology after going through all the other characteristics. I look at this as being a two dimensional grid. One dimension has the two basic approaches. I call the first approach the incurred claim estimation technique. By using the completion factor method, the PMPM projection and/or the loss ratio projection, you can forecast the ultimate claim costs. You subtract the paid-to-date costs and what you're left with is the reserve. The reserve factor method is the second approach and directly forecasts the reserve rather than the ultimate claim cost. The open claim factor, the premium percentage factor and/or the reserve per exposure unit may be used here. Basically the subdivisions within each category have to do with whether or not the method can come from claim data only, or whether or not the method incorporates per member, per month type exposures, or incorporates earned premium to form loss ratios. So within each major approach we have different variations.

What happens often in reserving is, instead of using one method we may be using all of these methods. We might think of it as only one process but we're combining them. I think a lot of people will do a completion factor method as their first building block. But they're actually doing their estimates by looking at their per member, per month projection costs and trends and finding whether or not their loss ratios are reasonable in terms of what they anticipated or whether or not they have a good handle on pricing. Then they might also be running some of these techniques that focus directly on the reserve by taking hindsight run-off costs and ratioing them to various items such as claim counts, premiums, or exposure units. So often in our reserve process we are not selecting one of these methods, we're selecting all of them. It's a matter of what order we do them in and how much weight we give to each technique.

Tables 1-4 show how to do a completion factor calculation. Table 1 is a very simplified example of four incurred months. Shown in an incremental fashion are the claim incurred and the months following. So one diagonal is the payment activity of a given month, and it is updated every month. This would be the typical way you would usually get the starting information from your computer system. The next step is to accumulate the payments (Table 2). In January we paid $15 on January claims. In February we paid $45. We have now paid a total of $60. By the end of March we've paid a cumulative total of $90 and by the end of April we've paid $100. Now the reason for these cumulative totals is because of the particular completion factor method that is going to be used. I'm going to ratio (Table 3) what's been paid through the end of month 1 to the end of month 0. I'll then ratio what's been paid through the end of month 2 to the end of month 1 to get the growth factor.

TABLE 1

INCREMENTAL PAYMENTS

	Incurred Month			
Lag (Months)	1/87	2/87	3/87	4/87
0	15	12	14	14
1	45	43	45	
2	30	30		
3	10			

TABLE 2

CUMULATIVE PAYMENTS

	Incurred Month			
Lag (Months)	1/87	2/87	3/87	4/87
0	15	12	14	14
1	60	55	59	
2	90	85		
3	100			

Table 3 shows the growth factors. Now as long as these growth factors are fairly stable (which for our small amount of data I'll accept as being fairly stable), the growth from what's been paid at the end of the first incurred month to the end of the following month is a multiplier of about four and a quarter. What I'm doing here is averaging all my available data for like periods. This is the point where we get into all the variations. Since you're probably going to be able to collect 12, 24, and 36 months of data, you will hear questions as to whether or not you should take the most recent point only, or whether you should average the last 3 points, or the last 6 points. Should you only use January patterns from past years to project January patterns for the current year? And should you just use straight averages or should you be weighting the more recent data more than the older data? There are a lot of variations. Another thing you might notice, if you're inheriting somebody else's work papers and you're new to the reserve area, is that a lot of people will show the reciprocal of this number. They're looking at that percent of ultimate that has been paid at this point. There's a lot of individual differences in whether you show multipliers or divisors and how you average, but this gives you the basic idea. Now that we've got the factors we do the reserve calculations (Table 4).

TABLE 3

COMPLETION FACTORS

Lag (Months)	Incurred Month 1/87	2/87	3/87	4/87	Average
0 to 1	4.00	4.58	4.22		4.27
1 to 2	1.50	1.55			1.52
2 to 3	1.11				1.11

So in April, beginning at the bottom we had paid $14. If we use the average of historical patterns, we had a multiplier of 4.27 to take us from the end of the current month to one month following, a multiplier of 1.52 to take us from one month following to two months following, a multiplier of 1.11 to take us from two months following to the ultimate. We're saying four months is ultimate so we multiply all of this together and we get an estimated ultimate for April of $101. Since $14 is paid to date, our reserve is $87. Now this calculation for April leads us into why we are usually not happy with just taking the claim data, making a completion factor calculation and thinking we're done.

TABLE 4

RESERVE CALCULATION

Incurred Month	Paid by 4/30/87	Average Completion Factor	Estimated Ultimate	4/30/87 Reserve
1/87	100	1.00	100	0
2/87	85	1.11	94	9
3/87	59	(1.52)(1.11)	100	41
4/87	14	(4.27)(1.52)(1.11)	101	87
				137

The multiplier is about 7. Now that multiplier might fluctuate a lot. The $14 paid could also easily fluctuate. So when we're projecting something that's this immature we are very skeptical as to how well the technique is working and we want to look at other techniques to see whether the result is reasonable.

The second part of my presentation will be about testing. I've categorized some reasonability testing factors as completion factor testing looking at trends and using ratioing techniques.

Suggestions on testing that can be done for the completion factor are the completion factor itself and the paid-to-date. We can look at the completion factor itself to see whether or not it looks reasonable as well as do a monthly completion factor calculation; some people like to do quarterly calculations. Another is to look at how much the most recent factor has changed from when we did our reserving last quarter, the quarter before, the year before. Another adjustment that might improve things is, if you have data that is seasonal, you may only want the corresponding months or quarters from the prior years so factors can be compared from different points in time to see how stable they are.

Now assuming that we have more data available than just the claim payment data itself, we can use our per number, per month exposure data to calculate other numbers and look to the patterns and the trends in those numbers and see if they fit what we expect in our environment. Some of the numbers we would look at would be the number of hospital days per member or per thousand members, the average cost per diem and the average length of stay. Do those fit what we realize is going on in our medical environment?

Table 5 is just a sample showing what kind of data you might collect and what kind of a report you might produce. Some people might use this chart simply as a reasonability test on their completion factors. Other people might use this as their basic method and just assume they're going to override their completion factor calculation by making selections of reasonable trends in solving backwards for the upward or downward adjustment in the estimate of ultimate incurred claims. I think the kind of weight you put on different techniques will depend on how much you know about your environment, how well your data is behaving, and what you think makes the most sense given the information you have. Would you put more weight on having an average per diem trend that fits what you believe is going on in the hospital marketplace or would you put more weight on the completion factors technique that's betting on the claims processing procedures being the same in the coming months as they have been in the past?

