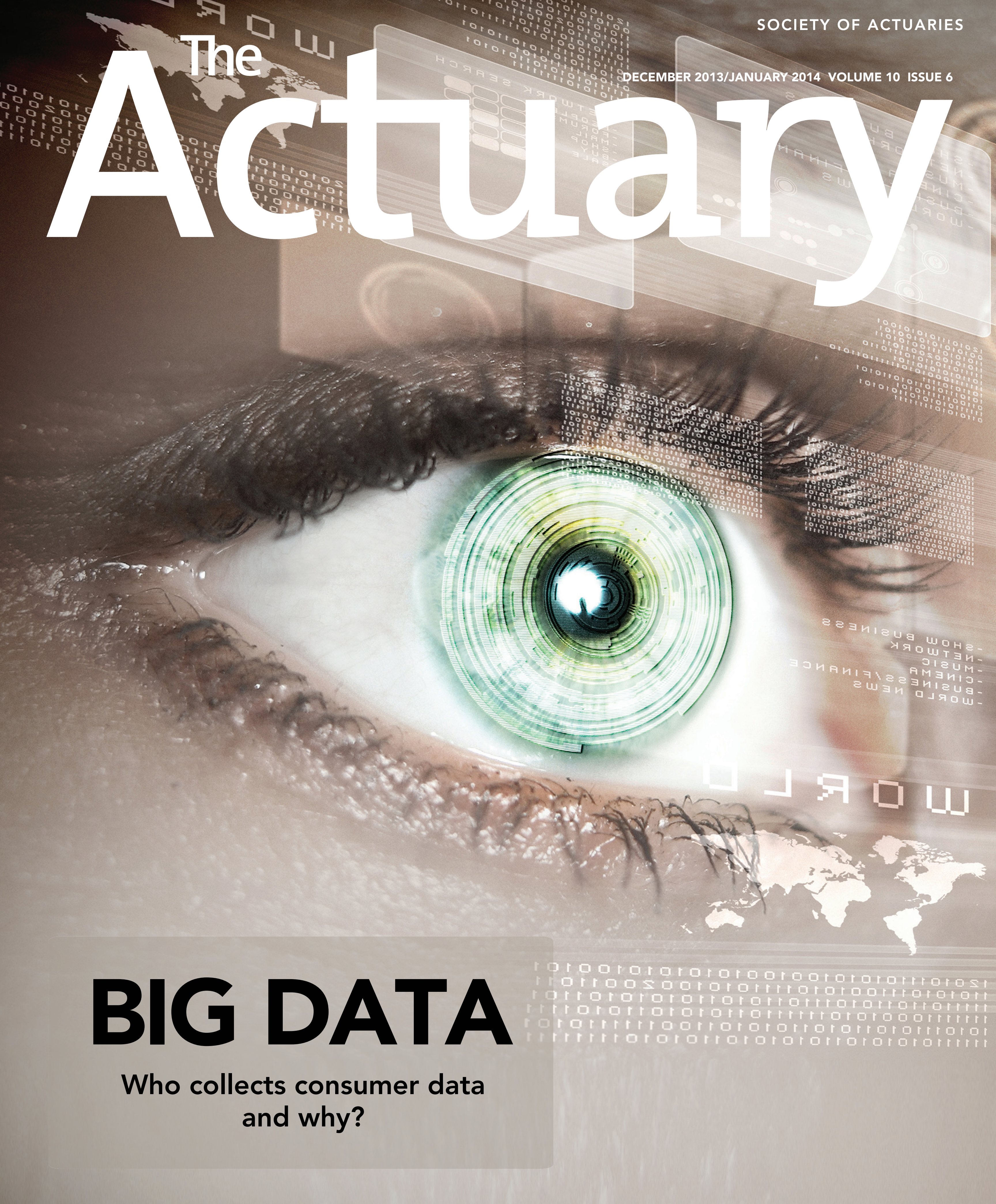
SOCIETY OF ACTUARIES

The Actuary

DECEMBER 2013/JANUARY 2014 VOLUME 10 ISSUE 6



BIG DATA

Who collects consumer data and why?

Dec'13/Jan'14

COVER STORY

FEATURES

BE SURE TO VISIT OUR DIGITAL EDITION AT ***www.soa.org/actuarymag.***

The Actuary
SOCIETY OF ACTUARIES

The Actuary is published bi-monthly (February, April, June, August, October, December) by the Society of Actuaries, 475 N. Martingale Rd., Suite 600, Schaumburg, IL 60173-2226. Periodicals postage paid at Schaumburg, IL, and additional mailing offices. USPS #022-627.

The Actuary is free to members of the Society of Actuaries. Nonmember subscriptions: students, $22; North American $43; Int'l $64.50. Please send subscription requests to: Society of Actuaries, P.O. Box 95600, Chicago, IL 60694-5600.

POSTMASTER: Send address changes to the SOA, c/o Communications Department, 475 N. Martingale Rd., Suite 600, Schaumburg, IL 60173-2226.

FPO
FPO
FPO
FPO FPO

The Actuary welcomes both solicited and unsolicited submissions. The editors reserve the right to accept, reject or request changes to solicited and unsolicited submissions, as well as edit articles for length, basic syntax, grammar, spelling and punctuation. *The Actuary* is copyedited according to Associated Press (AP) style.

For more information about submitting an article, please contact Jacque Kirkwood, magazine staff editor, at (847) 706-3572, *jkirkwood@soa.org* or Society of Actuaries, 475 N. Martingale Rd., Suite 600, Schaumburg, IL 60173-2226.

December 2013/January 2014 issue of *The Actuary*

DEPARTMENTS

ORSA

A forward looking view of capital and solvency

Helping insurers meet the challenges of ORSA

Editorial

TO COMMUNICATE OR NOT COMMUNICATE?

BY ROD BUBKE

IN HER LETTER FROM THE PRESIDENT in the August/September 2013 issue of *The Actuary*, Tonya Manning discusses the importance of actuaries being able to communicate clearly and concisely. "These communication skills are of paramount importance to our success, both individually and collectively as the greater community of actuaries," she wrote.

In October 2012, the Society of Actuaries' Board of Directors approved a strategic plan for 2013–2016. The plan contains the statements, "The SOA's career-long learning programs develop actuaries as technical experts, **business professionals and leaders**" and "foster career-long learning focused on technical excellence and **business acumen**" (bold added for emphasis).

In 2008, the SOA developed the Competency Framework, a set of eight competencies actuaries should possess to be successful. Two of those competencies are communication and leadership.

We all know it is important for us to be able to explain our work to others. At Ameriprise, part of our summer intern program is for the interns to spend time with actuaries in various levels and areas in the company. This helps them get a better picture of the profession and the company. When I meet with the interns, I always stress the importance of being able to communicate. I tell them it's not good enough to crunch numbers and be technically strong if you can't communicate results and their implications to your leaders and ultimately management.

So why am I talking so much about communication? As of Jan. 1, 2008, the American Academy of Actuaries implemented a continuing education component in the U.S. Qualification Standards. This applies to all actuaries who make statements of actuarial opinions. The standard requires 30 hours each calendar year to be qualified. That's not too bad; I think that makes sense. But in reading further you find there is a **maximum** of three hours that can be spent on general business courses and education materials. Doesn't this seem inconsistent with the need to be able to communicate?

Doors Are Open—Check Out BizLibrary

RESOURCES ON BUSINESS AND COMMUNICATION SKILLS NOW AVAILABLE

The Society of Actuaries has contracted with BizLibrary to offer members and candidates online video/audio business courses in the areas of communication, leadership, relationship management and strategic insight. Delivered via the SOA's new Learning Management System, those interested can select five courses for a one-year period at a discounted cost.

BizLibrary was launched in October in response to member requests asking for courses that can help them finesse their communication and management skills. Twenty-six courses developed by Skillsoft, a leading provider of online business skills training, are available. Check out BizLibrary on the SOA website. Go to Professional Development, E-Courses. Make sure you have the E-Courses tab open and click the first item, BizLibrary Business Skills: Courses on Professionalism, Leadership and Communication.

In June 2008, the SOA board approved a continuing education requirement for SOA members, effective Jan. 1, 2009. The SOA's requirement is somewhat different from the Academy's, with one of the differences being completing 60 credits over a two-year period, which doesn't have to be 30 each year. One area where they are partially the same is imposing a limit on the number of hours on business and management skills. The SOA's limit is 15 credits each two-year cycle or, on average, 7.5 credits per year. Again I ask, doesn't this seem inconsistent with the need to be able to communicate?

If being able to communicate is so critical to our profession's future, why do our continuing education requirements place maximums on the number of credits you can earn for education in this area? To be fair, I'm sure there are reasons for not wanting actuaries to get all or a large portion of their professional development credits in the so-called "soft skills." Our profession has been and continues to be highly technical in nature. However, in any given year if an actuary really wants to develop communication or leadership skills, they will likely come in bigger time chunks than the maximum allowed. A three-day course would exceed the limits of both the Academy and the SOA.

One could argue there is nothing stopping an actuary from getting more development in these skills; they just would not be able to apply them to their continuing education requirement. This is true; however, in these days of tight controls on expenses, how much is an employer willing to spend on professional development? This could limit the opportunities unless actuaries pay the cost on their own.

Then there are the questions of who should provide this type of education and what should it look like. I can safely say a session or two at an SOA meeting isn't what is needed. When I was on the Professional Development Committee, we struggled with this. Should the SOA be the provider or should we partner with an outside organization that already has a curriculum in this area, such as a business school? From a business school perspective, are there enough potential students to make it worth the time and effort?

So where do we go from here? First and foremost, I would encourage both the Academy and SOA to eliminate or significantly increase the maximum number of credits in communication and business skills actuaries can use to meet their continuing education requirements. Accompanying Manning's letter in *The Actuary* is a sidebar with current opportunities available for actuaries to sharpen their communication skills, some through the SOA and others that are not. Efforts need to continue to provide quality and relevant professional development opportunities in this area.

"**Effective communication is critical to our professional relevance**, as we continue to service our clients, and especially as we expand into new areas of practice, where we can aspire to impress these new audiences with the clear and concise ways in which we communicate to help them in their financial challenges," Manning also wrote (bold added for emphasis).

Rod Bubke

If being able to communicate is so critical to our profession's future, why do our continuing education requirements place maximums on the number of credits you can earn for education in this area?

So what is the answer to the question, "To communicate or not communicate?" The answer is most definitely to communicate; now we need to provide our members with the skill set to do so. A

Rod Bubke, FSA, MAAA, is vice president, Insurance and Annuity Valuation, at Ameriprise Financial. He can be reached at *rod.l.bubke@ampf.com*.

Letter From The President

IF WE WANT TO STRENGTHEN OUR PROFESSION, WE CANNOT SIT STILL

BY MARK J. FREEDMAN

THE FOLLOWING IS AN EXCERPT OF SOA PRESIDENT MARK J. FREEDMAN'S ADDRESS TO MEMBERS AT THE 2013 SOA ANNUAL MEETING & EXHIBIT.

What I like is that whenever I come to an SOA meeting, or for that matter, run into any other SOA member, even if I never knew that person before, something special happens. Tara Hansen, a colleague of mine at Ernst & Young, explained this to me a few months ago and I think it's true.

If you're an actuary, when you walk around your community, most people don't really know who you are or what you do. But, when you walk around an event like this, you're surrounded by people you know who have a unique and common experience. You have an instant connection just by being an SOA member. First, you ask where he or she works and within about 10 seconds, you generally find someone you both know. And then there's always the discussion around bad exam experiences. You know what I mean.

This leads me into explaining the real reason I served on the SOA Board and ran for president. I want to serve this room full of people who have been so great to me and who shared this experience with me over all these years. This is a party I'm proud to be invited to and I'm thrilled to be host for the next year.

Now I want to address a question many actuaries have asked me over the past year. They ask: "Why can't we just keep doing things like we always have? Demand for actuaries is good. Salaries are high. Why mess with a good thing? Let's just make our exams tougher (because we all know they've gotten easier over the years). We should just concentrate on that, keep our focus on the United States and Canada, and yes, we should also have some continuing education, but let's do that cheaper."

If we go down this route, the SOA won't need a marketing or communications area. No staff fellows. No head of education. We'll just use volunteers for everything. No international area. No strategic initiatives, because we wouldn't need a strategy. All we would need are high barriers to entry, lower dues and cheaper continuing education events.

In the short term, we'd be successful in accomplishing what we wanted. But in the long term, this simplistic approach would be disastrous.

- North American insurance companies will continue to consolidate and foreign companies will buy some of them.
- Defined benefit plans will continue to shrink.
- Actuarial jobs will continue to be outsourced offshore.
- The demand for actuaries would eventually fall short of the limited supply and the public would view us as soon-to-be-extinct dinosaurs.

- We would lose risk management jobs to non-actuaries and we would even lose some of our jobs to economists, like Zanny Minton-Beddoes, our keynote speaker.

If we want to strengthen our profession and SOA credentials, we cannot sit still!

We cannot be satisfied with protecting our turf and perpetuating the status quo. We need a well-thought-out strategic plan with strategic objectives and strategic initiatives supporting those objectives. We need a balanced plan that focuses not just on the supply side of our profession and maintaining the quality of the actuarial credentials, but on the demand side as well to increase the opportunities for and relevance of actuaries in the future.

Last year, I was fortunate to lead the SOA's effort in updating its strategic plan, and I think what our task force and ultimately the board came up with was terrific.

What I am going to speak about now are the three top priorities we need to address as an organization, in light of our new strategic plan, and what I'm going to concentrate on during my year as president:

1. International development,
2. New opportunities, and
3. Research supporting public policy.

INTERNATIONAL DEVELOPMENT

My first priority is international development. All over our new strategic plan you will see the word "global." Why is that? Aren't we a U.S. organization? The answer to that is a resounding "no."

If you looked at us several years ago, you could have said that we're a North American organization, as Canadians have always made up a large percent of our members.

And of course they still do. Canadians make up 18 percent of our members.

Look around you. Fourteen percent of our members are from outside North America and this is by far the fastest growing segment. In the room today, we have over 100 meeting attendees here from countries outside the United States and Canada, from places like China and Singapore, Hong Kong and Brazil, Mexico and Barbados.

We cannot be satisfied with protecting our turf and perpetuating the status quo.

Our president-elect, Errol Cramer, was born and educated in Durban, South Africa. New board member John Robinson grew up in the Carribbean and new board member Genghui Wu now lives in China. Sue Blank, another board member, now lives in Japan. Five of our 10 largest examination sites are in Asia.

We are not "becoming" a global organization. We already are one!

The primary reason we need to think strategically about the global landscape is to serve all of our members, wherever they are in the world today and wherever they may find themselves tomorrow.

How does globalization impact you, even if you reside in a North American job? Economies are global. We need to understand factors impacting economic issues around the world in order to do our jobs better.

Mark J. Freedman

I spent time over the summer speaking with local actuaries and government officials in Asia, and I can assure you, health care and pension issues are not just priorities in the United States. Government bodies around the world also need to consider how much publicly provided health care they can afford. China established a contributory pension system for urban workers in 2011 covering 280 million people. They expanded to rural workers adding another 460 million.

While pension actuaries do not normally work across borders, increasingly our international members will require research and education for the systems they support.

Investments are global. Acquisitions occur daily.

GLOBALLY RECOGNIZED CREDENTIAL

On both the buy and sell side of things, it is vital that the SOA provide actuaries with a globally recognized credential. If you're the chief actuary of a North American company, don't you need to understand issues abroad in case your company ever wants to expand internationally? And if your company has actuaries in a foreign location, wouldn't you feel more comfortable if the SOA trained those actuaries? And if you're working for a life, health or P/C insurer in North America that a foreign company just bought, wouldn't it be easier for you if that company already had several SOA members in its management?

