actuarial REVIEW

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RISKY BUSINESS

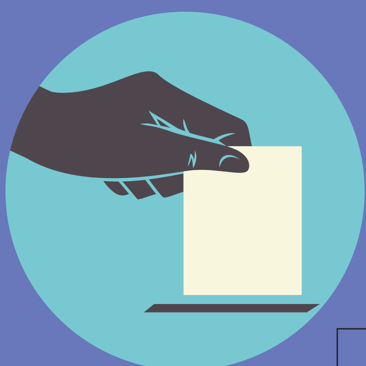
FIVE EMERGING RISKS WORTH WATCHING

Overcoming the Odds: Actuary Receives Life-Extending Kidney from CAS Classmate

actuarialREVIEW

March/April 2019

departments



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on the cover

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actuarialREVIEW

The magazine of the Casualty Actuarial Society

editor'sNOTE By ELIZABETH A. SMITH, *AR* MANAGING EDITOR

C'est la Vie

Striving and failing is a repeating pattern. On and on it goes, until one day . . . success. Then we pick another goal and the striving/failing pattern begins anew. Such is life. But sometimes, however much we strive, forces beyond our control do not allow for a crucial success. We must turn to others for a kind of support that goes far beyond any of the usual bonds of love and friendship.

Such was the case in our featured story on Larry Artes and Kay Kufera, two former colleagues who found themselves inextricably linked to each other's lives. Author Annmarie Geddes Baribeau relates a beautiful story about what it truly means to give of one's self.

Many of us try to do the right thing, but one CAS member goes far above and beyond.

AR's In Remembrance column also has fine examples of people who did the right thing — giving of their time; devoting themselves to a hobby or sport; advocating for education; advancing a profession; or serving their country. CAS members, both past and present, are admirable people.

In our cover story, Baribeau also revisits some emerging issues with new facets. Be sure to visit the *AR* website for a special animated treatment of our cover by our designer, GRAPHEK.

I hope you enjoy this issue as much I did putting it all together. ●

Corrections

In the January/February 2019 *AR*, Meghan McWilliams was misidentified as Elizabeth McMillen in the photos of new Associates admitted in November 2018. McWilliams is the first person seated on the far left in the photo on the top of page 28. The error has been corrected in *AR* online.

The Volunteer Honor Roll in the 2018 November/December issue of *AR* omits seven volunteers employed by Verisk. They are Michael Edward Doyle, Rebecca J. Gordon, Hanna Komlos, Ping Hsin Lee, Marc E. Levine, Rimma Maasbach and Yanjun Yao. With the addition of these volunteers, Verisk has reached the benchmark for the CAS list of large employers with at least 40 percent of members volunteering. ●

Actuarial Review welcomes story ideas from our readers. Please specify which department you intend for your item: Member News, Solve This, Professional Insight, Actuarial Expertise, etc.

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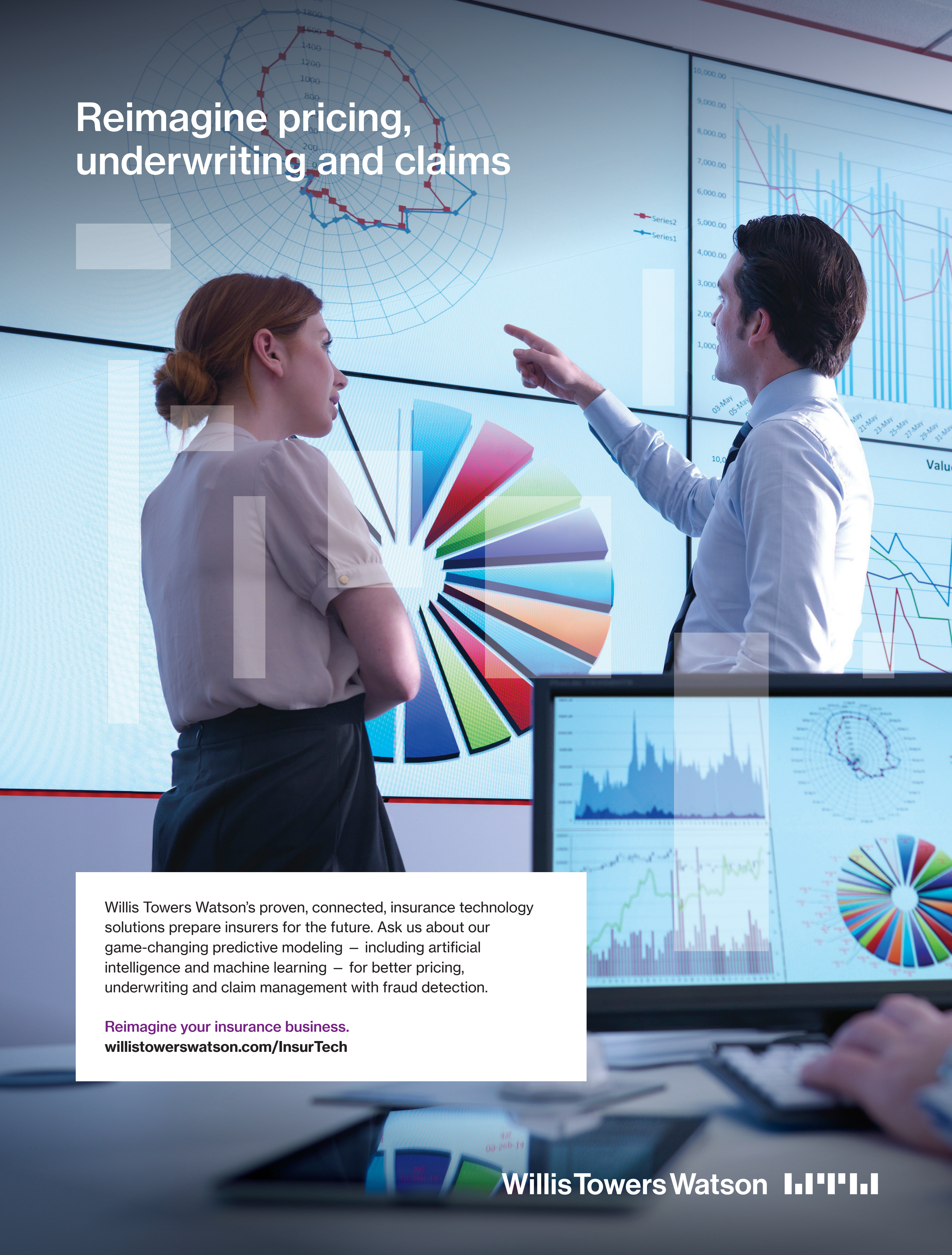
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Musings from Montréal

I recently gave a luncheon speech in Montréal at the Actuarial Students' National Association (ASNA) annual meeting, whose theme was "The Actuary of the Future." Naturally, I spoke about some of the threats and opportunities facing our profession, but I felt it was also important to stress that much of what experienced actuaries have learned throughout their careers is still relevant to both current and future actuaries. I would like to share some observations on what worked for me in the past and that I believe should continue to work for most actuaries in the future.

Good mentors are important.
I cannot stress strongly enough how having more experienced individuals who were unselfishly willing to share their knowledge and insights helped me throughout my career. That is not to say that I always took my mentors' advice, but I certainly progressed faster and made fewer mistakes as a result of them sharing their wisdom.

Experience is a wonderful teacher.
Even if some project is either not particularly successful, or worse, goes terribly wrong, there are good lessons to be learned by examining the "ruins" in retrospect. In fact, this is the essence of the actuarial control cycle!

