

THE Actuary

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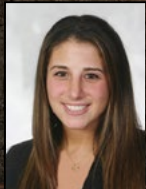
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CHALLENGES AND OPPORTUNITIES IN HEALTH CARE

BY KSENIA WHITTAL

The theme of this issue of *The Actuary* is health care. We all interact with the health care system in some way, even if some of us practice in other actuarial disciplines. Health care is also a deeply personal issue, which can make it a controversial

topic in any discussion. Nearly everyone seems to have an opinion on what is missing, what could be better or what's working well, based on his or her understanding of and own interactions with the system. While opinions vary, our goal with *The Actuary*, as always, is to focus on the facts. As one of my favorite sayings goes, "Facts do not require an opinion."

So, what are the facts? If we consider the United States (please forgive my bias as an actuary practicing in the United States), health care spending is a significant portion of the gross domestic product (GDP). It has been growing faster than inflation in the last several decades, and now comprises 17 percent of the total GDP.

Furthermore, health care is an industry with a unique set of challenges. First and foremost, the goods and services the health care industry offers are not things consumers seek out of a want or a desire, but rather out of need.

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Hence, most consumers are not thrilled to need or use health care services. My husband works in hospital administration, and he has commented that pretty much the *only* department in which you find “happy” customers is the maternity unit. Otherwise, the last place any of us wants to be is in a hospital or doctor’s office. Which leads to the next anomalous fact about this industry: The demand for acute health care services is largely inelastic.

Further, unlike most of the goods and services we purchase, most health care consumers are not able to make independent, well-informed choices regarding what type of care and services would benefit them the most. We rely on health care professionals to advise us and then deliver the needed care for which *they* get paid. And, finally, health care consumers are generally not health care *payers* (the government or insurance companies are); hence, the consumers in this situation are insulated from the true cost of the care they receive. This is all very different from purchasing an airplane ticket, for example, where the consumer is the decision maker, payer and consumer of the service.

You can imagine the tricky position in which most health care providers find themselves in this environment, as they juggle new regulatory demands, new data, more technology and directives to bend the infamous cost curve, all while attempting to improve quality and patient satisfaction. The role of regulators is no more enviable—they must balance budgets, the interests of consumers and the incentives of multiple stakeholders within the industry.

Not surprisingly, a lot is happening in the United States to amend, reform, complicate (unfortunately) and improve the health care industry—from how insurers operate to how providers are compensated. In this issue, Marla Pantano looks at health care and provider reimbursement in the United States through both provider and payer lenses, as the system moves away from the traditional fee-for-service (FFS) reimbursement to mandatory alternative payment models. The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) regulation will drive not only a significant change in both the delivery and financing of health care, but also a shift of risk from payers to the provider community.



Some of the emerging health care system changes are coming from within the industry. David Pierce and Ella Young investigate the challenges and opportunities for actuaries using electronic health record (EHR) data in their analytical work. Pierce focuses on issues that are front and center for actuaries practicing in the United States, and Young

comments on issues facing Canadian actuaries working with this additional data source. Interesting parallels and differences between the experiences in the two countries are worth noting.

There are two more feature articles in this issue that also compare and contrast different topics. The piece by Tim Jost tackles the premium stabilization programs introduced as part of the Affordable Care Act (ACA), and contrasts these to similar well-established programs used in the Medicare Part D market. The similarities and differences are striking and thought-provoking. The other article by Chris Pallot and Jennifer Gerstorff provides a comparison of the U.K.’s National Health Service, a public health care system, and the publicly funded Medicaid program in the United States. This comparison encourages actuaries to look beyond national borders for solutions and to learn from global experiences.

Finally, in an article by Daniela R. Furtado de Mendonça, the author shares the struggles and challenges actuaries and other stakeholders are facing in the Brazilian health care market.

I hope this October/November 2016 issue of *The Actuary* will provide you with a diverse sampling of the current issues in the health care industry in various parts of the world. Happy reading! ■



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BY CRAIG W. REYNOLDS

Craig W. Reynolds, FSA, MAAA, is president of the Society of Actuaries.

from the **PRESIDENT**

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Reflections

As my term as Society of Actuaries (SOA) president winds down, I would like to take the opportunity to look back and evaluate how things have gone. In my inaugural speech I identified five key goals, each of which are addressed here:

MAINTAIN THE VALUE OF OUR CREDENTIAL

Our desire to maintain or enhance the value of the credential underlies every decision the SOA makes. We understand your credential is one of your most valuable assets.