Demand for actuarial services is rising outside of North America. That doesn't mean that the SOA should conquer the world. The SOA needs to be smart and practical in this regard. For example, it might not make sense to develop an SOA presence in India, since the Institute and Faculty of Actuaries helps serve this market effectively. Taiwan, on the other hand—where the SOA already has a critical mass of members and candidates—is a natural partner. And in a country like China, with a fast-growing middle-class and already a high number of SOA members, there is also a natural relationship.

A fast-growing middle class means a fast-growing insurance sector and growing national demand for actuaries. The SOA needs to continue to explore these types of relationships in order to help grow leaders in our global actuarial profession.

Now that we know why we should expand globally, I'm going to initiate ways to get it done.

- We need to actively market our credentials to candidates and universities in those countries.
- We need to develop basic education that's more nation-specific, recognizing the fastest-growing markets in those countries, including areas like property-casualty insurance.
- We need to offer continuing education so knowledge never falls behind the ever-changing global landscape.
- We need to sponsor and publish research in the countries we serve.
- Finally, we need to provide all of our members—across the globe—with networking opportunities and knowledge sharing.

The actuarial profession has many challenges. Some of our traditional markets are either static or shrinking. Yet at the same time there are opportunities.

In many cases, it will make sense to work with other national actuarial organizations to accomplish these goals. And we've started to address the needs of our growing international membership already.

For example, we've started to deliver education directly to our members around the world in formats like the recent IFRS and GAAP seminars in Hong Kong and Taipei. We offer examinations in 46 countries around the world. But we need to do more. By pursuing these strategies in the global market, we'll ensure a strong global actuarial credential not just for members in other countries, but for you and me too.

EMERGING OPPORTUNITIES

The second priority I will address as president is how we can capitalize on emerging opportunities.

The actuarial profession has many challenges. Some of our traditional markets are either static or shrinking. Yet at the same time there are opportunities. Just last month, I was speaking with a new fellow at the Valuation Actuary Symposium. He claimed that the rapid pace of regulatory reform—things like health insurance reform in the United States and changes in insurance accounting under U.S. statutory, GAAP and IFRS—could generate a "full employment act" for actuaries for the next five to 10 years.

This occurred recently in Europe as Solvency II implementations for insurance companies strengthened the market for actuaries across the continent. And to a certain extent I agree this could generate a full employment act.

But a major challenge in seizing these opportunities is how we maintain a continuing relevance after we complete the implementation work. In order to do that, we need to contribute to the core business needs of our employers and clients and not just support their regulatory compliance.

Just as important as taking advantage of natural opportunities as they occur, we need to create new opportunities and find new areas of practice. We have done this in the past. For example, we've done a terrific job in jumping on the health insurance opportunity. Nine hundred attendees at the SOA health meeting in Baltimore—that's an incredible number! Some years ago, the SOA also set up an investment track and we now have many members in that area of practice.

The same goes with risk management.

Many actuaries have assumed the roles of chief investment officers and chief risk officers with our more traditional employers. At the same time, we need to expand into non-traditional fields. An opportunity here might be business analytics.

As Tonya (Immediate Past President Tonya B. Manning) mentioned in her speech at the general session yesterday, the new buzz word in business today is “big data.” Our traditional employers are increasingly talking about “big data” as well. For those of you who either read the book or saw the movie “Moneyball,” you’ll know what I’m talking about.

The SOA recently had a strategic initiative in this arena and created a substantial amount of research, but we have to take this further. Yet another possibility is banking. Actuaries in Australia and South Africa have made a successful move into banking. We need to try to replicate these types of successes.

RESEARCH AND PUBLIC POLICY

My third priority as president is research to support public policy. Health care reform, social security and public pensions are in the news every day. The question is whether we’re doing enough to help in the public debates.

The SOA is primarily a research and educational institution. But keep in mind, as actuaries, we are professionals. And the core of our duty as professionals is to serve the public. The natural way to reconcile this is that we need to educate and provide research to policymakers and regulators on public policy issues.

I’ve had this conversation with a number of our members and sometimes the reaction I get is “Wait a minute. That’s for other organizations, like the American Academy of Actuaries, to do.” My answer is that I’m not interested in arbitrary boundaries and the political structure of our profession—and our employers and the public don’t care about this either.

What I’m talking about is maximizing the power of all the resources we have as actuaries.

In some cases, organizations, such as the Academy, will be the channel through which we deliver our message to the public. In other cases, we might perform joint research projects with other national and international organizations. And there might be times when the SOA may need to deliver the message itself.

The worst thing we can do is to leave important public policy research on our shelves.

We must be an integral party to the discussion. I plan to make research to support public policy a priority, due to the important lesson we learned during the financial crisis.

We were extremely busy in our day jobs keeping our clients and employers from imploding. In the frenzy, we were largely silent when it came to communicating to the public. We wondered why no one in the media or government asked what we, as actuaries, thought about the financial crisis.

It is time for the SOA to be ready and at the table with timely research for public policy issues and events shaping the way we, our clients and employers conduct business.

In conclusion, I encourage all of you, as you go back to your business of being an actuary, to remember the priorities I laid out this year for the Society of Actuaries. Remember to think globally—how does your work and education impact the broader world around you? Think about emerging opportunities and keep a dialogue open with the SOA and with me as you identify those opportunities. And finally, consider how public policy issues and current events shape our world and in turn how we can educate policymakers and regulators so they can shape the solutions to those problems and take advantage of opportunities.

In closing, I look forward to working with all of you and realizing these priorities in the year ahead.

Thank you. A

Mark J. Freedman, FSA, MAAA, is president of the Society of Actuaries. He can be reached at *mfreedman@soa.org.*

Centers of Actuarial Excellence

TECHNOLOGY ENHANCED LEARNING IN ACTUARIAL SCIENCE CLASSES

BY EDWARD (JED) FREES AND MARJORIE ROSENBERG

EACH YEAR, *the Society of Actuaries sponsors an education and research grant competition for universities that have attained the Centers of Actuarial Excellence (CAE) designation. Not only do the grants serve as a benefit for CAE schools, the grants are a way for the SOA to work with these schools to further the development of actuarial research and intellectual capital.*

Grants are sizable, with amounts of up to $100,000 per year for up to five years. Since 2010, the SOA has awarded grants to:

- *Georgia State University (research), 2010*
- *University of Wisconsin–Madison (education), 2010*
- *University of Iowa (research), 2011*
- *University of Waterloo (research), 2011*
- *Temple University (research), 2012*
- *University of Michigan (education), 2012*

For 2013, grant recipients will not be announced until contracts are in place.

Several of the grants are coming to completion, including the University of Wisconsin–Madison's education grant to develop online study resources for actuarial students. These tools are publicly available on the SOA website and can aid candidates' preparation for exams P, FM, MFE, MLC and C.

The following article discusses the evolution of the online materials developed by Wisconsin and how they can be used to support actuarial education. Look for more information on other CAE grants in future issues of The Actuary. ***—Ronora Stryker***

In 2010, the University of Wisconsin–Madison was awarded the first education grant from the Society of Actuaries' Centers of Actuarial Excellence program. The purpose of our proposal was to develop technology enhanced learning (TEL) tools that would be distributed publicly to supplement the actuarial education classroom experience.

We are nearing the end of the three-year grant period and this article summarizes what we learned, the materials we produced and where we might venture in the future. The materials can be found at *www.soa.org/PracticeQuestionVideos.aspx.*

Everyone has a different learning style. As mentioned by John Mange and Sherri Blyth in their "Technology's Role in Actuarial Education" article in the December 2012/January 2013 edition of *The Actuary*, some of us learn best by reading and others by listening. Our approach was to create videos using the software Camtasia that combines both elements.

Over the three-year grant period, we focused on creating videos to help students understand the solutions to exam problems. The exam problems are those sample problems posted online by the Society of Actuaries and Casualty Actuarial Society. In addition to the video, we include our written solution and a CAS/SOA posted written solution. In this way, students can see alternate ways to solve a given problem.

CAE Program

READ MORE about the Centers of Actuarial Excellence Program—an overview, benefits, announcements and a listing of the current CAE schools. Visit the SOA website. Go to Education, University/College Resources and click on CAE home page for information.

We started with course P, as many of our students have difficulty with the material. More than 140 course P videos have been created. There are also videos for preliminary exams FM, MFE, MLC and C.

The videos use a similar format with an introduction slide of the problem number and the learning objective, presentation of the problem, a pause to allow the students to try the problem on their own, the video solution and a summary slide. Almost all videos include closed captioning.

Closed captioning provided an interesting addition, as the student could view the video, hear the explanation and also read what was being said. That triple reinforcement of the presentation of the solution helps accommodate multiple learning styles.

The videos were developed by our undergraduate students at UW–Madison. They gained many skills, including the art of teaching. As we gained experience, we developed a more intricate approach with a template for solving the given problem, expanding more in the solution to provide instruction. The goal was not always solving the problem in the quickest way. The student presenter discussed the strategy of solving the problem, and while going through the solution, would highlight important concepts, with perhaps more explanation. Thus, the student became aware of being a more effective communicator of technical concepts. Videos were critiqued by the group of students working on the project in that semester, building in a level of quality control. Over the three-year grant period, we employed 57 unique students. Some students worked over multiple semesters. We employed 96 students during the fall, spring and summer semesters, with an average of just over 10 each period. Faculties were involved to supervise the students.

The teaching, communication and software skills learned by the students will be invaluable when they continue on in their professional life. Students knowing how to create these videos could document these processes in a way that is clear when transferring responsibilities from person to person.

Videos are helpful for specific questions when a student is stuck and unable to solve the problem. As a supplement to these, flash cards were created to help students learn notation for exams FM and MLC. These flash cards contain the symbol, with its definition, as well as quizzes that provide the word and then ask the student to provide the symbol. In addition, the flash cards test relationships between quantities like annuity-immediate and annuity-due.

As a department heavily invested in applied statistics, there has been a substantial amount of material developed to aid in the education for regression analysis. The regression class is difficult for students as it is more unstructured and is a much more hands-on course than classes for the material found on the preliminary exams. This regression course builds on the basic statistics course, adds learning of statistical software and then finally adds the piece: regression. One overall purpose of the course is for students to be able to complete a project using regression techniques.

As such, we have created tutorials to aid in the learning process. There are tutorials about learning the statistical software package R, tutorials using Excel and interactive tutorials developed to increase student active participation on the software code.

Although an education grant, we developed a research attitude and experimented with many learning tools. As a product of this experimentation, interested viewers will find interactive lecture notes on the second half of Actuarial Mathematics and presentations of a series of lectures on copula regression, a topic our doctoral students study.

At the end of the three-year period, we have developed a strong approach to TEL that provides quality materials and also extensively involved our current students in both the learning and the development processes. We are planning on extensively integrating this material, developing other material for use in our classes and making some of the material public. The technology to produce the material is changing rapidly. In fact, since we wrote the grant proposal, the amount of massive open online courses (MOOCs) has exploded. These courses illustrate wide variety in educational topics using rapidly changing technology. As educators, we want to adapt our materials to the technology and to the learning styles of the generation of actuaries we see in our classes. A

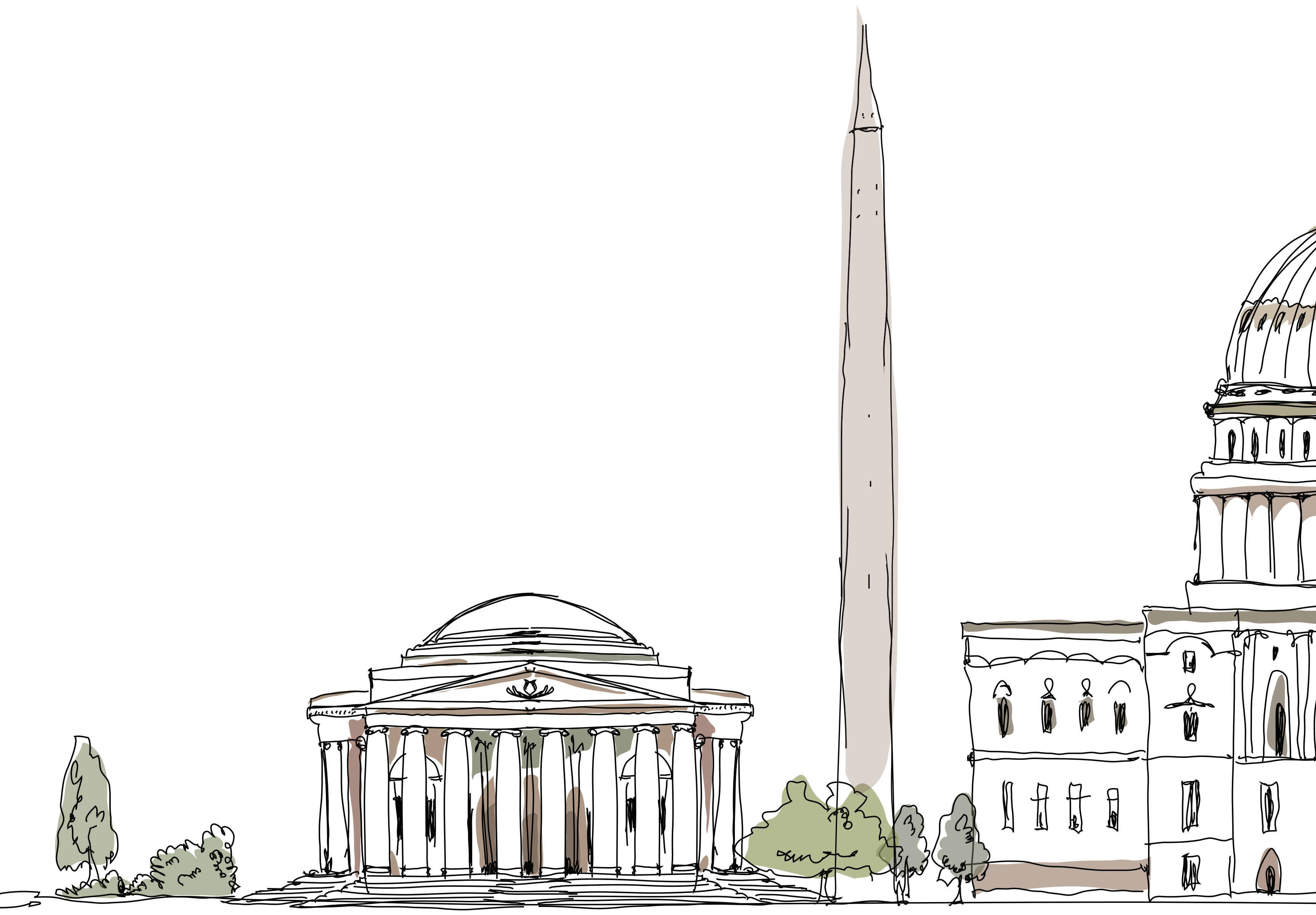
Edward "Jed" Frees, FSA, is a professor in the University of Wisconsin School of Business. He can be reached at *jfrees@bus.wisc.edu.*

Marjorie Rosenberg, FSA, is a professor in the University of Wisconsin School of Business and Biostatistics and Medical Informatics in the School of Medicine and Public Health. She can be reached at *mrosenberg@bus.wisc.edu.*

Ronora Stryker, ASA, MAAA, is a research actuary at the Society of Actuaries. She can be reached at *rstryker@soa.org.*

