TITLE: DEVELOPMENT OF AN INFLATION SENSITIVE EXPOSURE BASE FOR HOSPITAL PROFESSIONAL LIABILITY INSURANCE

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INTRODUCTION

The initial idea for the topic of this paper actually began in the mid-seventies, the period of the "malpractice crisis". As actuaries for a carrier specializing in Hospital Professional Liability Insurance (HPL), we are acutely aware that one of the primary causes of the "crisis" was the compound effect of several years of double-digit loss inflation without corresponding premium increases. During the same period, similar forces adversely affected the underwriting results in workers' compensation, our company's other major line of insurance. The effect of inflation on this line was not as severe, however, partially due to the use of an inflation sensitive exposure base, payroll, which generated additional revenue and helped to offset the higher than expected losses.

Given this background and the possibility that a new "malpractice crisis" may occur in the future, due to the high pure premium trends that continue to exist and the aggressive price competition for this line of business, it is understandable that we again became interested in developing an inflation sensitive exposure base for HPL insurance. We have summarized our thoughts on the following pages as to why Gross Patient Revenue (GPR) would make the best choice for an inflation sensitive exposure base to replace the average daily census (average number of occupied beds per year) and outpatient visit counts currently used. In addition, we have

outlined a procedure for making the conversion and for maintaining rates at an adequate level.

We would like to point out that the methodology used in this paper will not necessarily work in its present form for other malpractice carriers. It is offered only as a model that can be modified to meet an individual company's needs. In particular, the proposed approach was developed for a carrier selling primarily occurrence coverage for hospital professional liability. Although we do not believe that significant problems will be encountered if this procedure is applied to claims-made ratemaking, some adjustments will undoubtedly be required. A complete discussion of the peculiarities of this type of coverage can be found in Marker and Mohl's paper "Rating Claims-Made Insurance Policies."[1].

[1] Marker, J; Mohl, J: "Rating Claims-Made Insurance Policies", Pricing Property and Casualty Insurance Products, 1980. Casualty Actuarial Society Call Paper Program. pp. 265-304.

ADVANTAGES

It was pointed out in the introduction that an inflation sensitive exposure base (ISEB) is currently used for workers' compensation insurance. Two other examples of ISEB's are sales, which is used for products liability, and dwelling value, which is used for homeowners and some other property lines. In addition, ISO is working on the development of an ISEB for OL&T. The usefulness of an inflation sensitive exposure base for hospitals can be more readily appreciated if we consider some of the advantages of adopting such a system.

Probably the most important advantage of adopting an ISEB is the fact that premiums will generally increase with each renewal even though no rate revision is made. This will at least partially off set the high annual trend in loss costs characteristic to this line. A short example will illustrate this point.

> Assume that hospital rates are adequate on January 1, 1980, that the pure premium trend is 25% and that the selected exposure base, gross patient revenue, is increasing at a rate of 15%. In order to maintain an adequate rate level using the traditional exposure base of ADC and OPV's, a rate increase of 25% will have to be filed at the end of every year. This compares with a rate increase of 8.7%

(1.25 ÷ 1.15 = 1.087) that would be required if the inflation sensitive exposure base is used. As can be seen from the table below, the difference compounds if more than one year passes without rate level action or if inadequate increases are approved.

	Required Increase If No Rate Change Is Made		Required Increase If 50% Of Indication Is Approved	
Year	ADC & OPV	ISEB	ADC & OPV	ISEB
1980	1.000	1.000	1.000	1.000
1981	1.250	1.087	1.125	1.043
1982	1.563	1.181	1.266	1.089
1983	1.953	1.284	1.424	1.136

Since the opposition to a rate filing generally increases with the magnitude of the request, it may be easier to secure adequate rates with an ISEB than with an exposure base that is not inflation sensitive. A commissioner may find it easier to approve a filing for a 28.4% increase than a filing for a 95.3% increase, even though the premium dollars generated under both requests would be the same. In addition, if GPR is used as an exposure base, the insurance company should be able to defend itself against the cries of unaffordability made by the insureds whenever a rate increase is filed. By pointing to a rate that is a relatively low percentage of income, we can show that the increase will not adversely impact the hospital's operations.

