

actuarialREVIEW

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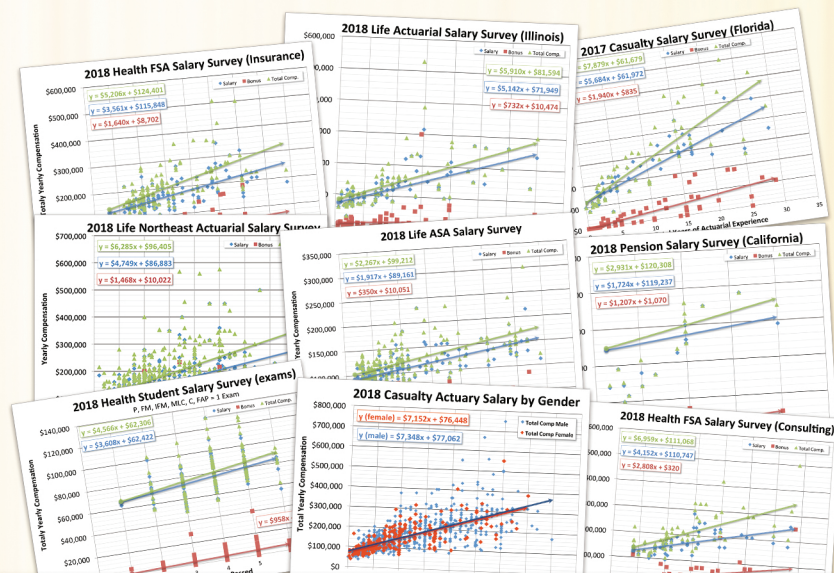
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departments

4 EDITOR'S NOTE

- Celebrating Hard Work

6 PRESIDENT'S MESSAGE

- Presidential Travels Open the Eyes

10 MEMBER NEWS

- Comings and Goings
- In Memoriam
- Calendar of Events
- In Remembrance
- CAS Staff Spotlight
- 5,000th CERA Credential Awarded
- Meet the 2019 CAS Trust Scholarship Winners
- The CAS Names 2019 University Award Winners
- CAS Receives Industry Awards for *Actuarial Review* and Social Media Campaigns

33 PROFESSIONAL INSIGHT

- Travelers Actuaries Cook Up Some Predictive Modeling Fun
- Making the Case for Actuaries in Banking

35 ACTUARIAL EXPERTISE

- 2019: A Good Year for CAS Research
- CAS and I.I.I. Issue Rating Variables White Paper

37 VIEWPOINT

- In My Opinion

39 SOLVE THIS

- It's a Puzzlement



FSC
LOGO

on the cover



26

Coming of Age: How will Gen Z Impact Personal Lines Coverage?

BY ANNMARIE GEDDES BARIBEAU

Digital natives are bound to change the way insurers communicate with customers.

22

Hemp: A Puzzle for Farmers and Actuaries Alike

BY REBECCA ARMON

The 2018 Farm Bill legalized hemp, but what does that mean for farmers and how will actuaries play a role in developing crop insurance for it?

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

Celebrating Hard Work

Summer 2019 has been very special for the CAS. We have a lot to celebrate!

It began with Association Media & Publishing's EXCEL Awards Gala. The CAS took home three prizes — golds for two of our social media campaigns and a bronze for an *AR* story. (See the story on page 21 for details.)

My colleagues and I attended that night to represent not only the different projects, but the many people who were involved with making them successful.

Take the award-winning story, "Driverless Utopia." Annmarie Geddes Baribeau had the solitary task of writing the piece, but she was not entirely alone. She had to find sources, ask sources for other sources, conduct interviews, work with company PR departments and fact check. She checked in with me before, during and after she crafted the gathered information into a story that appealed to *AR*'s readers and also to the larger public audience.

Then *AR* copy editors pored over the words, checking the facts, clarifying text and hunting down typos and asking the author questions they had. They repeated the process in the magazine

layout, this time checking for anything that needed further refinement or correction. All of the elements came together for this award-winning story! So many people contributed to the success of all these projects. And for that, we thank you!

While I'm giving thanks, I want to thank Jerry Degerness, FCAS, who reached out to me about getting more CAS members involved in writing obituaries for *AR*'s In Remembrance column. Stu Sadwin, FCAS, was contacted, and he wrote a lovely piece for Ted Stone in this issue. Gregory Kushnir, FCAS, also contributed to the obituary for Nathan Voorhis. Degerness, Sadwin and Kushnir's involvement exemplify the deep friendships that develop among people who work together.

Thanks also to our very own, Rebecca Armon, FCAS, who wrote about growing hemp and the implications for crop insurance. She is an *AR* copy editor, and this is her first story for *AR*. I hope to read more from her in the future.

Finally, thanks to the awarding-winning author and our cover story writer, Annmarie Geddes Baribeau. She knows insurance, and she also knows actuaries and what they'd like to read. ●

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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Presidential Travels Open the Eyes

Some of the benefits of being president are the opportunities to visit actuaries, employers and universities and to attend actuarial meetings across North America and around the world.

One of the burdens of being president, however, is journeying to and from these events. Aside from normal flight

delays and missed connections, most of my actual travel has been uneventful, with two exceptions. My very first official visit (to Mexico in September 2017) had to be cancelled because of a local earthquake. Harsh weather conditions also factored into my aborted visit to the Asian Actuarial Conference in Hong Kong in September 2018: All flights were cancelled for two days because of a

with the Actuarial Students National Association in Ottawa and Montréal were so impressive. The number of attendees was enviable — over 1,500 combined for two meetings! As a Canadian, I was proud to meet these hopeful young people in two of Canada's finest cities.

In the lower 48, I was thrilled to visit campuses at Temple University in Philadelphia, Ohio State in Columbus



The author (right) with Kevin Shin, the CAS Student Ambassador at Ohio State, in March 2019. Shin has since graduated with a BS in actuarial science.

Whether it's actuarial students in North America or established leaders in the industry both here and abroad, the goals of all my meetings are to forge and strengthen relationships.

severe typhoon! Fortunately, CAS Board Chair Brian Brown was able to carry out a goodwill visit later in December 2018.

From the time I became president-elect to my current service as president, I have taken over 40 trips — and I have eight more lined up for the end of 2019! That's a lot of traveling! While the actual journey can sometimes be rough, the meetings themselves have been wondrous events. Overall, the benefits have far outweighed the burdens.

Of all these events, the element they have in common is outreach. Whether it's actuarial students in North America or established leaders in the industry both here and abroad, the goals of all my meetings are to forge and strengthen relationships. With university students, I am promoting the actuarial career to the next generation of actuaries with the hope that they will choose the P&C route. I was impressed with my meetings

and University of Connecticut in Storrs this spring. As I anticipated, the students and professors were very welcoming and asked lots of questions about pursuing a P&C actuarial career. However, they all expressed disappointment that the CAS/SOA combination had not gone through as they had really hoped for a common preliminary syllabus. Sometimes the road is not smooth, but my successors and I will continue to build connections with universities and students.

Dialogue with other actuarial organizations around the world at meetings of the International Actuarial Association (IAA) helps solidify their bonds with us, the CAS. Together, we all work to strengthen the profession. CAS leaders had excellent one-on-one meetings with the heads of all the major actuarial bodies at semiannual IAA meetings in

President's Message, page 10



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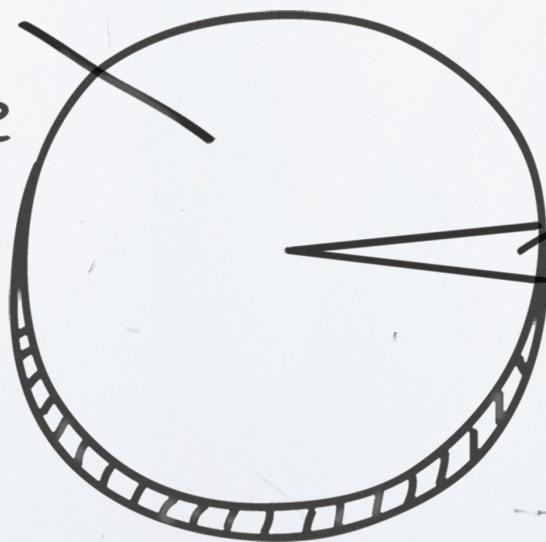


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President's Message

from page 6

Mexico City, Washington and Berlin. As well as specific bilateral concerns with each organization, our talks focused on what new initiatives each was undertaking and how we can learn from each other. Other organizations are particularly interested in our efforts related to the CAS Institute. Another common theme was refining the model for IAA governance.

At the Global Data Science Summit in London, U.K., organized by the Institute and Faculty of Actuaries, the overall consensus was that big data and data science are great opportunities as well as threats for our profession. This will continue, and our global actuarial community will rise to the challenge.

At semiannual meetings of the North American Actuarial Council (NAAC) in Puebla, San Diego and Otawa, I had the opportunity to deepen my personal relationships with the leaders of all the actuarial organizations in North America. The CAS will be hosting the next NAAC meeting in Charleston, South Carolina, where I hope we can reciprocate the hospitality shown by our previous hosts.

The highlight of my term as president has been the opportunity to meet CAS members in numerous settings, particularly to meet new Fellows and Associates at the New Orleans Spring Meeting. With record attendance expected for the Honolulu Annual Meeting, I am anticipating even greater festivities and celebrations in November. The large numbers of exam candidates and new Associates and new Fellows within the CAS speak well for both our reputation as the preeminent provider of

P&C actuarial education and the future of the CAS.

But we cannot be complacent and rest on our laurels. Other travel has taken me to visit The Institutes in Malvern, Pennsylvania, to better understand how they design educational material and examinations. I've also met with executives of individual actuarial employers and with our Employer Advisory Group to discuss how the CAS offerings, both pre- and post-Fellowship, can be improved to help address employer expectations from actuaries.

Being CAS President has certainly been an eye-opening experience. During my travels and discussions, I have found not only tremendous diversity in opinion but also a great deal of commonality of interest and approach to issues among actuaries. My travels are not yet done — remember that I have eight more trips in my future. Before the year is finished, I will have learned quite a lot, but not everything. What an education! ●

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.

COMINGS AND GOINGS

Alan Lange, FCAS, has been appointed to vice president, homeowners pricing actuary, at SageSure Insurance. Lange has more than 30 years of insurance experience, working extensively in personal property pricing and risk management.

Pinnacle Actuarial Resources has promoted **Nicholas Gurgone, FCAS**, to consulting actuary. Gurgone joined Pinnacle in 2015.

Matthew Mosher, FCAS, has assumed the role of president and CEO at AM Best. Mosher previously held the role of executive vice president and chief operating officer at the same company.

Jayne Plunkett, FCAS, has joined AIA Group as chief risk officer. Plunkett joins AIA from Swiss Re where she was CEO for reinsurance and regional president for Asia.

Lucas Koury, FCAS, has been appointed to chief actuary for Zurich Canada. Koury comes to Zurich with 15 years of actuarial experience, most recently as director of actuarial services at PwC Canada. ●

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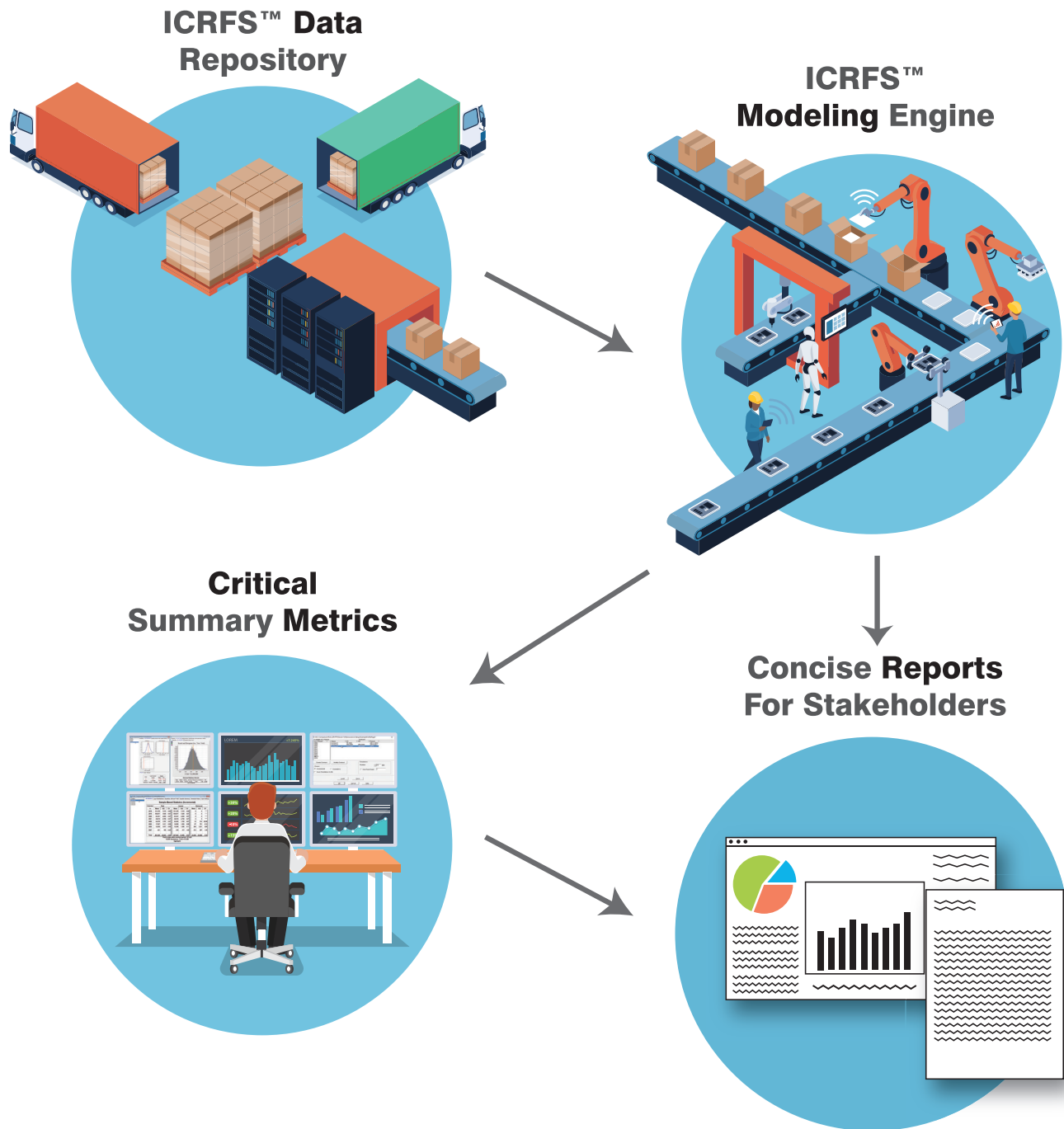
IN MEMORIAM