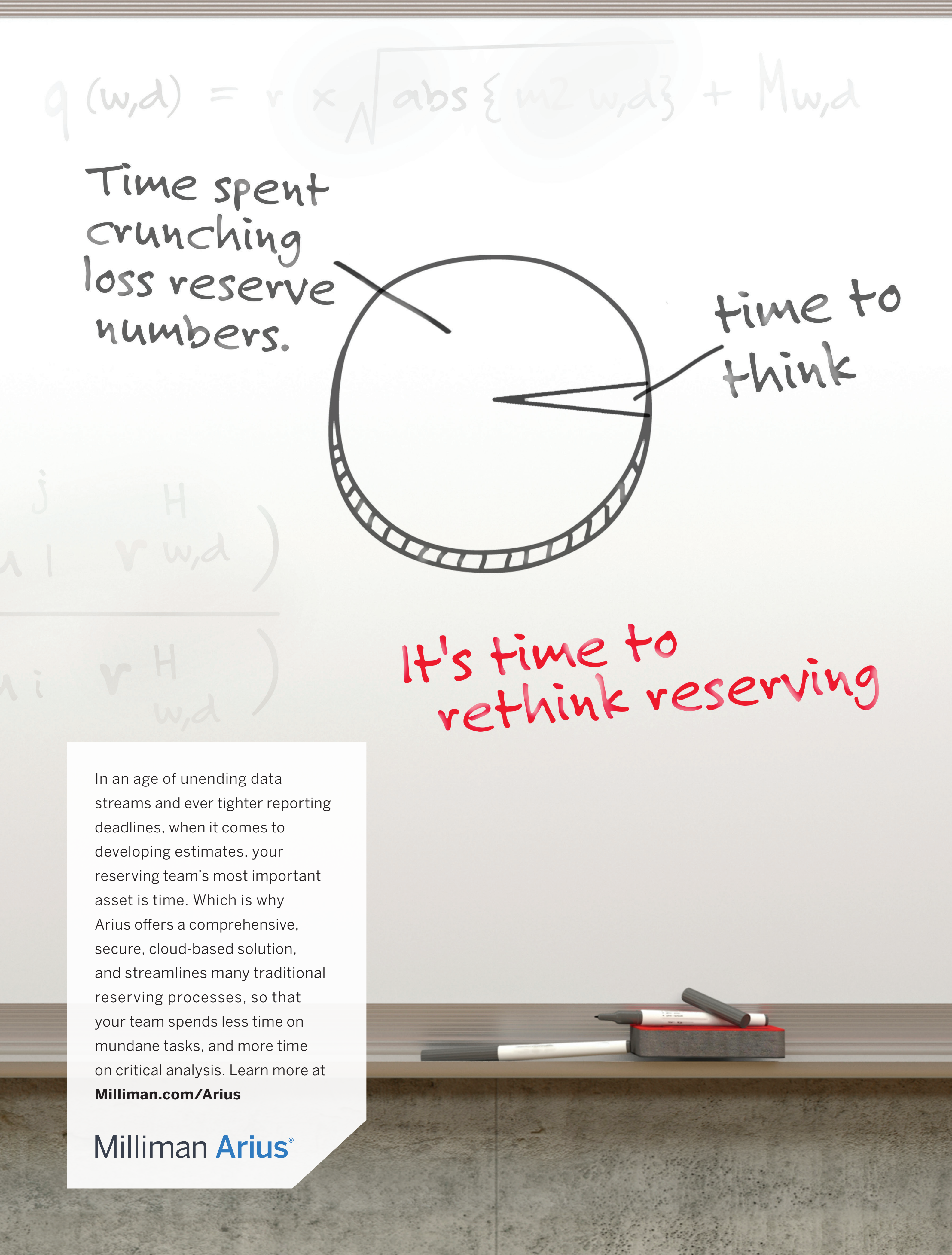
Think it through before you act.
Identify the *real* issue clearly before you start formulating answers. Articulating the problem is often half the battle of solving it. Knowing what you really need to answer will eliminate many false starts or inefficient processes. Know the limitations of your data and make sure your models are robust enough to exclude or otherwise handle problem data points. While unique approaches are great for adding insight, using your knowledge of solutions (including their weaknesses) that were applied to similar issues will often speed up your efforts. That being said, you should always be looking for how emerging technologies or data availability can offer new or improved solutions to old problems. Even a little knowledge of emerging technologies can help you find a better way.

Giving offers many rewards.
As Francis Bacon said, "Every man is a debtor to his profession." Be a willing and energetic volunteer, whether it's for a CAS task force or committee or for something else near to your own heart. Not only will you increase your understanding of issues, you will markedly grow your circle of colleagues. A wide personal network is never a bad thing. It gives you the ability to discuss issues or strategies in an open and nonjudgmental forum. Often, just discussing something with a trusted friend will lead to a much better answer.

Harness the power of the team.
Your team's knowledge is much greater than the sum of each member's individual knowledge. Whenever possible, seek input from a wide variety of sources. Encourage contributions from the more inexperienced team members, too. Not only will this help them grow as professionals, they will often be the source of fresh insights and ideas.

Trust, but verify your work.
Rigorously apply your chosen actuarial techniques in solving problems, but always ask yourself if your solution is reasonable. If your solution at first appears to be either unreasonable or a sharp

President's Message, page 8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President's Message
from page 6

departure from current practice, examine your data and assumptions closely. When suggesting radical changes, be sure all your facts are correct and your assumptions supportable. Whatever your proposed solution is, make sure it can be rationally explained in terms that your potential audience can readily understand.

Learn to build your case.
Your career will always be enhanced by building a strong foundation of both technical and communication skills. Your solution may be precisely correct, but it is of little value if you cannot persuade those with the authority to take action.

Curiosity enlarges your world.
Finally, never stop learning. Always be curious and expand your knowledge. Have a thorough understanding of how proposed risk solutions will work practically in the real world.

ACTUARIAL REVIEW *LETTERS POLICIES*

Letters to the editor may be sent to ar@casact.org or to the CAS Office address. Please include a telephone number with all letters. Actuarial Review *reserves the right to edit all letters for length and clarity and cannot assure the publication of any letter. Please limit letters to 250 words. Under special circumstances, writers may request anonymity, but no letter will be printed if the author's identity is unknown to the editors. Event announcements will not be printed.*

Remembering John Dingell

Dear Editor:

The passing of U.S. Rep. John Dingell reminded me of the impact he had on CAS members nearly 30 years ago. In "Failed Promises," his U.S. House Energy and Commerce Committee report (reported in the *Los Angeles Times*), he sharply criticized insurance regulation and — not for the first time — both the National Association of Insurance Commissioners and individual state regulators. He thought that federal regulation was inevitable unless state regulators made dramatic changes. The American Academy of Actuaries gave input to Dingell's committee. Among other things, Dingell's report recommended more reliance on actuarial opinions on loss reserves (thank you, AAA) and the NAIC moved quickly to add a requirement for a statement of actuarial opinion to the Annual Statement. Before the Dingell report came out, several states such as New York and California, among others, already had the SAO requirement and smaller states were concerned that they might not be able to hire actuaries to review newly required SAOs. I don't need to tell you that actuaries would have a lot less work to do if SAOs weren't mandatory. So, thank you, John Dingell.

—Anne Kelly, FCAS, MAAA

Want the latest on CAS member activities? We post real-time news on our social media channels. Follow us on Twitter, Facebook and LinkedIn to stay in the know!

COMINGS AND GOINGS

Paul Johnson, ACAS, has been promoted to chief risk officer at AmeriTrust, Inc. Johnson has been with AmeriTrust for 23 years, and has over 30 years of insurance experience.

Marvin Pestcoe, FCAS, has been appointed executive chairman and CEO of Langhorne Re Bermuda. Prior to this appointment, Pestcoe was chief risk and actuarial officer at PartnerRe and served on the company's executive committee.

Matthew Mosher, FCAS, executive vice president and COO of AM Best Rating Services, will take on the responsibilities of CEO of AM Best's Asia Pacific subsidiaries in Hong Kong and Singapore.

Robert Quane, FCAS, is the new head of underwriting and portfolio optimization at AXIS Capital Holdings. Quane will also manage the company's group-wide exposure management and underwriting risk frameworks and will chair its peril/product boards.

Pinnacle Actuarial Resources has promoted **Aaron Hillebrandt, FCAS,** to director and consulting actuary, and **Christopher Cortner, ACAS,** to consulting actuary.

Kimberly Holmes, ACAS, CSPA, has joined Kemper Corporation in the position of senior vice president, chief actuary and strategic analytics officer. Holmes joins Kemper with over 25 years of experience in insurance, actuarial functions and advanced analytics.

EMAIL "COMINGS AND GOINGS" ITEMS TO AR@CASACT.ORG.

CALENDAR OF EVENTS

May 19-22, 2019
Spring Meeting
Hyatt Regency New Orleans
New Orleans, LA

June 3-4, 2019
Seminar on Reinsurance
Fairmont Southhampton
Hamilton, Bermuda

September 16-18, 2019
Casualty Loss Reserve Seminar (CLRS) & Workshops
Fairmont Austin
Austin, TX

November 10-13, 2019
Annual Meeting
Hilton Hawaiian Village Waikiki Beach Resort
Honolulu, HI

IN MEMORIAM

Roy A. Berg (ACAS 1956)
1927-2018

Geoffrey Crofts (ACAS 1953)
1924-2017

Owen M. Gleeson (FCAS 1978)
1939-2018

Stephen S. Makgill (FCAS 1957)
1939-2019

IN REMEMBRANCE

In Remembrance is an occasional column featuring short obituaries of CAS members who have recently died. Longer versions of these obituaries are posted on the CAS website at bit.ly/PCASobits.

The Exemplary Volunteer

John J. Kollar (FCAS 1975)
1947-2017

Former CAS President John J. Kollar, whose CAS service encompassed education, strategic planning, methods development, literature and diversity, died on March 29, 2017. Born in Queens, New York, he earned a BA in math from Fordham University in 1968 and was stationed stateside during the Vietnam War. He married Helen Paul in 1970 and together they raised three children: John (FCAS 2009), Carolynne and Steven. He served the CAS in many capacities, from a new FCAS on the Examination Committee to VP-Admissions to a retiree University Liaison. As president he championed ERM, signing the Global Enterprise Risk Management Designation Treaty in 2009. He began at ISO in 1968 and retired in 2013 as vice president-personal lines/increased limits/rating plans for ISO Insurance Programs and Analytic Services. He held a CPCU, and he volunteered with the American Academy of Actuaries, Joint Risk Management Section and the Joint CAS/SOA Committee for the ERM Symposium. Community and church were also important to him. He enjoyed dancing with his wife, doing so whenever he could, and loved skiing. Kollar is survived by his wife, children, six grandchildren and brothers Joseph and Robert.

