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LARGE GROUP MEDICAL CLAIMS STUDY REPORT

Lecturer: JACK LUFF

The results of the Large Group Medical Claims Study will be presented. Twenty-six insurers participated and nearly 200,000 claims were studied. Factors of the study included plan type, deductible level, hospitals versus other charges, age and gender of claimant, diagnosis and zip code.

MR. JACK LUFF: This session is on the Large Group Medical Claims Study. I'm the experience studies actuary in the Society of Actuaries (SOA) office. I've been the staff liaison for this project for the last year or so, but there are other people in the office that were involved in the earlier stages of this project, so you may have some questions that I might not be able to answer. But I'll certainly do what I can.

This project has gone by a number of names. This is the title that was given for the project in the request for proposal that went out. It has also been referred to as catastrophic claims and a few other titles. I'm certainly not going to get into any detail on the current SOA research process, but I do want to note two aspects of the process that do come into play as far as this project is concerned, and as far as most of our research projects are concerned at the moment. Specifically there is a project oversight group (POG) associated with projects. This is a volunteer group of people who put the project together, and they make sure the project is going according to plan and they certainly do a fair bit of review of the output of this project. A key part of this is that there is typically a paid researcher involved in research projects for the Society. And the thing that is a little bit different about this particular project was there was data collection from a number of companies, and then a researcher was paid to do an analysis of these data.

I did want to mention that John Bertko was the person that was the chair of this POG during its early stages and really was quite instrumental in making the project actually happen, although he chose not to stay around until the bitter end.

The researcher for the project is Kyle Grazier. She is not a member of the Society. She is at Cornell University in their Health Studies area. There was some discussion as to whether we wanted an actuary to be involved in this project. The feeling was that there was some hope, by having an outsider involved in this, some additional value could be brought to the process. You can judge for yourselves as time goes on whether that worked out.

The time table as far as what went on in the project is as follows. The formal part started in the third quarter of 1992. Data was requested, the researcher was selected, the data specifications were set out by the POG and all these things happened at the same time. It is a little embarrassing to say that the final report was received by the researcher between Christmas and New Year at the end of 1994. It did comprise approximately ten pounds of paper. I think we've been sitting around in awe for about four months trying to figure out what to do with it, and only recently we really came to grips with what's in there and perhaps what's not in there and where we want to go with it. The other thing that I wanted to acknowledge is the fact that the funding for this project came from the SOA project funds and more significantly from the Health Section.

Our intention as far as the project is concerned is that there will be a paper report that is available and that there will be a computer file that will contain the claims information that was collected as part of the study, with again, some details. The proposal has to go through a couple of layers of approval. It is to sell for \$300 and the computer diskette will be \$600. There are some arguments that we should charge less for the paper report and charge more for the computer file. We'll see how this plays out.

Companies that contributed to the study would get the paper report for free, but would be charged half price for the computer file. The contributors also would get a copy of their own data in the study format, so it will facilitate comparisons to be made. Members of the POG would get the information for free. There are some good reasons for that. There will be a flyer with the September 1996 *The Actuary* that actually gives the final information in this area, what's available, an order form and so forth.

The computer file would contain the basic claims data that were collected. We would remove the company identifiers and the hardest thing that we have to face at the moment is we may have to drop some of the classification variables if they get too company specific. The thing that I particularly worry about in that area is zip code was part of the claims information, and as you'll see, some of the companies were quite regional. So including zip codes may get us a little too close to specific company information.

The companies that did contribute to the study are listed below. There are some Blue Cross plans in here. They certainly are relatively specific. There were 25 companies in total that contributed to the study, plus a 26th company that provided summary information, but in the final analysis it was not used. As I say, there are 25 companies that provided data. We asked for information on the type and incidence of large claims. Large claims was defined as \$25,000 or more of expense in one year. We did ask for information from either 1991 and/or 1992. Twenty-three companies provided information for 1991 and 24 companies provided information for 1992.

- General American
- Life of Georgia
- Great-West Life and Annuity
- The New England
- Wausau Insurance
- Celtic Life Insurance Company
- Benefit Trust Life
- Blue Cross/Blue Shield of Oregon
- Mass Mutual
- State Mutual Life Assurance
- American Chambers Life Insurance
- Prudential Insurance Company of America
- Blue Cross/Blue Shield of Alabama
- Blue Cross/Blue Shield of California
- Blue Cross/Blue Shield of Iowa
- Blue Cross/Blue Shield of North Carolina
- Employers Health
- Western Life Insurance Company
- Boston Mutual
- Centennial Life

LARGE GROUP MEDICAL CLAIMS STUDY REPORT

- The Mutual Group
- The Guardian
- Mobil Corporation
- Humana Health Care
- Principal Mutual Life

The main intention of the study had been to look at the incidence area. Only four companies provided information that gave an exposure base to use in terms of claim rates. The main steps through the project were fairly standard. We had to collect the data and get it into a standard form that could be used for the study. Probably the biggest step was the data were asked to be provided on computer tapes, but the work was done on a personal computer (PC) so it did have to be converted down to the staff format that was appropriate there. And then there was an analysis of the various claim profiles. The big thing that has come out of this study is a little bit of information on exposure. As I said, only four companies provided that information. The costs were to be broken down between the hospital expenses and other expenses. Then there was something that Kyle refers to as a deductible. I'm not sure that's really the way that actuaries would tend to think of that; we'll get to that a little later in the presentation.

The analysis variables that were part of the study were: carrier, year, plan type, age, sex, status, zip code and diagnosis. As I mentioned, zip code is there, but whether it will be in the final computer file remains to be seen. And I'm not sure what we are actually able to include as far as the paper report. The paper report at the moment does in fact include an analysis by the first two digits of the zip code, and about a quarter of the zip codes of that type did have at least 1,000 claims. So there was a fair geographic distribution. We are going to have to look at it from a company point of view to see whether it is appropriate to include in the database or not.