One key tactic we focused on was the enhancement of the Associate of the Society of Actuaries (ASA) curriculum to increase our focus on short-term insurance coverages and substantially expand our predictive analytics content. This action was motivated by our desire to maintain

the relevance of our credential in a changing world.

Sometimes we had to think about credential protection in unusual contexts. One example was our decision to sign a public letter calling on North Carolina to repeal House Bill 2 (HB2). I heard from many of you who voiced strong feelings on both sides of this topic. The Board felt it was important to sign this letter because HB2 rolled back discrimination protections for many of our members, allowing employers to fire or refuse to hire our members on the basis of gender identity or sexual orientation. Protecting our members' right to work is one of our most important responsibilities. Without that, what value would our credential have?

STRENGTHEN RELATIONSHIPS WITH OTHER ORGANIZATIONS

During my campaign and on many Listening Tour visits as president, I heard your messages loud and clear:

Our members want the actuarial organizations to work together better.

We have made substantial progress on this issue. I have regular and cordial communications with my counterparts at the American Academy of Actuaries (the Academy), the Casualty Actuarial Society (CAS), the Canadian Institute of Actuaries (CIA), the Conference of Consulting Actuaries (CCA) and the American College of Pension Actuaries (ACOPA).

We consult each other on issues that impact the profession, including the new International Association of Actuaries (IAA) educational syllabus, exam changes, diversity in the profession and public relations. We do not always agree on every aspect of these issues, but we evaluate and consider the impact on each organization in every decision we make, with a goal of making the whole profession stronger. We are working together more effectively than we have in many years.

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from the **PRESIDENT**

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EXPAND THE BREADTH OF WORK PERFORMED BY ACTUARIES

We know from our supply and demand study that we have an oversupply of actuarial candidates at the entry level. Fundamentally, we have two ways of addressing this matter. Some may suggest limiting the supply of actuarial candidates. I disagree. We do not want to discourage quality candidates we want and need. Increasing demand is the better option. This helps all of us by encouraging the best and brightest to join the ranks of our profession.

A shining example of this effort is our summer intern program. The SOA helped place interns at a number of companies that had not previously hired actuaries. Examples include NASA and Microsoft. Some of these companies are so pleased with the experience of working with actuaries that they plan to hire more actuaries. While entering new job territory was a little intimidating for some of the candidates, they soon realized that blazing new career paths for actuaries helps to expand what employers, candidates and actuaries consider “actuarial.”

ENCOURAGE AND SUPPORT DIVERSITY WITHIN OUR PROFESSION

This is an area of focus that makes me particularly proud of our organization. Two notable successes include our publication of a new statement on diversity¹ and kicking off a comprehensive research study on barriers to entry for the profession. The latter project is a joint effort with the CAS, the International Association of Black Actuaries (IABA) and the Actuarial Foundation—a great example of collaborating with other U.S. actuarial organizations.

Our effort to get our members to voluntarily and confidentially supply racial, ethnic and gender diversity data of themselves to their online profiles was less successful. We need better participation to allow us to effectively monitor our progress in dealing with diversity issues. Please join me in the SOA’s effort to better understand member demographics. Read my letter from the February/March 2016 issue of *The Actuary* (theactuarymagazine.org/embracing-diversity-and-inclusion), which includes detailed instructions on how to contribute your data confidentially.

Of course, we remain unequivocally committed to maintaining our high standards and our meritocracy. No one I know would advocate for changing that. In discussions related to this topic, I heard from many people who suggested that being color-blind was good enough. I disagree. As an example, according to U.S. government census data, U.S. actuaries are around 2 percent black and 2 percent Latino. This is far below the representation of these groups in the U.S. population, and approximately one-third of their representation among recent STEM graduates. We need to find more ways to make the actuarial profession more welcoming to underrepresented groups. Good intentions and professions of color-blindness are not working.

Our decision to sign the North Carolina letter was an example of walking the talk on these issues—sending a message to our members that every qualified actuary is welcome as a member and a candidate, irrespective of gender identity and sexual orientation.