A second advantage is that it may be possible to attain greater rate equity between insureds through careful selection of the exposure base. The major rate distinction in the current ISO manual is for type of hospital; for example, acute-care beds, convalescent or nursing beds, or sanitarium beds. In addition to these, some companies reflect loss cost differences in their rating structures that apparently vary within the following classes:

i. Territory (e.g. Urban vs. Rural)
ii. Size of Hospital (difference in loss cost per bed)
iii. Number and Type of Surgical Procedures Performed.

It is not surprising that these loss differences may exist. Most automobile liability policies cost more in urban areas than in rural areas partially because of higher severities and more litigious populations. It seems reasonable to expect professional liability costs to be higher in urban areas for the same reasons. It also stands to reason that the risk of loss will rise as the number of operations performed in a hospital of a given size increases. Similarly, a hospital carrying out proportionately more complex or "state of the art" surgeries will probably present a greater than average risk of loss. Although these factors are not included explicitly in the ISO manual, they are probably considered when the schedule credit or debit is selected. Furthermore, the experience rating plan will partially compensate for some of the differences

in hazard. But it would be preferable to use an exposure base that automatically adjusts for this type of change in hazard. An exposure base such as GPR will satisfy this constraint since the conditions affecting hazard will affect the base in a similar manner.

An example of a class of business that would be treated more equitably under the proposed plan is the one-day surgical clinics that are becoming more popular, at least in the West. These clinics present a much greater exposure than is contemplated in the OPV rates due to the comparatively high number of surgeries performed. Unlike the situation in an ordinary hospital, the patients are generally not kept overnight, so the exposure is not adequately reflected in the ADC count either. An exposure base such as GPR should produce a higher premium than the current system because a clinic that performs more surgeries than average will take in more money than a normal clinic. To further complicate matters, the future growth of these clinics could cause inadequate premiums to be charged to community hospitals if the current exposure base is retained. Average severity, and possibly frequency as well, may increase for traditional hospitals as a higher proportion of the simpler or more routine surgeries are performed at the clinics.

A third advantage to using an inflation sensitive rate is that it may prove to be more responsive to changes in a hospital's operating procedures. For example, in an effort to protect themselves

from legal action during the malpractice crisis of the mid-seventies, hospitals started performing additional diagnostic tests and called for second opinions more frequently before operating.[2] This resulted in increased receipts which would have produced additional premium for the insurers.

Another advantage to adopting an ISEB is that once ISO converts the other GL lines to an inflation sensitive base, HPL will be rated in a similar manner. Although we are addressing only the malpractice portion of the hospital risk in this paper, it is conceivable that a single rate could be developed to encompass the entire hospital liability exposure.

DISADVANTAGES

The introduction of any significant procedural change can generally not be accomplished without some problems. One of the most significant associated with the introduction of an inflation sensitive exposure base will be the market dislocations resulting from the large premium increases or decreases that some individual insureds will receive. A hospital by hospital comparison of the premiums based on the proposed and traditional exposure bases should be made before any change is implemented. However, it must be remembered

[2] Paxton, H.T.; "Making Your Practice More Malpractice Proof", Medical Economics, September 30, 1974. pp. 69-130.

that a large premium change for an individual hospital is not necessarily undesirable; there will be instances where a significant change is justifiable.

Another problem that will be encountered is the insured's resistance to the new plan during the change-over period. Resistance will occur because most hospital administrators will recognize the annual premium increases that are built into the plan. Due to the intense competition that resulted in relatively constant premiums over the last few years, it will be difficult to convince them that any increases should be made.

A third disadvantage is that the premium income will drop below the expected level should the government successfully impose a cost containment program on the hospitals. This drop should be a temporary phenomenon however, since the rate making routine can be adjusted to reflect a lower premium trend.

Another disadvantage for an individual company that adopts this procedure is the complications that arise from the current coding and reporting requirements whenever a non-standard rating technique is used.

SELECTING THE EXPOSURE BASE

The first step in developing an inflation sensitive rate is the selection of an appropriate exposure base. In order to narrow the list of candidates down, we started with the two criteria suggested by Dorweiler[3] in his classic paper on premium and exposure bases:

1. The magnitude of the medium should vary with the hazard.

2. The medium should be practical and easy to use.

We added two additional conditions:

3. The medium should be sensitive to inflation.

4. Historical data should be available in sufficient detail to allow the medium to be used in the initial rate calculations.