Let's discuss the overall data. There were about 76,000 claims from 1991 and about 95,000 claims from 1992. For total charges from the two eras, there is a little over \$4.4 billion for 1991 and a little over \$5.6 billion for 1992. The average claim cost for 1991 was \$58,400 and for 1992 it was \$58,800. Probably one of the biggest surprises from the study was that the average claim was essentially the same in the two years. I think certainly most members of the project oversight did expect that claim to increase somewhat between 1991 and 1992. By company, the smallest average claim in 1991 was \$51,900; the largest was \$68,500. In 1992, \$53,300 was the smallest and the largest was \$83,500. So there certainly was somebody that had a particularly large block of claims in 1992. The second largest in 1992 was down around \$65,000. Other than that one company, it certainly was relatively consistent for both years.

There are couple of other general facts. The largest claim that was reported to us for 1991 was about \$4.5 million, and the largest claim that was reported to us for 1992 was a little over \$7 million. Because of the way in which the data was collected, we didn't tie together the information from 1991 to the information from 1992, but I do know in fact that the largest claim occurred in the same company in the two years. Whether it is the same individual or not, we don't know, but it certainly was the same company. And we did have 35 claims of a million or more in 1991 and 39 claims of a million or more in 1992. So there certainly are a few very large claims out there in that period.

FROM THE FLOOR: Was that paid?

MR. LUFF: Paid was the basis for the study. As far as we know, that is the case. The largest company that contributed to the study comprised about 16% of the claimants in 1991 and about 19% of the claimants in 1992, and that is the same company between 1991 and 1992. That company also submitted the largest amount of claims which is about 18.5% in 1991 and nearly 21% in 1992. The next three companies were around 10% of the pot in both 1991 and 1992, and about 10% both by number of claims and amount of claims. The same three companies are represented in that set of figures, but they were not consistently two, three and four. There was a mix as you looked both by number and amount, and also as you moved between 1991 and 1992. But it was the same companies that were two, three and four overall.

There were about six companies that contributed less than 1% in the various study patterns. Again, for number and amount in 1991-92, there certainly were a few smaller companies that were in there. If we do this again, and I think that's one of the things we hope to do, there's no reason for the smaller companies not to be involved in the study. At least they can give us the data so we know the reason between the patterns.

As I mentioned, we were not able to get very much in the way of exposure information. Based on what we did find, the incidence of large claims was about 1%, but as I say, that is a much smaller sample than the whole study.

This is, of course, insured data. We do have information about different types of indemnity plans, preferred provider organizations (PPOs) and so forth. Mobil Oil was one of the contributors and theirs would have to be self insured in a sense at least. And based on this limited sample, the cost of the large claim, just taking the normal type of arithmetic as implied by that, we had \$193 in 1991 and about \$227 in 1992. So the fact that those numbers were so far apart versus the fact that the overall numbers were very similar does suggest that we definitely have a different sample in here. This was only based on four companies' worth of data. That's all that provided the exposure base.

FROM THE FLOOR: Is that per employee or per member?

MR. LUFF: It was per member, per person in coverage in the plan. I think that's another reason why these numbers have to be taken with a grain of salt because it's not clear how good that information is regarding identifying the various dependents.

Another area for which we did ask for the information was the hospital charges split out versus the other charges. Overall, the numbers are about 61% for hospital charges versus the total charges. The numbers did vary quite widely. And one company supplied "zero" as their hospital charges without saying that they did not split the information out. So a more detailed analysis was done based on companies that seemed to have done a reasonable split of their hospital charges versus their other charges or their total charges. And as part of this, the numbers are around 71% or 72% as the hospital charges versus the total charges. But again, the data are a little bit more suspect in this area.

One thing that does seem to be the case from this detailed analysis was that there was a fairly consistent general pattern that the hospital charges as the percentage of total charge did increase as the size of the claim increased. So we were having something like 65% at the \$25,000 claim level, and we're getting up to close to 80% for the million dollar types of claims.

LARGE GROUP MEDICAL CLAIMS STUDY REPORT

Let's get into a little bit more of the meat of what is going to be available in the study. There was a certain amount of information by status and sex. Status here applies to whether someone is an employee or dependent, and in the data we had for the claims, males were generally 70% of all employees, and females made up 30%. And females made up about 60% of the dependents. The thing that was surprising was that the average charges for females were less than the charges for males. That was true for both employees and dependents, and it was consistent through almost all of the companies that submitted the data. What's not surprising is that the average charge for dependents was higher than the average charge for an employee. That was true for all companies—all 25 companies with the data.

FROM THE FLOOR: Are these percentages on claims or exposures?

MR. LUFF: This is on the claims. We're past exposure at this point. There was the presentation made on this study at the Orlando meeting in 1994 but not too many health actuaries attended the Orlando meeting. But I did pick up some slides that Kyle Grazier used at the time to present some of this information graphically. This just gives the levels involved. The thing that Kyle did get into was the total amount of claims, and then the excess amount of claims over the \$25,000. I may be missing something, but I think basically if you take \$25,000 and stack it on top of each of those bars, you should pretty well end up with the difference. But she did feel that was a useful analysis. I'd be interested in any comments people might have in that area. Charts 1A and 1B are the total of the claims.

We're actually talking about the total charges involved. The number shown here is in fact the billion dollar number. This is just the gross amounts that were taken into account for the study. The 70% of the employee claims were male claims and the 30% of employee claims were female. These are just the gross figures.