The last grouping for reasonability techniques are multipliers; incurred ratios and multiple quarter tests. These only need claim data, so if you are in a position where you don't have exposures, you feel that your earned premiums are not giving you a lot of additional information, or you may not have a higher

TABLE 5

COMMUNITY RATED INPATIENT

		UTILIZATION								COST			
		CASES			DAYS			AVG. LENGTH OF STAY					
YEAR	MEMBERS	CASES	CASE/1000 MEMBERS	TREND	DAYS	DAYS/1000 MEMBERS	TREND	ALOS	TREND	PER DIEM	TREND	COST/CASE	TREND
80	1390164	33025	95.02		217480	625.77		6.59		201.67		1328.08	
80	1391730	32921	94.62		206706	594.10		6.20		207.79		1304.70	
80	1397005	32469	92.97		204120	584.45		6.29		209.27		1315.62	
80	1403809	31199	88.90		197560	562.93		6.33		245.05		1381.77	
	1394677	129614	92.87		825866	591.73		6.37		208.28		1327.13	
81	1411251	33619	95.29	0.28%	219895	623.26	-0.40%	6.54	-0.68%	239.48	18.75%	1566.38	17.94%
81	1423524	34363	96.56	2.05%	212119	596.04	0.33%	6.17	-1.69%	249.81	20.22%	1542.04	18.19%
81	1434115	33506	93.45	0.52%	208797	582.37	-0.36%	6.23	-0.87%	253.44	21.10%	1579.33	20.04%
81	1439955	32296	89.71	0.92%	200916	558.12	-0.85%	6.22	-1.76%	264.79	23.13%	1647.29	20.97%
	1427211	133784	93.74	0.94%	841727	589.77	-0.33%	6.29	-1.26%	251.59	20.79%	1582.90	19.27%
82	1447369	35728	98.74	3.62%	223801	618.50	-0.76%	6.26	-4.23%	279.55	16.73%	1751.12	11.79%
82	1412313	33530	94.96	-1.65%	202196	572.67	-3.92%	6.03	-2.31%	282.41	13.05%	1703.01	10.44%
82	1356419	32068	94.57	1.19%	195631	576.90	-0.94%	6.10	-2.10%	285.96	12.83%	1744.51	10.46%
82	1300303	29368	90.34	0.70%	179937	553.52	-0.82%	6.13	-1.51%	300.22	13.38%	1839.42	11.66%
	1379101	130694	94.77	1.10%	801565	581.22	-1.45%	6.13	-2.52%	286.48	13.87%	1757.00	11.00%
83	1269756	30450	95.92	-2.85%	187720	591.36	-4.39%	6.16	-1.58%	323.15	15.60%	1992.18	13.77%
83	1256024	29862	95.10	0.14%	182655	581.69	1.58%	6.12	1.43%	331.53	17.39%	2027.83	19.07%
83	1246054	29614	95.00	0.46%	175110	561.77	-2.62%	5.91	-3.07%	334.50	16.97%	1977.92	13.38%
83	1258196	27680	88.00	-2.59%	166711	530.00	-4.25%	6.02	-1.70%	340.90	13.55%	2053.18	11.62%
	1257708	117606	93.51	-1.33%	712196	566.27	-2.57%	6.06	-1.26%	332.24	15.98%	2012.00	14.51%

level of confidence in the pricing of those premiums than you do in the claim data you have for reserving, then you will want some techniques that you can apply to your completion factor data to see whether or not it's reasonable.

Exhibit 1 shows the formulas for three techniques. Again there are many different kinds of numbers that could be ratioed together but these will give you some ideas. The quarterly incurred ratios are ratios of different quarters' incurred ultimates. Again, what we are doing here is just looking for patterns. Are the patterns smooth? If they aren't, can I explain why they aren't? The multiple quarter tests are what I'd call a more direct override technique. It's saying let's replace the most recent quarter's estimate in the completion factor technique by taking the corresponding quarter for seasonality from the year before and then adjusting it for growth or decline in business. All these various options are different ways to make that adjustment for growth or decline in the business. I am taking the prior year's ultimate estimate, adjusting it for growth, and overriding my completion factor. These are some ideas for what you can do with that basic completion factor technique to challenge the results or add other techniques and improve it. Now I would like to put out an idea that comes from the HMO environment. Through the move that we've seen in the health care industry in the last few years we have the data available in some environments to use this idea. The reason we have this data is because HMOs have started cost containment programs, preadmission certification, and utilization review, and a lot of them have computer systems where they're capturing all this information.

If they have up-to-date information on the services they have authorized, the services they've provided, and the rates they've negotiated with providers for these services, they have them stored in a computer system with marvelous interface with claims processing, billing, accounting, etc. We can utilize all this information to get a firmer estimate on reserves. Typically, when we would use this approach we would focusing on one piece at a time: the hospital piece, the physician piece or the miscellaneous coverages. The potential flaw in all of this is to not have the various computer systems interface. This is a direction in which we might be moving and it may become feasible for insurance companies and HMOs to have systems with interfacing capabilities.

EXHIBIT 1

RATIO TECHNIQUES

- Quarterly multipliers (rolling 12 month period could be used for seasonality)

$$\frac{\text{Current estimate of incurred losses for xQyy}}{\text{Total payments for xQyy made during xQyy}}$$

- Quarterly incurred ratios

3Q82/4Q81	3Q83/4Q82	3Q84/4Q83
3Q82/1Q82	3Q83/1Q83	3Q84/1Q84
3Q82/2Q82	3Q83/2Q83	3Q84/2Q84

- Multiple quarter tests

$$4Q84 = 4Q83 \times \frac{3Q84}{3Q83}$$

$$4Q84 = 4Q83 \times \frac{2Q84 + 3Q84}{2Q83 + 2Q83}$$

$$4Q84 = 4Q83 \times \frac{1Q84 + 2Q84 + 3Q84}{1Q83 + 2Q83 + 3Q83}$$

Another technique (Table 5) focuses directly on the reserve. What makes this technique interesting is the fact that it's going to maximize more known facts than a completion factor technique. If we know what services we're authorizing, we have negotiated costs on those services, or we have excellent cost studies on what the services cost, we have a lot of valuable known facts.

Exhibit 2 is a sample of what a reserve calculation could look like under this system. Now the categories here are not fixed categories. They would vary by individual situations as to what is deemed valuable and what is deemed possible to track through your computer system. In this exhibit the reserve is calculated for one incurred month for a hospital. Claims are divided into three categories and utilize known facts or facts on which we might get good estimates. Pending bills are divided into two categories. One is for authorized services. (There was a record in the authorization system for this person to be hospitalized with such and such anticipated length of stay.) The other is for hospital bills that have come through but that we have no matching authorization record. The third category is for hospital days that have been incurred but no hospital bill has yet entered the system. Part of those are days where we've authorized people to go in the hospital but the hospital bill has not been received. Historically, there are days where we neither have a record of it in the authorization or the billing system, such as emergency care out of the system that will get reported later and be retroactively authorized.

EXHIBIT 2

HOSPITAL RESERVE CALCULATION ON 2/28
JANUARY - INCURRED MONTH

Pending Bills with Authorization	
Gross Amount:	$ 1,325,000
Average Payment Level:	x .85
	$ 1,126,250
Pending Bills without Authorization	
Gross Amount:	$ 100,000
Average Payment Level:	x .75
	$ 75,000
Incurred But Not Billed	
Authorized Days	$ 5,050
Unrecorded Days	+ 300
Total Days	$ 5,350
Average Per Diem	x 1,000
	$ 5,350,000
	==========
Grand Total Reserve	$ 6,551,250

What's the pending bill amount? What we need to study is the reduction for discounts, coordination of benefits, and claims that will be found invalid and not paid. This is a known fact. What's in our billing system that's not authorized? We'd expect the reduction factor logically to be lower because there will be more claims that will be denied. Coming from our authorization system are the number of hospital days authorized with no hospital bill yet received; that's a known fact. There is an estimate of how many more days will come through later, and finally an estimated average cost per hospital day. Calculate it all out and this is the reserve.

