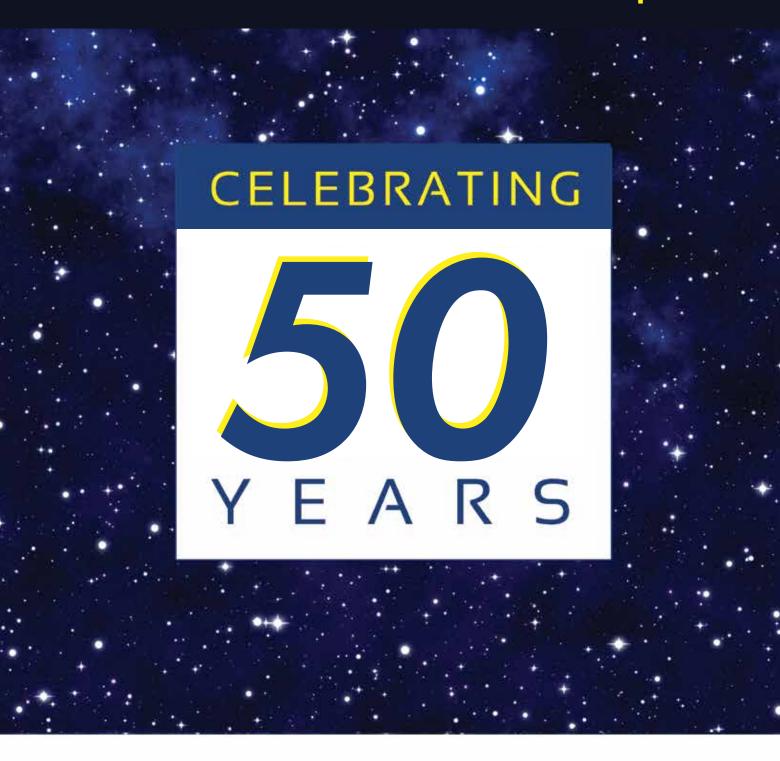


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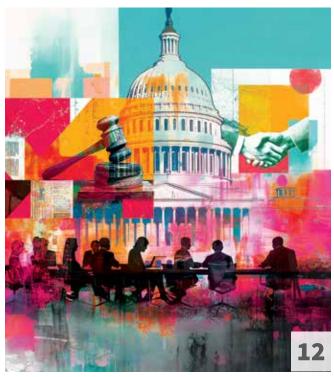
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helps shape public policy by offering independent,
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# Contingencies

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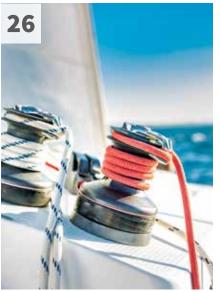
#### **PUBLICATION DESIGN & PRODUCTION**

BonoTom Studio Inc. www.bonotom.com

#### **ADVERTISING**

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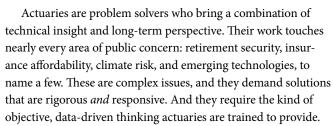
# Editor's Note | PREETI VASISHTHA

## The Actuary as Policy Architect

AT FIRST GLANCE, PUBLIC POLICY AND ACTUARIAL SCIENCE might seem

like distant disciplines—one is typically shaped by political debate and legislative compromise, the other is rooted in data, models, and mathematics. But look closer and you'll find that the two are deeply connected. The strength of a public policy

often depends on how well it has been informed by evidence and designed to hold up over time. That's where actuaries come in.



As long-term financial security, demographic shifts, and emerging risks intersect, state and federal governments face tough questions. How do we create affordable insurance products? How is climate change affecting personal health, property, and community solvency? What is the impact of technologies such as artificial intelligence and cybersecurity?

Our members and public policy team address such questions and more. They help policymakers see the trade-offs, understand unintended consequences, and adopt a long-term perspective by offering objective, actuarially grounded insights.

"Bringing Objectivity to Public Discourse" (page 12) highlights how the Academy engages across the policymaking spectrum at the federal and state levels, and through cross-practice initiatives. Building on that theme, Academy President Darrell Knapp's message (page 6) focuses on how relationships with various stakeholders at the federal and state levels and rigor support the organization's public policy efforts. Further reinforcing this perspective, Executive Director and CEO William J. Michalisin, in his inaugural column (page 8), reflects on how the Academy advances the public interest through professionalism, active public policy engagement, and a spirit of collaboration that exemplifies the U.S. actuarial profession at its best.

"Building a Public/Private Framework for LTC Financing" (page 20) explains how a coordinated approach between public programs and private insurance can address the growing long-term care needs of older adults and their families. "A New Look at Designing ERISA Retirement Plans" (page 48) offers retirement plan options that balance lifetime income predictability for retirees with manageable risk for employers.



Moving beyond public policy, other articles explore several timely issues. "Strengthening Stronger NAIC-Academy Ties for the Public Good" (*page 26*)—the concluding part of my interviews with NAIC leaders—explores how the NAIC-Academy collaboration supports regulatory decisions, sharpens risk oversight, and reinforces the vital role of actuaries in insurance.

As insurtech matures, "Inside Insurtech's Second Wave," (page 34) looks at the essential role actuaries play, bringing together technical expertise and strategic insight to improve and automate the insurance industry. And finally, "Rethinking Demographic Changes in Actuarial Models," (page 40) shows how as demographic patterns grow more complex, integrating complexity theory into actuarial science and deeper engagement with heterodox economic perspectives can help actuaries build more resilient, adaptive models for the future.

Through these articles, we not only showcase what actuaries do but also highlight where their expertise is urgently needed. And regarding public policy, when it is informed by actuarial expertise, it is grounded in data and shaped by long-term perspectives, laying a strong foundation for policies that endure amid changing conditions.

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On a personal note, I'm honored to share that I've been selected as a member of American Society of Association Executives' 2025–2026 Communications Professionals Advisory Council. It's a privilege to join a group committed to advancing the strategic role of communications across organizations in the U.S. As an editor and content leader, I see how thoughtful storytelling and well-crafted content can translate complex actuarial work into insights that inform public understanding and shape policy conversations. I look forward to learning from peers across sectors and bringing fresh insights into our editorial and content strategy—continuing to frame, support, and elevate the Academy's voice in shaping policy.

**PREETI VASISHTHA** is editor-in-chief, *Contingencies*, and the Academy's director of content.



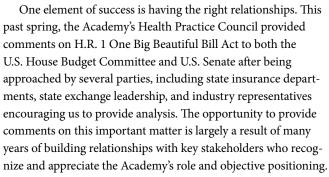
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# How Relationships and Rigor Support the Academy's Public Policy Efforts

THE SEPTEMBER/OCTOBER ISSUE OF CONTINGENCIES is focused on public policy and the Academy's role as the leading voice on issues that need an independent and objective actuarial perspective. The Academy's public policy offerts help it fulfill the part of its mission to serve the public (the other part of

efforts help it fulfill the part of its mission to serve the public (the other part: serving the U.S. actuarial profession). Instead of using this space to rhapsodize on all the wonderful public policy initiatives the Academy plays a role in, I thought I would discuss some of the things that help make us successful.



The Academy addresses relationships on several fronts. Staff—led by Senior Director of Public Policy Geralyn Trujillo and her team of public policy project managers work with—practice-area volunteer leadership to identify and form relationships with key stakeholders relevant to a specific area of interest. In addition, the Academy has three senior fellows: Rich Gibson (casualty), Cori Uccello (health), and Linda K. Stone





(retirement). They are actuaries who are contractors to the Academy and work heavily in the public policy area, focusing on relationships and advancing the Academy's public policy efforts on critical issues.

As a health actuary, I have had the privilege to work with and observe Cori on a number of efforts, and she has consistently made a valuable contribution to the Academy's efforts and recognition. Although I am sure that Rich, Cori, and Linda would all say they have an ideal job, all of us owe a great deal to their efforts—and we should thank them for their service to the Academy when we see them.

Additionally, the Academy Board of Directors' Strategic Planning Committee is currently working on a "stakeholder strategy" project to formalize the identification, growth, and nurturing of key stakeholders across the many issues the Academy touches on both the state and federal levels. Although this effort expands beyond just public policy, it should pay significant dividends in the public-policy space.

Another element of the Academy's success is the quality of the message. The Academy is currently working with the National Association of Insurance Commissioners' (NAIC) newly created NAIC Risk-Based Capital (RBC) Model Governance (EX) Task Force, to which we have provided written and verbal comments, and were requested to provide background information in a commissioner-only call. The opportunity to contribute to this matter reflects an extended period of providing high-quality analysis on a variety of RBC-related issues.

Responsibility for the quality of our message ultimately falls on Academy volunteers and our rather stringent review process that is facilitated by our dedicated staff. (Did you know that any statement from the Academy goes through multiple reviews—peer, policy, and legal, and communications review?) A key to that quality is the Academy's values of independence, objectivity, and balance. Independence requires that volunteers who work

Objectivity means that Academy statements do not typically take a public policy position but strive to present the anticipated outcomes of certain actions based on facts and actuarial principles. Balance means that when developing statements, we seek to engage, understand, and reflect different perspectives to address varied interests and needs of the broader population that may be affected by a proposed policy.

on Academy statements do not represent their employers or other affiliated organizations but seek to find solutions within the context of broader public interests. Objectivity means that Academy statements do not typically take a public policy position but strive to present the anticipated outcomes of certain actions based on facts and actuarial principles. Balance means that when developing statements, we seek to engage, understand, and reflect different perspectives to address varied interests and needs of the broader population that may be affected by a proposed policy. Balance also requires us to consider and/or include the perspective of all volunteers working on a particular statement and to seek a group of volunteers that will be able to provide a diverse set of perspectives.

In April, I had the privilege of attending the Academy's "Hill visits." Small groups of Academy volunteers from different practice areas meet with staff from congressional offices, committees, and federal agencies each spring on Capitol Hill in Washington. It was eye-opening to see the gratitude of these staff members when they realized the Academy was not there to request something, but to offer assistance and objective information meant to aid them in their work and decision-making. Many of those we met were very familiar with the Academy (reinforcing the importance of our relationships) and were appreciative of the level of analysis they had received from the Academy in the past (the importance of quality product).

Throughout this issue of *Contingencies* you will find many other examples of the important public policy work being conducted by the Academy, and our many dedicated volunteers. I hope you gain an even greater appreciation for the Academy's public policy contributions, as well as the people and processes that make it possible. And as members, I'd encourage you to get involved and lend your voice and expertise to the Academy's many policy-focused efforts.

**DARRELL KNAPP** is president of the Academy.

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Contingencies (ISSN 1048–9851) is published bimonthly by the American Academy of Actuaries, 1850 M Street NW, Suite 300, Washington, DC 20036–5805. For subscription information and customer service, contact the Contingencies subscription department at the address above or (202) 223–8196.

**Advertising offices:** Jeff Rhodes of MCI Group, 410-316-9857, jrhodes@mci-group.com. Periodicals postage paid at Washington, D.C., and at additional mailing offices.

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## What the Academy Stands Forand Why It Matters

THROUGH THIS NEWLY INTRODUCED COLUMN, I plan to periodically share updates on and from the Academy in Contingencies, with the hope that my messages will help you better understand the Academy's unique role and the many initiatives underway to best serve you, the public, and the U.S. actuarial profession.

reference point as we explore issues from many angles and perspectives. It's important for our members and stakeholders to understand the Academy's different role, focus, and intent, all of which drive our efforts and the trusted perspective we bring

> Our work centers on educating and collaborating with policymakers, regulators, the media, our members, employers, and the public

> > about the issues impacting society and the critical roles actuaries play in analyzing those issues, the risks,

and the need for supporting sustainable financial security systems in the U.S.—whether in health care, retirement, insurance, climate, or other key sectors of the economy. By highlighting and sharing the actuarial perspective, we help bring clarity and depth to complex issues that affect millions of Americans and reinforce the need to have experts like actuaries—guided by professional standards and a code of conduct-to aid

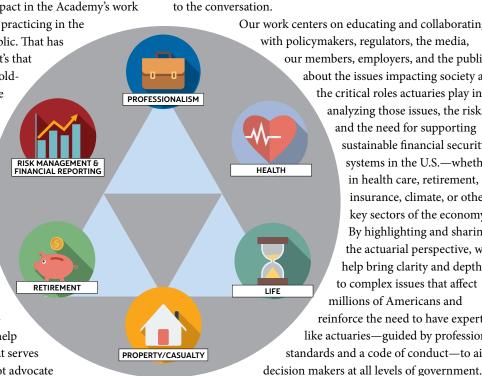
This is especially important in an environment where data are abundant, but rigorous, unbiased interpretation of such data and the potential, instantaneous sharing of misinformation is a common risk that can have lasting consequences.

Being the actuarial profession's public policy and professionalism voice means that we focus on upholding the high standards that define our work and reinforce the trust our stakeholders place on the actuarial profession. We ensure that self-regulation is maintained, promoted, and defended, which helps build trust that is critical to our work. That trust is reinforced through the core elements of professionalism housed within the Academy: the Professional Code of Conduct

This month marks four years since I joined the Academy as executive director and CEO. At the time, I knew enough about actuaries to understand the impact you have on nearly all aspects of our everyday lives, but I didn't fully understand or appreciate the same level of impact in the Academy's work on behalf of those same actuaries practicing in the United States and the broader public. That has certainly changed over time and it's that role and the members and stakeholders we serve that continue to drive my commitment to our mission—to serve the public and

U.S. actuarial profession. At the Academy, our RISK MANAGEMENT & FINANCIAL REPORTING mission is more than a statement; it's a responsibility. We serve as the voice of professionalism and public policy for the U.S. actuarial profession, providing independent, objective, and balanced analysis across health, life, property/casualty, retirement, and risk management and financial reporting, to help shape sound decision-making that serves the greater public good. We do not advocate for specific legislative outcomes or political positions. Instead, we provide nonpartisan, technically sound resources developed by our over 1,200 passionate volunteers—that inform and guide public policy conversations at all levels of government. This distinction reinforces our credibility and strengthens

Our independent and objective role is both distinct and essential as it sets us apart from from other types of organizations, particularly those that lobby or push for a certain position or perspective. There's nothing wrong with the work those organizations do for their members; it is important to the business and political spaces they serve. Their work can also be a useful



our ability to offer trusted insight.

The Academy helps decision makers and stakeholders better understand risk, plan responsibly, and promote long-term financial security for individuals and society. I like to say the Academy's work helps our many stakeholders make better decisionsdecisions based on the trusted knowledge and insight we provide.

adopted by all five, U.S.-based actuarial organizations; the U.S. Qualification Standards; the actuarial standards of practice developed by the Actuarial Standards Board; and the counseling and discipline process guided by the Actuarial Board for Counseling and Discipline. We ensure actuaries practicing in the public interest are well-prepared, ethically grounded, and equipped to offer expert analysis in a rapidly changing world—not only in their day jobs, but as "educators" and trusted partners on the policy stage.

Our communications—whether through Capitol Hill briefings, comment letters, issue briefs, webinars, podcasts, or blogs—are intended to be trusted sources of knowledge and insight, all grounded in the Academy's core values: objectivity, independence, and balance. These qualities make our work not only reliable but respected across the professional and policymaking spectrum, reinforcing both the value of an actuarial perspective and the Academy's role in amplifying it.

By promoting the actuarial perspective in this unique, nonpartisan role, we elevate both the profession and the public discourse. The Academy helps decision makers and stakeholders better understand risk, plan responsibly, and promote long-term financial security for individuals and society. I like to say the Academy's work helps our many stakeholders make better decisions—decisions based on the trusted knowledge and insight we provide. And we do this through our staff, senior fellows, and an extended network of volunteers representing multiple practice areas, employer types, and areas of expertise—all for the benefit of the many stakeholders we serve.

That's the Academy's role—and it's our commitment to serve as a trusted, informed, and principled voice; to support our members; and to advance the public interest through

professionalism, public policy engagement, and collaboration that reflects the very best of the U.S. actuarial profession.

Interested in getting involved and amplifying your voice? Join the effort. Visit actuary.org to learn more and please feel free to email me at michalisin@actuary.org with any questions, feedback, and ideas you may have on future topics and ways we can continue driving the Academy mission forward together.  $\triangle$ 

WILLIAM J. MICHALISIN is the Academy's executive director and



A look ahead at what's we'll feature in the upcoming issues of *Contingencies*:

- Academy's 60th Anniversary
- The Role of Professionalism
- Q&A with ASB Chair Kevin M. Dyke
- O&A with ABCD Chair William C. Hines
- Bias, Insurance, and Artificial Intelligence
- Cloud-Based Infrastructure for Insurance

Stay tuned for in-depth insights and expert analysis on the issues shaping the actuarial profession.

Have a topic that you would like to see covered? Send your ideas to editor@ actuary.org.

## At the Top of Your Game

AS A KID GROWING UP IN MICHIGAN, I had the opportunity to play a lot of hockey. Maybe it is my imagination, but the winters seemed colder back then—cold enough that my friends and I could skate on frozen ponds for nearly the whole season. As I got older, I convinced my parents to allow me to join an organized league and play in indoor rinks. Over the years—through hundreds of hours of ice time and a lot of thinking about the game—I developed a reasonable proficiency in skating, passing, shooting, and even some of the rougher elements of the sport. Eventually, life's priorities pushed hockey largely out of my life. There was college, actuarial exams, family, and work. Playing in the midnight beer league sounded fun, but the 7 a.m. business flights the next morning made it impractical.

Decades passed without me skating regularly, and I gradually lost interest in watching NHL games on television (which correlated with the Red Wings deep slide into irrelevance). But recently, I had the chance to watch one of the Stanley Cup games while I was stuck at the airport because of a delayed flight. After I got past my initial shock that a team from Florida was playing (and winning) the finals, I was drawn into the game and started to notice things had changed. Certain rules had been modified-around what goaltenders could do, what constituted icing, how long passes could be, and where face-offs occurred.

New penalties seemed to have been introduced, with unfamiliar hand gestures from the referee. The tools the players used were different than I remembered as well—skates had removable blades, sticks were made of high-tech materials, and helmets looked much more robust. In short, the game had evolved while I had not been paying attention.

A contributing factor to my abandonment of hockey was the need to study for actuarial exams. The hundreds of hours spent in ice rinks shifted to hundreds (if not thousands) of hours spent in front of a book, computer, notepad, and calculator. It was through those exams, as well

as on-the-job experience, that I built proficiency in my professional craft.