Using these criteria, we were able to reduce the number of candidates to four: Payroll, Total Expenses, Total Operating Revenue and Gross Patient Revenue. Specific definitions of these items can

[3] Dorweiler, P. "Notes on Exposure and Premium Bases." PCAS XVI, 1929.

be found on Exhibit I which summarizes the financial data requested by the American Hospital Association in their Annual Survey of Hospitals. Much of the data collected by the AHA each year is made available in two publications: "The AHA Guide to the Health Care Field" and "Hospital Statistics". Included in these publications on a statewide basis for all community hospitals are Average Daily Census, Total Expense, Payroll, Total Revenue and Gross Patient Revenue. In addition, the first three are given separately for each hospital that responds to the survey.

Any one of the four candidates would make a good exposure base. All four would be responsive to hazard: they would reasonably reflect size of hospital, and they would be larger with the presence of specialists and complicated procedures. Each of the candidates, however, has at least one important advantage or disadvantage over the others.

Payroll

Payroll has two advantages over the others. First of all, it is already audited for Workers' Compensation; this promotes efficiency since few additional records would be necessary. The second advantage is that payroll is probably the least susceptible to manipulation by the insured and should therefore result in a more accurate exposure count. The most significant disadvantage to payroll is that it may be the least responsive to hazard. Hospital

salaries have increased at a lower rate than hospital expenses or receipts. Furthermore, there is a potential moral hazard; a hospital that underpays its employees would receive comparatively lower premiums, but may actually present a greater risk of loss than other hospitals, due to employee discontent or the inability of the hospital to attract a fully competent staff.

Expenses

Total expense would probably be more responsive to hazard than payroll since it is tied more directly to the number and types of cases that are handled. However, some common situations can produce distorted premiums. Take for example two hospitals that handle equivalent case loads; if one hospital was purchased in 1950 and the other in 1980, there will be a considerable difference in mortgage expenses due to inflated construction costs and the significantly higher interest rates now being charged.

Total Operating Revenue

Total operating revenue, or gross receipts, should be more responsive to hazard than either payroll or expense since it is directly tied to the hospital's case load. In addition it would be easier to audit than expenses, although somewhat less convenient than pay-

roll. Its biggest disadvantage is that Medicare reimbursements, which are set by government formula instead of actual costs, and charity cases could distort the results, particulary for large urban hospitals.

Gross Patient Revenue

Gross patient revenue is defined to be gross revenue from service to patients based on full established rates. This exposure base should be more responsive to hazard than gross receipts since it avoids distortions such as those caused by Medicare, charity cases and bad debit deductions. Furthermore, by excluding revenue from sources such as the cafeteria, gift shops and parking lots, it is tied directly to malpractice risk. This exposure base will not be as easy to audit as payroll, however the problem should not be insurmountable, because the necessary information is generally collected by the hospitals for their own financial reports.

After weighing the obvious advantages and disadvantages of the four candidates, we selected gross patient revenue as our proposed exposure base.

DATA SOURCES/ADJUSTMENTS

The first step in developing an indicated rate using gross patient revenue was the collection and adjustment of the necessary data. Average daily census (ADC) and Outpatient Visit (OPV) counts, loss and ALAE limited to $100,000, and the policy period were obtained from company records for each hospital insured during policy years 1973 through 1978. Next, ADC, expense and payroll figures for the same set of hospitals were extracted from the AHA Guide to the Health Care Field. The figures for each policy year were taken from the subsequent year's edition of the guide. For example, the 1979 edition was used for policy year 1978. This was done because each edition summarizes data reported for the previous year. As described later in this section, the statewide ratios of revenue to expense and revenue to payroll were used to estimate the gross patient revenue for each hospital.

Several checks were performed and numerous adjustments were made to the data pulled from the AHA books. First of all, the AHA figures were modified to be compatible with company loss experience for non-annual policies. If a policy was cancelled after three months for example, the AHA figures were divided by four. We then checked to see if the company ADC count was approximately equal to the AHA ADC count. If they were not reasonably close, and if we could not find a plausible explanation for the discrepancy, the hospital in

question was removed from the data base. This occurred only once or twice during the course of the study.

Another situation that forced us to make adjustments occurred when some of the necessary information was missing from the AHA guide. In some cases, payroll was given but not expense; for a few other hospitals, ADC was given but neither payroll nor expense. The missing figures were approximated by using a ratio estimate. In the first case, the statewide ratio of expense to payroll for the appropriate year was applied to the hospital's payroll; in the second case, the ratios of payroll to ADC and expense to ADC were applied to the hospital's bed count. The ratios for policy years 1972-79 (AHA editions 1973-80) can be found on Exhibit II. It is worth noting from this exhibit that during the last eight years, expenses have been rising at a faster rate than payroll.