Now a calculation may be done for a hospital in far more detail because of the average cost of a hospital day. Maybe you will want to divide it by different categories such as whether or not this is psychiatric care, surgery, etc. So that gives you the general idea of what this approach would be and why it's building more on known facts than estimation. But the key to having those known facts is in the data collection.

Tables 6 and 7 are some examples of what kinds of reports might be coming out of your computer system in order to study the information to do this reserve calculation.

TABLE 6

HOSPITAL DAYS
JANUARY -- INCURRED MONTH

Status as of:	January	February	March	April	May	Ultimately
Closed -- Paid	100	3,000	7,000	8,000	9,000	9,800
Closed -- No Pay	0	50	150	150	200	200
Pending -- Bill and Authorized	200	1,100	650	650	650	--
Pending -- Bill	100	500	100	100	100	--
Pending -- Authorized	8,600	5,050	2,000	1,050	50	--
Total	9,000	9,700	9,900	9,950	10,000	10,000

You may want to keep track of your hospital days in a number of different categories (Table 6) as they move through time to their ultimate resolution of being closed-paid or closed-no pay. You can see how some of that data is derived. How many days end up dropping off because they are denied payment? They were improper claims. Most of the days of hospital claims were known in the month incurred because of preauthorization. But there is late information coming in all the time. So this is a sample of a report we might keep on the day count.

Table 7 is a sample of the report that we might keep on the dollars of activity where our ultimate resolution is keeping track of the dollars that were actually paid. But we also want to keep track of the dollars that were billed but denied. Another key data collection is, where there would be lot of variations in the kind of data you would collect to study your average cost per day. In the HMO systems I have seen, this has been one where costs per day actually made sense. But it's an idea worth being aware of as a way to improve the reserve calculations.

TABLE 7

HOSPITAL DOLLARS

JANUARY -- INCURRED MONTH

Status as of:	January	February	March	April	May	Ultimately
Closed -- Paid (Actual Paid)	94	2,850	6,790	7,920	9,000	9,800
Pending -- Bill and Authorization (Billed Amount)	235	1,325	820	750	770	
Pending -- Bill (Billed Amount)	118	100	120	122	118	
Closed -- Paid and Denied (Billed Amount)	108	3,363	8,012	9,662	10,850	11,760

MR. STRUG: A series of exhibits, (Graph 1, Tables 8 and 9) displays the development and seasonal patterns of the more common health coverages. When analyzing these results, one should keep in mind that the majority of the claim submissions are made by the provider of service rather than the beneficiary. This generally means that the claims will be reported faster and develop faster than claims submitted for reimbursement by the patient.

This series deals with hospital benefits. The benefits are comprehensive with first dollar coverage. Graph 1 presents each calendar quarter at five stages of development. Regarding development patterns, there is no discernible difference by quarter or no seasonal variation. Note how rapidly the claims develop.

Table 8 shows the pure premium by quarter for the past six years. There is definitely a seasonal pattern. When developing ratios to estimate raw quarters, an analysis of this type is a necessity. It also provides a test of trends used in rate making.

Table 9 shows calendar year ultimates at various stages of annual development. This is the familiar triangle. This is, obviously, most useful at year end for annual statement purposes. It provides a tool for determining if, in fact, there is and has been a change in the development pattern, be it from a reporting or processing lag.

As companies who previously had patient submit systems shift to a preferred provider submit system or an HMO system, one should expect to see a speed up in the development or a decrease in the lag factor.

The next series deals with surgical claims (Graph 2, Tables 10, 11). The comments I made relative to hospital benefits generally apply to surgical benefits. One major difference is in the lag factor. Surgical benefits develop slower than hospital benefits primarily due to reporting lag as physicians are not as automated as hospitals.

Our next analysis is of major medical benefits. Here (Graph 3, Tables 12, 13) we see a definite seasonal pattern in development. This is due to two hospital and physician benefits. The majority of these claims are submitted benefits by the patient and follow the old shoe box routine.