**CHART 1A
TOTAL AND EXCESS CHARGES BY STATUS AND SEX
1991**

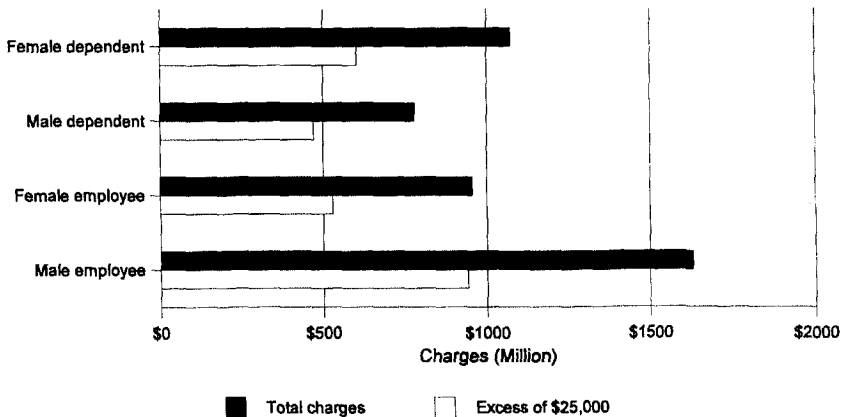
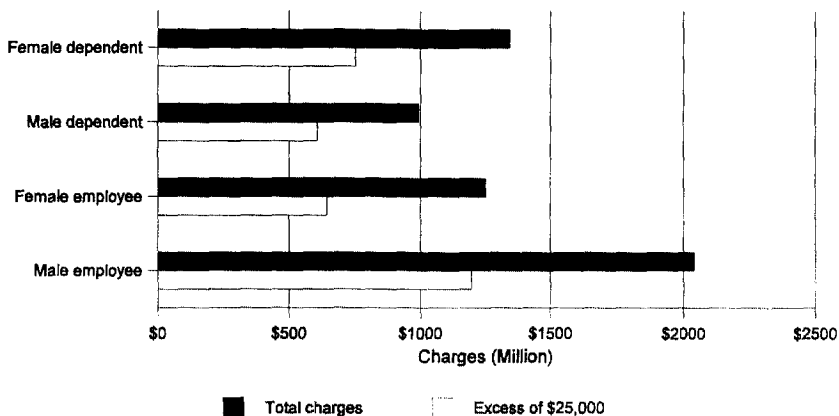
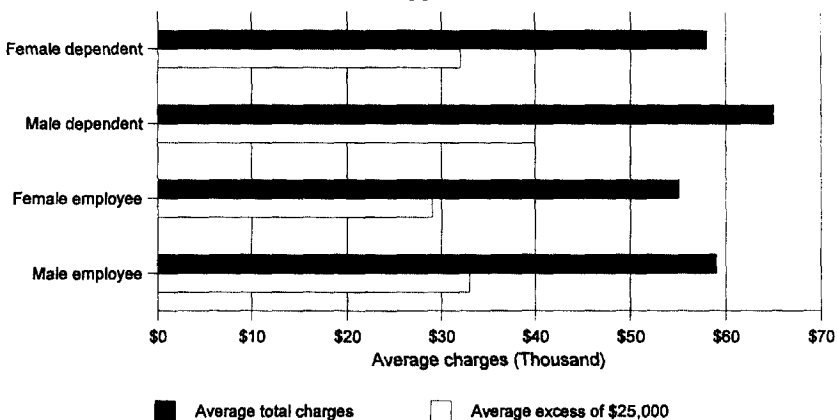


CHART 1B
TOTAL AND EXCESS CHARGES BY STATUS AND SEX
1992



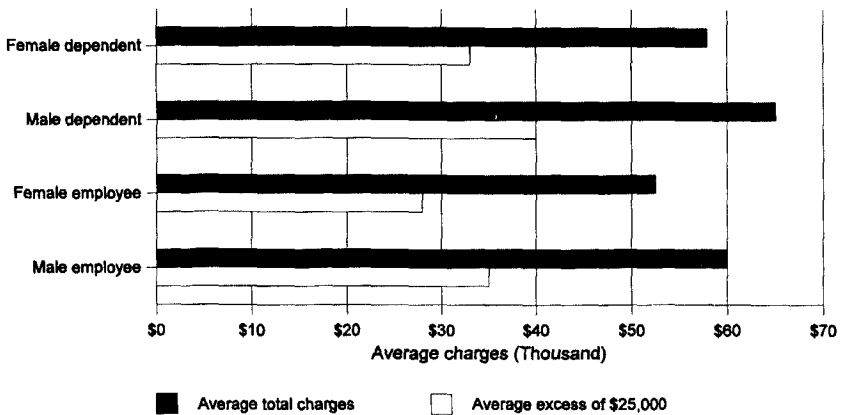
Charts 2A and 2B show the average charges per claim in 1991 and 1992. So we have our male employee claims at one level, and the female employee claims at another level. So this indicates that the average male employee claim was just less than \$60,000, the average female employee claim is somewhere around \$55,000, the male dependent claim is somewhere around \$65,000, and the female dependent claim is somewhere around \$57,000.

CHART 2A
AVERAGE CHARGES BY STATUS AND SEX
1991



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

CHART 2B
AVERAGE CHARGES BY STATUS AND SEX
1992



FROM THE FLOOR: Does this mix adults and children?

MR. LUFF: This does include everybody in that category. We do have a little bit of information by age as well, but certainly that is one of the key points you'll see in a moment. The largest rate of claim was for the very youngest people, so obviously that is going to steer these numbers. The second largest amount of claims was for the oldest people. Again, we're taking out most of the employee group. This was the information for 1991, and there is the same information for 1992. Again there is the same general pattern: down, down, up, up.

Charts 3A and 3B show age. As you might expect, the largest amount of total claims was for people in the age 30-64 range because that's where most of your covered population is. The highest average, as I just said, was with the youngest ages followed by the oldest ages. So here is the database as it exists for the whole amount of data, and here this number is in fact over half a million dollars.

As we said, in 1991, the highest rate of claims was for age one, followed by age zero, followed by the other juvenile ages, and then the 75 and over-age groups was the next group. The pattern was slightly different in 1992 but certainly the same general overall effect exists. The largest claims in 1992 were at age zero, then age one, then the two to nine, and 75 and over. And actually in both years, the main adult ages were remarkably similar. Again, you probably might not have expected that.

It did get into a certain amount of analysis by cause or diagnosis codes. We did use the International Classification of Diseases-9th Revision-Clinical Modification (ICD-9) codes for the study. The analysis was done in 19 broad groupings as well as in the printed report; there is material on the 30 most frequently used specific codes. The detailed information, whatever number of ICD-9 codes actually come out of the study, will be on the computer file. The highest charges overall were for circulatory diseases, various cancers, injuries, and poisonings. Those again are the total charges. And by rate, for

RECORD, VOLUME 21

males, premature and congenital conditions, infectious and parasitic diseases, and blood related diseases. It was a little different for females; nervous system disorders come in, but the other two are still the same. We are picking up these juvenile claims that are relatively high. We certainly would like to see a little more of a breakdown on some of this information. We've had some of it. Perhaps one of the reasons for buying the diskette is so that you can do all sorts of frequencies here to your heart's content.

