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## IN THIS ISSUE

Dementia Mortality

Dementia Screening –The Sweet 16

Migraine and Stroke

Family History vs. Personal Genomics

Skepticism and Evidence-Based Underwriting

Financial Underwriting Clinic—Indicators of Financial Statement Fraud

## DEMENTIA MORTALITY

Dementia is not something that most underwriters see that frequently – not least because sufferers tend to be of advanced years (and therefore with relatively few insurance needs), and producers tend to regard them as poor risks and therefore exercise ‘some pre-selection’.

However:

- Dementia is generally regarded as being on the increase (or is that an increased rate of diagnosis owing to greater awareness of the condition?);
- Since people are living longer managing finances in old age is becoming more important, and thus there is a greater demand for financial services products including various types of insurance;
- In the US certainly older lives are already an important market for life and long-term care insurance.

So we were pleased to spot an interesting-looking large-scale study in the *British Medical Journal*.<sup>1</sup> The subjects studies were over 22,500 patients aged 60 or more of family doctor practices in the UK who received a first-ever diagnosis of dementia between 1990 and 2007. Excluded were those previously diagnosed, and

cases of Pick’s disease, Huntington’s disease, Parkinson’s disease and dementia associated with HIV. Mean age at diagnosis was 82.2 years, and 68% of the dementia group were female. For comparison purposes they were matched with a random sample of five over-60 patients from the same practice; this control group numbered over 112,600.

Compared with the control group, mortality was heavy. Median survival was 6.7 years; for those aged 90 or over at diagnosis the figure was a mere 1.9 years. In percentage terms extra mortality was heaviest in the first year: 368%, falling to 249% in the second year and 234% in year 6 (see table 1).

**Table 1—Mortality ratios for those with dementia compared to those without\***

Year of follow-up	Mortality ratio %
1	368
2	249
3	237
4	248
5	242
6	234

\*Adjusted for age, sex, deprivation, smoking, alcohol, diabetes

Those mortality percentages are impressive enough given the age group, but the calculated Kaplan-Meier survival curves for ten-year survival are eye-watering. They show:

- Ages 60-69: around 75% dead at ten years (compared to just under 25% of the controls)
- Ages 70-79: around 80% (just under half)
- Ages 80-89: about 90% (75%)
- Ages 90 up: very few survivors beyond eight years (approximately 95% dead at ten years).

The article is as interesting for background information as it is for mortality ratios. The authors found that the incidence of dementia diagnoses was relatively stable, though with a slight increasing trend, from about 3.5/1,000 person-years in 1999; in 2005 and 2007 the rate was about 4 but in 2006 it was 5. Social deprivation had little impact on the risk of a dementia diagnosis—likewise cardiovascular disease, diabetes or alcohol dependency. Dementia patients were more likely to have a history of cerebrovascular disease (that figures). But they were less likely to be hypercholesterolemic or smokers (although smoker status was more likely to be ‘not recorded’ for the dementia group than for the controls).

Now these UK outcomes are rather different from an Alzheimer’s disease study in Seattle reported on by Singer in 2005.<sup>2</sup> This was a group similar in composition to (although smaller than – only 521 lives) the UK cohort: mean age 80.2 years, 66% female. Mortality ratios were substantially lower: for all patients combined 142%; for all males 149% and for all females 141%. The corre-

sponding annual excess death rates were 37, 52 and 33 per 1,000. Mortality ratio and excess death rate increased with test scores measuring severity of cognitive impairment, with physical features of the severity of the dementia, and especially with the presence of comorbid diseases such as stroke, coronary heart disease (CHD) and congestive heart failure (CHF).

Why the difference? It may be due to the vagaries of statistical analysis, and the subjects in the Seattle study were labeled as Alzheimer cases as opposed to ‘dementia’. But it is more likely to be due to the UK patients having been diagnosed as a result of recognition of symptoms and the Seattle ones having been detected by screening (on enrolment into a health organization). So the British lives were more likely to have had more advanced disease. In fact the UK authors quote evidence suggesting that dementia is under-diagnosed in an estimated 50% of primary care patients over the age of 65, and comment that family doctor recognition of the condition has remained low. Surely the UK is not unique in that.

