History **Lessons**

Can studying past unemployment rates predict future medical professional liability claims frequency?

by Susan J. Forray and Chad C. Karls

Is there a direct relationship between the state of the economy and future trends in the medical professional liability market? More specifically, will the current economic slowdown have an impact on this line's claim costs?

The steady drop in claim frequency since 2001—a trend for which there is no clearly identified, single causative factor—coupled with the recent worldwide economic recession, has medical professional liability insurance professionals wondering whether the downward trend will continue. Since no one really knows for sure why claim frequency has fallen over the past few years, no one can say with any certainty how large a role current or future economic conditions might play—if any—in either slowing down the trend or reversing it.

If claim frequency did, in fact, bottom out two or three years ago, is there any reason to expect a continued increase in frequency, given the broader economic environment we currently face in the United States?

One can look back to periods of similar economic conditions and draw rough comparisons. But without a rigorous statistical analysis, it is impossible to assess the significance of any results obtained from such comparisons; nor is it possible to forecast with any confidence how these relationships might play out.

Are there variables in the economy we can use to formulate an equation predictive of medical professional liability claims experience? We believe there are and have focused on the unemployment rate in particular, using it to conduct a statistical analysis. We wanted to see if we could discover an underlying mathematical relationship between the state of the economy and trends in medical professional liability coverage.

As a measure of this line's costs, we focused on claim frequency. We then attempted to forge relationship equations that would allow us to forecast future trends in claim frequency based on the U.S. unemployment rate.

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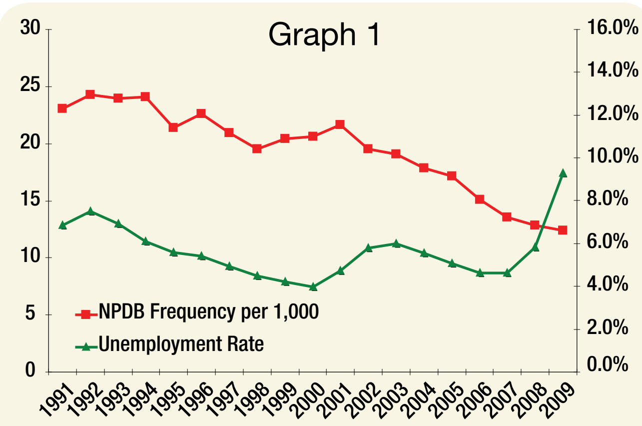
Key Points

- **At Issue:** Medical professional liability writers wonder if an increase in claims from the trough two years ago will continue.
- **The Situation:** Can an equation predict if medical professional liability claims will rise due to the economy?
- **What Happened:** The current spike in unemployment could put continued upward pressure on frequency.

Claims and Unemployment

Many informed opinions have been rendered concerning the correlation between the unemployment rate and insurance costs, including claim frequency. Insurance professionals hold particularly strong opinions about the effect of layoffs on workers' compensation claim frequency, arguing both for and against a positive effect.

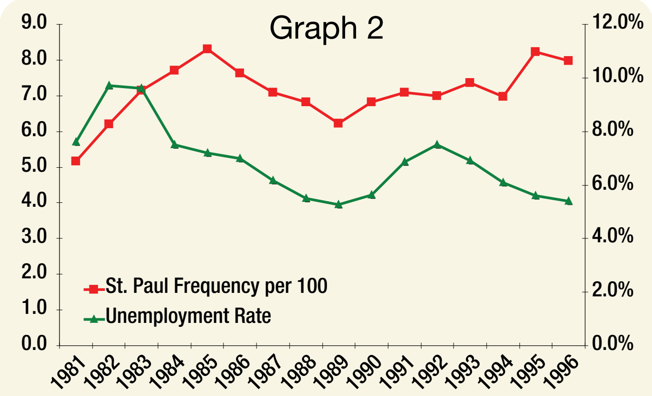
Is there a similar relationship between the unemployment rate and medical professional liability claim frequency? To examine this possibility, we first took a look at claim frequency as measured by the National Practitioner Data Bank and compared it to the unemployment rate from 1991 through 2009 (graph 1).



Sources: Milliman; American Medical Association; Bureau of Labor Statistics; National Practitioner Data Bank Public Use Datafile

A quick look at this graph suggests no relationship between the two variables during this time period which, unlike the situation today, is characterized by historically low levels of unemployment. Clearly, we needed data over a longer time period, preferably one including higher levels of unemployment, similar to today's environment. Unfortunately, the NPDB claim frequency data only went back to 1991.

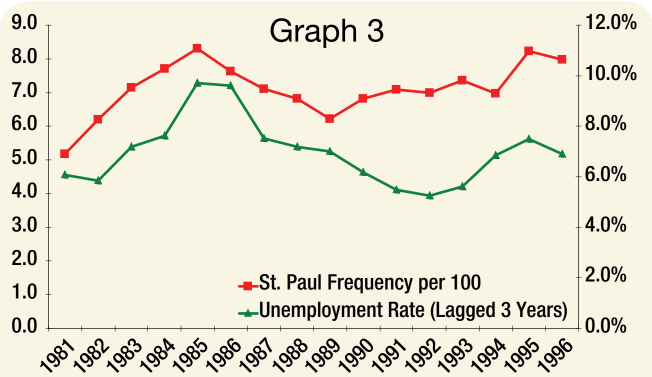
However, nationwide data going as far back as 1981, covering the last period in which U.S. unemployment approached 10%, was available through existing records of The St. Paul Cos.' rate filings from 1981 to 1997 (graph 2). Still, even with the St. Paul filings providing data for a more volatile period of unemployment, the two variables appear to have only a loose relationship.



