Panel Session 3E

# RESERVING FOR HEALTH INSURANCE

## General Framework

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1985 Casualty Loss Reserve Seminar

Kansas City, Missouri

## Introduction

We are all at this Loss Reserve Seminar because we recognize the importance of proper reserving. However, we have various backgrounds. Some are technicians; others managers. Some are very experienced; others relatively new. Some are solely involved with group health; others with casualty lines.

In addition, we all realize that there is no standard nomenclature and no universally accepted terminology within the group health reserving process. There are no statistical plans for group health insurance. Data elements used to identify group health data differ from company to company. Even when the same name is used, that term may have different meanings.

The objective of this session is to discuss the peculiarities and special considerations for five types of group health coverages. Therefore, we need to establish a common framework in which to satisfy the objective. This common basis will enable each of us to relate and communicate our procedures to those of our neighbor. This framework will also be simplified enough so that we won't be overwhelmed by the detail of such a broad topic.

We will use slides to help construct this framework. Handouts with more detail are available for your reference. These handouts incorporate the material and exhibits contained on the slides. There is notation to denote where the material for each slide begins. The plan of attack is to:

(slide 1)

1. briefly discuss general characteristics unique to group health reserving,

2. briefly consider source data requirements since analysis depends upon the kind and quality of the information, and

3. construct a framework for estimating incurred amounts and monitoring the results.

## General Characteristics

These characteristics describe major differences between reserving for group health and casualty/liability lines of business.

(slide 2)

1. The "tail" denoting the pattern of payments for claims incurred in a particular period is shorter than liability lines of business. Generally, a period of 24 to 36 months is used to analyze and estimate reserves.

2. Experience is studied in terms of months rather than in one-year (or half-year) units. The bulk of the reserves depends upon estimates for claims incurred in the most recent 3 to 6 months, depending upon the type of benefit coverage.

(slide 3)

3. For most group health coverages, there is a seasonal pattern for incurred claims by calendar month. For example, the first quarter of the year tends to produce higher pure premium values than the other three quarters.

4. Group health experience exhibits high claim frequency and greater volume. Hence, modelling for reserving is not performed on the basis of assumed probability distributions like lognormal and Pareto. In addition, techniques using formula reserving rather than case reserves are employed.

(slide 4)

5. Group health reserves are very volatile because external forces can have an almost instantaneous effect upon the most recent 3 to 6 months. Reserving requires the knack to immediately recognize factors that change incurral and payment patterns. In particular, changes must be recognized in utilization, economic conditions, and product mix as well as coverage changes mandated by legislation.

6. No reserves for loss adjustment expenses are established.

## Source Data Requirements

Reserving requires good, reliable data as does all analysis for management of risk. We'll categorize data as labels, dates, and amounts.

### Labels

Labels identify the experience. Selected labels are used to categorize combinations of homogeneous data into credible risk cells for reserving purposes. Reserving cells reflect different claim payment patterns resulting from the benefit structures, attitude of the providers and insureds, and cash flow requirements of providers and insureds. For this panel, we will assume that these combinations are dependent upon four data elements.

(slide 5)

1. Major benefit category (also called line of business). This denotes the type of benefit coverage. Examples are hospital, surgical, dental, and major medical.

2. Actuarial level of benefit. This denotes a subdivision within a major benefit category, such as major medical deductibles and limits, or inpatient versus outpatient coverage for hospitals.

3. Type of business. This denotes characteristics of the contract holder. Examples are small group business, non-group business, FEP, and national/country-wide business.

4. Financial arrangement. This denotes how the coverage is financed. Examples are prospective, cost plus, etc.

Advantages result from denoting reserving cells by code combination of these four separate data elements rather than a single element attempting to comprise all four concepts. There is capability for more detailed reporting. Flexibility exists to readily redefine reserving cells.

Other labels are important to identify changes in assumed patterns and trends within a reserving cell. These labels will be discussed later as needed.

Dates

The following dates should be available by month and year.

(slide 6 )

1. Incurred/earned date.

   a. For claims, this is the incurred date. Incurred date should be the date of admission for hospital benefits, and date of service for other services (physician, X-rays, etc.).

   b. For exposure and income, this is the earned date. Earned date denotes the statistical earned month for which there was risk for group health coverage.

2. Statistical Paid date.

   a. For claims, this is the date when the claim was adjudicated and the payment amount determined. This may not be the same as the date on which payment checks are cut.

   b. For exposure and income, this is the date when income was recorded on or after the incurred/earned date.

In addition, financial paid date is important to reconcile accounting and statistical data when checks are not cut daily.

Amounts

We will assume that there are three basic amounts for reserving purposes.

(slide 7)

1. Paid amount. This is the claim amount paid after application of appropriate deductibles, coinsurance, coordination of benefits, discounts, subrogation, and coverage limits.

2. Exposure. This denotes the number of subscriber contracts, or subscriber enrollments. Ideally, exposure should reflect the number of days at risk throughout a month. In many cases, this amount is a snapshot at the end of the month.

3. Income.

Other amounts are useful and will be addressed during discussion of types of coverage. These include number of claims (i.e., number of unique procedures or types of service); number of services; number of days, visits, or treatments (depending upon the major benefit category).

## General Procedures

For each reserving cell, the general procedure is assumed to be as follows:

(slide 8)

1. Develop experience reports detailing paid claims and cumulative paid claims by incurred month and paid months. We will call these triangular reports.

2. Estimate ultimate incurred amounts.

    a. This is an iterative process of estimating, analyzing, revising the estimate, and repeating the process.

    b. Completion factors are determined on the basis of the "age" of the claim and historical patterns of claim payments observed in the cumulative paid claims triangle. Different completion factor approaches are utilized, and values are adjusted for projected trends and judgment.

3. Monitor and evaluate current and past estimates. Review financial condition.

## Triangular Reports

1. Paid claims report. This report displays claim amounts paid by paid month for each incurred month in the study period.

(slide 9)

| | | INCURRED MONTH | | | |
|---|---|---|---|---|---|
| | | 1/85 | 2/85 | 3/85 | 4/85 |
| | 1/85 | 15 | | | |
| PAID | 2/85 | 45 | 12 | | |
| MONTH | 3/85 | 30 | 43 | 14 | |
| | 4/85 | 10 | 30 | 45 | 14 |

2. Cumulative paid claims report. This report displays cumulative claims payments for each incurred month in the study period.

(slide 10)

| | | INCURRED MONTH | | | |
|---|---|---|---|---|---|
| | | 1/85 | 2/85 | 3/85 | 4/85 |
| | 1/85 | 15 | | | |
| PAID | 2/85 | 60 | 12 | | |
| MONTH | 3/85 | 90 | 55 | 14 | |
| | 4/85 | 100 | 85 | 59 | 14 |

(slide 11)

## Completion Factor Approach

Completion factor is defined for a particular incurred month to be dependent upon the number of months of claim payment runoff. A completion factor is the percentage of estimated incurred claims (ultimate claim amount) already paid through a particular paid date. A completion factor is applied to cumulative paid claims as a divisor to derive an estimate for incurred claims.