Philip G. Buffinton (ACAS 1962)
1923-2016

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November 10-13, 2019

Annual Meeting
Hilton Hawaiian Village Waikiki
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March 9-10, 2020

ERM Symposium
The Westin Tampa Waterside
Tampa, FL

March 23-25, 2020

Ratemaking, Product
and Modeling (RPM)
Seminar & Workshops
Sheraton New Orleans
New Orleans, LA

May 10-13, 2020

Spring Meeting
Hilton Chicago
Chicago, IL

June 1-2, 2020

Seminar on Reinsurance
Loews Philadelphia Hotel
Philadelphia, PA

September 14-16, 2020

Casualty Loss Reserve Seminar
(CLRS) & Workshops
Hilton Orlando Bonnet Creek
Orlando, FL

November 8-11, 2020

Annual Meeting
Washington Marriott Wardman Park
Washington, D.C.

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.

A Humble Man

Edward C. "Ted" Stone (FCAS 1990)
Circa 1960-2018

Edward C. "Ted" Stone was such a humble man that few of his actuarial colleagues were aware he was from one of Philadelphia's more affluent families. Despite his heritage, Ted strove to create his own path. Gifted with mathematical skills, he chose the actuarial profession. Ted succeeded in his self-made career endeavor and made notable contributions as a member of the CAS Syllabus Committee, until he was struck by an aggressive form of cancer in his early 50s. Ted courageously battled this disease for years, undergoing lengthy surgical procedures on a number of occasions. He managed to keep his pleasant demeanor throughout. A lifelong sports fan who held season tickets to the Philadelphia Phillies, Flyers and Eagles, Ted survived long enough to see his beloved Eagles finally win a Super Bowl in 2018 — something that thrilled his friends and relatives. In fact, despite his deteriorating health, Ted traveled from Philadelphia to Minneapolis to witness the championship game in person. He is survived by his wife, Liz, his three children and numerous fond memories that he instilled in those who had the pleasure of knowing him.

—*Stu Sadwin, FCAS, MAAA*

Passionate About Nature

Nathan K. Voorhis (ACAS 1997)
1968-2018

Nathan Voorhis, COO and CRO at AmeriTrust Group, Inc. in Westerville, Ohio, died unexpectedly at the age of 50. He held bachelor's degrees in both mathematics and education from West Liberty University and a master's in applied mathematics from West Virginia University. He was a member of the American Academy of Actuaries and a former president of Buckeye Actuarial Continuing Education. Voorhis loved the outdoors and spent much of his time in the woods caring for his land in Ohio. He and his wife were runners, and he successfully completed two half-marathons and numerous 5Ks. He was passionate about animals and rescued several Doberman pinschers and his favorite pit bull, Dottie. A devoted family man, he was adventurous, dependable and loyal, with a strong work ethic. Surviving are his wife of 25 years, Vonnice Voorhis (Haught); son, Derek; parents, Norman and Vicki Voorhis (Arman); brother, Gary; mother-in-law, Nina Haught; stepchildren, Erica and Tony Berger; and many family members. In 2019 AmeriTrust created The Nathan K. Voorhis Memorial Gift Fund at St. Jude Children's Research Hospital with a donation of \$10,000. Nathan and Vonnice Voorhis were great supporters of the work done by St. Jude. Donations to the fund can be made at the following link: <http://giftfunds.stjude.org/nathanvoorhis>.

The Proud Kiwi

Stephen S. Makgill (FCAS 1957)

1929-2019

Stephen Makgill died peacefully at his home in Newtown, Pennsylvania, at the age of 89. He was married to Joan Woods Makgill for 63 years. Heather Makgill Lyon wrote that her father took great pride in being a CAS Fellow and that he and her mother had many great memories of CAS meetings and gatherings. An active CAS volunteer, Makgill most notably chaired the Long-Range Planning Committee (1986-1988) and received the Matthew Rodermund Memorial Service Award in 2008. He was born in Auckland, New Zealand, and graduated from the University of Michigan. He worked at The Travelers Companies in Hartford for 20 years. He moved his family to Berwyn, Pennsylvania, when he became president of the Pennsylvania and Delaware Compensation Rating Bureaus. In 1989 he retired with his wife to Fripp Island, South Carolina, where they spent 27 years playing golf and tennis. The couple loved to travel and often visited family and friends in New Zealand. Makgill also loved to fish. Makgill is survived by his wife; children, Kathleen (Greg) Sisk, Stephen (Kelly) Makgill Jr., Heather (William) Lyon and Allison (Trevor) Giles; brother, David of New Zealand; 15 grandchildren; and two great-grandchildren.

The Chess Player

Roy A. Berg (ACAS 1956)

1927-2018

After a full and productive life, Roy Albert Berg passed away peacefully at the age of 90 in Madison, Wisconsin. Born in Chicago, Berg worked as an actuary and vice-president at Old Republic Insurance Company in his hometown and at American Family Insurance in Madison. He valued his Norwegian roots, learning Norwegian as an adult and obtaining a master's in Scandinavian Studies in his 70s. He belonged to the *Ygdrasil* Literary Society and the *Torske Klubben* in Madison. Another passion of his was chess. He was a member of The Cliff Dwellers Club in Chicago and served a term as president. He served as first board of the chess team for the Cosmos Club in Washington, D.C. and traveled internationally for the club, winning games in Paris and London. He was the only team member to have a draw against the Capablanca Chess Club in Havana. He is survived by his wife of 67 years, Dorothy Dahlberg Berg; daughters, Ellen Marie and Christine Dorothy; son-in-law, Cyril W. Draffin Jr.; and four grandchildren. Berg was predeceased by his son, Eric Martin Berg. In lieu of flowers, donations may be made to the Eric Martin Berg Memorial Endowment at Knox College (www.knox.edu/berg).

The Educator

Geoffrey Crofts (ACAS 1953)

1924-2017

Geoffrey Crofts, age 92, passed away peacefully on March 14, 2017. Crofts was born in Winnipeg, Manitoba, Canada, to Thomas and Elsie Crofts. As a college professor at the University of Manitoba, Occidental College and the University of Hartford and as dean of the School of Actuarial Science at Northeastern University, he had an impact on the lives of students throughout the world. He was passionate about teaching and his pupils. He traveled around the world to teach and on trips given to him by his students to honor him. He was a Fellow of the Society of Actuaries and was active in his profession, his church and his community. Crofts kept fit by attending Silver Sneakers classes at his local gym. He was considered a guiding light for his family and a generous soul to all he met. He was preceded in death by his wife, Jean Crofts. He is survived by his sister, Irene Crofts; children, Gerald Crofts, Barbara (Barry) Purchase and Karen (Jon) Tyson; four grandchildren; three great-grandchildren and two more anticipated at the time of his death. In lieu of flowers, memorial contributions may be made to the Southern Poverty Law Center or the Geoffrey Crofts Bursary at the University of Manitoba. ●

CAS STAFF SPOTLIGHT

Meet Elizabeth Murray

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

- **What do you do at the CAS?**

I am the human resources manager at the CAS, responsible for staffing-related issues including recruitment, benefits, payroll, training and performance management.

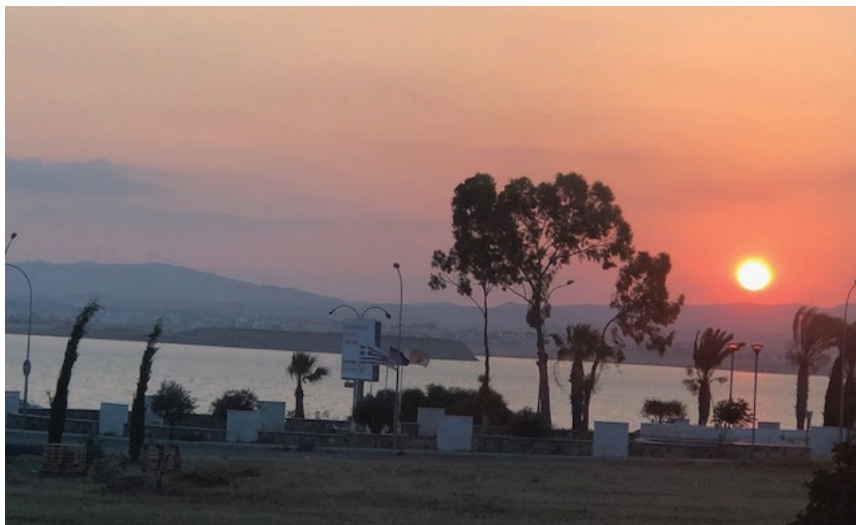
- **What do you enjoy most about your job?**

I like the variety of my work, but more importantly, the people I work with.

- **What's your hometown?**

London, U.K. I moved to Washington, D.C. in 2003 and, with the exception of a break from 2011-2015 when my family and I lived in Paris, France, I have been here ever since.

A sunset in Cyprus.



- **Where'd you go to college and what's your degree?**

I went to Brunel University in London and graduated with a BA in business administration (majoring in human resource management). I also have a post-graduate qualification in human resources development and am a chartered member of the U.K. Chartered Institute of Personnel Development.

- **What was your first job out of college?**

My first job out of college was working for HSBC Investment Bank in London in graduate recruitment and training. This position confirmed my desire to pursue a career in human resources. From there I went on to work in a range of generalist and specialist HR roles in organizations including Citigroup, EY and a recruitment search firm,



Elizabeth Murray

before finally moving to the U.S. In the States, I have worked as an HR manager for non-profit and trade association organizations.

- **Describe yourself in three words.**

Reliable. Friendly. Open.

- **What's your favorite weekend activity?**

I enjoy cooking, gardening and boating, and I like to relax with my family.

- **What's your favorite travel destination?**

I love to travel and regularly have a trip planned abroad, but I have a soft spot for Cyprus as I have family living there and have great vacation memories.

- **Name one interesting or fun fact about you.**

When I was younger, I wanted to be an actress and was featured in a few advertisements — don't try to Google as it was long before the internet! My claim to fame was 40 seconds in a 1983 film called *Anna Pavlova* (also known as *Pavlova: A Woman for All Time*), where I was a ballerina in the great Russian dancer's class. Film director Martin Scorsese played a cameo role. ●

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5,000th CERA Credential Awarded

Victoria Gao is the 5,000th professional to earn the Chartered Enterprise Risk Analyst (CERA) credential, announced the CERA Global Association (CGA) on June 3, 2019. Gao is a member of the Actuaries Institute in Australia and an associate director in the debt markets securitization team at the Commonwealth Bank of Australia.

"There is strong global demand for skilled enterprise risk management professionals. CERA is one of the most comprehensive and rigorous enterprise risk management qualifications available," said CGA Chair Nick Dumbreck.

"For me CERA was very relevant due to its applicability in nontraditional actuarial fields of work," Gao commented. "The theory provides a good foundation in the understanding of risk, its assessment and treatment."

Dumbreck recognized this milestone as an important step forward for global risk management. "CERAs are able to assess and manage the entire risk spectrum of an organization including financial, operational and strategic risk. Victoria and the other CERAs around the globe add value to enterprise risk management through their rigorous training, making them the best equipped to provide a 360° view of an organization's risk profile."

The CGA grants actuarial organizations, including the CAS, the right to award the global CERA credential to individual actuaries who have satisfied the requisite education and training requirements. Organizations are first subject

to a rigorous review of their proposed CERA program to ensure that it meets the CGA's exacting standards.

Currently, organizations in Australia, Austria, Denmark, Finland, France, Germany, India, Israel, Japan, the Netherlands, Republic of China (Taiwan), South Africa, Spain, Sweden, Switzerland, United Kingdom and the U.S. are authorized to award the CERA credential.