CHART 3A
TOTAL AND EXCESS CHARGES BY AGE
1991

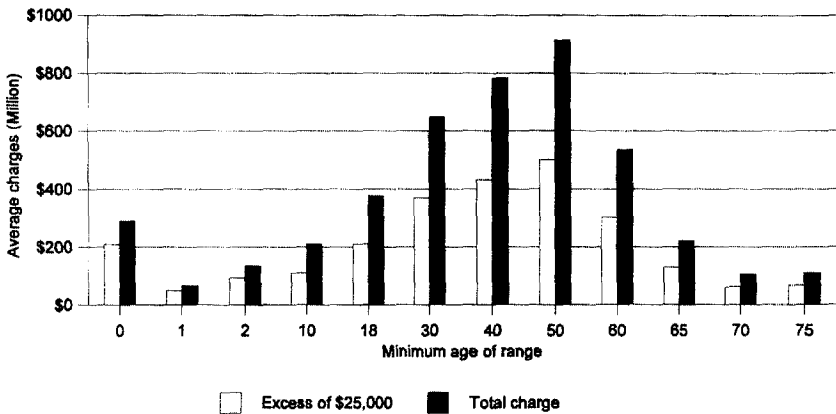
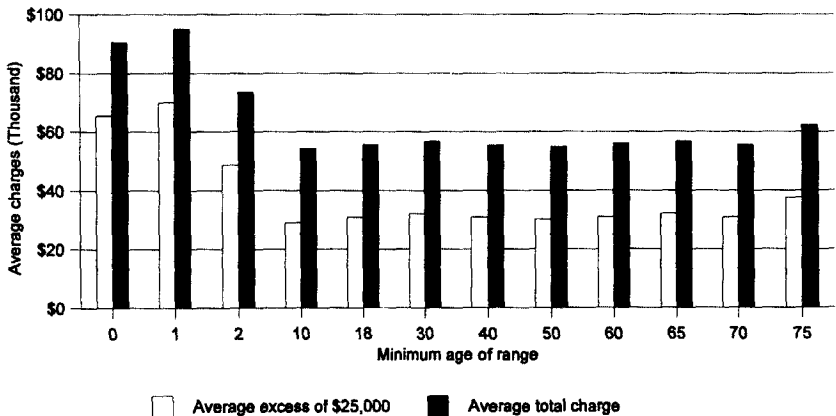


CHART 3B
AVERAGE TOTAL AND EXCESS CHARGE BY AGE
1992



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

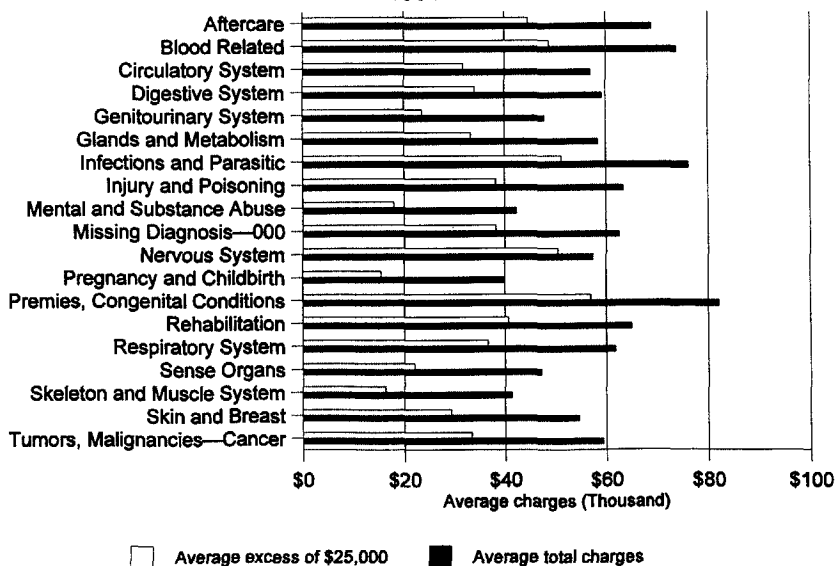
For specific diseases, the first three follow the general pattern. There's coronary atherosclerosis, acute myocardial infarction, and postmyocardial infarction syndrome. And then there was affective psychosis and osteoarthritis.

These were the principal diagnoses. Only one main diagnosis was requested and it was the principal diagnosis. We're not sure how good the information was that was submitted, but that doesn't seem to have caused any particular problems.

Charts 4-7 show the charges for the grouping of ICD-9 codes. These total charges in Chart 5 are at \$800 million. This shows the circulatory that were on the earlier slide. Premies, congenital conditions, infections and parasitic and so forth are shown. A similar slide for 1992 data is shown in Charts 6 and 7, and again, certainly the premature conditions and the infections and parasitic diseases still have the two highest amounts.

There is some information in the report that does break this down by age. As expected, premature and congenital condition is a big factor under age two. The most common diagnosis for ages 2 through 18 is mental conditions and substance abuse. These are just some miscellaneous facts that I pulled out of the report. Circulatory system disorders are the most common diagnosis for males 18 through 64, and for females 18 through 64, the most common diagnosis was cancer followed by circulatory disorders.