As a final check for reasonableness, we calculated the ratio of payroll to ADC and the ratio of expense to ADC for each hospital. Again, we looked for an explanation in those cases where the ratios seemed out of line, either when compared with each other or when compared with the statewide average.

At this point we were in a position to estimate gross patient revenue. This was done by using the following formula:

$$\text{Hospital GPR} = \frac{1}{2} \times \left[\text{Hospital Expense} \times \frac{\text{Statewide Revenue}}{\text{Statewide Expense}} + \text{Hospital Payroll} \times \frac{\text{Statewide Revenue}}{\text{Statewide Payroll}} \right]$$

Although this may not give a perfect answer for each individual hospital, the statewide totals for each year should be reasonably accurate. The ratios for policy years 1972-79 can be found on Exhibit III. From this exhibit, it can be seen that revenue has been rising at a faster rate than expense and at a much faster rate than payroll.

INDICATION - TRADITIONAL EXPOSURE BASE

In order to measure the effect of the change to the proposed exposure base, indicated rates on both the traditional and inflation sensitive bases are needed. The indicated bed rate at $100/300 limits was developed first. On Exhibit IV, a pure premium trend of 28.2% is developed for the state using a least squares line of best fit. Even though we have a substantial volume of data, we decided against giving this trend rate full credibility. A trend rate of 25.0% was selected after giving some weight to our countrywide results.

An indicated $100/300 bed rate of $1435 (+33.5%) is developed on Exhibit V using standard actuarial procedures. Indications of this magnitude have not been uncommon for hospital professional liability insurance, and they underscore the primary advantage of devel-

oping a rating procedure which uses an inflation sensitive exposure base.

INDICATION - INFLATION SENSITIVE EXPOSURE BASE

The procedure used to develop an indicated rate based on gross patient receipts is similar to the procedure used to develop the indicated bed rate. The only significant difference is that exposures as well as losses must be trended. The revenue trend rate was calculated to be +15.8% on Exhibit VI by fitting a least squares line to the average revenue per adjusted ADC* for the last eight years. This suggests that the adoption of revenue as an exposure base will result in an effective pure premium trend of approximately 7.9% (1.250 ÷ 1.158 = 1.079).

On level exposures are developed by trending the revenue for each policy year from the midpoint of the reporting period used by the AHA to a point six months after the assumed effective date. On Exhibit VII, a sample calculation shows the midpoint of the reporting period used in the 1979 edition of the AHA Guide to be approximately February 15, 1978. This is the date that should be used for policy year 1978. Calculations for other years produced similar results.

* Adjusted ADC is defined by the following formula

$$\text{Adjusted ADC} = \text{ADC} + \text{OPV} \times \left[\frac{\frac{\text{Outpatient Revenue}}{\text{Outpatient Visits}}}{\frac{\text{Inpatient Revenue}}{\text{Inpatient Days}}} \right]$$

The indicated rate per $1000 of gross patient revenue is developed on Exhibit VIII. A premium equaling less than 1.2% of GPR for basic limits coverage does not strike the authors of this paper as an unaffordable or excessive price.

TESTS

Once the indicated rates were developed using both the traditional and the proposed inflation sensitive exposure bases, we were in a position to check the results for reasonableness. The first test was performed in order to check the accuracy of the revenue trend. On level revenue for each policy year was divided by the ADC and OPV exposure count with the expectation that the results would be relatively constant. The actual calculations can be found on Exhibit IX. To our surprise, we found a small drop in the ratio at the beginning of the experience period and a larger drop at the end. After some study, we came to the conclusion that at least the latter drop was caused by a shift in our book of business from large urban hospitals to smaller hospitals. A shift of this type can produce a drop in the average revenue per bed. As can be seen from Exhibits X and XI, both average expense and average payroll increase with the size of the hospital. This indicates that average patient revenue will most likely increase with size as well.