The CERA qualification was initially established in the U.S. by the Society of Actuaries in 2009. That year, 14 national associations from 12 countries joined to create the global CERA credential, which addresses the growing need for

highly qualified risk professionals, especially in the finance sector.

The CAS currently has over

150 CERA credential holders among its membership. The CAS requirements for earning the credential include successfully completing Exam SP9, Enterprise Risk Management Specialist Principles, administered by the Institute and Faculty of Actuaries (U.K.). For more details on earning CERA through the CAS, see the CERA page on the CAS website.

Further information on earning a CERA and how employing a CERA can benefit your business can be found on the CERA Global Association website. ●



Victoria Gao, CERA

 **CERA** | **10**
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Meet the 2019 CAS Trust Scholarship Winners

The CAS has selected three university students as recipients of the 2019 CAS Trust Scholarship, an honor created to further students' interest in the property-casualty actuarial profession and encourage the pursuit of the CAS designations. The program awards up to three scholarships annually to actuarial students for the upcoming academic year, ranging from \$5,000 to \$10,000. This year's awardees are Tommy Anderson, a senior at the University of St. Thomas in St. Paul, Minnesota; Jack Richards, a senior at Drake University in Des Moines, Iowa; and Cason Wight, a senior at Brigham Young University (BYU) in Provo, Utah.

The recipient of the program's \$10,000 scholarship, Anderson, has gained industry experience at Travelers Insurance, where he interned in 2017 and 2018. He returned to Travelers this summer as an intern in the Actuarial and Analytics Leadership Development Program, focusing on small commercial analytics. Anderson participates in several campus activities including vice president of alumni relations for Gamma Iota Sigma and player on the men's varsity basketball team. "I'm honored to receive this prestigious award and grateful for the tremendous generosity of the CAS. This organization provides aspiring actuaries like me with the support they need to grow into industry leaders and positive difference-makers. The award further inspires me in my pursuit of the FCAS designation, and I am excited for the opportunity to meet and learn from many great actuaries through my involvement with the CAS. I also want to thank God, my family and friends, the faculty at St. Thomas, and my cowork-



Tommy Anderson



Jack Richards



Cason Wight

ers for their continuous support in my journey," said Anderson.

Richards, recipient of a \$5,000 scholarship, has completed three internships and spent this summer at Deloitte Consulting as a Summer Scholar with the Actuarial and Insurance Solutions practice. Previous internships include Farm Bureau Financial Services in fall 2017 and Travelers Insurance from 2017 to 2018. Richards is active at Drake University, having served as co-president of the Gamma Iota Sigma Chapter in 2018 and director of the Drake Symposium the last two years. "I am proud to be a recipient of the 2019 CAS Trust Scholarship Award. I've been amazed by the passion and volunteerism of the Casualty Actuarial Society, and I aspire to obtain my credentials and exemplify these values as a future actuary," said Richards.

Wight, recipient of a \$5,000 scholarship, spent last summer as a P&C actuarial intern at Oliver Wyman and pursued an internship at Cigna this summer. He is a leader within BYU's Actuarial Club, serving on its executive committee. Wight has also participated in several actuarial research projects and has shared those results at two student research competitions at the 2018 CAS Annual Meeting. The projects have also

resulted in a written report, "Auto Loss Cost Trends: Q4 2017," published by the CAS and SOA, and an academic paper to be published by an academic journal in fall 2019. "I am honored and thrilled about the scholarship. I appreciate what the CAS does and how they are supporting me in my education. I hope to have a positive impact on the profession going forward," said Wight.

CAS Trust Scholarship winners are chosen by the CAS Trust Scholarship Subcommittee. They must be enrolled, full-time students at a U.S. or Canadian college or university, show high scholastic achievement, and have taken at least one actuarial exam. A selection committee of CAS members assesses the candidates' academic records, two letters of recommendation and an application essay.

"The 2019 application process was highly competitive, and we were delighted to see that the CAS continues to attract top talent to its ranks," said Silvia Bach, FCAS, chair of the CAS Trust Scholarship Program. "The three scholarship recipients are outstanding individuals from a large pool of applicants. We look forward to recognizing and celebrating their achievements at the 2019 CAS Annual Meeting in Hawaii!" ●

The CAS Names 2019 University Award Winners

The CAS University Award Program recognizes innovative and exemplary ways that universities are preparing students for careers in the property-casualty insurance industry. The recipients for 2019 are Illinois State University, University of Connecticut and University of Toronto. Each school will receive a \$5,000 award to further enhance their programs. They will be recognized during the 2019 CAS Annual Meeting, November 10-13, 2019, in Honolulu, Hawaii.

Introduced in 2016, the goal of this annual award is to help promote and share ideas within the academic community and to celebrate and honor universities doing extraordinary work of preparing future P&C actuaries. The selection process is extremely competitive, with 33 schools throughout North America, Asia and Australia having sought recognition. Winners of the 2019 CAS University Award Program were determined by a panel of judges from the P&C insurance industry.

"The award program has entered its fourth year, and we have made innovation the center of our evaluation process," said Chris Coleianne, FCAS, CAS University Award Program chair. Award applicants were asked to share the innovative ways they have incorporated P&C concepts into their curriculum, research and industry engagement. "It's so exciting to see how the schools have continued to change and adapt their programs to prepare their students for careers in the property and casualty industry," said Coleianne. "This year's winners have distinguished themselves among the many strong applicants."

Meet The University Award Program Winners



University of Connecticut

The University of Connecticut (UConn) actuarial science program has eight actuarial faculty members, 14 adjunct professors and over 500 actuarial students. As a winner of the CAS University Award in 2016, the school had to wait three years to apply for the award again. During that time, UConn continued enhancing its P&C focus across the three key areas and reemerged as a two-time winner.

UConn's program highlights include the following:

- UConn added a required P&C ratemaking course for all actuarial science majors and a P&C reserving

course. Students concentrating on P&C subjects can choose courses that expose them to all subjects covered on CAS Associate-level exams. Actuarial students are also trained in relevant programming languages and are required to take two writing courses.

- Another required course, the Foundations of Actuarial Science, is a business-oriented actuarial class incorporating a moderated panel to study risk analysis for a publicly traded company. Over the course of the semester and through instructor-moderated discussions, students gain a deeper understanding of the role that P&C insurance can play in managing risk.
- Beginning in their sophomore year, actuarial students can take a case studies course in actuarial science that can give them realistic experience in P&C subjects and can hone their critical thinking and communication skills. Industry partners

Brian Brown, FCAS, CAS past president, addresses actuarial students at the University of Connecticut in Storrs.



contribute real-world, business issues material that is incorporated into the course's case studies.

- Another opportunity for real-world exposure is through an internship program developed in partnership with the State of Connecticut Department of Insurance, led by Chief Actuary Wanchin Chou, FCAS.

Interns receive course credit as they fulfill rotations, half on the P&C side and half on the life side.

"We are grateful for the outstanding support that the Casualty Actuarial Society provides to colleges and universities," said Jim Trimble, UConn's actuarial science program director. "CAS support benefits the students, the schools that offer such programs, and the insurance profession. We look forward to continuing our partnership with the CAS to further enhance our property and casualty offerings."

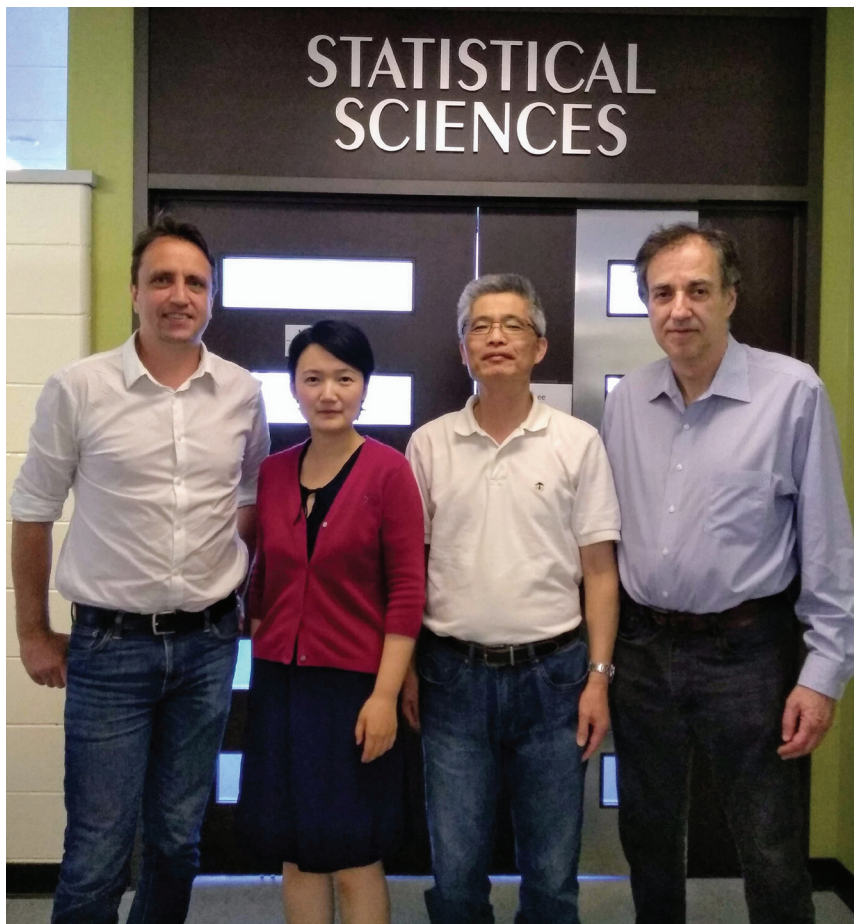


Statistical Sciences
UNIVERSITY OF TORONTO

University of Toronto

The University of Toronto's actuarial science program has five actuarial faculty members, more than 10 adjunct instructors, and about 228 actuarial students. The university impressed the judges with its focus on P&C insurance as shown in the following examples:

- The university offers a wide range of actuarial courses related to P&C insurance, including a three-course P&C series taught by seasoned CAS Fellows working in the Canadian P&C industry: Reserving Methods for P&C, Ratemaking Methods for P&C and Advanced Methods for



University of Toronto's actuarial program faculty are, from left to right, Andrei Badescu, Vicki Zhang, Sheldon Lin and Sam Broverman.

P&C (incorporating catastrophic pricing) and Reinsurance Pricing and GLM applications to P&C.

- Several opportunities are available for real-world exposure to the P&C industry through various courses and programs. These include a case studies and communications course focusing on presentation skills, a peer-mentorship program embedded into a data science course for actuarial students, and the actuarial club's mentorship program pairing industry professionals with students.
- Collaborations with P&C industry partners with professors and

students to conduct research aim to produce highly innovative and implementable models and methodologies to solve real-world problems in P&C insurance.

"We are thrilled to receive the CAS University Award this year! University of Toronto has been building a world-class actuarial science program for decades and, in the past few years, the addition of a suite of P&C courses has further elevated our profile in the P&C insurance sector," said Professor Vicki Zhang, associate chair, Undergraduate Studies in Actuarial Science. "We feel honored and energized to be recognized for our efforts. We also want to take this

opportunity to thank all our amazing industry instructors who had devoted huge amount of personal time to enrich our program. They are our partners in the truest sense. And of course, thank you CAS, for the award!"

Illinois State University



The Illinois State University (ISU) actuarial science program has 22 actuarial faculty members who teach required classes to 180 actuarial students. As a winner of the first CAS University Award in 2016, the university continued developing its P&C curriculum and research as well as growing its industry engagement.

ISU incorporates a wide variety of P&C topics into the undergraduate and graduate curriculum. Classes cover material on all of the CAS exams, VEEs and ACAS-required online courses. Some of ISU's program highlights include:

- The program is oriented towards practical actuarial professionalism, training students for real-world actuarial work. Students are required to get actuarial internships, and the majority fulfill this requirement at P&C companies.
- Students can also participate in "internship-like" experiences through



Actuarial students from Illinois State University in Normal.

programs like Pinnacle Actuarial University, which pairs students with analysts from a consulting firm to conduct projects on current P&C topics.

- The university hosts a Predictive Analytics Competition, supervised by P&C actuaries, and a Visual Analytics Competition organized by the ISU Katie School of Insurance.
- The university prides itself on the involvement of students in research work with faculty, both in its actuarial and insurance programs. The faculty consistently produce high-quality research publications

on P&C insurance topics. Based on the research by ISU's faculty and students, a symposium is organized each year by the Katie School, which also publishes the research studies online. Last year's symposium was "Disruptors, Distractions, & Drones."

"We are extremely happy that Illinois State University is a winner of the 2019 Casualty Actuarial Society, the second time after receiving it in the inaugural competition in 2016. It is a great honor and a great motivator to continue our work dedicated to the future of the actuarial profession." ●

CAS Receives Industry Awards for *Actuarial Review* and Social Media Campaigns

By JESSICA WHELAN, CAS PUBLIC RELATIONS COORDINATOR

The Casualty Actuarial Society was honored for exemplary work over the past year, garnering three coveted EXCEL Awards for marketing and communications projects: the *Actuarial Review* feature article “Driverless Utopia,” a social media campaign “Actuaries in Pop Culture Week” and the social media campaign for the 2018 CAS Annual Meeting. The EXCEL Awards, hosted by Association Media & Publishing, recognize excellence and leadership in nonprofit association marketing and communications. Winners in each of the highly competitive contest categories, which received over 750 entries this year, were honored at the EXCEL Awards Gala on June 24 in Washington, D.C.