GRAPH 1

HOSPITAL BENEFITS—1985

DEVELOPMENT BY INCURRED QUARTER

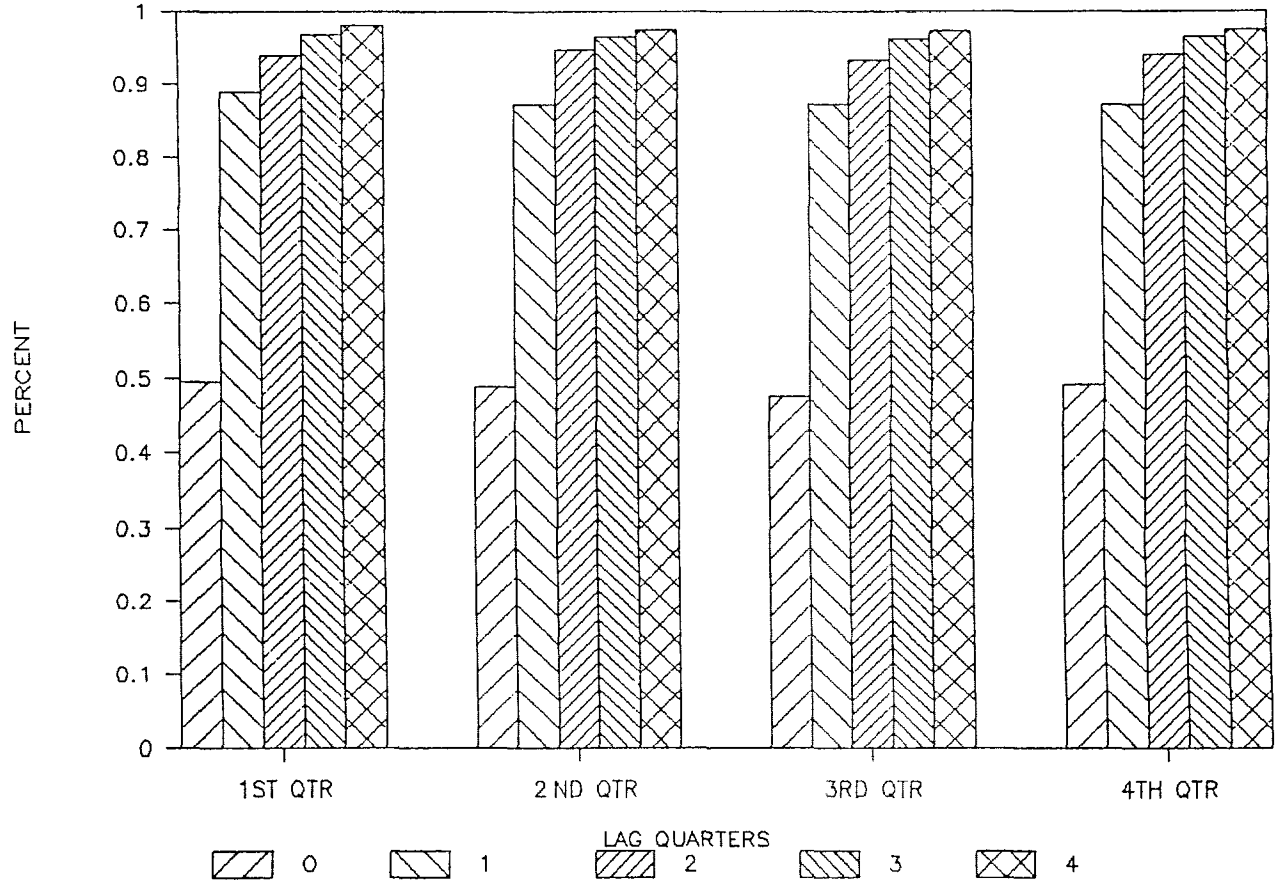

TABLE 8

HOSPITAL BENEFITS
PURE PREMIUM TRENDS
@ DECEMBER 31, 1986

			Quarterly Trends			Year Ending Trends		
	Ultimates (000's)	Exposure	Pure Premium	Prior Quarter Relationship	Prior Year Relationship	Pure Premium	Prior Quarter Relationship	Prior Year Relationship
1Q81	$220,831	3854828	$57.287	...	...	...	...	...
2Q81	225,546	3870391	58.275	1.7%	...	...	...	...
3Q81	223,403	3877938	57.609	-1.1%	...	...	...	...
4Q81	241,345	3884579	62.129	7.8%	...	58.829	...	...
	$911,125	15487736						
1Q82	$262,621	3902978	$67.287	8.3%	17.5%	$61.336	4.3%	...
2Q82	266,064	3884304	68.497	1.8%	17.5%	63.887	4.2%	...
3Q82	258,804	3851412	67.197	-1.9%	16.6%	66.277	3.7%	...
4Q82	264,425	3772451	70.094	4.3%	12.8%	68.257	3.0%-	16.0%
	$1,051,914	15411145						
1Q83	$284,001	3745168	$75.831	8.2%	12.7%	$70.365	3.1%	14.7%
2Q83	269,786	3719576	72.531	-4.4%	5.9%	71.379	1.4%	11.7%
3Q83	252,745	3684875	68.590	-5.4%	2.1%	71.770	0.5%	8.3%
4Q83	256,900	3669336	70.013	2.1%	-0.1%	71.762	0.0%	5.1%
	$1,063,432	14818955						
1Q84	$282,950	3657065	$77.371	10.5%	2.0%	$72.119	0.5%	2.5%
2Q84	278,285	3656890	76.099	-1.6%	4.9%	73.007	1.2%	2.3%
3Q84	270,331	3604756	74.993	-1.5%	9.3%	74.614	2.2%	4.0%
4Q84	278,244	3576923	77.789	3.7%	11.1%	76.562	2.6%	6.7%
	$1,109,810	14495634						
1Q85	$308,542	3629849	$85.001	9.3%	9.9%	$78.475	2.5%	8.8%
2Q85	311,823	3605620	86.482	1.7%	13.6%	81.080	3.3%	11.1%
3Q85	304,718	3581214	85.088	-1.6%	13.5%	83.601	3.1%	12.0%
4Q85	305,000	3586455	85.042	-0.1%	9.3%	85.404	2.2%	11.5%
	$1,230,083	14403138						
1Q86	$334,200	3591440	$93.055	9.4%	9.5%	$87.418	2.4%	11.4%
2Q86	332,800	3539991	94.012	1.0%	8.7%	89.287	2.1%	10.1%
3Q86	326,500	3470196	94.087	0.1%	10.6%	91.520	2.5%	9.5%
4Q86	332,700	3468843	95.911	1.9%	12.8%	94.254	3.0%	10.4%
	$1,326,200	14070470						

TABLE 9

HOSPITAL BENEFITS
INCURRED DEVELOPMENT
@ DECEMBER 31, 1986
(DOLLARS IN THOUSANDS)

INCURRED	PAID THRU 12/81	12/82	12/83	12/84	12/85	12/86	ULTIMATE
1981	$779,687	$910,093	$911,807	$911,253	$911,162	$911,125	$911,125
%	85.6%	99.9%	100.1%	100.0%	100.0%	100.0%	
1982	-	$915,950	$1,050,606	$1,051,644	$1,051,879	$1,051,914	$1,051,914
%		87.1%	99.9%	100.0%	100.0%	100.0%	
1983	-	-	$920,895	$1,057,870	$1,062,244	$1,063,432	$1,063,432
%			86.6%	99.5%	99.9%	100.0%	
1984	-	-	-	$906,108	$1,098,500	$1,109,079	$1,109,810
%				81.6%	99.0%	99.9%	
1985	-	-	-	-	$1,011,426	$1,214,786	$1,230,083
%					82.2%	98.8%	
1986	-	-	-	-	-	$1,073,465	$1,326,200
%						80.9%	