A Wisconsinite in Connecticut

Harry Thomas Byrne (FCAS 1959)
1930-2017

Harry T. Byrne, a 37-year veteran of Aetna Casualty in Hartford, Connecticut, died on August 27, 2017. Byrne was born in Janesville, Wisconsin, and graduated in 1952 from Wisconsin's Beloit College. After serving in the field artillery of the U.S. Army's 25th Infantry Division during the Korean War, he attended the University of Wisconsin Business Graduate School. Byrne joined Aetna in 1955, eventually settling in Wethersfield, Connecticut, in 1961 with his wife, the late Nancy (Ashley) Byrne. The couple were married for 52 years. He was a member of the First Church of Christ and volunteered for The Kidney Foundation, Habitat for Humanity and the United Way. Throughout the 1960s, he served CAS committees on education, examination, programs and election procedures. He was chair of the Associateship Examination Committee, a CAS Board director and a *Proceedings* author. He enjoyed tennis, skiing and traveling, but especially spending time with his family and grandchildren. Byrne is survived by his children: Thomas (Nancy) Byrne, Carolyn Yablon, Mary Byrne, Alan (Sandra) Byrne and Laura (John) Graham; siblings, William (Nancy) Byrne and Joan Cavitch; and 10 grandchildren. In addition to his wife, he was predeceased by his sisters, Kathleen Mowry and Anne Kisting.

The Marine

Edward James Hobbs (FCAS 1961)

1932-2016

Growing up in Savannah, Georgia, with its proximity to the sea, Edward Hobbs was drawn to become a marine. A graduate of Savannah's Benedictine Military School, he served honorably as a first lieutenant in the U.S. Marine Corps and captain in the U.S. Marine Corps Reserve. Even long after his military career, his ocean fascination led him to join the Church of St. Mary Star of the Sea in Unionville, Connecticut. He graduated from Pennsylvania's Villanova University and became senior vice president of the Insurance Company of North America in Philadelphia. His next career move was to Orion Group, Inc. of New York City and Farmington, Connecticut, where he was president and COO and retired in 1987. In the 1960s, he was a member of the CAS Education and Examination Committee, mainly focusing on education. From 1968-1970 he worked on finding examination locations for the CAS Committee on Sites. Hobbs also teamed up with other CAS notables, Robert Bailey, Frederic Hunt and Ruth Salzmann, to write the 1961 *Proceedings* paper, "Commercial Package Policies-Rating Statistics." He is survived by his wife Helene; six children; one brother; four grandchildren; three step-grandchildren; and one great-grandchild. A sister and two brothers predeceased him.

Children's Music Producer

Alan Richard Seeley (FCAS 1991)

1952-2018

Alan Seeley, a talented pianist, violinist and songwriter, who produced three CDs of original children's songs on his Songs for Kids label, died at home following a lengthy battle with pancreatic cancer. He was born in Fairfield, Connecticut, to Virginia and Joseph Seeley. A graduate of Fairfield Prep, he worked as a piano tuner prior to studying music at the University North Texas in Denton. He graduated from the University of Minnesota in St. Paul with a BA in mathematics in 1986 and earned an MS in financial engineering from Columbia University in 2015. He began his actuarial career in 1986, working in Minnesota, California and New York. He moved to Santa Fe in 2002 to be property/casualty actuary for the insurance division of the New Mexico Public Regulation Commission. In 2013 he became chief actuary and acting deputy superintendent for the New Mexico Office of Superintendent of Insurance, also in Santa Fe, serving there until 2018. His work included regulations as well as preparing new regulatory legislation for insurance. Seeley is survived by Elaine Woldorsky, his wife of 32 years, and brothers Robert and Kenneth. Contributions in Seeley's memory may be made to Doctors Without Borders or the Pancreatic Cancer Foundation.

Professor and Advocate

Gerald R. Hartman (FCAS 1969)

1933-2018

A professor emeritus at Temple University in Philadelphia and a CAS Academic Correspondent, Gerald R. Hartman earned both his FCAS and ACAS in May 1969, having graduated from the University of Pennsylvania in 1963. He was an enthusiastic promoter of and thought leader for the actuarial profession and an alum of the S.S. Huebner Foundation for Insurance Education, an organization that played a major role in sustaining insurance and risk management in higher education, thus directly contributing to the insurance industry and the public interest. In 1967 he wrote *Ratemaking for Homeowners Insurance* under the Foundation's imprint. He promoted Temple's new actuarial science program in a 1970 issue of *The Actuary* newsletter and advocated for an actuarial science major in Temple's MBA program. He contributed to the *Journal of Risk and Insurance*, writing the paper "Insurance Experience and Rating Laws" (*JRI* 37:2), and was thanked in the acknowledgments of Brown and Gottlieb's *Introduction to Ratemaking and Loss Reserving for Property Casualty Insurance*, Third Edition. His CAS contributions include the 1968 *Proceedings* paper, "Rate Regulation and the Casualty Actuary — Revisited," and committee involvement covering three decades, including work on basic and continuing education, new candidate recruitment and *Foundations* textbook development. Hartman retired to Scottsdale, Arizona.

CAS STAFF SPOTLIGHT

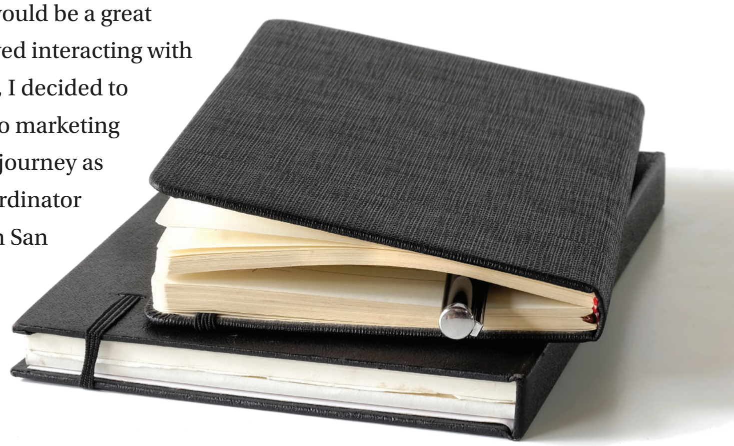
Meet Clarisa B. Figueroa, Marketing and Corporate Relations Manager

Welcome to the CAS Staff Spotlight, a column featuring members of the CAS staff. For this spotlight, we are proud to introduce you to Clarisa Figueroa.

- **What do you do at the CAS?**
  I manage the CAS Society Partners Program and am in charge of the promotion, sales and onsite execution of all exhibitor and sponsorship opportunities at CAS meetings and seminars. Part of my responsibilities is managing the marketing activities that promote the CAS continuing education programs to internal and external audiences. I also serve as a staff liaison for the CAS Employers Advisory Council and its oversight committee.
  Some of my other duties include collaborating with the online services department to promote and manage the CAS Career Center, managing *Actuarial Review* print advertising and working on other CAS marketing projects as needed, such as the weekly email bulletin and social media.
- **What do you enjoy most about your job?**
  My favorite thing is connecting with people. I am in constant communication with our Society Partners, vendors and staff — developing long-lasting relationships among these groups is of great importance to me both personally and professionally.
- **What's your hometown?**
  I was born in Santo Domingo, Dominican Republic, but was raised in Puerto Rico. Even though I have always considered myself Dominican and all my family lives there, my parents live in Toa Alta, Puerto Rico, which makes it my home.
- **Where'd you go to college and what's your degree?**
  I attended the University of Puerto Rico in Carolina. After being inspired by the movie *A Few Good Men*, I decided to pursue a bachelor's degree in criminal justice — all on the premise that "I can handle the truth!" (Laughs.)
- **What was your first job out of college?**
  During my last year of school, I realized I wanted to improve my conversational English, and with so many hotels in the area, working at any of them would be a great experience. I loved interacting with people so much, I decided to shift my career to marketing and started this journey as a marketing coordinator for H&R Block in San Antonio, Texas.
- **Describe yourself in three words.**
  Outgoing. Optimistic. Teammate.

Clarisa Figueroa

- **What's your favorite weekend activity?**
  Doing handcrafts or painting with my daughter. My favorite hobbies outside of motherhood are dancing and playing basketball.
- **What's your favorite travel destination?**
  The Caribbean is my favorite place to visit. I am forever in love with our tropical weather and delicious food. My dream destination is France, bien sûr!
- **Name one interesting or fun fact about you.**
  I have written six notebooks filled with poetry and memoirs.



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The CAS Institute Forms Governing Board and Executive Team

The CAS Institute (iCAS) announced the members of its first board of directors on January 3, 2019. The iCAS will be led by an appointed six-member board that reports to the CAS Board, its former governing body. Joanne Spalla, FCAS, MAAA, has been appointed iCAS president for a two-year term. She will be joined by iCAS Director Amy Brener, CAS Executive Director Cynthia Ziegler and three appointed directors: Peter L. Miller, MBA, CPCU, who will serve as chair of the 2019 iCAS Board for a one-year term and as a director for four years (2019-2022); Frank H. Chang, FCAS, Ph.D., who will serve a two-year term (2019-2020); and Stephen J. Mildenhall, FCAS, CSPA, CERA, Ph.D., who will serve a three-year term (2019-2021). Future directors appointed to iCAS will serve rotating three-year terms, with one new director appointed each year.