The complete listing of awards includes the following:

“Driverless Utopia” [Bronze EXCEL Award — Magazine Feature Article]

“Driverless Utopia” headlined the May-June 2018 issue of *Actuarial Review*, which was the most viewed issue of the



CAS staff members (from left to right) are Elizabeth Smith, Jessica Whelan, Mike Boa and Clarisa Figueroa.

year on the magazine’s website. Written by Annmarie Geddes Baribeau, the article combined engaging graphic elements with thought-provoking editorial content to examine a world caught between available technology and public perception.

#ActuariesinPOP [Gold EXCEL Award — Social Media Campaign-Other]



Over the course of a week-long campaign, the CAS shared some of the best pop culture references to actuaries from a variety of media on social media platforms using the hashtag #ActuariesinPOP. The content was delivered via customized graphics inspired by pop art to mirror the pop culture theme.

2018 CAS Annual Meeting [Gold EXCEL Award — Social Media Campaign Event/Convention]



The 2018 #CASAnnual campaign was executed on a variety of social media platforms before, during and after the meeting last November, and it included elements such as a social media toolkit for speakers, a daily Twitter contest for attendees and a custom Snapchat filter.

Association Media & Publishing will showcase EXCEL Award winners in the August/September issue of its *Signature* magazine. ●

Hemp: A Puzzle for Farmers and Actuaries Alike

By REBECCA ARMON

The 2018 Farm Bill legalized hemp, but what does that mean for farmers and how will actuaries play a role in developing crop insurance for it?

Marijuana has been in the news lately as multiple states have legalized it even though the Drug Enforcement Administration still lists it as a Schedule I drug. Hemp is another product of the cannabis plant that is getting some legal support at the federal level. The 2018 Farm Bill defined hemp as “the plant *Cannabis sativa* L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not” and specifies the limitation “with a delta-9 tetrahydrocannabinol (THC) concentration of not more than 0.3 percent on a dry weight basis.” The limit exists because THC is the part of the cannabis plant that makes people high. The Agricultural Act of 2014 allowed industrial hemp cultivation under state-controlled pilot programs, but the 2018 Farm Bill put in regulations to expand farming hemp. The 2018 bill requires states and tribal governments to develop a plan to monitor the amount of THC in the plants and dispose of any that exceed the 0.3% level.

What uses are there for hemp that would make it a valuable crop to grow? Hemp fiber has been touted as being better for the environment than cotton and CBD (cannabidiol) oil derived from the *Cannabis sativa* plant¹ has more significant monetary value. CBD oil is being studied for possible medical uses, but even without proven results, a 1-ounce bottle of CBD tincture with 300 milligrams of CBD can sell for \$50.² Worldwide legal production has grown



¹ Brian O’Connell, “CBD Oil vs. Hemp Oil: What’s the Difference in 2019?” The Street, Accessed April 29, 2019. <https://www.thestreet.com/lifestyle/cbd-oil-vs-hemp-oil-14941418>

² “How CBD Oil Prices Have Changed from 2012 to Today,” Made by Hemp’s CBD News. <https://madebyhemp.com/cbd-oil-prices-changed-2012-today/>

from 1.3 tons in 2000 to 100.2 tons in 2015, with about half grown in Canada and most of the rest in the United Kingdom. In 2015, the United States imported 25.1 tons.³

In the United States, farmers who want to plant hemp face many issues, including where they can buy the seeds and whether they need new machinery to harvest the crop. Also, the return they can expect from their harvest is uncertain and federal crop insurance is not currently available to cover the farming risks. Farmers often obtain loans to buy seeds, which can cost \$7 per pound on hemp varieties grown for fiber⁴ and \$0.25 to \$1 per seed for the type of hemp that produces CBD oil.⁵ These loans can be difficult to acquire as banks are more likely to lend to farmers who have crop insurance. In Illinois 12,000 acres of hemp are being planted, mostly for CBD oil, but that makes up less than 0.1% of total farmland in the state. Currently, 86%⁶ of insurable farming acreage in the U.S. is insured through federal crop insurance. The remaining 14% is either uninsured or only insured through private insurance, like crop hail coverage.

There are two main types of crop insurance, and farmers can choose to buy neither, one or both. Private crop hail insurance probably has a smaller market penetration partly because the premiums are not federally subsidized and covers only hail losses. Federal crop insurance, on the other hand, is regulated, subsidized and reinsured by the federal government. The subsidies and reinsurance over the next 10 years of the federal crop insurance program are budgeted at 9%⁷ of the \$867 billion⁸ price of the 2018 Farm Bill.

The 1996 Farm Bill created the Risk Management Agency to administer the Federal Crop Insurance Corporation (FCIC) and in the 2000 Farm Bill, Congress “expanded the role of the private sector allowing entities to participate in conducting research and development of new insurance products and features.”⁹

Federal crop insurance is also known as multi-peril crop insurance (MPCI) because it covers additional causes of loss such as drought, flood and decreased crop prices. MPCI functions by guaranteeing a certain revenue or yield, usually based on historical experience.

MPCI is a combined effort between the federal government and the private companies that have been approved by the federal government to sell crop insurance. These Approved Insurance Providers (AIPs) must take all comers, but they can choose to keep policies in their “commercial fund” or cede up to 75% of their premium by state to the “assigned risk fund,” where the federal government takes an 80% quota share of the business. It is quite likely that actuaries at one or several of the AIPs will help develop rates for crop insurance for hemp. The federal government also acts as a reinsurer sharing in the profits and accepting the losses as illustrated in Figure 1. These rules are all presented in the Standard Reinsurance Agreement (SRA) that is updated each year by the FCIC.

For gross loss ratios under 100%, the federal government shares part of the profits, increasing the AIPs’ net loss ratios. If the gross loss ratios are above 100%, the federal government shares part of the losses, decreasing the AIPs’ net loss ratios. There are three sets of net loss ratios, with the assigned risk net loss ratios having the narrowest band of possible outcomes, from 88.6% to 116.5%. Policies kept in the commercial fund are separated into two groups: policies written in the Corn Belt states and policies written elsewhere. The Corn Belt states are Kansas, Illinois, Iowa, Indiana, Missouri and Nebraska. A lot of money can be made by insuring in the Corn Belt states, so in an effort to make sure the AIPs would operate elsewhere, the FCIC created net loss ratios that gave the other states more profit and less loss potential as an incentive. Thus, Corn Belt states’ net loss ratios can be from 65.25% to 194%, while the other states can have net loss ratios from 57.4% to 151.5%.

³ “Narcotic Drugs 2016,” International Narcotics Control Board report. https://www.incb.org/documents/Narcotic-Drugs/Technical-Publications/2016/Narcotic_Drugs_Publication_2016.pdf

⁴ Chris Bennett, “How to Grow Hemp for CBD, Seed or Fiber,” *Farm Journal’s Ag Pro*, February 25, 2019. <https://www.agprofessional.com/article/how-grow-hemp-cbd-seed-or-fiber>

⁵ Peter Hancock, “Illinois hemp farmers leverage high risk for high profit potential,” *Northwest Herald*, June 14, 2019. <https://www.nwherald.com/2019/06/13/illinois-hemp-farmers-leverage-high-risk-for-high-profit-potential/ajw2ze2/>

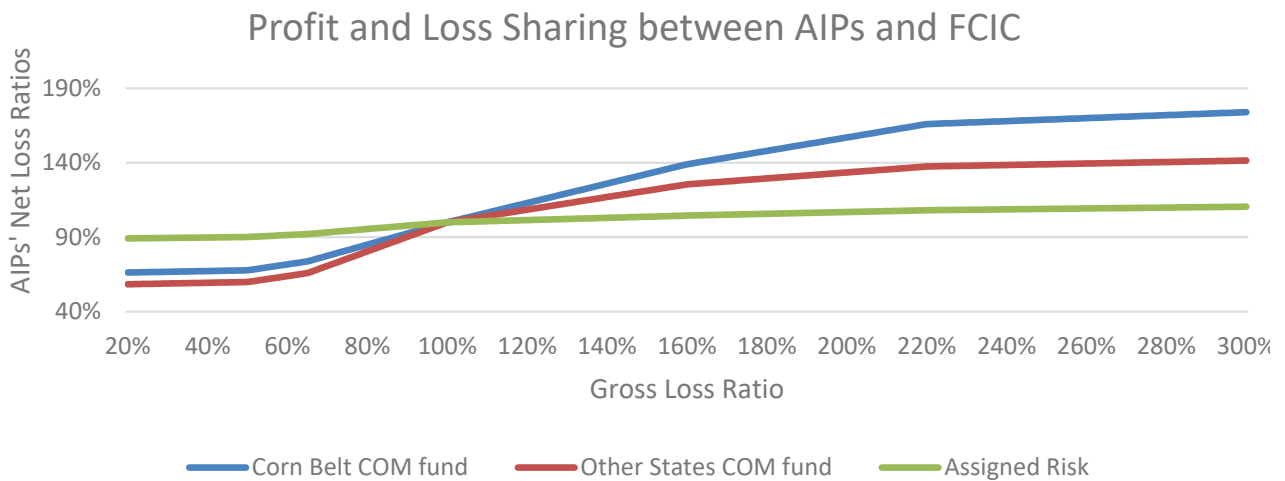
⁶ Isabel Rosa, Analyst in Agricultural Policy, “Federal Crop Insurance: Program Overview for the 115th Congress,” May 10, 2018. https://www.everycrsreport.com/reports/R45193.html#_Toc524363954

⁷ USDA, “Agriculture Improvement Act of 2018: Highlights and Implications,” May 14, 2019. <https://www.ers.usda.gov/agriculture-improvement-act-of-2018-highlights-and-implications/>

⁸ Keith Hall, Director of Congressional Budget Office, “Direct Spending and Revenue Effects of the Conference Agreement for H.R. 2, the Agriculture Improvement Act of 2018,” Letter to the chair of the Committee on Agriculture, U.S. House of Representatives, December 11, 2018. https://www.cbo.gov/system/files/2018-12/hr2conf_0.pdf

⁹ USDA Risk Management Agency, “History of the Crop Insurance Program.” <https://www.rma.usda.gov/en/About-RMA/History-of-RMA>

Figure 1. Relationship Between Gross and Net Loss Ratios for Assigned Insurance Providers



Source: U.S. Department of Agriculture Risk Management Agency.

Figure 2.

Net Loss Ratios			
	Commercial Fund		
Gross Loss Ratio	Corn Belt States	Other States	Assigned Risk
75.0%	81.25%	75.625%	94.375%
100.0%	100.00%	100.000%	100.000%
115.0%	109.75%	106.375%	101.125%

Source: U.S. Department of Agriculture Risk Management Agency.

Figure 2 is a small section of Figure 1 and will clarify the following example:

If an AIP wrote \$10M of gross premium in their commercial fund in Iowa and had a gross loss ratio of 75%, their net loss ratio would be 81.25% since Iowa is in the Corn Belt. This means gross premium would be \$2.5 million higher than gross losses, but the net difference between premium and losses would be \$1.875 million, meaning that the FCIC would profit by \$625,000. If this AIP put \$8 million of premium in Iowa in the assigned risk fund, in the first step, 80% would be ceded to FCIC, leaving premium net of quota share at \$1.6 million. Then if the assigned risk's gross loss ratio was 115%, the AIP's assigned risk net loss ratio would be 101.125%, resulting in

\$18,000 underwriting losses. Most AIPs would probably heavily use the assigned risk fund for a new and volatile crop like hemp.

There are several types of MPCI policies but the one most likely to be used for hemp is the Actual Production History (APH) policy, which is used for crops like oats, rye and tobacco. APH policies provide a guarantee based on coverage levels and the farmer's actual production history, the number of acres planted and the farmer's percentage share of the land. If the yield does not reach the guarantee, the insurance pays the difference between the guarantee and what the farmer made. Farmers can usually select within the range of 50% to 75% coverage, implying a deductible of 50% to 25%.

$$\begin{aligned} \text{Guarantee} &= \text{APH Approved Yield} \times \text{Coverage Level} \times \\ &\quad \text{Acres Planted} \times \text{Farmer's Share.} \quad (1) \\ \text{Given a Loss, Indemnity Payment} &= (\text{Guarantee} - \text{Actual} \\ &\quad \text{Yield}) \times \text{FCIC Price.} \quad (2) \end{aligned}$$

The APH approved yield is based on the farmer's actual production history when available. With a new crop like hemp, there will need to be transitional yields. The 2014 Farm Bill allowed industrial hemp cultivation under state-controlled pilot programs,¹⁰ so some history of production exists. Steve Rutledge, president and owner of Professional Land Manage-

¹⁰ Ryan Quarles, Kentucky's Commissioner of Agriculture, "Hemp connects Kentucky's past with its future," *Lexington Herald Leader*, June 5, 2018. <https://www.kentucky.com/opinion/op-ed/article212616434.html>

¹¹ Bennett, <https://www.agprofessional.com/article/how-grow-hemp-cbd-seed-or-fiber>

ment, has grown hemp for fiber and harvested 1 to 2.5 tons per acre¹¹ in the last three years. But 2015 through 2018 were good years for most crops, so that production might be higher than average. On the other hand, that production might turn out to be lower than average if farmers are still learning the best way to cultivate the plants. A transitional yield might be an average of 1.8 tons for the counties in Kentucky where Rutledge was farming. For other areas, insurance companies might compare the differential in yield of other crops and apply it to the hemp base yield.