(slide 12)

| INCURRED MONTH | PAYMENTS THRU 8/85 | CF | EST INCURRED AMOUNT |
|---|---|---|---|
| 1/85 | 105 | .99 | 106 |
| 3/85 | 100 | .95 | 105 |
| 6/85 | 80 | .80 | 100 |
| 8/85 | 10 | .11 | 91 |

e.g., for 3/85, EST INC = 100/.95 = 105

Completion factors are the reciprocal of the development factors commonly used for casualty reserving. Some people also use the term completion factor for the multiplier.

There are two general patterns assumed; duration pattern and seasonal pattern.

Durational Pattern

(slide 13)

Completion is assumed to be more dependent on the length of time between incurred date and paid date than the calendar month of incurral. The period between incurred date and paid date is called runout, runoff, or lag. For claims incurred in July, 1985 for example, 7/85 is lag month 0, 8/85 is lag month 1, etc. Completion factors are the products of completion ratios. Completion ratios denote paid/paid completion from a given paid month to the next paid month. The table below illustrates a claim pattern.

(slide 14)

| LAG MON | CUMULATIVE PAYMENTS | CR | CF |
|---|---|---|---|
| 0 | 5 | .10 | .05 |
| 1 | 50 | .63 | .50 |
| 2 | 80 | .89 | .80 |
| 3 | 90 | .90 | .90 |
| 4 | 100 | | 1.00 |

e.g., for lag month 2, CR = 80/90 = .89

CF = (.89)*(.90)

Completion ratios are derived from the cumulative paid claims triangle using the most current data available for each ratio. The selected completion ratios are then used to calculate completion factors for each lag month. These are applied to the cumulative paid amount in each incurred month to generate an estimated incurred amount. The oldest incurred month in the study period is assumed to be complete (completion factor = 1.00).

1. Cumulative paid claims.

| | | INCURRED MONTH | | | | |
|---|---|---|---|---|---|---|
| | | 1/85 | 2/85 | 3/85 | 4/85 | 5/85 |
| | 1/85 | 5 | | | | |
| PAID | 2/85 | 51 | 5 | | | |
| MONTH | 3/85 | 79 | 53 | 6 | | |
| | 4/85 | 90 | 80 | 50 | 5 | |
| | 5/85 | 100 | 90 | 80 | 50 | 5 |

2. Completion ratios.

(slide 15)

| | | INCURRED MONTH | | | | |
|---|---|---|---|---|---|---|
| | | 1/85 | 2/85 | 3/85 | 4/85 | 5/85 |
| | 1/85 | | | | | |
| PAID | 2/85 | .10 | | | | |
| MONTH | 3/85 | .65 | .09 | | | |
| | 4/85 | .88 | .66 | .12 | | |
| | 5/85 | .90 | .89 | .63 | .10 | |

Selected completion ratios in this example are displayed in the last line of the completion ratio table above.

Seasonal Pattern

(slide 16)

Completion is assumed to be dependent upon the calendar month of incurral as well as the length of time between incurred date and paid date. Completion factors are developed using a ratio of (cumulative paid amount) to (estimated incurred amount) on a calendar month basis.

(slide 17)

| INC MON | PAYMENTS THRU 8/84 | PAYMENTS THRU 8/85 | CF | EST INC AMOUNT |
|---|---|---|---|---|
| 3/84 | 80 | 100 | 1.00 | 100 |
| 4/84 | 75 | 105 | .99 | 106 |
| : | | | | |
| 3/85 | | 72 | .80 | 90 |
| 4/85 | | 78 | .71 | 110 |

For 3/85, CF = $\frac{\text{payments thru 8/84 for inc in 3/84}}{\text{est incurred amount for 3/84}}$

= 80/100 = .80

Calculated completion factors are adjusted judgmentally before final application. The examples in this presentation use single incurred months. However, one may also use rolling or moving incurral periods such as quarters.

## Special Considerations for the Most Recent Incurred Months

The credibility of completion factors may be questioned for the most recent 3-6 months. Rules of thumb state that completion factors less than 50% to 70% require further analysis. Completion factors are used for the "prior period." Whereas the most "recent period" generally requires additional investigation. Adjustment can be performed as follows:

(slide 18)

1. Use averaging to smooth out ratios. Adjust for seasonality. Use completion factors calculated and applied to 3-month periods in lieu of single months.

2. Use pure premium trending. A pure premium (also called net claim cost) is the (estimated incurred amount)/(earned exposure). The projected pure premium value for a recent month is multiplied by the recent month's exposure in order to estimate the incurred amount.

$$\begin{array}{lcl} \text{Est inc amount for 8/85} & = & \text{projected pure premium for 8/85} * \text{exposure for 8/85} \\ \text{projected pure premium for 8/85} & = & \text{pure premium for 8/84} * \text{annualized trend factor} \end{array}$$

   These trend factors reflect inflation, utilization shifts, and per diem changes. Trend factors are commonly determined by judgment, using regression on pure premiums, or reviewing pure premium trends to date. Here it is important to have proper exposure.

3. Adjust judgmentally after reviewing results from different methods.

(slide 19)

## Monitoring Reserve Estimates

Monitoring reports provide feedback (1) to analyze current reserve estimates for adjustment and revision, and (2) to evaluate past reserving estimates and procedures.

1. Analyze current reserve estimates.

(slide 20)

a. Review hindsight completion factors by month. These are the completion factors that should have been used in the past, given that the latest incurred estimates are the best. One way to accomplish this is to divide each incurred month's cumulative payments in the cumulative paid claims report by the estimated incurred amount. Check that calendar year pattern assumptions are valid by reviewing the completion factors along the diagonals.

(slide 21)

| | | INCURRED MONTH | | | |
|---|---|---|---|---|---|
| | | 1/85 | 2/85 | 3/85 | 4/85 |
| PAID MONTH | 1/85 | .15 | | | |
| | 2/85 | .60 | .13 | | |
| | 3/85 | .90 | .59 | .14 | |
| | 4/85 | 1.00 | .91 | .60 | .15 |
| EST INC | | 100 | 93 | 98 | 96 |

hindsight completion factor for incurrals in 1/85 paid through 2/85 = $\frac{\text{cum'l payments thru 2/85}}{\text{est inc amount for 1/85}}$

= 60/100 = .60

b. Compare hindsight completion factors with the completion factors selected for the current valuation month. Perform comparison of completion factors between calendar years for corresponding 1-month, 3-month, 6-month, and 12-month incurral periods at the same relative points of runoff.

(slide 22)

c. Review loss ratios.

d. Review trends for various indices. These are annualized trends for 1-month, 3-month, 6-month, and/or 12-month incurral periods. Valuation month is the month in which a reserve estimate is established for all incurrals through that month. The following indices are recommended.