Spalla has been heavily involved in the implementation of The CAS Institute. She currently works as a consultant and has over 30 years of actuarial experience in primary insurance and reinsurance. A long-time CAS volunteer, she has served in a number of CAS leadership roles, including board director and vice president-marketing & communications.

Miller is president and CEO of The Institutes. In those roles, he currently leads the CPCU Society and The Griffith Insurance Education Foundation. Miller is also on the board of the Insurance Institute of Switzerland and chairs the Institute for Global Insurance Education.

Chang is the director of insurance and safety analytics at Uber Technologies, where he has worked since 2014. Prior to that, he was Google's lead actuary (and first dedicated staff actuary) from 2012 to 2014. He holds the Certified Litigation Management Professional designation and also serves as a professor at the Litigation Management Institute.

Joanne Spalla, FCAS, MAAA

Peter L. Miller, MBA, CPCU

Mildenhall is an assistant professor of risk management and insurance and director of insurance data analytics at St. John's University's Peter J. Tobin College of Business. Before joining St. John's University in 2016, he was global CEO of analytics for AON plc, based in Singapore, and head of Aon Benfield Analytics. Mildenhall also helped establish Aon's Singapore Center for Innovation and Analytics. He began his career at CNA.

The iCAS Board appointed an Executive Team to execute its strategy. In addition to Brener, Spalla and Ziegler, the current Executive Team consists of iCAS Exam Committee Chair Todd Lehmann, FCAS; CAS CFO Todd Rogers; and CAS Chief Communications Officer Mike Boa.

The new board will provide strategic direction for iCAS educational initiatives and programs, including the Certified Specialist in Predictive Analytics (CSPA) credential for analytics practitioners. The iCAS also recently announced a new set of credentials for catastrophe risk with the International Society of Catastrophe Managers (ISCM): the Certified Specialist in Catastrophe Risk (CSCR) and the Certified Catastrophe Risk Management Professional (CCRMP).

"We are thrilled to bring together these experts to continue leading our growing efforts in the credentialing space for quantitative professionals," said iCAS President Spalla. "With 400 members from over 200 companies, The CAS Institute continues to meet the demand for certification and continuing education in specialized practice areas."

The CAS Institute is a CAS subsidiary that empowers quantitative professionals in the insurance industry by providing innovative, rigorous and trusted credentials. The credentials are backed by the CAS's globally recognized educational standards, as well as the specialized knowledge and resources that analytics professionals need to impact their organizations and their careers. Visit thecasinstitute.org to learn more.

Overcoming the Odds: Actuary Receives Life-Extending Kidney from CAS Classmate BY ANNMARIE GEDDES BARIBEAU

In the fall of 2017, Larry Artes wrote one of the most difficult emails of his life.

For decades, Artes has had polycystic kidney disease (PKD), a chronic illness that can lead to kidney failure. Since his kidneys were approaching the failure threshold of 15 percent capacity, he added his name to the long list of others who need a functioning kidney.

The only remaining option was to ask family, friends and close colleagues to consider donating one of their kidneys.

"I struggle with this request," he wrote in an email to colleagues, "since I have never myself needed to weigh the pros and cons of being a transplant donor (because) I've never had any healthy organs to spare."

An Arduous Journey

About 600,000 people in the United States have PKD, according to the National Kidney Foundation (NKF). It's a genetic disease that causes uncontrollable cystic growth on kidneys, the body's primary blood-cleansing organs. Unlike simple kidney cysts, those resulting from PKD can lead to kidney enlargement, structure changes and lower function.

Artes grew up knowing he might inherit the disease from his mother. Of her five sons, three inherited the disease and Larry is the last surviving family member with PKD.

Artes learned his kidney challenges were growing worse when he passed a kidney stone while attending a CAS exam seminar at Georgia State University in 1980. Decades later, his kidney function began to decline and the kidney cysts expanded his organs to the size of footballs.

During the summer of 2017, his symptoms placed him at donation status. Of the estimated 120,000 people awaiting organ donations in the United States, 100,000 are waiting for a kidney.* Patients include those who have autoimmune (e.g., diabetes) and urinary tract diseases. PKD is the country's fourth-leading cause of kidney failure. Unfortunately, the median wait time is three and a half years and not everyone makes it. Thirteen people die every day waiting for a kidney, according to the NKF.

An Improbable Coincidence

Artes sent emails to expand the pool of prospects and his daughter created a Facebook page. The response was encouraging. "People who I had never met signed up for testing as possible donors," he recalls. "It is humbling to see people do that." While Artes hoped and waited for a donor, his kidney function continued to diminish and a meeting was scheduled in June to plan predialysis surgery.

His best match turned out to be Kay Kufera, a CAS classmate. Artes and

Kay Kufera and Larry Artes.

Kufera became Associates in spring 1988 and Fellows in fall 1990 (see photo next page).

The two had a lot in common early in their careers. They began their actuarial work at the same company, the Baltimore, Maryland-based USF&G, which was acquired by the St. Paul Companies before being folded into Travelers Insurance. Artes was also a mentor to Kufera's husband, Joe, an actuary-turned-statistician.

During the years of taking exams, Kufera lived with two other female actuaries and shared a townhouse courtyard with Artes and his wife, Susie.

When they embarked on different career paths, Artes stayed loosely in touch. Kufera is a pricing and reserving actuarial consultant who has served clients such as the National Flood Insurance Program. Artes retired after 35 years of service to insurance companies. During his career, he was a pricing actuary for workers' compensation and commercial auto as well as construction industry-specific coverage. Artes and

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* https://www.kidney.org/news/newsroom/factsheets/Organ-Donation-and-Transplantation-Stats

Shared Experience. *Seated in the front row of this photo of the New Fellows' class of November 1990 are Kay Kufera (fourth from the left) and Larry Artes on the far right. Kufera and Artes also earned their Associateships at the same time in 1988.*

Kufera now live about 12 miles apart in Maryland.

"I knew he would eventually need a kidney," she says, but was unaware that non-relatives could match. After seeing Artes' email, she started down the complex kidney donation testing process in November 2017. It began with a questionnaire to ensure that the potential donor understood the process and potential risks of donation and was in excellent physical health. There were also several tests to determine the likelihood that Artes' body could accept Kufera's kidney.

After the kidney function test, Kufera wryly says, "The numbers were so good, the nephrologist was drooling from the results."

But there is more to a proper match than physiological compatibility. Kufera wanted her close relatives, including her husband, her two sons and her mother, to be OK with the potentially risky donation procedure. Her husband was very concerned about risks to her health following the donation, but the couple realized the benefits would far outweigh the risks. As the months went by, she did not communicate with Artes until she knew she was the one. "I didn't want to tell him and get his hopes up," she explains.

A physician from Johns Hopkins Hospital called Kufera to share the news. "It was on Holy Thursday," she recalls, adding that her desire to live her faith motivated her kidney donation to Artes. "I believed all along that I was being led to offer to donate my kidney and that all would be fine," she says. The news reached Artes soon after in March 2018. "I don't know how you make a decision like this," Artes says.

Kidney donation, he explains, is 95 percent safe for donors, but not 100 percent safe. Since qualifying for being a donor indicates excellent health, donors tend to have longer-than-average lifespans.

The organ transplant took place last May. Their spouses wheeled Kufera and Artes to the same pre-op room, she recalls. Artes light-heartedly tossed out one-liners through the curtain divider as the two were prepared for surgery. The transplant procedure took four hours for Kufera and six hours for Artes.

While still in the hospital, they visited each other and encouraged each other as they mended. After three weeks, Kufera had recovered enough to return to work full-time. It took four months for Artes to recover from surgery.

Two Lives Changed

"Without the transplant or dialysis, my life would have ended in the not-too-distant future," Artes says. "The transplant not only saved me from being tied to a dialysis machine for four or more hours, three or more days each week for the rest of my life, it increased my life expectancy to a level above that for dialysis patients and even transplant patients who receive a cadaver kidney."

While the kidney donation saved Artes' life, the experience was transformative for Kufera as well. Before the surgery, her chaotic life meant a constant focus on completing task after task. Recovery forced her to slow down and enjoy quality time with friends and family. She is now more deliberate, making time for relationships.

Kufera encourages kidney donation under the right circumstances. "I think that people need to be aware that there are many more patients who need kidneys than there are kidneys that are available."

Now back to their normal lives, they keep in touch and go for walks together. Sometimes, she says, it feels strange thinking that "a part of me was in someone else."

Invariably, Artes will tell her, "Your kidney tells me she misses you."

RISKY BUSINESS

FIVE EMERGING RISKS WORTH WATCHING

By ANNMARIE GEDDES BARIBEAU

Emerging risks are potential threats that can have a significant impact on a company, an industry or the world. By their very nature, emerging risks involve a high degree of uncertainty since they are new, changing, or yet to be understood.

