

Variation by Duration in Individual Health Medical Insurance Claims

**Revised
October 3, 2006**

by

**Leigh Wachenheim, FSA, MAAA
Principal & Consulting Actuary
Milliman**

Table of Contents

Section I. Overview	1
Section II. Data and Methodology	3
Section III. Results	6
Appendix A: Data and Information Request	A-1
Appendix B: Monthly Factors	B-1

I am grateful to many people who supported this work with their time and expertise. I thank Ronora Stryker, ASA and Research Actuary with the Society of Actuaries, for coordinating our work with the participating carriers and the Project Oversight Group. Jan Schuh at the Society also assisted with this coordination.

The Project Oversight Group (POG) consisted of the following members of the Society of Actuaries: Richard Garner, Victor Pagua, Peter Perkins, Bernie Rabinowitz, Greg Russell, Thomas Stoiber, Karl Volkmar and Jerry Winkelstein. The POG spent many hours reviewing and discussing with us drafts of our study outline, data request and draft reports, offering invaluable advice and insight.

At Milliman, I thank Missy Gordon, who worked closely with me on this study, spending long hours loading and analyzing data, following up with the participating carriers as needed and drafting portions of this report. I also thank my colleague, William F. Bluhm, for reviewing drafts of this report and offering his always helpful comments.

Finally, I thank the nine companies who contributed data to this study who are named in Section II. This analysis would not have been possible without their willingness to share their data and other resources with all of us.

Leigh M. Wachenheim, FSA, MAAA
October 3, 2006

Section I. Overview

Milliman, Inc. was engaged by the Society of Actuaries (Society) to prepare a descriptive study of the variation in claim costs by policy duration in individual major medical insurance. This engagement was a result of a request for proposals published by the Society's Health Section Council for projects that result in information, data or tools useful to practicing health actuaries. This report presents results for single (vs. family) contracts with long-form underwriting, based on our analysis of the experience provided by seven carriers. A single contract is one that insures only one person.

This study is based on approximately \$1.3 billion in incurred claims provided by seven carriers. We requested data for claims incurred in 2001 and 2002. Two carriers provided 2002 and 2003 data, since they did not have ready access to 2001 data due to systems conversions and other issues. All incurred claims were adjusted by the contributing carriers for benefit differences, provider discounts, trend and demographics.

This report is intended for the benefit of the Society of Actuaries. Although we understand that this report will be made widely available to third parties, Milliman does not intend to benefit third parties with its work. In particular, the results in this report are technical in nature and are dependent upon specific assumptions and methods. No party should rely upon these results without a thorough understanding of those assumptions and methods. Such an understanding may require consultation with qualified professionals. This report should be distributed and reviewed only in its entirety.

Section II of this report includes a description of the data and methods used in our analysis. Section III includes durational factors by year, for durational years 1 – 6 and 7+. The report also shows how results vary by (1) deductible category, (2) issue age category, (3) rating classification and (4) pre-existing condition limitation.

The results indicate that single contract, long-form underwritten individual health medical claim costs vary significantly by duration from issue, depending on deductible category, issue age category and rating classification. In general, the results show that per member average incurred claim costs in the first year are approximately 75 percent to 85 percent of average claim costs in the second year. On average, the incurred claim cost slope remains relatively steep in years three through five, and thereafter the claim costs begin to plateau.

In performing this analysis, we have relied on data and other information provided to us by the carriers who contributed to this study. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of this analysis may likewise be inaccurate or incomplete.

This analysis presents the durational experience of seven carriers, which may not be indicative of the experience of other carriers. Readers must carefully consider the extent to which the results in this report reflect their own actual or expected experience.

We have performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our work.

Section II. Data and Methodology

In this section of the report, we discuss the participating companies, data collection guidelines and data adjustments.

Participating Companies

The following nine companies submitted data for this study:

1. Anthem Inc. of Virginia
2. Blue Cross Blue Shield of Arkansas
3. Blue Cross of California
4. Blue Cross Blue Shield of Kansas
5. Blue Cross Blue Shield of Missouri
6. Blue Cross Blue Shield of North Carolina
7. Blue Cross Blue Shield of Tennessee
8. Celtic
9. Highmark

This report is based on the single contract, long-form underwritten data submitted by seven of the nine participating companies. We excluded the experience of two companies due to unresolved data concerns. Six of the seven companies are Blues companies. The data used to develop the results in this report include, in aggregate, \$1.3 billion in incurred claims incurred in calendar years 2001 through 2003 and 10.4 million exposure months. The \$1.3 billion of incurred claims translates into \$2.1 billion in adjusted incurred claims.

Table II-1 below shows aggregate claim and exposure information for the data used in our analysis by durational year. This information is presented only to establish the credibility of the results. While it would be possible to calculate per member per month claim cost values based on this information, patterns in those results would not be particularly useful since the mix of data by carrier and policy form can vary by duration.

Table II-1: Adjusted Claim Dollars and Exposure by Duration

Durational Year	Adjusted Claim Dollars (in 000s)	Exposure (in 000s)
Year 1	\$467,591	3,076
Year 2	\$341,888	1,813
Year 3	\$263,736	1,319
Year 4	\$241,220	1,059
Year 5	\$199,182	804
Year 6	\$131,861	521
Year 7+	\$479,840	1,767
Total	\$2,125,317	10,360

Data Collection Guidelines

Incurred claims and exposure were collected by durational month and segregated by: (1) contract status, (2) underwriting method, (3) deductible category, (4) issue age category, (5) rating classification and (6) pre-existing condition limitation. Each of the parameters was further segmented into the following inputs:

- Contract Status: Family versus Single;
- Underwriting Method: Long-Form versus Guarantee Issue;
- Deductible Category: less than or equal to \$1,000, greater than \$1,000 but less than or equal to \$2,500 and greater than \$2,500;
- Issue Age Category: less than or equal to 35, greater than 35 but less than or equal to 50 and greater than 50;
- Rating Classification: Standard versus Non-Standard; and
- Pre-Existing Condition Limitation: the number of months of insurance coverage required before covering pre-existing conditions.

This report includes results only for Single, Long-Form contracts. We also received experience for family contracts, but excluded that data from our analysis due to outstanding questions regarding inconsistencies in the way experience was reported by the carriers. We suggest that the SOA consider studying the durational curve for family contracts in the future, as we expect the pattern may be different than the pattern for single contracts. We also excluded the data for guarantee issue business since the exposure was not sufficient to develop meaningful results.

The SOA's request for data, including detailed data contributor guidelines, is included as Appendix A. To summarize, we defined "individual health" benefit plans as those that are fully medically underwritten (or guarantee issue) and that provide comprehensive major medical coverage. We indicated that association and group trust business could be included if it was voluntary and fully medically underwritten. The following types of business were excluded: (1) HMO products, due to concerns regarding the impact of capitation arrangements on durational variations, (2) COBRA and group conversion, (3) short term (temporary) medical plan of insurance and (4) plans providing limited coverage, such as hospital only, accident only, cancer, disability and dental.

We also asked that claim figures be provided prior to adjustments for reinsurance or pooling.

Data Adjustments and Validation

We asked that all claims be adjusted to remove the impact of differences in benefits, provider discounts, trend and demographics. In order to accomplish this, we asked each carrier to use its own internal factors to adjust claim levels to be consistent with a defined standard:

- A standard major medical plan (including prescription drugs) with a \$200 deductible, 80 percent coinsurance and \$1,200 (including deductible) out-of-pocket maximum;
- A 37-year-old single male; and
- An incurral date of 7/1/01 using an annual trend rate of 13 percent, before leveraging, to adjust claims.

We tested the carrier's adjustments for benefits, trend, and demographics, using claim data incrementally adjusted for each of these factors. That is, each carrier provided unadjusted claim data, along with claim data adjusted only for benefit changes, only for trend changes, and only for demographic changes. Using that data, we calculated the adjustment factors

implied for each of these in each carrier's data by dividing the adjusted claims by the unadjusted claims. We then compared the implied adjustment factors to what we considered to be a range of reasonable factors, which we had developed independently. The factors we used for comparison are described further below.