#### **USQS Requirements**

Precept 2 requires that an actuary perform actuarial services only when he or she "...satisfies the applicable qualification standards." The U.S. Qualification Standards (USQS)—as promulgated by the Academy's Committee on Qualifications—contain section 2, which provides a General Qualification Standard applicable to any actuary who is issuing a Statement of Actuarial Opinion (SAO) while providing actuarial services. The USQS recognize the importance of the education and examination process in requiring actuaries to satisfy a basic education requirement prior to issuing any SAOs:

Section 2.1(a) Basic Education: Have achieved 1) through education or mutual recognition, a Fellow or Associate designation from either the Society of Actuaries (SOA) or the Casualty Actuarial Society (CAS), 2) the Enrolled Actuary (as defined in section 2.1.1) designation, or for all others 3) membership in the American Academy of Actuaries through its approval process.

The USQS continue in section 2.1(b) by outlining a demand for three years of responsible actuarial experience. The



requirement to have both foundational academic knowledge of the subject and practical working experience acknowledges the criticality of making black-and-white technical decisions as well as gray professional judgment choices.

Section 2.1(c) expands on the previously mentioned general requirements, demanding that an actuary be knowledgeable of the U.S. laws applicable to the specific SAO. A requirement of familiarity with U.S. actuarial practices and principles is also included. Section 2.1(d) adds additional qualification standards which relate to the area of actuarial practice or any particular subject within the area of actuarial practice. Those supplementary strictures enforce some combination of another basic education obligation within the area of practice (either achieved through the pursuit of credentialing or via additional educational opportunities) and an apprenticeship-like requirement of working under another actuary qualified to issue the SAO for a minimum time period (which can vary from one to three years depending on the level of credential achieved and education pursued).

Importantly, section 2.1.2 clarifies that the basic education requirement for an area of actuarial practice or a particular subject area within an area of actuarial practice need only be met once. The acceptance of long-ago education prevents actuaries from the constant challenge of intense studying and examination. However, without further rules, an actuary's required skills could be frozen in time upon credentialing.

Addressing this critical need for maintenance and continuous enhancement of skills, the USQS devote section 2.2 to continuing education (CE). Section 2.2.1 provides an excellent rationale for the CE requirement by emphasizing,

"Actuarial practice is grounded in the knowledge and application of actuarial science, a constantly evolving discipline. If actuaries are to provide their principals with high-quality service, it is important that they remain current on emerging advancements in actuarial practice and science that are relevant to the actuarial services they provide."

The USQS rest on that rationale to clarify that all actuaries seeking to satisfy the General Qualification Standard must complete and document at least 30 hours of relevant continuing education *every year*. Because of our commitment to professionalism, three hours of that total must be related to professionalism, and one hour must cover bias topics.

The USQS CE requirements apply to all actuaries subject to the Code of Professional Conduct when issuing statements of actuarial opinion.

#### Meeting the CE Standard

Relevant CE is clarified to mean that it (a) broadens or deepens an actuary's understanding, (b) exposes the actuary to new and evolving techniques, (c) expands an actuary's knowledge of practice in related disciplines, and (d) facilitates an actuary's entry into a new area of practice.

It is important that, while 30 hours overall must be achieved and documented annually, only six of those are required to be from organized activities, defined as those which involve interaction with actuaries or other professionals working for different organizations. Some examples of organized activities include conferences, webcasts, in-person or online courses, and relevant committee work. Possible CE, which is relevant but not considered organized, might be reading actuarial literature, reviewing statutes, writing papers, or viewing replays of webcasts.

Also, please note that the USQS CE requirements apply to all actuaries subject to the Code of Professional Conduct when issuing statements of actuarial opinion. Those actuaries under the jurisdiction of the Joint Board for the Enrollment of Actuaries' (JBEA) CE requirements, who are also members of one of the other actuarial organizations that have adopted the Code, must consider compliance with both sets of continuing education on an ongoing basis. Notably, while the JBEA rules operate on a three-year cycle, actuaries covered by the USQS rules must continue to satisfy USQS requirements annually if issuing SAOs.

Perhaps unsurprisingly, the Actuarial Board for Counseling and Discipline (ABCD) inquiries often involve a failure to obtain or document sufficient CE credits. CE forms a vital part of our ability to uphold the reputation of the actuarial profession. As the rules and tools of our professional trade evolve, be sure to keep your eyes on the professionalism puck!

**TIM GEDDES** is a member of the Actuarial Board for Counseling and Discipline. He was the Academy's vice president, professionalism, from late 2022 to late 2024. He previously served as vice president, retirement, and as a member-selected director on the Academy Board. In his youth, only the really tough survived the winters and the hockey.





he intersection of public policy and the work of actuaries is familiar territory to most Academy members. But for many outside the industry—particularly those who work on policy issues at the federal and state levels—the connection between the two might seem a bit of a head-scratcher.

How could these professionals who meticulously follow numeric outcomes related to casualty, finance, health care, life insurance, and retirement issues be involved in the policy world, where negotiation and compromise are essential to the process?

The answer is they are not, at least not in the conventional way most think about policymaking. Public policy tends to evoke images of lobbying, where people in suits wine and dine elected officials, trying to pass legislation or influence decisions that benefit their company, their industry, or some segment of the population. Our members know that the Academy is not in the lobbying business. Instead, we inform and educate lawmakers, regulators, and their staff by providing actuarial analysis and application of actuarial principles and insights through the work of our volunteer committees presented in scores of publications, webinars, events, and presentations we produce each year. Instead of lobbying for a solution, we provide information that helps the decision makers better understand the issues, supporting an informed

decision and optimal solution for the public.

Academy members with their expertise in risk assessment, financial modeling, data analytics, and long-term forecasting—offer objective

analysis that is essential for tackling complex and pressing policy challenges. Their involvement is especially critical in areas where long-term financial security, demographic shifts, and emerging risks intersect—including aging and fiscal security through the lens of public programs; private retirement savings; the shifting affordability of insurance products; how climate change affects personal health, personal property, and community solvency; and the impact and influence of technology innovations such as artificial intelligence (AI) and cybersecurity.

Public policy decisions—whether made in state legislatures or federal agencies—can have far-reaching consequences for financial systems, insurance markets, and consumers. The Academy plays a unique and vital role in this by offering objective, actuarially grounded insights that support effective regulation and sound policymaking. What follows is a look at how the Academy engages across the policymaking spectrum at the federal and state levels, and through cross-practice initiatives.

Far from the world of lobbying, the Academy helps shape public policy by offering independent, actuarially grounded insights on complex issues—from retirement security and insurance affordability to climate risk and emerging technologies. Through the work of its volunteers, it helps policymakers at all levels address today's challenges with clarity, credibility, and long-term perspective.

Discourse

BY TED GOTSCH

#### **Federal Efforts**

One of the most visible ways the Academy engages with elected officials and shares our members' expertise with federal lawmakers is through our annual Hill visits, which we hosted this past April.

Some 40 members, accompanied by Academy staff, participated in more than 30 Capitol Hill visits, sharing their nonpartisan professional perspective with both congressional committees and individual staff. Academy members represented all five practice areas, emphasizing priority issues such as Medicare, Social Security, climate events, lifetime income, AI, and more.

"Hill visits are really important because they begin a conversation with the people that we want to interact with," Academy President Darrell Knapp said. "It's not expecting to walk out of the Hill visit with any sort of firm conclusion or 'Hey, we scored this big win.' It is about starting a conversation with a number of influential representatives and their staffers while reinforcing the value an actuarial perspective and the Academy's role delivering it."

This year's event brought some changes to the annual visits. For the first time, members from all practice areas participated at the same time, resulting in a more concentrated and coordinated visit than in years past. It also facilitated a cross-practice-area perspective, bringing members together to engage on broader policy issues and share the experience with both new and longtime colleagues and friends.

As the Academy continues to focus on broader questions around aging and financial security, this year's Hill visits created an opportunity for volunteers from the Life Practice Council (LPC) to team up with members of the Retirement Practice

Council (RPC). While some conversations with Hill staffers naturally focused on Social Security, bringing the two teams together allowed for a more expansive conversation on the challenges of sustaining income over a lifetime through products such as annuities.

LPC member Theresa Resnick, who participated in Hill visits for the first time, noted that when people talk about retirement savings, they often overlook the role of personal savings outside traditional retirement vehicles like pensions and defined contribution plans.

"From a federal policy member level, that message has to get out," she said. "The greater they have that understanding, they can be more balanced in policy that they may be setting. They need to understand what the retirement picture looks like and what the options are for people after they stop earning a wage."

Similarly, Health Practice Council (HPC) member Isaac Squire said Hill visits provided him with an opportunity to speak to those in Congress working on the same issues that he is. "It is good to meet the people working on different rules and policies and seeing what questions they have," he said. "It does seem everyone is talking about subsidies, taxes, benefit levels, and drugs covered. There are big problems that we can work on together."

Beyond the Hill visits, the Academy also holds meetings with different federal agencies throughout the year, allowing federal agency staff and Academy volunteers the opportunity to delve deeper into policy discussions. This engagement, coupled with Hill visits, underscores the Academy's mission to provide unbiased actuarial expertise and advice.



The federal landscape includes both the legislative and executive branches, which create laws and regulations that benefit greatly from the insights, expertise, and analysis that our Academy volunteers provide daily—both in their professional roles and their volunteer work for the profession. We are also intentional about ensuring our engagement remains transparent and nonpartisan, regardless of political party or ideology.

The Academy stands firm on its mission and vision to be the preeminent source of actuarial expertise as it works to serve the public and the U.S. actuarial profession, without the burden of taking a side. We share our insights and with everyone who has influence, interest, or awareness of our key policy issues, regardless of title, position, or opinion—a rarity in Washington, D.C.

Growing those relationships and building the Academy's reputation as a source of truth comes in handy when pressing policy matters arise. That's when practice councils often choose to send comment letters to leading lawmakers or congressional committees, sharing our nonpartisan insights on a given topic, based on work a committee or the practice council has done or is doing.

Recent examples include letters<sup>[1]</sup> sent by the HPC's Individual and Small Group Markets Committee to the House Budget Committee leadership and Senate Leadership in response to H.R. 1, the One Big Beautiful Bill Act. The letters focused on potential changes to, and the impact of, different provisions under consideration on the individual health insurance market. The Academy also submitted a cross-practice letter<sup>[2]</sup> to the National Oceanic Atmospheric Administration (NOAA), strongly encouraging it to rethink retiring its Billion Dollar Weather and Climate Disasters database. The letter underscored the value of public databases, not only for the actuarial world,



but also for broader research and the development of possible mitigation strategies that impact communities within and outside the U.S. Finally, the RPC's Pension Committee sent a letter<sup>[3]</sup> in response to the Internal Revenue Service's public request for feedback in helping it identify and prioritize its 2025-2026 Priority Guidance Plan.

#### **State Efforts**

On the state policy front, the Academy maintains a strong presence through its involvement with several state-focused organizations. Our most active and visible engagement is with the National Association of Insurance Commissioners (NAIC), where many of our volunteers and practice councils are actively engaged. The Academy also participates in the work of the National Council of Insurance Legislators (NCOIL) and the National Conference of State Legislatures (NCSL).

The Academy's relationship with the NAIC is long-standing and grounded in close collaboration with the actuarial task forces and the regulators who serve

on them. Read also "Securing Stronger NAIC-Academy Ties for Public Good" on page 26. It's no surprise that the meeting agendas for the Life Actuarial Task Force. Health Actuarial Task Force, and Casualty Actuarial and Statistical Task Force are often filled with reports and presentations from Academy committees and volunteers—both on policy and professionalism--related topics. Regulators frequently turn to the Academy for reports and analysis to inform and support their work.

A recent example comes from the March 2025 national meeting, where life practice volunteers provided an update on the progress and potential framework recommendations related to the VM-22 Field test; health volunteers shared a recent report on the current state of longterm care insurance market; and professionalism volunteers briefed regulators on current and anticipated opportunities to comment on actuarial standards of practice (ASOPs).

The Academy's engagement with the NAIC goes beyond the actuarial task forces. We frequently work with NAIC



commissioners and the executive committees as they evaluate a range of projects and issues. One notable example is the newly created NAIC Risk-Based Capital (RBC) Model Governance (EX) Task Force. The Academy is actively involved as this commissioner-led task force develops guiding principles for updating RBC formulas across the life, health, and property/ casualty lines of business. The task force also seeks to educate their international and federal counterparts on the efficacy and current state of RBC and support the state regulatory role in balancing company solvency with the availability of products to meet consumer needs.

The Academy submitted cross-practice comments<sup>[4]</sup> on the task force's initial charges and offered verbal comments during a conference call and during the in-person meeting at the Spring National Meeting in March, emphasizing our commitment to working with the commissioners. The Academy continues to work with the task force's leadership team, NAIC staff, and other stakeholders as the project progresses and new items emerge.

Katie Dzurec, the Academy's director of state public policy outreach,

said it is important to get relevant resources into the hands of state-level stakeholders at the right time to support decision-making. "Insurance regulation is predominantly a state-based endeavor, so conversations with state policymakers are critical," she said. "It is our goal to get objective, relevant resources into the hands of state regulators, legislators, and others when they need them. We can't do that if we don't communicate with them."

#### **Expanding Policy Reach**

One of the key priorities of the Academy is to educate the broader policy community about the wide range of topics that actuaries focus on while preserving our independent, nonpartisan, and balanced voice. We work with elected officials and regulators at the federal and state levels, as well as with the broader community of trade organizations, consumer advocacy groups, think tanks, and the media. We collaborate across all levels with organizations like the ACLI, AHIP, and NAMIC in the U.S., while also building working relationships with some international groups such as the Actuarial Association of Europe and the

International Congress of Actuaries. We rely upon the expertise of our volunteers to identify and present potential solutions to the challenges across practice areas, all within the broader context of risk and financial security. So, what are those issues? You will find the information in the Academy's Policy Forum,[5] which was built upon the premise of the Election Clearinghouse<sup>[6]</sup> that debuted last year. Today's Policy Forum builds on the framework developed during the 2024 presidential election year and identifies the broader policy issues that continue to be top of mind for our volunteers, the profession, public policy stakeholders, and elected officials.

The Policy Forum offers a one-stop shop where anyone can access some of the Academy's most impactful policy work. It includes a curated list of issue briefs, blogs, webinars, podcasts, presentations, and *Contingencies* articles. Rather than organizing content by practice areas, the Policy Forum groups resources under broad and cross-cutting themes, highlighting issues and concerns that you may recognize from news articles, political debates, and social commentary, including:

- Aging and financial security
- AI and data
- Impact of climate events
- Access to and affordability of insurance
- Investment and financial reporting How did we select these topics? They're not only timely—they're also areas where an actuarial perspective adds real value.

Aging and financial security looks at how an increasing older U.S. population presents significant fiscal and social challenges, from increased health care needs to retirement security challenges to accessibility to key insurance products, including homeowners and flood insurance policies.

## **Trump Uses Executive Orders to Create Policy Pathway**

With the federal legislative process increasingly hamstrung by the nation's politically polarized environment, U.S. presidents have turned to using executive orders (EOs) more to set policy—even if they are only a temporary fix.

President Trump issued 142 EOs during the first 100 days of his second term in office, the most ever<sup>[12]</sup> to be issued during that period—far ahead of the 99 issued by Franklin Roosevelt during his first term in 1933. The orders set the administration policy but can be overturned by the courts and rescinded by future presidents.

Several of these EOs fall into policy areas that are of interest to the Academy and its membership—mostly in the health care space. Even though it is uncertain how long they will remain in place, it is imperative to understand them.

#### **Health Care**

- "Delivering Most-Favored-Nation Prescription Drug Pricing to American Patients"<sup>[13]</sup>—says Americans should not subsidize low-cost prescription drugs and biologics in other developed countries by paying more for the same products in the U.S.
- "Regulatory Relief to Promote Domestic Production of Critical Medicines"[14]—attempts to streamline the regulation of manufacturing pharmaceutical products in an effort to enhance the domestic pharmaceutical manufacturing base.
- "Lowering Drug Prices by Once Again Putting Americans First"[15]—seeks to reform federal health care programs, intellectual property protections, and safety regulations to provide access to prescription drugs at lower costs to American patients and taxpayers.

- "Empowering Patients Through Radical Price Transparency"[16]—intends to empower patients with accurate health care pricing information by having the Trump administration enforce price transparency regulations approved during his first term.
- "Lowering Costs and Reducing Barriers to IVF"[17] directs policy recommendations to protect in vitro fertilization (IVF) and reduce out-of-pocket and health plan costs for such treatments.
- "Prohibiting COVID-19 Vaccine Mandates in Schools"[18]—bars federal funds from being used to support or subsidize educational institutions that require students to receive COVID-19 vaccination to attend school in person.
- "Enforcing the Hyde Amendment"[19]—ends the use of federal dollars to fund or promote abortion.
- "Make America Healthy Again" [20]—establishes the Make America Healthy Again Commission, which is tasked with investigating and addressing the state of health in America, with a focus on childhood chronic diseases.

#### **Climate and Cyber Risk**

"Achieving Efficiency Through State and Local Preparedness"[21]—says state and local governments should play a more active and significant role preparing for incidents like weather events and cyber attacks in an effort to save lives, protect livelihoods, and reduce taxpayer spending.

#### **Artificial Intelligence**

"Removing Barriers to American AI Innovation<sup>[22]</sup>—
revokes President Biden's EO on AI while calling for the
U.S. to enhance its AI efforts through development of
systems free from ideological bias or social agendas.

Rising health care costs and demographic changes place significant stress on Medicare and Medicaid. Actuaries evaluate cost trends, utilization patterns, and funding mechanisms to guide sustainable policy decisions. Meanwhile, through evaluating plan funding, demographic trends, and benefit structures, actuaries help ensure retirement systems remain financially sound and resilient. Their work supports policies that promote long-term financial security, both for individuals and for public and private institutions.

One area of focus for the Academy is the growing prominence of annuities as a financial security tool, a topic explored at our inaugural Insurance Investment Summit, [7] held in New York City last May. During the two-day forum, panelists and attendees

engaged in dynamic conversations, discussing differing perspectives and experiences related to the insurance investment sector. Regulators also weighed in, with all participants focused on practical solutions for navigating this evolving landscape.

AI and data recognizes the important role of actuaries in assessing model accuracy, fairness, and transparency as AI becomes more embedded in decision-making processes, including in underwriting and claims management. The actuarial input is crucial in shaping ethical frameworks and governance standards that protect consumers and maintain trust in financial systems.

Reflecting the value that actuaries bring in this area is the recent issue brief<sup>[8]</sup> exploring the topic of discrimination in



(L-R) Committee on Cyber Risk Chairperson Wanchin Chou, Data Science and Analytics Committee Vice Chairperson Maggie Ruzicka, P/C Committee on Equity & Fairness member David Reyes, and Homeowners' **Insurance Task Force Vice Chairperson Emma Casehart** on Capitol Hill on April 3.

machine learning algorithms and the underlying data of these models. The Academy's ongoing focus and work through the Cyber Toolkit is another reflection of how this continually evolving issue has considerable influence on public policy, federal and state regulation, and an international focus on how to build frameworks, establish protocols, and ensure that innovation continues while being bal-

As technology transforms the landscape, it raises important questions about how the actuarial profession will evolve. Actuaries have an opportunity not only to help shape the future of the industry and the organizations they serve, but also to ensure that, as systems and processes become increasingly automated, the human experience remains central.

anced with transparency and accuracy.