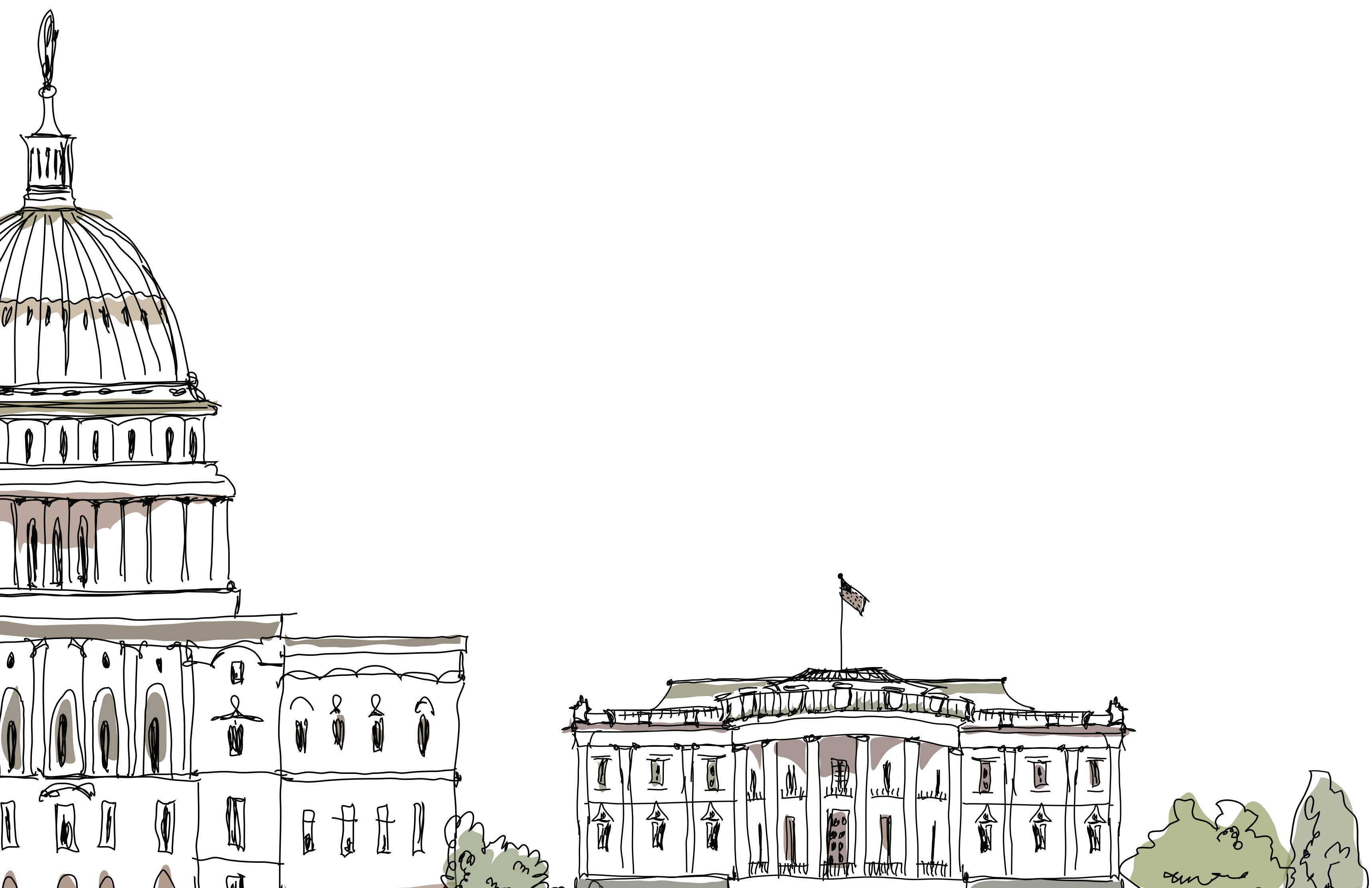
IMPLEMENTIN

AN ACTUA



G THE ACA:

RIAL PERSPECTIVE

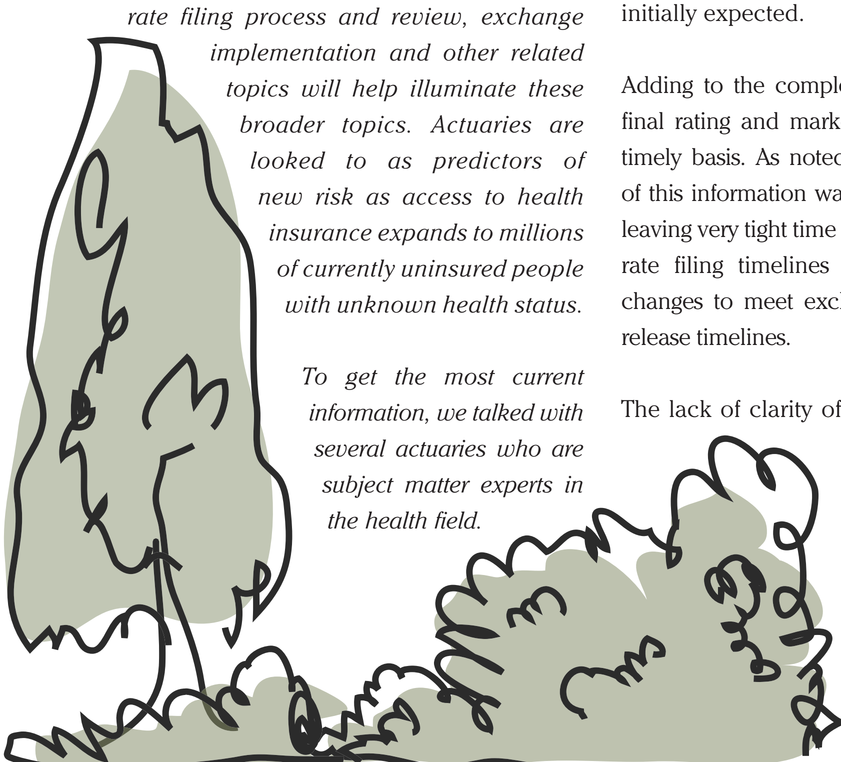


ACTUARIES ARE LOOKED TO AS PREDICTORS OF NEW RISK AS ACCESS TO HEALTH INSURANCE EXPANDS TO MILLIONS OF CURRENTLY UNINSURED PEOPLE WITH UNKNOWN HEALTH STATUS. HERE'S SOME INFORMATION FROM AN ACTUARIAL PERSPECTIVE. **COMPILED BY KARIN SWENSON-MOORE AND THE EDITORIAL STAFF**

EDITOR'S NOTE: The following insights were collected in September 2013, which is prior to knowledge of the exchanges' operational struggles during the first weeks after their Oct. 1 launch, and also prior to the president's announcement on Nov. 14, 2013, alluding to the possible extension of pre-ACA health plans. This latter announcement is causing additional uncertainty among many health actuaries than was contemplated in September 2013.

The implementation of the Affordable Care Act (ACA) has had a tremendous impact on the health care industry in general. Exploring lessons learned from the perspective of product development, rate filing process and review, exchange implementation and other related topics will help illuminate these broader topics. Actuaries are looked to as predictors of new risk as access to health insurance expands to millions of currently uninsured people with unknown health status.

To get the most current information, we talked with several actuaries who are subject matter experts in the health field.



Our thanks to Dan Bailey, FSA; Hobson Carroll, FSA; Laure Goldberg, FSA; Paul Harmon, FSA; Brett Heineman, ASA; Erik Poppe, FSA; Sam Vorderstrasse, FSA; and others who contributed their thoughts, knowledge and insights.

AFFORDABLE CARE ACT IMPLEMENTATION

The greatest concern raised by the actuarial contributors about the ACA—related to implementation and decisions made to date—is the uncertainty, inconsistency and lack of timely rules, guidance and decisions at both the federal and state level. Even in states where some level of reform was already in place, the ACA requirements are far more material and significant than initially expected.

Adding to the complexity was not receiving final rating and market guidance rules on a timely basis. As noted by one source, much of this information was received during 2013, leaving very tight time frames to meet required rate filing timelines and necessary system changes to meet exchange and market rate release timelines.

The lack of clarity of federal rules applying to large employers and concerns about the revenue impact of delaying the Employer Shared Responsibility (ESR) penalties to 2015 also were significant.

Further, responders were surprised that most states chose to implement the federal age curve, rather than adjusting to market-specific curves. Massachusetts, New Jersey, Minnesota, Utah and the District of Columbia created their own specific factors.[1]

IMPLEMENTATION CHALLENGES

Organizations have been challenged to implement the ACA, especially in the arenas of defining products, rating assumptions, 3Rs, preparing filings, regulatory requirements and working with the exchanges.

Complexity and uncertainty around the ACA regulations, as well as delayed release of federal and state guidance, created implementation challenges not only for exchange business, but also for large employers.

Paul Harmon, FSA, shared his thoughts about exchange products.

"We were prepared for a certain level of uncertainty but we were not prepared for states to make detailed benefit level decisions on products after rates and contracts were filed," he said. "This resulted in needing to revise the contract and rate filings on multiple occasions."

Hobson Carroll, FSA, who consults in the self-insured arena, said the confusion caused by the delay in the employer mandate created a great deal of stress after a lot of effort and resources were already spent adjusting benefit designs, administrative capabilities and other related issues.

Contributors were also concerned about communicating the impact of ACA internally to corporate leaders, and with effectively managing the many system and process changes under aggressive and fluid requirements and timelines.

"On the actuarial side in particular, we were challenged by the volume of rate filing, rating formula and assumption changes occurring simultaneously," said Laure Goldberg, FSA. "There were several work streams that required actuarial expertise and leadership ranging from understanding the "3Rs" (the federal risk mitigation programs), to the phase-out of certain rating factors, to drafting a new federal filing that hardly resembled past state filings. The actuarial team had the additional challenge of helping the organization, up to the CEO level, understand all of these rating changes and how they would affect our customers."

MARKET CHANGES

The actuarial contributors expect to see significant change across many aspects of the health care market. With the new subsidies and focus on the individual market, several actuaries commented on the potential for movement of members from the small group market to the individual market. This movement will be driven by several factors, including the potential rate increases that could occur for some small groups who experience dramatic changes due to the new rating formula, combined with the temporary reduction in individual market rates emanating from the reinsurance subsidization.

The potential for rate changes in the small group market could also impact funding approaches and how small groups organize to purchase health insurance. The contributors suggested that small groups might be more likely to use self-funding or the Professional Employer Organization umbrellas as a mechanism to purchase health insurance. In both cases, the small employer would have the opportunity to avoid the general small group rating pool and rating rules.

Contributors predict that we will continue to see more participants in the individual market—particularly from Medicaid providers and community-based plans and providers. Over time, however, they expect to see consolidation as the market becomes mature. This trend will also be driven by the continued consolidation in the provider community and the further development of integrated provider groups.

GLOSSARY OF TERMS

3Rs—Includes the federal reinsurance program, risk adjustment payments and risk corridor payments outlined in the ACA.

ACA—The Patient Protection and Affordable Care Act, passed by the U.S. Congress in early 2010.

Accountable Care Organization (ACO)—A health care delivery system that assumes risk for patient utilization, total cost of care and outcomes.

Coordinated Care Organization (CCO)—Similar to an ACO. Also known as Coordinated Care Plans (CCPs).

Employer Shared Responsibility (ESR)—This provision requires large employers offering health insurance to modify eligibility requirements for coverage, as well as the level of premium support from the employer, or pay a financial penalty (as defined in ACA).

Health Maintenance Organization (HMO)—Typically provides a more tightly managed care system with more limited access to providers, often in exchange for a higher level of benefits.

Patient Centered Medical Homes (PCMH)—Health care delivery focused on improving quality of life and outcomes for individuals with multiple conditions and high medical needs.

Primary Care Physician (PCP)—Primary care physician, most often found in an HMO model.

Reinsurance—Three-year federal transitional program designed to reduce premiums for the individual risk pool, and redistribute the costs to groups.

Risk Adjustment—Federally administered program to redistribute premiums among individual and small group health insurance carriers within each state based on the health status of the individuals enrolled in each carrier.

Risk Corridor—Federally administered program to protect health insurance carriers against severe financial losses in the individual and small group risk pools, and to charge carriers with significant financial gains.

Brett Heineman, ASA, highlighted the consolidation dynamic.

"In general, I expect health plans to consolidate in response to the consolidation trend in the provider community," he said. "In addition, the movement toward care integration models will also create incentives for provider networks to develop their own health plans to provide coverage in addition to care. These will be marketed as ACO or PCMH plans, but will really operate like HMOs of yesteryear—hopefully with better acceptance from the community, and better technology to drive quality outcomes."

EFFECT ON NATIONAL HEALTH UTILIZATION

Contributors generally believe that short-term utilization in 2014 will remain steady, or increase, as newly insured seek long-delayed services, and as benefit richness increases, with potential cost offsets coming from more aggressive provider contracting that could drive the cost per service down. There could be a backlash from aggressive contracting tactics though.

"We are concerned that the trend in large-dollar claims will accelerate as providers face reduced base rates and also know that a large fraction of the population doesn't have lifetime limits but has a strong annual out-of-pocket maximum," said Sam Vorderstrasse, FSA.

There also is concern about spikes in small group costs in late 2013, as insureds seek services prior to changes in coverage.

Longer term, the contributors did not expect that the ACA will significantly affect national health care cost trends. Some raised concerns about inadequate provider capacity.

Prior to the ACA, many large employers were already seeking innovative approaches to managing trends.

IMPACT OF THE CHANGING ENVIRONMENT

Several contributors commented on the changing environment and how it will impact the rating process in 2015.

Harmon summarized the sentiment of the group regarding the uncertainty and the potential strategic response of the carriers.

"I think 2015 implementation will be very similar to 2014 in that we'll still face a high level of uncertainty regarding state and federal decisions until later in the filing preparation process, and there will only be limited enrollment and cost information to adapt assumptions for, particularly the 3Rs," he said. "I think 2015 strategy will be very interesting as carriers adapt to the new marketplace and try to better target their price and benefits to the competition."

Vorderstrasse also commented on the potential uncertainty.

"Sometime during 2015, I would expect carrier cash flow concerns to start arising in small carriers in small markets," he said. "Not having enough information for rate filings will require extending the unknown claims cost question into the 2015 contract year. With the extended open enrollment period for 2014, we will also not know final enrollment numbers by the time rate filings for 2015 are due."

In addition to the rating impact, the contributors also expect employers to more seriously consider dropping coverage and make further benefit design changes. These benefit designs will be more likely to account for cost-sharing provisions that emphasize favorable provider-payer partnerships and ensure a more efficient provision of care.

IMPACT OF 3R PROTECTIONS

As a group, the contributors had varying views toward the 3Rs policy in the ACA (federal reinsurance, risk adjustment and risk corridors). Goldberg, for example, identified the possibility for the policy to reduce conservatism for selection concerns:

> THE IDEA BEHIND THE 3RS IS TO MITIGATE THE CONCEPT OF 'GOOD RISKS' AND 'BAD RISKS.'

"The idea behind the 3Rs is to mitigate the concept of 'good risks' and 'bad risks' as the individual mandate is implemented," she said. "Nationally, this should help reduce padding for selection concerns."

Another contributor highlighted the potential for the reinsurance program to reduce individual rates in the shorter term, but this effect will wear off over time as the reinsurance program is phased out. This source added that hopefully this wear-off will be offset by additional members entering the individual market from the uninsured ranks that are better risk overall than observed 2014 market risk levels.

Health Watch

The October 2013 edition of *Health Watch,* the newsletter of SOA's Health Section, is dedicated to ACA implementation. Read articles such as "Risk Corridors under the Affordable Care Act—A Bridge over Troubled Waters, but the Devil's in the Details," "Diary of a Health Care Reform Actuary," "The ACA—Two Policy Experts' Perspectives," and more. Visit **www.soa.org/Health-Watch-2013.pdf.**

In contrast, Heineman pointed out the potential incentive for some carriers to underprice, given the additional financial backing afforded by the 3Rs protection.

"I think carriers, particularly small carriers, have the incentive to underprice in hopes of growing membership in the short term, and getting paid on the back end by the 3Rs," he said. "I doubt many carriers will deliberately take this kind of risky strategy. However, an overly optimistic carrier may be bailed out in a way they never would have been without the ACA, and it will be interesting to see how states will react to under-priced carriers."