(slide 23)

- o pure premiums
- o $\frac{\text{estimated incurred amount for incurred month MM/YY}}{\text{total payments in month MM/YY}}$
- o $\frac{\text{estimate incurred amount for incurred month MM/YY}}{\text{payments in month MM/YY for incurrals in MM/YY}}$
- o $\frac{\text{reserve as of valuation month MM/YY}}{\text{total payments in month MM/YY}}$
- o $\frac{\text{reserve as of valuation month MM/YY}}{\text{payments in month MM/YY for incurrals in MM/YY}}$
- o exposure

e. Convert completion factors to multipliers.

2. Evaluate past reserve estimates and procedures with restated estimates.

Compare past estimates with restated estimates. The restated estimate for reserve as of a specific valuation date is runoff since that time plus the estimated liability yet remaining. This restated estimate is also called recast reserve.

(slide 24)

a. Compare original booked reserves with recast estimates by valuation dates.

b. Compare current valuation month's reserve with the restated reserve for the valuation date one year earlier, after adjusting the latter for changes in exposure, inflation, and inventory.

c. Compare various indices over time.

- o $\frac{\text{current valuation month's reserve}}{\text{total payments in valuation month}}$
- o $\frac{\text{current valuation month's reserve}}{\text{estimated incurred amount for incurrals in valuation month}}$
- o $\frac{\text{current valuation month's reserve}}{\text{estimated incurred amount for incurrals in 3 months ending in valuation month}}$

## Wrap-Up

We have established a common framework in which to discuss the perculiarities and special considerations for five types of group health coverages. To build our foundation, we did the following:

(slide 25)

1. Reviewed general characteristics unique to group health reserving.

2. Defined source data requirements since analysis depends upon the kind and quality of the information.

3. Employed completion factor approaches with special techniques for the most recent months to estimate incurred amounts and included monitoring of results.

(slide 26)

Now, let's use this framework as we all participate in the balance of the session.

Panel Session 3E

# RESERVING FOR HEALTH INSURANCE

## Coverages

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Now that Glenn has covered the basics of reserving health coverages, we will discuss the different types of coverages. First, I will discuss hospital, physician, supplementary coverage and comprehensive major medical (CMM). Then, Emil will discuss dental and Medicare supplementary coverages.

In discussing these coverages, I will give some of my own experiences as well as covering the actuarial techniques. My background in health reserving has included acting as the in-house actuary for a medium sized life and health insurance company, acting as a consultant on health reserving techniques to HMOs and small to medium sized insurance companies, and acting as the actuary on numerous audits of insurance companies, HMO's and Blue's.

First, I'll cover the traditional approaches to the hospital, physician and supplementary coverages. Then, I'll describe a new approach to reserving these coverages that is tied to the recent changes in medical care cost containment. Finally, I'll discuss CMM, giving special attention to the small and medium sized operations, where there may be data limitations.

The techniques selected by a particular company will depend on the volume of business it transacts and the amount of information captured in their data collection system. If we have a large volume and good data systems, then we look at hospital claims in subcategories. The first dimension to consider is inpatient vs. outpatient care. Outpatient care has a slower payment pattern than inpatient care. Since the treatment mix today is shifting to outpatient care, separating the data into homogeneous categories is important. An additional dimension to consider is the type of business and financial arrangements. Some of the factors that may indicate the subgroups include: separate data on extremely large accounts, cost plus groups, experience rated groups, small groups, etc. Consideration should

also be given to claims administration when the insurance company allows the employer to use a special claims administrator. This can affect not only claim payment patterns but the timing and quality of financial reporting.

Typically, reserve analysis on one of the hospital subcategories begins with the completion factor approach. The completion ratios selected are not typically based on only the most recent month's payment pattern, but are the average of the latest 3-6 months' completion ratio, or alternatively, the ratio is based on the sum of the latest 3-6 months of payments. The completion factor approach can be applied to dollars, hospital days or hospital stays. The use of days and the average per diem is preferred over dollars, unless there is little stability in the per diem. The per diem could be based on the average paid during the last quarter or trended from historical data. With the recent emphasis on paying hospitals by DRG (Diagnostic Related Group), we may be using hospital admissions times the average cost per admission in the future. The outpatient completion factor is usually based on dollars.

Once the initial estimate is established using completion factors on hospital days and trending per diems, the challenge process begins. The challenge process is focused on the most recent months, typically three months, where there is the greatest uncertainty in reserves. Options in the challenge process include:

- Completion factor
  - Using the monthly or quarterly factors from last quarter's analysis
  - Using monthly or quarterly factors from the corresponding period in the prior year's analysis (seasonality)

- Testing ultimates for reasonableness - trend
  - Hospital days/1000 members
  - Hospital stays/1000 members
  - Average length of stay
  - Cost per diem
  - Cost per stay

- Ratios
  - Multiple quarter test
  - Incurred ratios
  - Multipliers

While reviewing the various completion factors and the reserves they generate, we keep in mind changes in the environment. If there has been a slow down in receiving or processing hospital bills, we know that the historical factors will understate current reserves. Statistics that assist in the review of processing changes are average processing time and counts of outstanding claim files.

In reviewing hospital trends the key trends to focus on are: hospital days/1000 members (utilization) and cost per diem. Do these trends look reasonable in light of changes in the marketplace, i.e., emphasis on utilization review, impact of DRG's, rising medical costs? For example, if the utilization rate is dropping rapidly, more rapidly than expected, then we increase the estimated ultimate days.

There are many ratios or relationships that can be reviewed through further testing the estimates of ultimate for reasonableness. Some of these are:

- 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

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

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

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

For physician services, medical and surgical, we begin the reserving process with the completion factor approach applied to dollars. The completion factor method is less certain for physician services than hospital services for the most recent incurred months, due to longer processing time, so the trend analysis and ratio tests are important for physician services. The trends to compare to events in the marketplace are the change in number of services per member per month and the change in average cost of services. The ratio tests may be used as a means of calculating the most recent quarter's incurred claims rather than just as a reasonableness test.

Supplemental coverages will most likely have the least stability in their patterns and the greatest processing lag. These services may be miscellaneous charges, charges extending

the basic coverage limits but not the major medical limits, extended care facilities, drugs, and so on. Usually there is not a sufficient volume of these coverages to be subdivided into homogeneous subcategories. So more judgment will be involved in estimating the ultimate incurred costs as we proceed with the reserve analysis. The emphasis will be on the completion factor approach applied to dollar amounts and trends and ratios.

Now, as I mentioned earlier, I would like to talk about a new approach that we are seeing used by some HMO's. The underlying cause of this new approach is active cost containment programs such as pre-admission certification and utilization review, which call for the collection of more detailed information and more up-to-date information. This information can then be used not only to control costs, but to improve reserve estimates for the hospital, physician, and miscellaneous coverages. This approach may be practical in the future for insurance companies as well as HMO's if we see a continued trend towards pre-admission certification and utilization review. Where insurance companies benefit from the experience of the HMO's is by the knowledge that the information collected for the cost containment program can be also used to improve reserving. The major difficulty we have seen with the new HMO reserve systems is that a separate computer system is used for the cost containment programs, and it is not well interfaced with the claim billing system. When these two systems have close controls and ties, then we have the maximum information available with which to reserve.