CHART 4
AVERAGE TOTAL AND EXCESS CHARGES
1991



RECORD, VOLUME 21

CHART 5
TOTAL AND EXCESS CHARGES
1991

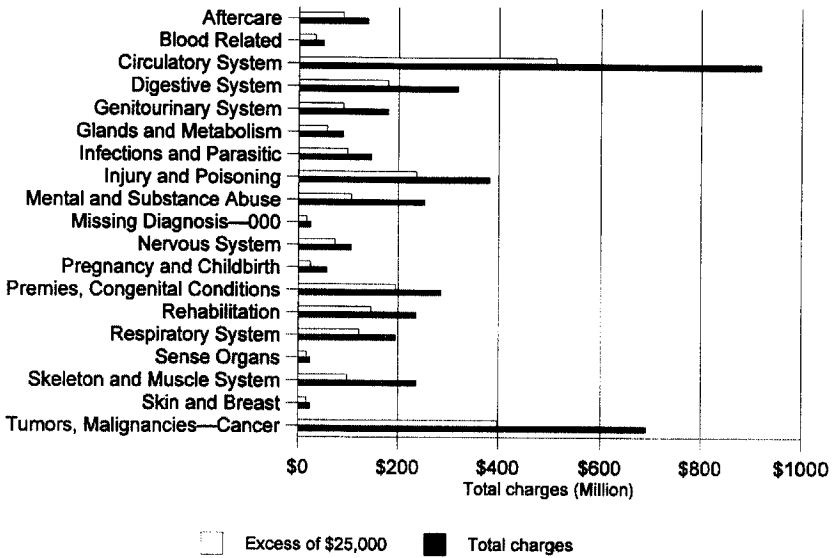
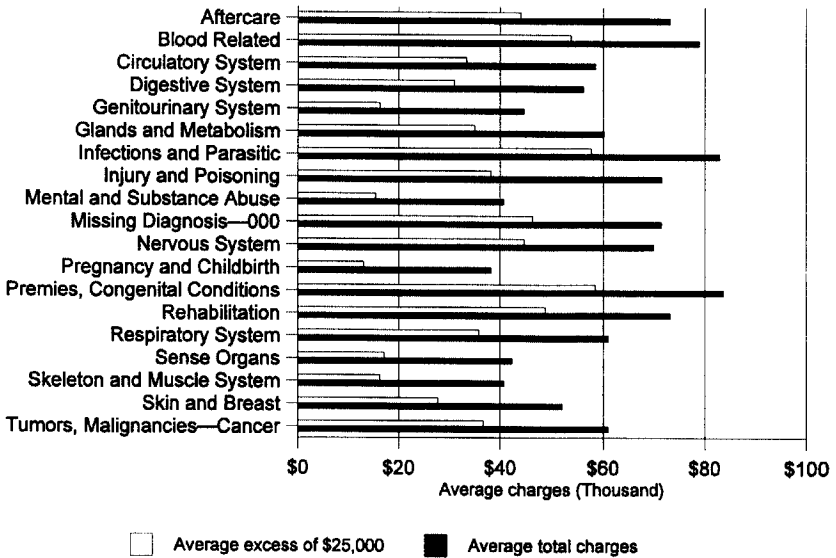


CHART 6
AVERAGE TOTAL AND EXCESS CHARGES
1992



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

CHART 7
TOTAL AND EXCESS CHARGES
1992

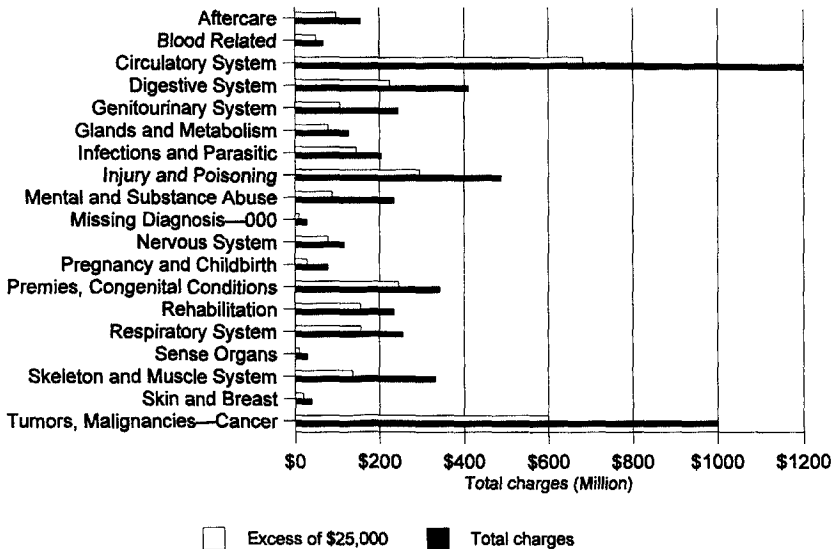


Chart 8 shows male and female total charges. This reflects what I said but with more detail. I'll skip the similar chart for 1992 and go to the average totals in Chart 9. Once again, for males and females and you can see the various details that are in that.

FROM THE FLOOR: Why are there male charges for pregnancy and child bearing?

MR. LUFF: We are certainly hostage to what companies have coded in that area, and obviously you can cut it either way. That's an area we may make a little more specific, if possible, in a further request for data. There is similar information from 1992, and childbirth still does have a significant male component.

I am referring to the total of the claims represented in the database. So certainly we're saying that this seems, and numbers are available, there are many circulatory charges but not a terribly large amount per charge. There are certainly a lot of them.

Next area that I go into in the report is by plan type. By plan type, we are talking about the broad type of coverage: indemnity, HMO, PPO etc. The number of claims in the indemnity area were 33,000 in 1991 and almost 36,000 in 1992. The average claim was \$56,000 for 1991 and \$57,000 for 1992. For HMOs, the number of claims was 13,000 in 1991 and almost 19,000 in 1992. Remember for 1992 that there are some differences in the companies that contributed data in 1991 and 1992. Perhaps there is some movement that is occurring in the industry. The HMO charges were \$66,000 in 1991 and \$62,500–66,000 in 1992, definitely higher than the indemnity charges, which is perhaps a little surprising.