Whichever way you look at it, dementia has a very significant mortality impact: even mortality ratios of around 150% imply plenty of excess deaths at age 80. But clearly the impact of dementia varies depending on how you find it. If you come across it accidentally on an APS, generally that looks like very bad news. If you go looking for it among a non-diagnosed population, the outcome can be rather less serious – if not exactly benign.

It is important to recognize, though, that mortality varies a great deal by degree of cognitive impairment. A study by Lee et al<sup>3</sup> based on data from the Memory and

**UNDERWRITER e-ALERT is an independent publication designed to provide business information and opinion to life and health insurance underwriters. It is intended to encourage discussion and further research.**

**UNDERWRITER e-ALERT does not recommend any specific action or risk appraisal in any individual life or health insurance application. All information and opinion published should undergo formal scrutiny by underwriting officers, medical directors, actuaries, legal counsel, and other insurance professionals as appropriate.**

Medical Care Study found a big variation in survival. Those with mild cognitive impairment still displayed significant mortality – about 15% dead at 1,400 days compared with 8% of those with no cognitive impairment – but of the ‘severe dementia’ group less than half survived at the 1,400 day point.

Those agents that don’t bother submitting dementia cases tend to know what they’re doing.

1. Rait G, Walters K, Bottomley C, Petersen I, Iliffe S, Nazareth I. Survival of people with clinical diagnosis of dementia in primary care: cohort study. *Brit Med J* 2010;341:c3584
2. Singer RB. Mortality derived from 5-year survival in patients with Alzheimer disease. *J Ins Med* 2005
3. Lee HB, Kasper JD, Shore AD et al. Level of cognitive impairment predicts mortality in high-risk community samples: the Memory and Medical Care Study. *J Neuropsychiatry Clin Neurosci* 2006; 18:543–546

## THE SWEET 16—A NEW DEMENTIA SCREENING TOOL

The previous article clearly illustrated the excess mortality risk associated with dementia. Insurance screening of older age applicants for dementia risk requires a method that is quick, reliable and inexpensive.

Fong, Jones, et al report the creation of a new brief cognitive assessment tool: the Sweet 16. (Development and Validation of a Brief Cognitive Assessment Tool - The Sweet 16, *Arch Intern Med*. Published online November 8, 2010. doi:10.1001/archinternmed.2010.423).

The authors state that cognitive impairment is often unrecognized among older adults, and that current assessment instruments are underused, lack sensitivity, or

may be restricted by copyright laws. So they developed a test designed to spot problems in thinking, learning and memory skills in under three minutes.

The Sweet 16 (named for its 16-point scale) was developed in a cohort from a large post-acute hospitalization study and compared with the Mini-Mental State Examination (MMSE). Sweet 16 cut points correlated with widely used MMSE cut points. Sweet 16 performance characteristics were independently validated in a cohort from the Aging, Demographics, and Memory Study using clinical consensus diagnosis, the modified Blessed Dementia Rating Scale, and the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE).

The Sweet 16 is reported to be simple, quick to administer, and available as open access. The performance of the Sweet 16 was considered equivalent or superior to that of the MMSE.

A Sweet 16 score of less than 14 (approximating an MMSE score <24) demonstrated a sensitivity of 80% and a specificity of 70%, whereas an MMSE score of less than 24 showed a sensitivity of 64% and a specificity of 86% against the IQCODE. When compared with clinical diagnosis, a Sweet 16 score of less than 14 showed a sensitivity of 99% and a specificity of 72% in contrast to an MMSE score with a sensitivity of 87% and a specificity of 89%.

Dr. Gary J. Kennedy, director of geriatric psychiatry at Montefiore Medical Center in New York City, said that while better cognitive testing is needed, the jury is still out on whether or not the current innovation will fit the

Item No.	Item Description	Cognitive Domain	Points
1 – 8	Orientation to time and place	Temporal/spatial orientation	8
9 – 11	Immediate repetition (3 items)	Registration	3
12 – 13	Digit spans backward	Sustained attention	2
14 – 16	Recall (3 items)	Short-term memory	3

## Global claims technology survey – live!

SelectX Ltd ([www.selectx.co.uk](http://www.selectx.co.uk)) and global claims consultant, Karin Lloyd ([www.karinlloyd.com](http://www.karinlloyd.com)) are pleased to announce the first ever global survey of current claims technology and processing in life and health insurance.