What I'm referring to here as the "new approach" is not really a new approach for the actuarial profession, but a modification of the approach that is usually referred to as average claim or case reserving. Currently, most health reserves are generated by the completion factor approach, where we estimate the ultimates and then subtract the paid to arrive at

the reserve. But if we have a great deal of information available on the pending claims, and there are very few incurred but unreported claims, then we can improve our estimates by directly calculating the reserves for each of these claims. Under a cost containment program using pre-admission authorization and utilization review, the major claims that we would be talking about are pending claims that are billed and authorized, pending claims that are billed but not authorized, pending claims that are authorized but the bill has not been received, and finally, a few claims where no knowledge of the claim exists at the end of the month.

Currently, HMO's have available considerable information about their unpaid claims. Therefore, their reserve systems can be tailored to minimize the places where estimates must be made. For example, where there are tight authorization controls, the HMO knows how many days of hospitalization they have authorized and incurred. If they are referring patients outside of the system for special treatments or services, they can also have good counts on the number of treatments authorized outside of the system. The HMO will have contractual arrangements with hospitals and other providers. The nature of these arrangements will indicate the best way to utilize information for reserving. For example, if the HMO has contractual arrangements with each hospital for a set rate per day based on cause of stay, the data collection for reserving will emphasize subdividing authorized days by hospital and by cause of stay. If, on the other hand, the contractual arrangements with the various hospitals are for a flat 15% discount, then separation of data by hospital is not as important in arriving at the average per diem. Two aspects of the average cost study that need emphasis are: first, good systems controls to relate actual historical paid dollars to the counts that are available for reserving; and secondly, subdivisions of the data. In selecting subdivisions of data we are trying to minimize the cost variation within each

subdivision. Possible subdivisions for hospital stays would be premature baby, boarder baby, adult medical, adult surgical, pediatric medical, pediatric surgical, psychiatric and other special stays.

The next three slides show a sample hospital calculation and some of the categories in which the days and dollars could be tracked for reserving. In the reserve calculation, we first take from the computer system the dollar sum of all pending bills for authorized treatment. We reduce that sum by the historical average amount for discounts, coordination of benefits, subrogation and so on. Next, we take the dollar amount in the computer system for all pending bills where the treatment is not authorized. An HMO often authorizes out-of-area service retroactively, but in some cases claims will be denied. We thus have a greater percentage reduction on these pending bills than on the pending bills for authorized treatment. The next category is the claims where the bill has not yet been received or entered into the computer system. Through the pre-authorization and utilization review system we will have counts of hospital days that have been authorized. We need to add to these authorized days some extra days that have not gone through the authorization system, but which will ultimately be authorized in a retroactive manner. Also, in the real world computer systems do not have completely accurate and up-to-date information, so our unrecorded days category would take up any consistent shortfalls in the days count coming from the authorization records. We then take the total number of days for services that have been incurred but the bill is not yet in the computer system and multiply it by an average cost per day. Finally, we total together the dollars generated for each of these pieces to get the total reserve for the January services. Similar calculations would be made for all of the other incurred months and for physician and miscellaneous services.

Because the basic idea of this approach is to maximize the information that is available through the computer systems that contain authorization/utilization records, claim records and accounting records, the particular categories that are used for the calculation will depend upon the individual situation. So it is possible that instead of having the three components shown here, there would simply be two components, services which have been billed and services which have not been billed. There could also be more categories. We might have a separate category for claims where a payment has been made but the file is not yet closed due to coordination of benefits or subrogation.

The next two slides demonstrate data collection for the calculation that we have just reviewed. On the hospital days chart you can see that a key to making this approach work is that out of the 10,000 hospital days that ultimately go through the claims system, we are assuming that the HMO is aware of 9,000 of these at the close of the month. As long as we can obtain good information on the average cost of a hospital stay, the new approach should be a significant improvement over approaches that project total hospital days or dollars based on historical trends. The hospital dollars history not only shows the dollar amounts used in the sample calculation, but also the need for collecting the total amount billed so that we can trace historical relationships between pending billed amounts and final dollars paid.

The last coverage I will discuss is CMM. A fair number of insurance companies write only comprehensive major medical coverage. They may be subdividing the business only by size of group or financing arrangement. Some of these insurance companies have had difficulties in producing reserves that prove to be close to the actual reserve needed. A number of factors have contributed to these difficulties and some can be corrected. Factors that are often dealt with through general

awareness are changed medical practices and costs. The average insurance company writing CMM probably wouldn't be able to produce statistics on utilization, cost per service or average length of stay for reserving. The only exposure measure collected may be earned premiums and not member months of coverage.

Other areas that have caused some insurers problems in the past can be improved internally. Examples here include processing changes and the coding of incurred dates. Often processing changes can be monitored through claim system statistics on average processing time, through counts of unprocessed files at the close of each month and through improved communication from the claims and systems departments regarding recent changes.

Disagreements regarding the definition of incurred date have arisen several times in my experience. One definition that does not work well in completion factor analysis is to allow only one incurred date per insured per year, usually the date the deductible is satisfied. It is surprising how often the actuaries, accountants and claims examiners all have different opinions on what the incurred date is and how it is coded in the reserve system. A common problem with incurred date coding is what date to use for one check that covers many small charges. One insurance company with limited claim system capabilities assigned the earliest incurred date of any service as the incurred date for all the services. This caused so much distortion in the ultimate claim cost by month of the year, that a special audit was called to determine the cause of the high costs in January through April. The coding shortcut for multiple service dates was found to the cause. Another shortcut for multiple services that works well is to separate out any large bills, and then have the computer system spread the remaining cost uniformly over the months from the earliest service date to the latest service date.

After performing the completion factor calculations and comparison to historical completion factors, the only trend test available may be loss ratios. Here it is important to separate groups by size of expense ratios, so the mix of business will not affect the analysis. Monthly, quarterly and 12 month rolling loss ratios may be reviewed. The ratio tests can also be used to establish ultimate costs for the most recent incurred quarter.

An additional complication in reserving CMM is that the deductible often stays the same while inflation marches on. We also find that the higher deductible plans are selected more often today, so that data for reserving needs to be separate by deductible.