SUPPORT OUR MEMBERS IN INTERNATIONAL MARKETS AND ENHANCE THE GLOBAL REPUTATION OF OUR ORGANIZATION

The SOA is an international organization, with 15 percent of our members and 22 percent of our candidates located outside of the United States and Canada. Volunteers and staff work continuously to enhance the reputation of actuaries around the world and, more importantly, to serve our members and candidates in those markets. Two notable examples of our efforts were:

- The creation and execution of an insurance executive exchange program to host Chinese insurance executives in the United States. The opportunity allowed SOA and China Association of Actuaries (CAA) members to share and learn more about our similarities, our differences and how we all can advance the actuarial profession. The CAA will host a mirror exchange in China in 2017.
- The opening of a new office in Beijing and the hiring of a lead China representative was focused on providing services to members, candidates, employers and universities in our third-largest market.

I have great confidence in the SOA and its leaders. The SOA staff is dedicated, talented and passionate. The Board is forward-looking, thoughtful and committed. I see great things ahead for our profession and our organization. This has been one of the great experiences of my life, and I am grateful for the opportunity. ■

Reference

¹ SOA.org/board-announcements/2016/june-2016-board-meeting



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A ROUNDUP OF NEWS FROM THE GLOBAL COMMUNITY

Whether you travel the world or never leave your home country, you are affected by global organizations, international requirements and the increasingly international nature of the actuarial profession itself. Here is some news from around the world.

NEW SOA STAFF FELLOW IN CANADA

The Society of Actuaries (SOA) welcomes Ben Marshall, FSA, CERA, FCIA, MAAA, as the new staff fellow, Canadian Membership. Marshall also holds the Chartered Life Underwriter (CLU) and Chartered Financial Consultant (ChFC) credentials, has a Doctor of Jurisprudence, and is a member of the Canadian and Ontario Bar Associations.

Marshall served as chief financial officer for FaithLife Financial in Waterloo, Ontario, before joining the SOA, and he has experience as a senior executive in risk management and capital management for the Royal Bank of Canada.

Marshall always has been interested in volunteer work. An active SOA volunteer for years, he has served as the chair of the International Section, where he initiated and structured a partnership between the International Section and other key section councils.

His volunteer work extends to involvement in a variety of international charitable organizations, including World Vision and Actuaries Without Borders (AWB). Marshall is a past committee member of AWB, a special interest section of the International Actuarial Association (IAA) that facilitates the provision of temporary actuarial services in areas lacking such resources. He and his wife also have spent time in Cambodia, bringing poverty relief to orphanages.

Marshall is looking forward to continuing close collaboration between the SOA and the Canadian Institute of Actuaries (CIA), connecting SOA members in Canada to the global community of actuaries, and exploring more opportunities for actuaries in a variety of fields. “I want to help employers identify the value proposition that the SOA and actuaries in general can provide,” he notes. “For example, in Canada, we can identify and define opportunities within the banking industry.”

Marshall can be reached at bmarshall@soa.org or (519) 616-3749.



2016 CHINA INTERNATIONAL CONFERENCE ON INSURANCE AND RISK MANAGEMENT

The China International Conference on Insurance and Risk Management (CICIRM) was held July 27–30, in Xi’an, China. The conference, in its seventh year, was jointly organized by Tsinghua University’s China Center for Insurance and Risk Management and the Cass Business School of City University, London, and hosted by the School of Economics of Xi’an University of Finance and Economics.

CICIRM serves as a platform for international communication and cooperation in the insurance industry, risk management and actuarial science. The SOA’s lead China representative, Jessie Li, FSA, presented the topic “SOA—China Partnerships and Tailored Services.”

INSURANCE CHINA 2016 INTERNATIONAL SUMMIT

SOA President Craig Reynolds, FSA, MAAA, attended the Insurance China 2016 International Summit that took place Sept. 22–23, in Shanghai, China. The conference was organized by Shine Consultant and hosted by Fudan Insurance Research Institute.

The summit focused on “Practice New Development Concept. Build International Insurance Center.” Discussions were based on the latest market developments in a variety of areas in the insurance industry in China. Reynolds participated in the panel discussion titled “How to Promote Insurance System to Realize Further Healthy Development” at the Senior Dialogue.