Markets covered by the survey include the United States and Canada, the UK and Ireland, the European continent, South Africa, Australia and New Zealand, India, China and selected other Asian countries.

The survey looks at the use of technology in claims management now and in the future:

- The current landscape: what systems and processes are in use and how they compare
- Current business drivers
- The future of claims operations: the need for improvements in efficiency and effectiveness
- The potential enabling power of technology
- The appetite for new investment.

Taking part in this survey will enable you to understand how the claims technology in your company compares with competitors around the world and equips you to make sound future investments whatever your current level of technology support.

The costs of conducting the survey are being covered by our sponsors, so that **participation in the survey is free** and the **tabulated survey results** will be **free to participating companies**.

The survey runs until the end of the year, and only participating companies will receive the free tabulated survey results. **So if your company has not yet received an invitation and unique survey link, please contact us as soon as possible:**

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bill. "Do we need something better than the MMSE?," he asked. "Absolutely. It's cumbersome to use. You need pencils and paper and props to administer it. And there are also a lot of difficulties with how to score it."

"And I would say that reading this description of the 'Sweet 16,' it sounds like it's much more easily administered," Kennedy observed. "But still, I'm not convinced this is the answer to the problem. Because diagnosing cognitive impairment is not the same as diagnosing diabetes. It's much more complicated than that. People's cognition varies with life experience. It's not like simply testing for blood sugar levels. There isn't a single diagnostic marker."

But Fong, Jones et al point out that efforts to screen are imperfect under the MMSE, the current gold standard for dementia testing. That test has copyright controls that limit its availability, and the results it provides may be compromised by patients' differing educational backgrounds, they noted. A score of 14 or less was found to detect 80 percent of cognitive impairment cases, compared with the 64 percent success score logged by the MMSE. However, the MMSE outperformed the Sweet 16 with respect to correctly identifying patients with no cognitive impairment: 86 percent success vs. 70 percent, respectively.

Nevertheless, when compared with clinician assessments, Sweet 16 scores of 14 or less occurred in 99 percent of the patients diagnosed with cognitive impairment. Scores of 14 or less also occurred in 28 percent of people who were not diagnosed with cognitive impairment, suggesting a potentially high rate of false positives.

## MIGRAINE AND STROKE

Migraine is a common condition affecting 15% to 20% of the population, with women being roughly twice as likely to suffer as men. Around one in five sufferers experience aura, a premonitory sensation that warns of an impending attack. Received wisdom acknowledges some connection between migraine and stroke, but

there is a lack of clarity about the strength of that connection and the risk of stroke among migraine sufferers.

Clearly this is a subject of some interest to underwriters as regards mortality impact, although the underwriting handling of migraine tends to be benign. But it is of particular interest to underwriters assessing critical illness (CI) risks. Given that stroke is usually one of the primary, or core, conditions covered, an increased stroke risk is highly relevant. And the potential for migraine to manifest itself in variant form (including hemiplegia, aura, dyesthesia and visual disturbances), and even give rise to cerebral white matter lesions, can create difficulties in CI claims management in proving or disproving the presence of stroke – at least to the claimant's satisfaction.

### Hemorrhagic stroke

The bulk of the research and the associated discussion have been in respect of migraine and ischaemic stroke. Kurth and colleagues, writing in the *British Medical Journal*<sup>1</sup>, suggest that this is due mainly to the generally low incidence of hemorrhagic strokes, but they cite two case-control studies that point to an association, as well as a large population-based study employing insurance data that indicated an association between peripartum migraine and increased risk of intracerebral hemorrhage.

The authors conducted research involving participants in the US Women's Health Study. These were 27,860 women aged 45 up who were free from stroke or other major disease at baseline. 5,130 reported any history of migraine, and 3,612 had had migraine in the previous 12 months; of these 1,435 reported having an aura. Follow-up was for an average of 13.6 years, during which time 85 hemorrhagic strokes arose, 28 of which proved fatal. Compared with women with no history of migraine, there was no increased risk overall of hemorrhagic stroke among the migraine sufferers (hazard ratio 0.98, 95% confidence interval 0.56-1.71). However, among the women who experienced aura the risk was

increased – by 2.25 times (95% confidence interval 1.11-4.54). The authors calculate that there were four additional hemorrhagic stroke events per year for every 10,000 women experiencing migraine with aura.