GRAPH 2

SURGICAL BENEFITS—1985

DEVELOPMENT BY INCURRED QUARTER

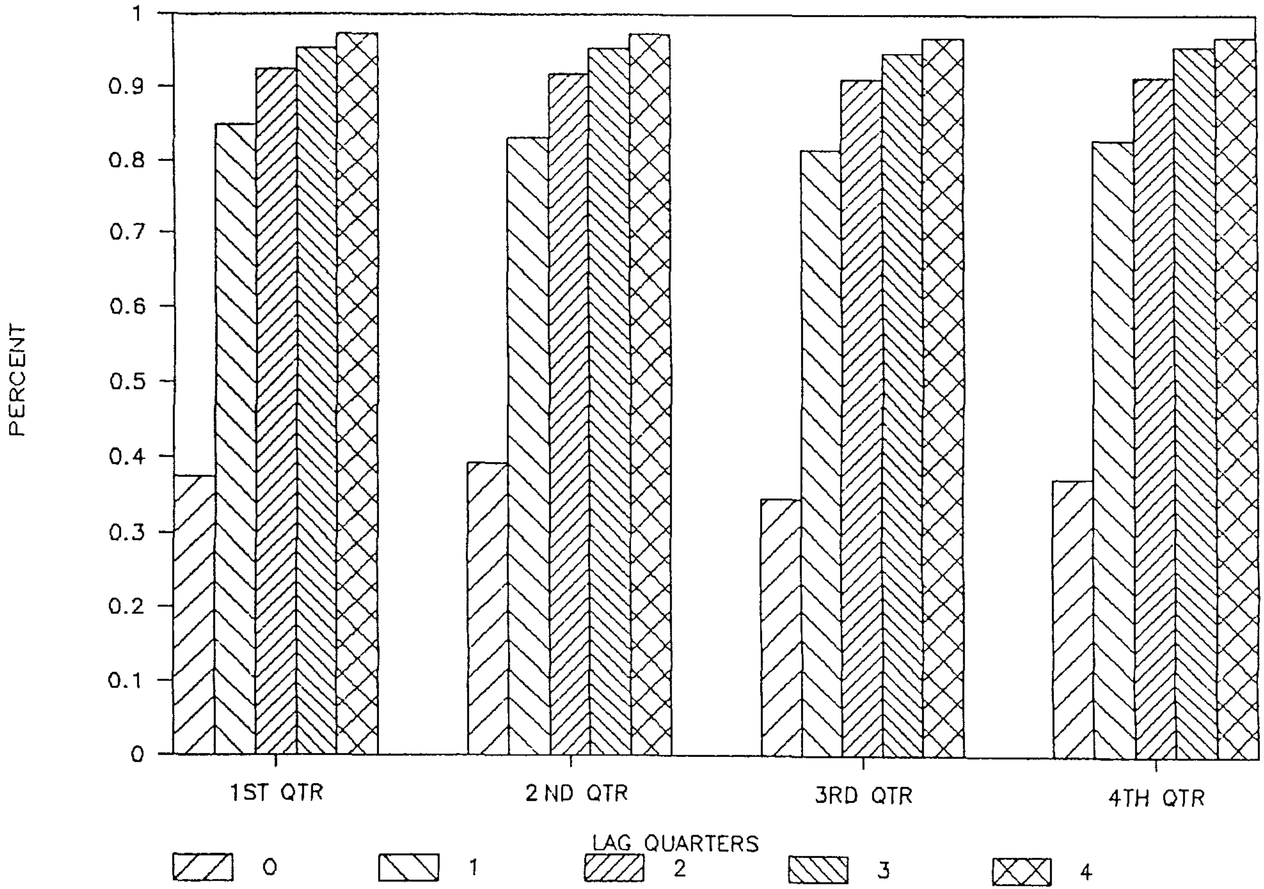

TABLE 10

SURGICAL BENEFITS
PURE PREMIUM TRENDS
@ DECEMBER 31, 1986

			Quarterly Trends			Year Ending Trends		
	ULTIMATES (000'S)	EXPOSURE	Pure Premium	Prior Quarter Relationship	Prior Year Relationship	Pure Premium	Prior Quarter Relationship	Prior Year Relationship
1Q81	$56,218	3,605,237	$18.367	---	---	---	---	---
2Q81	64,899	3,618,276	17.936	-2.3%	---	---	---	---
3Q81	63,854	3,622,432	17.627	-1.7%	---	---	---	---
4Q81	63,659	3,627,477	17.549	-0.4%	---	17.869	---	---
	$258,630	14,473,422						
1Q82	$74,807	3,646,921	$20.512	16.9%	11.7%	$18.410	3.0%	---
2Q82	71,824	3,621,980	19.830	-3.3%	10.6%	18.882	2.6%	---
3Q82	70,546	3,580,334	19.704	-0.6%	11.8%	19.399	2.7%	---
4Q82	69,786	3,527,415	19.784	0.4%	12.7%	19.960	2.9%	11.7%
	$286,963	14,376,650						
1Q83	$82,199	3,501,771	$23.474	18.7%	14.4%	$20.683	3.6%	12.3%
2Q83	77,485	3,475,175	22.297	-5.0%	12.4%	21.301	3.0%	12.8%
3Q83	72,999	3,440,318	21.219	-4.8%	7.7%	21.691	1.8%	11.8%
4Q83	72,177	3,423,867	21.081	-0.7%	6.6%	22.026	1.5%	10.4%
	$304,860	13,841,131						
1Q84	$86,209	3,412,497	$25.263	19.8%	7.6%	$22.460	2.0%	8.6%
2Q84	80,278	3,400,246	23.609	-6.5%	5.9%	22.788	1.5%	7.0%
3Q84	75,492	3,344,398	22.573	-4.4%	6.4%	23.132	1.5%	6.6%
4Q84	75,889	3,322,947	22.838	1.2%	8.3%	23.581	1.9%	7.1%
	$317,868	13,480,088						
1Q85	$92,420	3,469,999	$26.634	16.6%	5.4%	$23.939	1.5%	6.6%
2Q85	90,227	3,446,776	26.177	-1.7%	10.9%	$24.590	2.7%	7.9%
3Q85	88,702	3,427,547	25.879	-1.1%	14.6%	25.407	3.3%	9.8%
4Q85	90,000	3,424,987	26.277	1.5%	15.1%	26.243	3.3%	11.3%
	$361,349	13,769,309						
1Q86	$107,500	3,431,802	$31.325	19.2%	17.6%	$27.414	4.5%	14.5%
2Q86	107,000	3,367,987	31.770	1.4%	21.4%	28.801	5.1%	17.1%
3Q86	108,300	3,307,995	32.739	3.1%	26.5%	30.504	5.9%	20.1%
4Q86	109,000	3,286,565	33.165	1.3%	26.2%	32.237	5.7%	22.8%
	$431,800	13,394,349						

TABLE 11

SURGICAL BENEFITS

INCURRED DEVELOPMENT

(DOLLARS IN THOUSANDS)

INCURRED	PAID THRU 1981	1982	1983	1984	1985	1986	ULTIMATE
1981	$209,447	$257,167	$258,527	$258,617	$258,627	$258,630	$258,630
%	81.0%	99.4%	100.0%	100.0%	100.0%	100.0%	
1982	-	$233,935	$285,739	$286,857	$286,943	$286,963	$286,963
%		81.5%	99.6%	100.0%	100.0%	100.0%	
1983	-	-	$247,898	$303,423	$304,681	$304,860	$304,860
%			81.3%	99.5%	99.9%	100.0%	
1984	-	-	-	$254,158	$312,905	$317,630	$317,868
%				80.0%	98.4%	99.9%	
1985	-	-	-	-	$277,038	$355,138	$361,349
%					76.7%	98.3%	
1986	-	-	-	-	-	$330,600	$431,800
%						76.6%	