CHART 8
TOTAL CHARGES BY DIAGNOSIS AND SEX
1991

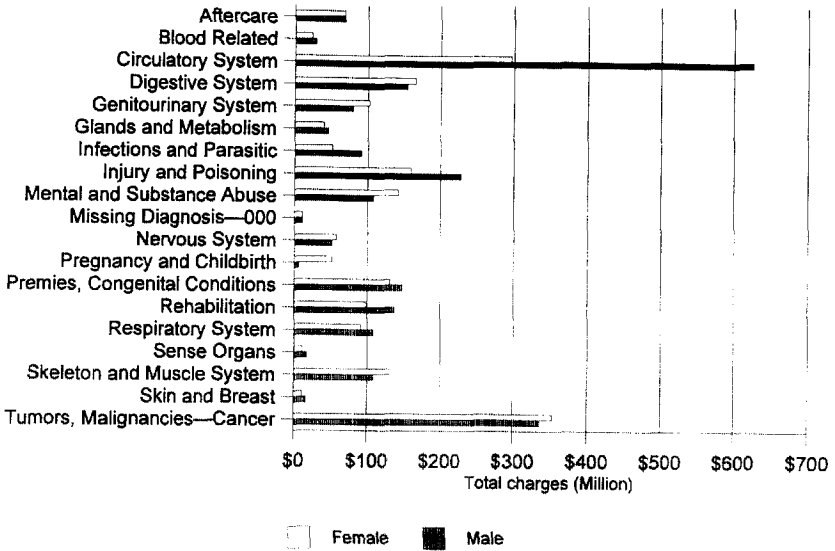
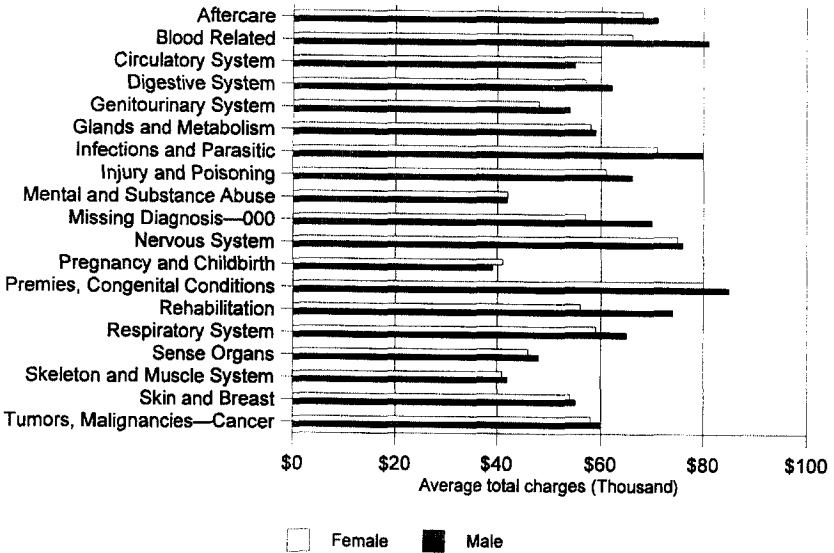


CHART 9
AVERAGE TOTAL BY DIAGNOSIS AND SEX
1991



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

FROM THE FLOOR: Do you have exposure information for claims?

MR. LUFF: I don't have exposure in terms of number of people covered for insurance. The closest we have is that these are the number of claims that arose out of that type of business.

The corresponding information was in the PPO with claims at 22,000 in 1991, and 31,000 in 1992. Average claims were at \$56,000–57,000; quite similar numbers as to the indemnity. And then the unknown claims showed up at 7,000 in 1991, and almost 10,000 in 1992. Their average claim was around \$60,000. Is it expected that we might find the HMO claims to be higher than the other type of claims? My impression is that the argument is that HMOs do manage costs a little more tightly, and I kind of expected their claims to be a little lower.

One suggestion was that HMOs are in the metropolitan areas where there are higher costs. Another comment is that management may be on the low end of claims and once they get into their catastrophic claims, about the same methods apply.

A comment was made that the claims run off on HMOs, but the nature of the management may be quicker. And since we're only tracking the claims per calendar year, they may get more HMO claims in a shorter period. But if we were to track the claims totally by person from start to finish, we might get a different pattern.

Another comment is that the mix of people in HMOs is different than in the other types of plans, particularly the younger age people, and when we saw the younger age people, their claims were higher. Also, the thought was that people with injuries are going into non-HMO-network hospitals, which distorts the HMO values because of the difference in costs for injuries.

FROM THE FLOOR: I think something that we all have to remember is average claim is only one portion of the claim cost.

MR. LUFF: I did look at the hospital charges by plan type for this. Numbers are around 70%, but again the HMO charges did tend to be a little bit higher. That maybe supports some of the things that were just said as well. Some of that extra HMO charge may well be showing up specifically in the hospital charges.

Kyle had done some work in something that she called deductible. I've characterized it as implied deductible, but that's really not accurate either. It's about claims at various levels. In 1991 for male employees between 35% and 41% of the claims that were \$25,000 were in fact \$50,000 or greater. And between 8% and 14% of the claims were in fact \$100,000 or greater. So this does get into the idea of the distribution of claims by size.

Chart 10 shows the number of excess claims by level for male employees in 1991. So this is saying that of these large claims, somewhere between 35% and 40% of them for all ages were at least \$50,000. And then somewhere around 10% or 12% of them were at least \$100,000. And then there is the pattern at \$150,000–250,000 as well. I've done that for amount as well (Chart 11) and you might expect the amount percentages are higher because of the cumulative effect in this. But it's saying that of the claims that were in the study, around 60%, dropping off to 50% and jumping back up to nearly 70% were at the

\$50,000 level or greater. This is by amount of claims. We certainly did have a jump up at age 75, but that easily could be caused by two or three very large claims at the older ages.