On the other hand, Vorderstrasse thought that the impact would be more modest.

"I don't think that the risk adjustment program presents much protection in the immediate term, since the biggest risk factor is the overall morbidity of each statewide market," he said. "Beginning in 2015, the transitional reinsurance program will begin to be scaled back, which will increase premiums in the individual market."

COST OF CARE AND ACCOUNTABLE CARE ORGANIZATIONS

One of the major concerns is how Accountable Care Organizations (ACOs) or Coordinated Care Organizations (CCOs) are likely to affect availability and cost of care, and related concerns about these entities. In most cases, the contributors believe that these organizations hold real promise, but savings are not likely to occur immediately.

Heineman highlighted some challenges.

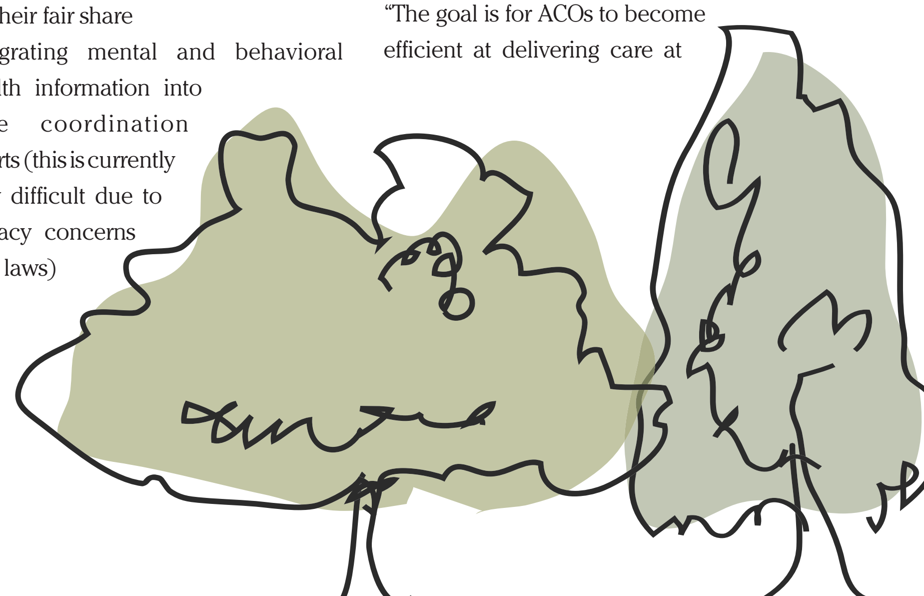
"I am a firm believer in the power of care coordination, but I don't think CCOs will succeed in lowering the cost of care for the majority of instances during the first year of implementation," he said. "I think it will take some time for the industry to work the kinks out of the system. Specific challenges for this space include:

- Motivating patients to participate and do their fair share
- Integrating mental and behavioral health information into care coordination efforts (this is currently very difficult due to privacy concerns and laws)
- Synchronizing care coordination efforts with providers
- Providing outcome-based incentives for care coordinators to drive increased quality.

"My biggest concern about CCOs is that they represent a new paradigm in providing care. Current providers have fundamental barriers to fully embracing this new paradigm including information technology infrastructure and training, education on how to use a CCO effectively, reimbursement incentives to use CCO, and old-fashioned 'that's not the way they were trained' sentiments. These barriers are not insignificant, and pose the biggest threat to the success of CCOs. I think enough organizations will get it right that there will be an increase in adoption of care coordination over the next several years, with best practices and operating models becoming established."

Erik Poppe, FSA, identified some of the potential advantages.

"The goal is for ACOs to become efficient at delivering care at



multiple settings without the overlapping of costs that had existed in the past," he said. "For example, transition of care from an inpatient setting to a home setting will be more efficient with linked electronic medical records when all the patients' providers belong to the same ACO."

Dan Bailey, FSA, further highlighted the potential of these programs with specific examples of their effectiveness.

"The concept of coordinated care, in general, works well in actual practice—it has been working well for some time," he said. "For elderly and non-elderly populations, coordinated care has long been an inextricable part of Staff Model and Group Model HMOs—it is inherent in their delivery model. These organizations pre-date the use of the term 'Coordinated Care.' Co-location of services (primary, specialty, allied and ancillary) in these types of delivery structures also enhances their ability to coordinate care and uses resources more efficiently while improving patient health and quality of care. PCP buy-in and an emphasis on better primary care is common to these models and to effective CCOs in general. These delivery concepts seem to be more practical and prevalent in urban locations, supported by robust networks with adequate geo-access. In these types of delivery systems, which tend to be more local, coordinated care arises more naturally. It is an effective way of improving efficiency. Coordinated care works in terms of lowering per capita health care cost, all else being equal. It is not, however, the silver bullet or panacea for all that ails our system. In a broader sense of the term 'coordinated care,' we even have examples of its effectiveness as provided through Medicare Advantage (MA) Coordinated Care Plans (CCPs), which are HMOs, HMO-POS and PPO plans, including HMO Special Needs Plans. Over 90 percent of the 15 million people in MA Part C medical plans are enrolled in CCPs. MedPAC conducted analysis showing that MA CCP plans, especially HMOs, provide more benefits for less medical cost at lower total cost. This translates into lower cost to the MA member in terms of monthly member premium and member cost-sharing.

"Medicare beneficiaries benefit both from the coordinated care practiced in MA plans (to varying degrees) as well as in the newer accountable care programs made available to the 35 million beneficiaries in Original A/B Medicare (not MA). These ACOs recently brought about under the ACA are an extension of the MA experience and a concerted effort to stimulate better care delivery more broadly in the largely fee-for-service space. The jury is still out on the effectiveness of these new ACOs. But these are not the only CCO examples. Many states are experimenting with coordinated care for their residents covered by Medicaid, and they are assembling the data and analytics to prove or disprove its value."

BENEFICIAL OR NOT?

Actuarial contributors commented on the aspects of the ACA that will have the greatest benefit to the United States, and what aspects will not, both in the short and long term.

Many contributors cited improved access to comprehensive health insurance with lower member cost sharing for more individuals as a significant benefit. They also cited increased consumer awareness of health care costs and benefits due to transparency requirements.

"Another benefit of the ACA is the education and transparency of the actual health care costs to the average U.S. citizen," said Poppe. "Most employees are not aware of the total cost of health care provided by their employer; after ACA is fully implemented, these costs will be very apparent. Ideally, this will lead to consumer pressure that results in reduced health care costs across the board in the coming years."

Several contributors noted the lack of focus on health care cost reform and control as a major missed opportunity.

Goldberg noted that there needs to be a parallel effort to control health care costs. "Without more focus on the cost aspect, it will be challenging for the ACA to succeed in making health care both more accessible and more affordable," she said.

"The ACA did little to limit the cost increases providers, drug companies and durable medical equipment vendors pass through," said Heineman. "This will come to a head sometime between 2015 and 2017, as many carriers will face costs rising faster than premiums."

Other contributors noted the complex rules and responsibilities for employers, the lack of catastrophic low-cost coverage, inadequate penalties causing healthy, currently uninsured individuals who do not qualify for premium subsidies to remain uninsured, and significant rating factor changes resulting in substantial premium rate changes for younger, lower-risk individuals.

One source added that by limiting the catastrophic level of benefits (plans with less than 60 percent actuarial value will be subject to penalties), along with low penalty consequences, some Americans who do not have coverage and perceive themselves to be healthy risks will choose not to enter the market in the early years of the ACA, keeping costs higher for those who select coverage.

WHAT WOULD YOU CHANGE ABOUT THE ACA?

Our responding contributors offered many suggestions for change. Some of the opinions included:

- Increase clarity and timeliness of ACA rules and regulations, and better coordinate decisions needed at both the federal and state level.
- Change the Employer Shared Responsibility affordability test to reflect family coverage. Also, provide more guidance on family design benefit richness evaluation.
- Allow exchange plans with less than 60 percent actuarial value to provide lower-cost premium options and thus attract additional lower-risk individuals to the exchange marketplaces.
- Include standardized provider reimbursement in the exchanges.
- Address existing continuation of coverage requirements such as COBRA and group conversion laws that may be inconsistent with ACA.
- Address the continuum of health insurance reform to include Medicare.

Harmon commented on the work and re-work required as carriers and regulators attempted to achieve clarification concerning the regulatory guidance.

"Decisions were revisited multiple times, causing compressed timelines for filings, updates and implementation," he said. "Uncertainty places large risks on the new marketplace on either side of the pricing spectrum through carrier conservatism or simplified pricing approaches."

IN CLOSING

2013 has been an action-packed year for health actuaries as we implement ACA for 2014. Health plans already are moving into the next cycle of product development, rating and implementation. Actuaries will be challenged to manage expectations around enrollment and risk with little data. Hang on for another wild ride!

Karin Swenson-Moore, FSA, MAAA, is director, Actuarial, at Cambia Health Solutions. She can be reached at *karin.swenson-moore@cambiahealth.com.*

END NOTE

[1] *http://www.cms.gov/CCIIO/Programs-and-Initiatives/Health-Insurance-Market-Reforms/Downloads/state-specific-age-curve-variations-08-09-2013.pdf.*

RELATED READS

Read the SOA's research report, "Cost of the Newly Insured Under the Affordable Care Act." The research predicts ACA-driven changes in individual market composition of the individual health care market could drive up underlying claims costs by an average of 32 percent nationally by 2017. Visit the SOA website. Click on the Research tab, then Completed Research Projects. Click on Health and scroll down to access the report.

WHY SHOULD WE CARE ABOUT SUSTAINABILITY?

SUSTAINABILITY REFERS TO THE ABILITY OF HUMANS TO ENDURE FOR FUTURE GENERATIONS. WHAT CAN ACTUARIES DO TO HELP ENSURE THAT NATURAL RESOURCES LAST? BY MAX J. RUDOLPH

IN DECEMBER 2012, the International Working Group on Actuarial Sciences and Sustainability (IWGASS), held a summit to discuss climate change, sustainability and the actuary's role.

IWGASS was formed by the Society of Actuaries' (SOA) research department to identify research needs on sustainability and examine how actuaries could assist in analyzing, measuring and mitigating the associated potential risks. The one-day summit, held in Chicago, featured the following speakers and topics.

- Dr. Paul Brandt-Rauf, dean of the School of Public Health at University of Illinois–Chicago. Brandt-Rauf shared research about the feedback loop between humans and the natural environment. He noted that, until recently, humans had a small ecological footprint.
- Tim Harris, Milliman. He shared his thoughts about the skill set brought to the table by actuaries.
- Dr. Aled Jones, director of the Global Sustainability Institute (GSI) at Anglia Ruskin University in the United Kingdom. Jones shared his Limits to Growth (LTG) research project, on which he has collaborated with U.K.-based actuaries. The focus is on energy, food, water, land, commodity, social mobility and environmental loading (quantifying a tipping point).
- John Richardson, currently with Guggenheim Insurance but at the time with CNO Financial. He provided background about how he became interested in this topic and shared some resources he has found valuable.
- Dr. Leonard Sonnenschein, president of the World Aquarium and Conservation for the Oceans Foundation. He discussed the signals given by the oceans relative to climate change. He also spoke on desertification.

A summary of the summit is available on the SOA website. The summit identified areas for actuarial involvement to quantify and measure potential financial implications of the risks, with opportunities to partner with other disciplines and organizations to analyze and model resource supply and demand. Max Rudolph, one of the attendees, provides the following thoughts on the summit and why actuaries need to pay attention to natural resource sustainability issues.—**Ronora Stryker**

EMERGING RISK NO. 1: SUSTAINABILITY

Sustainability refers to the ability of humans to endure for future generations. You might think of my old Scoutmaster's motto, "Leave a campsite better than you found it," taken to an extreme.

Since attending the Society of Actuaries' December 2012 Natural Resource Sustainability Summit, I've been thinking a lot more about the topic. For the last year I have been seeking out material, looking for information that could help me draw my own conclusions. Nothing I read was completely unbiased, and I'm sure my evolving opinions will be apparent here too. I am not an expert, just someone who wants to know more. My reading list recently included *This Time Is Different: Eight Centuries of Financial Folly* by Carmen Reinhart and Kenneth Rogoff, showing that high debt is not sustainable, and *Spillover: Animal Infections and the Next Human Pandemic* by David Quammen,

READ THE REPORT

Read the full report on the Natural Resource Sustainability Summit. Visit ***www.soa.org/NatResourceSustain.***

Actuarial Sustainability Action

- Casualty Actuarial Society's Climate Change Committee
- Institute of Actuaries of Australia's Energy and Environment Committee
- The Institute and Faculty of Actuaries in the United Kingdom's Resource and Environment Member Interest Group
- International Actuarial Association (IAA)
- International Working Group on Actuarial Sciences and Sustainability (IWGASS)

which focuses on concerns about humans interacting with animals and sharing diseases. I am finding convergence from interactions between climate, economic conditions and disease. Although I will reference information I learned at the summit, this article reflects my views alone.

Much as the SARS epidemic led me to research influenza 10 years ago, Arctic sea ice melting has taken climate change from an interesting theoretical consideration to something impacting my daily life. Changes to the jet stream increase severe weather frequency and severity. Crops are moving north and uphill as the temperature increases. Insects follow the same pattern, sometimes without predators at the new locations. Interactions between risks act to intensify them, as when drought and infestation of forests lead to wildfires. From an ecosystem perspective, it is all happening too fast to smoothly evolve to a new equilibrium. Species are disappearing faster than usual, leaving the earth more concentrated and less resilient.

All of these events will lessen economic productivity.

Sustainability has a time frame of forever, and considerations about sustainability issues should be dynamic, possibly using complexity theory to consider future alternative scenarios. This leads directly to a concentration on exposures, stress scenarios and "what if" analysis that focuses as much on qualitative as quantitative analysis.

It goes well beyond what I considered as a life company actuary or even in my enterprise risk management consulting practice. It focuses on previously rare events like running out of water, oil and arable land. The challenge is to put these emerging risk events into a financial context for decision making. How can we value changing trends of air and water quality in light of demographics and economic growth?

Areas have been identified for actuarial involvement to quantify and measure potential financial implications of the risks, with opportunities to partner with other disciplines and organizations to analyze and challenge. We need to carve out a seat at the sustainability table.

When we survey emerging risks, the focus is on risks that impact the respondents or their company directly. Reinsurers of property and casualty risk have recently become involved with the topic, and the Casualty Actuarial Society has formed the Climate Change Committee. British and Australian actuaries have already been tackling the topic.

Actuaries have staked a claim to a role in enterprise risk management, focusing on aggregation techniques and quantification of risks. The mathematics involved to quantify risks comes naturally to the profession.

Our goal can't be to prove or disprove global warming. We must be objective and let the data speak. Our skeptical nature will prove useful when peer reviewing work done by those whose work is biased. Are recent changes nothing more than a natural cycle? Do our actions reinforce current cycles or is the natural cycle moving in an offsetting direction today, with accelerating trends in our future?

The earth's climate appears to be changing at a faster rate than its regular cycles would predict. While the earth will survive whatever humans throw at it, much like the dinosaurs, our reign won't last forever. The question is: Can we survive until the next great disruption (e.g., asteroid) or will we hasten our own demise? How seriously should we treat these changes? What is the downside if we answer this question wrong?

Few topics attract a more heated discussion than climate change. Statements differ about

Agenda Items

Sustainability will be a topic of discussion at the International Congress of Actuaries (ICA) 2014 meeting in Washington D.C., March 30 to April 4. Visit ***www.ica2014.org.***

why the earth is warming, with explanations varying from natural cycles to human use of fossil fuels. Rare is the moderate view proposing cause and effect that can be accepted by all parties. This reminds me of the debate about the perils of smoking. Both sides manipulated statistics to "prove" their arguments. Bias was defined by your personal views. During this period, actuaries priced life insurance policies by segmenting smokers and nonsmokers yet avoided the broader discussion. In 2005, the Society of Actuaries entered the debate with *Economic Effects of Environmental Tobacco Smoke*, estimating the cost of second-hand smoke to society. By entering the discussion, actuaries were able to influence opinion and substitute facts for appearances.