The impact of climate events weighs how climate-related risks—including flooding, hurricanes, and wildfires—pose major challenges to financial systems and insurance markets. Actuaries contribute to policy

discussions by quantifying the long-term impact of these risks and identifying adaptive strategies that enhance resilience across sectors.

Earlier this year, in response to the devasting and destructive wildfires in Los Angeles, the Academy published a supplement to the annual practice note that was developed by the Committee on Property and Liability Financial Reporting with the Casualty Practice Council. [9] The supplement offered insights and case studies for casualty actuaries who were in the middle of their annual opinion season. The supplement helped provide insight and support as actuaries were developing their

Statement of Actuarial Opinion. The supplement was timely and impactful for our members and for the regulatory community, who were also struggling to understand how to account for the unprecedented event and its impact on the filings and insurance products.



Access to and affordability of insurance does a deep dive into the affordability of coverage, whether it's for health, life, or property insurance. Actuaries support the development of policies and regulations that balance affordability with solvency, helping insurers manage risk responsibly while expanding coverage options for individuals and families.

Some recent work by the Academy in this area is a February issue brief<sup>[10]</sup> on the state of long-term care insurance. The brief discusses the growing demand for this product, driven by the aging baby boomer generation, estimated at 73 million in 2020. Among those over 65, 70% are expected to need longterm care services.

Finally, investment and financial reporting delves into policy decisions around such things as tax incentives, retirement savings vehicles, and financial market regulation that can significantly influence Americans' ability to build wealth and plan for the future.

An example of the Academy's work on this issue is its paper<sup>[11]</sup> about the Security Exchange Commission's (SEC) cybersecurity disclosure requirements, which outlines the SEC's cybersecurity incident disclosure requirements; highlights some of the trends associated with the filings since the Cybersecurity Risk Management, Strategy, Governance, and Incident Disclosure rule became effective in December 2023; and discusses the potential financial risks toward organizations surrounding inaccurate or misleading disclosure.

The Policy Forum serves as the conduit to compile the Academy's best work into one location that is accessible to a broader audience. It helps the Academy display its highest-profile content in the federal and state space together while allowing the organization to better fulfill its mission: to assist policymakers at all levels and serve the public and the U.S. actuarial profession.

#### Staying the Course

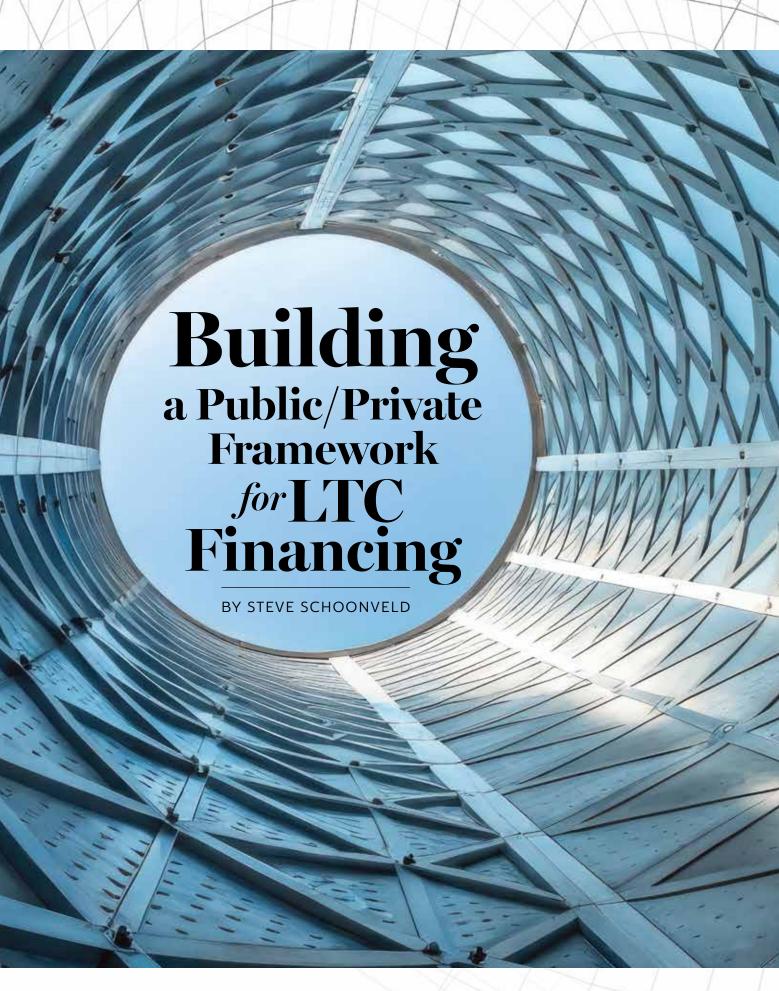
As the policy landscape continues to shift, the Academy remains committed to being a trusted, nonpartisan resource. Whether through issue briefs, Hill visits, or participation in regulatory discussions, our work reflects the power of actuarial insight to inform sound decision-making. By staying nonpartisan, forward-looking, and rooted in our mission, the Academy helps ensure that public policy is shaped by facts, fortified by expertise, and focused on the public good while reinforcing the valuable role an actuarial perspective brings to the equation. 🛕

TED GOTSCH is policy content and publications manager for the Academy.

#### **Endnotes**

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- [22] "Removing Barriers to American AI Innovation"; Office of the White House; Jan. 23, 2025.



A coordinated approach between public programs and private insurance can create a sustainable foundation to meet the growing long-term care needs of older adults and their families.

here is overwhelming consensus among experts that the need for care and support for older adults and their families is enormous. There is little disagreement over how that can be best accomplished, as a majority believe funds from both public and private sectors are necessary to meet this growing need. But what does a public/private collaboration mean, and is it too late to make it work?

The opportunities in long-term care (LTC) financing have been present for decades. With a majority of baby boomers now entering the age during which care needs arise, is that window of opportunity closing? Are both the public and private industry sectors able to meet the ever-increasing needs of these older adults? What is the role of public programs and private approaches and how would they blend to meet consumer needs? These are critical decisions requiring meaningful study and research. [1] Many have argued for a front-end public program, where the first dollars of claims are covered, while others advocate for a back end or catastrophic public approach where benefits begin after a year or two. There are reasons supporting each. However, a collaborative approach must address the increasing demand on current public programs such as Medicaid. It must also address the caregiver supply crisis and the need for a robust financing market to reduce the devastating impact of LTC expenses on older adults and their families.

Either way, neither current public nor private approaches are comprehensive enough to truly address the LTC crisis. Middle-income families are often forced to use their retirement savings; they must rely upon family members for 24/7 care; and too often they

depend on Medicaid. Long-term care insurance (LTCI) must be affordable and supportive of families trying to provide for their loved ones. Older adults seek to remain in their homes with support for both their acute and long-term care needs as they age. Furthermore, they require caregiver training and support for those times when they do wish to rely on family members or community resources.

Such a public/private collaboration can address the caregiving crisis, improve the ability of middle-income population to purchase private insurance, and help reduce overall care needs and costs.

This article aims to not only address the state of today's LTCI market, but also offer solutions to the problems raised previously.

#### The Evolution of Long-Term Care Insurance

LTCI came into existence in the early 1980s and has evolved significantly from the initial nursing-home-only coverage offerings to today's hybrid products that combine life and annuity policies with long-term care expense coverage. Today, over 7 million individuals have some form of LTCI coverage. [2] Furthermore, approximately \$16 billion in LTC claims were paid

in 2024 for the current in-force standalone long-term care population. [3] That number is projected to more than double within 10 years and peak at \$41 billion in 2041. [4] Clearly, insureds are being supported by the coverage they purchased many years ago.

The survey projections assumed that just 13.6% of in-force policies were issued within the past 10 years, while over 80% were issued between 2000 and 2015. [5] One reason for that dip is the evolution of the market during that period, with a shift toward hybrid life and LTCI policies, as well as the high volume of standalone policy sales in the early 2000s. One can only imagine how much more robust the industry's projected claims would be if the market had continued to grow in line with the sales patterns of the early 21st century.

In 2002, over 755,000 standalone LTC policies were placed. [6] The group LTC market was very robust, the Federal LTC program had launched and was generating significant sales, and a hybrid market was beginning to emerge. In recent years, sales of standalone long-term care insurance policies have fallen to less than 10% of their 2002 peak, and sales of hybrid products and short-term care policy sales have not fully made up for the decline.

While many carriers over the history of LTCI have done an exceptional job producing products and writing

coverage for their clients over the years, the limited number of carriers available to educate consumers about the need for coverage and to meet demand has contributed to the decline. And while innovation in underwriting and issue, technology, and sales support has kept pace with broader trends in the insurance industry, a return to the sales levels of 2002 has yet to be seen.

There are plenty of other contributing factors that have caused the gap between demand and coverage levels:

- 1. A recent industry study found that consumers don't purchase long-term care coverage because "they have competing financial priorities" and "they are overwhelmed by the perceived costs of LTC protection..."<sup>[7]</sup>
- 2. While carrier innovation has indeed occurred in the past 25 years, state-based regulations have not changed to support the broad product innovation that's needed. Specifically, policies that meet the needs of the middle income—such as short-term care and affordable state partnership program products<sup>[8]</sup>—have only recently emerged.
- 3. State and federal programs aimed at fostering collaboration between public and private insurance programs have been slow to develop. By comparison, nearly 90% of people enrolled in traditional Medicare have some form

- of supplemental coverage, including Medigap, Medicaid, or employer-sponsored retiree health plans.<sup>[9]</sup>
- 4. Selling LTC insurance requires a health producer's license and specific LTC insurance continuing education. While these requirements promote necessary product knowledge, they may also limit the number of advisors and brokers who actually support and sell LTC products.

#### **Market Differences**

Having an appreciation for music, it is interesting to consider how our approaches to both listening and LTCI products have evolved from 2000 to today. Remember that the iPod was not introduced until October 2001; Napster had just launched, and music stores were still thriving as Amazon didn't begin selling music until late 2000. At the turn of the century, we were listening to music on CDs, cassettes, and even old records. Today, music can be streamed on virtually every electronic device you own, including your car and phone. You no longer need a stereo system, a Walkman, or a boombox. When was the last time you dropped a quarter in a jukebox?

LTCI policies continue to be designed with as little flexibility, relying on product features and requirements rooted in the NAIC Long-Term Care Insurance Model Act and Regulation (640 and 641, respectively) in effect since 2000. [10] Sure, we packaged the "CD" differently, through hybrids, short-term care products, and chronic illness riders, but the core content and provisions remain the same.

Certainly, carriers now issue and deliver policies using modern technology and have developed care and claim support tools that reflect today's care and caregiving needs. But one clear example of the system's inflexibility is the inability to use policy benefits to support needs before the insured becomes ADL-dependent or experiences severe





cognitive impairment. While the tax code does have limitations, early intervention is an approach that can reduce reliance on informal and family caregiving, and increase the likelihood that claimants may remain at home. Not only is home care preferred by most, but it is also less expensive, and it is what consumers want from their LTC insurance product.

As stated above, LTCI has evolved from a primarily standalone product into a broader ecosystem that now includes a mix of hybrid-life-and-LTC, hybrid-annuity-and-LTC, chronic illness riders, short-term care products, and offerings across both group and individual products. Furthermore, there is a broad but relatively small distribution force made up of insurance brokers, financial advisors, captive agents, and employee benefit specialists.

Finally, while the number of carriers is lower than at the market's peak, a mix of public and private companies, mutual insurers, and fraternal carriers continue to write these products. This evolving maturity requires the support of state, federal, and tax regulations that can create a common platform across the full spectrum of long-term care solutions, which appeals to consumers.

#### **Public Programs Opportunities**

During a recent Academy webinar on the state of the LTCI industry, attendees were polled on this question: "What will have the biggest impact on future LTC insurance markets?"

Nearly two-thirds of the attendees selected a state or federal LTC/LTSS program with tax incentives as the most promising path to enhancing the future of the market. A Medicare home care benefit was a distant second. [11] It's worth noting that this unscientific poll included a diverse group of attendees, both actuaries and non-actuaries, with approximately half working in state and federal agencies, and the other half from consulting firms, insurance carriers, and other employers.

Similarly, a recent Employee Benefit Research Institute survey found that 61% of employees expect their future care recipients to qualify for Medicaid. Furthermore, a majority of employees are seeking ways to finance their long-term care needs: 53% said they are willing to purchase a LTC policy through their employer, and 64% indicated that they would pay an additional state payroll tax during their working years[12] to obtain coverage. Clearly, a majority of the 2,445 employees in this online survey are searching for financial support for their future LTC needs. Like many other consumers, respondents in this study are seeking LTC solutions that span a broad spectrum—from home- and community-based services to institutional care, and from private market offerings to public-program supports. This highlights the opportunities that both public and private solutions can provide while emphasizing the need for collaborative approaches.

Due to the current and anticipated explosion in Medicaid costs, both state and federal initiatives are being proposed to



# Without updating and clarifying the market for LTC financing products, we risk placing even greater strain on public programs and families not only from the baby boomer generation but those that follow.

address the crisis. Washington state implemented the WA Cares program to help address these challenges. This approach provides a front-end coverage for LTC expenses, offering a benefit of up to \$36,000 (indexed annually for inflation), and is funded through a payroll tax. Recently, the governor of Washington signed a bill to create new standards for a supplemental product that is intended to work alongside WA Cares and has been described as "very similar to how Social Security and Medicare work.<sup>[13]</sup>

Popular Medicare supplement products help cover out-of-pocket costs, including copayments and deductibles that Medicare does not pay. In this way, these supplements represent a very small portion of the overall Medicare program costs for senior health care.

Given that the average length of a LTC claim exceeds two years, and the cost of care in Washington state ranges from

\$44,000 to \$166,000 per year, [14] the WA Cares program itself functions more like the true "supplemental" product. While the average claimant may have his or her initial care needs covered, the costs for a claim that continue into the second and third years of care can be devastating. Is WA Cares an example of appropriate public/private collaboration, or should state programs evolve to cover more than just initial nominal expenses?

Additionally, there have been significant complications with WA Cares. For example, while participants who leave the state may continue to fund their coverage through voluntary premiums—similar to the payroll tax—many are unlikely to maintain their coverage. These "lapses" result in a lower overall payroll tax, but they also reflect a phenomenon similar to what the private LTCI market experienced when policies were priced with high lapse expectations—in other words, as lapse-supported products. Moreover,

benefits are reduced for care received outside of Washington state.

Another approach being offered at the federal level is the Well-Being Insurance for Seniors to be at Home Act, or the WISH Act. This proposal, introduced by Rep. Tom Suozzi (D-NY) and co-sponsored by Rep. John Moolenaar (R-MI), seeks to establish a "federal catastrophic long-term care insurance program that provides financial support for disabled seniors while fostering a more vibrant private sector insurance market". [15] The bill, introduced on Feb. 11 this year, seeks to reduce the need for older adults to spend down their assets to qualify for Medicaid and to generate Medicaid savings by supporting home-based care at the onset of care needs. The WISH Act also proposes an income-based elimination period, designed to enable affordable private insurance supplemental products.

As federal programs like WISH and additional state-based programs are being considered (California, Minnesota, and Massachusetts), LTC insurance products should be allowed to coordinate care with these programs to reduce unwanted gaps in coverage and inconsistencies between programs.

# A Need to Review State Regulations

In recent years, many *Contingencies* authors have presented potential solutions to the crisis that is now at our doorstep:

■ Sam Gutterman, who is chairperson of the Academy's Social Security
Committee and member of the
Retirement Practice Council, has called
for actuaries to continue repeating the demographic and financial
facts over and over to spur serious
discussions. [16] In 2025, these facts are
no longer actuarial projections—they
are a clear reality. Achieving consensus
to address an issue like long-term care
requires educating policymakers. We
are now at the end of the decades spent

- anticipating—and ignoring—the crisis.
- Robert Eaton, a member of the Academy's Data Science and Analytics Committee and past chairperson of the LTC Combo Product Valuation Practice Note Work Group, has highlighted how technology may help reinvent the LTCI marketplace, pointing to tools such as fall detection, enhancing communication to prevent social isolation, and wearables that monitor vital signs. <sup>[17]</sup> These tools can support both public and private solutions by enabling older adults to remain in their homes longer and more safely. However, as noted above, the current state regulations for LTC insurance products do not readily enable such supports.
- Paul Forte offered 10 ideas, including building wellness initiatives aimed at delaying or mitigating the effects of aging. He also called for realigning LTCI with the broader health care system. [18] This was further discussed in a recent article that advocated integrating acute and long-term care approaches in the same way many dual-eligible (Medicare and Medicaid) programs are supported in about half of the states. [19]

As state- and federal-based solutions emerge, the 25-year-old state insurance regulations must be reviewed to improve and encourage true public/private collaboration and partnership. This includes coordinating benefits between programs, providing opportunities that truly supplement state or federal programs, and aligning the evolving needs of older adults and their families. Without updating and clarifying the market for LTC financing products, we risk placing even greater strain on public programs and families not only from the baby boomer generation but those that follow.

#### An Opportunity to Build a Robust System

This year, the first of the baby boomer generation turns 80, the age at which LTC needs begin to increase significantly. Soon, more adults will be reaching this age than the 11,400 currently turning age 65 each day. [20] The demand for care and caregivers will be overwhelming. The opportunity and ability for many older adults to retire comfortably while affording their LTC costs is diminishing. As a result, there will likely be growing reliance on community care and family caregivers to meet the escalating demand. Public/private collaborative solutions

should be developed to support community and family caregiving, assist families in navigating care needs, integrate acute and LTC services, and fund long-term care needs through a combination of both public and private resources.

Let's work together to build an LTCI market robust enough so that the next article on the state of the industry is a list of successes not warnings. It is time to toss the CDs and Walkmans and get real about LTCI.