# COVERAGES

HOSPITAL

PHYSICIAN

SUPPLEMENTARY

CMM

DENTAL

MEDICARE SUPPLEMENT

# HOSPITAL SUBDIVISIONS

INPATIENT vs. OUTPATIENT

TYPE OF BUSINESS

FINANCIAL ARRANGEMENT

# HOSPITAL - COMPLETION FACTOR CHOICES

DOLLARS

DAYS

STAYS

# REASONABLENESS TESTING

# FOCUS ON LATEST

# 3 INCURRED MONTHS



## COMPLETION FACTOR TESTING

## REASONABLE TRENDS

## RATIO TECHNIQUES

# COMPLETION FACTOR TESTING

QUARTERS AS WELL AS MONTH

USE FACTORS FROM LAST QUARTER'S ANALYSIS

USE FACTORS FROM THE CORRESPONDING PERIOD IN LAST YEAR'S ANALYSIS (FOR SEASONALITY)

# REASONABLE TRENDS

HOSPITAL DAYS (OR STAYS)/1000 MEMBERS

COST PER DAY (OR STAY)

AVERAGE LENGTH OF STAY

## COMMUNITY RATED INPATIENT

| | | UTILIZATION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CASES | | | DAYS | | | AVG. LENGTH OF STAY | | COST | | | |
| 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 | | 6.28 | | 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 | 1246854 | 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% |

# RATIO TECHNIQUES

MULTIPLIERS

INCURRED RATIOS

MULTIPLE QUARTER TEST

## 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

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

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

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

# PHYSICIAN AND SUPPLEMENTARY COVERAGES

COMPLETION FACTOR APPROACH APPLIED TO DOLLARS

REASONABLENESS TESTING MORE IMPORTANT DUE TO LONGER DEVELOPMENT TIME

# NEW APPROACH

REASON: ACTIVE COST CONTAINMENT PROGRAMS, SUCH AS PREADMISSION CERTIFICATION AND UTILIZATION REVIEW, PROVIDF UP-TO-DATE DATA ON THE COST OF OUTSTANDING CLAIMS

USE: HOSPITAL, PHYSICIAN AND MISCELLANEOUS COVERAGES

# NEW APPROACH

## COMPLETION FACTOR APPROACH:

Obtains Reserves by Estimating Ultimates and Subtracting the Actual Paid

## NEW APPROACH:

Obtains Reserves Directly for Each Piece: Pending, Unauthorized, Unbilled and Unreported

# NEW APPROACH

## MAXIMIZE KNOWN FACTS

- AUTHORIZED SERVICES
- COST CONTROLS
  - by hospital
  - by cause of stay
  - by discount rates
- COST STUDIES

# JANUARY - INCURRED MONTH

## HOSPITAL RESERVE CALCULATION ON 2/28

| | |
|---|---|
| **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: | .75 |
| | $ 75,000 |
| **INCURRED BUT NOT BILLED** | |
| AUTHORIZED DAYS | 5,050 |
| UNRECORDED DAYS | 310 |
| TOTAL DAYS | 5,350 |
| AVERAGE PER DIEM | x $1,000 |
| | $ 5,350,000 |
| GRAND TOTAL RESERVE | $ 6,561,250 |

# 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 | 750 | 650 | 650 | - |
| PENDING - BILL | 100 | 500 | 100 | 100 | 100 | - |
| PENDING - AUTHORIZED | 8,6000 | 5,050 | 2,000 | 1,050 | 50 | - |
| TOTAL | 9,000 | 9,700 | 9,900 | 9,950 | 10,000 | 10,000 |

## HOSPITAL DOLLARS (THOUSANDS)

## 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 | $ 9,8000 |
| 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 |

# CMM
# RESERVE ISSUES

LESS INFORMATION AVAILABLE

CHANGING MEDICAL PRACTICES

POTENTIAL PROCESSING PROBLEMS

POTENTIAL INCURRED DATE PROBLEMS

# CMM
# INCURRED DATE ISSUES

## DEFINITION OF INCURRED DATE



## GROUPING OF MINOR SERVICES IN ONE BILL

## IMPACT OF INFLATION ON DEDUCTIBLE

Panel Session 3E

# RESERVING FOR HEALTH INSURANCE

## Dental and Medicare Supplementary Coverage

Emil J. Strug

1985 Casualty Loss Reserve Seminar

Kansas City, Missouri

# RESERVING FOR HEALTH INSURANCE

Susan has ably and clearly defined and displayed the various approaches and techniques in establishing and evaluating ultimate claim liabilities for hospital, physician, supplementary and comprehensive major medical coverages. Inasmuch as these techniques and approaches are of such a universal nature, it would be redundant to repeat them as they apply to Dental and Medicare supplementary programs. It will be more productive and informative if I highlighted the differences in developmental patterns between these coverages and those analyzed by Susan. In addition, I will indicate some of the characteristics of the benefits within these coverages that impact the estimation of the liabilities in the early stages of development when historic patterns are inappropriate.

In this first slide (attachment 1), I've portrayed in graphical form the development pattern of hospital, physician, major medical, dental and medicare complimentary coverages for the first quarter of 1983 paid through June of 1985 with the estimated ultimates as of June of 1985. In the written handout you will find the numeric data contained in attachment 1A.

There are a couple of caveats relative to the data being presented. First, the data and factors displayed are for a mature portfolio of business; that is, renewals constitute more than 90% of the business. Secondly, hospital, physician and dental are provider submitted claims; Medicare Supplementary is predominately provider submitted with Major Medical being subscriber submitted claims. What does this all mean? A provider submitted claim means that the hospital or doctor sent the claim directly to the insurance company for reimbursement with the subscriber or patient being responsible for the non-covered services.

Except for dental, practically all benefits for hospital and physicians are payment in full programs. Subscriber submitted claims are those claims submitted to the company with the reimbursement generally going to the patient. I should clarify that subscriber is synonymous with contract holder.

As I've already mentioned, this slide portrays the development of the five coverages being discussed. Let us first concentrate on the dental. Dental is the green colored bar. You will note that it is the fastest developing of the coverages shown and that at the zero quarter that over 65% of all the claims dollars are paid.

Let us now look at Medicare Complimentary; the purple bar. It develops substantially faster than Major Medical but somewhat slower than the other three coverages with a decent payment base by the first quarter of development.

At this point we can certainly say that neither Dental nor Medicare Complimentary present any particular problems in terms of late development tails.

This slide (attachment 2) presents in detail the development of dental for each incurred quarter of 1983 at various stages of run-off. With one quarters worth of development, completion factors will produce very accurate estimates of ultimate liabilities. For the "0" period, the ratio method that Susan outlined would be most likely used. For companies that operate in more than one state and have a subscriber submit system will have a different development pattern than that displayed in the graph. The earlier periods would have a higher completion factor with the more developed cells being more comparable.