IWGASS MISSION STATEMENT

"To integrate the professional expertise of individuals around the world from academia to the actuarial profession and industry to identify and analyze risks, perform research, and propose solutions related to environmental issues that threaten long-term sustainability. In particular, the actuarial skill set of risk and uncertainty management and financial analysis will be brought to bear to quantify or monetize the impact of potential risk mitigation and adaptation strategies, while members of academia, industry, and the actuarial profession will present current key issues of environmental, social and economic importance, and their relevant models and data, that can be addressed using the actuarial skill set. Specific areas of study may include (but not be limited to) climate change, natural resource depletion, water and air pollution, land management, agriculture and energy issues."

During the industrial age, economies have used resources, polluted the air/water, and generally subsidized economic growth. One could view the next period in our history as one where we repay these subsidies. Economic growth will have to slow, perhaps to a negative level, in order to repair prior damage and proactively prepare for the costs of overshooting our ecological footprint. This could coincide with a low inflation rate scenario far into the future.

One thing we know for sure: It is easier—and cheaper—to address a growing issue early in its development.

Focusing on financial implications seems a natural place for actuaries to start. Costs will increase before the benefits are seen, so politicians will need to enact a longer time horizon than ever before. Environmental costs, whether reacting to extreme weather events or proactively building features that address rising sea levels, will eat into GDP growth. This should be a mainstream discussion. Rebuilding should not be automatic after a hurricane or flood. Some areas should be allowed to revert to their natural state. It is easier politically to subsidize rebuilding than to make these tough decisions. Unbiased information is hard to find and maintaining perspective helps objectivity. The industrial age has viewed growth as a given for 300 years, but could it be a reflection of accounting practices that have ignored environmental degradation?

Whether the earth's climate changes are long term or short, risk managers need to understand the potential implications in order to enter the discussion. There is a growing supply of material available about sustainability. Actuaries should review it before taking on redundant research. Much of the available material stresses the importance of being proactive about supply/demand issues and considering the planetary impact of the decisions we make.
Some of the other actions actuaries can take, as discussed in the summit, include publishing research on the hypothesis that years of inaction look OK until a tipping point is crossed and the planet can't recover and the impact of recent events such as droughts, wildfires and Hurricane Sandy; use the second-hand smoke study as a model for a research project; research the sustainability of agricultural practices; and create a new section in the SOA devoted to sustainability research.

These discussions require longer time horizons than most people are comfortable with, seeking out leading indicators and tipping points. Climate changes in complex ways, incorporating interactions, self-corrections and surprises. It does not move in a straight line. Can we take the chance that the recent warming of the oceans, high levels of carbon dioxide and melting Arctic ice might accelerate in the future rather than recede? Someone needs to substitute facts for impressions, transparency for ignorance. Why not actuaries? A

Max J. Rudolph, FSA, CERA, CFA, MAAA, is founder of Rudolph Financial Consulting, LLC. He can be reached at *max.rudolph@rudolph-financial.com.*

Ronora Stryker, ASA, MAAA, is a research actuary at the Society of Actuaries. She can be reached at *rstryker@soa.org.*

BIG DATA

WHAT IS IT, HOW IS IT COLLECTED AND HOW MIGHT LIFE INSURERS USE IT?

BIG DATA AND THE POTENTIAL USES OF THIS INFORMATION HAVE BEEN RECEIVING A SIGNIFICANT AMOUNT OF ATTENTION. WHO COLLECTS CONSUMER DATA AND WHY? WHO USES THIS CONSUMER DATA AND WHY? WHAT REGULATES THE USE OF CONSUMER DATA? BY ANDY FERRIS, DAVID MOORE, NATHAN POHLE AND PRIYANKA SRIVASTAVA

To get the bad customs of a country changed and new ones, although better, introduced, it is necessary first to remove the prejudices of the people, enlighten their ignorance, and convince them that their interests will be promoted by the proposed changes; and this is not the work of a day.—Benjamin Franklin (1781)

Big data and the potential uses of this information have been receiving a significant amount of attention lately. From the real-life story of the Oakland Athletics portrayed in the movie "Moneyball" to improving effectiveness of the latest presidential political campaign, the use of big data and analytics has rapidly evolved from a back-room niche to a strategic core competency. Given the rapid change and growth in the area of big data, there is significant variation in the extent to which the general population understands the data collected and the extent to which it is available to others. This variation in understanding spans across individuals, professions, industries and companies. Naturally, the knowledge and understanding of how that data can be used for business processes vary as well. Industries such as technology, retail, banking, and property and casualty (P&C) insurance have fundamentally changed after experiencing an analytics revolution around utilizing big data to make better business decisions. The life insurance industry, on the other hand, appears to be at the early stages with respect to fully embracing big data into its core operations.

One potential reason for the lack of adoption is simply due to a knowledge gap as a result of the recent explosive nature of big data, which within the context of this article refers to large data sets that cannot be handled using traditional tools and infrastructure. The primary objective of this article is to reduce the knowledge gap and equip readers with additional knowledge of the data available to insurance companies by exploring the following questions:

- Who collects consumer data and why?
- Who uses this consumer data and why?
- What regulates the use of consumer data, including regulations and moral rules?
- Do big data and applications of that data have a place within the life insurance industry?

WHO COLLECTS CONSUMER DATA AND WHY?

Data about each of us is being collected on a daily basis through our regular actions, such as using a credit card, sending a personal email, going on vacation or completing a survey. In addition, those who use social media may voluntarily broadcast additional information about themselves and those they communicate with. While some of this data requires our permission to be collected by third parties, other elements can be collected without the individual's permission or knowledge. In this section, we briefly describe several representative entities or forums that collect consumer data.

Perhaps the most publicized collectors of consumer data are Internet-based navigation sites, such as Google, Yahoo or Bing. Although each of these companies may be widely known for its Internet search engine, which may be its richest data source, these companies have a much broader business model with tools to collect consumer data. For example, Google offers Gmail, a free email service, which is used by many individuals. Gmail is another application wherein Google collects information on its customers. Within a person's Gmail account, Google will read the content of the emails in your inbox and will configure its marketing bar to your current conversations. So, if you were emailing someone about pursuing your master's in business administration (MBA), Google may show advertisements for MBA-related items, such as graduate school prep courses.

A second manner in which massive amounts of our data is collected is via social networking websites and mobile applications, such as Facebook, Google+, Twitter and Yelp. The data collection policies vary by company and may change frequently due to regulatory or other business reasons. It is easy for a given user of such a site to believe he or she "owns" the account and the related data posted to the site. The user, however, typically has not paid a fee for the service, and has merely voluntarily entered certain data and used a website owned and maintained by a third party. This is similar to the email service provided by our employers—the employer, not the individual, ultimately owns the account, the content of the emails, etc.

The third example of consumer data collection is third-party marketing providers, such as KBM, Acxiom and Equifax. These companies collaborate with other companies to collect consumer data and build consumer databases to sell. The extent of this information is far reaching, including wage data such as occupational codes and purchase behaviors such as retailer transaction data. *The New York Times* article "Mapping, and Sharing, the Consumer Genome" provides more information on third-party data providers.

Excerpt from "Mapping, and Sharing, the Consumer Genome," published by *The New York Times*[1]

Right now in Conway, Ark., north of Little Rock, more than 23,000 computer servers are collecting, collating and analyzing consumer data for a company that, unlike Silicon Valley's marquee names, rarely makes headlines. It's called the Acxiom Corporation, and it's the quiet giant of a multibillion-dollar industry known as database marketing.

Few consumers have ever heard of Acxiom. But analysts say it has amassed the world's largest commercial database on consumers—and that it wants to know much, much more. Its servers process more than 50 trillion data "transactions" a year. Company executives have said its database contains information about 500 million active consumers worldwide, with about 1,500 data points per person. That includes a majority of adults in the United States.

Such large-scale data mining and analytics—based on information available in public records, consumer surveys and the like—are perfectly legal. Acxiom's customers have included big banks like Wells Fargo and HSBC, investment services like E*Trade, automakers like Toyota and Ford, department stores like Macy's—just about any major company looking for insight into its customers.

For Acxiom, based in Little Rock, the setup is lucrative. It posted profit of $77.26 million in its latest fiscal year, on sales of $1.13 billion.

A subset of the third-party marketing industry is data collected by credit card companies and department stores. Each time a consumer swipes their card, the transaction data is collected. This information is consolidated and may potentially be sold to third parties, typically on an aggregate level (i.e., the exact, individual account or sales receipt information is typically not sold to third parties). Those third parties then have access to the types of items purchased, type of store involved, location of purchase, etc. This data is particularly appealing to the financial services industry, and life insurance companies are in the process of discovering ways to utilize this information in a similar fashion.

The fourth category of data collection is the set of data repositories that have been traditionally used within the life insurance industry and are therefore more well-known by underwriters and other life insurance industry practitioners.

- Life insurance application (part 1 and part 2) data: This is data collected via the life insurance application, which includes both administrative (part 1) and medical history (part 2) data.
- Paramedical exams: This exam consists of a series of basic tests and measurements conducted by a third-party nurse as part of the underwriting process; data collected may include height, weight, blood pressure and related items.
- Medical exam/lab tests: This exam is more in-depth than the paramedical exams and includes such tests as a urinalysis and blood test.
- Medical Information Bureau Group Inc. (MIB): The MIB is a membership corporation owned by approximately 470 member insurance companies in the United States and Canada. The MIB collects each person's medical history, which insurance companies can query to inspect a person's medical information.
- Prescription drug database: Several companies offer a service that compiles prescription drug information from several pharmacy and health care providers into a summary presentation to allow underwriters access to the medical history of the applicant.
- Motor vehicle records (MVR): Driver records, including accident history and violations, are tracked by the Department of Motor Vehicles (DMV). This information can be purchased/queried by companies.
- Social Security Death Index Master File (SSDI): The SSDI collects the social security numbers of deceased U.S citizens; this is queried by life insurance companies to analyze death claims, among other uses.

Another category of consumer data collection has recently emerged due to a new focus on self-health. Increased use of "Quantified Self" applications such as Fitbit and Nike+ Fuel Band enables customers to monitor and share lifestyle/health data such as:

- Weight and body measurements
- Heart rate, blood glucose and blood pressure
- Location, length and speed of an exercise or other activity.

This personal real-time data has many potential applications in the life insurance industry, although these are not discussed here. There is, however, a very similar example in the P&C industry: Progressive's "Snapshot" and Allstate's "Drivewise" collect driving data with a device that policyholders can install. The data includes information on mileage, speed and driving habits such as how often you drive after midnight.

WHO USES CONSUMER DATA AND WHY?

Many companies and industries use this data. We have seen companies supplement their existing, internal data sources by accessing external datasets, such as querying a proprietary database it has purchased. These companies are utilizing external consumer data for the primary purpose of helping to improve their respective business operations. For example, the retail industry is increasingly employing data mining techniques to analyze the buying behavior of its customers and using such predictive analytics to drive strategic business decisions.

In the banking industry, commercial banks have used big data to make data-driven decisions on everything from credit lines and consumer loans to managing collections and detecting fraud.

Company Spotlight: Chase Bank
Users of Consumer Data in Banking

In his book, *Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie or Die*,[2] former Columbia University professor Eric Siegel discusses how Chase Bank used predictive models to predict risk of foreclosure on their mortgages and used this data to assess the value of their mortgage portfolio.

Other popular uses of big data in banking include:

- Using historical transaction data of a consumer's accounts to build predictive models to cross-sell and up-sell other financial services with an aim to maximize customer lifetime value
- Identifying fraudulent customers and transactions using multiple modeling approaches such as neural networks, heuristic models and business rule
- Developing "collections models" to predict risk of delinquency and to drive an integrated collections and recoveries approach.

In addition to the technology, retail and banking industries, the P&C insurance industry has readily adopted the use of big data. An example of predictive modeling and advanced data-mining techniques within the P&C industry is the use of insurance scores, made popular by Progressive Insurance.

Company Spotlight: Progressive Insurance
Users of Consumer Data in Insurance

Progressive Insurance was one of the first P&C companies to use credit scores and analytics to make better business decisions. During the 1990s and early 2000s, Progressive had 10 consecutive years with double-digit growth, which helped lead to Progressive's rise from the 11th largest personal auto carrier in 1992 to the third largest by 2002.[3]

By 2006, however, Progressive's growth rate had decreased. As a result, Progressive was forced to reinvent itself through the use of Snapshot and other strategies that incentivize consumers for sharing their data. Since then, by a variety of measures, Progressive has outperformed the industry in its growth and profitability.

WHAT ARE THE RULES AROUND DATA COLLECTION AND USAGE?

The primary applicable U.S. law is the Fair Credit Reporting Act (FCRA)[4] and, according to *The New York Times* article "U.S. Agency Seeks Tougher Consumer Privacy Rules,"[5] there may be stricter consumer privacy rules in the future. Another relevant insurance law is the Health Insurance Portability and Accountability Act (HIPAA).[6] In addition to FCRA and HIPAA, other state privacy laws and local rules may apply.

Even with these regulations, there still may be a significant amount of gray area in evaluating which data is available for use with insurance applications, particularly around the potential ethical aspects of data usage. In these cases, the company should consider the legal, moral and reputational risks involved with using such data.

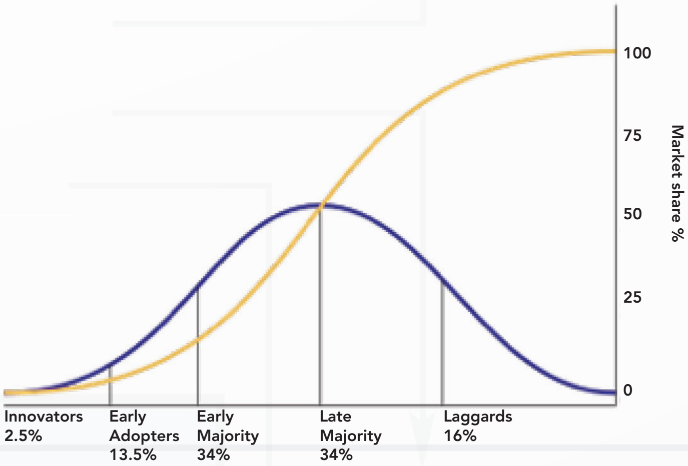
The quality and relevance of the data are two more considerations to layer on. Determining whether the data is reliable is a key aspect in considering the use of big data in core business processes. Companies must be prepared to challenge themselves and defend decisions made based on this data.

WHAT IS THE CURRENT USAGE OF BIG DATA AND ANALYTICS WITHIN THE LIFE INSURANCE INDUSTRY?

As compared to some other industries, the life insurance industry is generally at an earlier stage than others in using big data in core business processes in a strategic manner. One can liken the gradual, but uneven uptick in understanding and application of big data to the diffusion of innovations, as detailed by Everett Rogers in his book *Diffusion of Innovations.*[7]

As shown in the chart, the blue line represents the number of companies adopting an innovative concept over time and that includes a significant hump in the middle representing the mass adoption. The yellow curve shows the adoption on a cumulative basis. As previously demonstrated by the Progressive example and highlighted in Rogers' book, the benefits of adopting a revolutionary idea are time sensitive. By the time "laggards" finally adopt an innovation, it may already have been superseded by a more recent idea that is being used by "innovators." The earlier adopters of an innovation may receive a greater portion of the early benefits and/or challenges resulting from that innovation, but the innovator must be able to cope with the higher degree of uncertainty associated with that innovation.