**STEVE SCHOONVELD, MAAA, FSA**, is a member of the Academy's Long-Term Care Committee.

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- [7] "2024 Long-Term Care Consumer Study"; OneAmerica Financial; October 2024.
- [8] These products allow seniors to keep financial assets beyond the normal limits and still qualify for Medicaid due to the purchase of a partnership eligible policy. Until recently, the required inflation protection of 5% made these policies unaffordable for many.
- A Snapshot of Sources of Coverage Among Medicare Beneficiaries; KFF; September 2024.
- [10] Reference the date and appropriate model regulation. While an update did occur in 2017, the changes primarily focused on rate increase issues.
- [11] Note that multiple responses were allowed to the polling questions.
- [12] Employee Perspectives on Long-Term Care; EBRI; May 2025.
- [13] "Changes to the WA Cares Fund expand long-term care support"; Washington State Department of Social and Health Services; May 2025.
- [14] Cost of Long Term Care by State; CareScout.
- [15] Suozzi Introduces One-of-a-Kind Bipartisan Bill to Address Senior Long Term Care Crisis; Congressman Thomas Suozzi; March 2025.
- [16] "The Looming Crisis of Long-Term Care"; Contingencies; October 2024.
- [17] "Innovation and Long-Term Care Insurance"; Contingencies; July/August 2022.
- [18] "Writing Long-Term Care in a Short-Term World"; Contingencies; March/April 2024.
- [19] "Supporting Older Adults"; The Actuary; June 2025.
- [20] "Turning 65 This Year? Here Are 10 Key Things To Know"; Kiplinger.

#### **Academy Resources**

Earlier this year, the Academy's Long-Term Care Committee released an issue brief, *The State of Long-Term Care Insurance–2025*, which explores the 40-plus-year history of long-term care insurance and how the industry has evolved to better meet consumer needs and address early challenges with pricing and carrier risk. The brief also discusses managing in-force blocks, emphasizing that policyholder engagement is crucial for both existing and new business. In addition, the Academy hosted a webinar examining the current LTCI landscape and the potential impacts of emerging changes.





NAIC President Jon Godfread, Nebraska Insurance Commissioner Eric Dunning, Wisconsin Insurance Commissioner Nathan Houdek, and NAIC President-Elect Scott White explore how deepening collaboration with the Academy bolsters regulatory decisions, sharpens risk oversight, and reinforces the vital role of actuaries in today's insurance landscape.

IN THE SECOND INSTALLMENT of this two-part, wideranging interview, Jon Godfread, National Association of Insurance Commissioners (NAIC) president and North Dakota's insurance commissioner; Eric Dunning, Nebraska Department of Insurance commissioner; Nathan Houdek, Wisconsin insurance commissioner; and Scott White, NAIC president-elect and Virginia State Corporation Commission Bureau of Insurance commissioner discuss how the Academy expertise informs regulatory decision-making and enhances insurance market oversight, while underscoring the trusted, enduring relationship between the two organizations. They also highlight the critical role actuaries play in shaping sound regulatory policy, advancing risk management, and ensuring consumer protection across evolving insurance markets.

How can an organization like the Academy—which provides independent and balanced insight and resources to stakeholders such as its members and the NAIC—better serve the industry and its insurance commissioners?

Godfread: One thing I consistently promote with my team in North Dakota is the utilization of professional development opportunities. The insurance landscape is ever-changing, and staying current with the latest trends and technology can help our industry better serve consumers through stronger and more stable markets.

Stronger collaboration is also key. Creating more opportunities for dialogue between actuaries, regulators, and industry leaders can bridge knowledge gaps and ensure policymaking reflects both technical expertise and real-world market needs.

Above all, the Academy's greatest value is its commitment to objectivity. One area where the insurance industry excels is assessing risk,

Editor's Note: This is the final installment of a twopart interview with several state insurance commissioners. Be sure to read the first part in the July/August issue of Contingencies, in which National Association of Insurance Commissioners (NAIC) leaders share how they are charting the future of insurance in an evolving landscape.

#### **Meet the Commissioners**

Jon Godfread is the NAIC president and also serves as the chair of the Government Relations (EX) Leadership Council and vice-chair of the Senior Issues (B) Task Force. He has led the North Dakota Department of Insurance as commissioner since 2016.



Eric Dunning chairs the NAIC's International Insurance Relations (G) Committee and has been Nebraska's insurance director since 2021.





scott White is the NAIC president-elect and has chaired the Financial Condition (E) Committee, the Long-Term Care Insurance (EX) Task Force, and the Southeast Zone. He is a member of the International Association of Insurance Supervisors (IAIS) Executive Committee, Macroprudential Committee, and Insurance Capital Standard Task Force.





largely due to the work of actuaries. It's difficult to tie numbers up into politics because numbers don't lie. By continuing to offer clear, fact-based insights, the Academy helps regulators cut through the noise and focus on policies that truly serve consumers and maintain strong markets.

**Dunning:** The Academy's focus on serving policyholders through better analysis and better data has been an incredible resource for regulators and policyholders. Continuing that tradition is an important source of strength for both. As we move forward with new artificial intelligence (AI) tools, actuaries will be at the forefront of helping to explain the new resources that the new tools will put at our disposal.

Houdek: The Academy plays an important role by ensuring that actuaries working across all lines of business are well-informed and qualified for their roles. The Academy's briefs, policy papers, and other publications are important resources for regulators. Our departments of insurance will need reliable, balanced sources of information in the coming years as the industry faces many challenges and emerging risks, and we will

look to organizations like the Academy for its insights and guidance.

White: The work done by the Academy is incredibly important to me. It contributes so much to the NAIC's efforts—work that we rely on and apply both within the organization and in our state-level work. I'd say the Academy really helps fill-or complement—gaps in actuarial expertise in some of the most critical areas we face. And it does so in a way that brings balance and provides insights that stakeholders across the board can trust.

Let me give you an example. One issue I've been very involved in—both in Virginia and at the NAIC—is financial solvency. You're probably familiar with the shift in investment strategies by life insurers over the past decade, much of it driven by private equity ownership and the prolonged low-interest rate environment. That trend has continued even as rates have risen. What we're now seeing is a move toward more complex, opaque, and illiquid investments—particularly structured products like CLOs (collateralized loan obligations).

This shift has raised a number of questions and highlighted gaps in our current insurer investment framework. One of the

major debates we've been engaged in concerns how much capital insurers should be required to hold against these structured products in the event of default. These assets are relatively new and materially different from traditional bonds, yet they've often been treated similarly when it comes to assigning capital charges.

In response, we've launched an ambitious initiative to develop new capital charges specifically for asset-backed securities like CLOs—charges that more accurately reflect the tail risk involved. This is incredibly complex work, and we've leaned heavily on the Academy's expertise. The Academy has earned the trust of regulators and stakeholders alike, and its input has been critical in this very contentious debate, particularly given the high stakes for industry players whose business models

By continuing to offer clear, fact-based

insights, the Academy helps regulators

cut through the noise and focus on

policies that truly serve consumers

and maintain strong markets.

—Jon Godfread

framework.

What's been particularly valuable is that no one has questioned the integrity or the quality of the Academy's work—it's one less thing we have to worry about as we try to navigate these challenges. We hope to use the Academy's work not only to inform capital charges for these specific assets, but also as a foundation for evaluating future investment types as new and more complex financial products emerge.

We greatly appreciate the Academy's role in this process and the value it brings to both current and future regulatory work.

are tied to the current capital

The NAIC is has made significant progress with its Al Governance Framework, to which the Academy provided comments and input. How do you see Al and other evolving technologies shaping the future of insurance? What do you view as the keys risks and opportunities associated with AI?

Godfread: AI and other emerging technologies are significantly transforming the insurance industry, presenting both exciting opportunities and substantial challenges. I am a strong advocate for the responsible use of AI to enhance work efficiency and serve as a safeguard against potential human errors. Overall, AI is making things faster and more efficient. It can help insurers better predict risks, expedite claims processing, and more effectively detect fraud. For consumers, that could mean more personalized policies, quicker responses, and a smoother overall experience.

But with all that potential comes real responsibility. One of the biggest concerns is making sure AI is used fairly. If we're

not careful, algorithms could unintentionally lead to biased decisions in underwriting or claims, which isn't acceptable. That's why efforts like the NAIC's AI Governance Framework matter; they help ensure that AI is used in a way that is transparent, accountable, and puts consumers first.

As regulators, we have to strike the right balance. We want to encourage innovation because it can genuinely improve the industry; however, we also need to ensure that new technologies don't come at the expense of fairness or consumer protection. It's all about working together, as regulators, industry leaders, and experts like those at the Academy, to ensure that AI strengthens the insurance market while maintaining fairness and accessibility for everyone.

**Dunning:** Nebraska was an early adopter of the NAIC AI Governance Framework. I believe it provided a solid structure to approach regulation in a quickly evolving area. As a regulator, and as a close observer of the policymaking space, I've been frustrated by challenges getting and analyzing data to help get a handle on the challenges our market faces. AI is going to give us so much leverage to extend the work done by actuaries and others who will help design and evaluate insurance products. We know that there are Americans who have a difficult time accessing the value of insurance. AI has enormous potential to help close those gaps.

Houdek: The NAIC has spent recent years building a regulatory framework consistent with the AI principles. The most recent work product, the AI bulletin, ensures the deployment of novel technologies is consistent with regulator expectations—especially in the context of unfair discrimination. New and emerging technologies can benefit consumers by mitigating potential losses, providing premium discounts, and improving consumer-facing aspects of the insurance life cycle, but those technologies must comply with existing laws and regulations.

The next big project being undertaken by the NAIC, the update to the Insurance Information and Privacy



Protection Model Act, addresses the emerging issue of transparency and fairness in the use of consumer data. The NAIC has been measured but responsive in dealing with emerging risks and opportunities of AI and I am confident we, as an organization, can meet the regulatory challenges presented by evolving technologies.

White: I know the Academy was very involved when we were working on the AI bulletin, providing valuable expertise and perspective. I see the actuarial community playing an increasingly important role in every area of this discussion—and that role is only going to grow.

When I explain this to a general audience, I frame it in terms of risk—specifically, the intersection of



consumer protection, privacy, and cyber risk. Technological innovation, particularly through machine learning and AI, touches all three. It not only creates new opportunities but also accelerates the areas of concern.

There's certainly a lot to be excited about—AI is bringing greater efficiency, improved decision-making, and cost reductions. These benefits are especially visible in companies moving away from legacy systems. What AI-powered algorithms can do now—analyzing vast datasets in real time, identifying patterns, making predictions—would've been unimaginable just a few years ago. It's transforming risk management, fraud detection, customer service, and distribution channels.

And we want to encourage all of that innovation. But we also need to be clear-eyed about the risks. One of the biggest concerns we're facing is the lack of transparency in these models. They're highly complex and understanding how decisions are made within them can be very difficult.

That's why reporting is so important—how are the data collected? What kind of data hygiene protocols are in place? How was the model built? We focus more on the process than the output, because we don't want to be overly prescriptive, but we need to ensure a sound foundation.

A related issue is the use of third-party vendors. This is something we're very focused on at the NAIC. The lack of transparency becomes a real problem when a company says, "That model was developed by our vendor," and the vendor, in turn, won't provide details for proprietary reasons. That's a significant regulatory challenge. This year, it's one of the major projects our AI-focused committee is working on.

Then there are the more traditional concerns, like data bias. This has been on our radar for at least five years. These models often rely on historical data—if that data are biased or skewed, there's a real risk of amplifying or perpetuating existing inequities.

Overarching all of this is the question of how regulators keep pace with the rapid adoption of AI. While investment landscape and risk assessment of more complex assets and reinsurance transactions.

—Nathan Houdek

some predicted a faster
timeline for AI's impact
five years ago, it hasn't quite moved as quickly as expected. But
we know it's happening—and we know things could change very
fast. That's especially true with the developments in generative
AI. So we're preparing ourselves to be ready for immediate and

potentially profound shifts in the regulatory landscape.

The Academy continues

to be an important partner

as we navigate the

challenges of the evolving

Can you talk about your interactions with actuaries, the role they play at the state level, and their contributions to regulatory efforts?

Godfread: Actuaries play a vital role in insurance regulation at the state level. As I previously mentioned, the insurance industry excels at assessing risk, largely due to the contributions of actuaries. Their expertise in risk assessment, pricing, and financial stability helps ensure that insurance markets remain fair, competitive, and solvent. In my role, I rely on my actuaries to provide objective, data-driven insights that guide regulatory decisions, from evaluating rate filings to assessing the financial health of insurers.

One of the most valuable aspects of working with actuaries is their ability to distill complex financial and statistical data into meaningful analysis. Whether we're reviewing proposed premium changes, stress-testing solvency models, or analyzing emerging risks like climate change or AI-driven underwriting, actuaries help regulators make informed, balanced decisions that protect consumers while maintaining market stability.

Beyond just the numbers, actuaries play a key role in shaping policy. Their work helps us anticipate future challenges, refine

regulatory frameworks, and ensure that insurance products are priced fairly and sustainably. Frankly, I encourage my actuaries to shed light on any blind spots I may have when we're making policy decisions.

**Dunning:** I have a standing meeting with the senior member of Nebraska's actuarial team. It is the one meeting I actively look forward to. Getting a handle on how our markets are performing, and talking through the potential consequences on responses, is always fascinating for an insurance nerd like me.

Houdek: In Wisconsin, we do not have dedicated actuary positions at our agency, but we work with several contract actuaries on various projects. For example, our consulting actuary plays a critical role in helping to establish payment parameters for our 1332 State Innovation Waiver reinsurance program, the Wisconsin Healthcare Stability Plan (WIHSP). This actuary team has helped the WIHSP weather the uncertainty of a pandemic, changing federal regulatory approaches, and the Medicaid unwinding to ensure that premiums remain reasonable for individual insurance market plans every year since the program's inception.

As chair of the NAIC Financial Condition (E) Committee and co-chair of the RBC Model Governance (EX) Task Force,

I regularly interact with members of the Academy to discuss important issues relating to risk-based capital and the overall U.S. solvency framework. The Academy continues to be an important partner as we navigate the challenges of the evolving investment landscape and risk assessment of more complex assets and reinsurance transactions.

White: I started my career over 25 years ago as an attorney, and like most attorneys early in their careers, they put

you in areas that nobody else wants to do. For me, in Virginia, that meant I was in charge of workers' compensation hearings. This required me to work with a seasoned actuary to develop testimony and review what's known as assigned risk rates and loss costs for workers' compensation—every bit as dry and technical as it sounds. But it was there that I learned invaluable lessons that I carry with me to this day.

Working with that actuary was a formative experience. The rigor he brought to the process was incredible. I had to dive deep into very complex areas of workers' comp that I wasn't familiar with, learn them, and then be able to communicate

them effectively. This actuary had a unique ability—not only to understand and analyze the data but also to translate it into terms that our judges could grasp. When I put him on the stand, his ability to communicate complex concepts to a lay audience made my job much easier.

That experience taught me a lot about working with actuaries, and since then, I've been very comfortable collaborating with them. In Virginia, we use both in-house actuaries and actuarial consultants. They've been invaluable, particularly in our long-term care filings. We strive to strike a balance between protecting consumers from rate shocks while ensuring that companies will be financially stable enough to pay claims in the future.

We also have an in-house life actuary who focuses on the asset side of things—specifically, the valuation of assets and their impact on reserves. This is critical in the long-term liability space, where future obligations can span decades.

In the health insurance area, we have a key in-house health actuary, which is crucial given the high-profile nature of the Affordable Care Act market. He carefully reviews assumptions to ensure that companies entering the market are on solid footing.

We're also increasingly using predictive rate models. While we don't have a designated P&C actuary in-house, we rely on

Getting a handle on how our markets

are performing, and talking through the

consultants who have been very helpful in that regard.

At the NAIC, I collaborate with actuaries on financial solvency issues, predictive rate models, and even on development of our group capital standard. Ours is unique—called the aggregation method—and it was developed with input from

potential consequences on responses international matters, like the [with an actuary], is always fascinating. -Eric Dunning regulators and actuaries at the NAIC. This work dates to the late '90s, and to this day, I apply

the same level of rigor to complex topics that I learned back in those workers' compensation filings in the late '90s.

What strategies do you use to recruit and retain actuaries, and how can the Academy help support these efforts?

**Godfread:** Recruiting and retaining highly skilled actuaries in the public sector is a persistent challenge, largely due to the competitive salaries and benefits offered by the private sector. However, what we can offer is something just as valuable:

meaningful work that directly impacts millions of consumers, along with a strong focus on professional development and work-life balance.

We emphasize the unique role actuaries play in state insurance regulation, where their expertise helps ensure fair pricing, market stability, and consumer protection. This mission-driven work can be a significant draw for professionals seeking a career with purpose.

To compete with private-sector opportunities, we prioritize ongoing education that allows actuaries to expand their expertise and advance in their careers.

We also recognize that flexibility and work-life balance are increasingly important factors in job satisfaction.

The Academy can play a key role in supporting these efforts by raising awareness about public-sector career paths, offering training that aligns with regulatory needs, and helping to connect actuaries with opportunities to serve in state insurance departments. By working together, we can cultivate a pipeline of dedicated professionals committed to maintaining robust and equitable insurance markets for the future.

Dunning: I start with pleading. I'll move on to begging if that doesn't work. In all seriousness, there are very special people who are called to public service, and particularly actuaries. I've been so impressed with Nebraska's team. My colleagues are here at every stage in their career. Some who are relatively early, taking tests and undergoing the rigor of the credentialing process to those who are further along in their careers. Nebraska is extremely fortunate to have the University of Nebraska Actuarial Science Program just down the street. We've had the pleasure of having interns from the program here, and we get to work with others as well.

**Houdek:** As mentioned above, Wisconsin does not currently have dedicated actuary positions at our agency, but we may consider pursuing position authority in the future. Any change to our agency's position authority would require approval from both our governor and the state legislature.

White: Yes, we have a strategy for recruiting actuaries, and to your point, to afford them, we generally aim to bring them on at the tail end of their careers when they're looking for a change. Many of them are at a point where they want to contribute more to society—while that may sound lofty, we do find that it's

We emphasize the unique role actuaries play in state insurance regulation, where their expertise helps ensure fair pricing, market stability, and consumer protection.

—Jon Godfread

often the case. They're often looking for a second career, and we've had success with that approach.

For example, the workers' comp actuary I mentioned earlier, who trained me on actuarial concepts, was at Oliver Wyman at the time. He's now our in-house actuary at the Bureau of Insurance, and he's been with us for years and does an outstanding job. Similarly, our last two health actuaries came from Anthem, our largest health writer in the ACA markets. They were looking for a change, and we were able to bring them on to help review filings from Anthem

and other carriers in the individual market.

Our life actuary also came from the private sector, and he's been with us for 10 years now.

The key for me, once we bring them on, is to keep them engaged. We've applied a similar strategy—once they're on board, we allow them to work on not only the areas they were originally brought in for but also to explore other areas that pique their interest, as long as they have the skill set for it. Actuaries are intellectually curious, and they enjoy exploring different challenges.