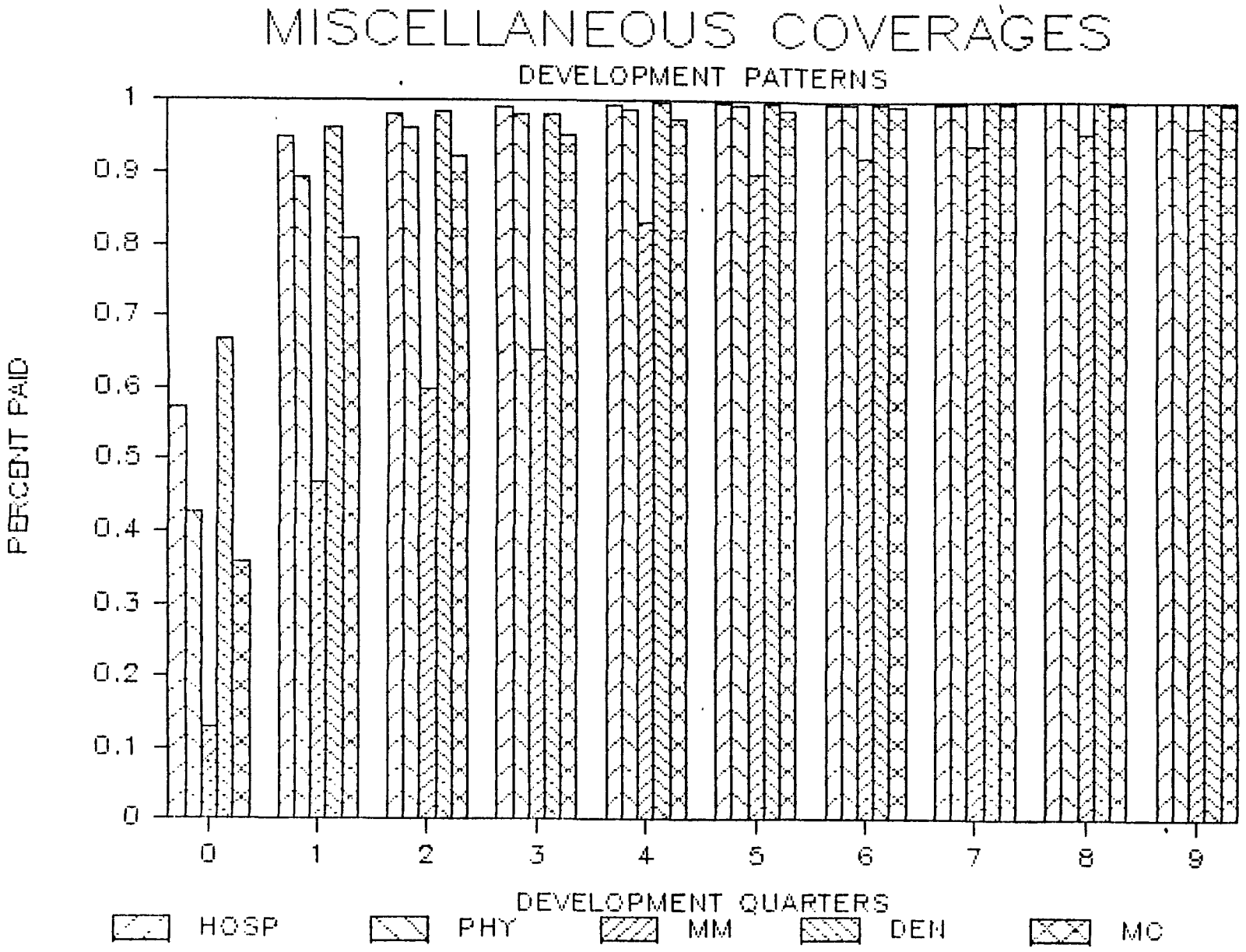
To test the reasonableness of the estimated ultimates an historic array of pure premiums (attachment 3) is a most helpful tool. This slide shows how one might array exposure, ultimates and pure premiums to evaluate and compare current estimates to historic trends and current expectations relative to cost and utilization.

One of the phenomenom of dental coverage is that the pure premium for the first year of coverage for a new account is 10 to 15% higher than the subsequent year. For a company with a growing portfolio of business appropriate adjustments have to be made when a large segement of new business is written initially and possibly in the following year if the growth pattern changes. This type of analysis allows for the identification of this peculiarity and for the development of appropriate adjustments. This slide (attachment 4) highlights the abberations that occur when there is a substantial change in exposure and which should be considered when initially establishing the estimated ultimate for that time period.

Let us now turn our attention to Medicare Complimentary coverage. This slide (attachment 5), as was the case for dental, presents the development for each incurred quarter for 1983 at different stages of run-off. A review of the graph would indicate that with two quarters of development the factor method should produce fairly accurate results. With one quarter worth of development, the factors could provide some indication of the reserve level. With three or more quarters of run-off the results should be very close to actual. Historically, we have found that at the zero and one quarter stage of development we rely heavily on the ratio method.

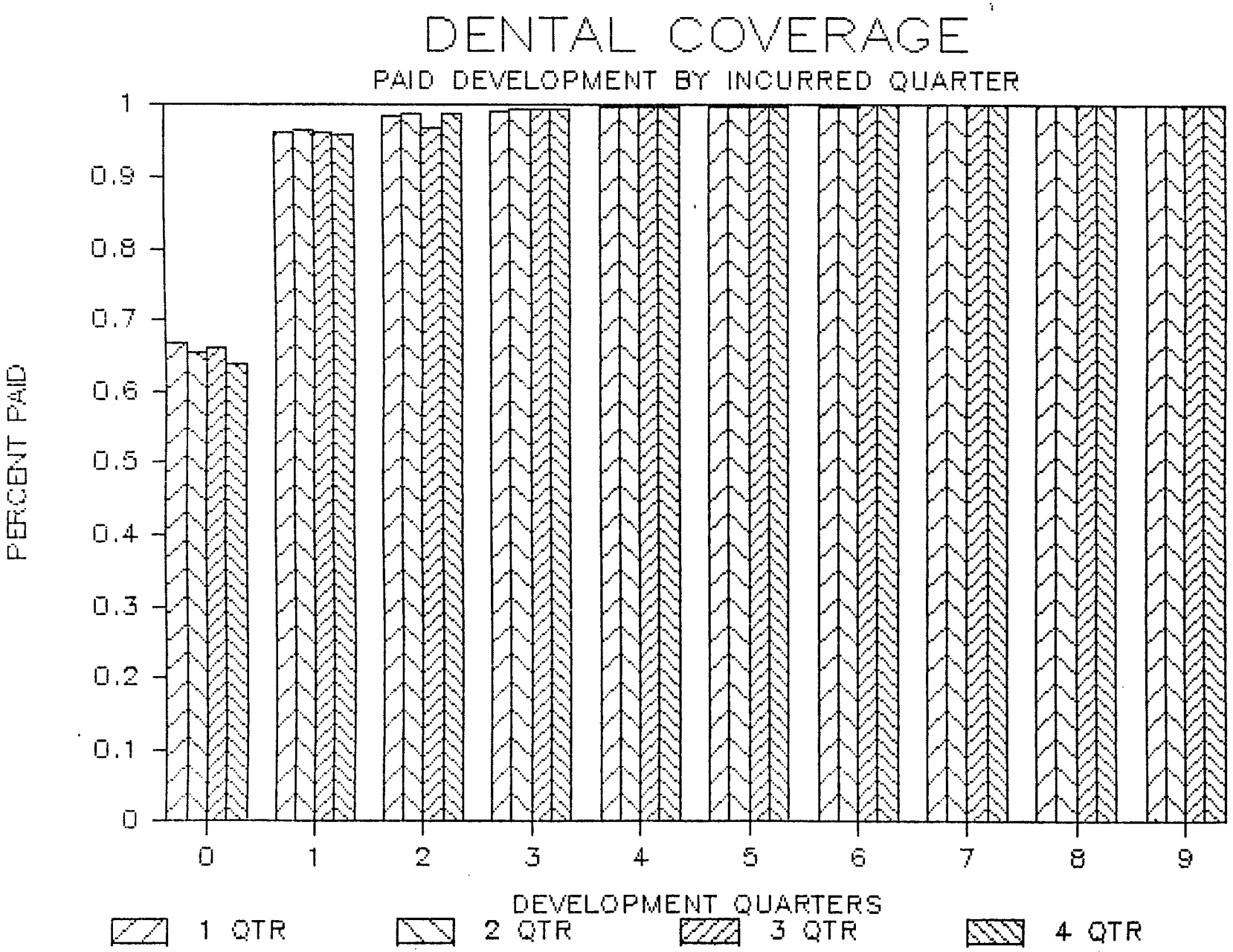
For those companies where claims are submitted by the Medicare beneficary it will be necessary to go beyond two quarters of development before completion factors produce fairly stable results. As was the case with Dental, arraying of pure premiums (attachment 6) is a good way to evaluate the reasonableness and adequacy of your estimates. This also serves as a vehicle to introduce changes in Medicare deductibles. Changes to Part A and Part B deductibles and coinsurances are published in the Federal Register. This allows for adjustments to pure premiums and ultimates in the early stages of development.