### Ischemic stroke

While the risk association between migraine and ischemic stroke is clear the mechanism involved is not. Explanations include direct vascular involvement as part of the pathophysiology of migraine, platelet hyperaggregability, the presence of cardiovascular risk factors such as hypertension, smoking, hyperlipidaemia and oral contraceptive use, and a genetic cause.

Etminan and colleagues published in 2005<sup>2</sup> a meta-analysis of 14 studies and noted a relative risk among migraine sufferers of 2.16; in those with migraine with aura the risk was 2.27 and in those without 1.83. In women taking oral contraceptives the risk was 8.72. Among men and women aged under 45 the relative risk was 2.36 and among women under 45 2.76.

Another meta-analysis was conducted by Schürks et al<sup>3</sup>, this time into the association between migraine and cardiovascular disease. The authors calculated relative risk of migraine and ischemic stroke as 1.73; for migraine with aura it was 2.16 and for non-aura migraine 1.23. The results suggested a greater risk among women: 2.08 against 1.37 for men. The risk was further increased among those aged less than 45 years, smokers and oral contraceptive users. There was no association between migraine and myocardial infarction or death due to cardiovascular disease.

What are the practical implications for the management of mortality and morbidity risks? A degree of caution is called for in the way these studies are interpreted. A *BMJ* editorial<sup>4</sup>, referring to the article by Schürks et al, observed that the number of studies was too small to examine risks in subgroup ... but also that the absolute risk for stroke among most individuals is low, so a doubling of risk “is not cause for panic.” Underwriters should heed this: the risk of stroke in a young population, say

under age 45, is very low, so a doubling of risk represents very very few additional strokes per 1,000 lives per year. Kurth and colleagues<sup>1</sup> noted four additional strokes per 10,000 lives per year – 0.4 per 1,000; this is a rate observed by other investigators. A third of the strokes observed in that study were fatal, making the overall mortality risk 0.13 per 1,000. Even for critical illness, which pays out on mere diagnosis, the extra premium required to cover the increased risk will still be small in the context of the basic rate of premium.

Is the presence of cardiovascular risk factors more of an issue? Yes, it appears so. And what about oral contraceptive users? Yes again; in fact this appears to be the group most at risk – although given what is known about the condition, women who suffer from migraine with aura and who are having oral contraception will be rare applicants for insurance nowadays. But either way underwriters need to ensure that these risks are handled fairly with due attention to available statistical information.

1. Kurth T, Kase CS, Schürks M, Tzourio C, Buring JE. Migraine and risk of haemorrhagic stroke in women: prospective cohort study. *Brit Med J* 2010;341:c3659

2. Etminan M, Takkouche B, Isorna FC, Samii A. Risk of ischaemic stroke in people with migraine: systematic review and meta-analysis of observational studies. *Brit Med J* 2005;330(7482):63

3. Schürks M, Rist PM, Bigal ME, Buring JE, Lipton RB, Kurth T. Migraine and cardiovascular disease: systematic review and meta-analysis. *Brit Med J* 2009;339:b3914

4. Loder E. Editorial: Migraine with aura and increased risk of ischaemic stroke *Brit Med J* 339:doi:10.1136/bmj.b4380

## FAMILY HISTORY: UNDERAPPRECIATED, BUT EVER-RELIABLE

Which is the more effective screening tool? Genetic testing or family history?

In a Cleveland Clinic study presented at the American Society of Human Genetics Annual Meeting November 4, 2010, family history risk assessment has been shown to be one of the most effective tools for predicting

what diseases an individual may be at risk for developing. (Comparison of family health history to personal genomic screening for risk assessment of breast, colon and prostate cancer. B. Leach, C. Eng Genomic Med Inst, Cleveland Clinic, Cleveland, OH)

Dr. Charis Eng, the lead author said "It's the best kept secret in health care."