- **Benefits:** Table II-2 shows the range of factors we used to test the impact of benefit adjustments. We used Milliman's *Health Cost GuidelinesTM* (HCGs), to develop this range. First, we used the HCGs to develop a monthly paid claim cost for the standard plan described above. We then developed factors for a very rich plan (no cost sharing), medium plan (deductibles as indicated in Table II-2, 80 percent coinsurance and a \$1,000 out-of-pocket maximum) and a very lean plan (deductibles as indicated in Table II-2, 70 percent coinsurance and no out-of-pocket maximum). We found that the adjustment factors implied by the carrier data fell into these ranges.

Table II-2: Comparable Range of Benefit Adjustment Factors

Deductible Category	Deductibles Tested	Benefit Factor Range	
		Rich Plan	Lean Plan
<= \$1,000	\$0 and \$1K	0.8	1.6
>\$1,000 and <= \$2,500	\$1.5K and \$2.5K	1.0	2.0
> \$2,500	\$3K, \$5K and \$10K	1.3	4.0

- **Trend:** In our data request, we asked carriers to discount claims to July 1, 2001, using a 13 percent annual trend rate. For validation, we simply ensured that the ratio of trend adjusted to unadjusted claims in each incurral period was consistent with this assumption.
- **Demographics:** We used Milliman's HCGs' age/gender factors to determine a reasonable range of demographic adjustment factors for each of the three issue age categories analyzed. The HCGs provides age/gender factors for adult males and females in five-year age bands (e.g. 25- to 30-year-olds) and for four age groups for children. We used (1) 0.7-2.0, (2) 0.4-1.1, and (3) 0.2-0.6 as the reasonable ranges to compare to the carrier implied factors for the '<35,' '>=35 and <50,' and '>50' age categories, respectively,

We also asked that carriers use billed charge levels (no discounts) when reporting covered charges.

In our data request, we asked that the carriers define "duration" as the time difference between the date of issue and the date of claim incurral. Based on the monthly exposure data provided, we believe it is likely that two or three of the carriers contributed data based on calendar month of duration. We suspect this because exposure in the first monthly duration is approximately half the exposure in the second duration. This should be kept in mind when reviewing the results in this report, including the monthly results in Appendix B.

We calculated adjusted monthly claim costs per exposure per month (PEPM) for each durational year by dividing the adjusted incurred claim costs by the monthly exposure for the data cell. We calculated durational factors by dividing the adjusted monthly claim cost PEPM at each duration by the average second year claim cost for each study cell.

Section III. Results

This section of the report includes the results of our analysis. Common industry perception is that claim costs continuously increase by duration. In our experience, many carriers use durational factors that trend steeply from the first to the second year (e.g., 20 to 30 percent annually), moderate during the second year (e.g., 10 to 15 percent), and then level off (e.g., increasing 0 percent to 5 percent per year).

One important finding of this study is that this pattern is not consistent across carriers. We examined the results for each carrier and identified two distinct patterns. Below, we present and discuss those results, along with aggregate results across all seven carriers. We then present results showing how the durational pattern varied by deductible level, issue age, rating classification and pre-existing condition limitation provisions.

Observed Durational Patterns

In reviewing the results for each carrier, we detected two distinct durational patterns. The first pattern was fairly similar to the pattern described above, where the trend from the first year to the second year, on average, was at the low end of the 20 to 30 percent range mentioned (approximately 23 percent). Thereafter, the durational curve for these carriers was generally increasing. We observed this pattern in the experience of five of the seven carriers, which we will refer to as "Group 1." The second group includes two carriers with durational curves that did not conform to this generally increasing pattern ("Group 2").

Table III-1 below shows average durational factors by durational year for each group. The cost in each duration is shown relative to the second yearly duration (which is always 1.000). A set of durational factors was calculated for each carrier, and the factors shown in the table represent the straight average of those factors in each year for the carriers in each group. Each of these groups is described further below.

We used straight (arithmetic) averages in our work because we wanted the experience of each carrier to carry equal weight. There are likely a number of differences between the participating carriers in terms of rating and underwriting and other business practices, and we did not wish to give undue influence to some carriers which using a weighted average, based on volume, would have done.

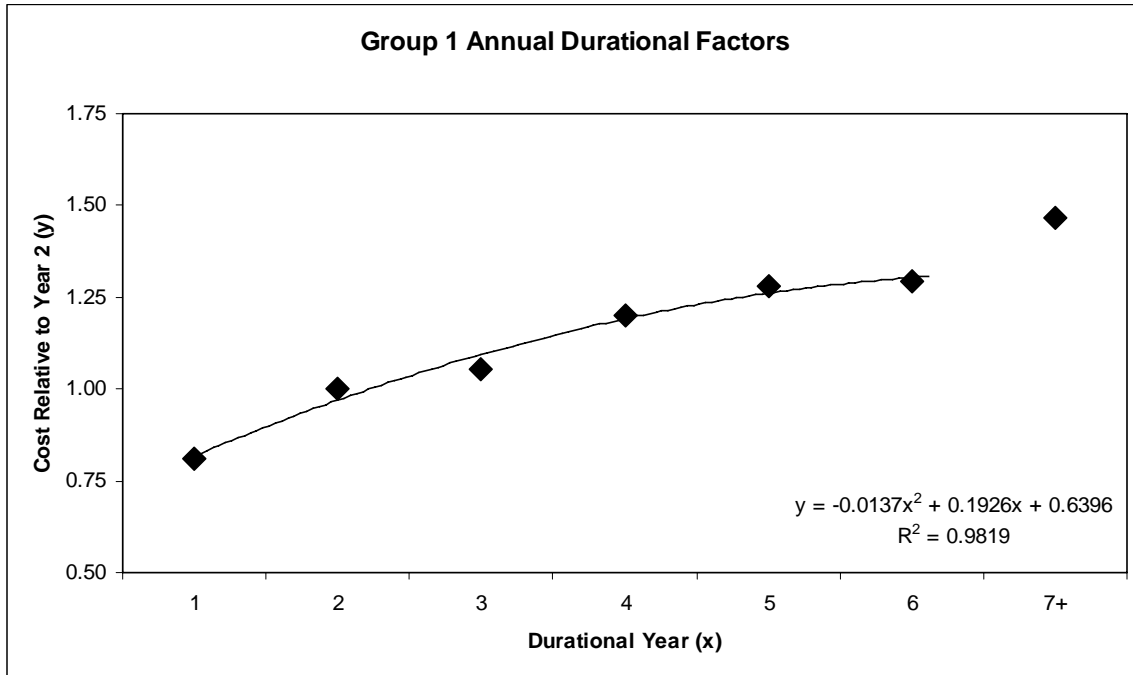
Table III-1: Durational Factors

Durational Year	Durational Factor	
	Group 1	Group 2
Year 1	0.812	0.774
Year 2	1.000	1.000
Year 3	1.054	1.021
Year 4	1.198	1.060
Year 5	1.282	0.896
Year 6	1.293	0.924
Year 7+	1.465	0.870

Group 1

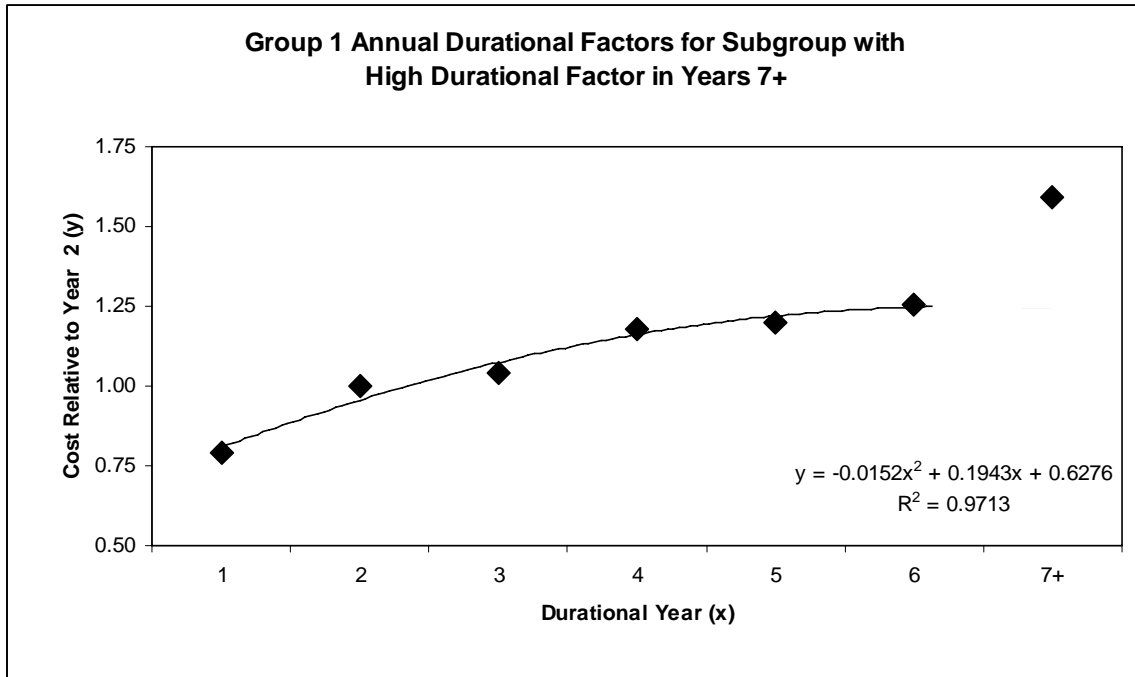
Figure III-1a is a graphical representation of the arithmetic average durational factors by durational year for the first group. We fitted a polynomial curve to the data. We chose the order of the equation based on a backward elimination strategy for selecting variables using partial F tests. The figure also shows the associated R^2 value as an indication of fit.