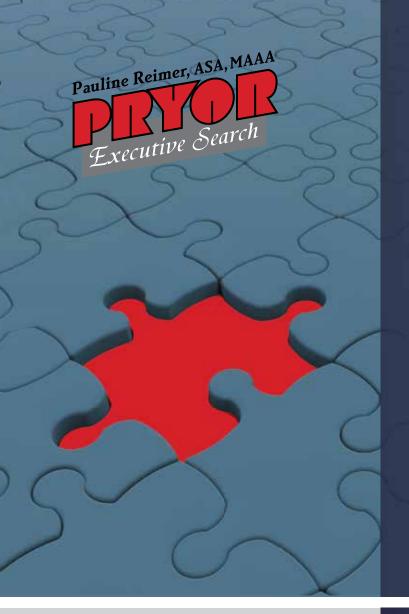
For example, the workers' comp actuary, who was instrumental in helping us with our workers' comp filings, is now helping us on a national level. He conducted an excellent analysis of the potential subsidization issue regarding carriers who sustain losses from natural catastrophes in one state and whether that impacts Virginia. Our health actuary, meanwhile, has been very involved in our long-term care filings, an area outside of his initial focus. He's provided fresh perspectives, and we've really appreciated his insights.

Finally, our life actuary has taken a leadership role at the national level—he co-chairs the Life Actuarial Working Group at the NAIC, which is driving crucial changes to our investment framework. We're incredibly proud of the work he's doing.

So, in summary, the key to retaining these talented professionals is to continuously challenge them and provide opportunities to step outside their comfort zones. All of them seem very satisfied with the work they're currently doing.

We thank the commissioners for sharing their insights into the evolving challenges and opportunities facing insurance regulation today, and for highlighting the Academy's role as a trusted partner.

**PREETI VASISHTHA** is editor-in-chief, *Contingencies*, and the Academy's director of content.



# The Perfect Fit...

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As insurtech enters its next phase, actuaries have an essential role to play—one that blends technical expertise with strategic insight.

BY NANCY MANN JACKSON

# WAVE

#### WHEN CHARLES ZHU WORKED

as an actuarial analyst, he would sometimes spend hours manually developing different models for comparison and selection. Today, as the vice president of actuarial at Olympus Insurance, Zhu works with Akur8, an actuarial modeling platform that makes the model selection process more data driven and less manual.

The technology provides a more streamlined way to build models, Zhu says. "The software makes data-driven decisions that would have taken an analyst much longer," he says. "Even entry-level analysts can build a good model from scratch. That makes our team more effective and allows us to work faster and better. Most people enjoy making business decisions but do not love manually running model after model to get the information needed to make the best decision."

Insurtech, short for insurance technology, refers to the use of innovative technology to improve and automate the insurance industry. It includes startups, tools, and platforms that are transforming how insurance is bought, sold, managed, and underwritten. While insurtech is not new, it's becoming increasingly important to the insurance industry, providing opportunities to create a customer-first approach and maximize efficiency and productivity.

For actuarial professionals, understanding and embracing insurtech's potential and the value they can bring to the transformation will be crucial for thriving in an increasingly automated future.

#### The Rise of Insurtech

When insurtech startups came on the scene in the early 2010s, the property and casualty (P&C) market was first to embrace them. Because of the annualized process of P&C insurance, it's more adaptable to innovation, says Sherry Chan, managing director, insurance and actuarial advisory services at EY.

The health insurance market was next to adopt new technologies. "The health insurance sector has gone through a lot of health equity discussions, which provided a good opportunity for AI to be leveraged," Chan says.

The life insurance market is making strides but overall has been slower to adopt insurtech. "On the life side, more companies are taking a slow approach because they want to have a clearer understanding of what the regulatory rules of the road will be, " says Scott Harrison, co-founder of the American InsurTech Council, founder and principal of High Point Strategies, LLC, and Harrison Law Office, PC. "They are avoiding the struggle of developing a really good governance and risk management framework."

As insurance markets have gradually embraced innovations, the nature of insurtech has evolved.

Insurtech 1.0, Zhu says, was focused on leveraging technology to distribute products more effectively. After a decade or more, "it's now almost table stakes for carriers to have a tech-enabled distribution platform," he says.

Today, insurtech 2.0 is focused on leveraging technology for process enhancements and efficiency gains overall, including claims, underwriting, and operations, Zhu says. For example, property carriers are using aerial surveillance technology to assess property damage. Machine learning models can quickly predict repair costs using historical data, sensors, and images. Automated selection models can improve the precision of the underwriting process and the efficiency of underwriting teams.

Chan says, "We're in the infancy stages of seeing possibilities and the realm of everything AI can change. There's so much unlimited possibility. We're so early and we don't even know the possibilities."

#### **Vast Potential and Implications**

As insurtech evolves, practitioners expect it will improve every aspect of the insurance business.



## **Regulating Insurtech**

For all the value insurtech offers, it's not without risks. For example, a health insurer is facing a federal lawsuit due to its use of an algorithm that automatically rejected 300,000 claims without examining them individually. The algorithm spent 1.2 seconds analyzing each claim, leading to wrongful rejections, according to the lawsuit.

The lawsuit reflects the risk involved in using emerging technologies to streamline insurance business, and regulators are trying to catch up. "The National Association of Insurance Commissioners has been updating regulatory adoption across states. Internationally, there are more regulations on AI and how to ensure models are not causing harm such as unlawful discrimination," says Arthur da Silva, vice president, Actuarial at Slope Software. "The regulations are evolving quite a lot. And the fact that they're changing creates some risk, because regulators may restrict the use of these tools for some tasks."

The regulatory push and pull is expected. As technology rapidly evolves, it creates regulatory gaps, and companies and regulators must navigate these gaps over time, says

Joseph Krug, actuarial product manager at State Farm-owned insurtech venture Quanata.

"My core principle for navigating this landscape is always doing the right thing for the customer," Krug says. "This approach is both ethically sound and pragmatically effective, as it typically aligns with the intent of regulations even when specific rules haven't caught up with technological capabilities. The most successful insurtech companies will treat regulatory compliance not as a hindrance but as an opportunity to build trust with both consumers and regulators, establishing governance frameworks that demonstrate their commitment to ethical practices beyond minimum requirements."

One challenge for regulation is that many organizations and leaders in insurtech are new to the insurance business and don't have an understanding of its regulatory nature. "In the past, everybody operating in this space was already part of the insurance ecosystem, but when it comes to insurtech, that's not the case," says Scott Harrison, co-founder of the American InsurTech Council (AITC). "Some of the most important players are data scientists or other professionals who

know little about insurance regulation. In order to get to common sense regulatory frameworks, we need to educate and bring along the tech people, so they have a better understanding of what our needs are."

For example, several years ago, one of Harrison's insurance company clients was negotiating a contract with an outside vendor. The insurance company asked the vendor if they would be using any form of Al or predictive analytics and the vendor refused to answer, claiming it was proprietary information. "The vendor had no concept of the responsibilities of their intended customer as a regulated company," Harrison says.

One focus of AITC is helping the third-party vendors understand what it means to do business with a highly regulated industry. Insurance companies can help by explaining to potential vendors their regulatory requirements and asking if the vendor is willing to cooperate with regulators. "It helps educate the vendors about the expectations of doing business in the insurance market," Harrison says. "Over time, the vendor world will become a much more efficient partner in solving some of these issues."

"Most people think of insurtech as underwriting and policy servicing, but there's a lot that can be done on the back end," says Arthur da Silva, vice president, Actuarial at Slope Software, an actuarial modeling and analysis software company. "There's a lot of opportunity that has not been explored yet, like connecting finance and actuarial data to underwriting systems and sales systems without the need to rebuild the logic in a separate system."

For example, software platforms that seamlessly integrate finance, underwriting, and other teams can boost collaboration and insights across an insurance organization. "I've talked to underwriters who say if they had access to more profitability figures in the underwriting process, that could make them do their jobs better," da Silva says. "They want to use as much information as possible when making their decisions, not just mortality risk but also financials and profitability."

Insurtech is expected to drive some specific shifts in the future, including:

#### 1. Harnessing data for personalization.

"Data are the new oil of the economy, and life insurance companies are data-rich," Chan says. By using new technologies to convert, normalize, and leverage the data, insurance companies can use it to predict what products policyholders want to buy, for example.

# **Overcoming Hesitancy**

Technology is now available to streamline almost every aspect of the insurance business, but many insurance companies and markets remain hesitant to embrace innovations.

For many, the reluctance depends on the use case. For example, using insurtech for underwriting decisions is high risk, but using it to select prospects for marketing is lower risk, says Arthur da Silva, VP, actuarial at Slope Software, an actuarial modeling and analysis software company.

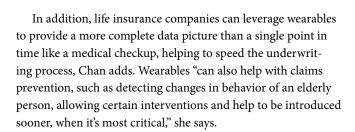
Another reason for hesitancy is the decision of whether to build their own tech solution or partner

with a third-party vendor. "A lot of carriers are dealing with the build vs. buy decision," says Charles Zhu, vice president of actuarial at Olympus Insurance. "We went with the buy model because we needed something fast to add value to the organization."

Some legacy insurance companies are investing in building their own solutions, which may take more time but allows them to own the technologies. For example, Quanata, a State Farm-owned insurtech venture, has developed products such as a mobile-based telematics program that offers drivers up to

50% discounts based on their daily driving decisions.

For legacy insurance companies that are struggling to embrace technological change, "having conversations is the first step," says Sherry Chan, managing director, insurance and actuarial advisory services, EY. "Be open to seeing demos, come to the table to discuss possibilities, and offer your perspective. You don't have to make a commitment, but it gives you a glimpse of the potential and provides you an opportunity to be a part of building something through your feedback."



#### 2. Increasing market segmentation.

"The ability to segment is becoming more available via the ubiquity of data," says David McFarland, founder and CEO of Cincinnati-based Coterie Insurance, which focuses on micro-commercial policies under \$2,500. "That allows companies more ability to compete in loss ratio."

For example, in the past, it was difficult for companies to compete on pet insurance because the average premiums were too small, McFarland says. Now, the pet insurance space is exploding.

As a result of segmentation, McFarland predicts traditional markets will become more commoditized and more new

markets will open or expand, such as cyber insurance, front end carrier markets, E&S (express and surplus) market, and the micro commercial market.

#### 3. Improving customer experience.

Evolving technologies will make it increasingly easier to build a more customer-focused experience.

"It's about meeting customers where they are through multiple binding options, from traditional agency to direct-toconsumer, prefilling applications with aggregator platform data, offering telematics-based discount programs, and creating cohesive digital experiences," says Joseph Krug, actuarial product manager at Quanata, a State Farm-owned insurtech company.

Customer expectations have evolved significantly due to the impact of technology in everyday life, he says. "A seamless customer experience is no longer merely a differentiator but a fundamental expectation. Companies that successfully create modern, digital-first experiences are well positioned to acquire, retain, and renew their portfolios at profitability levels exceeding expectations."

#### The Role of Actuaries

As insurance transforms from a traditional legacy industry to a fast-paced, tech-enabled one, insurtech experts say the industry will need people with actuarial skills and an openness to change.

For example, at Coterie, the insurtech startup focused on micro-commercial policies, 100% of underwriting is handled digitally. However, the company still employs actuaries in roles such as portfolio analysis, and data infrastructure and architecture. "Actuaries know how insurance works, and their input on how the data should be structured is instrumental in building an insurance company," says McFarland. "You don't have to have the title actuary; just bring your education and skills that can inform products. Certain jobs might be eliminated, but that doesn't mean the skill set will not be needed."

Actuaries bring not only a deep understanding of the insurance ecosystem, but they also bring agreed-upon professional ethics and standards. As insurtech innovations evolve, "we need to attach insurtech to a discussion that has well-developed and articulated professional standards," says American InsurTech Council's Harrison. "Everyone understands the role actuaries play and their overarching professional standards. We need to bring the use of AI and technology under those same professional standards."

At one time, mortality tables were considered innovative, and actuarial standards had to be developed to govern their use, Harrison says. Over time, he predicts the market also will force the development of standards for the use of AI and data science. "We need to create an environment where that can happen," Harrison says. "Actuaries should view this as an opportunity, not a threat."

Through their training, experience, and certification, actuaries develop skills of strategic thinking and decision-making—and those skills are vital for a technology-driven future. "Actuaries are in a good position to leverage the possibilities of AI because they see the whole value chain," Chan says. "Whatever comes out of generative AI, we still need a high-level understanding of whether it makes sense and how to put it to use. AI will allow actuaries to replace mundane, time-consuming work and free them to do more strategic work."

#### **Preparing for a Changing Future**

Actuaries and insurance leaders can focus on sharpening their skills and preparing to overcome new challenges.

The first step to preparing for a tech-enabled future is to accept that the industry is evolving and be open to change. At a conference in 2024, Coterie's McFarland heard a speaker from a large company advising attendees not to worry about AI

because "no one has really figured it out, it's very early, and it's all going to be fine.' But that's not true. There are lots of companies making huge strides with generative AI and automation. Don't go in with the mentality of complacency, assuming you'll be fine. Companies need to be figuring it out and experimenting with it."

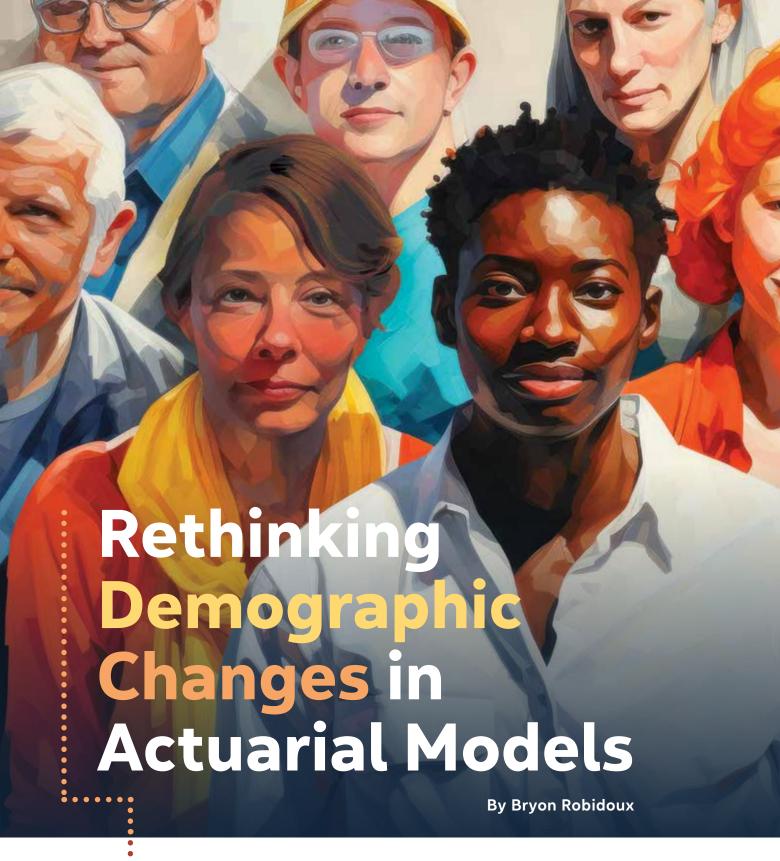
Some of the biggest challenges presented by the evolving insurtech landscape include data accuracy, security, and privacy. "There will always be a need for expertise in navigating the complexities of insurance," Krug says. "The most successful outcomes occur when insurance expertise is paired with technical expertise, creating a synergistic relationship where actuaries provide the critical business context that data scientists sometimes lack."

Actuaries can make themselves more valuable by developing three essential skills:

- Interpreting technical innovations through a lens of business strategy. "By understanding both the capabilities of new technologies and the fundamental principles of insurance risk, actuaries can guide organizations in implementing AI and advanced analytics in ways that create genuine business value rather than just technological novelty," Krug says.
- Embracing interdisciplinary collaboration as a core competency. The work that makes the biggest impact occurs "at the intersection of actuarial science, data science, underwriting, and customer experience," Krug says. "Actuaries who can facilitate these cross-functional partnerships and integrate diverse perspectives will be particularly valuable."
- Building a range of skills. Focus on becoming an expert in actuarial science, but also build other tangential skills and knowledge. "Having a range helps you to become fairly dynamic," McFarland says. "When you have the ability to dip into pricing and data structure, you have more to offer. Nobody has security; life is going to continue to throw curveballs. Having a range can help you be prepared."

As traditional insurance professionals continue learning and growing with the industry, opportunities for growth, new responsibilities, and increased efficiencies will continue to arise. Actuaries, who are skilled at managing risk and applying those skills with professional standards that guide their work, may be especially crucial for determining the right circumstances for using new technologies, where the process might break down, and how to avoid potential pitfalls. Insurtech is driving an evolution in the insurance industry, and actuaries can help steer the ship in the right directions.

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This article explores, as demographic patterns grow more complex, how integrating complexity theory into actuarial science and deeper engagement with heterodox economic perspectives can help actuaries build more resilient, adaptive models for the future.



IN LAYMAN'S TERMS, demographics is the study of the characteristics of people in a population—such as their age, gender, race/ethnicity, income, and where they live—to understand how groups change and grow over time. This article doesn't look into evolving demographic statistics, but instead will examine the impact of those statistics on global politics and the economy, especially how they cause stability or instability. I will begin at a high level and gradually delve deeper, focusing on the complexity of interactions. The exploration will review how interactions and complexity impact actuarial and economic models. Finally, I will provide some suggestions on moving forward.

#### Globalization

In his book, *The End of the World Is Just the Beginning*: *Mapping the Collapse of Globalization—The Collapse of* Globalization and Its Aftermath, geopolitical strategist Peter Zeihan defines deglobalization as the unraveling of the interconnected global economic system that has existed since the end of World War II. The U.S. built the foundation of globalization by providing global security, cheap energy, stable supply chains, and open international trade. This system enabled unprecedented economic growth, stability, efficiency, and innovation worldwide. Still, it was always fragile—dependent on U.S. willingness to guarantee the safety of global trade routes and maintain international order.

Zeihan argues that the pillars supporting globalization are now collapsing. The U.S. is retreating from its role as a global protector, making international shipping and trade riskier and less reliable. At the same time, demographic decline (aging and shrinking populations in many countries), resource scarcity, and rising geopolitical tensions undermine the foundations of global supply chains. As these trends accelerate, the world will fragment into regional economies, where goods become more expensive and lower in quality, and countries increasingly compete sometimes militarily—for access to resources and secure trade routes. Deglobalization marks the end of the world as we know it: A shift from an era of global cooperation and abundance to one of regional fragmentation, scarcity,

and instability, driven by the breakdown of the systems that made globalization possible.<sup>[1]</sup>

Another way to reconcile Zeihan's concerns on deglobalization is by understanding network science. University of Pennsylvania Professor Damon Centola's book, *Change: How to Make Big Things Happen* teaches how large networks with strong ties foster immunity to change and contagions. Weak network ties are fragile because contagions can spread rapidly, causing frequent instability. Therefore, as global supply chain connections atrophy and weaken, we should expect amplified global variability due to less immunity to contagious events. [2]

#### **Demographics and the Complex World**

In his book, *Demographics Unravelled: How Demographics Affect and Influence Every Aspect of Economics, Finance and Policy*, global macro researcher Amlan Roy says, "People influence social change and policies. The environment that they live in conditions their behavior. The environment determines the interaction of various systems (health, education, labor, social welfare, legal, political, etc.) and the institutional framework. Policies have a role to play, and the role of government influences the environment within which consumers and workers reside." [3]

Furthermore, the age distribution of a country impacts the speed at which the economy is growing and its fundamental properties. As people age, their consumption versus savings habits morph.<sup>[1,3]</sup> Young people have families and buy houses, which makes them heavy consumers taking on debt because incomes are low in their 20s and 30s. A young population will have a rapidly growing, debt-driven economy. As people age, they pay down the debt and mature in their careers until the kids move out or go to college. Once the kids are gone, consumption decreases, and savings increase as they prepare for retirement. In retirement, they draw down their savings and consumption levels for everything but health care.<sup>[1]</sup> These savings and consumption habits impact politics, too.