GRAPH 3

MAJOR MEDICAL BENEFITS—1985

DEVELOPMENT PATTERNS

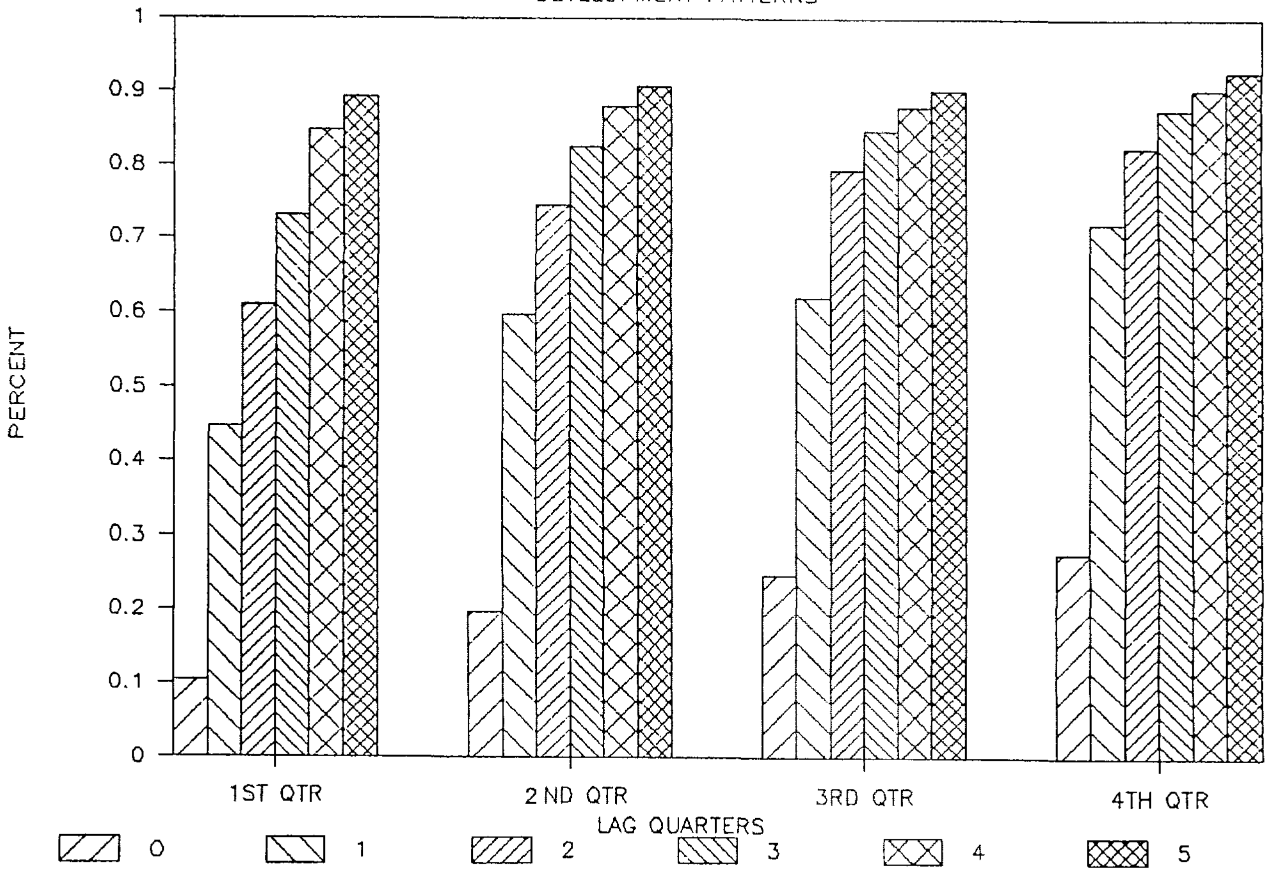

TABLE 12

MAJOR MEDICAL BENEFITS
PURE PREMIUM TRENDS
@ DECEMBER 31, 1986

			Quarterly Trends			Year Ending Trends		
	ULTIMATES (000's)	EXPOSURE	Pure Premium	Prior Quarter Relationship	Prior Year Relationship	Pure Premium	Prior Quarter Relationship	Prior Year Relationship
1Q80	$27,358	3,157,820	$8.664	---	---	---	---	---
2Q80	16,426	3,153,056	5.210	-39.9%	---	---	---	---
3Q80	17,301	3,143,088	5.504	5.6%	---	---	---	---
4Q80	15,875	3,128,831	5.074	-7.8%	---	6.116	---	---
	$76,960	12,582,795						
1Q81	$30,923	3,135,645	$9.862	94.4%	13.8%	$6.411	4.8%	---
2Q81	19,555	3,160,294	6.188	-37.3%	18.8%	6.656	3.8%	---
3Q81	20,451	3,170,366	6.451	4.3%	17.2%	6.892	3.5%	---
4Q81	20,521	3,166,815	6.480	0.4%	27.7%	7.239	5.0%	18.4%
	$91,450	12,633,120						
1Q82	$41,604	3,324,937	$12.513	93.1%	26.9%	$7.965	10.0%	24.2%
2Q82	28,196	3,316,375	8.502	-32.1%	37.4%	8.535	7.2%	28.2%
3Q82	28,642	3,300,439	8.678	2.1%	34.5%	9.075	6.3%	31.7%
4Q82	30,024	3,268,924	9.185	5.8%	41.7%	9.724	7.2%	34.3%
	$128,466	13,210,675						
1Q83	$50,932	3,209,728	$15.868	72.8%	26.8%	$10.522	8.2%	32.1%
2Q83	36,123	3,190,236	11.323	-28.6%	33.2%	11.236	6.8%	31.6%
3Q83	35,995	3,163,278	11.379	0.5%	31.1%	11.929	6.2%	31.4%
4Q83	36,085	3,162,938	11.409	0.3%	24.2%	12.505	4.8%	28.6%
	$159,135	12,726,180						
1Q84	$54,614	3,135,709	$17.417	52.7%	9.8%	$12.869	2.9%	22.3%
2Q84	43,206	3,136,036	13.777	-20.9%	21.7%	13.486	4.8%	20.0%
3Q84	42,553	3,069,078	13.865	0.6%	21.8%	14.112	4.6%	18.3%
4Q84	37,821	3,065,049	12.339	-11.0%	8.2%	14.364	1.8%	14.9%
	$178,194	12,405,872						
1Q85	$47,674	3,189,051	$14.949	21.2%	-14.2%	$13.745	-4.3%	6.8%
2Q85	44,055	3,176,027	13.871	-7.2%	0.7%	13.769	0.2%	2.1%
3Q85	44,500	3,139,806	14.173	2.2%	2.2%	13.847	0.6%	-1.9%
4Q85	46,600	3,128,312	14.896	5.1%	20.7%	14.472	4.5%	0.8%
	$182,829	12,633,196						
1Q86	$51,500	3,129,350	$16.457	10.5%	10.1%	$14.845	2.6%	8.0%
2Q86	48,000	3,099,171	15.488	-5.9%	11.7%	15.252	2.7%	10.8%
3Q86	49,000	3,066,918	15.977	3.2%	12.7%	15.704	3.0%	13.4%
4Q86	52,000	3,074,061	16.916	5.9%	13.6%	16.209	3.2%	12.0%
	$200,500	12,369,500						

TABLE 13

MAJOR MEDICAL BENEFITS

INCURRED DEVELOPMENT

(DOLLARS IN THOUSANDS)

INCURRED	12/80	12/81	12/82	12/83	12/84	12/85	12/86	ULTIMATE
	PAID THRU							
1980	$39,211	$69,238	$73,396	$75,120	$76,307	$76,540	$76,910	$76,960
%	50.9%	90.0%	95.4%	97.6%	99.2%	99.5%	99.9%	
1981	-	$49,876	$84,383	$89,041	$90,994	$91,084	$91,181	$91,450
%		54.5%	92.3%	97.4%	99.5%	99.6%	99.7%	
1982	-	-	$74,433	$120,497	$126,323	$127,556	$127,889	$128,466
%			57.9%	93.8%	98.3%	99.3%	99.6%	
1983	-	-	-	$95,219	$150,146	$157,184	$158,017	$159,135
%				59.8%	94.4%	98.8%	99.3%	
1984	-	-	-	-	$107,529	$167,892	$175,982	$178,194
%					60.3%	94.2%	98.8%	
1985	-	-	-	-	-	$109,899	$169,492	$182,829
%						60.1%	92.7%	
1986	-	-	-	-	-	-	$116,710	$200,500
%							58.2%	

Table 12 indicates that there is a seasonality as to incurrals. With two seasonal patterns influencing the outcome, the estimating of ultimates takes on an added challenge. Some of the variation you see in the pure premiums is a result of a transfer as well as change in benefits.

Medigap policies (Graph 4, Tables 14 and 15) show a seasonal development and incurral pattern. This reflects the impact of a calendar deductible for Part B benefits and a spell of illness deductible for Part A benefits.

The last set of charts deal with dental benefits. As you can see (Graph 5) not only do they develop fairly rapidly but there is little seasonal variation. There is seasonal variation by incurred quarter (Table 16). Some caution should be taken when dealing with dental. If it is a new line of business and rapidly growing, the first year pure premiums can be 10 to 15% greater than the second year's pure premium. The pure premium exhibit (Table 16) can aid in setting ultimates based on the mix of new and renewal business.