Anticipating risks is often a combination of perception, reality, vision and perspective. Recency can play a role, which is why rankings of current and future risks can look similar. Emerging risks also can be considered by likelihood (frequency), impact size (severity) and time horizons. Long-term risks from demographic changes, for example, do not share the immediacy of severe weather and the risk of natural catastrophes.

Identifying emerging risks is an inexact science, but actuaries, risk managers and decision makers must anticipate threats to assure resilience. Despite the multitude of emerging risk possibilities, there are those that rise to the top. There are also new developments. Surveys show that climate change is gaining importance as an emerging risk. This is an impressive change. Not long ago, the immediacy and long-term severity of climate change were not taken as seriously.

This article examines the top five risks chosen by participants from a list of 23 emerging risks for the “12th Annual Survey of Emerging Risks.” Released in February, the survey is sponsored by the Joint Risk Management Section — a collaboration of the Casualty Actuarial Society (CAS), Society of Actuaries (SOA) and Canadian Institute of Actuaries (CIA) — and conducted by Rudolph Financial Consulting, LLC.

To add perspective, the article includes the views of actuaries who specialize in enterprise risk management (ERM). The opinions of risk managers and other decision makers from around the world are also brought to bear from two other recently released surveys sponsored by the World Economic Forum (WEF) and Allianz Global Corporate & Specialty. In these additional surveys, risk is characterized differently, providing more specific risk concerns.

In the “Emerging Risks” survey, 267 primarily North American actuaries and risk managers most identified the five following emerging risks: climate change (22 percent); cyber/interconnectedness of (physical) infrastructure (15 percent); (disruptive) technology (13 percent); financial volatility (5 percent); and demographic shift (5 percent). Some of these risks also corrrelate, such as cyberrisk and disruptive technologies.

No. 1 Climate Change

For the first time, climate change ranks highest in the "Emerging Risks" survey, edging out cyber/interconnectedness of infrastructure (see Chart A). The highest number of respondents (22 percent) name climate change as their top emerging risk, up from 7 percent in last year's report, where it tied with regional instability in the No. 5 slot.

In the past, climate change was understood as being far off in the future, explains S. Michael McLaughlin, a board member with OneAmerica Financial Partners who helped build the SOA's Chartered Enterprise Risk Analyst (CERA) designation.

Chart A. Top Emerging Risks, 2018 Results

	Risk	Top Ranking
1	Climate change	22%
2	Cyber/interconnectedness	15%
3	Technology	13%
4	Financial volatility	5%
5	Demographic shift	5%
6	Asset price collapse	5%
7	Globalization shift	4%
8	Pandemics/infectious diseases	4%
9	Interstate and civil wars	3%
9	Regional instability	3%

12th Annual Survey of Emerging Risks.

The physical damage from climate change, such as the impact of rising sea levels, McLaughlin notes, has fueled the issue's immediacy. The Actuaries Climate Index® (ACI), which shows changes in extreme weather patterns, is also boosting awareness, he observes. The ACI, which became available in 2016, is sponsored by the American Academy of Actuaries, CAS, SOA and CIA.

There is a growing consensus that climate change is resulting in more frequent and severe natural catastrophes, observes Barry Franklin, regional head of risk for Zurich North America. "Whether you believe climate change is responsible for extreme weather events or not, natural catastrophes remain a significant risk," he says. "There will be costs and risks associated with transitioning to a low-carbon economy," he adds, and companies need to be prepared to deal with both.

According to the WEF's "Global Risks Report 2019" (see Chart B), failure of climate change mitigation and adaptation is the second most likely risk. Extreme weather is ranked No. 1 in likelihood by the 1,000 risk managers, executives and leaders from around the world, and natural disasters are ranked No. 3. Released in January, the report was produced in partnership with Marsh & McLennan Companies and Zurich Insurance Group.

Chart B. Top 10 Risks by Likelihood

1	Extreme weather events.
2	Failure of climate-change mitigation and adaptation.
3	Natural disasters.
4	Data fraud or theft.
5	Cyberattacks.
6	Man-made environmental disasters.
7	Large-scale involuntary migration.
8	Biodiversity loss and ecosystem collapse.
9	Water crises.
10	Asset bubbles in a major economy.

World Economic Forum "Global Risks Report 2019."

No. 2 Cyber/Interconnectedness

Cyber/interconnectedness risk, aka cyberrisk, could arguably top the emerging risk list. While 15 percent of respondents in the "Emerging Risks" survey name it their top emerging risk, it still ranks No. 1 when respondents are asked to rank the one risk that has the greatest future strategic impact (see Chart C). Cyberrisk has reigned supreme in this spot since 2014, when it toppled economic volatility during the nervous years after the Great Recession.

Chart C. Top Five Emerging Risks with Greatest Future Impact, 2018 Results

	Risk	Top Ranking
1	Cyber/interconnectedness	12%
2	Climate change	11%
3	Technology	9%
4	Demographic shift	7%
5	Financial volatility	6%

12th Annual Survey of Emerging Risks.

Chart D. Top 10 Risks in the U.S.A.

Rank		Percent	2018 Rank	Trend
1	Business interruption (incl. supply chain disruption)	40%	2 (39%)	↑
2	Cyber incidents (e.g., cybercrime, IT failure/outage, data breaches, fines and penalties)	36%	1 (45%)	↓
3	Natural catastrophes (e.g., storm, flood, earthquake)	33%	3 (38%)	=
4	Market developments (e.g., volatility, intensified competition/new entrants, M&A, market stagnation, market fluctuation)	27%	4 (23%)	=
5	Changes in legislation and regulation (e.g., trade wars and tariffs, economic sanctions, protectionism, Brexit, Euro-zone disintegration)	20%	6 (17%)	↑
6	Fire, explosion	18%	5 (19%)	↓
7	New technologies (e.g., impact of increasing interconnectivity, nanotechnology, artificial intelligence, 3D printing, autonomous vehicles, blockchain)	17%	8 (13%)	↑
8	Shortage of skilled workforce	14%	10 (11%)	↑
9	Climate change/increasing volatility of weather	12%	9 (11%)	=
9	Loss of reputation or brand value	12%	7 (14%)	↓

Source: Allianz Global Corporate & Specialty.
Figures represent how often a risk was selected as a percentage of all responses for that country.
Respondents: 340. Responses: 405.
More than one risk and industry could be selected. Figures don't add up to 100 percent as up to three risks could be selected.

Cyberrisk falls under a big umbrella; sources and other surveys cite several different types of cyber threats in their rankings. After the top three climate-related risks by likelihood, the WEF study ranks massive incidents of data fraud and theft as its fourth and cyberattacks as its fifth top risks.

In the Allianz Risk Barometer 2019, 340 Allianz Global Corporate & Specialty customers and insurance industry professionals ranked cyberrisk at No. 2 (see Chart D), as opposed to the WEF study's No. 5 ranking of large-scale cyberattacks. The Allianz report indicates that the broad category of business interruption is the greatest risk for now and the next five years, with half of respondents seeing cyber incidents the most likely cause.

Cyberrisk is top of mind to Mario DiCaro, vice president of capital modeling & analytics at Tokio Marine HCC. "One of my main concerns is the contrast I hear between what some corporate security experts believe is possible and what is actually happening." He explains that the issue seems to be a tendency to think the rules in place protect a system from failure when, in reality, rules are routinely broken or ignored. Those are specifically the weaknesses intruders try to exploit.

No. 3 (Disruptive) Technology

Technology, or specifically the unintended consequences of technology, can lead to disruption, to catastrophic economic losses, or to both. Thirteen percent of respondents in the "Emerging Risks" survey consider disruptive technology — including drones, self-driving cars, additive manufacturing, the internet of things and nanoparticle exposure — their most imperative emerging risk.

Disruptive technology is a double-edged sword that can harm or help an organization. In the Allianz survey, 17 percent of U.S.-based respondents cite "new technologies" as a current and future risk, ranking it No. 7 on the list for the United States. It is also ranked No. 7 internationally based on the responses of 19 percent of the respondents in the Allianz Risk Barometer study. (See chart E.)

When asked to rank the new technology with the greatest risk potential, 67 percent of respondents in the Allianz survey name artificial intelligence, 43 percent autonomous vehicles/mobility and 27 percent block chain. When asked which new technologies are the most useful or valuable, 69 percent select artificial intelligence, 42 percent data science and 41 percent blockchain.*

*More than one risk and industry could be selected. Figures don't add up to 100 percent as up to three risks could be selected.

Increasing reliance on technology, including cyber-connected devices, e-commerce and artificial intelligence, widens exposure for bad actors to threaten businesses with ransomware or business disruption, Franklin says. He also raises the issue of the insurance industry's ability to keep pace with disruptive technologies and emerging business models from insurtech.

As the number of connected devices and machines increases, so do concerns about data security and protection, third-party liability and the aggregation of risks. "Internet of things technologies are generally not well-protected from cyberattacks as third parties can remotely control cars and possibly trucks in the future, among other intrusions," observes Thomas Le, managing director of Ultimate Risk Solutions.