Most crops are not all-or-nothing in terms of yield. In a bad year the yield may be significantly below average, but it is usually above zero. The CBD oil variety of hemp is the most profitable, but “CBD hemp reacts to stress by producing THC,” which can result in “more than CBD’s legal limit of 0.3% THC,”¹² which would then mean losing the whole crop. Historical data doesn’t have many total losses, so pricing hemp may be different from other crops. MPCIC policies could be written to exclude losses due to high THC levels or have a lower guarantee in those cases. Whatever limits placed on hemp guarantees would have to be agreed to by the U.S. Department of Agriculture’s Risk Management Agency and the AIPs.

For MPCIC policies, major crop prices are based on commodity prices at the Chicago Board of Trade or the Intercontinental Exchange, but other crop prices are determined by the FCIC. This could be an issue for a new crop like hemp where the prices may drop dramatically as the number of acres planted increases. Since 2012 CBD oil prices have dropped 88%.¹³ Also, with hemp prices much higher than any other crops, there can be severity issues. In 2017 the Illinois Department of Agriculture calculated an average price of \$673 for an acre of corn and \$557 for an acre of soybeans. But CBD production could be valued at \$90,000 to \$160,000 an acre.¹⁴

However, Rutledge says that hemp for fiber might pay 7 to 11 cents per pound, which translates to \$140 to \$220 per ton. At between 1.5 and 2 tons per acre that would be \$210 to \$440

an acre. This means there would probably need to be separate policies depending on the type of hemp grown and for what purpose. This is not new for crop insurance as crops grown for seed often have different policies from those grown for the plant itself.

Suppose the FCIC investigated what farmers are being paid for hemp fiber and decided to create a guaranteed price of \$170 per ton of hemp fiber. In the example of 1.8 tons of hemp grown for fiber per acre in Kentucky, if a farmer owned 100% of a 50-acre field planted with hemp and wanted a 70% coverage level, the guarantee would be:

$$\begin{aligned}\text{Guarantee} &= \text{APH Approved Yield} \times \text{Coverage Level} \times \\ &\text{Acres Planted} \times \text{Farmer's Share} \\ &= 1.8 \times 70\% \times 50 \times 100\% = 63 \text{ tons.}\end{aligned}$$

If that farmer only harvested 61 tons from his 50 acres, the indemnity payment would be:

$$\begin{aligned}\text{Indemnity Payment} &= (\text{Guarantee} - \text{Actual Yield}) \times \text{FCIC} \\ \text{Price} &= (63 - 61) \times \$170 = \$340.\end{aligned}$$

Guarantees for hemp fiber will be much less severe, and thus easier to price, than those for the CBD oil variety.

With CBD oil sales projected to rise from half a billion dollars in 2018 to \$1.8 billion by 2022,¹⁵ farmers are going to be interested in growing hemp. As the rates of smoking in the United States decrease, tobacco farmers are looking for another crop. Hemp was cultivated in Kentucky starting in the 1700s,¹⁶ so it is probably no coincidence that Senator Mitch McConnell of Kentucky sponsored the 2018 Farm Bill that legalized hemp.¹⁷ Farmers growing hemp will want MPCIC crop insurance. And the complexity of hemp with its 0.3% THC limit will be an interesting puzzle for both farmers and actuaries. ●

Rebecca J. Armon, FCAS, is an actuary with Tokio Marine HCC in Houston and a copy editor for Actuarial Review.

¹² Ally Marotti, “This is farming like we’ve never done before. Illinois hemp farmers face risks with first planting of newly legal crop,” *Chicago Tribune*, June 16, 2019. <https://www.chicagotribune.com/business/ct-biz-illinois-cbd-hemp-farmers-20190524-story.html>

¹³ <https://madebyhemp.com/cbd-oil-prices-changed-2012-today/>


¹⁴ Hancock, <https://www.nwherald.com/2019/06/13/illinois-hemp-farmers-leverage-high-risk-for-high-profit-potential/ajw2ze2/>

¹⁵ “Total U.S. cannabidiol (CBD) consumer sales from 2014 to 2022 (in million U.S. dollars),” Statista, 2019. <https://www.statista.com/statistics/760498/total-us-cbd-sales/>

¹⁶ Quarles, <https://www.kentucky.com/opinion/op-ed/article212616434.html>

¹⁷ John Hudak, “The Farm Bill, hemp legalization and the status of CBD: An explainer,” The Brookings Institution, December 14, 2018. <https://www.brookings.edu/blog/fixgov/2018/12/14/the-farm-bill-hemp-and-cbd-explainer/>

Coming of Age



By ANNMARIE GEDDES BARIBEAU



| How will Gen Z Impact Personal Lines Coverage?





Generation Z is entering the personal lines insurance market at a time when insurtech products are vying for their attention. Earlier generations were introduced to similar aggregated data-based products adjusted by risk and augmented with features. But Gen Z can choose from newer insurtech products that emphasize coverage by risk factor and specific use as well as other customer-centric approaches.

Born between 1996 to 2015, give or take a couple years, Generation Z is the most ethnically diverse and largest generation in American history. Also known as digital natives, Gen Z makes up 27% of the U.S. population, according to businessinsider.com.

“The insurance industry is underestimating Gen Z [and] how they can change the market,” says Steve Armstrong, vice president of product operations for the Allstate Corporation and president-elect of the Casualty Actuarial Society. “Gen Z [has the] firm belief insurance can be done better with more efficiency.”

Insurtech companies are betting that Gen Z will prefer customer experience with regular contact, from initial sale through the claims process and renewal, via multi-channel, digitally based transactions. There is also the presumption that this generation of consumers will be willing to share personal data to customize products.

Taking a cue from insurtech concepts, some traditional insurers are also jazzing up their game. Some are developing innovative new products and services using insurtech partnerships and cloud-based, digital technologies to meet customer needs, expectations and experience. Others are forging partnerships with or acquiring insurtech companies and technologies to be more competitive.

“Getting the tea”* about Gen Z’s preferences starts with appreciating how they differ from previous generations and how that could shape their choices.

The Gen Z Difference

“Each generation’s persona is shaped by events and conditions during their formative years,” explains David Stillman, co-author with his 20-year-old son Jonah of *Gen Z @ Work*. “If you try to market to Gen Z like millennials, it will not work,” Jonah Stillman warns, because Gen Z is more focused on survival and practicality while millennials desire meaning and passion.

Among the several influences on Gen Z, three will most likely have the greatest impact on personal lines insurance: Gen Z’s primarily Gen X parents, the economy and continuing technological change.

Born from about 1965 to 1982, Gen X became job-seeking adults when the prosperity from the Post-World War II economic boom was over. “Gen X is being squeezed financially,” says Warren Wright, who refers to Gen Z as second-wave millennials. He is founder and CEO of Second Wave Learning and author of *Second-Wave Millennials: Tapping the Potential of America’s Youth*.

*personal information

Even though Gen X was the only generation to fully recover their wealth after the Great Recession, Warren explains, the value of their capital assets, like their house and stocks, have not had time to accumulate into a decent amount during a long period of time compared to baby boomers. “So even though they ‘recovered’ their assets, their assets are not large,” he explains. Watching their primarily Gen X parents go into survival mode during the economic uncertainty of the Great Recession has also influenced Gen Z to be exceptional savers and careful spenders.

Compared to baby boomers and their millennials, Gen X parents are more pragmatic with their Gen Z offspring, notes Jonah Stillman. “Millennials were told as long as they participated, they were still winners. Gen Z was told there were winners and losers and you will have to fight for what you need.”

Being raised in post-9/11 America also sent a message early on to Gen Z that “the world is a dangerous place,” Warren says. This generation’s Gen X parents were part of the growing number of latch-key kids raised in the advent of increasing divorce rates and the dual-income family — all of which has influenced how they parent. Gen Z’s parents did not tend to let them go and explore the world.

Growing up with existential threats has made the desire to survive deep in Gen Z. Some older Gen Zers identify with Katniss Everdeen, the heroine from the *Hunger Games* who risks her life to participate in a sinister survival-of-the-fittest game of elimination as her sister’s proxy. Gen Z’s parents also hover over their offspring’s “every move to make sure they don’t take any risks or make any mistakes,” Warren observes. Therefore, Gen Z’s tendency to be risk averse and security- and survival-minded makes insurance an appealing product. Gen Z will like the idea of insurance, Warren predicts, but warns, “If insurance is packaged in a traditional, old-school manner, Gen Zers will never get the message.”

Perhaps the most important influence on Gen Z is grow-



Jonah Stillman

“Millennials were told as long as they participated, they were still winners. Gen Z was told there were winners and losers and you will have to fight for what you need.”

ing up and reaching adulthood with smartphone in hand. Previous generations, explains Jonah Stillman, were digital¹ pioneers while Gen Z is the first generation of digital natives who has only known a world with digital access. “Technology is just who we are,” he explains. “We expect technology instead of accept it.”

Ninety-five percent of Gen Z aged 13 to 22 years own smartphones, according to the “State of Gen Z 2018.” Most “cannot live” without them. Fifty-eight percent of Gen Z reports feeling uncomfortable if they don’t have their phones for a few hours or less, according to a survey of about 1,000 Gen Zers published last fall by The Center for Generational Kinetics. Of these, 31% are uncomfortable with being away from their phones for a half hour or less. Offering internet access, smartphones, as opposed to cell phones, serve as the lifeline for Gen Z and millennials. Pew Research echoes a similar sentiment in its “Mobile Fact Sheet,” dated June 12, 2019. It notes that 96% of those aged

18 to 29 own smartphones. That figure gradually tapers down to the oldest generations of baby boomers and traditionalists who are more than 65 years old. For that group, 53% own smartphones, while 39% own cell phones and 9% do not own mobile phones.

Constantly hanging on social media and surfing the internet has made Gen Z quite savvy in the digital world. Sixty-eight percent of Gen Z reads at least three product reviews before making a first-time purchase with their own money, according to survey. “They will do price comparison, read reviews and know how to sort out the [fake] ones,” Armstrong says.

What Gen Z Wants

Gen Z craves something that transcends innovative products, competitive price or multiple ways to communicate with insurers. To feel safe, they desire authenticity and transparency.

¹ <https://genhq.com/generation-z-research-2018/>

“They prefer no surprises,” says Armstrong. “They want to know what the premium is and buy it as quickly as possible.” Warren also advises that insurers be clear about insurance and take the what-you-see-is-what-you-get approach.

Just because Gen Z are digital experts does not mean they desire a primarily digital relationship with insurers. In-person contact is a crucial way these power users seek authenticity. “[This is] the first generation that went through social and emotional learning in school,” Warren observes.

However, the meaning of in-person is different from how other generations and Webster’s dictionary define it. Since Gen Z does not differentiate between physical and digital experiences, communicating with an insurance agent face-to-face can include using Skype, Facetime and virtual hangouts, Jonah Stillman explains.

The study “The Next Generations and Insurance: Understanding Buying Behaviors and Preferences of Younger Adults” by Applied Systems and ORC International provides insight into the interplay of digital and traditional methods of communication. “For auto and homeowners insurance,” the study notes, “the preferred and most frequently used communication channel by millennials and Gen Z is a direct call to an agent,” according to the survey results released in November 2018.

When asked which channels they most *frequently* use to interact with their current insurer, the 1,002 respondents, aged 18 to 38, answered in the following order: direct call to agent, website, in-person meeting, call center, mobile app, online chat and text with agent. However, when asked which channels they *prefer* for buying auto insurance, directly calling an agent and meeting in person were the top two choices over websites and call centers. The least preferred were mobile apps, online chat and texting with agents.

This desire for face-to-face interaction holds true when purchasing a car as well, according to a 2016 Autotrader

and Kelley Blue Book survey, “What You Need to Know About Gen Z: And Why It Matters.” Although equally comfortable with shopping online, 68% said they would rather buy a car in-store, according to the 2016 survey. When asked about their ideal shopping experience, Gen Z wants a positive experience while millennials and Gen X seek convenience and baby boomers are concerned with price.

How insurance is presented online is also critical for demonstrating authenticity to potential buyers. Dave Stillman expressed concern about the danger of making insurance appear too simple when Gen Z needs to be educated about insurance and how it works. “The sale of insurance to this generation is the inclination to be convenient and they can miss important details.”



Joshua Calderon

Calderon . . . views insurance as a sophisticated financial product and was turned off by overly simple websites associated with insurtech products. “Their sites seem too easy, like they were canned.”