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SICKNESS AND PROFIT

Syed Muzayan Mehmud, ASA, MAAA, FCA, is a predictive modeler with Wakely Consulting Group. In analyzing 2014 Affordable Care Act (ACA) data from 20 different insurers and 50 issuers, he discovered the sickest patients generate the most profit for insurance companies. What? It was commonly believed that sicker patients would cost their insurers more. So why the switch? Read “ACA Year 1: The Sickest Patients = The Most Profit.”

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How much can you safely withdraw from your retirement account each year without running out of funds? According to a recent article in *USA Today*, “you could withdraw 4 percent per year from your nest egg and it would last 30 years.” But, today, financial experts say withdrawing 4 percent per year could spell disaster for your standard of living.

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The changing role of the CFO in a digital world is the focus of “Anatomy of the Future CFO,” an article on *CFO.com*. A visionary third eye for the future, a shape-shifting mode for constant transformation and an array of custom tools are key.

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PROMOTING COLLABORATION AMONG BUSINESSES AND ACADEMIA

BY DAVID HUDAK

As stated in its mission statement, the Education & Research (E&R) Section has a strong focus on supporting and encouraging actuarial education and research. One way this is done is by promoting collaboration among business and academic actuaries, both in terms of research and education.

The biggest activity the E&R Section supports is the annual Actuarial Research Conference (ARC). This is an international conference that is sponsored by a different university each year. In past years, the ARC has taken place in the United States, Canada and Mexico. The conference is a venue where actuaries from both industry and academia can meet and present cutting-edge research in the actuarial field.

The 2016 ARC was sponsored jointly by the University of Minnesota and the University of St. Thomas. Talks

consisted of current research from academics and industry, as well as from graduate students. The conference was very successful and featured over 100 talks. Georgia State University will sponsor the 2017 ARC in Atlanta.

The E&R council is also active in sponsoring sessions at other actuarial conferences. The council typically sponsors sessions and breakfasts at the SOA's Life and Annuity Symposium, Health Care Meetings and Annual Meeting & Exhibit. The council also publishes a newsletter, *Expanding Horizons*, twice a year. The newsletter covers a wide variety of engaging topics ranging from research areas of interest, innovative actuarial teaching methods and diversity in the actuarial profession.

The council plans to expand its role in the ever-changing actuarial world, and it invites suggestions and participation from the actuarial community.

David Hudak, ASA, Ph.D., is department head, Mathematics, at Robert Morris University in Pittsburgh. He is also the chair of the Education & Research Section at the Society of Actuaries.

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Tom Totten, FSA, EA, MAAA, is CEO of Nyhart in Indianapolis. He is also chair of the Entrepreneurial & Innovation Section at the Society of Actuaries.

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ALWAYS LOOKING FORWARD

BY TOM TOTTEN

The newly renamed Entrepreneurial & Innovation (E&I) Section (formerly the Entrepreneurial Actuaries Section) is led by a dedicated council that is looking for ways to support its members by providing relevant content to those who are interested in changing the environment of actuaries. We changed the name of the section to ensure we are including those actuaries who may work at large entities and are doing meaningful intrapreneurship activities.

In 2016, we focused on webinars and an interesting project called the Entrepreneurship Book. We hope to highlight a number of actuaries who are leading innovative changes at their companies and educate other actuaries on how they did it with some form of case study. We have a number of actuaries who volunteered to tell their stories, but we are also open to hearing more.

Personally, it's my mission to ensure that actuaries have a seat at any firm that includes risk as part of the equation (which, frankly, is every firm). While it is our job in many cases to quantify risk, it isn't always our job to embrace risk; but as an entrepreneur or an intrapreneur, it must be in your DNA. However, this DNA can be taught, and I hope our section provides avenues for risk-seeking actuaries to share these experiences. We are beginning a new effort that encompasses Asia and may involve Insure-Tech actuaries, who are very entrepreneurial.

I invite other actuaries to take this journey. Let's lead it.