Figure III-1a: Durational Factors for Group 1



Furthermore, we noted that, within this first group, two carriers' data indicated a significant increase in durational effect in years 7+. The average factors derived from those two carriers' experience are shown in Figure III-1b.

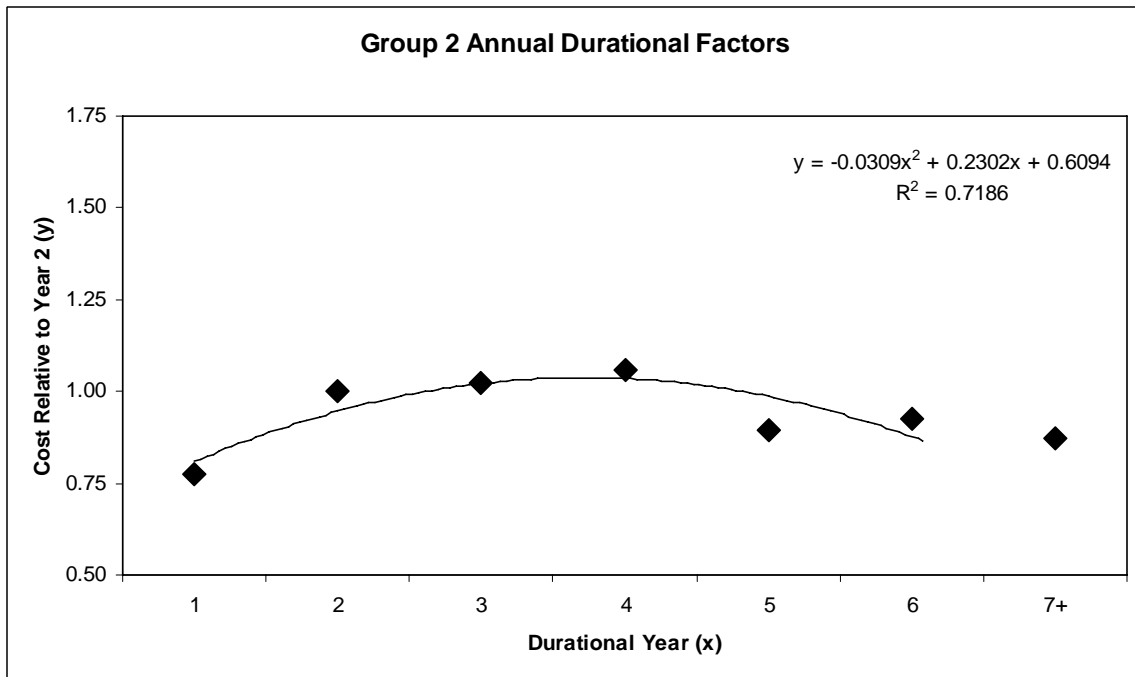
Figure III-1b: Durational Factors for Subgroup with High Durational Factor in Years 7+



Group 2

The experience of the second group showed average claim costs in later durations below the average in earlier durations. The average factors derived from those carriers' data are shown in Figure III-1c (Group 2).

Figure III-1c: Durational Factors for Group 2



There are a number of reasons why the durational impact may vary between carriers, other than random fluctuations. Examples include:

- **Commission Scales:** Front-end-loaded commission scales can give agents/brokers an incentive to roll their business, particularly if the company does not pay lower commissions on replacement business than on other new business.
- **Durational Rating Factors:** Companies that include a durational rating factor in their premium rates may be more likely to experience a steeper durational effect, since healthier insureds who can pass underwriting have more incentive to secure a new policy.
- **Underwriting Practices:** Companies with stricter underwriting guidelines and/or practices may be more likely to experience a steeper durational impact than other companies.
- **Internal Dating Practices:** Company dating practices vary with regard to insureds who change policies, move to lower deductibles and so on.
- **Exceptionally High or Low Premium Rates:** Premium rate increases that are very high or low compared to historical averages or premium rate levels that vary significantly from market averages may cause an unusual lapsation which will directly impact durational patterns to the extent that healthier insureds are more or less likely to stay.
- **Operational Differences:** Companies vary in the time it takes to issue member cards, acclimate members to a new network and other factors that may inhibit utilization in the first months of coverage.

In general, individual companies need to consider their own company practices when comparing results from this study to its own company experience.

Below, we present average durational factors based on the data of all seven carriers. Above we discussed that we observed more than one durational pattern in the data we reviewed, and that should be kept in mind when reviewing the aggregate results. Table III-2 below shows average annual durational factors by durational year across all seven contributors, along with total adjusted dollars and contract months in each year. Monthly factors for the first 36 months are shown in Table B-2 in Appendix B.

Table III-2: Durational Factors, Adjusted Claim Dollars and Exposure

Durational Year	Durational Factor	Adjusted Claim Dollars (in 000s)	Exposure (in 000s)
Year 1	0.801	\$467,591	3,076
Year 2	1.000	\$341,888	1,813
Year 3	1.044	\$263,736	1,319
Year 4	1.159	\$241,220	1,059
Year 5	1.171	\$199,182	804
Year 6	1.187	\$131,861	521
Year 7+	1.295	\$479,840	1,767
Total		\$2,125,317	10,360

Figure III-2a is a graphical representation of the durational factors in Table III-2. Exposure here represents the average annual number of contracts (in 000s) among the seven carriers in each year. For example, in year six, each carrier had, on average, slightly fewer than 100,000 contracts in force. We are providing the exposure to assist the reader in evaluating

the credibility of the results. In Figure III-2b, we have fitted a quadratic equation to the durational factors from Table III-2.