For instance, we now have countries such as China, Germany, and Italy, with more people over 40 than under 40. In these countries, health and social welfare have become massive issues. There could likely not be enough workers to take care of the aging population. This distribution of ages can have radical repercussions on the cost of capital and a country's various institutions and politics.<sup>[1]</sup>

# Understanding Governmental Institutions and Their Roles

2024 Nobel laureates Daron Acemoglu and James A. Robinson, in their tome, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, clearly illustrate that politics and economics are inseparable. Politics is the operating system in which the economy runs, much like Microsoft Windows is to Excel. [4] Institutions can either be extractive or inclusive and pluralistic.

#### **Extractive Institutions**

The more extractive government institutions the more power is concentrated in a small, fortunate few who are incredibly wealthy while the population suffers in poverty. Even if extractive governments appear extremely prosperous, history has shown that the prosperity will likely reverse, [4] much like Argentina in the 20th century. An increase in economic power leads to a rise in political power, and vice versa, through a vicious cycle. This cycle forces extractive countries to become more extractive, poorer, and less stable. [4]

#### **Inclusive and Pluralistic Institutions**

The wealth and prosperity of a nation depend on the inclusiveness and plurality of the institutions, which create a healthy friction between groups, ensuring the stabilization of power among them. As diversity, equity, and inclusion increase, the friction becomes healthier, magnifying the stability of the institutions. As long as the political and economic powers stay balanced, everyone will work together to create more inclusive and pluralistic societies through the virtuous cycle.<sup>4</sup>

In Power and Progress: Our Thousand-Year Struggle Over Technology and Prosperity, Nobel laureates Acemoglu and Simon Johnson explain that when smaller, innovative, competitive companies exist, they fight for the best people, giving laborers more bargaining power and a larger share of productivity gains. Consumers win because they can purchase cheaper, more innovative products. The governed win because power is balanced, and institutions stay inclusive and pluralistic. Healthy competition produces creative destruction, which causes older, less competitive organizations to die and younger, more innovative companies to take their place. Therefore, establishing well-functioning antitrust laws is paramount for keeping economic and political power contained and keeping the government secure, stable, long-lasting, and prosperous.[5]





#### **Coming Full Circle**

Currently, the stability of the global economy ultimately rests on the stability of the U.S. institutions. In The Myth of Capitalism: Monopolies and the Death of Competition, authors Jonathan Tepper and Denise Hearn illuminate how, as companies merge, competition suffers, innova-

tion decreases, labor has less bargaining power, and political and economic dominance increases. As political dominance swells, unhealthy conformity follows, allowing more extractive institutions. Over the last 50 years, this process has occurred in the U.S. due to its evolving antitrust definition, increasing enforcement difficulty. As organizations and institutions become more extractive, the government loses stability due to infighting and unhealthy friction, leading to our current political environment.[6]

#### **Demographics and Complexity**

As I have tried to demonstrate, our world is a complex adaptive system (CAS). A CAS is a dynamic network of interacting, heterogeneous agents (people, firms, and institutions) that adapt and evolve in response to environmental changes, leading to emergent behaviors that cannot be predicted by analyzing individual components alone. These systems exhibit self-organization, nonlinear interactions, and feedback loops, enabling them to maintain resilience and functionality despite external perturbations. This stability happens with no centralized control. [7]

#### **Redefining Demographics**

When studied through the lens of CAS, demographics

By framing demographics as a complex adaptive system, researchers can better capture the unpredictability and interdependence inherent in population systems, moving beyond simplistic linear equilibrium models, which ignore essential interactions.

> emphasizes the dynamic interplay of individuals, environmental factors, and social structures that drive population changes. Furthermore, it explores how diverse individuals and groups adapt to their circumstances and respond to changing environments, producing unpredictable, emergent patterns in population size, structure, and distribution over time. By framing demographics as a CAS, researchers can better capture the unpredictability and interdependence inherent in population systems, moving beyond simplistic linear equilibrium models, which ignore essential interactions.

#### How Does Complexity Impact Models and the Work of Actuaries?

Static equilibrium analysis is the bedrock of actuarial science, financial mathematics, and economics. Static equilibrium in economics refers to a market condition where supply equals demand at a particular price and quantity, and there are no inherent forces causing change—meaning there is no incentive for buyers or sellers to alter their behavior. Economists typically analyze this state as a snapshot without considering how the market reached this point or how it might evolve.

The limitation of static equilibrium analysis is that it ignores how markets move toward equilibrium and how long it takes.

[8] Furthermore, it does not capture the effects of unexpected events or the adjustment process—dynamic models address these. But in the podcast "Ninety-Eight Years of Economic Wisdom" on *Freakonomics* Radio Network, economist Robert Solow states that economists design current models more as mathematical exercises than as tools to explain how the economy works largely because they rely on dynamic stochastic general equilibrium (DSGE) models. Solow does not take DGSE seriously because it assumes a single-person economy conforming to her whims.

#### You Can't Unfry an Egg

Nobel Laureate Ilya Prigogine's *The End of Certainty: Time*, *Chaos and the New Laws of Nature* explains that complexity scientists would describe static equilibrium models as Newtonian, suitable for mechanical, linear systems. The results are predictable from their starting parameters. If given a couple of points along the path of an object, their future path is predictable. More astonishingly, the path before the starting point can be

determined by reversing time, much like the planets orbiting in the heavens. This time invariability gives great power for reducing systems to their fundamental components to describe their behavior. You can re-create the process by running a single entity.<sup>[9]</sup>

CAS vastly differs because thousands, millions, or billions of agents work simultaneously. The properties of the system emerge from the aggregate behavior of the individual agents, so you cannot analyze the pieces to understand the big picture. [7] As you add more energy to the system, new, unexpected behaviors and properties manifest, causing a bifurcation. At the

bifurcation or tipping point, time is no longer reversible. You won't be able to get back to what you had. For instance, you cannot unfry an egg by cooling it! Bifurcation is where risk becomes uncertain and significantly diminishes or loses predictability.<sup>[9]</sup>

#### **Predicting and Managing Instability**

Static equilibrium models vastly overstate the predictability of the world and future events. Bank of England economist Sir Mervyn King's *Radical Uncertainty: Decision-Making Beyond the Numbers*, clarified that during the 2008 Global Financial Crisis (GFC), banks could not make sense of their equilibrium model results. During the worst days of the crisis, they had to abandon their models when they needed them the most. They had to go

back to basics. Furthermore, it says there is little information and use of applying random jumps to fatten the tails when creating economic scenarios if there is an inability to explain why the jumps occur.<sup>[10]</sup>

#### **Compare and Contrast Models**

To understand the revolution happening in economics, read Steve Keen's book, *The New Economics: A Manifesto*, especially the chapters "Why the Manifesto" and "Neoclassical Disease." He argues that equilibrium analysis assumes that the sum of the parts equals the whole, whereas a CAS assumes the whole equals the sum of its parts and all the interactions between them. [8] In extremely adverse scenarios, we provide insurance where the interactions' risk will overwhelm the parts' risk.

In *Making Sense of Chaos: A Better Economics for a Better World*, Doyne Farmer of the Santa Fe Institute outlines a framework of complexity economics grounded in CAS, contrasting it with traditional neoclassical, equilibrium-based models. He illustrates this distinction through the example of

Basel II banking regulations during the GFC. Under a static equilibrium framework, Basel II regulators assumed that the banking industry could minimize systemic risk if each bank independently minimized its risk-implying that industry-wide risk was merely the sum of its parts. However, this assumption proved dangerously flawed. In practice, Basel II amplified risk rather than reducing it. During the market downturn, regulatory guidelines prompted banks to behave similarly. As institutions sold off assets to manage their portfolio risks, asset prices declined, triggering further sell-offs across the system. This sell-off created a positive

feedback loop in which the interactions among banks overwhelmed individual risk management strategies, exacerbating the severity of the crisis.<sup>[11]</sup>

#### The Potential Solution

. . . . . . . . . . . . . . . . . . .

We must look at

heterodox versions

of economics, such as

complexity, evolutionary,

quantum, and others,

to acquire diverse

perspectives and

solutions to

our problems.

Suppose Zeihan is correct that deglobalization marks a shift to regional fragmentation, scarcity, and instability, driven by the breakdown of the systems that made globalization possible. In that case, we need more dynamic modeling techniques such as simulations, nonlinear mathematics, and agent-based models to capture adaptation and feedback. Furthermore, we must look at heterodox versions of economics, such as complexity, evolutionary, quantum, and others, to acquire diverse perspectives and



solutions to our problems. Treating one flavor of economics as dogma is risky, as banks discovered during the GFC.

I am learning the open-source agent-based simulation software Minsky, written and maintained by Steve Keen and his team. Its advantage is that it is built explicitly for financial modeling because it allows for double-entry accounting. It can model large-scale macro economies of money supply and capital and smaller-scale models of the internal workings of insurance assets and liabilities. It can create alternative scenarios, complement our current models, and give new insights.[8]

#### **The Bottom Line**

The world is a dynamic system marked by complexity and constant interaction. Demographic analysis offers one lens through which we can make sense of its emergent behaviors. World War II was a critical bifurcation point, ushering in the baby boom and the era of globalization. Globalization delivered the growth and stability that shaped the past 80 years. But that era is ending: globalization is retreating, and the baby boomers are retiring. These shifts will profoundly affect the global economy, politics, and society.

Equilibrium-based financial models presuppose a stable environment, which globalization luckily provided, yet they offer no account of how such stability arises—or collapses. This omission becomes critical as the global system retracts and breaks current strong economic ties. As seen in previous crises, components' nature and degree of interaction are central to identifying failure points, bifurcations, and evolving relationships between variables. As the Global Financial Crisis made clear, models grounded in equilibrium assumptions systematically overlook these dynamics, rendering them increasingly inadequate for understanding and managing systemic risk in a deglobalizing world.

Even without factoring in climate change—which this article has not addressed—the potential for instability is substantial. This article advocates for integrating complexity theory into actuarial science and a deeper engagement with heterodox economic perspectives. These tools and frameworks may prove essential for navigating the demographic and systemic shifts likely to define the decades ahead. A

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### A New Look at Designing ERISA Retirement Plans

OVER THE PAST FEW DECADES, PRIVATE-SECTOR EMPLOYERS have steadily shifted away from traditional defined benefit (DB) plans that offered guaranteed lifetime income, favoring instead defined contribution (DC) plans focused on asset accumulation. While this shift has reduced employer liabilities, it has left many retirees struggling to convert their savings into reliable lifetime income. Surveys show that retirees value lifetime income options, yet efforts to integrate insured income products into DC plans have seen limited success. As workforce demographics and retirement expectations evolve, it's clear that new retirement plan designs are needed—ones that balance lifetime income predictability for retirees with manageable risk for employers.

For a retirement plan covered under the Employee Retirement Income Security Act (ERISA) to be considered tax qualified,<sup>[1]</sup> it must meet many requirements. One such requirement is that the plan be classified as either a DB plan or a DC plan. Although certain plan designs are referred to as hybrid plans due to their

disclosure requirements; maintenance of an Employee Retirement Income Security Act (ERISA) funding standard account to ensure sufficient funding; and plan termination rules, among others. Most of these are discussed later in the paper.

However, the ERISA DB-DC classification requirement can limit other



features of both DB and DC structures (i.e. cash balance, age weighted, target benefit), a DB-DC classification<sup>[2]</sup> is necessary for several reasons, including the Pension Benefit Guaranty Corporation (PBGC) insurance coverage and the associated premiums; the Accounting Standards Codification financial

innovative plan design possibilities, particularly when a plan doesn't fit into either classification. Examples include Collective Defined Contribution Plans, [3] variable annuity plans with mortality experience benefit adjustments, [4] and plans based on modern tontine structures. [5]

#### The Classification Issue

DB plans require that a guaranteed retirement benefit be provided usually based upon a plan benefit formula and each participant's compensation and years of service. Actuarial assumptions and a funding method are employed to determine the minimum contributions needed to fund the benefits based on the Internal Revenue Code and associated regulations. The funding is the responsibility of the employer. [6] Because the assumptions used are unlikely to ever totally match the actual experience of the plan (mostly investment return and mortality incidence), the funding level required will vary.<sup>[7]</sup> A primary reason for employer abandonment of DB plans governed by ERISA has been the uncertainty in unfunded liabilities and required contributions.

On the other hand, DC plans provide for an uncertain benefit in the form of an account balance calculated based on the accumulated contributions and investment earnings over the years that the participant is covered by the plan. These plans are funded by either the employee, employer, or both. Neither the employer or employee has as an obligation after the funds are contributed to increase the amounts regardless of the plan's investment experience if it is poor. This lack of potential liability makes DC plans more

attractive to employers than DB plans. However, under ERISA, DC plans cannot directly[8] offer periodic benefit payments that use longevity sharing among retirees. This is an important element in providing lifetime income to retirees on a cost-effective basis.

Since not all plan designs can fit into either the DB or DC structure, more innovative plan designs would be available if ERISA was modified to eliminate the DB-DC classification in favor of a single retirement plan type, neither DB nor DC.

#### **Primary Features Applicable to Plans**

There are many plan designs that would be possible if the DB-DC classification was eliminated. The plans, however, would need to specify many requirements. The following are some primary ones.

- How will the plan benefits be determined? There are many options available. Benefits could be fixed or variable based on a simple or complex formula. The plan would also need to specify how variable benefits, when applicable, would be determined and adjusted.
- Who will fund the plan? Contributions could be funded by the employer and/or the plan participants and could be pre-tax or post-tax regardless of the benefit structure of the plan. Currently, only DC 401(k) plans allow for pre-tax employee contributions, which provides an incentive for employers to use DC plans.
- How will the contribution amounts be determined? This feature would depend on the plan benefits provided. A plan that provides fixed benefits, similar to a current DB plan, would likely have minimum contribution requirements subject to legislation and regulations designed to ensure that plan assets are sufficient to pay the fixed benefits. However, in the case of plans in which benefits are variable, such funding requirements would not be applicable. Instead, the plan would specify the level of contributions from each, and those could be fixed or variable.
- When and in what form will benefits be payable? Each plan would specify the optional forms of payouts available and when payments may commence.

- It should, however, be required that all plans provide for some income options, whether variable or fixed, or whether paid directly from the plan or through insured annuity purchases. In addition, annuity options that provide survivor benefits to spouses would be required for all plans. This is not the case for most DC plans[9] under ERISA currently.
- How will plan assets be invested? This would be subject to the type of plan benefits being provided. To the extent that benefits are guaranteed at some meaningful level, it would likely be the employer that would control the investments since the liability attributable to insufficient assets would fall on the employer. However, where the benefits are variable, plan participants would likely be given control of investing among choices selected by the employer.

#### Possible New Plan Designs

As noted above, eliminating the DB-DC classification would permit many new plan designs to be available. [10] Below are descriptions of several example plan designs currently not available under ERISA. These include a brief description of the plan provisions detailed previously.

#### PLAN 1: Enhanced Variable Annuity Plan

- Monthly benefits payable at retirement age based upon a formula related to years of service and compensation. Upon retirement, a lump sum (actuarially equivalent to the monthly benefit) is transferred to a separate trust account under the plan for retirees only. The benefits are payable from this account. The benefit payable is subject to change based upon actual investment and mortality experience (within this retiree pool) that differs from what is assumed.
- Employers fund the plan.
- Contribution amounts are subject to rules that ensure adequate funding of benefits for every participant at the time of retirement when the lump sum is transferred to the retiree trust. No further contributions are required on account of retirees because benefits are subject to change on account of experience.

- Upon retirement (normal or early), optional annuity forms are payable. Lump sums may also be available but are not required.
- Investments will be managed by the employer. However, separate trusts exist for pre-retirees and retirees.

#### **PLAN 2: Variable Payout Lifetime Annuity Plan**

- Benefits are initially determined based on the participant's account balance and converted to a lifetime income amount using actuarial assumptions at payout age. Benefit levels are subsequently adjusted to account for the investment and mortality experience of the plan which differs from those assumed.
- Both employees and employers fund the plan with pre-tax contributions.
- Employee contribution amounts are based on participant election (may use defaults). Employer contribution amounts could be fixed or discretionary based on compensation and/or a matching formula.
- Upon retirement (early or normal), optional annuity forms are available. Lump-sum distributions equal to the account balance may be permitted as well as the purchase of insured fixed-income annuities if a guaranteed (as opposed to variable) benefit is desirable.
- Investments are directed by participants before retirement, based on options selected by the employer. Upon retirement, investments are managed by the employer in a separate account designated for retirees only.

#### **PLAN 3: Aspirational Target Benefit Pension Plan**

- Aspirational benefit is determined based upon a formula using service and compensation similar to a traditional DB plan. Benefit levels are subsequently subject to adjustments based on plan experience. Adjustments will likely vary based on whether the participant is a pre-retiree or a retiree.
- The plan will be funded through fixed employer and employee contributions, which can be equal or different. Contributions would be made on a pre-tax basis.
- Contributions (both employer and employee) will be determined at the employee's plan entry, based on actuarial assumptions. [11] These contributions are calculated to be sufficient to fund the aspirational retirement benefit at normal retirement age. Contributions would be adjusted only if the plan is amended to change the aspirational benefit formula or to account for changes in compensation. Contributions would not increase solely due to plan experience.
- Upon retirement (early or normal), optional annuity forms are payable.

■ Investments will be managed by the employer.

The above three examples are illustrative. The first example represents a plan design similar to those in use today but incorporates mortality experience adjustments among retirees. The second represents a modern tontine structure type plan similar to what is now available in Canada. The third is a type of collective defined contribution plan.

#### Other Considerations

ERISA plans are currently subject to many rules and regulations. While most of these will still apply, modifications will likely be required to accommodate new plan designs. Here are some key considerations.