Joshua Calderon, a 23-year-old auto owner in Harrisonburg, Virginia, views insurance as a sophisticated financial product and was turned off by overly simple websites associated with insurtech products. “Their sites seem too easy, like they were canned,” he says. Calderon, a district executive for a national nonprofit organization, paid a little more premium for a traditional insurer because it felt more secure than the newer options.

Calderon was not interested in digital communication as the first line of contact or for filing a claim. Recalling a positive experience with live customer service when he filed a claim while under his parents’ coverage, he wanted the option to talk to a customer service representative first. He is, however, fine with using digital channels for less complicated transactions.

The features of an insurance product, whether auto, renters or homeowners insurance, also factor into the choice of insurers for Gen Z and millennials. Eighty-five percent of both groups consider 24/7 customer service as important, according to the Applied survey, while 74% felt mobile app access was important.

Gen Z's comfort with buying insurance through non-insurance sources is likely to affect the insurance purchasing process, predicts the study "Developing a Business Model for the Insurance Customer of the Future." The study was released in March 2019 by Majesco, which offers cloud-based core, digital and data products and services to the insurance industry.

If Amazon decides to enter the insurance market, the study predicts, it is likely to be successful since it has loyal customers who look to the online retailer for nearly everything in their lives, according to the study, which is based on the responses of 167 Gen Zers, 99 millennials, 166 Gen Xers and 100 pre-retirement baby boomers. Calderon sees that. "For some reason," he explains, "I trust Amazon and would be open to both purchasing insurance and streamlining payments for other services through the site."

Further, the Majesco study notes that 57% or more of Gen Z is open to buying insurance through nontraditional sources. Sixty-two percent indicated they would be fine with buying homeowners insurance from a real estate website or app; 58% are open to buying renters insurance from an apartment search site and app; and 57% would buy auto insurance through a car shopping website or app, according to the Majesco study.

Sharing Economy

Gen Z is also the first generation to be part of the sharing economy at a young age, which has important insurance implications. Most significantly, Gen Z is quite comfortable with ridesharing, according to the Majesco study. From 2017 to 2018, Gen Z's use of rideshare services jumped sharply from 45% to 62%. Ridesharing is also one of several factors caus-



Samantha Williams

Williams . . . started using Uber when her mother returned to work . . . Ridesharing was more convenient and cost-effective than driving a car and paying for insurance. . . . but her summer internship required her to travel longer distances as a sole passenger, which became quite costly.

ing Gen Z to delay obtaining driver's licenses and automobiles. High use of ridesharing, however, could also reflect Gen Z's age and station in life.

Twenty-year-old Samantha Williams, a business student at Washington University in St. Louis, started using Uber as a teenager when her mother returned to work in suburban Washington, D.C. Ridesharing was more convenient and cost-effective than driving a car and paying for insurance. At school, ridesharing off campus with friends or short distances also makes sense, she explains.

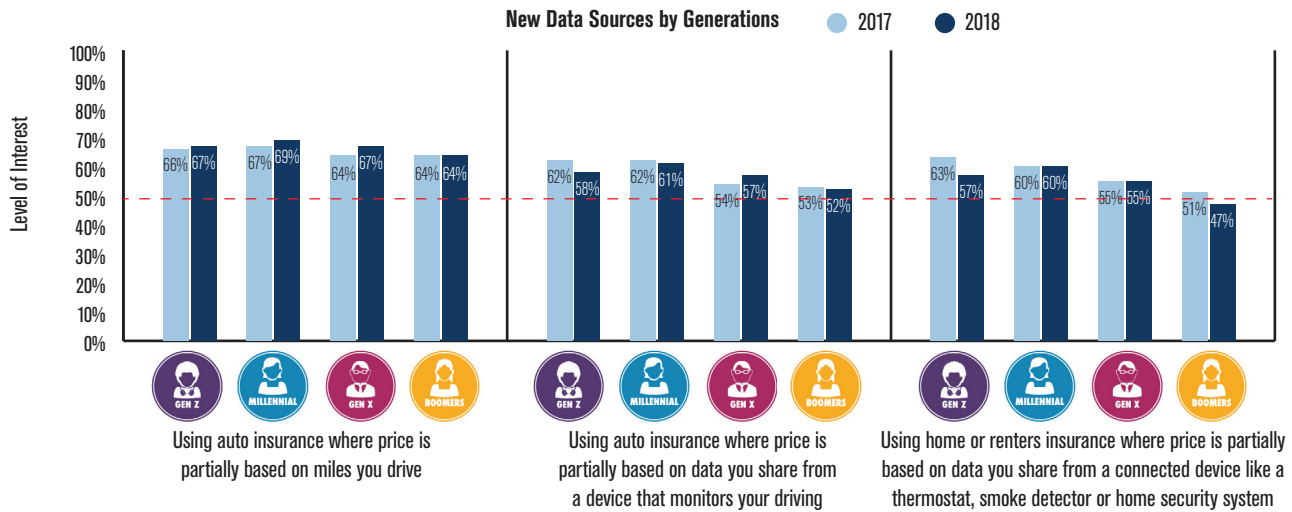
However, she says, "You cannot Lyft everywhere." It is fine for short trips, she explains, but her summer internship required her to travel longer distances as a sole passenger, which became quite costly. Unless she lands her first job in a major city, she plans to acquire a driver's license.

The Autotrader and Kelley Blue Book survey reveals that 92% of Gen Z plan to own their own vehicles because they see car ownership as safer, more reliable, more convenient and more flexible than car- or ridesharing. Prognosticators thought millennials would not be as interested in driving compared to older generations. It turned out, however, that millennials clocked more miles driven than baby boomers, according to "Generational Trends in Vehicle Ownership and Use: Are Millennials Any Different?" released this year

by the Massachusetts Institute of Technology.

Another ridesharing trend with growth potential is peer-to-peer car sharing through services like Turo or Getaround, according to the Majesco study. Its use, however, is minimal so far. Five percent of Gen Z and 6% of millennials are renting out their cars for short-term use. Gen Z is also comfortable home-sharing through companies like Airbnb and HomeAway. Twenty-seven percent of Gen Z in the Majesco study

Figure 1.



Source: Derived from “Developing a Business Model for the Insurance Customer of the Future,” March 4, 2019, by Majesco. Used by permission.

have used home-sharing services in 2018, up from 17% in 2017 and bypassing the other generations.

Data and Coverage

About half of Gen Z is also willing to share data if they see value in doing so, according to the Majesco study. Gen Z is more willing to share the number and types of friends and followers in social media, up from 43% in 2017 to 46% in 2018, the same percent as millennials. However, Gen Z could become less interested in sharing other types of data. The interest digital natives have in sharing the content of social media posts declined from 48% in 2017 to 43% in 2018. In contrast, interest among millennials grew 10 percentage points from 41% to 51%.

Applying non-risk data and its degree of usefulness in insurance is controversial. Insurtech startups use new sources of data and data scientists to model coverage differently than traditional methods applied by actuaries, explains Denise Garth, senior vice president of strategic marketing, industry relations and innovation for Majesco. “My perspective is [actuaries] need to think outside the box and look at a broader range of new, different data and modeling from other industries as well as from the customers’ perspective, given they are increasingly willing to share data if they get something of value in return — an outside-in approach,” she explains.

Armstrong observes that “most of the use of the data is not really for predicting accidents and risks.” Rather, the utility of data is to ease the process of buying insurance, he observes,

citing Lemonade, which auto-fills potential policyholder data in the application process.

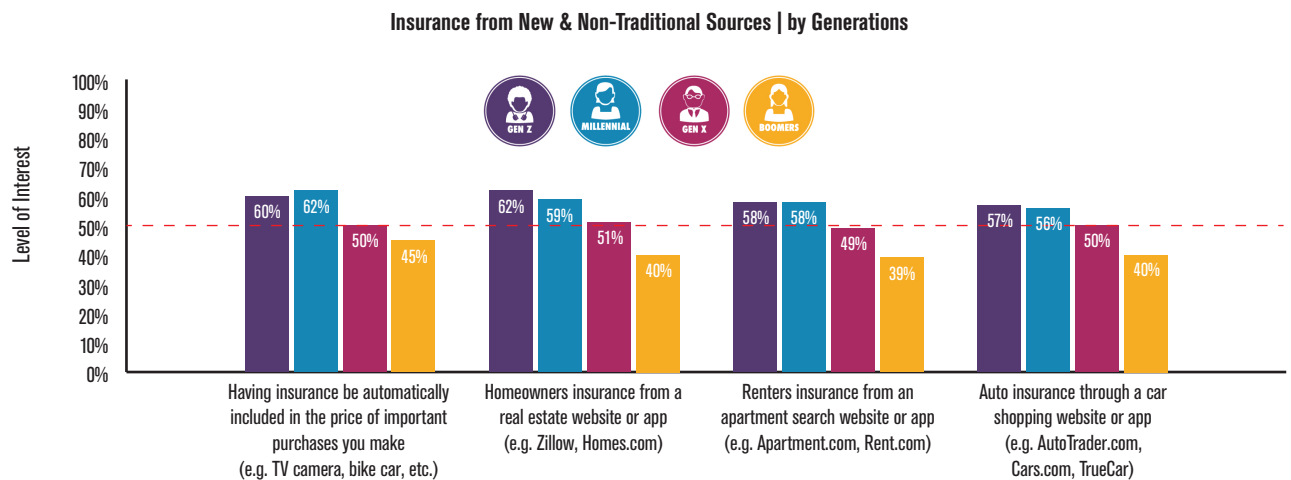
While the traditional insurance industry pioneered usage-based insurance for automobiles, insurtech companies have taken the concept in new directions with on-demand, peer-to-peer, parametric and other approaches. Rather than applying risk-indicative information and providing discounts as traditional insurers do, insurtech companies have turned that approach upside down by placing more weight on the driver’s behaviors to be risk selective.

Compared to the traditional insurance model of basing coverage on estimated miles driven to distinguish pleasure use and commuting, companies like Metromile offer coverage at lower mile limits. The concept has broad appeal. Allstate has launched a pay-per-mile product called Milewise, which has been successful in all 13 states where it is available, Armstrong says. “It appeals to the more urban and very budget-conscious — in other words, Gen Z.”

While an assumption exists that digital Gen Z will be fine sharing personal data for less expensive insurance, there is some evidence that is not true as a whole. At least half of all generations were open to their auto insurance price being partially based on data sharing through a device, according to the Majesco study. However, interest from Gen Z dropped from 62% in 2017 to 58% in 2018 while the interest of older generations remained similar or increased (see Figure 1).

As an example, the idea of the low-mileage approach appeals to Kara Capell, a Ph.D. candidate in saxophone at Loui-

Figure 2.



Source: Derived from “Developing a Business Model for the Insurance Customer of the Future,” March 4, 2019, by Majesco. Used by permission.

siana State University, who is transitioning from paying for coverage through her parents’ policy to buying her own. She is not interested in being tracked, however. The first-time home buyer also plans to buy insurance from a traditional insurer to bundle coverages.

Nationwide announced a partnership in March with Slice Labs to develop on-demand auto insurance that allows drivers to turn on coverage when they need it. However, Trōv, which offers on-demand coverage for individual items and renters insurance “without a long-term commitment,” pulled its product from the U.K. market in June, according to Coverager.² It will be interesting to see Trōv’s appeal in the United States where renters insurance offers what appears to be fuller coverage at an affordable price. On average, renters insurance was \$185 annually in 2016, according to the National Association of Insurance Commissioners.

Gen Z’s willingness to share data through internet of things devices could change the tenor of renters or homeowners insurance. More than half of Gen Z is open to sharing data from their residences, according to the Majesco study, if they see value from their insurers. However, this sentiment dropped six percentage points from 63% in 2017 to 57% in 2018. Meanwhile, millennials held steady at 60% willingness for both years (see Figure 2).

Conclusion

Gen Z is coming of age just as insurtech concepts and products are being introduced into the personal lines market. While some tech-loving Gen Zers will be open to customer experience through primarily digital communication channels, a significant portion of this youngest generation of personal lines insurance buyers desires to experience insurance through people — especially for more complicated transactions such as making purchasing decisions and filing claims.

The nation’s first digital natives will change how insurers communicate with their customers. Cynical of website marketing gimmicks and photos of the perfect, digitally savvy Gen Z will be drawn to companies that evoke transparency and authenticity. Gen Z is also showing signs of being less inclined to share personal data, especially if they see no value in doing so. This could continue as consumers become more aware of personal data privacy concerns.

Regardless of whether an insurer is traditional or considered insurtech, those that make Gen Z feel safe in a world of risk will win over the country’s first generation of digital natives. ●

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

² <https://www.coverager.com/observations-on-trovs-d2c-uk-exit/>

Travelers Actuaries Cook Up Some Predictive Modeling Fun

By ANNMARIE GEDDES BARIBEAU

Predictive modeling and cooking have a lot in common. There is choosing quality ingredients, apportioning them just right and applying the relevant tools and techniques to create rewarding results.

Just as cooking shows have transformed the culinarily challenged into foodies, actuaries from Travelers are applying the same approach to encourage predictive modeling. The aptly named session, “The Travelers Predictive Modeling Cooking Show,” is receiving rave reviews.