"Demographics is destiny," says Rudolph. "It's tied in with other things, like low growth, due to an increase in the dependency ratio, and that is going to slow down the economy and growth."

No. 4 Financial Volatility

Financial volatility relates to the ebb and flow of economic variables such as commodity prices, equity market performance and interest rates. Participants ranked this risk as No. 4 in the "Emerging Risks" survey. It ties with demographic shift at five percent of the top emerging risk vote.

The Allianz report also ranks market development, which includes volatility, market stagnation and market fluctuation, as concern No. 4 for respondents from the United States. "Financial market condition risks, which include stock market volatility, changing interest rates, inflation and the effects of trade wars," are all risks at the enterprise level, says McLaughlin. "When one industry suffers in a trade war, effects may be felt throughout the economy." Le also points to the proliferation of exchange-traded funds (ETFs) and high-frequency trading "that could lead to wide financial market swings and contribute significantly to a financial market meltdown."

The WEF's report ranks asset bubbles 10th in likelihood. In this year's "Emerging Risk" survey, asset price collapse ranked No. 6, slightly down from No. 5 in the previous study. Rudolph, author of the "Emerging Risks" study and principal of Rudolph Financial Consulting, points out that economic concerns tend to be considered current rather than emerging risks. In the long term, Rudolph also warns of an underappreciated risk. "We are at risk for low economic growth. The possibility of that is way higher than people realize."

No. 5 Demographic Shift

Populations that are evolving by age, size and migration trends are driving changes in economic growth and levels of government intervention. "Demographics is destiny," says Rudolph. "It's tied in with other things, like low growth, due to an increase in the dependency ratio, and that is going to slow down the economy and growth."

The ratio of the non-working, aged population (aged zero to 14 and over the age of 65) to those ages 15 to 64 years old is called the dependency ratio; this ratio is growing larger in the United States. "We are at a point where we have extended the federal balance sheet as far as we can, and we have to make choices," Rudolph says. Like climate change, demographic change is an emerging risk requiring preparation. It could mean choosing between lowering social security payments and limiting college scholarships, he adds.

More immediately, companies have to closely monitor changes in customer groups and expectations and to fill talent gaps. Franklin sees a combination of concerns related to tal-

Chart E. Allianz Risk Barometer 2019 Top 10 Threats

Ranking changes are determined by positions year-on-year, ahead of percentages.

Rank		Percent	2018 Rank	Trend
1	Business interruption (incl. supply chain disruption)	37%	1 (42%)	=
2	Cyber incidents (e.g., cybercrime, IT failure/outage, data breaches, fines and penalties)[1]	37%	2 (40%)	=
3	Natural catastrophes (e.g., storm, flood, earthquake)	28%	3 (30%)	=
4	Changes in legislation and regulation (e.g., trade wars and tariffs, economic sanctions, protectionism, Brexit, Euro-zone disintegration)	27%	5 (21%)	↑
5	Market developments (e.g., volatility, intensified competition/new entrants, M&A, market stagnation, market fluctuations)	23%	4 (22%)	↓
6	Fire, explosion	19%	6 (20%)	=
7	New technologies (e.g., impact of increasing interconnectivity, nanotechnology, artificial intelligence, 3D printing, autonomous vehicles, blockchain)[2]	19%	7 (15%)	=
8	Climate change/increasing volatility of weather	13%	10 (10%)	↑
9	Loss of reputation or brand value[3]	13%	8 (13%)	↓
10	Shortage of skilled workforce	9%	15 (6%)	↑

Source: Allianz Global Corporate & Specialty
The eighth annual Allianz Risk Barometer survey was conducted among Allianz customers (global businesses), brokers and industry trade organizations. It also surveyed risk consultants, underwriters, senior managers and claims experts in the corporate insurance segment of Allianz Global Corporate & Specialty and other Allianz entities. Figures represent the number of risks selected as a percentage of all survey responses (2,882) from 2,415 respondents. Applicable respondents could provide answers for up to two industries. All respondents could select up to three risks per industry. Figures don't add up to 100 percent because three risks could be selected. Ranking changes are determined by positions year-on-year, instead of percentages.

ent, including what he calls "generational brain drain" due to retiring seasoned workers being replaced by people who lack training and experience.

Since the U.S. economy is currently doing well, companies are finding it difficult to recruit and retain employees, Franklin says, predicting the growing need for agility and flexibility in the workplace. The shortage of a skilled workforce is also a concern among respondents of the Allianz study, who rank it No. 8 for U.S. businesses and No. 10 worldwide.

Conclusion

While threats can vary considerably, certain emerging risks rise to the top. Climate change, regardless of the cause, can no longer be ignored. Cyberrisk also should remain high on the list for years to come. This is not just because of innovative bad actors, but because disrupting technologies and internet of things vulnerabilities will expand risk potential exponentially.

Unquestionably, there are other emerging risks, including pandemics and infectious diseases, regulatory changes, political distress (both on the worldwide and national stages) and terrorism. Having the courage to call out risks despite the lack of data — and encouraging resiliency — is what enterprise risk management is all about.

To those in the risk management profession, Rudolph offers caution. "The risk I worry about the most is that actuaries and risk managers aren't looking far enough out into the future — our time horizon tends to be no longer than the tactical plan while it should preferably be as long as the liabilities," he says.

Annmarie Geddes Baribeau has been covering insurance and actuarial topics for nearly 30 years. Her blog can be found at www.insurancecommunicators.com.

[1] Business interruption and cyber incidents are tied at the top of the ranking at 37%. However, business interruption received more responses by number.
[2] Fire, explosion ranks higher than new technologies by number of responses.
[3] Climate change/increasing volatility of weather ranks higher than loss of reputation or brand value by number of responses.

The Experts Weigh In — Emerging Risks Poll

Annmarie Geddes Baribeau @agbaribeau Author and President, Insurance Communicators, LLC

What do you consider to be the top five emerging risks? @CASact #AR

Barry Franklin, Regional Head of Risk, Zurich North American

1) Natural catastrophic risks
2) Cybercrime
3) Unintentional release of personal information to third parties
4) Inability to keep pace with disruptive technologies and emerging business models such as insurtech
5) Talent (attracting and maintaining skilled workforce) @CASact #AR

Mike McLaughlin, board member, OneAmerica Financial Partners, Inc.

1) Cyber
2) Reputation
3) Climate change
4) Financial market conditions
5) Political risk @CASact #AR

Max Rudolph, Principal at Rudolph Financial Consulting, LLC

1) Financial volatility
2) Climate change
3) Regional instability
4) Demographic shift
5) Cyber @CASact #AR

Thomas Le, Managing Director, Ultimate Risk Solutions

1) Cyber hacking of physical infrastructure (such as utilities)
2) Drones carrying explosives that can target buildings and individuals
3) Internet of things supporting the ability to control just about anything that is connected to the web, including homes, appliances and vehicles
4) Aggravation of catastrophic loss due to business interruption of tight supply chain management
5) Financial volatility — proliferation of exchange traded funds (ETFs) and high frequency trading that may lead to wide financial market swings @CASact #AR

Mario DiCaro, VP, Capital Modeling & Analytics, Tokio Marine HCC

1) Silent cyber business interruption/utility outage aggregation event
2) Widespread cyber ransomware event
3) Unprecedented earthquake in California
4) Surfacing of a contaminant directly linked to cancer or Autism spectrum conditions
5) Insurance switching to federal regulation rather than state regulation, making lawsuit patterns more widespread @CASact #AR

ETHICAL ISSUES

Qualified Services

Ethical Issues is written by members of the CAS Committee on Professionalism Education (COPE). The column's intent is to stimulate discussion among CAS members. Therefore, positions are sometimes stated in such a way as to provoke reactions and thoughtful responses on the part of the reader. Responses are welcomed. The opinions expressed by readers and authors are for discussion purposes only and should not be used to prejudge the disposition of any actual case or modify published professional standards as they may apply in real-life situations.

P.I. Skware is an FCAS who has been employed by Wedu Consulting Services for 12 years. She has worked on a wide range of projects during her tenure but specializes in workers' compensation (WC) reserving for captives and self-insureds.

Legs & Arms, Ltd. (L&A) is a manufacturer of mannequins for the fashion and retail industry and has been in business for over 50 years. L&A has been insured under a large deductible WC policy with a deductible of $100,000 per occurrence for the last 15 years. The company has engaged Wedu for the last 10 years to perform an analysis of its retained liabilities related to this deductible. P.I. was assigned to the L&A account from the very start and has been performing quarterly analyses of its unpaid claim liabilities ever since.

Times have been hard for L&A. First, the migration from brick and mortar to online shopping decreased the demand for mannequins. Now, U.S. tariffs on goods from China and other countries are restricting the supply of cheap clothing. Most of the department store chains that buy from L&A are in this segment of the market. L&A is looking to cut costs to stay afloat.