This concludes my portion of the presentation. We will now open the session for questions of the panelist.


MISCELLANEOUS COVERAGES
DEVELOPMENT PATTERNS
PERCENT PAID
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
DEVELOPMENT QUARTERS
HOSP
PHY
MM
DEN
MC

DEVELOPMENT BY INCURRED QUARTER
(BASED ON THE FIRST QUARTER OF 1983)

| DEVELOPMENT QUARTER | HOSP % PAID | PHYS % PAID | MAJ MED % PAID | DENTAL % PAID | MEDCOMP % PAID |
|---|---|---|---|---|---|
| 0 | 57.3% | 42.5% | 13.0% | 66.7% | 35.8% |
| 1 | 95.0% | 89.3% | 46.9% | 96.3% | 80.8% |
| 2 | 98.3% | 96.1% | 59.9% | 98.5% | 92.4% |
| 3 | 99.3% | 98.1% | 65.5% | 98.2% | 95.4% |
| 4 | 99.6% | 99.0% | 83.2% | 99.7% | 97.5% |
| 5 | 99.8% | 99.5% | 90.0% | 99.9% | 99.0% |
| 6 | 99.9% | 99.8% | 92.3% | 99.9% | 99.4% |
| 7 | 99.9% | 99.9% | 94.1% | 100.0% | 99.7% |
| 8 | 100.0% | 100.0% | 95.7% | 100.0% | 99.8% |
| 9 | 100.0% | 100.0% | 96.4% | 100.0% | 99.8% |


DENTAL COVERAGE
PAID DEVELOPMENT BY INCURRED QUARTER
PERCENT PAID
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
DEVELOPMENT QUARTERS
1 QTR
2 QTR
3 QTR
4 QTR