Here’s what attendees at various CAS meetings are saying: *“Really informative!”* *“My favorite session of the day.”* *“Technically sound presentation done in a casual way.”*

The show, which originally began as an internal training class, features an interactive competition between two teams, “Slice and Dice” and “Occam’s Razor,” which face off to develop the best model.

Chad Wilson, an inland marine actuary, envisioned the idea of the show after he sat through a 20-hour online predictive modeling course. Desiring to present the principles, techniques and process of predictive modeling in a quicker and more engaging manner, he began considering what a predictive modeling session in a cooking show format would be like.

With the enthusiasm and support from other Travelers actuaries, his idea began taking root. “We developed the event to help the audience members understand the basics of modeling and understand the modeling process,” says



Panelists from “The Travelers Predictive Modeling Cooking Show” are (left to right) Melissa Schenck, ACAS; Megan Camanocha, ACAS; Nathan Hubbell, FCAS; Chad Wilson, FCAS; and Richard Sutherland, FCAS.

Melissa Schenck, a customer analytics actuary. “We want the audience to understand the handoff in the process to create a better predictive model,” she explains.

Other team members who helped develop or participated in the session include modeling actuaries Megan Camanocha, Nathan Hubbell, Laura Johnson and Jon Sanders; Rick Sutherland, a product liability actuary; Sovanna Ly, a workers’ compensation actuary; and Priyanka Shah, a business intelligence consultant. Sam Srini, director of advanced analytics data engineering, and Cheryl Philstrom, senior administrative assistant, are also part of the team.

The show begins when Wilson takes the stage as the master of ceremonies, explains the competition and introduces the three to seven actuaries available to participate. The chef and sous chef demonstrate how to prep for predictive modeling through exploratory analysis to find underlying relationships in the data.

Members of the audience each get a piece of the data and play along, submitting their own predictions to build a collective, group-sourced, audience model.

As both teams undergo the model-

ing process, Wilson asks why a data set, a.k.a. the ingredients, is being imported in the model and the reasoning behind selecting certain variables. “We get into feature engineering,” Wilson describes, explaining, “[There is a] ‘feature of the day’ from creating new data from the data you have.” The session also includes lift charts and confusion matrices.

“The most important piece is the drama surrounding the data,” Schenck says. The dish is “taste-tested,” Wilson adds, when the models are checked according to standard practices. “In business, the modeler will tell you the reasons why it works and try to explain the measurable metrics for how effective it is,” he notes.

“The Travelers Predictive Modeling Cooking Show” has been on tour offering seven shows in five cities over the past year at conferences for underwriters, actuaries and regulators. Its next stop will be at the Gamma Iota Sigma International Conference in Dallas on Friday, September 27. ●

Annmarie Geddes Baribeau is a frequent AR contributor. Her blog can be found at www.insurancecommunicators.com.

Making the Case for Actuaries in Banking

By J. MICHAEL BOA, CAS CHIEF COMMUNICATIONS OFFICER

More than 50 actuaries from actuarial organizations around the world recently gathered with bankers in Washington for a day-long seminar focused on the evolution of analytics and risk management in banking. Attendees learned how the actuarial skill set aligns with the talent needs in the banking sector.

“Advanced analytics and modeling have tremendous potential to help banks add value through better decisions, risk reduction, and risk/return management,” explained the seminar’s keynote speaker, Hans Helbekkmo, Partner, Risk Practices at McKinsey. Helbekkmo kicked off the day describing the most important issues facing banks today, such as credit risk analytics, fraud management, and model risk management and validation. This set the stage

ing involves the input of our greatest asset — people,” said Hallworth. “Actuaries’ deep understanding of the math behind the analysis, combined with our keen business sense and problem-solving abilities, make us well-suited to handle the modeling and risk management being done in banks.”

Jennifer Chancey, ASA, treasury analyst for United Bank, discussed the recent regulatory emphasis on stress testing and capital modeling and its implications for banks and their models. Chancey gave an overview of an effective bank stress-testing framework in comparison to similar frameworks for insurance companies.

Erik von Schilling, FSA, FCIA, SVP balance sheet management for Canadian Imperial Bank of Commerce (CIBC), spoke on post-global financial crisis regulation such as formal liquidity

“Our actuarial standards of practice and robust continuing education programs allow actuaries to build models and ask the right questions in that process . . .”

— Brian Brown, FCAS

for a deeper dive into these and other issues over eight sessions.

Scott Hallworth, FCAS, chief data, model & analytics officer for Federal National Mortgage Association (FNMA, or “Fannie Mae”) and formerly of Capital One, described his successful transition from chief actuary of a major insurance company to a cutting-edge bank known for its drive for advanced modeling and analytics. “The continued evolution and adoption of advanced analytics in bank-

requirements. He explained how these constraints are managed and optimized through treasury risk management, funding programs, and business transfer pricing.

Other sessions discussed machine learning and artificial intelligence in banking, credit risk management, the U.S. banking regulatory environment, and the talent gaps banks are dealing with today. The seminar concluded with a capstone by Brian Brown, FCAS,



Scott Hallworth

principal and consulting actuary for Milliman, who shared his thoughts on how actuarial education and training prepare actuaries to model complex risks, whether the risks are those faced by insurance companies or banks. He outlined how regulators are interested in the model validation process in banks, and the resources that the actuarial profession can bring to bear in this area. “Our actuarial standards of practice and robust continuing education programs allow actuaries to build models and ask the right questions in that process, such as ‘Have we captured the tail risk?’ and ‘How sensitive is the model to changes in assumptions?’” explained Brown.

Presentations from the sessions are available through the seminar’s webpage at casact.org/education/banking/2019/index.cfm?fa=sessions.

The seminar was a collaboration among the Casualty Actuarial Society, Society of Actuaries, Canadian Institute of Actuaries, and the Actuarial Society of South Africa. The organizations expect to continue with joint efforts to open doors for actuaries in non-traditional areas where the actuarial skill set is valuable. ●

2019: A Good Year for CAS Research By BRIAN FANNIN, ACAS, CSPA, CAS RESEARCH ACTUARY

It's been an interesting year. It began with several signed contracts as a result of requests for proposals (RFPs) released in 2018. By the time this issue sees print, the research associated with those contracts will likely have been posted online. Completing these publications represent the first time that I've observed the entire research process — from the beginning of an idea, development and approval, review and selection of research partners, reading of and commentary on interim drafts, and finally release to the public. It sounds like a lot of steps, and it is. Along the way, there is a steady cast of CAS volunteers and staff who lend their support and input.

I've been on the road a lot this year. In March, I was in Boston, where the CAS hosted its first-ever introductory Python workshop. Having been involved in many of the R workshops over the years, it was exciting to see us broaden the set of educational offerings, with the implication that CAS actuaries are continuing to expand their skill sets. Open-source languages like R and Python appear to be going mainstream amongst actuaries and I'm delighted about that. The benefits, in terms of reproducibility and a wider set of algorithms to draw on, are tremendous. Further, tools like R and Python (and Julia and Octave, etc.) allow the global actuarial community to develop its own tools. Looking for an implementation of the chain ladder reserving technique? You can find one on both R and Python.

May found me at the CAS Spring Meeting in New Orleans, where I learned of several significant items to research. There was a fabulous concur-

rent session about the changing nature of wildfire and what it means for our industry. There's much work to be done here and I expect that CAS members and researchers will have more to say on this topic. Josh Newkirk, FCAS, and Ryan Ferguson, FCAS, of the Long-Term Pricing Analysis Working Party gave a presentation about their work to date. That session closed with a live, interactive pricing simulation which, while far from perfect, did manage to get people out of their seats and talking.

Also in New Orleans, Stephen Mildenhall and I gave a talk about the role of artificial intelligence (AI) in insurance. I think it's nearly impossible to open an insurance-related publication that doesn't talk about AI or deep learning. The typical headline runs quickly to breathless hyperbole, along the lines of, "AI Is The Only Thing About Insurance That Matters From Now On." Mildenhall very effectively cut through the hype and, for the first time, I feel like I'm beginning to get it. Deep learning is computationally rich, but honestly, the mathematics are not crazy. Anyone who didn't sleep through their linear algebra class should be able to follow it. There are definitely new elements at play. Among them are that (1) the algorithms are applied at tremendous scale, (2) we need to re-think how we structure input data and (3) there is a change in how we interpret the model results. The implications for the actuarial profession and the industry couldn't possibly justify the hype, but I am convinced that we will see a lot of development here. I hope to push forward a number of research projects on those questions in the coming year.



Brian Fannin

Travel for the CAS also brought me in contact with many new faces. In February, at Florida State University, I spoke at a meeting of Gamma Iota Sigma, an academic fraternity for students interested in risk management and actuarial science. It's always great to interact with the next generation of actuaries; the perspective has changed a lot since I first entered the field. This issue has more to say about Generation Z (see the cover story), but this Gen-X actuary thinks that we'll need to stay on our toes to keep up with them.

I'm typing this from my hotel in Houston, where I'm attending the annual meeting of the International Association of Black Actuaries. I spent two hours yesterday with a group of students talking about R and SQL. I was pelted with questions that were astute, incisive and clear evidence that these students are eager to leave their mark on our industry. It was a blast!

In Florida, Texas and Philadelphia, I gave talks about data visualization. This is one of my favorite topics, which is why I was so excited that earlier this year we established the Data Visualization Working Party. We have a group of actuaries

with many different perspectives (pun intended) on this subject. The topic is very broad, but we are wrangling it into shape as best we can. Data visualization is a fact of life for most actuaries, but I'm not sure that we think of it as formally as we do, say, statistical modeling. The reality is that — long before we get to non-data “stylistic” choices — there are many guiding principles that can speed human comprehension and enhance clarity. Put differently, the same amount of time that is spent in consideration of predictor variables in your model can be spent in deciding how to visually present them.

I am often asked about sources of “real” insurance data for research. I

point to the Schedule P data set compiled by Glenn Meyers and Peng Shi as a fantastic resource for loss reserving analysis. You can access it on the CAS website, or via the R package called “raw.” Perhaps lesser known is the fact that the CAS — thanks to the tireless efforts of Rick Gorvett — does have a set of actual data from an insurance carrier. This is available to research commit-

tees for specific projects upon request. Although the data has been stripped of personally identifiable information and altered, it is still regarded as sensitive and will therefore only be available upon request and subject to a non-disclosure agreement. Nevertheless, it exists and has already been used by the Ratemaking Committee for a project that is expected to be published soon. ●

Be a Research Reviewer

We want to ensure that funded projects are of high quality and need volunteers to assess early drafts from our research partners. This is your opportunity to get access to leading-edge research before it is published and to pose questions and get answers from some of the brightest researchers in our field. If you are interested, please email Brian Fannin at bfannin@casact.org.

CAS and I.I.I. Issue Rating Variables White Paper

By KATE NISWANDER, CAS MARKETING AND COMMUNICATIONS MANAGER

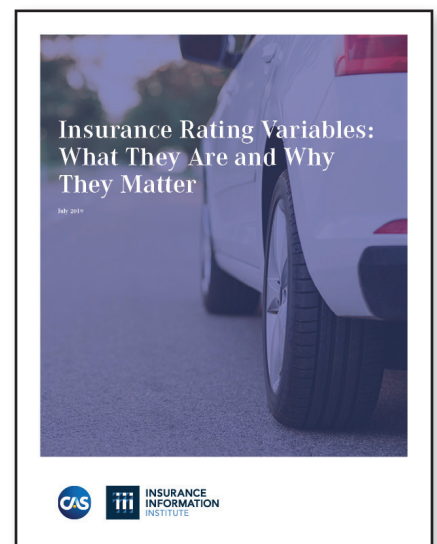
Rating variable usage has recently generated discussion within the United States, with some states passing legislation controlling the use of certain variables such as gender. “Insurance Rating Variables: What They Are and Why They Matter,” a recent white paper and infographic jointly released by the CAS and Insurance Information Institute (I.I.I.), is recommended reading for anyone looking for an accessible primer on the issue, including federal lawmakers, regulators and the general public. The white paper aims to improve public understanding of how rating variables are used and regulated, and the important role they play in pricing insurance.

Earlier this year, the CAS Board of Directors adopted guidelines enabling the CAS to produce educative statements. Authorizing the production of documents such as the rating variables

white paper is a new tool that the CAS will use to further its mission of providing casualty actuarial science education. “CAS educative statements will relate to issues that have emerged in a public forum — issues that the CAS believes call for timely clarification, correction or education as appropriate and desirable,” said CAS President Jim Christie.

The white paper marks the first joint educational statement from the CAS and I.I.I., and it is consistent with both organizations’ missions to educate policymakers, the media and the public with sound, objective information on property-casualty insurance issues.

“I strongly encourage our members to circulate the white paper internally at their own companies,” said CAS President-Elect Steve Armstrong. “Since I shared the paper with my colleagues at Allstate, the paper has been passed along to many different departments.



We’ve also added the paper as a resource to our internal library.”

The paper with its accompanying infographic is available from the Casualty Actuarial Society and Insurance Information Institute websites. ●

IN MY OPINION By GROVER EDIE

Lessons from Housekeepers

The housekeepers are here today. I can hear them from my office in the basement. They come about every four weeks, and two of them take about two hours to clean four bedrooms, three-and-a-half bathrooms, the family room, library, dining and living rooms. They mop the kitchen, foyer and hall floors, and sweep part of the basement (not my office). They do much more, but this should give you an idea of what they do. Diane, my wife, is the manager in charge of the project called “cleaning the house.”