A few months ago, Rick Skee, the risk manager for L&A, told P. I. that the CFO is requiring that an RFP be issued for actuarial services on the WC program to see if the company could reduce its costs. P.I. has been working with L&A for a long time and understands the difficult situation. After discussing the situation with Wedu management, P.I. submits a proposal that lowers their fees by 20 percent from current levels, while still providing the same services. After returning from an extended vacation, P.I. becomes involved in a due diligence project for another client that takes all of her time and attention. The due diligence project is completed two months after the L&A proposal was submitted, and P.I. realizes that she has not heard back from L&A on the RFP process. P.I. calls Rick only to find out that Rick is no longer with the Company. P.I. contacts Rick through LinkedIn and sets up a call. During the call, Rick explains that he was part of the recent downsizing at the L&A. After expressing her concern for Rick's situation, P.I. asks about the actuarial RFP. Rick tells her that his layoff occurred before a decision was made, but he still has friends at the company and will find out for P.I.

Later that day, Rick calls P.I. and tells her that, while the Company would have preferred to stay with Wedu, the CFO decided to award the work to another consulting actuary. Rick tells P.I. that the new actuary recently completed her first analysis, which resulted in a significant reduction in the estimated WC liability and forecasted rates for the remainder of the year, compared to P.I.'s last report. He also tells P.I. that the company is expecting the reduction in expense to have a very favorable impact on year-end results and is excited to share the resulting increase in profit on its earnings call in three months. P.I. tells Rick that she is very surprised about the reduction in the WC estimates and asks about the actuary. Rick's contact informed him that the work was awarded to Penny N. Teller, an ASA who had been L&A's lead consulting pension actuary for the past eight years.

In an effort to reduce costs, the company recently froze its pension plan. This significantly reduced the amount of consulting work needed, resulting in less billable hours and fees for Teller. P.I. learned from Rick that Teller foresaw the upcoming reduction in consulting work on L&A's pension plan and the likelihood that the WC actuarial services would be put out to bid. In response, she has been reading material from CAS exams related to estimating unpaid claim liabilities as well as other industry information on WC. Teller also attended the most recent NCCI Annual Issues Symposium to build her WC expertise.

Rick tells P.I. that all of this information is confidential and he asks P.I. not to share any of this information with anyone else as it could jeopardize his severance package and his reputation in the industry.

P.I. is shocked that the company would allow an actuary without a P&C designation to perform the WC study. Without talking with anyone from the company, P.I. contacts Teller and questions her about her qualifications to provide actuarial services related to large deductible WC programs. Teller believes that it is inappropriate for P.I. to challenge her qualifications but does tell P.I. about the WC and P&C reserving knowledge that she has gained in recent months. She goes on to tell P.I. that she also has a personal friend who is a P&C actuary to whom she can pose questions as needed and that, while it is none of P.I.'s business, she believes she is qualified to provide these actuarial services. Knowing that the company has a significant portion of its unpaid claim liability connected to permanent total disability life-time claims, Teller asks P.I. how up-to-date she has been on recent trends in mortality and asks P.I. if she is sure she was qualified when she provided past reports.

Should P.I. Skware contact the ABCD?

Yes

Precept 2 states "An Actuary shall perform Actuarial Services only when the Actuary is qualified to do so on the basis of basic and continuing education and experience, and only when the Actuary satisfies applicable qualification standards." P.I. has found no evidence that Teller is qualified.

Precept 13 states "An Actuary with knowledge of an apparent, unresolved, material violation of the Code by another Actuary should consider discussing the situation with the other Actuary and attempt to resolve the apparent violation. If such discussion is not attempted or is not successful, the Actuary shall disclose such violation to the appropriate counseling and discipline body of the profession, except where the disclosure would be contrary to Law or would divulge Confidential Information."

No

Precept 1 states that "an Actuary shall act honestly, with integrity and competence, and in a manner to fulfill the profession's responsibility to the public and to uphold the reputation of the actuarial profession." P.I. cannot act with integrity while giving out information that she was asked to keep confidential.

Precept 9 states "An Actuary shall not disclose to another party any Confidential Information unless authorized to do so by the Principal or required to do so by Law." P.I. only learned about the new actuary and the lower estimates from Rick through his contact, and his information is not publicly known. In addition, Rick told P.I. the information about Ms. Teller in confidence and asked her not to share it. To share this information with others would be a violation of that trust.

Maybe

Based on Precepts 2 and 13, P.I. could contact the ABCD for informal guidance on how to proceed with this matter. Members and staff of the ABCD will make a reasonable effort to keep confidential the facts and circumstances involved in any request for guidance, subject to the confidentiality provisions in Section X of the Rules of Procedure.

IN MY OPINION BY GROVER EDIE

Gear Up for That Dreaded Meeting

A few years ago, I attended a management meeting that I was convinced would be contentious. Some of the managers wanted the company to cease writing several lines of business. Understandably, the managers of those lines were inclined to continue writing. The chief financial officer and I (as chief actuary) had done some research and realized (independently) that the lines of business in question had, indeed, turned around their financial positions and were headed towards profitability. The CFO further confided to me that, if we dropped the lines in question, the expense ratio for the remaining lines would rise to an unprofitable level. The CFO and I were prepared for the meeting, and each of us brought in a formidable stack of paper to provide evidence of our discoveries.

The early part of the meeting itself was like a warm-up for an explosion. When the president brought up the question of whether we should continue writing the subject lines of business, it felt like someone had lit the fuse to a Fourth of July rocket — and a big one at that. I waited for pandemonium to erupt . . . and then . . . nothing.

The CFO then spoke: "We need to give those programs a little more time, but at this point, it appears they might be turning profitable." And so we moved on to the next topic.

What I didn't know was that he had spoken privately with all the attendees of the meeting, telling them of his findings and allowing them to understand the facts beforehand.

At another meeting, the seniormost member went into a long rant about everything wrong with our work, our business units, the marketplace in general, and just about anything else that came to his mind. It was a tantrum worthy of a spoiled three-year-old, but when it was over, the rest of us simply went on with the rest of the meeting as though nothing had happened.

So why is it that some meetings are productive, others turn into "verbal food fights" and still others are simply wastes of time? And what can you do to arm yourself in case you and your work become targets in a much-dreaded meeting?

A lot of keeping meetings productive has to do with understanding the roles the participants play in the meetings. As for keeping a target off your back in a meeting: First, do a good and thorough job of preparing (this is a given) and second, compile supportive evidence so you are ready to defend your position.

Know the type

Understanding personality types, like those espoused by Myers-Briggs, can help us understand how some people operate and what to expect from them. I tend to use Myers-Briggs and other categorization systems to help me recognize how people will act in a meeting. While people may change roles for different gatherings and groups, they tend to be of a basic type.

There are those who try to get agreement from all of the participants before the meeting, like the CFO in the first meeting. They are called **arrangers**. Arrangers don't always bend over backwards for everyone, but they try to achieve compromises that are acceptable to all.

Some participants are out to tear down anyone in their career path. Embarrassing the opposition or creating bad press for them in a meeting guarantees more than one person hears the damaging news, whether or not it is true. I call these folks **destroyers**.

Then there are the **clowns**. Their only purpose is to entertain, and a meeting provides them a stage. I have used humor to break the mood in a meeting before, but clowns treat a meeting like a performance. I usually don't invite them to a meeting.

The **contrarians** can serve a useful purpose. Always on the opposite side of everyone else, they provide a reasonable devil's advocate and bring up issues others might not consider. But once a decision is made, they need to support the outcome.

Reporters are people who come in place of the persons you invited, and "report back" to the invitees. They come with no authority, mainly listen and sometimes answer questions.

Reporters should not be confused with true **representatives**, who have the same voice and vote as the decision makers for whom they are standing in.

Obstructionists do not want the

meeting to be successful for whatever reason. Often it is because they did not get their way in the past.

Orators like to hear themselves speak and will do so often and at great length. They expand the amount of time in a meeting well beyond its useful limits, if getting something done is what you consider useful. They believe that it is beneficial for them to impart their knowledge to the masses.

Wallflowers are warm bodies in the conference room. For whatever reason, they do not contribute to the discussion.

Peacemakers try to arbitrate between opposing sides without offending either.

The next time you are in a meeting, see if you can identify some of these meeting types. If you can, it might give you a better perspective of the meeting.

Get it together

I tend to be prepared for meetings with stacks of papers and notebooks full of charts and graphs. In yet another meeting that I expected to be a blowup, I came armed with evidence. I had the facts to back up my position, something I suspected my opponent would not have. That meeting did not degrade into a shouting match. My preparation, the exhibits and the illustrations I had brought enabled me to make a reasoned and unemotional rebuttal to the emotional plea that was to be presented.

But unless I have reviewed all of the materials right before the meeting and know where everything is, I may lose opportunities to support or rebut a position because I am busy looking up stuff in a stack of paper. Properly organizing data is crucial.

Agenda items in meetings can move from one point to another rather quickly, and a few seconds may be all you have to make your point. Indexes, tabs, a summary — all are helpful, both at the meeting and as some things to go over as a reminder before the meeting starts. Organized documentation can serve as a fire suppressor, even to those who tend to "not be burdened with the facts or with reason."

We've got to stop meeting like this

I cannot promise that you will never, ever, ever have a combative meeting, but knowing who you are dealing with and arming yourself with documentation will help you get through that dreaded encounter.