- PBGC coverage: Most qualified DB plans are currently covered by the PBGC, which insures vested accrued benefits (up to a limit) should a plan terminate with insufficient assets to cover the insured benefits. Plans that provide for some level of fixed benefits would likely be required to be covered by (and pay premiums to) the PBGC. The level of the benefits to be guaranteed should impact the premium amounts, thus requiring different premium structures based on benefit designs. Plans that do not guarantee fixed benefits would be exempt from the PBGC, similar to current DC plans.
- Accounting standard rules: Currently, DB plans are subject to disclosure in most employer financial statements. [12] This is required for the possibility that plan assets may be insufficient to cover expected guaranteed benefits and the employer could be exposed to additional liability. Such a requirement should remain in place to the extent that the guaranteed benefit entitlements could exceed plan assets. Plans that do not guarantee any benefits (those that are fully variable) would be exempt from these requirements.
- Minimum funding requirements: For plans that guarantee some benefit level, there should be a requirement that plan assets are sufficient to cover benefits. This is accomplished through a set of minimum contribution requirements, as currently applicable to DB plans. [13] The actual required minimum contributions would be subject to different rules than currently applicable depending on the plan benefit structure. Such a contribution requirement would generally not apply when benefits are not guaranteed in any form.
- Actuarial assumptions: Depending upon the type of plan, there will be a need to use actuarial assumptions. This could apply to the funding of the plan if there are minimum funding requirements, in converting account balances to annuities, or measuring the need to modify benefits due to plan experience. There may be additional requirements for actuarial assumptions.

## Changes are necessary to allow retirement plan designs to better address the current needs and preferences of both employers and employees, and eliminating the DB-DC classification would permit many new plan designs to be available.

The primary assumptions would be a rate of return on plan assets (present and/or future contributions) and life expectancies. The employer would serve as a fiduciary and be required to act in the best interests of the plan participants when selecting assumptions. However, it would be best to have government regulations that define a range of reasonable assumptions.

- Other methodologies: Plans with variable benefits would require a method for benefit adjustment to account for experience that differs from what was assumed. Such a method would provide for frequency of change as well as the extent that any experience should be immediately recognized or deferred. It would likely be appropriate for regulators to provide rules governing acceptable methods.
- **Employer pooling:** Some variable benefit plan designs will function effectively only if there is a large enough scale and new participants are continually entering the plan. Unfortunately, many plans may lack sufficient critical mass. Therefore, it would be best to have individual employers band together to create multiple-employer plans. There is currently some allowance for this under the law; [14] however, there are also restrictions. Pooling of employers within plans should be further encouraged by legislation and regulations.
- Non-discrimination: Currently, qualified plans funded with tax-favored contributions are subject to limitations. The purpose is to limit the benefits available to highly compensated employees<sup>[15]</sup> in comparison to non-highly compensated employees. There are a variety of rules based upon the plan types, and these rules can be complex depending upon the plan type and employee demographics. Nondiscrimination requirements should continue, though they will likely need to take a different form to accommodate new design plans that differ from those currently available.
- **Reporting requirements:** As is the case currently, ERISA plans are subject to reporting requirements with government agencies. The primary reporting requirement is through the Form 5500<sup>[16]</sup> and attachments series. In addition, plans with more than 100 participants are required to undergo an

annual audit. These reporting requirements should remain in place, though the information collected will need to be changed to better report on the actual plan features.

#### Conclusion

Changes are necessary to allow retirement plan designs to better address the current needs and preferences of both employers and employees, and as discussed above, eliminating the DB-DC classification would permit many new plan designs to be available.  $\triangle$ 

MARK SHEMTOB, MAAA, FSA, EA, provides consulting on retirement income security at both the individual and the institutional levels.

- [1] Contributions are tax deductible employer (and employee under a 401k arrangement) and the trust is exempt from paying taxes.
- [2] A discussion of the differences can be found on the Department of Labor website.
- [3] Collective Defined Contribution Plans; American Academy of Actuaries; September 2024.
- [4] Currently these plans can have benefits adjusted based on investment performance but not based on mortality experience of the retiree group.
- "Annuities Versus Tontines in the 21st Century"; Society of Actuaries; March 2018.
- DB plans could have required employee contributions, but this is a
- The funding method is prescribed by law and does not necessarily insure adequate funding of all liabilities.
- Plans can offer retirees the option to have an insured annuity purchase with their account balance.
- This includes 401(k) plans which are the most popular type of plan being used.
- [10] All current plan designs would also be available.
- [11] Similar to how a target benefit DC plan works.
- [12] FASB Accounting Standards Codification.
- [13] 26 U.S. Code § 412-Minimum funding standards; Cornell Law
- [14] Employers can join Pooled Employer Plans which are DC plans.
- [15] Highly compensated employee is defined under the Internal Revenue Code based upon compensation, ownership, and officer status.
- [16] Form 5500 Series; Department of Labor.

# Member Spotlight | JON WU

#### Give More, Receive More

#### JON WU'S ACTUARIAL CAREER HAS SPANNED CONTINENTS, PRACTICE AREAS, AND DISCIPLINES—from

life insurance to enterprise risk management to mergers and acquisitions. Wu, MAAA, FSA, CERA, who worked with the Connecticut Retirement Security Authority, has been an Academy member since 1992. In this Q&A, he shares insights from his global experience, the lessons he's learned along the way, and the value he finds in staying connected to the profession through Academy membership and volunteer work.

# What is your practice area and/or area of expertise?

I began my career as a life actuary, gaining experience in pricing, valuation, underwriting, and investments. I later transitioned into a mergers and acquisitions (M&A) role, supporting the company's expansion into the U.S. market. Over time, my responsibilities grew to include leading the company's global initiatives in Canada, Latin America, and the Asia-Pacific regions. Through these opportunities and by collaborating with joint venture partners, I broadened my expertise to encompass finance, health, property and casualty (P&C), and enterprise risk management (ERM). During my international assignments as an expatriate, I also performed HR functions, recruiting, training, and retaining local actuarial talent.

# What led you to become an actuary, and what attracted you to the profession?

I graduated from business school with a major in finance and public accounting. Through conversations and interviews with professionals across various fields, I discovered that actuarial student programs at large corporations—with their rotational opportunities across departments and strong prospects for career growth—were an ideal fit for my aspirations. I was particularly drawn to the idea of excelling in my daily work while dedicating my evenings to further developing my actuarial expertise.



# Describe a time when your professionalism training helped you in your career.

As a senior actuarial student, I was assigned with recommending a dividend scale to the board. To support my recommendations, I presented them to the deputy chief actuary, meticulously referencing ASOP [Actuarial Standard of Practice] No. 15, line by line. This experience was truly eye-opening, illustrating the vital role that actuarial standards of practice play in our profession. Since then, I have consistently consulted ASOPs for guidance, alongside my company's own standard operating procedures (SOPs). This reliance proved especially valuable during my overseas

assignments, where I collaborated closely with local colleagues and engaged with regional regulators.

# Tell us about a time when your actuarial expertise influenced an important decision in your workplace.

With training in asset share analysis and APL programming, I was able to support my company in evaluating the value of various books of business involving long-duration contracts. This expertise enabled me to transition quickly into the M&A field. The actuarial rotation program further deepened my understanding of IBNR's [Incurred But Not Reported] significance in short-duration lines such as health and P&C, as well as key concepts in insurance accounting and capital requirements. As a result, I became the lead actuary for M&A, advising on valuation, contract terms, and conditions, and even instructing investment banking advisors on specialized methods for assessing insurance portfolios. In one M&A transaction, I helped the company identify a substantial IBNR shortfall before finalizing the joint venture agreement.

Leveraging my enterprise risk management expertise, I assisted the company in implementing a robust ERM framework across all subsidiaries, fostering a comprehensive approach to balance sheet management. This included routinely considering the impacts on Value at Risk, Earnings at Risk, and Capital at Risk before making

critical decisions, as well as developing the initial iteration of our ORSA [Own Risk and Solvency Assessment] report before the ORSA was required by the regulators.

# What's one of the biggest lessons you've learned in your career?

Technical skills have helped me advance in the workplace, but it is the soft skills that have allowed me to go even further. This has been especially true in M&A situations, particularly in joint venture deals. The real challenge begins the day after the transaction is complete, when the new company must start delivering results. Placing the right talent in the right roles and bringing together individuals with diverse abilities to form a high-performing team are both essential to success. Additionally, I have found that utilizing SOPs and risk dashboards to monitor the performance of each subsidiary has been invaluable.

# What advice do you wish you were given at the beginning of your career?

Artificial intelligence (AI) and predictive analytics have been at the forefront of industry discussions in recent years. Early in your career, I encourage you to learn as much as possible and focus on acquiring skills that will enhance your understanding of actuarial assignments and their applications. At the same time, consider how climate change could impact your line of business—both now and in the future. Take time to identify your niche and reflect on what you are passionate about pursuing over the next three to five years and seek out mentors who can help you achieve your goals.

# What do you value most about your Academy membership or Academy volunteer work?

Academy membership provides me with access to a wealth of information and a wide array of topics relevant to my work. Through volunteering, I can share my expertise with the volunteer groups while also building connections with actuarial professionals beyond my organization. This experience has broadened my actuarial perspective. As a life and health actuary, I greatly appreciate the opportunity to learn from property and casualty actuaries—especially for my international assignments involving P&C businesses. I have also gained valuable insights by collaborating with other volunteers on the development of practice notes.

For me, volunteering has been more than worthwhile—I have had the privilege of connecting with actuaries across a variety of practice areas, greatly enriching my professional journey.

#### What is the value of your MAAA designation?

As an MAAA, I have the privilege of signing financial statements, which underscores my professional credibility. Additionally, my designation often serves as a valuable conversation starter when meeting with regulators and trade associations abroad, providing opportunities to discuss the role and impact of the Academy. These interactions frequently open doors to further meaningful dialogue in the countries where we operate.

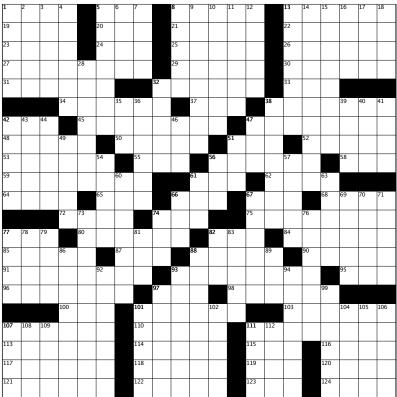
# Would you like to share anything else with aspiring or new actuaries, or those interested in volunteering for the Academy?

I have always believed in the principle that the more you give, the more you receive—a sentiment that has proven true throughout my career. Whenever I was interested in volunteering, I simply followed the [Academy Connect] link of the Call for Volunteers email to explore available opportunities, selecting topics I both knew well and wanted to learn more about, while keeping in mind the expected time commitment. I chose to focus on one or two areas that resonated with me, ensuring I could dedicate quality time to collaborating with others. I encourage you not to hesitate in reaching out to the chair or vice chair if you need further information; sometimes, making that initial connection is as simple as clicking a link or sending an email. For me, volunteering has been more than worthwhile—I have had the privilege of connecting with actuaries across a variety of practice areas, greatly enriching my professional journey.

# Beyond work—what are your hobbies or personal interests?

I enjoy playing pickleball for its simplicity and accessibility. I also hope to visit all the national parks and travel more extensively, as I am eager to learn how things work in different cultures.

#### Cabinet Members



#### Across

- out (deduce) 1
- 5 Pedagogue's deg.
- 1996 George Michael album 8
- Unimagined 13
- 19 Rate of motion
- Acting instructor Hagen
- 21 "Stormy Weather" singer
- 22 Supporter of Hillary
- 23 "Coming of Age" actress Lee
- Country road feature 24
- 25 Arctic bloom
- 26 Isolating tactics
- 27 Symptom of gout
- 29 Dashboard button
- Dessert, in Derby 30
- 31 Cabinet member #1
- 32 Sides for chilaquiles
- 33 Martian rover?
- 34 Pepper
- "The Hurt Locker" hazard,
- Obliterate from memory 38
- 42 JFK customer
- 45 Man's man
- 47 Formula alternative
- Dam that created Lake

- 50 Slurpee's competitors
- E-Type or F-Type, informally
- 52 Lodge
- 53 Hit lists
- 55 Oaf
  - Characteristic of an insect's
- '60s protest grp.
- Cabinet member #2 59
- 61 Humorist
- 62 Vector
- 64 In the ballpark
- 65 "East of Eden" character
- 66 Fathers and sons
- Whistle blower 67
- 68 Western Indians
- 72 Dudley Do-Right's grp. Paragon of patience 74
- 75 Cabinet member #3
- 77 Summer in April
- Persevere 80
- Ballpark figure 82
- Pulled a fast one? 84
- 85 Australian river
- Brown for one 87
- 88 Credible
- 90 Small shrubby African tree

- 91 Wept
- Ethereal quality
- Asian capital
- Peopled
- 97 E. Asian country
- Corresponded
- 100 Man of tomorrow
- 101 Caravan members
- 103 Cabinet member #4
- 107 Britain's first family of
- 1997-2007
- 110 University of Maine campus site
- 111 Sway
- 113 Branford Marsalis album \_\_ Abstract"
- 114 Siamese or Persian
- 115 Famous first lady
- 116 It may be on one's radar
- 117 It divides to multiply
- 118 Junipero, whose statue is in Golden Gate Park
- 119 Dampen flax
- 120 No longer with us
- 121 Norwegian arctic explorer
- 122 Hearts that don't beat very much?
- 123 "Gott mit\_
- 124 Of another nature

#### Down

- Substitute 1
- 2 Ayers Rock, alternatively
- Instrument with sympathetic strings

- Unexpected outbursts
- Wind sounds
- 6 Case in Calais
- Apple bits
- "Appointment in Samarra" novelist
- Things that are pleasing
- 10 Cabinet member #5
- Nonet
- 12 Musical markings
- 1946 Triple Crown winner
- Cabinet member #6
- Small, spinning top
- Importune
- One who makes a good first impression?
- Bonny girl
- Destroy gradually
- Monetary units of Samoa
- Louisville slugger
- Potemkin village, e.g. 36
- 38 Garden flower
- 39 Heavenly bodies
- 40 Dog-eared Spreads to dry
- 1920s anarchist in a celebrated trial
- Assyrian god of war
- Cashless deals
- Bouvier \_\_\_ Flandres (dog
- breed)
- Looking sickly 47
- Shady retreat 51 Exec's perk
- A sacred song in Sicily
- Burgundy, in Burgundy
- Like some excuses
- Made a comeback
- Kind of designer

- abed and daylight slumber": Housman
- 66 Iamaican address
- 67 Overhang
- 69 Sweet Hungarian wine
- 70 Like Henry VIII
- 71 Skylark, for one
- 73 Cabinet member #7
- 74 Procter & Gamble detergent
- 76 Dated women?
- US govt interagency body responsible for developing cybersecurity policies
- 78 Blow hard
- \_\_ coward?": Hamlet 79
- 81 It may get burned at home
- 82 Way out of reach
- 83 La Pulga Atomica, e.g.
- 86 Football blunders
- 88 Based on the number 20 89 Alternative to "die"
- 92 Shutterbug
- 93 Cabinet member #8
- 94 Sub rosa items
- Sentence analyzer 99 Stunt man, perhaps
- 101 Littoral area
- 102 Flowering plant in the daisy
- family
- 104 West Coast shrub
- 105 Cleans up, in a way 106 Blackhawk home
- 107 Cattle feed
- 108 Literally "superior one" 109 Auth. credited on many old
- poems
- 111 Fujimori's land 112 Temperate

Previous Puzzle: X Marks the Spot

М	0	L	Α	R	S		S	С	Α	В		М	Α	Z	X		G	Α	Ν	G
Α	Р	0	G	Ε	Ε		L	Α	М	Ε		Α	R	ı	L		Α	G	Ε	Ε
R	Ε	Т	R	Α	L		Α	F	Ε	W		R	I	С	Ε		L	Ε	G	S
X	C	Н	Ε	C	Κ		Р	Ε	N	Α	L	1	Z	Ε	S		L	0	Α	Z
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R	Α	C	С	О	o	N		K	o	R	Ε	Α		Ε	Α	Т		М	G	М
				0	N	Ε	S		В	1	D		C	Α	R	Α	C	Α	R	Α
S	U	N	Х		ı	D	0	L		S		L	Α	S		G	R	0	ı	Ν
Α	٧	0	C	Ε	Т		В	1	Т		Р	Α	L		Ζ	Ε	Α	R	Ε	D
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Ε	L	Ε	ν	Α	Т	О	R		R	Ε	Р		F	L	Ε	Ε				
S	Α	Υ		S	0	N		F	0	R	М	S		Ε	R	Α	S	Ε	R	S
			Α	Т	Т	1	М	Ε	S		S	1	Т	Ε		S	U	Р	Ε	R
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R	Ε	S	1	N	S		S	Ε	Т	1	N		K	Ε	М	Р	Т			
Ε	R	S	Т		0	S	Т	R	Α	C	ı	Z	Ε		В	L	_	N	D	X
Α	В	U	Т		F	L	Ε	Α		Κ	Н	Α	Т		0	ı	L	Ī	Ε	R
Т	Α	Ε	L		Т	Α	L	L		L	ī	М	Ε		S	C	ı	L	L	Α

E L S E X M A S E L A N S A N E L Y Solvers: Steve Altschuld, Dean Apps, Jared Dashoff, Todd Dashoff, Ken Kudrak, George Levine, Will Lynch, Jim Muza, Ray Niswander, Stuart R.C., Madhumathi Windon, and Wendy E. Windsor

Solutions may be emailed to puzzles@actuary.org. In order to make the solver list, your solutions must be received by Oct. 1, 2025.

## **American Academy of Actuaries**

# New Membership Requirements 2

What are the new requirements?

#### Education

Compliance with the Competency Framework, which includes baseline knowledge of key actuarial competencies, U.S. laws and practices, and U.S. actuarial professionalism.

Achievement of an actuarial credential from an actuarial organization, both of which are recognized by the Academy.

#### Experience

Three years of responsible actuarial experience, including at least one year of responsible U.S. actuarial experience.



# Why it matters

The new requirements will be effective **starting Jan. 1, 2026**, and aim to ensure that the Academy continues to maintain high standards in support of fulfilling its mission to serve the public and the U.S. actuarial profession.

Visit actuary.org/membership-requirements to read our FAQ and learn more.



"With these new requirements, Academy membership will continue to represent the expertise and professionalism expected by our stakeholders in our ever-changing environment."

# Are We on the Same Wavelength?

Eight of the across entries require a letter to be changed, which will create a new word before entry. These letters are all crossed, so the down entries will help you determine which letters to substitute. The exchange occurs in a particular way each time. Keep track of the letters you replace; they will spell out, in order, a hint to what's going on.