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FEATURE
ELECTRONIC HEALTH RECORDS





A WHOLE NEW WORLD OF DATA

CHALLENGES AND OPPORTUNITIES WITH ELECTRONIC HEALTH RECORDS

BY DAVID PIERCE AND ELLA YOUNG

As the health care industry continues to evolve, so must the actuaries who serve it. As more revenue is tied to value-based care that focuses on improving patient outcomes, risk effectively is being shifted from payers to providers. As this shift occurs, actuaries who have traditionally supported payers will need to adapt their tools and expertise to better support the provider space. One area that has the potential to be disruptive for actuaries as they reach out to providers is the type of data sources available to use. As actuaries engage with providers more, providers will want to make use of the clinical, billing and other data available in their own electronic health records (EHRs), in addition to claims data provided from a payer. Actuaries who practice in the health care space will need to become familiar with the potential gains and challenges of this data in order to grow the presence of the field in the new health care payment landscape.

NEW DATA, OLD AND NEW CHALLENGES

EHR data presents actuaries with a new domain to demonstrate their value and expertise. Actuaries have long been experts in using administrative claims data, a skill built up over decades of practice and educational standards.

The first new challenge actuaries will need to overcome is accessing the data. Interoperability of EHRs continues to be a top story at health care industry events and in newsletters. This presents actuaries with the opportunity to help providers extract the most value out of the data in their EHRs, along with the challenge of learning new techniques and standards. Adding to this challenge is that different EHR vendors provide different mechanisms to access the data, and at varying costs to the providers.

The most common methods likely to be encountered for data extraction are Health Level 7 (HL7) messages, flat file data extracts or a custom application program interface (API). Unlike claims data that has been standardized over years of practice, EHR data feeds vary by vendor and version. And not all EHRs are created equal. Not only is every EHR feed different, but the structure of the feed is different than claims data—and it requires a different approach to utilize it.

This new structure creates an opening for actuaries to play a large supporting role in the data extraction process. Payers have maintained claims databases for years and have staff dedicated to curating and maintaining those databases. Providers, on the other hand, especially primary care providers, traditionally have not been in the position of maintaining databases. This has led to many ambulatory EHR vendors storing the EHR data either in the cloud or on their servers. This means the provider office does not need to support a complex hosting environment, but it can make it more challenging to acquire the data when there is not a local data expert at the provider's location. Actuaries can support providers by being the data experts who can translate the raw data from the EHR into what providers need in their claims data.

Once the access issues have been fixed (which is not an easy task in some instances), the next issue to resolve is variations within the EHR data. While there is variability across different administrative claims fees, actuaries have a general sense of what will be included and the format of the data. The health care payment systems have standardized many of the fields actuaries use in their analyses. With minor variation, an actuary knows what to expect in the diagnosis field or the Health Care Common Procedure Coding System (HCPCS) field. This is not the case with data from an EHR.

Take laboratory tests and results, for example. Laboratory tests can be codified using the Logical Observation Identifiers Names and Codes (LOINC) standard; however, data feeds from EHRs often do not include LOINC codes, but instead include a human readable description of the test. Different users in the same provider clinic will use different terminology to describe the same test. For example, the hemoglobin A1c test used to diagnose and monitor diabetes can be recorded as: HbA1C, A1C, Hemoglobin A1C, etc. Similar scenarios exist for the actual lab values and other tests. Actuaries will need to understand how this variability will impact their analyses and develop methods to standardize and consolidate differences in terminology among users.

Additional issues of which actuaries should be aware prior to engaging with a project using EHR data are: How is EHR data linked with existing claims data? Will the needed data

be available in the extract? EHR data is typically *raw* data, as compared with processed administrative claims data, meaning that defining who is who is not always straightforward. This is why in most cases, when linking EHR data with claims data, an actuary will need to create a master patient index (MPI) in addition to the patient identifiers in the claims and EHR data. The quality of the data contained in the EHR is something that will likely not be fully known until the extract has been evaluated. Providers have the ability to customize their EHR workflows in order to better align with how they practice medicine. This capability is a great thing for the patient and the provider, because technology should enable workflows, not make them more cumbersome. The downside to customization is that data captured in the customized workflow may not be available in the extract from the EHR. This can leave valuable data locked in the EHR because most APIs and extracts pull only specific fields that were anticipated to be used in standard workflows. Clever approaches and an intimate knowledge of EHR systems are required to work around this issue.

background

MEDICAL CODING TERMS

HEALTH LEVEL 7 (HL7) is an organization that provides common standards to be used in the exchange of electronic health information. (www.hl7.org)

HEALTH CARE COMMON PROCEDURE CODING SYSTEM (HCPCS) is a multilevel system of standardized codes that represent medical services that assist in processing medical claims for payment.