Figure III-2a: Durational Factors—Seven Carriers

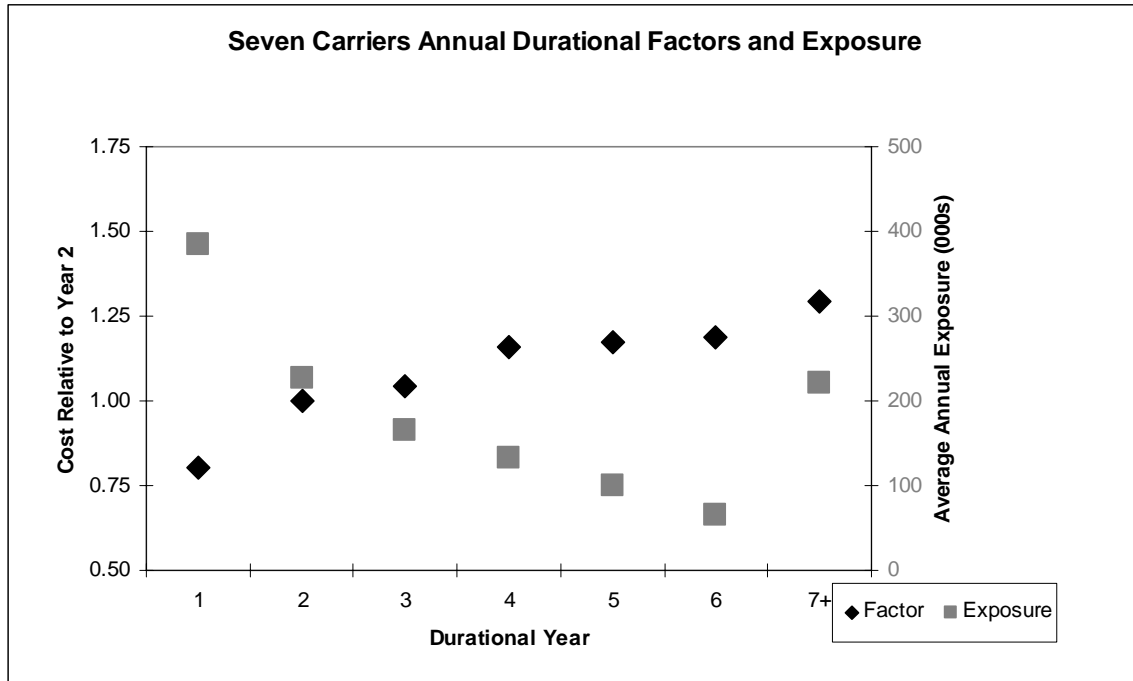
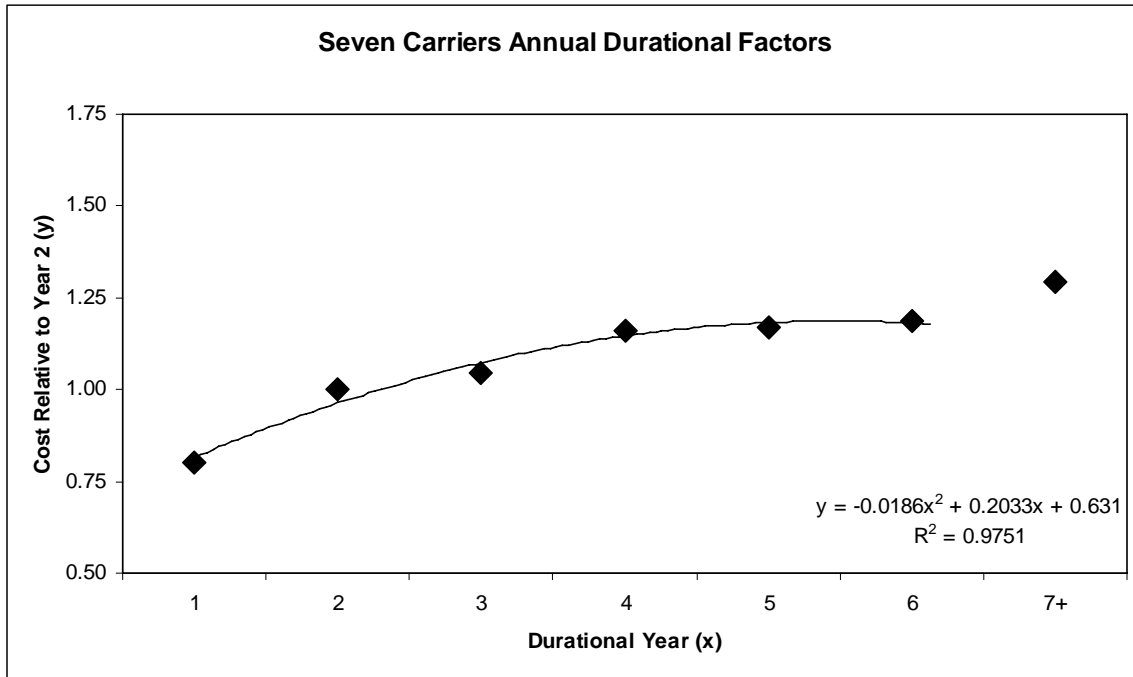


Figure III-2b: Durational Factors with Fitted Quadratic Curve



Results by Deductible Level

We segmented the experience by deductible level into two categories:

- less than or equal to \$1,000 and
- greater than \$1,000

As we mentioned above, we initially considered including separate results for contracts with deductibles exceeding \$2,500, but lacked sufficient data to produce credible results.

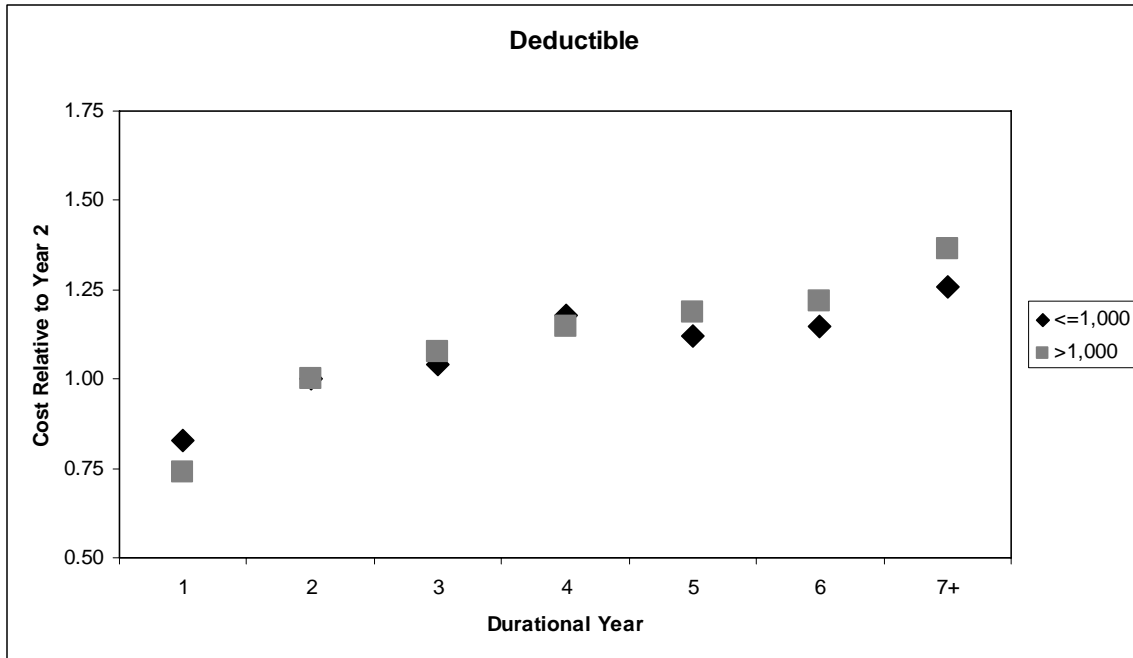
Table III-3a shows results by deductible category. Detail by month for the first 36 months is shown in Table B-3 in Appendix B.

Table III-3a: Aggregate Durational Slope by Deductible Category

Durational Year	<= \$1,000	>\$1,000
Year 1	0.827	0.739
Year 2	1.000	1.000
Year 3	1.039	1.077
Year 4	1.179	1.148
Year 5	1.121	1.189
Year 6	1.147	1.219
Year 7+	1.257	1.363

Figure III-3 includes a graphical representation of the results in Table III-3a.

Figure III-3: Durational Slope by Deductible Category



The adjusted claim dollars and exposure associated with each category and year are shown in Tables III-3b and III-3c.

Table III-3b: Adjusted Claim Dollars (in 000s) by Deductible Category

Durational Year	Deductible Category		Total
	<= \$1,000	>\$1,000	
Year 1	\$236,314	\$231,277	\$467,591
Year 2	\$146,082	\$195,806	\$341,888
Year 3	\$101,641	\$162,095	\$263,736
Year 4	\$85,700	\$155,519	\$241,220
Year 5	\$64,669	\$134,513	\$199,182
Year 6	\$39,833	\$92,028	\$131,861
Year 7+	\$77,820	\$402,020	\$479,840
Total	\$752,058	\$1,373,259	\$2,125,317

Table III-3c: Exposure (in 000s) by Deductible Category

Durational Year	Deductible Category		Total
	<= \$1,000	>\$1,000	
Year 1	1,423	1,653	3,076
Year 2	763	1,051	1,813
Year 3	501	818	1,319
Year 4	378	681	1,059
Year 5	286	518	804
Year 6	181	340	521
Year 7+	388	1,380	1,767
Total	3,920	6,440	10,360

Results by Issue Age Category

We segmented the experience by issue age into three categories:

- less than or equal to 35 years,
- greater than 35 years and less than or equal to 50 years and
- greater than 50 years.