Diffusion of Innovations*



Another potential reason for the lack of adoption is that technology companies, for example, are typically closer to the data and the methods used to collect the data. The applications of big data, as described above, may be more readily apparent to an executive at Facebook, for example, than a C-suite executive in a life insurance company. Also, as mentioned previously, the regulatory oversight in the insurance industry may be greater than that for the social media sites. There are also various moral concerns specific to the life insurance industry with potential implications on policyholders that likely do not exist in other industries.

DOES BIG DATA HAVE A PLACE WITHIN THE LIFE INSURANCE INDUSTRY?

In light of this information, it comes as no surprise that the life insurance industry has been slower to incorporate big data into core business operations and processes, such as the use of predictive modeling for application triage that divides applicants into different risk segments to help streamline the application process.

As Rogers explains, the early adopters often enjoy a greater portion of the benefits and challenges in disruptive transformations. To take advantage of these opportunities, actuaries will have to understand and appreciate the growing use of big data and the potential disruptive impacts on the life insurance industry. Actuaries will also need to become more proficient with the underlying technology and tools required to use big data in business processes. Some life insurance companies may fundamentally redefine how they view technology—from the traditional view of technology as a back-office support tool to a new view of technology as a strategic differentiator. The traditional view of technology by many insurance companies is fundamentally different from the view of some companies in other industries, such as Amazon.com or Apple. It is interesting to speculate on the customer experience that might be delivered if a high-tech company such as Amazon were to make a strategic choice to use its technologically advanced platforms to distribute life insurance in mass scale.

Below is an illustrative listing of some of the point solutions involving big data and predictive analytics that life insurance companies have begun to implement:

- Agent recruitment and retention
- Target marketing/enhanced customer segmentation
- Underwriting/application triage
- Claims management/fraud detection.

NEXT STEPS

Many of our everyday actions are being logged and that information is being used by a variety of industries. Moving these data collection policies and the uses of this data from the subconscious to our consciousness is a first step in the process of potentially applying big data in a business context.

The life insurance industry appears to be in the very early stages of a transformative and potentially disruptive wave as the industry begins to adopt the use of big data in a strategic manner, as has been done in other industries. Some of the early adopters in the life insurance industry have already considered or implemented one or more point solutions, designed to improve a particular function by utilizing big data. We anticipate that an even more significant shift will emerge from these point solutions, toward a broader strategic approach to considering big data and analytics for new methods of developing, marketing, distributing and underwriting life insurance products. A precursor to implementing the use of big data and capitalizing on its potential, however, is to first understand the data available, how it is collected and how it is used in other applications. We hope this article has been helpful in that regard. A

Andy Ferris, FSA, MAAA, CFA, is a senior manager at Deloitte Consulting LLP and is a member of the Board of Directors of the Society of Actuaries. He can be reached at *anferris@deloitte.com.*

David Moore, FSA, MAAA, is a manager at Deloitte Consulting LLP. He can be reached at *davmoore@deloitte.com.*

Nathan Pohle, FSA, CERA, MAAA, is a senior consultant at Deloitte Consulting LLP. He can be reached at *npohle@deloitte.com.*

Priyanka Srivastava is a senior consultant at Deloitte Consulting LLP. She can be reached at *prisrivastava@deloitte.com.*

END NOTES

1 Natasha Singer, "Mapping, and Sharing, the Consumer Genome," *The New York Times*, June 16, 2012.

2 Eric Siegel, *Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie or Die* (Hoboken, New Jersey: Wiley, 2013).

3 Glenn Meyers, "Adopting Predictive Modeling for Competitive Advantage," *ISO Review*, December 2009.

4 Fair Credit Reporting Act, *http://www.ftc.gov/os/statutes/031224fcra.pdf.*

5 Tanzina Vega and Edward Wyatt, "U.S. Agency Seeks Tougher Consumer Privacy Rules," *New York Times*, March 26, 2012.

6 Health Insurance Portability and Accountability Act of 1996, *http://www.hhs.gov/ocr/privacy/.*

7 Everett M. Rogers, *Diffusion of Innovations*, 5th ed. (New York, N.Y.: Free Press, 2003).

REFERENCES

*Figure, Diffusion of Innovations
Reprinted and adapted with the permission of Simon & Schuster Publishing Group from the Free Press edition of DIFFUSION OF INNOVATIONS, Fifth Edition by Everett M. Rogers. Copyright © 1995, 2003 by Everett M. Rogers. Copyright © 1962, 1971, 1983 by the Free Press. All rights reserved.

Note: The points of this article represent the views of only the individual authors, not the Society of Actuaries or its Board of Directors.

Education

WRITTEN-ANSWER QUESTIONS ADDED TO MLC EXAM

BY KEN BONVALLET AND STUART KLUGMAN

THOSE WHO REMEMBER receiving Society of Actuaries (SOA) exam scores by U.S. mail often express alarm and confusion at changes in the exam system. They are reassured, however, when told that "contingencies" is still part of the exam system, and it is still a difficult exam to pass.

Actuarial mathematics continues to be the heart of an actuary's education and one of the requirements common to all tracks. In recent years, the name of this exam has gone from Course 3 to Exam M (for models) to Exam MLC (models for life contingencies). The syllabus at various times has included risk theory, simulation and Poisson models, but the central topic has always been actuarial present values of risk and how they are applied to basic pricing and reserving.

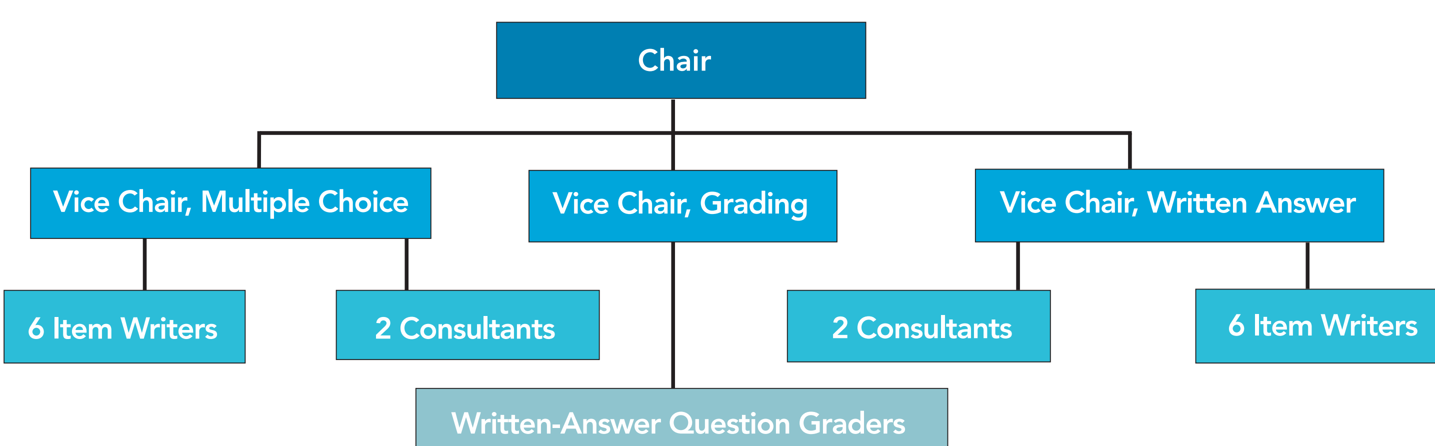
Exam MLC has been a three-hour multiple-choice exam since May 2007. When the syllabus changed in 2012 to emphasize multiple state models and modern insurance models and products, the number of questions was reduced, from 30 to 25. Effective with the May 2014 exam, written-answer questions will be added, the exam time will be extended to four hours, and the learning outcomes will reflect the expectation that candidates demonstrate mastery of the material at a higher cognitive level.

WHY CHANGE?

Two years ago, the SOA Board of Directors directed a task force to examine whether changes were needed to Exam MLC because of the following.

- Fellowship exam committees reported that candidates were not successfully

MLC Exam Committee



making the transition to written-answer exams.

- Employers complained that some actuaries who had passed MLC were unable to do practical actuarial work.
- The MLC Exam Committee found it difficult to write seven-minute, multiple-choice questions at appropriate cognitive levels on some topics.
- Multiple-choice questions cannot reward a candidate who correctly works all but the last step of a problem correctly but then makes a mistake, i.e., there is no provision for partial credit.
- Multiple-choice questions cannot differentiate between a candidate who can work nearly all of a problem and a candidate who has no idea how to start the same problem.
- Guessing may cause a borderline candidate to pass or fail inappropriately.

The task force recommended adding written-answer questions, and the MLC Curriculum and Exam committees went to work to implement the change.

WHO IS THE MLC EXAM COMMITTEE?

We have all heard about the hundreds of volunteers that support the SOA education structure, which includes the exam committees. The MLC Exam Committee consists of 20 of those volunteers (not counting written-answer graders)—some newly recruited for the change in exam, some veterans whose service began earlier than Exam M and Course 3, all the way back to Course 150. To handle the new exam structure, new item writers and consultants were recruited, and the committee was restructured shown on page 36.

The Exam Committee has two functions.

- It creates an exam every six months, subject to the approval of the Education Committee officers. Starting May 2014, it will also grade the written-answer exams.
- It is an expert body that collectively expresses its opinion as to what pass mark will discriminate between candidates who demonstrate mastery and those who do not. The result is a recommended pass mark.

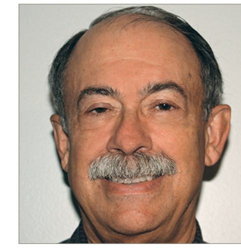
The committee does not determine the learning outcomes, determine which texts or which sections of texts will be recommended in support of those outcomes or set the pass mark. However, it does provide input to those who do make such decisions.

WHAT HAPPENED TO COMPUTER-BASED TESTING FOR MLC?

MLC was to move to computer-based testing (CBT), but later than the other preliminary examinations because it was not jointly sponsored by the Casualty Actuarial Society. When it came time to begin the MLC transition, a new syllabus was in the planning stage. This syllabus was introduced in May 2012.

CBT requires a large bank of exam-tested questions, but the past unpublished exams had few questions that were appropriate for the new syllabus. This meant deferring CBT until a sufficient number of exams had been given under the new syllabus. In the meantime, the decision was made to add written-answer questions.

We are working with the CBT vendor to be able to meet the needs of MLC; after that happens, MLC will move to CBT.



Ken Bonvallet

Stuart Klugman

PLANNING FOR THE NEW EXAM STRUCTURE

The Board of Directors approved a structure that included the following specifications.

- The exam will be four hours long; the current 15-minute read-through period would continue.
- Approximately 60 percent of the exam points will be written answer, but candidates may allocate their time as they wish.
- The multiple-choice questions will tend to be more straightforward than those currently being asked.
- The pass mark will be set based on total exam points and will be such that a candidate cannot pass with a poor written-answer paper.
- Candidates who perform poorly on the multiple-choice questions will not have their written-answer questions graded.

Examinations are first drafted 12 months before they are given, to allow time for thorough review, editing, testing by experts and approval. So the May 2014 exam was drafted shortly after the revised syllabus and exam structure were developed. Since no existing exam includes both multiple-choice and written-answer components, several major steps had to be completed with little precedent.

A. Restructure and enlarge the Exam Committee to be able to write, edit and review more questions.

B. Recruit dozens of graders who would commit to many hours of first grading in a period of 10 days, then two days of second grading at a meeting site, twice per year.

C. Develop a process that would produce a total exam that covered the learning outcomes with appropriate weights and whose multiple-choice exam would be an appropriate screening exam.

D. Publish sample questions well in advance of the May 2014 exam.

E. Develop a schedule to get multiple-choice scores compiled quickly so that a cutoff score will be set and graders may begin their work. Then, total scores must be compiled on a timely basis so that the subset of papers near the likely pass mark can be established, second grading completed for these papers and scores sent to candidates.

Some past examinations containing actuarial mathematics had included written-answer questions, so past chairs were consulted. When the timeline was laid out, it became clear that scores could be prepared for communication to candidates one week later than currently, provided the exam was given in late April and late October.

IMPLEMENTING THE NEW STRUCTURE

The Curriculum Committee has restated the learning outcomes to reflect the higher cognitive levels expected in a written response. Verbs such as calculate were replaced by explain, apply, interpret and compare.

Grading written-answer papers is a time-consuming task, and especially difficult when done by volunteers in their spare time. To be fair to candidates, all SOA written-answer exams provide for a second grading of papers that are close to the expected pass mark. If the two graders cannot agree on the score for a paper, then they discuss the paper in detail.

This process is a challenge for fellowship exams with a few hundred candidates, but MLC has had well over 2,000 candidates per session for years, and the numbers are rising. In May 2013, there were more than 3,000 candidates. To meet the challenge, the board agreed that not all written-answer papers would be graded.

- The multiple-choice exam will serve as a screening exam; candidates who do not achieve a minimum score on this part of the exam will not have their written-answer papers graded.

- When the exam results are announced, the minimum score will be announced, and those who did not achieve it will be told their score.

The timing of the second grading of written-answer papers was set so that the entire Exam Committee is able to review the exam results at its regular semi-annual meeting. This gives the committee the opportunity to request that more papers receive second grading.

GOOD NEWS FOR CANDIDATES AND OUR PUBLICS

For well-prepared candidates, these changes are good news.

- They will have more time and better ways to demonstrate their knowledge of the syllabus.

- They will receive partial credit for demonstrating what they know.

- Borderline papers will receive a second grading and discrepancies between the first and second scores will be resolved.

For our profession and our publics, these changes will better identify candidates who demonstrate mastery of the material. A

Ken Bonvallet, FSA, MAAA, is retired from Nationwide Financial.

Stuart Klugman, FSA, CERA, is a staff fellow, Education, at the Society of Actuaries. He can be reached at *sklugman@soa.org*.


ATTEST TO YOUR
CPD HOURS
Keep track of what you earn ...while you learn.
Visit soa.org/cpd to learn more.
100%
80%
65%
25%

Book Review

ACTUARIES AS HEROES

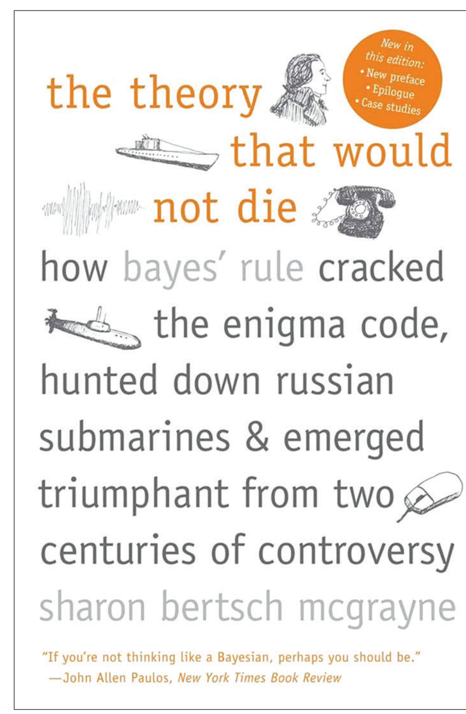
BY JAY M. JAFFE

IT ISN'T OFTEN that a book is written with an actuary as one of its heroes. But Sharon Bertsch McGrayne's recent publication is a must read for any actuary or others interested in learning not only about Bayes' rule and its history but also how this theorem has shaped our world for the past 200 years. *The Theory That Would Not Die: How Bayes' Rule Cracked the Enigma Code, Hunted Down Russian Submarines and Emerged Triumphant from Two Centuries of Controversy* also explains how actuaries have been some of the main users of Bayes' rule to address real-world problems.

I became aware of this book because of an editorial I wrote in the August/September 2013 edition of *The Actuary*. The article described my vision that actuaries would begin to use their talents to help address many societal issues. One of the areas I mentioned was autism. An actuarial friend from a long time ago wrote to me about *The Theory That Would Not Die* and how actuaries had used Bayes' rule in the past and suggested that this methodology might be helpful in finding ways to attack autism. I quickly downloaded a Kindle version of the book and began reading.