CHART 10
NUMBER OF EXCESS CLAIMS BY LEVEL
MALE EMPLOYEES IN 1991

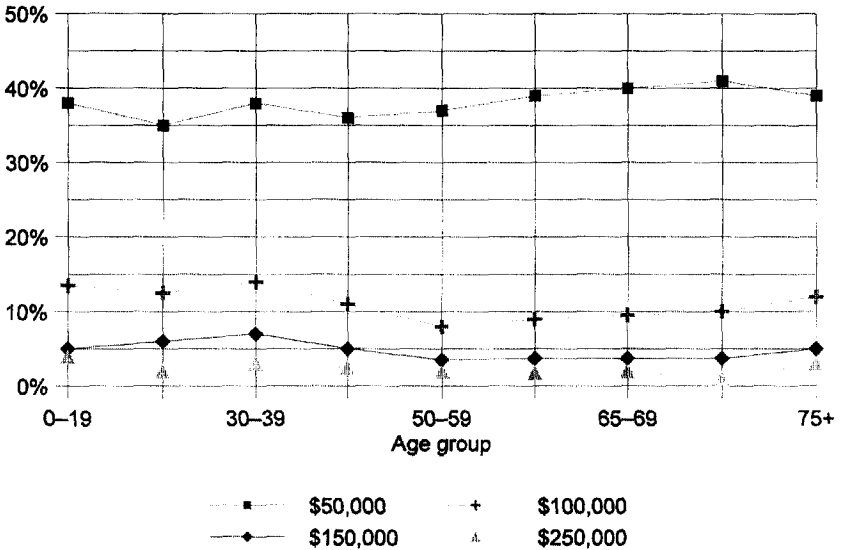
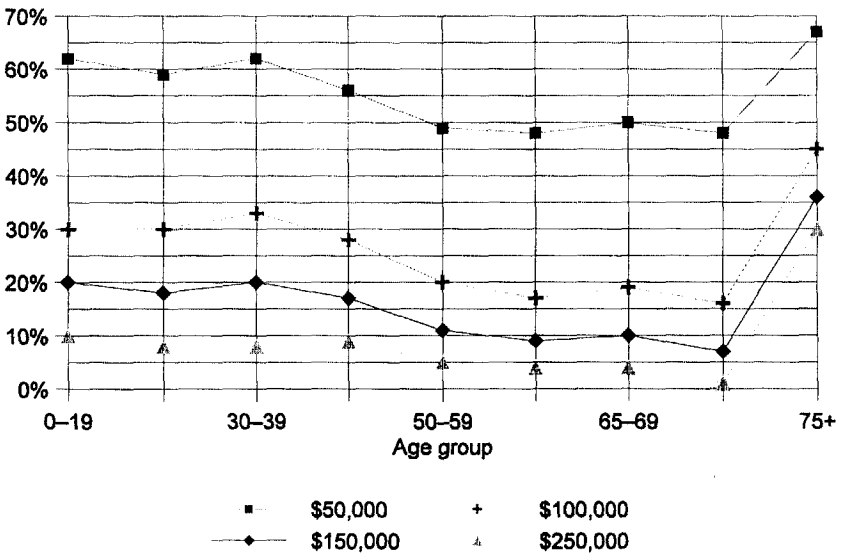


CHART 11
AMOUNT OF EXCESS CLAIMS BY LEVEL
MALE EMPLOYEES IN 1991



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

I did do this for quite a number of combinations, and depending on what your interest is, we can show you those. But certainly the next bigger category was the female dependent category (Charts 12A and 12B) and this does show much more varied patterns by age. Characterizing it by a small range of numbers can't be done. I don't know whether some of the congenital disorders are showing up here or not.

Chart 13 is the amount of excess claims by level for male employees in 1992. The heavy line is the male employees in 1991 at the \$50,000 level. Again we still have this jump up at the high age group but I'm not sure where it came from.

FROM THE FLOOR: Are these claims primary or secondary to Medicare?

MR. LUFF: My understanding is they're primary. Certainly the Medicare has some effect at the older ages. But I'm not sure why it wouldn't show up specifically at 75 and older as opposed to 65 and older. There certainly is some variation by age for some of these. The same thing applies for the female dependents in 1992 (Chart 14). The heavy line is the \$50,000 line from the previous year.

The reason that we're looking to charge money for these results is so that we can in fact redo the study. We certainly touched on some of the limitations of this and there are some limitations in the study itself as to what has been done versus what could be done. You might want to think either in terms of producing a final report and including some of these additional cost pads that might be of interest. Maybe some of you have some ideas that you'd like to express either now or later in that area. But certainly the intention of making the data available on a diskette is that you could take this information and play with it to your heart's content. And then it would be on your shoulders if you draw an inference from 100 claims and go broke. It's your fault and not ours.

When will the diskette be available? We still have to come to grips with whether we are going to include everything on the diskette, specifically the zip code. There is some work that has to be done to lead up to that decision. I'm not sure whether that work is going to get done over the summer or not since the researcher was at a university studying and may well have some plans for the summer already. It may be into the fall before we can get that done. But certainly my intention and my hope is that it would be available fairly soon after any announcement in the September issue of *The Actuary*. I'm putting myself on the spot when I say that, and hopefully we can deliver, but that is certainly our intention.

This is the area that the SOA used to be fairly active in 20 years ago. The problem of getting the information out in a timely fashion is why the SOA efforts in the health area fell apart. We definitely need to get the information out quickly so it is of use. I think one of the reasons why we looked at these large claims as a first new step in this area, is simply because this information isn't quite as time sensitive as some of the other information. But there certainly is a time sensitivity to it that we do have to respond to.

The other thing that is possible is that we may make this information available without telling you what the companies are. You saw the slide earlier, and that was another reason perhaps for leaving it out of alphabetical order. So you're not going to go back and remember most of what's on that slide. But we may get around the problem that way. If there's a lot of claims in southern California, you can guess that perhaps Blue Cross of California was in there, but you have to remember whether it really was or not.