The long entries at 1 across and 41 across are phrases related to the theme and left unclued. There is one foreign word and five proper nouns (four and a half, if you consider that one of them is part of a double definition clue, where one answer is a proper noun and one isn't). Everything else is playable in Scrabble. Ignore punctuation, which is intended to deceive.

Thanks to Jerry Miccolis for test-solving and editorial suggestions.

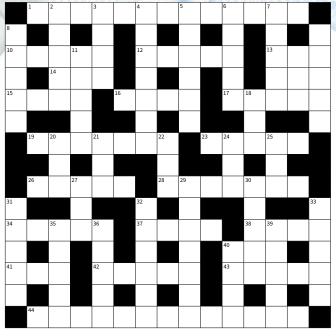
#### Across clues

- 1) See instructions
- 10) Studied and streamed with headphones
- 12) What "decimal" might mean, frequently
- 13) Musical talent in improvisational era
- 14) Pronounced retreats from the majority party
- 15) Alternately, we may sit to the right
- 16) Look after two states
- 17) Roll with us, his degenerates
- 19) Describing a standard tattletale
- 23) Brave superstar sometime met in Hot Springs, for example, having left New Hampshire
- 26) Appropriate but noisy rally

- 28) Laugh self-consciously over what at first is one of Elon's brood
- 34) Am I reckless and crazy? To be or not to be, famously
- 37) Anxiety inside supersafe arboretum
- 38) Tired of Kerouac or Ginsberg
- 41) A little bit of cartilage from a stingray, years ago
- 42) Silk-like substance is pastel for the most part
- 43) Nag or she goes astray
- 41) See instructions

#### Down clues

- 2) Western Hemisphere assembly is offering asylum
- 3) Overstates some admiration in a postscript
- 4) Noontime frolicking with no new feeling
- 5) One or the other is there, I suspect
- 6) Gives money to Joy, Desdemona, and Siobhan, primarily
- 7) Bracelets of copper coming up against 43% tariffs
- 8) Dinner's starting a little late because of what goes on top of the sole
- 9) Frivolous pursuit marginally yields benefits
- 11) Two kinds of doctors inject
- 18) Hesitation in speaking to a well-known actress by her first name



- 20) Undertake cat adjustments
- 21) Gossip at an afternoon gathering
- 22) Punch may be served here while a tower is being erected
- 24) Bet on a short golf shot
- 25) Controversial federal agency on the rocks?
- 27) Cabaret lyricist at a low point
- 29) Want hot fritters? There's quite an assortment
- 30) Forbidden at upset to express displeasure
- 31) Throw out easy junk at first, then finally the music equipment

- 32) No good, you say? Japanese bank notes the family name of many Vietnamese people?
- 33) Who in Paris and in Marseilles can be unassuming?
- 35) Crime disrupted, thanks to the gendarmes
- 36) Scour in the first place and in the second, polish, then scour again
- 39) Make a mistake or another mistake
- 40) The essence of genteelness to you of the old school

Letter substitution according
to:

TOM TOCE is an FCAS and a seasonal director at KPMG. He is a member of the Jeopardy Hall of Fame. Solutions may be emailed to ttoce@nyc.rr.com. In order to make the solver list, you should send him your solutions by Oct. 1, 2025.

#### Solution to Previous Issue's Puzzle-Jump for Joy

#### **ACROSS**

- 1 ALTER→LATER—Hidden First Letters A + L + T + E + R
- 4 OPUS—Anagram "soup" anag.
- 7 BYPATH—Comb. Reversal/ Insertion (P(iccadill)Y rev.) inside (BAT + H)
- 10 FILED→FIELD—Deletion FIL(m)ED (delete M(ale))
- 12 MASCOT—Hidden ... grandma's cottage
- 13 ARTY—Deletion (p)ARTY (delete P)
- 15 YARD—Reversal "dray" rev.
- 16 ELOPE—Insertion LOP inside (t)EE(n)
- 17 DIARY→DAIRY Comb. Container I(saiah's) inside (D + (c)ARY)
- 19 DUO—Comb. Deletion DU(e) + O (delete (hom)E)
- 21 HUSTLER—Anagram "Her lust" anag.
- 23 OPTION→POTION
  Deletion OP(era)TION
  (delete ERA)
- 27 AFRO→FARO &LIT Construction A + F + RO(und)
- 28 OPTICAL—Anagram "capitol" anag.
- 29 ARID→RAID Comb.
  Container/Deletion
  (monste)R inside AID(e)
  (delete E)
- 30 STREAK—Insertion R inside STEAK
- 31 EVICTEE—Anagram "Cite eve" anag.
- 33 YAM-Reversal "May" rev.
- 35 EDICT—Construction ED + I + C + (suppor)T
- 38 ANGST—Anagram "gnats" anag.
- 40 BLOT→BOLT—Charade B + LOT

- 43 PURR—Charade UP (rev) + RR
- 44 CHASTE—Homonym CHASED hom.
- 45 SERVE—Deletion S(w) ERVE (delete W) [with out]
- 47 BEHELD—Comb. Deletion/ Insertion (s)HEL(l) inside BED
- 48 ORYX—Construction OR + Y(ak) +(te)X(as)
- 49 ROUGE→ROGUE— Charade ROUG(h) + E(stimate)

# Across Payoff Word = L+E+A+P+F+R+O+G

#### **DOWN**

- 1 LOFTY—Construction L + OF(fers sereni)TY
- 2 TEE—Double Definition/ Pun Double Definition/Pun
- 3 ROD—Deletion (t)ROD
- 5 PIANO—Charade PI + ANO
- 6 SCARED→SACRED—
  Deletion SCAR(r)ED (delete (boxe)R)
- 7 BAHT→BATH—Hidden Every Fourth Letter (rab) B(is t)A(ke s)H(ort )T(rip)
- 8 PLAZA—Double Definition Double Definition
- 9 TUTOR—Anagram "Trout" anag.
- 11 LODESTONE—Anagram "to don Lee's" anag.
- 14 EVIL→VEIL—Deletion (d) EVIL
- 18 YEN—Deletion YEN(ta) (delete TA)
- 20 OPAL—Homonym OPEL hom.
- 21 HEART—Charade HEAR + T
- 22 RATE—Charade RAT + E
- 24 TURNTABLE—Anagram "tan butler" anag.
- 25 OLIVE—Charade O + LIVE



- 26 CANE→ACNE—Hidden American Embassy...
- 28 OKAY→OAKY— Spoonerism "KO" Spoonerism
- 30 SEE—Deletion SEE(k) (delete K)
- 32 IOTA—Hidden ...Patriot Act
- 34 MAHALO—Comb. Anagram M(aui's) + "aloha" anag.
- 36 EDUCE→DEUCE— Charade EDU + ac(CE)ss
- 37 CRAVE→CARVE— Charade C(ocaine) + RAVE
- 39 GUSTY→GUTSY— Container US inside (G + TY)
- 41 THERE—Homonym THEIR hom.
- 42 ICED—Reverse Letter Bank "Decided" Reverse Letter Bank
- 45 SIR—Comb. Deletion/ Reversal RIS(e) rev.
- 46 RIG—Deletion RIG(id) (delete ID) [40% of RIGID]

Down Payoff Word = C+H+E+C+K+E+R+S

#### Bonus Payoff Word = H+O+P+S+C+O+T+C+H

Solvers: Steve Alpert, Dean Apps, Jack Brauner, Lois Cappellano, Bob Campbell, Laura Cremerius, Jared Dashoff, Todd Dashoff, Christopher Dickens, Mick Diede, Deb Edwards, David Handelman, Jason Helbraun, Pete Hepokoski, Max Jackson, Ruth Johnson, Mike Kosciuk, Ken Kudrak, Ben Lynch, Michael Manos, David McGarry, Jon Michelson, Jim Muza, David and Corinne Promislow, Ram Raman, Jay Ripps, Bob and Shannon Schriver, Andrew Shewan, Sally Smith, Zig Swistunowicz, T.O.C.E (Josh DenHartog and Sam Donohoe), and James and Betsy Uzzell

#### **Party People**

THERE IS A WELL-KNOWN PROBLEM IN MATHEMATICAL FOLKLORE that's been around at least 75 years. "Prove that at a party of six people, there are either three mutual acquaintances or there are three mutual strangers." Of course, after 75 years we would hope that they would all be well acquainted.

This problem is often posed in an introduction to Graph Theory. Translating the problem into Graph Theory, each of the six people at the party is a *vertex* of a *graph*, G. For each pair of vertices (people), there is a unique line between them which is an *edge* of G. (We use the pair of vertices to denote their edge.) From the six vertices of G, we obtain 15 edges. (This graph is the *complete graph of order*<sup>[2]</sup> *six*, denoted  $K_6$ .) We color-code each edge of G depending on the relationship between the two people represented by the pair of vertices defining that edge. If the two people are acquainted, we code their edge blue but if they are strangers, we code their edge red.

The old problem now reads: Prove that if the edges of  $K_6$  are variously colored blue and red, then there is a blue triangle<sup>[3]</sup> or a red triangle.

■ **Proof:** Choose any vertex, V. There are five other vertices in  $K_6$  and so there are five edges coming out of V. Of these, at least three edges must be of the same color. Without loss of generality (WLOG), assume that the three edges are blue. One end of these three blue edges is V; let the vertices at the three other ends be X, Y, and Z. If edges XY, YZ, and ZX are all red, then they form a red triangle. If not, then one of this latter set of edges must be blue. WLOG assumes it is edge XY. Then VX, XY, and YV form a blue triangle. QED

The above proves that  $R(3,3) \le 6$ , where R(m,n) is the Ramsey number for m and n. Problem 1, below, asks you to prove that R(3,3) > 5 and thus  $R(3,3)^{[4]} = 6$ .

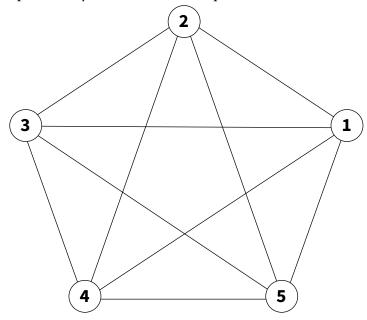
#### Problem 1

Show that the edges of  $K_5$ , (the complete graph of order five) can be colored blue and red with no monochromatic triangles. (See the diagram for a picture of  $K_5$  without color.)

Instead of saying "a blue triangle or a red triangle," I said a "*monochromatic* triangle," thus simplifying the following problem statement.

#### Problem 2

Prove that if the edges of  $K_6$  are variously colored blue and red, then there are *two* monochromatic triangles. (The two triangles could both be blue, both red, or one blue and one red.)



The Problem 2 proof is like the proof of the old problem shown previously. Both proofs require you to show that you are forced to create colored triangles no matter what coloring choices you make. They are the opposite of Problem 1 where you are asked to color a single graph without any colored triangles.

In doing your Problem 2 proof you may want to visually represent a graph, G, by drawing it in the plane. To do so, you would represent each vertex of G by a point, and then, for each edge uv of G, you would draw a curve that connects the point representing u with the point representing v. The positions of the points and the shapes of the curves can be chosen freely, as long as they allow the reader to unambiguously reconstruct the graph G from the picture. (Thus, for example, curves should only pass through each other at points that are NOT vertices. See the drawing of  $K_s$ .)

Solutions may be emailed to puzzles@actuary.org.

In order to make the solver list, your solutions must be received by Oct. 1, 2025.



- 1. What is the probability the final score ends up 15 to 14? This is a two-part question. First, you need to figure out the probability someone will hit score 14 with the opponent at scores 0, 1,2.... all the way to 13. We can do this using the Binomial Distribution. Second, for each score, we need to figure out what comes first, the server winning two points in a row or the trailing competitor reaching 14 points. We can do this recursively. If the score is 14-13, we know that there is a 0.5 probability the receiver will win the next point and force a 14-14 tie. If the score is 14-12, there is a  $(0.5)^2$ chance the losing player will win the next two points, and there is also that same 0.25 probability that the trailing player will win the next point and lose the following point, bringing us to the 14-13 score scenario. Playing this out for every scenario, we can do the calculations and see that the probability the final score ends at 15-14 is approximately 24.9%.
- 2. What is the mean number of points played in a set? We can use our work from above to figure out the distribution of final scores ranging from 15-0 all the way to 15-14. To figure out the mean number of points if the match ends 15-14, realize that there is a 0.5 probability the server will win the next point, creating exactly 29 points in the set. The probability of there being 30 points in the set is 0.5 (the server losing the point at 15-14) 8 0.5 (the server winning the second point), or 0.25. We can continue this out for all additional scores, and see that if the match hits 15-14, there will be on average 32 points in the set. Combining this with our calculations



for sets that don't hit 15-14, we can see that the mean number of points in a set is 26.1 points.

3. How do the above numbers differ if the server has a 45% chance of winning the point? This turned out to be a lot tougher than intended. We know that both numbers will be larger that what we computed above, but by how much? Likely the easiest way to solve this is via simulation. We can easily set up a sample 'set' in Excel, creating a random number to predict who will win each point, and then computing the final score and the total number of points for that set. Once you have this basic format down, we can copy each row a bunch of times to simulate a set and get the probability of the match

reaching the score 15-14 and the mean number of points in a set. Doing this leads to answers of 29.3% probability the match will end 15-14 and 26.5 mean number of points.

Solvers: Rui Gio, Chi Kwok, Daniel Wade, Clive Keating, Tony Pistilli, David Promislow, Bill Feldman, and Bob Conger. Bob Conger was inadvertently left off the solver's list for the previous puzzle.

#### **Endnotes**

- [1] Formally a graph is defined as a pair of sets: a set of vertices and a set of pairs of vertices, the edges.
- [2] The order of a graph is the number of its
- [3] A triangle is K<sub>3</sub>, a complete graph of order 3.
- [4] R(4,4)=18 but the exact value of R(5,5) is unknown, but it is known that 43<=R(5,5)<=46.

Ad Index To add your company's name to this list, call Jeff Rhodes, MCI USA at 410-316-9857, or email jeff.rhodes@mci-group.com.
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#### **Public Goods and Actuaries**

A GOOD DEAL OF POLITICAL SCIENCE DISCUSSION has dealt with the implications of public and private goods. Two fundamental characteristics of a public good are non-excludability, meaning it is difficult to prevent people from using it, and non-rivalry, where one person's use does not reduce its availability to others.

These characteristics distinguish public goods from private ones and help explain their importance in both economic theory and social policy. Public goods are essential for society's economic and political stability due to their fundamental importance, as they support economic growth, social equity, and the

smooth functioning of democratic institutions. Key issues relate to their scope, access, acceptability, and financing.

Let's consider the following examples, which illustrate the range of public goods:

- Scientific knowledge. Although it may be kept secret for proprietary purposes, sharing ideas benefits society in the long run.
- Public safety and national defense.

  These protect everyone in a country, regardless of who pays taxes.
- Clean air. Everyone can breathe it, and one person's use doesn't reduce what's available to others.
- Infrastructure. Systems such as legal and political institutions, public parks, bridges, sewage treatment, and GPS benefit everyone.

To this list, I would add what philosopher John Rawls called primary social goods, which encompass rights, liberties, and opportunities. They are essential for individuals to pursue their values and maintain their self-respect. These include education, employment, and freedom of expression.

However, private markets rarely supply either public or primary social goods effectively or equitably. If left to market forces alone, such goods can become limited or unaffordable. Governments often step in to fund, regulate, or directly provide certain public or primary social goods.

It falls to governments or other public entities to address these needs through collective provision, funding, or oversight. In doing so, they can promote



and benefit from social inclusion and equitable access through Social Security, Medicare, and other assistance programs, which also help foster social cohesion essential for well-ordered societies.

But there are challenges, such as the free-rider problem. Because people cannot easily be excluded from using public goods, many benefit without contributing to their cost. Private markets struggle to supply many public goods due to the free-rider problem; however, technology can be used to enhance access to certain public goods by producing them more efficiently or disseminating them more cost-effectively.

Collectively, we should be able to reach a consensus on the extent to which certain public goods are desirable, although disagreements may arise regarding the best ways to achieve these goals and how to fund them.

A just social system usually requires financial or structural incentives to ensure fair access to public and primary social goods and opportunities. But there may be limited incentives for individuals to pay for things that can be used without contributing to their cost. If more people free-ride, funding for public goods such

as parks, public health, or national security may become insufficient to maintain their quality or accessibility, leading to classic market failures. To address these issues, governments can apply tools such as taxes or regulations.

So far, I have described these concepts in broad terms. The following examples illustrate

how actuaries are involved in the provision and sustainability of public goods, as well as how they address the free-rider problem:

■ Public health initiatives involve collective actions aimed at preventing disease and promoting well-being across populations. These include vaccination programs, addiction treatment services, sanitation and waste management, and efforts to ensure access to clean air and water. While vaccines are often viewed as direct health protection for individuals, their broader function lies in preventing the spread of infectious diseases. This collective benefit, as seen in the control of diseases such as measles, influenza, and COVID-19, demonstrates the public health sector's role as a public good. Although actuaries have not often been directly involved with such

public policy issues, they do deal with the consequences of resolving these issues. Other public health actions, involving such areas as management of sanitation and waste, addiction, and environmental degradation, are often overlooked but are critical to preventing illness and death, especially in those who are vulnerable or who have co-morbidities. Even in non-crisis periods, the cumulative impact of these issues can be significant.

■ Risk pooling mechanisms, such as those used in private-sector insurance and pensions, represent another collective strategy for managing risk. These include designing, pricing, and evaluating products that utilize the pooling of risks—core functions of actuaries. Insurance and pension programs provided by the private sector have been within the domain of

insurance practice for far more than a century. While participation in these programs is not free and eligibility is often based on employment status or baseline health, they allow individuals with similar risk characteristics to share the financial burdens of adverse events such as death, disability, longevity, and property damage. Actuaries and regulatory supervisors play a key role in ensuring that financial promises are kept. In their projections, actuaries account for the impact of individuals who leave the risk pool, recognizing that these individuals no longer affect the experience of those who remain, even if the average experience of the overall pool changes.

In addition to these examples, actuaries serve the public good in many other ways, including through their work on climate resilience, long-term

care, retirement security, and insurance affordability—where actuarial insight helps inform sound policies that protect vulnerable populations and promote equitable outcomes. These actions align with the Academy's mission to serve the public and demonstrate how the profession contributes to the effective provision of public goods in a rapidly changing world.

In sum, I hope this overview helps actuaries focus on the underlying characteristics of those participating in or using various goods, whether public, private, social, or hybrid. Institutions that protect against risk or mitigate uncertainty stand to benefit from rigorous actuarial analysis, especially as society grapples with how best to deliver and sustain goods critical to its well-being.  $\triangle$ 

SAM GUTTERMAN is chairperson of the Social Security Committee and member of the Retirement Practice Council.

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