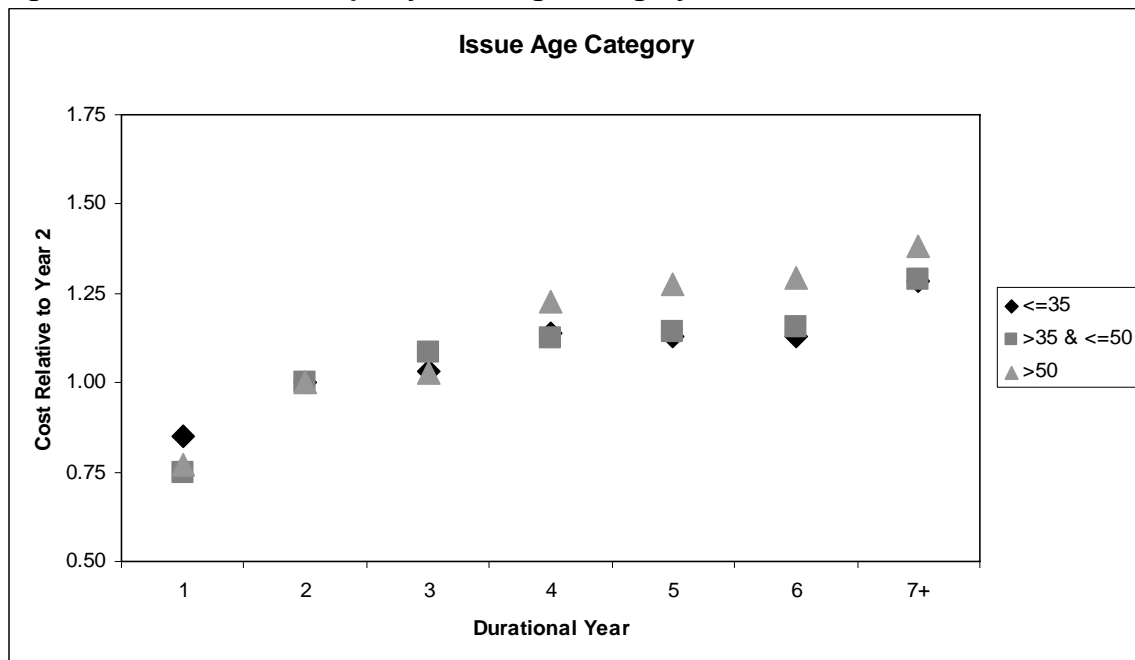
Table III-4a shows results by category and year. Detail by month for the first 36 months is shown in Table B-4 in Appendix B.

Table III-4a: Aggregate Durational Slope by Issue Age Category

Durational Year	Issue Age Category		
	<= 35	> 35 and <= 50	> 50
Year 1	0.850	0.748	0.771
Year 2	1.000	1.000	1.000
Year 3	1.032	1.083	1.027
Year 4	1.139	1.127	1.229
Year 5	1.130	1.142	1.274
Year 6	1.130	1.155	1.294
Year 7+	1.287	1.288	1.384

Figure III-4 includes a graphical representation of the results in Table III-4a.

Figure III-4: Durational Slope by Issue Age Category



The adjusted claim dollars and exposure associated with each category and year are shown in Tables III-4b and III-4c.

Table III-4b: Adjusted Claim Dollars (in 000s) by Issue Age Category

Durational Year	Issue Age Category			Total
	<= 35	> 35 and <= 50	> 50	
Year 1	\$280,885	\$111,262	\$75,443	\$467,591
Year 2	\$191,382	\$91,497	\$59,009	\$341,888
Year 3	\$140,625	\$76,418	\$46,692	\$263,736
Year 4	\$122,538	\$68,719	\$49,963	\$241,220
Year 5	\$91,915	\$64,669	\$42,598	\$199,182
Year 6	\$58,805	\$44,609	\$28,446	\$131,861
Year 7+	\$216,374	\$190,464	\$73,002	\$479,840
Total	\$1,102,524	\$647,640	\$375,153	\$2,125,317

Table III-4c: Exposure (in 000s) by Issue Age Category

Durational Year	Issue Age Category			Total
	<= 35	> 35 and <= 50	> 50	
Year 1	1,860	690	526	3,076
Year 2	1,038	438	338	1,813
Year 3	719	342	258	1,319
Year 4	532	302	226	1,059
Year 5	360	253	191	804
Year 6	209	181	131	521
Year 7+	615	800	352	1,767
Total	5,333	3,006	2,021	10,360

Results by Rating Classification

We segmented the experience by rating classification into two categories:

- standard and
- non-standard.

According to our instructions to the data contributors, any policy that was sold with a substandard rating or exclusionary rider was to be classified as non-standard. Policies issued with smoker rates were to be considered non-standard. We indicated that any policies that were issued “super-standard,” “preferred,” or likewise could be grouped with and classified as standard for the study. Clearly, the “non-standard” category could include a wide spectrum of business, which must be kept in mind when reviewing these results.

Three of the carriers did not have non-standard business; therefore, we have excluded them from the rating classification analysis. Of the four remaining carriers with both standard and non-standard business, the percentage of their business that was non-standard varied from 8 percent to 27 percent. The impact of including versus excluding the highest and the lowest percentage of non-standard business carriers did not significantly change the results. For that reason, we have left them in the rating classification analysis.

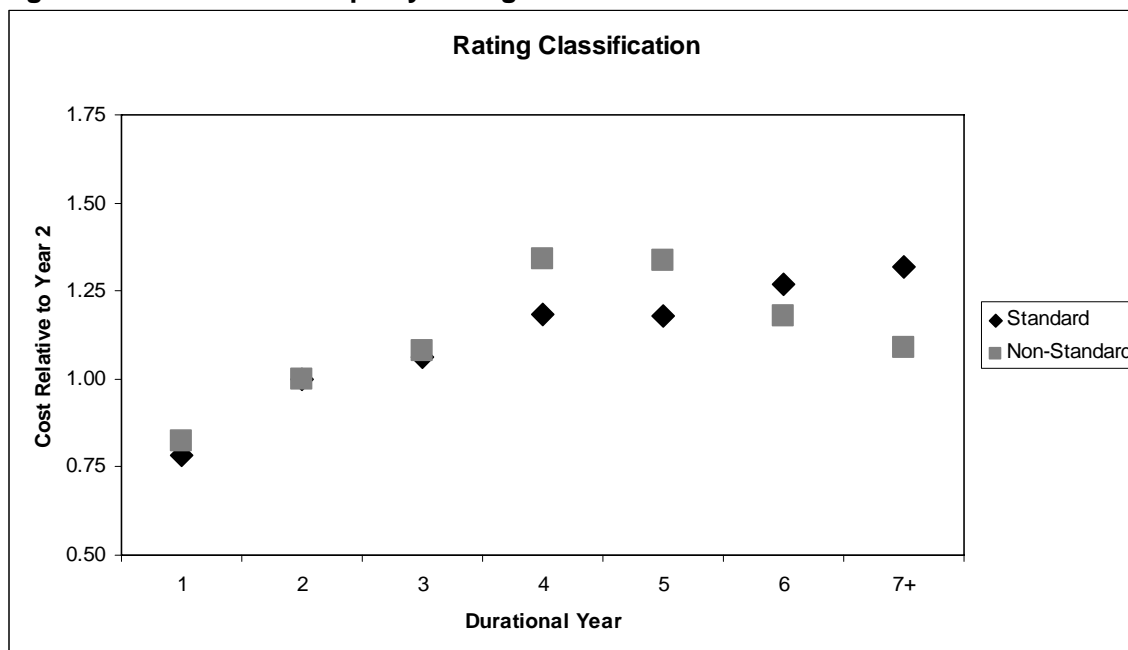
Table III-5a shows results by category and year. Detail by month for the first 36 months is shown in Table B-5 in Appendix B.