As a final test, premiums were calculated using both exposure bases and then compared for each individual policy. For more than 70% of the hospitals, the difference between the two premiums was less than 25%. Of the remaining policies, the largest increase was approximately 100% and the largest decrease was in the neighborhood of 60%. Although the change for this set of policies turned out to be somewhat larger than we had hoped to see, the premium based on gross revenues may be more reasonable than the one developed using the traditional exposure base. However, in order to avoid significant dislocations during the transition period, a cap of ±25.0% on the allowable premium change at manual rates resulting from the exposure base revision can be introduced. In view of the relatively few hospitals with large changes, it should be possible to phase out the transition program in about two years.

SUMMARY

We have presented a method for converting hospital professional liability insurance rates to an inflation sensitive exposure base. The current exposure base of beds and OPV's was developed several decades ago when the risk to exposure ratio for this line of business was significantly lower than it is today. Throughout most of this period, inflation rates were maintained at levels considerably lower than currently exist. In today's environment, however, inflation is an important dimension in measuring risk and should be reflected in the exposure base.

AMERICAN HOSPITAL ASSOCIATION

ANNUAL SURVEY OF HOSPITALS

F. FINANCIAL DATA

1. REVENUE (for the reporting period only)

a.	Gross revenue from service to INPATIENTS (based on full established rates).....		$ .00
b.	Gross revenue from service to OUTPATIENTS (based on full established rates).....		$ .00
c.	TOTAL GROSS revenue from service to PATIENTS (a + b).....		$ .00
d.	(1) Deductions for contractual adjustments.....	$ .00	
	(2) Deductions for bad debts.	$ .00	
	(3) Deductions for charity...	$ .00	
	(4) Other deductions.....	$ .00	
	(5) Total deductions.....		$ .00
e.	TOTAL NET (revenue from service to PATIENTS (c - d (5)).....		$ .00
f.	Other OPERATING REVENUE.....		$ .00
g.	NONOPERATING REVENUE (appropriations, contributions, grants).....		$ .00
h.	TOTAL REVENUE (e + f + g).....		$ .00

2. EXPENSES (for the reporting period only):

a.	PAYROLL EXPENSES (for all categories of personnel specified below:	
	(1) Physicians and dentists (include only salaries).....	$ .00
	(2) Medical residents (include medical interns).....	$ .00
	(3) Dental residents (include dental interns).....	$ .00
	(4) Other trainees (medical technology, X-ray therapy, admin., and so forth)...	$ .00
	(5) Registered and licensed practical nurses.....	$ .00
	(6) All other personnel.....	$ .00
	(7) TOTAL PAYROLL EXPENSES [add (1) through (6)].....	$ .00

Continued on next page

2. EXPENSES (continued)

b. NONPAYROLL EXPENSES:

(1) Employee benefits (social security, group insurance, retirement benefits).	$ .00
(2) Professional fees (medical, dental, legal, auditing, consultant, and so forth).....	$ .00
(3) Depreciation expense (FOR REPORTING PERIOD ONLY).....	$ .00
(4) Interest expense.....	$ .00
(5) All other expenses (supplies, purchased services, and so forth).....	$ .00
(6) TOTAL NONPAYROLL EXPENSES [add (1) through (5)].....	$ .00
c. TOTAL EXPENSES [a(7) + b(6)].....	$ .00

DEFINITIONS

Payroll	: 2a(7)
Total Expense	: 2c
Total Operating Revenue	: [1e + 1f]
Gross Patient Revenue	: 1c

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

AHA Book	(1) Total Expense	(2) Payroll	(3) Average Daily Census	(4) Expense Per Payroll (1) ÷ (2)	(5) Payroll Per Expense (2) ÷ (1)	(6) Expense Per ADC (1) ÷ (3)	(7) Payroll Per ADC (2) ÷ (3)
1973	1,609,648	930,190	40,104	1.730	.578	40.137	23.194
1974	1,800,382	1,022,757	41,187	1.760	.568	43.712	24.832
1975	2,055,331	1,134,646	41,829	1.811	.552	49.137	27.126
1976	2,429,808	1,321,147	41,590	1.839	.544	58.423	31.766
1977	2,834,826	1,500,560	41,737	1.889	.529	67.921	35.953
1978	3,230,691	1,675,189	41,792	1.929	.519	77.304	40.084
1979	3,655,536	1,867,002	41,843	1.958	.511	87.363	44.619
1980	4,193,888	2,128,384	41,804	1.970	.507	100.323	50.913