GRAPH 4

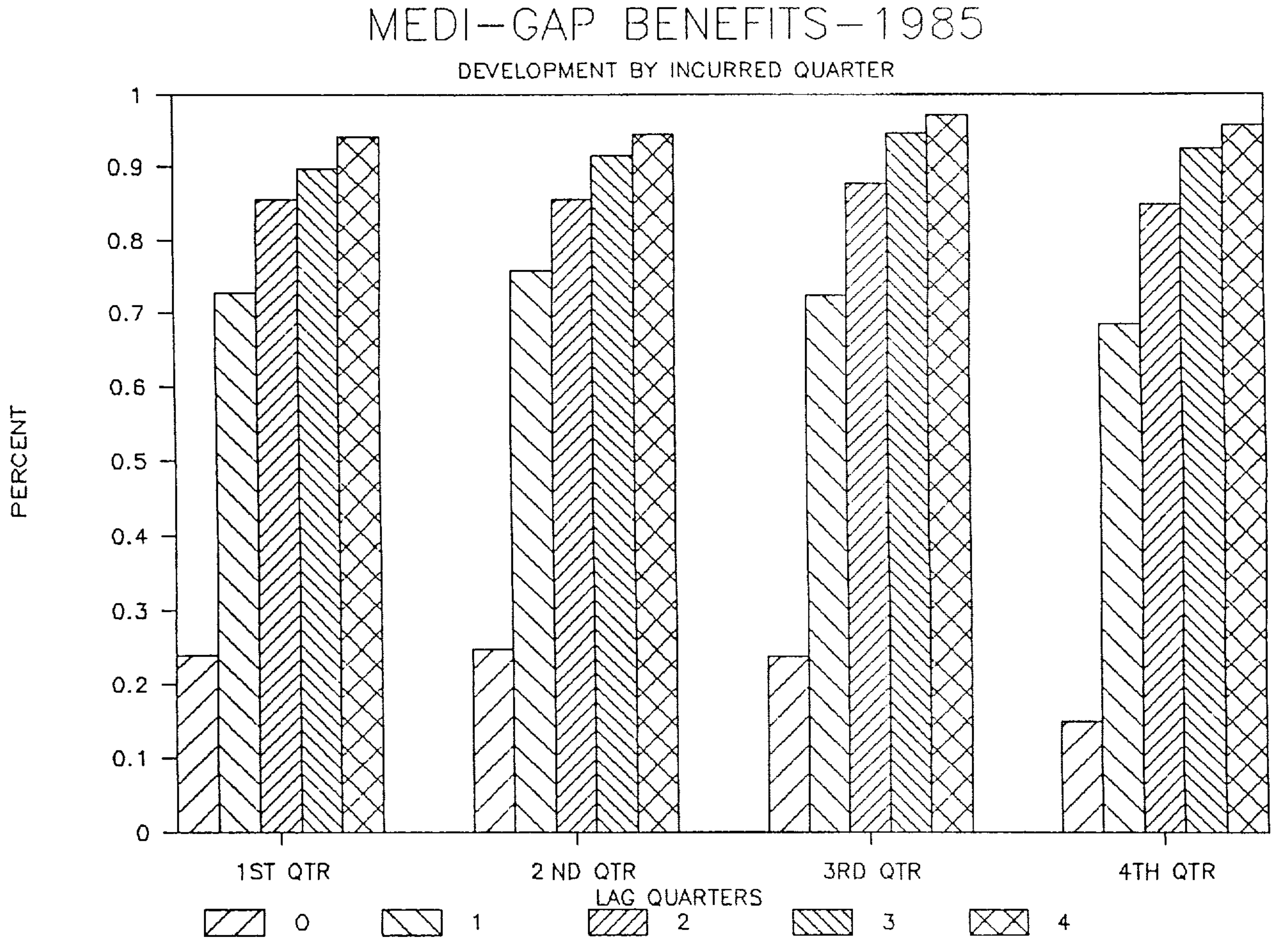
MEDI–GAP BENEFITS–1985
DEVELOPMENT BY INCURRED QUARTER
PERCENT
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1ST QTR
2 ND QTR
3RD QTR
4TH QTR
LAG QUARTERS
0
1
2
3
4

TABLE 14

MEDIGAP BENEFITS
PURE PREMIUM TRENDS
@ DECEMBER 31, 1986

			Quarterly Trends			Year Ending Trends		
	ULTIMATE (000's)	EXPOSURE	Pure Premium	Prior Quarter Relationship	Prior Year Relationship	Pure Premium	Prior Quarter Relationship	Prior Year Relationship
1Q81	$30,250	1,315,235	$23.000	...	...	...	...	...
2Q81	28,912	1,315,442	21.979	-4.4%	...	...	...	...
3Q81	28,526	1,337,157	21.333	-2.9%	...	...	...	...
4Q81	30,185	1,347,769	22.396	5.0%	...	22.175	...	...
	$117,873	5,315,603						
1Q82	$38,816	1,318,013	$29.450	31.5%	28.0%	$23.774	7.2%	...
2Q82	36,939	1,315,441	28.081	-4.6%	27.8%	25.283	6.3%	...
3Q82	35,358	1,322,959	26.726	-4.8%	25.3%	26.639	5.4%	...
4Q82	38,602	1,350,989	28.573	6.9%	27.6%	28.209	5.9%	27.2%
	$149,715	5,307,402						
1Q83	$47,840	1,351,074	$35.409	23.9%	20.2%	$29.724	5.4%	25.0%
2Q83	45,018	1,348,463	33.385	-5.7%	18.9%	31.045	4.4%	23.8%
3Q83	41,091	1,349,010	30.460	-8.8%	14.0%	31.957	2.9%	20.0%
4Q83	43,486	1,348,070	32.258	5.9%	12.9%	32.879	2.9%	16.[illegible]%
	$177,435	5,396,617						
1Q84	$53,810	1,355,289	$39.704	23.1%	12.1%	$33.959	3.3%	14.2%
2Q84	50,330	1,364,009	36.899	-7.1%	10.5%	34.842	2.6%	12.2%
3Q84	45,357	1,370,752	33.089	-10.3%	8.6%	35.487	1.9%	11.0%
4Q84	48,516	1,349,887	35.941	8.6%	11.4%	36.400	2.6%	10.7%
	$198,013	5,439,937						
1Q85	$56,101	1,337,437	$41.947	16.7%	5.6%	$36.942	1.5%	8.8%
2Q85	51,697	1,334,354	38.743	-7.6%	5.0%	37.399	1.2%	7.3%
3Q85	49,263	1,357,044	36.302	-6.3%	9.7%	38.220	2.2%	7.7%
4Q85	50,900	1,360,328	37.417	3.1%	4.1%	38.589	1.0%	6.0%
	$207,961	5,389,163						
1Q86	$58,850	1,330,895	$44.218	18.2%	5.4%	$39.146	1.4%	6.0%
2Q86	54,800	1,311,268	$41.792	-5.5%	7.9%	39.894	1.9%	6.7%
3Q86	51,750	1,288,373	40.167	-3.9%	10.6%	40.882	2.5%	7.0%
4Q86	52,600	1,258,630	41.791	4.0%	11.7%	42.011	2.8%	8.9%
	$218,000	5,189,166						

TABLE 15

MEDIGAP BENEFITS

INCURRED DEVELOPMENT

(DOLLARS IN THOUSANDS)