RANDOM SAMPLER BY JIM WEISS

An Actuary, a Doctor, a Lawyer, a Teacher and a Preacher Walk into a Bar …

Editor's note: An earlier version of the following was posted by the author on LinkedIn on August 1, 2018.

An actuary, a doctor, a lawyer, a teacher and a preacher walk into a bar. The lawyer passes the bar, the preacher takes the cup, the teacher tests a few items and the doctor gives out several shots. The bartender then looks at the actuary and says, "What do you do?"

Despite once ranking higher among "top jobs" than the other more well-known professions at the bar, the actuary struggles to answer the bartender's question with confidence or clarity. Teachers teach, preachers preach, doctors heal and lawyers litigate. Actuaries use mathematics and common sense to ensure there is money in the bank to bring people hope during difficult times, but how does one condense that calling into a succinct summary that, well, "actuates"? [According to Dictionary.com, the verb to actuate is "to incite or move to action; impel; motivate" and "to put into action; start a process; turn on."]

As it happens, the professions represented at the bar counter have followed sinusoidal cycles of crisis and rebirth that have helped teach their members exactly who they are. And briefly comparing the others' journeys to the actuary's may help the latter develop a more meaningful answer to the barkeeper's deceptively simple icebreaker. We will exempt the preacher from our meditation due to his or her categorically different calling, but the other professions have all generally walked similar paths looking something like the following (events are not presented in strictly chronological order):

- **Genesis** — Basic human problems such as pain (doctor), accusation (lawyer), confusion (teacher) and thirst (bartender) motivate individuals to find or become solutions. The actuarial profession was actuated, in part, by a need for protection and trust in the ashes of insurance company failures.[3]
- **Identity** — Problem solvers develop systems and ideals to guide themselves and future generations. These constructs may be simple, such as an oath to "Do No Harm," or complex, such as a code of common-law evolving out of centuries of legal practice. They may be wide reaching, such as actuarial standards, or hyperlocal, such as a master practitioner teaching an apprentice.
- **Crisis** — Overreach and experimentation sometimes create rather than solve problems. Lawyers may win ruinous decisions, questionable surgeries may be miscast as cures for societal challenges, education may produce leeching lifelong customers and excessive faith may be placed in actuarial models. Perhaps less frequently, shocks may be exogenously imposed, for example, Prohibition.[4, 5, 6, 7]
- **Rebirth** — Saviors often emerge in unlikely places. A fictional small town lawyer may impact generations of scholars, a mild-mannered TV host may teach simple kindness, anonymous battlefield doctors and nurses may turn necessity into invention and a cat modeling paper may remind actuaries of forgot-

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ten exposure posing threats not unlike those that originally yielded the profession.[8, 9, 10, 11] The noblest of professions almost unfailingly return to their promised land.

Given the above similarities to his or her bar mates, why doesn't the actuary simply answer the bartender, "I provide protection and trust"? The reason may relate to a modern-day crisis, of sorts, affecting many disciplines. The emergence of big data has arguably coincided with a measurement obsession in how different professions are conducted and evaluated. If data are available to measure and predict, the thinking goes, so must we (relevance is sometimes optional). And we have thus seen several types of analyses affect how doctors, teachers, and lawyers practice (e.g., short-term survival rates in medicine, standardized test scores in education, and genetic sequences in legal proceedings), but it is certainly debatable how many of these have led to effective intervention.[12, 13, 14] Yet presumably few individuals in the affected professions have ceased to view their respective callings as healing, teaching and litigating.

This leads us to the two professions at the bar whose identities have arguably been most and least affected by big data's emergence. In part because actuaries rely heavily on measurement

techniques, their identity has weathered a great deal of introspection due to big data. Other professions with similar skills have usurped actuaries in job rankings, and actuaries have agonized over how much of what they do could be replaced by machines or statisticians — and how they should change as a result. [15, 16, 17] Meanwhile, bartenders as a whole have arguably experienced less tumult than other professions, and their one true crisis was only the result of a temporary public policy. Today robots may be able to mix drinks, but mixologists can be confident that a robot will be unlikely to know the perfect concoction, or question to ask, for five random individuals who walk into a bar.[18] Why feel insecure?

In the introduction we noted "actuaries use mathematics and common sense." Big data has arguably inclined the profession much more in the former direction, but the latter distinctive is arguably equally if not more critical to achieving impact. For example, actuaries' successes with cat models have not simply been affected with advanced simulation, but by identifying relevant data and implementing learnings in ways that foment protection and trust, which, as we noted, is the basic problem actuaries solve. And, it is said by a true actuarial *Survivor* contestant, actuaries can find opportunity in any risk simply by "believing in yourself and your profession."[19] Consummate professionals should engage in continuous pursuit of the most appropriate tools and methods, but if they begin to forget who they are and what they do, they risk being forgotten by others.

Acknowledgment: Cheers to the ingenious Su Wash of ISO who helped me brew many of the ideas in this post.

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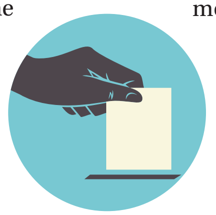
IT'S A PUZZLEMENT BY JON EVANS

Identity Politics

In the country of Terrachaos, there is a huge number of voters and national elections are held routinely. Each voter is either a Paleomorph or a Neomorph, and each voter gets one vote. There are three political parties: Patriacrats, Plutocrats, and Xenocrats. Every Neomorph always votes for the Xenocrats. Paleomorph voting is more complicated. The percentage of Paleomorphs voting for the Patriacrats is equal to the percentage of voters who are Neomorphs at the time of the election. The remaining Paleomorphs vote at a constant percentage *P* for the Plutocrats and a corresponding fixed percentage 1-*P* for the Xenocrats. For example, if the Neomorphs are 20 percent of all voters at election time and *P* = 70 percent, then the Paleomorphs will vote 20 percent for the Patriacrats, 56 percent for the Plutocrats, and 24 percent for the Xenocrats. Consequently, the overall vote, combining Paleomorph and Neomorph votes, will be: Patriacrats 16 percent, Plutocrats 44.8 percent and Xenocrats 39.2 percent.

If any party gets 50 percent or more of the overall vote, that party forms the government and implements its policies. If no party gets at least 50 percent, then the Plutocrats form a coalition government with the other party that got the most votes, and the policies of that other party are implemented. In the previous example, the Plutocrats would partner with the Xenocrats and implement Xenocrat policies, even though the Plutocrats got more of the total votes.



Under the policies of either the Plutocrats or the Xenocrats, the ratio of Neomorphs to Paleomorphs will increase by 10 percent by the time of the next election. For example, if there are 10 Neomorphs for every 100 Paleomorphs at the time of an election, these policies will lead to 11 Neomorphs for every 100 Paleomorphs at the time of the next election. The policies of the Patriacrats will keep the ratio of Neomorphs to Paleomorphs constant until the next election, or 10 Neomorphs for every 100 Paleomorphs in that election.

The Neomorphs are initially a small, but non-zero, fraction of the voters. Depending on the value of P, as described previously, what will happen over time to the Neomorphs as a percentage of the voters and with respect to the political party composition of the government?

Alternatively, suppose the Paleomorphs vote for the Patriacrats in a percentage equal to the square root of the percentage of voters that are Neomorphs at election time. For example, if 4 percent of the voters are Neomorphs, then the Paleomorphs vote 20 percent for the Patriacrats. Otherwise, everything is the same as previously described. What happens over time?

Stealthy Cruise Missiles

In this puzzle, a non-stealth cruise missile flying at 2,000 miles is detected by the radar at its target when it is 1,000 miles away, giving 30 minutes' warning. A somewhat stealthy cruise missile, of similar physical shape and size, diffusely reflects the radar energy at a rate that is only 10 percent the rate of the non-stealth missiles, but only flies at 1,000 miles per hour. The first question is: What is the warning time for this missile? An advanced stealth missile, flying at only 500 miles per hour, is designed to give only 5 minutes' warning. The second question is: What is the rate of radar energy reflection for this missile relative to the non-stealth missile?

The key to this puzzle is the "radar equation" which implies that the energy *E* received back at an active radar station is, all other relevant things being equal, inversely proportional to the 4th power of the distance *r* of the target from the station. So, the minimum energy threshold for radar detection of the somewhat stealthy missile will occur when $10\%\ r^{-4} \geq (1{,}000 \text{ miles})^{-4}$, or when $r \leq 562$ miles. Since this missile flies at 1,000 miles per hour, that will give about 33 minutes and 45 seconds of warning time.

To be detected only five minutes before it hits, the stealthy missile will need to be first detected when it is 41.67 miles away. So, its relative rate of radar reflection *a* will need to satisfy $a(41.67 \text{ miles})^{-4} \geq (1{,}000 \text{ miles})^{-4}$ or $a \leq 0.0003$ percent.

Solutions were also submitted by Bob Conger, Dominick Elia, Kristen Fox-Neff, Clive Keatinge, Matthew Pear and David Zheng.

Know the answer? Send your solution to ar@casact.org.

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