Increased access and decreasing prices for commercial genetic risk assessment for common diseases raises questions about how it compares to standard family history questions in clinical medicine. Eng and Leach compared family history risk assessment with Navigenics Personal Genomic Screen for breast, prostate and colon cancer in subjects at the Genomic Medicine Institute at Cleveland Clinic. They categorized each subject into the following groups based on family history and personal genomics results: general population risk, moderate risk or high risk. Each subject's hereditary risk was assessed based on clinical criteria and/or validated gene test results.

Half the subjects were male and half were female. Both family history and personal genomics put 59%, 41%, and 39% of subjects into the same risk categories for breast, prostate, and colon cancer, respectively. But overall risk level concordance between family history and personal genomics was low for all three cancers.

For prostate cancer, personal genomics predicted a moderate to high risk while family history only predicted general population risk. Subjects with moderate colon cancer risk on personal genomics were only general population risk on family history. None of the hereditary prostate cancer subjects were assessed as high risk on personal genomics. Based on family history, for subjects with hereditary breast cancer risk, personal genomics only identified 10% as high risk. None of the hereditary colon cancer subjects were high risk on personal genomics.

For cancer risk, family history and personal genom-



**If you read Underwriter e-ALERT, you should also read Hank's *JournalScan*, which focuses on the current medical literature, reporting on and analyzing studies of importance to mortality and morbidity underwriting. For a sample issue, contact Esther at [LedesmaE@aol.com](mailto:LedesmaE@aol.com) or visit [www.hankgeorgeinc.com](http://www.hankgeorgeinc.com).**

ics agreed on the subjects' risk categories only 46% of the time. For subjects with a hereditary risk, personal genomics only identified one subject as high risk. For patients at moderate to high hereditary risk some may elect a personal genomics approach over validated family history and disease-specific testing. Based on this study, family history and personal genomics may be complementary tools for cancer screening. But a thorough family history questioning is still the proven gold standard and should still be used to clinically evaluate an individual's risk of developing cancer until further research is done to prove that personal genomics can predict an individual's risk or can be integrated with family history to increase sensitivity.

The bottom line? Both approaches classified about 40 percent of participants as having above-average risk — but they picked the same people only about half the time. For example, the genomic screening missed all people with a strong family risk of colon cancer, half of whom Cleveland Clinic gave extra scrutiny to prove they carried a specific gene mutation. A patient might have done only personal genomic testing and been very reassured and not followed up with clinical evaluation.

Navigenics listed some men at risk for prostate cancer when their family history predicted a risk no higher than average. The difference is caused by genomic screening's broad protocols for DNA variations, including

some that aren't proven to play a major role. Most importantly, personal genomic screening often doesn't include high-profile gene mutations that are linked for specific diseases and can require more specialized testing.

Another problem is that both the maternal and paternal sides of a family affect hereditary risk. Researchers have found that women not only know less about the health of their paternal relatives, and they tend to dismiss the threat of breast cancer if it's on the father's side of the family.

"Family history remains the best genetic tool we have, but health care providers are not taking advantage of it" says Dr. Maren Scheuner of the Veterans Affairs Healthcare System in Los Angeles. Because genes alone are seldom entirely responsible for health risks, a family health history should also reflect shared environmental or lifestyle factors that can further affect an inherited risk.

## **SKEPTICISM AND EVIDENCE-BASED UNDERWRITING**

The experienced underwriter is a professional skeptic. He learns early in his career that 'evidence' of insurability is critical to his risk analysis and classification. As time goes on, he learns that he can analyze and classify risk with limited evidence (simplified underwriting) or substitute evidence (teleunderwriting, pharmacy databases, etc.). But always, he is sensitive to the possibility of information being withheld, manipulated or falsified for the purpose of 1) obtaining insurance and 2) acquiring the most advantageous rate for that insurance.

But when it comes to the 'scientific' evidence upon which rate classifications and pricing are based, underwriters and actuaries can easily be misled. And they are no less vulnerable than the general public to believing the latest scientific study without doing any critical analysis.