INCURRED	PAID THRU 12/81	12/82	12/83	12/84	12/85	12/86	ULTIMATE
1981	$87,986	$116,536	$117,782	$117,872	$117,873	$117,873	$117,873
%	74.6%	98.9%	99.9%	100.0%	100.0%	100.0%	
1982	-	$110,758	$147,393	$149,633	$149,687	$149,715	$149,715
%		74.0%	98.4%	99.9%	100.0%	100.0%	
1983	-	-	$130,927	$174,865	$177,229	$177,425	$177,435
%			73.8%	98.6%	99.9%	100.0%	
1984	-	-	-	$141,926	$194,536	$197,782	$198,013
%				71.7%	98.2%	99.9%	
1985	-	-	-	-	$139,672	$204,001	$207,961
%					67.2%	98.1%	
1986	-	-	-	-	-	$154,320	$218,000
%						70.8%	

GRAPH 5

DENTAL BENEFITS—1984

DEVELOPMENT BY INCURRED QUARTER

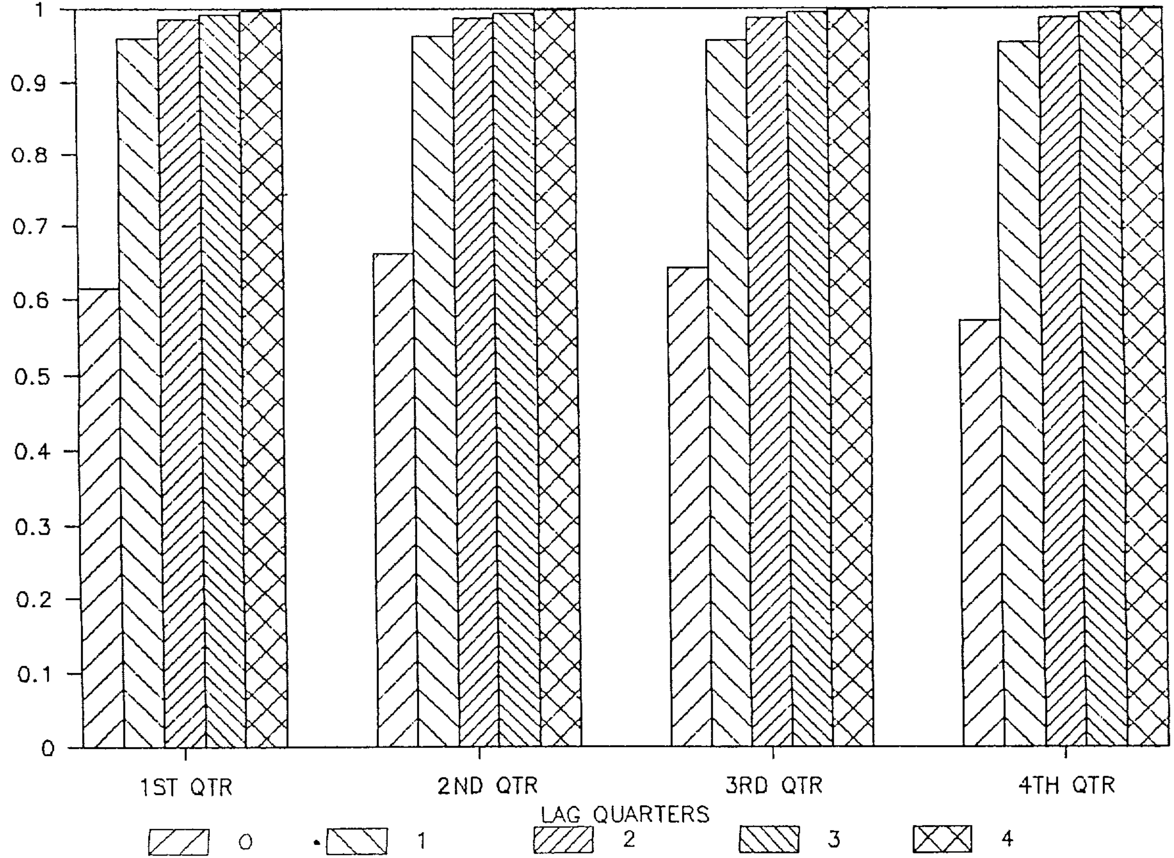

TABLE 16

DENTAL COVERAGE
DECEMBER 1984

	Ultimates (000's)	EXPOSURE	Quarterly Trends: Pure Premium	Quarterly Trends: Prior Quarter Relationship	Quarterly Trends: Prior Year Relationship	Year Ending Trends: Pure Premium	Year Ending Trends: Prior Quarter Relationship	Year Ending Trends: Prior Year Relationship
1Q78	$1,724	241142	$7.149	...	...	...	...	...
2Q78	1,918	259420	7.393	3.4%	...	...	...	...
3Q78	2,110	276758	7.624	3.1%	...	...	...	...
4Q78	2,926	320989	9.116	19.6%	...	7.901	...	...
	$8,678	1098309						
1Q79	$3,096	332203	$9.320	2.2%	30.4%	$8.450	6.9%	...
2Q79	3,150	346300	9.096	-2.4%	23.0%	8.840	4.6%	...
3Q79	3,099	367650	8.429	-7.3%	10.6%	8.976	1.5%	...
4Q79	3,612	402834	8.966	6.4%	-1.6%	8.942	-0.4%	13.2%
	$12,957	1448987						
1Q80	$4,184	427963	$9.777	9.0%	4.9%	$9.092	1.7%	7.6%
2Q80	4,404	441824	9.968	2.0%	9.6%	9.327	2.6%	5.5%
3Q80	4,113	456560	9.009	-9.6%	6.9%	9.434	1.1%	5.1%
4Q80	4,572	468852	9.751	8.2%	8.8%	9.622	2.0%	7.6%
	$17,273	1795199						
1Q81	$5,300	493789	$10.733	10.1%	9.8%	$9.881	2.7%	8.7%
2Q81	5,783	521807	11.083	3.3%	11.2%	10.184	3.1%	9.2%
3Q81	5,543	551512	10.051	-9.3%	11.6%	10.412	2.2%	10.4%
4Q81	6,188	567440	10.905	8.5%	11.8%	10.628	2.7%	11.1%
	$22,814	2134548						
1Q82	$6,552	590772	$11.091	1.7%	3.3%	$10.785	0.9%	9.1%
2Q82	6,804	606073	11.226	1.2%	1.3%	10.833	0.4%	6.4%
3Q82	6,679	617475	10.817	-3.6%	7.6%	11.010	1.6%	5.7%
4Q82	7,245	624169	11.607	7.3%	6.4%	11.187	1.6%	4.7%
	$27,280	2438489						
1Q83	$7,438	626577	$11.871	2.3%	7.0%	$11.383	1.8%	5.5%
2Q83	7,905	639963	12.352	4.1%	10.0%	11.669	2.5%	7.7%
3Q83	7,288	651622	11.184	-9.5%	3.4%	11.751	0.7%	6.7%
4Q83	7,935	658329	12.053	7.8%	3.8%	11.863	1.0%	6.0%
	$30,566	2576491						
1Q84	$8,550	665241	$12.852	6.6%	8.3%	$12.113	2.1%	6.4%
2Q84	9,000	679574	13.244	3.1%	7.2%	12.345	1.9%	5.8%
3Q84	8,200	678396	12.078	-8.8%	8.0%	12.559	1.7%	6.9%
4Q84	9,100	691532	13.159	9.0%	9.2%	12.835	2.2%	8.2%
	$34,850	2715243						