CHART 12A
 NUMBER OF EXCESS CLAIMS BY LEVEL
 FEMALE DEPENDENTS IN 1991

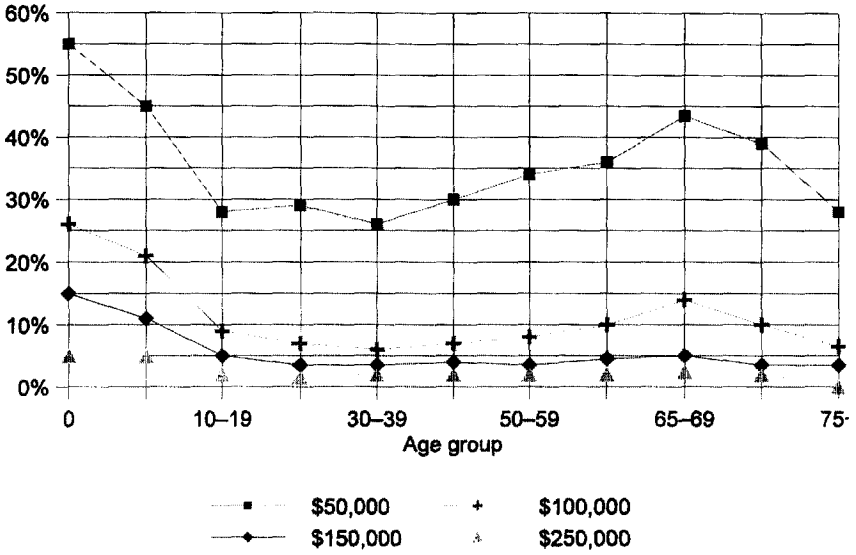
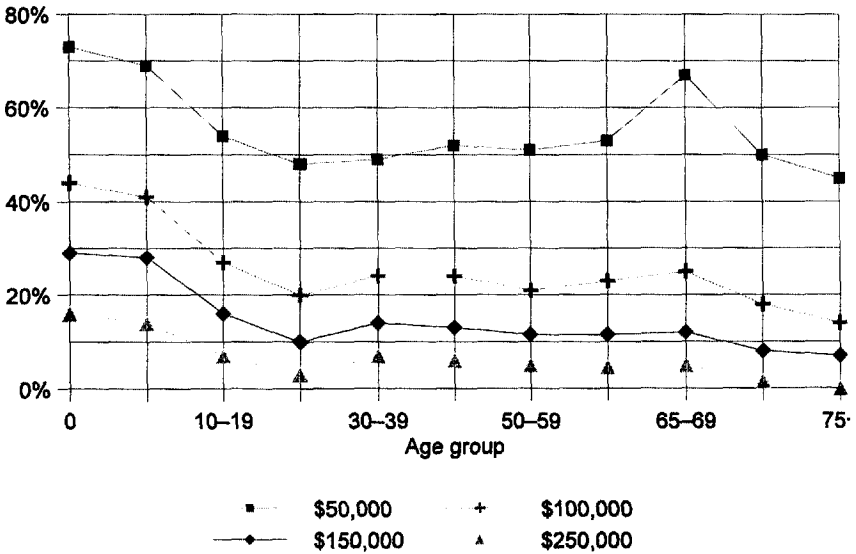


CHART 12B
 AMOUNT OF EXCESS CLAIMS BY LEVEL
 FEMALE DEPENDENTS IN 1991



LARGE GROUP MEDICAL CLAIMS STUDY REPORT

CHART 13
 AMOUNT OF EXCESS CLAIMS BY LEVEL
 MALE EMPLOYEES IN 1992

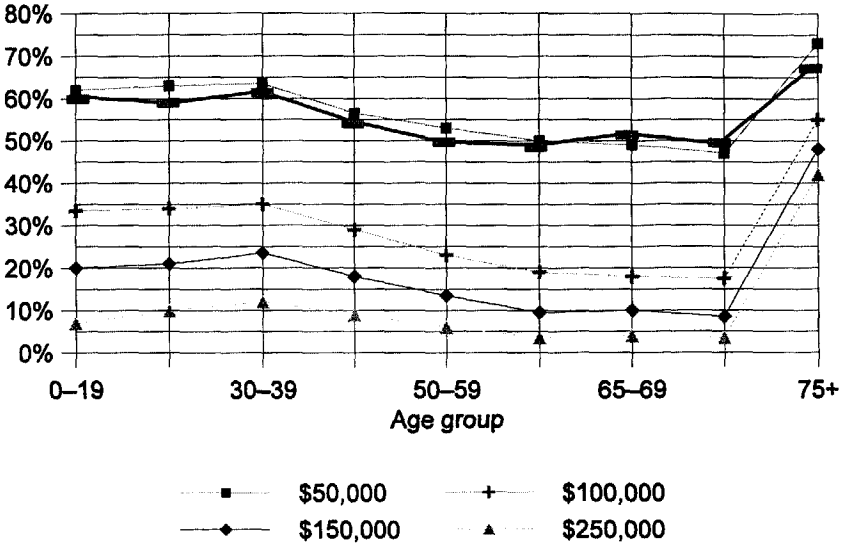
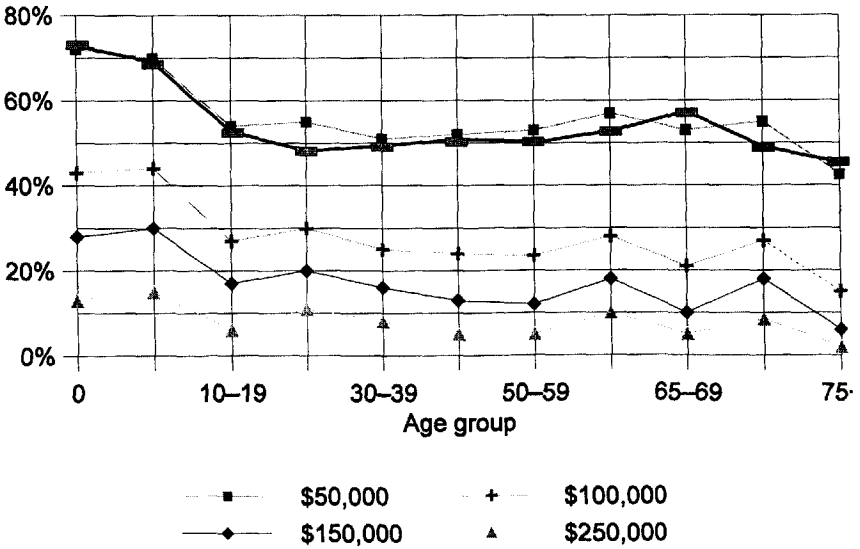


CHART 14
 AMOUNT OF EXCESS CLAIMS BY LEVEL
 FEMALE DEPENDENTS IN 1992



RECORD, VOLUME 21

FROM THE FLOOR: Have you done any trend analysis, even though you only have two years?

MR. LUFF: The researcher did look at the information between 1991 and 1992 to a fair degree and did find that there was not very much in terms of a trend. But most of the categories she looked at in 1992 looked very similar to 1991. And that's all the more reason why we would like to get a few more years in there. If you get five years you get a bit better feel as to whether there is a trend than if you are just looking at two years.

The question was were there any audits on the data. We certainly looked at the data to make sure that they were reasonable. It was a relatively bare bones type of record that was requested. Not very much came out of the auditing that was done as being problem cases. And that was certainly part of the standardization of identifying anything that looked strange but wasn't taken into the final study. The only thing that really looked particularly strange was the hospital versus other charge.

I don't have the report here as far as what the second largest claim was, for example. It did seem, in the pattern overall, that the \$7 million claim did not seem to be terribly out of whack relative to the other very large claims. It certainly had to cap off at some point. But it is something that we maybe should go back and take a look at and we should make sure it is not a terribly unreasonable pattern.