Table III-5a: Aggregate Durational Slope by Rating Classification

Durational Year	Standard	Non-Standard
Year 1	0.785	0.825
Year 2	1.000	1.000
Year 3	1.063	1.080
Year 4	1.181	1.341
Year 5	1.181	1.338
Year 6	1.269	1.180
Year 7+	1.317	1.090

Figure III-5 includes a graphical representation of the results in Table III-5a.

Figure III-5: Durational Slope by Rating Classification



The non-standard rating classification increases to duration year 5 and then decreases, whereas the standard rating classification continues to rise. While the reasons for the negative slope in the non-standard curve are not clear, it could reflect, at least in part, recovery among persisting policyholders from conditions that resulted in the non-standard rating. It could also reflect deaths among the sickest policyholders. There does appear to be enough experience to make the results credible, and all four carriers do show this pattern in the last two periods. The adjusted claim dollars and exposure associated with each category and year are shown in Tables III-5b and III-5c.

Table III-5b: Adjusted Claim Dollars (in 000s) by Rating Classification

Durational Year	Rating Classification		Total
	Standard	Non-Standard	
Year 1	\$308,138	\$102,592	\$410,730
Year 2	\$238,972	\$60,086	\$299,059
Year 3	\$192,582	\$42,409	\$234,991
Year 4	\$178,885	\$40,192	\$219,076
Year 5	\$144,678	\$37,355	\$182,033
Year 6	\$98,913	\$20,455	\$119,368
Year 7+	\$368,096	\$47,964	\$416,060
Total	\$1,530,264	\$351,054	\$1,881,317

The Standard and Non-Standard column labels have been interchanged since the May 23, 2006 version of this report.

Table III-5c: Exposure (in 000s) by Rating Classification

Durational Year	Rating Classification		Total
	Standard	Non-Standard	
Year 1	2,056	483	2,539
Year 2	1,262	236	1,498
Year 3	962	151	1,114
Year 4	790	126	917
Year 5	592	107	698
Year 6	381	64	445
Year 7+	1,272	161	1,433
Total	7,315	1,328	8,644

The Standard and Non-Standard column labels have been interchanged since the May 23, 2006 version of this report.

Results for 12 Month Pre-Existing Condition Limitation

We asked contributors to sort experience data according to the number of months of insurance coverage required before pre-existing conditions would be covered. Most of the carriers in this study use a pre-existing condition limitation of 12 months, while the others used pre-existing condition limitations of 0 months and 6 months. In order to maintain confidentiality of the contributors, we are only providing specific results based on the data of the carriers with a 12-month limitation.

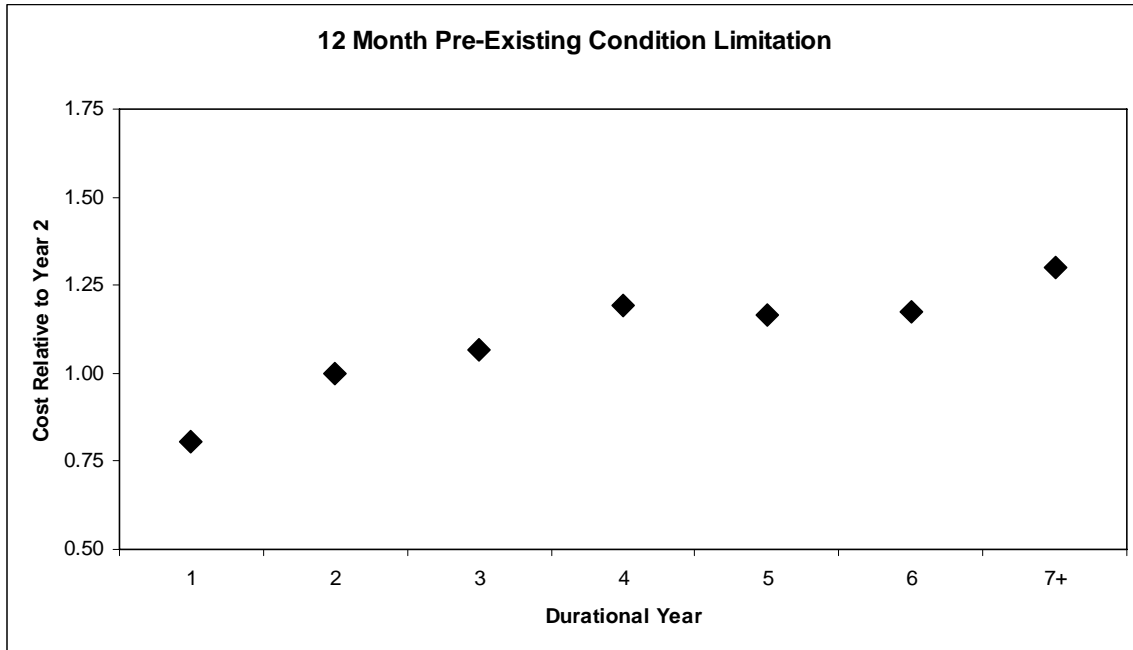
Results by year are shown in Table III-6. Monthly results are included in Table B-6 in Appendix B.

**Table III-6: Durational Factors, Claim Dollars and Exposure
12-Month Pre-Ex Limitation**

Durational Year	Durational Factor	Adjusted Claim Dollars (in 000s)	Exposure (in 000s)
Year 1	0.807	\$287,238	1,844
Year 2	1.000	\$181,959	967
Year 3	1.064	\$131,774	649
Year 4	1.193	\$109,263	493
Year 5	1.167	\$79,678	361
Year 6	1.173	\$45,399	210
Year 7+	1.299	\$54,452	294
Total		\$889,764	4,818

Figure III-6 includes a graphical representation of the results in Table III-6.

Figure III-6: Durational Slope for Contracts with a 12-Month Pre-Ex Limitation



Conclusion

This study reviewed the durational data of seven individual health insurance carriers. While some of the carrier's data exhibited a durational pattern consistent with the pattern in factors commonly used in the industry to project future experience, there were carriers whose data exhibited a different pattern. In particular, two carriers' data showed durational factors trending negative in later years. The analysis also showed that durational patterns in the data did vary somewhat by deductible, issue age and rating classification. We also included a set of factors for business with a 12-month pre-existing condition limitation.

This report only examined the durational pattern in single contract business and not family contract business. Likewise, this study did not include an analysis of how durational patterns might vary by gender. We believe it would be worthwhile to study the durational patterns in family business (vs. single) as well as by gender sometime in the future.

Appendix A: Data and Information Request



SOCIETY OF ACTUARIES

Date: August 10, 2004

To: Potential Participants in Individual Major Medical Experience Study

From: Ronora Stryker, ASA, SOA Research Actuary, 847-706-3614

Re: Request For Data

The Society of Actuaries Health Benefit Systems Practice Area and Health Section are sponsoring new research that examines the effect of underwriting wear-off and cumulative anti-selection on individual comprehensive major medical claim costs by policy duration. The project, "Analysis of Claims By Policy Duration for Individual Major Medical Insurance" will provide actuaries with various durational claim cost curves that can be used for pricing and company benchmarking purposes.

The SOA has contracted with Milliman USA to perform the research including analyzing and compiling claim data. An oversight committee of SOA member volunteers with expertise in this area has been formed to work closely with the research team. The end result will be a report made available to members via the SOA web site, NAAJ, or other SOA publication.

In order to meet its objective, the SOA is in need of individual comprehensive major medical incurred claim data for calendar years 2001 and 2002 in the attached format and requests your participation. All data contributed will be kept confidential and not disclosed or deemed identifiable in any way to anyone other than the SOA or Milliman USA staff directly involved with this project. All confidential information will be stored in a safe and secure environment to ensure that unauthorized persons will not have access to confidential information. The final report will show overall industry results (Individual company results will not be shown.) and will include a list of the participating companies.

In addition to the claim data, we also would like each contributing company to provide a lapse study for their business or at least a narrative of the business detailing historic rate increases exceeding 15% per year. This will help the researchers interpret the effect of anti-selective lapsation caused by the rate increases on the durational curves.

Data should be sent to the Lead Researcher at the contact information listed below by **October 15, 2004**. Please also contact the Lead Researcher should you require special assistance in submitting data or would like to participate but cannot supply the data in the requested format.