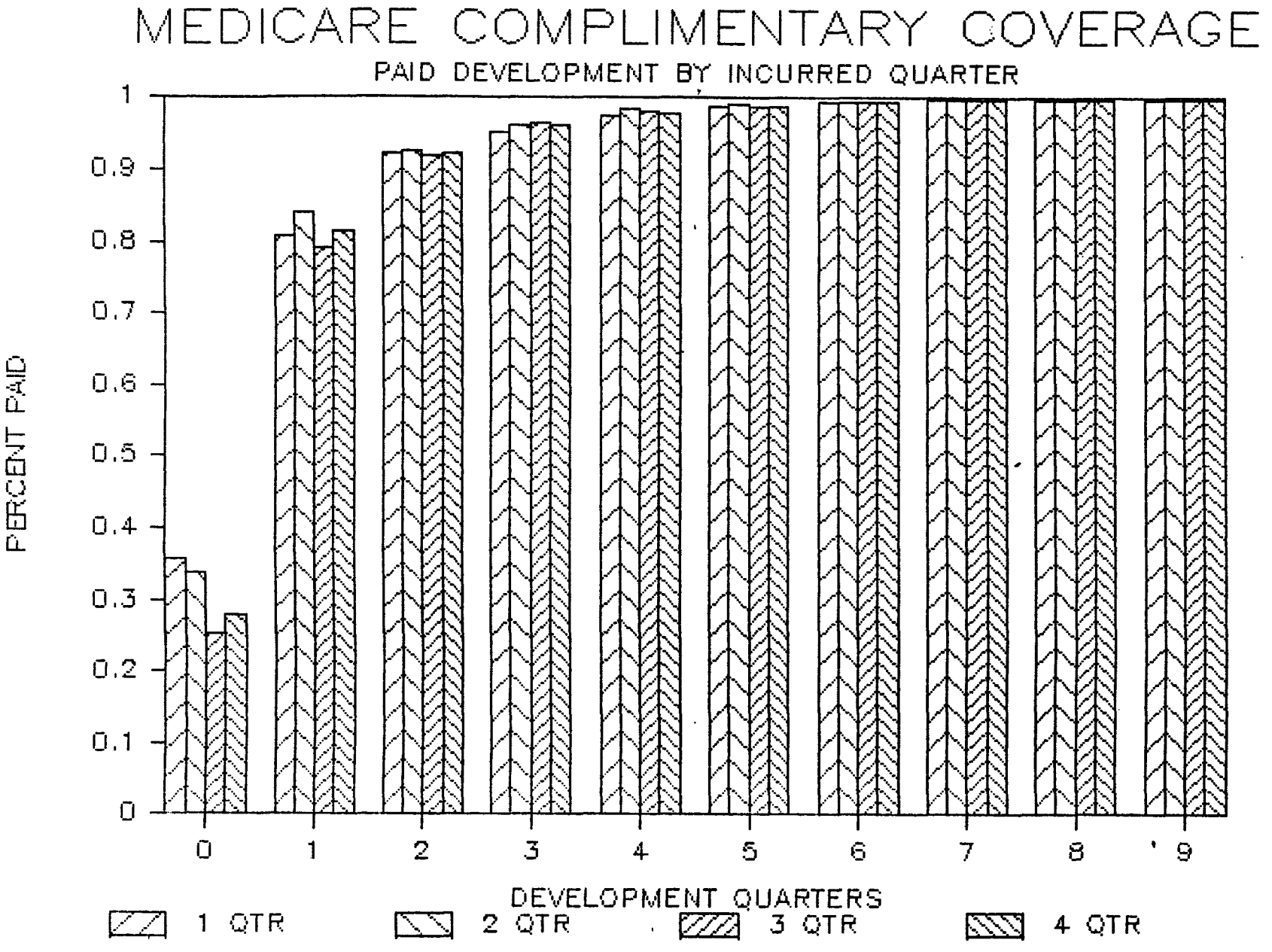
DENTAL COVERAGE
JUNE 1985

| | 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 |
|---|---|---|---|---|---|---|---|---|
| 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% |
| | 6,188 | 567440 | 10.905 | 8.5% | 11.8% | 10.688 | 2.7% | 11.1% |
| | $22,814 | 2134548 | | | | | | |
| 1Q82 | $6,553 | 590772 | $11.092 | 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 | 6,681 | 617475 | 10.820 | -3.6% | 7.7% | 11.011 | 1.6% | 5.8% |
| 4Q82 | 7,245 | 624169 | 11.607 | 7.3% | 6.4% | 11.188 | 1.6% | 4.7% |
| | $27,283 | 2438489 | | | | | | |
| 1Q83 | $7,441 | 626577 | $11.876 | 2.3% | 7.1% | $11.385 | 1.8% | 5.6% |
| 2Q83 | 7,906 | 639963 | 12.354 | 4.0% | 10.0% | 11.671 | 2.5% | 7.7% |
| 3Q83 | 7,287 | 651622 | 11.183 | -9.5% | 3.4% | 11.753 | 0.7% | 6.7% |
| 4Q83 | 7,934 | 658329 | 12.052 | 7.8% | 3.8% | 11.864 | 0.9% | 6.0% |
| | $30,568 | 2576491 | | | | | | |
| 1Q84 | $8,520 | 665241 | $12.807 | 6.3% | 7.8% | $12.101 | 2.0% | 6.3% |
| 2Q84 | 8,835 | 679574 | 13.001 | 1.5% | 5.2% | 12.271 | 1.4% | 5.1% |
| 3Q84 | 8,125 | 678896 | 11.968 | -7.9% | 7.0% | 12.458 | 1.5% | 6.0% |
| 4Q84 | 8,870 | 691532 | 12.827 | 7.2% | 6.4% | 12.651 | 1.5% | 6.6% |
| | $34,350 | 2715243 | | | | | | |
| | $9,500 | 701296 | $13.546 | 5.6% | 5.8% | $12.841 | 1.5% | 6.1% |
| [illegible] | 9,800 | 712000 | 13.764 | 1.6% | 5.9% | 13.038 | 1.5% | 6.3% |

* 2Q85 Exposure is a rounded estimate.

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% | 10.688 | 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 | 678896 | 12.078 | -8.8% | 8.0% | 12.559 | 1.7% | 6.9% |
| 4Q84 | 9,100 | 691532 | 13.159 | 9.0% | 9.2% | 12.935 | 2.2% | 8.2% |
| | $34,850 | 2715243 | | | | | | |


MEDICARE COMPLIMENTARY COVERAGE
PAID DEVELOPMENT BY INCURRED QUARTER
PERCENT PAID
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
DEVELOPMENT QUARTERS
1 QTR
2 QTR
3 QTR
4 QTR

MEDICARE COMPLIMENTARY COVERAGE
GROUP PREMIUM AND DIRECT BILLED
PURE PREMIUM TRENDS
@ JUNE 30, 1985

| | ULTIMATE ( 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 |
|---|---|---|---|---|---|---|---|---|
| 1080 | $23,663 | 1,142,425 | $20.713 | --- | --- | --- | --- | --- |
| 2080 | 22,496 | 1,136,585 | 19.793 | -4.4% | --- | --- | --- | --- |
| 3080 | 21,293 | 1,154,936 | 18.437 | -6.9% | --- | --- | --- | --- |
| 4080 | 23,396 | 1,164,411 | 20.093 | 9.0% | --- | 19.757 | --- | --- |
| | $90,848 | 4,598,357 | | | | | | |
| 1081 | $26,703 | 1,158,375 | $23.052 | 14.7% | 11.3% | $20.347 | 3.0% | --- |
| 2081 | 25,805 | 1,155,826 | 22.326 | -3.1% | 12.8% | 20.977 | 3.1% | --- |
| 3081 | 24,920 | 1,176,308 | 21.185 | -5.1% | 14.9% | 21.660 | 3.3% | --- |
| 4081 | 26,809 | 1,186,051 | 22.604 | 6.7% | 12.5% | 22.289 | 2.9% | 12.8% |
| | $104,237 | 4,676,560 | | | | | | |
| 1082 | $33,935 | 1,185,857 | $28.616 | 26.6% | 24.1% | $23.696 | 6.3% | 16.5% |
| 2082 | 33,002 | 1,182,401 | 27.911 | -2.5% | 25.0% | 25.085 | 5.9% | 19.6% |
| 3082 | 31,641 | 1,186,661 | 26.664 | -4.5% | 25.9% | 26.448 | 5.4% | 22.1% |
| 4082 | 34,490 | 1,213,065 | 28.432 | 6.6% | 25.8% | 27.909 | 5.5% | 25.2% |
| | $133,068 | 4,767,984 | | | | | | |
| 1083 | $41,988 | 1,212,641 | $34.625 | 21.8% | 21.0% | $29.432 | 5.5% | 24.2% |
| 2083 | 40,390 | 1,209,901 | 33.383 | -3.6% | 19.6% | 30.797 | 4.6% | 22.8% |
| 3083 | 36,840 | 1,208,992 | 30.472 | -8.7% | 14.3% | 31.728 | 3.0% | 20.0% |
| 4083 | 38,216 | 1,205,527 | 31.701 | 4.0% | 11.5% | 32.547 | 2.6% | 16.6% |
| | $157,434 | 4,837,061 | | | | | | |
| 1084 | $46,455 | 1,211,629 | $38.341 | 20.9% | 10.7% | $33.478 | 2.9% | 13.7% |
| 2084 | 44,252 | 1,216,979 | 36.362 | -5.2% | 8.9% | 34.226 | 2.2% | 11.1% |
| 3084 | 40,800 | 1,225,194 | 33.301 | -8.4% | 9.3% | 34.927 | 2.0% | 10.1% |
| 4084 | 43,300 | 1,219,992 | 35.492 | 6.6% | 12.0% | 35.867 | 2.7% | 10.2% |
| | $174,807 | 4,873,794 | | | | | | |
| 1085 | $52,800 | 1,188,218 | $44.436 | 25.2% | 15.9% | $37.348 | 4.1% | 11.6% |
| 2085 | 50,300 | 1,183,564 | 42.499 | -4.4% | 16.9% | 38.863 | 4.1% | 13.5% |