Source: Hospital Statistics

Exhibit III

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

AHA Year	Revenue	Expense	Revenue Per Expense	Payroll	Revenue Per Payroll
1973	1,697,772	1,609,648	1.055	930,190	1.825
1974	1,917,071	1,800,382	1.065	1,022,757	1.874
1975	2,154,728	2,055,331	1.048	1,134,646	1.899
1976	2,569,893	2,429,808	1.058	1,321,147	1.945
1977	3,130,929	2,834,826	1.104	1,500,560	2.087
1978	3,612,316	3,230,691	1.118	1,675,189	2.156
1979	4,167,580	3,655,536	1.140	1,867,002	2.232
1980	4,802,114	4,193,888	1.145	2,128,384	2.256

Source: Hospital Statistics

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

$100/300 LOSS AND ALAE
ANNUAL TREND

Policy Year	(1) Exposure	(2) $100,000 Limited Loss And ALAE	(3) Development Factor	(4) Ultimate Loss & ALAE	(5) Ultimate Pure Premium	(6) Least Squares Exponential Fit	(7) Difference (5) - (6)
1973	21,992	2,926,896	1.075	3,146,413	143.07	149.55	(6.48)
1974	20,009	4,395,974	1.085	4,769,632	238.37	191.75	46.62
1975	19,001	3,718,112	1.070	3,978,380	209.38	245.85	(36.47)
1976	21,996	6,269,262	1.038	6,507,494	295.85	315.21	(19.36)
1977	22,008	7,408,656	1.153	8,542,180	388.14	404.15	(16.01)
1978	21,004	6,939,210	1.718	11,921,563	567.59	518.18	49.41

Annual Trend 1.282

Coefficient of Determination .924

Exhibit V

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

INDICATED $100/300 BASE RATE
TRADITIONAL EXPOSURE BASE

Policy Year	Exposure	$100,000 Limited Loss And ALAE	Development Factor	Ultimate Loss & ALAE	Trend Factor to 1-1-82	Trended Losses	Pure Premium
1976	21,996	6,269,262	1.038	6,507,494	$(1.250)^5$	19,859,296	902.86
1977	22,008	7,408,656	1.153	8,542,180	$(1.250)^4$	20,854,932	947.61
1978	21,004	6,939,210	1.718	11,921,563	$(1.250)^3$	23,284,303	1,108.57
Total	65,008					63,998,531	984.47

Class Plan Off-Balance	.98
Indicated $100/300 Pure Premium 984.47 ÷ .98	1,004.56
Permissible Loss and ALAE Ratio	.70
Indicated $100/300 Base Rate 1,004.56 ÷ .70	1,435.09
Current $100/300 Base Rate	1,075.00
Indicated Change 1,435 ÷ 1,075	+33.5%

Assumed Effective Date: January 1, 1981

Exhibit VI

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

REVENUE TREND

AHA Book	Revenue (000)	Adjusted ADC	Revenue Per Adjusted ADC	Exponential Fit
1973	1,697,772	44,057	38,536	36,471
1974	1,917,071	46,211	41,485	42,251
1975	2,154,728	46,543	46,295	48,947
1976	2,569,893	46,412	55,371	56,704
1977	3,130,929	46,694	67,052	65,690
1978	3,612,316	46,746	77,275	76,101
1979	4,167,580	47,008	88,657	88,162
1980	4,802,114	46,958	102,264	102,134
Trend				1.158
Coefficient of Determination				.992

Source: Hospital Statistics

Exhibit VII

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

MIDPOINT OF REPORTING PERIOD
1979 AHA BOOK

Last Month of Reporting Period		Percent of Hospitals	Period
Dec	1977	.048	0
Jan	1978	.001	1
Feb	1978	.002	2
Mar	1978	.019	3
Apr	1978	.013	4
May	1978	.013	5
Jun	1978	.263	6
Jul	1978	.007	7
Aug	1978	.035	8
Sep	1978	.547	9
Oct	1978	.013	10
Nov	1978	.004	11
Dec	1978	.035	12

Weighted Average	7.6 ≃	August 15, 1978
Midpoint of Reporting Period		February 15, 1978