Lead Researcher
Leigh M. Wachenheim, FSA, MAAA
Principal
Milliman USA
8500 Normandale Lake Blvd.
Minneapolis, MN 55437
(952) 820-2481, e-mail: leigh.wachenheim@milliman.com

If you have any questions regarding the study or participation, please feel free to contact the Lead Researcher or me at any time. Thank you for your consideration and kind assistance.



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT**

Health Plan Data Request

The Society of Actuaries (“SOA”) is requesting the following data for its individual major medical claims durational study. The SOA has contracted with Milliman USA to perform the research. Please review this request and forward any questions you have to the Lead Researcher, Leigh Wachenheim, at leigh.wachenheim@milliman.com or (952) 820-2481.

Please provide the Detailed Data File in a fixed length text electronic format and the Data Contributor Form by **October 15, 2004**. Please note from this file, the Validation Data File will be determined and sent back to the contributing carrier for verification.

To help the researchers interpret the duration curve results, please also submit with your data, any company lapse information/reports about the individual block or narrative of historical rate increases for the block that exceeded an annual 15%. If you are unable to provide, please contact Leigh Wachenheim at the above phone number and e-mail address.

File Name: Detailed Data File

Field	Type	Length	Comments/ Definitions
Carrier Number	Text	4	In order to maintain confidentiality of data submitted, a four digit number will be set up per carrier in order to allow us to validate data for each carrier. This number will be arranged ahead of time.
State of Issue	Text	2	Two letter postal initials reflecting the state the policy is issued in. Ex. New Jersey = 'NJ'
Underwriting Method	Text	2	'LF' = long-form, defined as a written application with material health questions, 'GI' = Guarantee Issue.
Pre-Existing Condition Limitation	Numeric	2	# of months of insurance coverage required before covering pre-existing conditions. Example, for a pre-existing condition limitation referred to as a 6-6-12 (for conditions arising within 6 months prior to the effective date, requiring 6 months treatment free or 12 months to exempt the exclusion) = '12'
Deductible Amount	Numeric	5	Average Individual Deductible. Ex. a \$1,000 deductible plan = '01000'.
Subscriber Age	Numeric	2	Subscriber age at issue. Ex. a 36 year old = '36'.
Family Status	Text	1	Family status of the subscriber's contract. 'S' = if contract is Single, 'F' = if contract is other than single.



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT**

Field	Type	Length	Comments/ Definitions
Rating Classification	Text	1	'S' = Standard Contract, 'N' = Non-Standard Contract, In general, any policy that is sold with a substandard rating or exclusionary rider should be considered Non-Standard. Non-Standard rating simply refers to any rate to which a loading factor has been applied. Any policies that are considered Super-Standard may be group with Standard contracts. Smoker rates should be considered non-standard for the purpose of this study. Any policy issued with an exclusion rider should be treated as non-standard.
Duration Month	Numeric	2	Number of months elapsed from the date of issue to the date of incurral. In the case where a company has re-underwritten a policyholder as though they were a new applicant, but nonetheless left the policy in force, the date of issue is defined as the last date the policyholder has undergone underwriting. Number to be capped at 84 months. Ex. a policyholder with a February 10, 2001 date of issue is defined as being in their 3rd durational month for any claim incurred between April 10, 2001 and May 9, 2001. A policyholder with a January 12, 2001 date of issue is defined as being in their first duration month when a claim is incurred from January 12, 2001 through February 11, 2001. First durational month = '01'. For policies in durations over and including 85 months, use Durational Month = '85'.
Incurred/ Exposure Year	Numeric (YY)	2	Include experience from Claims Incurred (on a run-out basis) during Calendar years 2001 and 2002. This time period should include actual claims that were paid up until this report is generated. For facility charges = year of admission, physician charges = year of procedure/visit, prescription charges = year of fill.
Earned Premium	Numeric	15	Earned Premium by Exposure Period. Ex. \$15,000,352.45 = 00000001500035245



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT**

Field	Type	Length	Comments/ Definitions
Incurred Claims	Numeric	15	Contains Claims that were actually incurred in the Calendar Years 2001 and 2002. Reference Incurred Month and Year field for more detail. Ex. \$15,000,352.45 = 00000001500035245
Adjusted Incurred Claims	Numeric	15	Apply internal rating adjustment factors/ assumptions to adjust incurred claims from above to represent what claims would have been assuming the following: <ul style="list-style-type: none"> • Payment at billed charge levels (no discounts) for covered charges • A standard major medical plan (inc pres drugs) with a \$200 deductible, 80% coinsurance, and \$1,200 (inc ded) out-of-pocket maximum. • A 37 year-old single male • Incurred date of 7/1/01 (use a annual trend rate of 13%-- before leveraging-- to adjust claims) For simplicity, adjustment factors should not be applied on a claim by claim basis but rather once claims have been aggregated for a particular block of cells. For clarification, please call the researcher, Leigh Wachenheim (at 952-820-2481). If this process is particularly onerous, please call Leigh to discuss alternatives.
Benefit Adjusted Claims	Numeric	15	Use internal factors to adjust each incurred claim aggregated cell by type of benefit plan to a standard plan of \$200 ded with 80% coinsurance with a total out of pocket max (including deductible) of \$1,200. See incurred claim for field format. (This field will be used in checking reasonability of Adjusted Incurred Claims.)
Covered Billed Charges	Numeric	15	Billed Charges for any service that was covered by insurance. See incurred claim for field format. (This field will be used in checking reasonability of Adjusted Incurred Claims.)
Trend Adjusted Claims	Numeric	15	Trend claims to 7/01/01, assuming annual trend rates of 13%. See incurred claim for field format. (This field will be used in checking reasonability of Adjusted Incurred Claims.)
Demographic Adjusted Claims	Numeric	15	Using internal rating factors for age, sex and family status adjust each incurred claim aggregated cell to the level of a single, 37 year old male. See incurred claim for field format. (This field will be used in checking reasonability of Adjusted Incurred Claims.)



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT**

Field	Type	Length	Comments/ Definitions
Exposure – Contracts	Numeric	12	Number of months contract/certificate holders were eligible for benefits. Should coincide with the durational month field. Each contract holder should be counted separately. For example, if 100 plans were in force for the entire month and 10 were in force for half the month, exposure would be 105 = (100 x 1.0 + 10 x 0.5). This would be entered as 000000000105.
Exposure – Adult Dependents	Numeric	12	Number of months adult dependents were eligible for benefits during the durational period. Should coincide with the durational month field. If necessary use factor to estimate. This may be appropriate where an exact number is not available. Ex. 12,000 = 000000012000.
Exposure – Children Dependents	Numeric	12	Number of months child dependents were eligible for benefits during the durational period. Should coincide with the durational month field. If necessary use factor to estimate. This may be appropriate where an exact number is not available. This field is specific to each child member covered and does not simply refer to a child(ren) unit. Ex. 12,000 = 000000012000.



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
VALIDATION DATA FILE**

Please complete the following information and include with your data submission:

Company Name:

Company Contact Name:

Company Contact Phone Number:

Company Contact E-mail Address:

Subsidiary Company Names Included in Data Submission:

To the best of your knowledge is the data provided accurate and complete?

Please Circle one: YES No

If No, please explain:

To the best of your knowledge are the incurred claims based on the most complete payment data available and do they include no margin?

Please Circle one: YES No

If No, please explain:



SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT

File Name: Validation Data File

This file will be created from the submitted data and sent back to each carrier as a control to validate the detailed data.

Table with 2 columns: Field Name and Input Line. Fields include Carrier Number, State of Issue, Underwriting Method, Pre-Existing Limitation Condition, Deductible Amount, Subscriber Age, Family Status, Rating Classification, Earned Premium, Incurred Claims, Adjusted Incurred Claims, Benefit Adjusted Claims, Covered Billed Charges, Trend Adjusted Claims, Demographic Adjusted Claims, and Exposures.

- 1. Data should be provided only from individual major medical experience. Individual major medical coverage is defined as an accident and sickness insurance policy that provides hospital, medical and surgical expense coverage, to an aggregate maximum of not less than \$500,000; coinsurance percentage per year per person not to exceed 50% of covered charges, provided that the coinsurance out-of-pocket maximum after any deductible shall not exceed \$10,000 per year.
2. For the purposes of this study, individual health benefit plans include those that are fully medically underwritten and provide comprehensive major medical coverage.
3. HMO products are not to be included, as capitation payments do not provide adequate information that can be used in the calculation of durational effects.



