SOCIETY OF ACTUARIES

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To Err is Humamn;
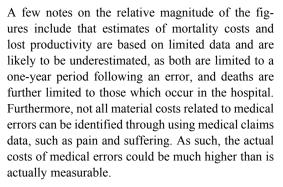# To Estimate is Actuarial

by Steven Siegel

Alexander Pope, the greatest poet of his age, who lived in the eighteenth century and wrote the famous line "to err is human, to forgive divine," might have sought treatment for his ailments using the cutting edge medical technology at the time—leeches. Although we might laugh (or be grossed out) at the primitive nature of such treatment in light of the incredible advances in medical science over the past three centuries, a sobering fact remains—errors in medical practice happened then and still do now. I hope those reading this article have never experienced or known first-hand the potentially devastating consequences of a medical error. Yet, the frequency of medical errors and their impact on costs to the U.S. health care system and overall economy is an undeniably critical component of the system that bears further examination.

Realizing the importance of medical errors on the U.S. health care system, the Health Section commissioned the Denver office of Milliman to conduct a research project to measure the annual frequency of medical errors and the total measurable cost to the U.S. economy of these errors. The genesis of the project was an idea from Jim Toole, former chair of the Health Section Council, who had been reviewing previous studies on this topic. Based on his vision for the project, a request for proposals was issued and the team from Milliman led by Jon Shreve was ultimately selected to do the work.

Using an extensive medical claim database, Milliman identified costs of medical errors in the United States of $19.5 billion in 2008. Of this amount, the vast majority identified (about 87percent or $17 billion) was a direct increase in the medical costs of providing inpatient, outpatient, and prescription drug services to individuals who were affected by medical errors. Milliman also identified increases in indirect costs of approximately $1.4 billion related to increased mortality rates among individuals who experienced medical errors and approximately $1.1 billion related to lost productivity due to short-term disability claims.

In terms of frequency, the claims database used represented a large insured population and was extrapolated to the U.S. population. The results of this extrapolation yielded an estimate of 6.3 million measurable medical injuries that occurred in 2008. For inpatient settings, seven percent of admissions in the claims database resulted in some type of medical injury. For purposes of the study, medical injuries identified in the database were translated into estimated medical errors using reference information found in prior studies and consultation with medical professionals. Of the 6.3 million injuries, Milliman estimated that 1.5 million were associated with a medical error. The total cost per error was measured as approximately $13,000, resulting in the total cost estimate to the U.S. economy of $19.5 billion. In addition, these errors resulted in over 2,500 excess deaths and over 10 million excess days missed from work due to short-term disability.

A few notes on the relative magnitude of the figures include that estimates of mortality costs and lost productivity are based on limited data and are likely to be underestimated, as both are limited to a one-year period following an error, and deaths are further limited to those which occur in the hospital. Furthermore, not all material costs related to medical errors can be identified through using medical claims data, such as pain and suffering. As such, the actual costs of medical errors could be much higher than is actually measurable.

I would encourage you to read the entire report which also contains an extensive appendix that details the development of the frequency and cost estimate for each individual type of error. The report can be found in the Health Research section of the SOA website at *www.soa.org*. One of the hoped for outcomes of this report is that the information will ultimately be used to help inform approaches and processes for reducing errors. In this regard, if you have any ideas for applications of this information or other thoughts, I'd love to hear about it. Please e-mail me at *ssiegel@soa.org*. And as Pope might say, while we, as humans, will continue to make errors, perhaps this information can help us reduce the occasions for the need for forgiveness. ■

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