Sources: St. Paul Cos. rate filings; Milliman analysis of Bureau of Labor Statistics data

The next question we asked was: "What if frequency is not dependent upon the unemployment rate at the given time? What if frequency rates lag the economy and unemployment rate by some consistent period of time?"

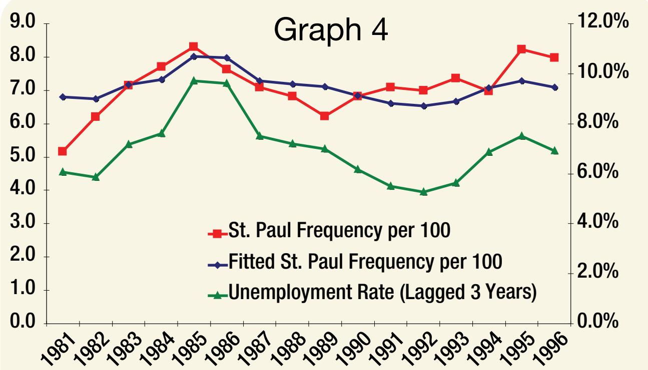
Graph 3 shows the St. Paul frequency rates in red and the unemployment rates once again in green. But in this case the unemployment rates lag the frequency rates by three years. So, on the far left of this graph, where we show an unemployment rate of 6% and a St. Paul frequency of slightly more than 5%, those numbers represent the unemployment rate for 1978, not 1981, as indicated at the bottom of the graph. Here 1981 applies to the St. Paul frequency rate only. Every unemployment rate number along the graph is three years behind the St. Paul frequency rate number.



Fitted St. Paul Frequency per 100 = 0.33 × Unemployment Rate (Lagged 3 Years) + 4.8	
R^2 =	0.287
F Statistic =	5.64
P Value =	3.2%

Sources: St. Paul Cos. rate filings; Bureau of Labor Statistics

With the three-year lag incorporated in the comparison, the relationship between unemployment and frequency appears compelling and consistent. As a result, we elected to derive a mathematical relationship between the claim frequency (as given by the St. Paul national data) and the unemployment rate that existed three years prior to those reported frequencies. Graph 4 shows the resulting fitted equation.



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What Lies Ahead?

The fitted equation incorporating the three-year lag works out to about .33 times the unemployment rate, plus a factor of 4.8. A change in the unemployment rate by 1% during this period is associated with a 0.33% change in the St. Paul frequency.

Three years after unemployment hit approximately 10% in 1982, St. Paul frequency spiked at just over 8%.

U.S. unemployment hit 10% for the first time since 1983 in October of 2009 and has remained close to that level since then, according to the U.S. Bureau of Labor Statistics. Does that mean frequency is destined to spike again, hitting a new high at the start of 2013?

The short answer is: Probably not, although some continued rise in frequency is to be expected.

Our fitted frequency suggests that a 10% unemployment rate in 2010 could mean a 1.5% additive rise in the frequency rate between 2010 and 2013, but this projection must be softened by other factors not included in the equation. For many medical professional liability writers, frequency bottomed out in either 2007 or 2008. The effect on future frequency of the small rise in frequency that has already taken place for these writers is unclear.

Although the data suggest claim frequency is tied to economic conditions, it is difficult to separate economic factors from others, particularly when there has been such a steady and unexplained decrease in frequency over the past few years.

Many factors have been put forward as possibly contributing to the decline—patient safety initiatives, "I'm sorry" laws and tort reform initiatives being just a few.

In attempting to measure the relationship between the unemployment rate and claim frequency, there were some variables we did not have that would have helped to give our equation (and therefore our projections) more statistical confidence.

These variables include: quantification of the impact of patient safety initiatives; more medical professional liability data over a longer time period; and some quantifiable data describing how the public's (and potential jury members') perceptions of tort reform and medical professional liability insurance may have changed over the past few decades.

The challenge lies in balancing the different factors, and determining which will have the greater effect on claim frequency. Despite not having all the data we would like, we feel confident that the likely continuation of patient safety initiatives will continue to exert downward pressure on claim frequency at the same time as the state of the economy may lead to a frequency uptick.

We do not believe frequency rates are going to rise suddenly as a result of economic factors or return to anything like pre-2001 levels. But the current spike in unemployment could put upward pressure on frequency, resulting in a small but significant bounce. It will be important for medical professional liability insurers to keep a close watch on frequency rates over the next few months and respond accordingly, particularly as the market remains soft.

Small increases in frequency should not be dismissed automatically as aberrations. They very well may be harbingers of things to come. BR