I thought about the nature of their work and how it might apply to what we actuaries do. The big differences are the setting and the result. Actuaries work in offices; housekeepers work in homes. The actuarial work product is an analysis or a report; the housekeeper’s product is a clean home. However, I realized that housekeeping is much like an actuarial project in many ways, including in the execution of the two projects.

Keep turnover from affecting the project

Diane insists that at least one of the two housekeepers that the service sends has worked here before. And she really doesn’t like having three cleaners working — it creates too much chaos. There are certain ways she wants things done, certain cleaning solutions used, etc. She doesn’t want to train new people.



In an actuarial project, team member turnover generally causes more errors, takes longer to accomplish the task and delays the project. That doesn’t apply if one of the team members needs to be replaced due to performance, but keep the same people on the project if the work they did the last time was satisfactory. Training newcomers to a project only slows it down. See *The Mythical Man Month*,* a classic yet still applicable book on the topic.

Let the client know you are working

“Kilroy was here” was an expression and drawing from WWII that American military personnel drew wherever they were during the war. I think of this doodle when the housekeeper folds the toilet paper over the top of the roll — it says, “I was here.” I sometimes think their rearranging some items on a shelf is another way to indicate, “Yes, I did dust this shelf.”

In a project, I like to give an indication that I did what I was asked to do. I often do something in the workbook

or document or write or say something specific about the project to indicate I did, indeed, review it. It can be helpful to document something that will trigger my memory of my work later, such as: “This review was more difficult than normal because the month and day were reversed in the date field.”

In an office environment, keep in mind how others see you while working. Make work your first priority, not your phone.

Communicate the project’s status

This morning, the housekeepers’ car broke down, so they called to say they were running late. This is understandable and even acceptable unless it becomes a frequent occurrence. But showing up 45 minutes late and *not* calling first creates a different reaction from the customer, even if the cause of the delay is reasonable.

If I am working on a project and it is running behind, I tend to call and let the client know, even if it is the client’s fault for not supplying the data on time or

* Brooks, Frederick P., Jr., (1995) *The Mythical Man-Month* Addison-Wesley Longman, Inc. You can also find it in the CAS’ Online “Business Skills Online Publication Resource” website https://www.casact.org/pubs/gbse/index.cfm?fa=s_rs&category=Project+Management&Keyword=&submit=Search.

another reason. Sending an email to say, “We ran into some difficulties with the data and are running about X days behind” helps shape the recipient’s expectations. If I can let them know when we first discover a problem and alert them to a potential delay, it is even better.

Have a plan of action

One of the housekeepers starts in the master bathroom (the hardest part), while the other does something else. There are usually two, but sometimes three of them. Each person has certain rooms assigned to clean. And one does the tasks involving liquids (cleaning bathrooms, kitchens) while the other handles the “dry” tasks (dust, vacuum, take out trash, etc.).

Consultants typically have a plan of action and share that plan with the other members of the team. It also can provide a basis for the report and for estimating the time needed to do future projects, especially if you keep track of each of the components of the plan.

Use the resources provided

Our housekeepers use the cleaning supplies we provide, not the ones they would usually bring to the job. Diane is sensitive to some chemicals, and neither of us want to be exposed to harsh cleaning agents. Speaking of which, one of our housekeepers was sent to the hospital with a respiratory crisis when she used a commercial cleaning solution at another house in an enclosed shower. Fortunately, she recovered.

It doesn’t help if you say, “I wish we could use software ABC for this project” if it isn’t available. And if you are a whiz at some other software, but the boss wants you to do it in Excel, then you had better use the latter.

Be aware of customer sensitivities

Diane’s grand piano is off limits for cleaning. It’s to the point that the housekeepers don’t even dust it or vacuum under it. The piano has a rather fragile finish that can, and has been, damaged by improper dusting. (In one instance, a housekeeper, who hadn’t been at our house before, dusted the piano and subsequently scratched the finish. The others knew it was off limits, but apparently forgot to “train her” on that matter.)

If the recipients want a narrative of the results, I don’t give them a spreadsheet. My job is to deliver the product in the format the customer wants, not the format that is easiest for me.

There may be certain things that management considers prohibited, so try to discover them and be sensitive of them. The Council Bluffs branch office might be the least profitable branch in the company, but don’t keep harping on it if the president’s nephew is running it.

Tackle the hard parts of the job first

When you are fresh, it’s best to take on difficult tasks right away. Do the easy ones later. The housekeepers do the master bathroom first, because it is the hardest to do. Psychologically, getting the hardest tasks out of the way first makes the project seem easier.

Be social, but not too social

The housekeepers are social while they are here, but not overly so. Their job is to clean the house, not to socialize. Some of them have been coming to our home for over a decade, and they keep Diane up on what is going on in their lives and she lets them know what is going on in ours. It establishes a personal, not just a professional, relationship and helps cement both relationships.

Believe it or not, for some people, their job is not the most important thing in their life. And they will likely talk about whatever is the most important thing: their cat, dog, kids, grandchildren, trips, illness — whatever is in the back of their minds. Until you can connect with those things, you really haven’t connected with them. That connection is key to communicating on a level below the surface while not turning your time at work into a social gathering. Again, the proper mix is key.

Give a little bit more

One housekeeper would do one “extra” task each time she came that wasn’t on the list, like washing the globes on the chandelier in the dining room. She did a great job on the routine items, but this one extra item caused her to stand out and made us really appreciate her. Coming to work only occasionally, she would see things that we didn’t.

Conclusion

In general, a working life is rarely easy, but there are things you can do to make work more efficient. (1) Try to avoid turnover. It happens and can hurt a project, but you must be able to bounce back. (2) Show that you did your job and be sure to demonstrate that you are doing the job, while you are working. (3) Communicate if the project hits a snag and is running late. (4) Make your plan and (5) use the resources your clients provide. (6) Deal carefully with customer sensitivities. (7) Work on the hard parts first and (8) be social, but not too social. And finally, (9) do a little extra.

In the spirit of doing a little extra, I’ll leave you with a bit more advice: Observe others while they work and see what you can learn from them. ●

IT'S A PUZZLEMENT By JON EVANS

Lawn Mower Geometry

This puzzle was created and written by Don Mango. Neither Don nor I have solved it. So, it is the duty of you, the dear readers of this esteemed column, to solve it by any means necessary!

When I was growing up in Texas, I would cut lawns in the summer — a physically draining experience. As I slogged along, I was naturally thinking of how to optimize my cutting by minimizing the time to completion. I had all sorts of half-baked heuristics about how to handle trees or long skinny patches or even triangles. Over the years, I have noodled about the possibility of some very smart actuaries being able to systematically approach the problem. So, I humbly offer the problem of Lawn Mower Geometry.

Let's assume the following:

- A nice riding mower with a 3-foot diameter (perfect circle) travels at 10 feet per second.
- It can turn on its center (rotate) at 45 degrees per second.

- Stopping costs four seconds (the combination of slowing down, turning and accelerating again).
- There are no issues with the boundaries of the lawn and no weed whacking is necessary. All the grass has to be cut with the mower.

Problem: What is the fastest way to cut each of these shapes?

1. A 50-foot-by-100-foot rectangle.
2. A 50-foot-(side A)-by-100-foot-(side B)-right triangle.
3. Two different trapezoids:
 - Attached on the 50-foot side.
 - Attached on the 100-foot side.

Manned Spaceflight Safety

Note to readers from Jon Evans: As of July 17, 2019, we received no solutions for the "Manned Spaceflight Safety" puzzle. This was actually a very easy puzzle, but it required spending just a small amount of time looking up some statistics using Google, Wikipedia or another online reference source. There seems to be a pattern that whenever a puzzle requires some amount of thought or online information lookup involving engineering, natural sciences or other real-world subjects, readers tend not to submit solutions. Our advice is not to panic or despair

when you see such a problem, but calmly and methodically think through the problem and about how readily available

information might be used to solve it.

The puzzle asks solvers to use statistical analysis of the American spacecraft experience to determine whether capsules or orbiter-gliders are safer in terms of risk of a fatal accident. Data for this problem, as of July 17, 2019, is available online at www.wikipedia.org/wiki/List_of_human_spaceflights

and www.wikipedia.org/wiki/List_of_space-flight-related_accidents_and_incidents.

Data for the U.S.-manned capsule flights is as follows:

Program	Manned Flights	Fatal Incident Flights	Fatal Flight Rate
Mercury	6	0	0%
Gemini	10	0	0%
Apollo (including Skylab crews and Apollo-Soyuz)	15	0	0%
Total	31	0	0%

These tabulations do not include the two flights of the North American X-15 and the three flights of the private SpaceShipOne — both are rocket-powered airplanes that technically entered space-level altitudes, but at only a fraction of orbital velocity. Readers may also recall the tragic fatalities of the Apollo 1 test in 1967, but that was a ground test inside a capsule and not an actual flight test.



Now, for the Space Shuttle orbiter-glider, the data is as follows: 135 manned flights and two fatal incident flights for a fatal flight rate of 1.4815%.

We could construct many statistical tests, but it is hard to think of a good test that shows this experience implies any statistically meaningful difference between the capsules and the orbiter-glider. Perhaps the simplest approach is to assume that each flight for the capsules was an independent Bernoulli trial and that the probability of each capsule flight being a fatal incident was the same as the average rate for the shuttle. Under those assumptions, the probability that none of the 31 capsule flights would be a

fatal incident flight, as none were, would be $(100\% - 1.4815\%)^{31} \approx 63\%$.

Now for the truly wild Bayesian at heart, let's suppose we want to include the Soviet/Russian and Chinese capsule experience:

Program	Manned Flights	Fatal Incident Flights	Fatal Flight Rate
Vostok	6	0	0%
Voskhod	2	0	0%
Soyuz	141	2	1.4184%
Shenzhou	6	0	0%
Non-U.S. Capsule Total	155	2	1.2903%
Including U.S. Capsule Total	186	2	1.0753%

If we assume again that each capsule flight had the same 1.4815% fatal probability as for the Space Shuttle experience, then the probability (calculated using a binomial distribution) of two or fewer fatal flights among the 186 total international capsule flights is about 48%. So, again the historical experience suggests no meaningful difference in fatal flight rates between capsules and orbiter-gliders. ●

Know the answer?
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WESTERN INSURER plans to hire an FCAS Auto Pricing Actuary and Manager for Position 85527. Manage small staff. Requires: auto ratemaking experience, SQL programming skills, hands-on can-do attitude, management experience, predictive modeling skills, enthusiasm for new insurer data analysis methods and systems.

PERSONAL LINES PRICING ACTUARY is sought by a Southeast insurer for Position 83594. FCAS with 15+ years of property and casualty experience needed. Leadership opportunity.

CONSULTANT SEEKS EXPERIENCED ACTUARIAL ANALYST for Position 85723. 1 to 4 years of property and casualty actuarial experience is a must. Ideal candidates will have statistical programming skills.

PERSONAL LINES ACTUARY AND VICE PRESIDENT is needed by a Massachusetts insurer for Position 84803. FCAS will manage staff and must have 10+ years of property and casualty actuarial experience. Manage profitability analysis, pricing, product development and work closely with analytics team, marketing, underwriting and claims professionals.

NORTHEAST ORGANIZATION intends to hire an E&S Actuary and Manager for Position 85598. Management experience and Excess and Surplus experience are a must. FCAS with 10+ years of property and casualty actuarial experience sought.

FCAS CASUALTY ACTUARY WITH TELEMATICS EXPERIENCE is immediately sought in California for Position 85438. Hands-on programming skills required. Predictive modeling skills are a must.



COMMERCIAL PRICING FCAS is needed by a Midwest insurer for Position 85658. Requires commercial liability reinsurance experience or workers compensation experience. Prominent pricing, modeling and profitability analysis opportunity.

PERSONAL LINES PRODUCT MANAGER AND ACTUARY is sought by Midwest client for Position 85764. Insurtech opportunity to make a big difference in personal lines insurance. FCAS or ACAS.

WORKERS COMPENSATION ACAS sought for a non-traditional role in Chicago for Position 85235. Additional exposure to commercial auto is a big plus.

SENIOR PERSONAL LINES ACTUARIAL ANALYST is needed by a Midwest insurer for Position 83245. Personal lines pricing experience is a must.

COMMERCIAL FINANCIAL REPORTING ACTUARY is immediately sought by a Midwest insurer for Position 84686. FCAS/ACAS. Must have strong modeling skills, data analysis skills, as well as strong accounting standards knowledge.

HOMEOWNERS PRICING AND ANALYTICS ACTUARY is needed in California for Position 85798. Insurtech opportunity for an ACAS or FCAS.

CLIENT FOR POSITION 85194 has an immediate need for a Near-ACAS or ACAS with 4+ years of property and casualty actuarial experience. Stable, growing parent company with lots of interesting things to do. Reserving experience is ideal. Assignments may include reserve analysis, financial forecasting, management reporting, financial reporting, statistical programming and special projects.