A long list of recent books and articles addresses this problem: 1) *Bad Science: Quacks, Hacks, and Big*

*Pharma Flacks* (Goldacre); 2) *Lies, Damned Lies, and Science: How to Sort through the Noise around Global Warming, the Latest Health Claims, and Other Scientific Controversies* (Seethaler); 3) *Proofiness: The Dark Arts of Mathematical Deception* (Seife); 4) *Wrong: Why experts keep failing us--and how to know when not to trust them* (Freedman); and more.

Doctors, medical researchers and other "scientists" who publish the results of their studies in erudite medical journals are only human. They may have motives that are not purely altruistic. The information from a study can be manipulated by degrees of withholding or falsification of data to assure a desired conclusion. Despite caveats and disclaimers (including the usual "further studies are needed"), it is widely understood that the majority of readers will tend to make decisions based on the conclusions of a study without rigorous analysis or debate. This has been problematic relative to the pharmaceutical industry and new medical technologies. For the general public, it is especially frustrating to those seeking a healthy lifestyle through diet changes and food supplements.

In recent decades, insurers have felt pressure to be responsive to the "latest evidence" rather than rely on time-tested, decades-long studies. While the innovation culture and competition are understandable drivers in the business of insurance, the long-term nature of life and living benefits insurance require a prudent approach to evaluating any new evidence that is used to support a relaxation of risk classification standards or pricing.

So, how should underwriters and actuaries detect good science from bad science?

Gaeta and Nagurney explain that "threats to a study's validity may be internal or external. Some are controllable, while others are not. External threats to a study's validity include the inability of study results to be generalized to a population or situation other than that studied. Even if a study is internally valid and the demonstrated outcome real, results are not guaranteed to be

applicable to other settings. ... Internal threats to validity of a study involve problems with study design or implementation. Bias is the systematic introduction of error, which distorts results of a study in a non-random way. Most studies have some potential sources of bias. ... Bias is entirely different than chance, which is a purely random study outcome. Regardless of how carefully a study is designed, the possibility always remains that demonstrated results are the result of random chance rather than to a real association or cause-effect relationship. A primary purpose of statistical analysis is to estimate the likelihood that results obtained could have occurred solely by chance. ... The presence of variables other than those under study, which nonetheless may have had significant effects on the outcome of a study, is a very common research problem. Be alert for these confounding variables, as authors do not consistently identify them. Study results may be affected to varying degrees simply by the fact that a study is being performed." (Evaluating the Literature: Review Criteria for Various Types of Studies - Can the reader believe the study results? Concepts of validity. April 14, 2009, <http://emedicine.medscape.com/article/773527-overview>)

Hanson and McNamee recommend focusing on four criteria (Efficient Reading of Papers in Science and Technology - Reading in Depth: Challenge what you read. January 6, 2000, [www.cs.columbia.edu/~hgs/netbib/efficientReading.pdf](http://www.cs.columbia.edu/~hgs/netbib/efficientReading.pdf)):

#### **Examine the assumptions**

- Do the results rely on any assumptions about trends or environments?
- Are these assumptions reasonable?

#### **Examine the methods**

- Do they measure what they claim?
- Can they explain what they observed?

- Did they have adequate controls?
- Were tests carried out in a standard way?

#### **Examine the statistics**

- Were appropriate statistical tests applied properly?
- Did they do proper error analysis?
- Are the results statistically significant?

#### **Examine the conclusions**

- Do the conclusions follow logically from the observations?
- What other explanations are there for the observed effects?
- What other conclusions or correlations are there in the data that they did not point out?

#### **Consider the source**

A high-quality, peer-reviewed journal is more reliable than a book. If the journal is not peer-reviewed or has an acceptance rate above 20 percent, you should be more skeptical of the content. The same standard applies to conference proceedings. You should investigate the source and support for the conference to determine whether reports presented there were peer-reviewed and selected for quality.

#### **Consider who financed the study**

A commercial company funding a study has a vested interest in the outcome. Independent studies with different results must be considered. Interpretation of findings is subjective and experts often disagree.

#### **Consider the study format**

Different types of studies require different evaluations. Studies involve experiments, surveys, animal models, meta-analyses, and qualitative studies. You should evaluate each of these differently.