The book starts by describing Bayes' rule as "a simple, one-line theorem: by updating our initial belief about something with objective new information, we get a new and improved belief." The Rev. Thomas Bayes made his discovery sometime during the 1740s but it didn't get published until years later, after his death, when Richard Price was asked to review his papers and discovered the essay. Bayes' rule was rediscovered by Pierre Simon Laplace in the 1770s. Eventually, as indicated by the title of the book, the story moves into other areas where Bayes' rule has been instrumental in solving problems. Bayes' rule played a major role in unraveling the Nazi's Enigma code during World War II, tracking down submarines and lost nuclear bombs, and helping uncover the causes of certain sicknesses, as well as contributing to solving numerous modern problems. The book also describes several of the historical battles between frequentists and Bayesians, which occurred during the two centuries following the discovery of Bayes' rule.

At several places throughout the book, the author mentions the contributions of Italian actuary and mathematician Bruno de Finetti. But the main actuarial star of *The Theory That*



Would Not Die is Arthur Bailey. Bailey graduated from the University of Michigan in 1928 where he studied statistics in the math department. During the 1940s, he developed his belief that the actuaries' "beloved Credibility formula was derived from Bayes' theorem."

There's another episode in the book about the time an actuary by the name of L.H.

Book Mark!

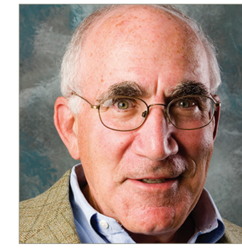
If you've read a book you think fellow actuaries would be interested in, send in the title, the author and a short write-up on the key highlights for our readership audience. Or, if you prefer to submit a book review for publication in *The Actuary*, send it to the ***actuary@soa.org*** for consideration.

Longley-Cook was asked by the president of his insurance company to predict the probability that two planes would collide in midair. This was a very practical question because of the rapid growth in air travel in the years following World War II. Early in 1955, Longley-Cook sent the president a statement to expect "anything from 0 to 4 air carrier-to-air carrier collisions over the next ten years." Longley-Cook's prediction was prescient. In 1957, two passenger planes collided over the Grand Canyon and a few years later there was another collision in New York City. Bayes' rule had helped Longley-Cook derive a solution to a problem without prior experience. (A few years later, Longley-Cook published *An Introduction to Credibility Theory*, which I still review on occasion.)

There is another interesting actuarial sideline to the Grand Canyon plane collision incident. Years ago, I heard the story about an insurer that limited the number of executives on any single plane. This was a common risk management practice at the time. Because of a late meeting in Los Angeles, several employees of this company, including a well-known actuary, missed their separate flights. Their original two flights were the planes that collided over the Grand Canyon.

Besides its information about Bayes' rule and the stories of actuaries' contributions to the advancement of Bayes' rule, *The Theory That Would Not Die* was a trip down memory lane. Several of the people who have been influential in Bayes' rule during the past 50 years were either known to me personally or just a degree or two of separation away. The book provided me with new insight into their lives and accomplishments. For example, while in graduate school, the work of Harvard professors Robert Schlaifer and Howard Raiffa was taught to me by a professor who had been their student. Around Cambridge (MA not UK) these two Harvard profs were the walking gods of the new ways to use math in business. I recall we used a mimeographed textbook written by Schlaifer and Raiffa made available to us prepublication because of my teacher's connection with the pair.

An even closer connection is another brilliant person by the name of Albert Madansky. I first met Al while we both were working for an attorney as experts in a legal matter. I had no idea of his influence on the world and the extent of his accomplishments. As a young man, Al worked at RAND Corp. and used his expertise to predict the probability of nuclear accidents, which was a hot topic back then. His post-RAND life is also filled with many accomplishments, some of which are described in *The Theory That Would Not Die*. He returned to the Booth Graduate School of Business at the University of Chicago and a career addressing many practical business problems.



Jay M. Jaffe

To my friend Blaine, thanks for taking the time to send your email. I greatly enjoyed *The Theory That Would Not Die* and its stories of the history and applications of Bayes' rule as well as renewing my connection with the book's actuarial and nonactuarial heroes. I'm headed to London in a few weeks and because of you I've already made plans to make a long-delayed visit to Bletchley Park[1] and see how Bayes' rule helped the Allies win WWII. A

Jay M. Jaffe, FSA, MAAA, is president, Actuarial Enterprises Ltd. He can be reached at *jay@actentltd.com*.

END NOTE

[1] During World War II, Bletchley Park was the site of the United Kingdom's main decryption establishment, the Government Code and Cypher School (GC&CS), where ciphers and codes of several Axis countries were decrypted, most importantly the ciphers generated by the German Enigma and Lorenz machines.

A Look Into ERM

MAKING RISK MODELS COLLABORATIVE

BY DAVE INGRAM

STUDIES TELL US that business managers believe their actions make a difference in the success of their firms. That statement does not seem very controversial. It is hard to imagine a situation where you would not want that to be true.

But in fact, with our risk models, we make that contribution disappear into the mist of probabilities. And then we wonder why so many managers are opposed to "letting a model run the company."

Take out the documentation of your assumptions. Now think about it. Are there any people in that documentation? Or is it a cold recitation of disembodied numbers? For the most part, models are usually "net" of some difficult risk management actions; the assumptions are set by analyzing the result of difficult decisions that had to be made by someone.

Our risk models might be treated more as the "tool" rather than "the answer" so that we can work out how to let managers add their judgment—and their ability to improve the results of the company—to the model. This would require treating the modeling process as a dialog and collaboration, rather than as a stone tablet brought down from the mountain by the modeling team who wrestled with the fates to create it.

But making a complex stochastic risk model into an interactive process seems to be fantastically difficult. Perhaps it is similar to an attempt to track the exact position of a single spoke on a bicycle in a race. The spoke is moving and the bike is moving. One is tempted to create a model of the model to solve the problem. For the bike, that would be a good answer, as the movement of the spokes and the bike are predictable. And with enough insight into the rules of the models we create, we would recognize that we can track individual elements without jabbing a stick into the spokes.

We can provide a story with our recitation of numerical assumptions. The story would include some basic ideas about the past and continuing (or changing) strategy regarding risk and the efforts needed to achieve that strategy. For most insurers, the first statement about that strategy would be a declaration about whether the firm intends to grow risks faster than capital, capital faster than risks or to manage to keep them in about the same balance as they were in the recent past. That declaration can be followed by statements about management actions undertaken to make that happen. Then, that can be followed by the assumptions that flow from those prior statements and the degree to which those assumptions might change if that part of the story changes. This story might also mention the revenue and profit expectations that are often a motivation.

The same sort of statements can be made about the makeup of risk within any individual risk category. Is the plan to maintain the riskiness of a unit of activity (risk as percent of premium or percent of assets, for example), to allow it to grow or to restrict its growth? Again, this is followed by discussion of the management actions needed to achieve that goal. Then you can present the numeric assumptions and discuss the dependency of those assumptions of management's effectiveness in achieving the goals.

The above are just two examples of the stories and the people embedded within the assumptions of our risk models. The new Actuarial Standard of Practice (ASOP) 46, "Risk Evaluation in Enterprise Risk Management," seems to put an enormous burden on actuarial risk managers. It suggests that actuarial risk managers should consider a very wide range of "information about the financial strength, risk profile and risk environment of the organization" in performing a risk evaluation.

Dave Ingram

But if we view this broad requirement in the context of involving and communicating with the rest of management about how vital their continuing work is to the viability of the organization, then we can use that requirement as an outline for the story which needs to be told about what we are modeling. A

David Ingram, FSA, CERA, MAAA, is executive vice president with Willis Re Inc. He can be contacted at *dave.ingram@willis.com.*

Section Highlights

IT'S A GREAT TIME TO BE A SECTION MEMBER!

BY JILL LEPRICH

All 19 SOA sections are working harder than ever to deliver tangible and valuable benefits to members. Until now, the Section Council members and friends were the workforce behind most of the section member benefits—webcasts, meeting sessions, newsletter articles, contests and competitions. In 2013, several sections explored providing new sources of content. These efforts are continuing into 2014 and are available to section members only.

The Investment Section launched a subscription to publications. Shortly after that, two other sections (Management & Personal Development and Health) joined in to offer subscriptions valuable to their members. As the year is coming to a close, and the section dues renewal season is upon us, here is some of the feedback we've received. If you are a member, check out these benefits. If you aren't, the 2014 annual dues renewal is the best time to join.

INVESTMENT SECTION

Investment Section members have a subscription to EBSCO Business Source Corporate Plus (EBSCO BSC+). It offers online access to some of the top business, finance and investment journals. The most read sources by the Investment Section members this year have been:

Financial Analysts Journal
Financial Planning
Harvard Business Review
Journal of Finance
Journal of Financial Planning
Journal of Fixed Income
Journal of Marketing
Journal of Pension Benefits
Journal of Portfolio Management
Journal of Risk and Insurance
Life Insurance Selling.

HERE'S WHAT THE INVESTMENT SECTION MEMBERS ARE SAYING:

"This month, I enjoyed 'Term Premia and Inflation Uncertainty: Empirical Evidence from an International Panel Dataset' in the *American Economic Review*.

"I also added to my reading list 'Level 5 Leadership: The Triumph of Humility and Fierce Resolve' in *Harvard Business Review*." —Tom Anichini, ASA

"I like having access to HBR, and I've also used it to research specific investment topics in addition to general browsing."—Mary Pat Campbell, FSA

MANAGEMENT & PERSONAL DEVELOPMENT SECTION

The Management & Personal Development Section Council purchased getAbstract for its section members; it went live to the membership in April 2013. Similar to the Investment Section's subscription benefit, the MPD members have access to a free subscription to getAbstract, the world's largest resource for business books. This membership includes access to summaries of thousands of the top business books and best-sellers, downloadable in many formats.

HERE'S WHAT MEMBERS ARE SAYING.

"GetAbstract is an excellent service. I will be better able to decide which books are likely to provide a better return on my time investment. I appreciate this tangible value-added benefit of section membership."—Dave Snell, ASA

"I have found the reviews I have read to be very well-written. They run about five pages—compact, and very readable. I have learned a lot, and I find them to be thought-provoking. If this service is available to you, I strongly recommend that you read a review of a topic that interests you, and judge for yourself. I find them to be a great use of my time."—Jerry Enoch, FSA

"I'm the type who likes to read the whole book, not just summaries. However, since I only have enough time to read one or two books a month, I have to be selective. I used to ask people for recommendations. Now I go to getAbstract for that. (I still talk to people once in a while, though.)"—Sophia (Thi) Dao, FSA

"The summaries provide a good baseline for basic understanding and what may be worth further investigation, whether it's reading the book in its entirety, or investigating other books by the author[s], etc." —Nick Ortner, FSA

HEALTH SECTION

In May 2013, the Health Section purchased *Health Affairs* online subscription for its members, and the members are grateful!

HERE'S WHAT THEY HAVE TO SAY.

"The July issue of *Health Affairs* focused on Medicaid, which was immensely helpful to me and my team as we are working with clients in the Medicaid space. Our clients expect us to be up on the latest research so it's great to have easy access."—Sara Teppema, FSA

"I am a long-time subscriber to *Health Affairs*, so was excited to see that access to the resource would now be a part of the benefits of Health Section membership. In addition to putting a few dollars back into my own pocket, the access and attention to the resource will benefit the profession. So many of us work in our own little silos, products, companies, etc.—without good awareness of what's happening 'beyond' and what interesting developments are on the horizon. … Thanks to all who worked to bring this resource to section members. I hope that you are successful in publicizing the value of this access and that others take advantage of it."—Janice Carle, ASA

"I would like to thank the SOA for giving us access to *Health Affairs*. It is an expensive, expansive publication with some of the most provocative writing on health policy produced in the world today. For most of us, the one or two articles a month may not justify the expense, but still those one or two articles are of enormous interest and value to the profession.

"With the transformation of health insurance from the [Affordable Care Act] or even from more specific areas of cost management, it has become important for actuaries to have passing familiarity with population subgroups, behaviors, delivery systems and treatment options that are more granular and specific than in the past when pricing was a matter of deductible and coinsurance levels from continuance tables.

"Goodness knows we have too much to read as it is, but having access to the entire archive of articles this specific means that when someone asks a question of the actuary, how much will this cost (save), *Health Affairs* probably has an article on it and if the article doesn't have the exact answer, there is a great list of citations that may. It is a great first stop."—Rebecca Owen, FSA

Jill Leprich worked for the Society of Actuaries as a section specialist at the time this article was prepared.

CONTINUED ON **PAGE 44**

THE INVESTMENT SECTION

BY THOMAS M. ANICHINI

What is the best new benefit the Investment Section could provide?

I contemplated this question after becoming council chairperson. My conclusion: Regardless of how much investment-related content we as a section produce, we should also avail our members of high-quality content produced by others. I decided to explore affording our members online access to some of the top business, finance and investment journals.

Following a few months vetting and negotiating with publishers and database providers, at our 2012 face-to-face meeting, the council selected EBSCO Business Source Corporate Plus (EBSCO BSC+).

With no increase to our dues, via EBSCO BSC+, we now provide our members online access to current and past issues of:

- *Financial Analysts Journal*
- *Harvard Business Review*
- *Journal of Financial and Quantitative Analysis*
- *Journal of Risk and Insurance.*

The service also provides access to historical archives[1] of:

- *Journal of Alternative Investing*
- *Journal of Derivatives*
- *Journal of Finance*
- *Journal of Fixed Income*
- *Journal of Investing*
- *Journal of Portfolio Management*
- *Journal of Wealth Management.*

We introduced EBSCO BSC+ to members in April. My favorite feedback arrived Day 2 of the rollout:

"Wow," said Gregory D. Hansen, ASA. "This is truly awesome. Thank you so much for getting it done. And BTW I've never written the SOA to compliment them before (and I became an ASA in 1980)."

Thonas M. Anichini

If you are not already a member, join the Investment Section and begin enjoying EBSCO BSC+. A

Thomas M. Anichini, ASA, CFA, is a senior investment strategist at GuidedChoice. He can be reached at *tanichini@guidedchoice.com.*

END NOTE

[1] Historical archives means full-text articles are not available during an initial embargo period, typically lasting 12 to 18 months.

THE TECHNOLOGY SECTION

BY STEVE FINN

Electricity was installed in the White House during the term of the 23rd president, Benjamin Harrison. He and his wife were afraid of being electrocuted, so they allegedly had staff members turn lights on and off for them. They would often sleep with the lights on.

Conrad Gessner, a noted Swiss biologist, was concerned a new invention in his time would lead to an overload of information that would be "confusing and harmful" to the mind. The invention? The printing press. It seems that throughout history, as technology advances, there is an initial level of mistrust, skepticism and even fear. I believe these fears come less from the new development and more from the idea of change. While some people can easily embrace change, it can be scary for those who are used to their "tried and true" methods and processes and who are either reluctant or unwilling to move forward. It probably is not a coincidence that the phrase "change tool" is found within the word "technological."

The SOA's Technology Section works to embrace change, which continues to arrive at an increasingly rapid pace. Our 1,100 members recognize there is a growing need to integrate technological developments into their daily lives, both at work and at home. We encourage all members of the SOA to go to *http://www.soa.org/Professional-Interests/Technology/tech-detail.aspx*, find items of interest and become a tool of change. A

Steve Finn

Steven J. Finn, FSA, MAAA, is senior staff actuary at Ameriprise Financial Inc. and former chairperson of the Technology Section. He can be reached at *steve.j.finn@ampf.com.*

LIVING to 100

SOCIETY OF ACTUARIES
INTERNATIONAL SYMPOSIUM

Living to 100 Symposium

Jan. 8-10, 2014
Walt Disney World Swan Resort
Orlando, Florida

Over 40 international participating organizations—including the Society of Actuaries—present the 2014 International Living to 100 Symposium.