Source: Hospital Statistics

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

INDICATED $100/300 BASE RATE
INFLATION SENSITIVE EXPOSURE BASE

Policy Year	(1) Revenue (000)	(2) Trend Factor To 7-1-81	(3) Revenue Trended To 7-1-81	(4) $100,000 Limited Loss And ALAE	(5) Development Factor	(6) Ultimate Loss & ALAE	(7) Trend Factor To 1-1-82	(8) Trended Losses	(9) Pure Premium (8) ÷ (3)
1976	1,256,850	2.200	2,765,070	6,269,262	1.038	6,507.494	$(1.250)^5$	19,859,296	7.18
1977	1,408,561	1.900	2,676,266	7,408,656	1.153	8,542,180	$(1.250)^4$	20,854,932	7.79
1978	1,510,012	1.641	2,477,930	6,939,210	1.718	11,921,563	$(1.250)^3$	23,284,303	9.40
Total			7,919,266					63,998,531	8.08

Permissible Loss and ALAE Ratio .70

Indicated Rate Per $1,000 of Patient Revenue 11.54

8.08 ÷ .70

Assumed Effective Date: January 1, 1981

Exhibit IX

STATE XYZ
HOSPITAL PROFESSIONAL LIABILITY INSURANCE

TRENDED REVENUE PER EXPOSURE

Policy Year	ADC & OPV Exposure	Revenue (000)	Revenue Trended To 7-1-81	Revenue Per Exposure
1973	21,992	782,266	2,672,221	121.51
1974	20,009	856,648	2,527,112	126.30
1975	19,001	946,953	2,412,836	126.98
1976	21,996	1,256,850	2,765,070	125.71
1977	22,008	1,408,561	2,676,266	121.60
1978	21,004	1,510,012	2,477,930	117.97
Total	126,010		15,531,435	123.26

Exhibit X

COUNTRYWIDE
ADJUSTED EXPENSE PER INPATIENT DAY

Hospital Size	1972	1973	1974	1975	1976	1977	1978	1979	Least Squares Exponential Trend	1981 Fitted Point	Index
6-24	75.43	77.29	83.44	100.43	117.46	132.19	152.34	176.19	1.138	222.66	.792
25-49	68.68	73.86	82.73	98.97	113.42	132.33	151.68	172.05	1.148	226.71	.807
50-99	72.97	78.86	86.58	101.96	117.95	134.53	149.68	170.12	1.134	218.97	.779
100-199	84.32	91.23	101.06	119.14	135.52	154.64	172.50	193.55	1.132	249.67	.889
200-299	92.43	100.97	111.35	129.93	143.37	169.76	186.94	206.90	1.128	265.93	.947
300-399	99.35	104.77	116.80	137.82	157.25	177.72	200.70	223.27	1.131	287.34	1.023
400-499	100.22	109.94	122.11	140.68	160.89	183.55	208.78	234.15	1.133	300.78	1.071
500 +	115.34	123.95	136.73	161.97	182.45	206.40	228.53	254.17	1.126	325.71	1.159
Total	94.87	102.44	113.55	133.81	152.76	173.98	194.34	217.34	1.132	280.96	1.000

Adjusted expense per inpatient day is a measure that reflects the costs incurred by a community hospital in providing one day of inpatient care, with the costs adjusted to eliminate that portion expended for outpatient care.

Source: Hospital Statistics

Exhibit XI

COUNTRYWIDE
AVERAGE SALARY PER EMPLOYEE

Hospital Size	1972	1973	1974	1975	1976	1977	1978	1979	Least Squares Exponential Trend	1981 Fitted Point	Index
6-24	5,263	5,438	5,758	6,248	6,994	7,237	8,169	9,345	1.085	10,467	.764
25-49	5,470	5,687	6,019	6,589	7,202	7,804	8,784	9,516	1.086	11,018	.804
50-99	5,870	6,120	6,443	7,084	7,727	8,266	9,077	9,921	1.080	11,378	.830
100-199	6,438	6,801	7,148	7,986	8,620	9,257	10,034	11,003	1.081	12,707	.927
200-299	7,088	7,404	7,788	8,575	9,366	10,094	10,769	11,676	1.077	13,481	.983
300-399	7,395	7,594	8,084	8,999	9,798	10,395	11,250	12,079	1.077	14,011	1.022
400-499	7,281	7,674	8,163	9,054	9,832	10,498	11,428	12,417	1.081	14,434	1.053
500 +	7,860	8,190	8,626	9,515	10,433	11,112	11,902	12,854	1.076	14,851	1.083
Total	7,051	7,368	7,787	8,635	9,426	10,082	10,896	11,825	1.080	13,708	1.000

Source: Hospital Statistics

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