## Causation versus correlation

*"You see there is only one constant. One universal. It is the only real truth. Causality. Action, reaction. Cause and effect."*

– The Merovingian in *The Matrix Reloaded*

This is usually where the underwriter, the physician and the lawyer part company. Statistical correlation is related to probability theory and the law of large numbers. If green-eyed people have shorter life expectancies than blue-eyed people, that may be a statistical correlation. Whether insurers are justified in charging green-eyed people more for life insurance is not only debatable, but may be illegal.

Green eyes may be an entirely "random in nature" factor completely unrelated to mortality. But predictive analytics is primarily grounded in statistical correlations and is widely used in property/casualty/liability underwriting. The use of predictive analytics through database

mining to define risk factors and to determine insurance pricing is controversial at best. Statistical correlation rather than 'cause and effect' is the justification used to explain these practices to regulators and legislators.

Physicians are held to a different and higher standard relative to best health care practices. Cause and effect should be evident when deciding what screening, diagnostic and treatment methods are used. A statistical correlation may be interesting, but probably cannot be used to justify a medical protocol.

With life insurance and living benefits insurance, the medical protocol standards for defining risk factors and for determining risk classifications and pricing withstood the test of time during the 20th century. The law of large numbers is indisputably important to actuarial pricing, but proven evidence of causality will better serve risk classification practices.



## FINANCIAL UNDERWRITING CLINIC

### INDICATORS OF FINANCIAL STATEMENT FRAUD

At an IIA (Institute of Internal Auditors) / ISACA (Information Systems Audit and Control Association) Joint Meeting (November 3, 2009), Ernst & Young gave a presentation on "Fraud-Detection, Risk Assessment, & Data Analytics."

As described by E&Y, the 'perfect storm' has created opportunity for financial fraud all across the business landscape. As companies and organizations downsize in this ongoing recession, there is an immediate impact on internal financial controls. As budgets decrease, companies do more with less. The internal and external pressures include increasing layoffs, decreasing stock prices, and increasing difficulty gaining access to credit. Internal financial controls loosen and people rationalize more opportunities for fraud. Certainly, business owners and senior executives who are cheating their companies won't hesitate to perpetrate financial statement fraud on insurers.

The indicators of financial statement fraud include:

#### 1. Red Flags - Company Structure & Culture

- "Tone at the top"
- Focus on analyst expectations at the expense of financial statement accuracy
- Recurring disagreements with auditors and/or changes in auditors
- Management compensation solely tied to operating results

- Control of company by small group or single person
- Weak internal controls
- High turnover of executive management and/or board members
- Large amounts of merger activity
- Weak internal audit function in an area
- Recent initial public offering

## **2. Red Flags - Financial**

- Consistently meeting or exceeding analyst expectations
- Related party transactions
- Untimely or non-existent account reconciliations
- Missing, altered or fabricated documents
- Inventory write-downs
- "Big bath" restructuring charges
- Cash flows significantly lower than net income

## **3. Other Red Flags**

- Anonymous tips
- Unexplained good financial results despite peer group and industry downturn

Fraudulent financial statement schemes can involve:

- Misstatement or omission of material information/accounting records from financial statements.
- Improper capitalization / deferral of expenses
- Improper revenue recognition
- Asset/liability manipulation
- Improper accounting of inventory control transactions
- Improper manipulation of tax accounts
- Improper journal entries
- Management estimates
- Significant / unusual transactions

Financial statement review should consider these common fraud risk areas:

- Accounts payable
- Accounts receivable
- Accounting: materials management & inventory control
- Purchase order management
- Revenue recognition / procure to pay
- Capitalization vs. expenses
- Sales analysis

To view the entire presentation, visit <http://storage1.colony1.net/11062/Presentations/P1109%20Fraud%20Detection%20Risk%20Assessment%20and%20Data%20Analytics.pdf>.

**For additional information about an inspection service whose investigators have skills in financial analysis and can talk intelligently with CPAs, corporate treasurers and other financial advisors, contact First Financial Underwriting Services Inc. Phone: (800) 570-3477 Fax: (800) 571-3477; E-mail: [ali@firstfin.com](mailto:ali@firstfin.com)**

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First Financial Underwriting provides the Life and Health Insurance industry with the information and data needed to assess the insurability of applicants. Our team of fully trained inspectors are capable of handling all inspection requirements nationwide.

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