Join actuaries, insurance and medical professionals, demographers, biologists, scientists and others from three continents to share ideas and knowledge on aging, changes in survival rates and their impact on society along with observed and projected increases in aging populations.

Content for the 2014 Living to 100 Symposium, the fifth in the series, has been expanded to include more topics than ever before related to future life expectancy and the implications of the growing senior populations. A sample of the many stimulating discussions and presentations include:

- The effect of obesity and other lifestyle factors on longevity
- The secondary prevention of Alzheimer's disease
- Mortality trends and projections of older ages, including a panel of prominent actuaries discussing key factors involved in developing mortality forecasts for social security programs
- The impact of marriage on longevity
- Drivers of longevity
- Societal challenges and adaptations as a result of longer lifespans
- Innovative business solutions in response to the aging population

Plan to be a part of this interactive, multidisciplinary learning experience!

Visit ***livingto100.soa.org*** to learn more.

Become a Sponsor/ Participating Organization

More than 40 distinguished organizations are already supporting this Symposium. Check out our site to view the list of sponsors: ***livingto100.soa.org.***

Become a sponsor of this Symposium. Contact Denise Fuesz at ***dfuesz@soa.org.***

Become a participating organization. Contact Jan Schuh at ***jschuh@soa.org.***

Out Of The Office

ACTUARIES ON THEIR OWN TIME

Knee Deep In Water

Scott Houghton helped put shad back on the menu in Connecticut.

He has volunteered with the Connecticut Department of Energy and Environmental Protection (DEEP) stocking shad and Atlantic salmon in the Connecticut and Farmington rivers watersheds since 1998. The species "became extinct in the early 1800s after adults were blocked from spawning areas by the construction of dams on the mainstream Connecticut River and its tributaries," according to DEEP's website.

"The shad program has been a success; we no longer need to stock shad and they have a self-sustaining population in the Farmington River and other parts of the Connecticut River Basin. There's a commercial and sport fishing market for the shad, with some limitations to protect them," Houghton says. "There are enough of them now that I see fresh shad on the restaurant menu specials here, and this is actually a good thing."

The salmon are another story.

Since the 1960s, DEEP has been reintroducing Atlantic salmon to Connecticut's rivers. This year, according to Bruce Williams of DEEP's Inland Fisheries service, in a thank you letter to Houghton, "A total of 768,109 fry were stocked in Connecticut this spring, 557,629 in the Farmington River watershed and 210,480 in the Salmon River watershed." Houghton stocks the fry. He volunteers several times a year.

"I and my fellow volunteers brave poison ivy, thorny brush, steep river banks, cold and fast-moving streams, slippery rocks and black bears, carrying 5 gallon buckets of water and 1-inch salmon fry through forests and streams," he says. "Using GPS and contour maps, we stock the salmon fry in small areas of the rivers and tributaries that are a suitable habitat for them—moderately moving water with rocky bottoms with lots of hiding places, avoiding areas where trout will feed on them and avoiding high-grade, fast-moving rapids."

Houghton continues, "If all goes well, they will live in the streams for two to three years, migrate to the Atlantic and attempt to return from the ocean to the same steam when they are 5 to 6 years old to spawn. Currently, they're trapped on their return and used as breeding stock for additional stockings, and allowed to return to the ocean as Atlantic salmon may return to spawn multiple times."

Houghton first volunteered after speaking to people stocking salmon while he was fishing. He now trains others.

"Much like a canoeist or kayaker, we learn to read what the river/stream bottom looks like from the water patterns on the top," he says. "We learn how to avoid or navigate hazards like steep river banks, poison ivy, bears, slippery rocks, and swift current and rapids. We learn to read geologic survey contour maps, and the identification of preferred habitat—rocky bottoms with hiding places and moderate current, 9 to 36 inches deep, places where the small fish we stock are less vulnerable to predators."

Houghton has volunteered for 15 years.

He has used his actuarial skills to conduct an informal mortality/survivorship study of Atlantic salmon "using the data from our stocking and the published data on fish runs that pass through the fish ladders."

He wanted to see if the second generation of stocked fish had better survival rates but there was not enough data to reach any credible conclusions, he says. A

Scott D. Houghton, FSA, MAAA, is a consulting actuary at KPMG LLP. He can be reached at *sdhoughton@kpmg.ca.*

In Tune With Music

Besides being an actuary, **Dwayne McGraw** is a concert-level classical guitarist.

He finds the two pursuits complement each other.

"Playing classical guitar well, like being a good actuary, is all about how effectively you can solve problems, pay attention to the details, implement solutions, have your final product make sense at a 'high level,' and communicate your ideas so they are understandable and useful to a wide audience," he says.

McGraw began playing in his late 20s. He became "fascinated with the type of music that could be played on classical guitar as well as the technical mastery required to be able to play this type of music." This was after attending—but "not by choice"—a classical guitar concert.

His favorite piece is "La Catedral" by Agustin Barrios, a three-movement piece inspired by the composer hearing Bach played on an organ in a cathedral.

"The piece is amazing for the guitar and wonderful to hear played live," McGraw says.

To continue to hone his craft, he participates in festivals and competitions and takes lessons via Skype and in person with two top national guitarists. He is currently working with Grammy Award winning guitarist William Kanengiser.

Performing live has taken him to Boston Guitar Fest, Columbia State University's annual Guitar Symposium & Competition and Guitare Montreal: Montreal International Guitar Festival and Competition.

McGraw practices for an upcoming competition.

"Most competitions are held in conjunction with a larger classical guitar festival, which provides an opportunity to perform in master classes, attend a lot of concerts, and meet and learn from other musicians. … However, I am able to hold my own and find it very rewarding to perform at amazing concert halls in front of well-known judges from the classical guitar community."

Next year brings McGraw's world tour, with competitions in the United States, Canada and Europe.

"I have not made it to the finals yet," he says, "but I am still persevering."

He also plans to put out a CD in 2014.

McGraw keeps it local as well, performing outreach engagements at his son and daughter's school, churches and hospices.

"It gives me an opportunity to share music and practice performing," he says, "while giving the audience an opportunity to experience music they would not ordinarily seek out for themselves."

He finds that for himself "every day creates more and more memorable experiences as a musician—because it is a constant learning/growing process."

This parallels his experiences as an actuary.

"Being an actuary is also a constant learning/growing process. As an actuary, one of my most memorable experiences is of course attaining my fellowship. The other is acquiring the skills and experiences to serve as an appointed actuary with several organizations and using these skills to make an effective transition to actuarial consulting last year."

Just as he worked hard to become an actuary, he has striven to become a guitarist. "Being a classical guitarist is an aspect of my life that I created and worked to achieve and is now part of me," he said. "I have no 'music' genes. I can't play any other instruments. But I am pretty good at this one." A

Dwayne McGraw, FSA, MAAA, MBA, is a consulting actuary at Wakely Actuarial. He can be reached at *dwayne.mcgraw@WakelyActuarial.com.*

The SOA At Work

A STRONG AND HEALTHY PROFESSION

WHEN I THINK ABOUT what we have accomplished in 2013, I am very proud. In the simplest terms, we collectively—members, volunteers, the Board of Directors and SOA staff—did a tremendous amount of work for the benefit of the profession, our members and candidates, employers and the Society.

For the sake of space, I will briefly summarize just a few of our accomplishments:

- Our Public Pension Blue Ribbon Panel was launched to help identify causes of public pension underfunding and suggest ways the actuarial profession can help address this critical social issue. Our work here is positioning the SOA and our members as a source of understanding and ideas to address this major public issue in the United States.
- We made great progress in the development and launch of our new general insurance track. We commissioned and published a major new textbook, *Fundamentals of General Insurance Actuarial Analysis*, and our first general insurance fellowship exam was administered in October. We've also released a brand new "Applications of Statistical Techniques Module" offering a learning experience in practical data analysis for those pursuing this track. This is a unique offering and helps distinguish our track from others offering training and credentials in general insurance.
- We partnered with the Canadian Institute of Actuaries to release important new research on the health care system in Canada. This research and its release demonstrate the power we can gain from leveraging the SOA's research capabilities with the understanding of Canadian issues of the CIA. We're working to extend these types of partnership efforts in 2014.
- "The Cost of Newly Insured Under the Affordable Care Act,"—a major SOA research report—was published early this year and received a great deal of attention from the media and policymakers. We've also provided important research on performance benchmarks for Accountable Care Organizations (ACOs), which are becoming a major force in the health landscape. These efforts demonstrate the benefits the SOA's non-partisan, objective research can provide to our members and the public.
- In the same vein, the Board of Directors reviewed and adopted a new SOA Public Policy Research and Analysis Statement establishing the purpose and values that will guide the way we conduct research seeking to inform public policy development and public understanding of critical social issues. The Board also adopted important new directions for our work on experience studies, long a key feature in our research efforts.
- We reviewed and made critical decisions on the SOA's response to the Canadian Institute of Actuaries' University Accreditation Program (UAP). The SOA Board reviewed this matter very carefully and in great depth and ultimately decided not to accept the UAP for SOA exam credit. We continue, of course, to review and assess future directions for the SOA's educational system, but have been given clarity on this issue by the Board's decision.
- We continued to expand our outreach to candidates and members outside of North America and adding to our professional development programs in these areas, particularly Asia. SOA leaders made numerous visits to universities, local actuarial clubs, and employers throughout Asia in addition to the many visits we also made in the United States and Canada.
- We've continued building our relationships with universities, professors and students studying actuarial science through our

Centers of Actuarial Excellence program and our Hickman Scholars program.

- We're making great strides in revamping and updating the SOA's website, which we'll be releasing to our members in the New Year. We're excited about these changes and know they'll give our members and candidates a significantly improved interaction with the website.

As we move into the New Year, key initiatives include:

- Completing our first full cycle of the General Insurance track exams and beginning to offer important new professional development opportunities in this field.
- Extending our international outreach efforts, with particular focus on Asia and Latin America.
- Beginning a review of the SOA's education strategy and, in particular, how major social changes in adult education are likely to affect the needs of our members and candidates in the future.
- Exploring and identifying new ways we can engage with and serve our members, supporting them in their "communities" and providing them with new ways to engage with other actuaries.
- Exploring and developing new programs to encourage the growth of new opportunities for actuaries in traditional fields, or in new and non-traditional fields.
- Completing the rollout of our public pension work noted above.
- Reviewing and assessing the SOA's relationships with other actuarial organizations and ensuring that we're focused on strengthening those relationships for the benefit of the actuarial profession and the public it serves.

This is just the tip of the iceberg, so to speak. As always, we work to establish and implement initiatives that will strengthen our bonds with members, candidates, employers, volunteers, other actuarial organizations and the international community as it relates to the actuarial profession. In the process, we will establish programs, services, and other initiatives that will move the profession and the Society of Actuaries forward, keeping it strong, healthy and viable—a profession and a Society that stand out from the crowd—that has strong roots and will continue to grow.

Happy New Year, everyone. May it be a happy and healthy year, and a time of great service to our community and the world at large.

— SOA Executive Director Greg Heidrich

THE ACTUARIAL PROFESSION IN THE NEWS

The SOA is focused on raising awareness of actuaries in the media. Recent efforts have been successful. Here are just a few examples:

How to Make a 'Health Exchange' Work for You

FSA David Axene is quoted in this *MarketWatch* article on health insurance exchanges. For the entire article, visit *www.marketwatch.com*, search term David Axene. Or use the QR code.

Study Shows How to Fix Big Flaw with 401(k) Plans

A new SOA retirement study is mentioned in an article on *CBSNews.com.* Visit *www.CBSnews.com*, search term Big Flaw, to read the entire article. Or use the QR code.

View all of these articles by going to *www.soa.org/newsroom* and clicking on the Profession In The News link.

PROFESSIONAL DEVELOPMENT OPPORTUNITIES

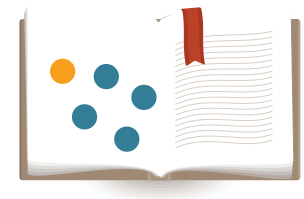
LIVING TO 100 SYMPOSIUM V
Jan. 8 – 10
Orlando

REFOCUS 2014
March 9 – 12
Las Vegas

INVESTMENT SYMPOSIUM
March 13 – 14
New York

View all Professional Development opportunities by visiting *www.soa.org* and clicking on Event Calendar.

Good Research Reads



COMPLETED RESEARCH STUDIES

SOA Releases New Report on Decisions to Retire

There is a significant difference between men and women in their concerns and feelings about retirement, a new report shows.

Committee Posts the Next Evolution in DC Plan Design—A Guide for Plan Sponsors

This new paper is geared toward helping plan sponsor fiduciaries understand existing options and carry out their due diligence when studying retirement income solutions for DC retirement plans.

PBITT Working Group Releases Summary of 2012 VA Survey

A majority of insurers now use dynamic lapse functions for GMDBs in looking back at five years of results, according to new survey results.

New Report Explores Future Costs of the Canadian Health Care System

The Society of Actuaries and Canadian Institute of Actuaries sponsored research on the Canadian health care system.

Building ARIMA and ARIMAX Models for Predicting Long-Term Disability Benefit Application Rates in the Public/Private Sectors

Using the Social Security Disability Insurance benefit claim rate as a proxy, this study investigates two statistical approaches to forecasting long-term disability benefit claims.

To view a complete listing, visit ***www.soa.org/Research*** and click on Completed Research Studies.

COMPLETED EXPERIENCE STUDIES

Literature Review and Assessment of Mortality Improvement Rates in the U.S. Population; Past Experience and Future Long-Term Trends

The SOA has released a report initiated by its Retirement Plans Experience Committee that reviews current literature on models and assumptions used in the projection of mortality improvement.

To view a complete listing, visit ***www.soa.org/Research*** and click on Completed Experience Studies.

WRITE FOR *THE ACTUARY*

Do you have an article you think should appear in *The Actuary*? Would you like to write it or know someone who might be interested? We are looking for articles covering topics such as solvency issues, longevity, regulatory environments of emerging markets, what makes a good leader, and how the role of the non-traditional actuary is changing. Email your ideas or articles to ***theactuary@soa.org***.

YOU Impact.

SOA 2013
SOCIETY OF ACTUARIES
Annual Meeting & Exhibit

The Society of Actuaries would like to acknowledge and thank the **2013 SOA Annual Meeting & Exhibit event sponsors and exhibitors** for their support, leadership and commitment to the actuarial profession.

EVENT SPONSORS

Actuarial Careers, Inc.® • axis • Canada Life™ Reinsurance • FactSet • hannover re® • RGA 40th Anniversary • SCOR • SunGard® • Swiss Re

EXHIBITORS

2014 International Congress of Actuaries • Actex Publications • Actuarial Careers, Inc. ® • The Actuarial Foundation
Actuarial Resources Corporation • American Academy of Actuaries • AmeriLife, LLC • Andover Research, Ltd.
Aurigen Reinsurance Company of America • Centers of Actuarial Excellence • Conning • Deloitte Consulting LLP
DW Simpson Global Actuarial & Analytics Recruitment • Ernst & Young, LLP • Exam One
Ezra Penland Actuarial Recruitment • Gen Re • GGY AXIS • IBM Insurance Outsourcing Services • Inovalon, Inc.
Insight Decision Solutions , Inc. • Jacobson • KPMG LLP • Lewis & Ellis, Inc. • MathWorks • MIB
Milliman Inc. • Moody's Analytics • Munich Re • Oliver Wyman • Optimum Re • Pacific Life • Pagos Inc.
Polysystems, Inc. • Prudential • Pryor Associates Executive Search • Quantitative Risk Management
RGA • Reinsurance Management Associates, Inc • SCOR Global Life Americas • SNL Insurance
SunGard • Towers Watson