**SOCIETY OF ACTUARIES
INDIVIDUAL MAJOR MEDICAL STUDY – ANALYSIS OF CLAIMS BY POLICY DURATION
DATA CONTRIBUTION FORMAT**

- managed by a primary care physician where managed care can mean authorization, referral, notification and any other indirect involvement as well as direct involvement in the care.
4. This should not include any COBRA or group conversion business. As well, short term policies should be excluded from the data.
 5. Plans such as hospital only, accident only, cancer, disability, and dental will be excluded. However, maternity, supplemental accident, and other related optional medical benefits will be included when part of a major medical plan.
 6. Dependent as well as policy/certificate holder claims should be included.
 7. The claim figures should be stated prior to any reinsurance or pooling.
 8. All claims will be adjusted to remove the impact of differences in benefits, geographic area, provider discounts, time period, and demographics. In order to accomplish this, we will ask the insurance carrier to use their own internal factors to adjust claim levels to be in line with a given standard plan. (Please refer to the Plan Data Request for a description of the standard plan.)

Appendix B: Monthly Factors

This appendix includes results by monthly duration through the first 36 months and by year for years 1 through 6 and 7 plus. While a substantial quantity of individual health major medical data has been submitted for this study, care must be taken when analyzing results at this level of detail because of the low level of exposure. In addition, some carriers may have used a calendar month definition of duration (vs. policy month), which should be kept in mind when reviewing the factors for early monthly durations. Table B-1 below provides a table of contents for this Appendix.

Table B-1: Monthly Durational Factor Tables

Table	Contents
B-2	All (Group 1 and 2 Combined)
B-3	By Deductible
B-4	By Issue Age
B-5	Rating Category
B-6	12-Month Pre-Existing Condition Limitation

Table B-2 shows durational factors by month for the first 36 months and by year.

**Table B-2: Factors by Duration
All Categories**

Durational Factors	
Single Contracts, Long-Form	
Duration	All Categories
Monthly Factors	
1	0.624
2	0.681
3	0.773
4	0.755
5	0.813
6	0.773
7	0.828
8	0.904
9	0.955
10	0.915
11	0.913
12	0.956
13	1.029
14	0.988
15	0.991
16	1.042
17	0.990
18	0.992
19	0.998
20	0.942
21	0.993
22	1.069
23	0.962
24	1.012
25	1.017
26	0.992
27	1.007
28	0.934
29	1.016
30	0.992
31	1.053
32	1.068
33	1.047
34	1.208
35	1.162
36	1.103
Annual Factors	
1	0.801
2	1.000
3	1.044
4	1.159
5	1.171
6	1.187
7+	1.295

Table B-3 shows results by duration for contracts with a deductible less than or equal to \$1,000 and with a deductible greater than \$1,000.

**Table B-3: Factors by Duration
by Deductible Category**

Durational Factors		
Single Contracts, Long-Form		
Duration	Deductible	
	<=1,000	>1,000
Monthly Factors		
1	0.638	0.577
2	0.726	0.552
3	0.777	0.807
4	0.785	0.685
5	0.817	0.866
6	0.804	0.741
7	0.888	0.738
8	0.898	0.913
9	1.030	0.784
10	0.941	0.821
11	0.942	0.826
12	1.003	0.824
13	1.041	0.971
14	1.031	0.994
15	1.010	0.943
16	1.089	0.958
17	0.979	0.959
18	0.942	1.112
19	0.966	1.086
20	0.934	0.998
21	0.941	1.042
22	1.037	1.139
23	0.947	0.942
24	1.068	0.876
25	0.964	1.241
26	0.948	1.136
27	1.045	1.003
28	0.939	0.945
29	1.011	1.099
30	0.987	1.031
31	1.007	1.092
32	1.201	0.946
33	0.952	1.152
34	1.254	1.044
35	1.158	1.108
36	1.065	1.184
Annual Factors		
1	0.827	0.739
2	1.000	1.000
3	1.039	1.077
4	1.179	1.148
5	1.121	1.189
6	1.147	1.219
7+	1.257	1.363

Table B-4 shows results by duration for contracts issued in three different issue age groups.

**Table B-4: Factors by Duration
by Issue Age Category**

Durational Factors			
Single Contracts, Long-Form			
Duration	Issue Age Category		
	<=35	>35 & <=50	>50
Monthly Factor			
1	0.723	0.508	0.489
2	0.734	0.598	0.635
3	0.844	0.705	0.715
4	0.811	0.656	0.742
5	0.884	0.752	0.787
6	0.828	0.744	0.710
7	0.871	0.859	0.740
8	0.900	0.928	0.901
9	1.002	0.863	0.893
10	1.004	0.824	0.897
11	0.933	0.885	0.895
12	0.934	0.894	1.053
13	1.080	0.943	1.104
14	1.037	0.932	0.884
15	1.040	0.967	0.929
16	1.002	1.191	0.892
17	1.030	0.947	0.916
18	0.982	0.992	1.046
19	0.892	1.064	1.115
20	0.933	0.948	0.956
21	0.963	0.990	1.040
22	1.083	1.081	1.083
23	0.916	0.979	1.049
24	0.993	0.980	1.084
25	0.947	1.126	1.003
26	0.950	1.020	1.054
27	1.078	0.984	0.919
28	0.974	0.914	0.894
29	0.940	1.134	1.031
30	0.918	1.134	0.992
31	0.979	1.194	0.993
32	1.174	0.993	1.052
33	0.952	1.106	1.062
34	1.279	1.166	1.170
35	1.121	1.181	1.200
36	1.134	1.107	1.037
Annual Factors			
1	0.850	0.748	0.771
2	1.000	1.000	1.000
3	1.032	1.083	1.027
4	1.139	1.127	1.229
5	1.130	1.142	1.274
6	1.130	1.155	1.294
7+	1.287	1.288	1.384

Table B-5 shows results by duration for contracts issued on a standard and non-standard basis, respectively.

**Table B-5: Factors by Duration
by Rating Category**

Durational Factors		
Single Contracts, Long-Form		
Duration	Rating Classification	
	Standard	Non-Standard
Monthly Factors		
1	0.632	0.538
2	0.623	0.533
3	0.793	0.743
4	0.754	0.697
5	0.826	0.747
6	0.751	0.825
7	0.832	1.016
8	0.942	0.913
9	0.870	1.678
10	0.843	0.852
11	0.855	1.017
12	0.916	1.051
13	1.036	0.939
14	1.002	1.038
15	1.012	0.935
16	0.981	1.048
17	1.005	0.951
18	1.001	0.976
19	1.018	0.927
20	0.987	0.941
21	0.976	1.293
22	1.054	1.021
23	0.902	1.004
24	1.036	0.957
25	1.111	1.071
26	0.927	1.408
27	1.038	1.109
28	0.934	0.912
29	1.087	0.978
30	0.995	1.118
31	1.131	0.960
32	1.143	1.053
33	1.096	1.236
34	1.132	1.058
35	1.023	1.110
36	1.162	0.934
Annual Factors		
1	0.785	0.825
2	1.000	1.000
3	1.063	1.080
4	1.181	1.341
5	1.181	1.338
6	1.269	1.180
7+	1.317	1.090

Table B-6 shows results by duration for contracts with a 12-month pre-existing condition limitation.

**Table B-6: Factors by Duration
12-Month Pre-Existing Condition Limitation**

Durational Factors Single Contracts, Long-Form	
Duration	12-Month Pre-Existing Condition Limitation
Monthly Factors	
1	0.625
2	0.703
3	0.796
4	0.774
5	0.820
6	0.798
7	0.838
8	0.863
9	0.975
10	0.944
11	0.890
12	0.975
13	1.058
14	1.025
15	0.977
16	1.081
17	0.955
18	1.007
19	0.983
20	0.979
21	0.999
22	1.026
23	0.902
24	0.993
25	1.068
26	1.012
27	1.076
28	0.941
29	1.020
30	0.980
31	1.079
32	1.117
33	1.022
34	1.206
35	1.151
36	1.160
Annual Factors	
1	0.807
2	1.000
3	1.064
4	1.193
5	1.167
6	1.173
7+	1.299