LOGICAL OBSERVATION IDENTIFIERS NAMES AND CODES (LOINC) is a standard code set used for identifying laboratory observations.

ADMISSIONS, DISCHARGES AND TRANSFERS (ADT) messages are some of the most common HL7 messages and consist primarily of demographic information about a patient from a hospital or clinic.

EXPANDING TRADITIONAL ACTUARIAL WORK WITH EHR DATA

Actuaries have long used administrative claims data from a payer in their work. In health care, a payer has broader visibility than any single individual provider does regarding the claims experience of an individual patient. This wider view is important for risk scoring and understanding episodes of care across health care providers. Conversely, providers who have cared for patients for several years are going to have more longitudinal data on their patients, including lab values and vital signs. Additionally, EHR data can include more information than claims data for the same encounter, because typically only the data elements required to get a claim paid are coded on the claim. Another benefit of EHR data is that it can be extracted and used in real time as opposed to the delay seen in claims data. The opportunity to link claims and clinical data from an EHR combines the best of both data sets and could be used to expand a number of offerings, including reserve analysis and analyzing quality metrics.

Actuaries rely on the holistic view of individuals from claims data to perform a number of analyses, including reserve estimation. Reserves traditionally have been focused on how to estimate the financial liability of a payer for the claims that have occurred but have not yet been reported. If actuaries have access to real time or close to real time (e.g., daily) EHR, or admission, discharge or

transfer (ADT) feeds, then the entire reserve process could be expanded and improved upon. Having access to the billing data contained in an EHR, actuaries would know about events long before they are reported in the payer data. Actuaries would be able to use up-to-date information regarding utilization of services by place of service, and then apply additional models to account for denials, severity and services for which no claim data is available. This has the potential to reduce variability in reserve models, allowing payers to have more confidence in the reserve estimate. This would be valuable to payers, but also to providers as they assume more risk.

When providers begin taking on risk through accountable care organizations (ACOs) or capitation models, they need to think about their overall exposures and what the likely utilization outcomes will be for the performance year. Using claims data alone is not ideal for this, which is due to the timing limitation previously discussed. Likewise, EHR data alone is not sufficient for this either due to the absence of other provider billings. Unless the providers are part of a truly integrated network, they will not have visibility into all of the services providers outside of the group deliver to their patients. This makes the combined claims and clinical offering the ideal solution for these groups as well. By combining robust analysis on claims and EHR data, ACOs will be in a better position to estimate their end-of-year performances and evaluate potential corrective

ACTUARIES CAN SUPPORT PROVIDERS BY BEING THE DATA EXPERTS WHO HELP TRANSLATE THE RAW DATA.



actions. As more provider groups join or form ACOs or other alternative payment model arrangements, actuaries will need to be in a position to support them.

Supporting ACO quality metrics is another area in which combining claims and EHR data adds value. In the United States, quality metrics are a continued focus for ACOs and other managed care entities, especially as the impact of the Merit-Based Incentive Payment System (MIPS), as delineated in the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), becomes effective for providers. Being able to support both claims and clinical quality metrics is going to be a must for actuaries if they are to add value in the provider consulting space. There are several quality measures that rely solely on clinical data, and the ability to calculate them and recommend improvement strategies in near real time will be a must moving forward in this space.

IS THE JUICE WORTH THE SQUEEZE?

There are many challenges and opportunities in using data from an EHR. Some of these were detailed already, but, additionally, there is the real expense to acquire the data, which varies by EHR system (monthly fees or one-time setup costs). The question of whether it's worth the investment depends on the business situation and what other data sources are available. In addition to the question of cost, the availability of data, which has a lot to do with the national medical delivery model, needs to be considered.

U.S. PERSPECTIVE

The U.S. health care system is a highly complex, decentralized system with multiple private and public payers.

As individuals move throughout the United States, both regionally and through time, their utilization data generally does not follow them. For example, when an individual qualifies for Medicare—the federal health insurance program for people over age 65—the federal government becomes the insurance payer. The claims data for this individual begins when he or she enrolls in Medicare. None of the prior payer data is transferred or available. If individuals retain their pre-Medicare

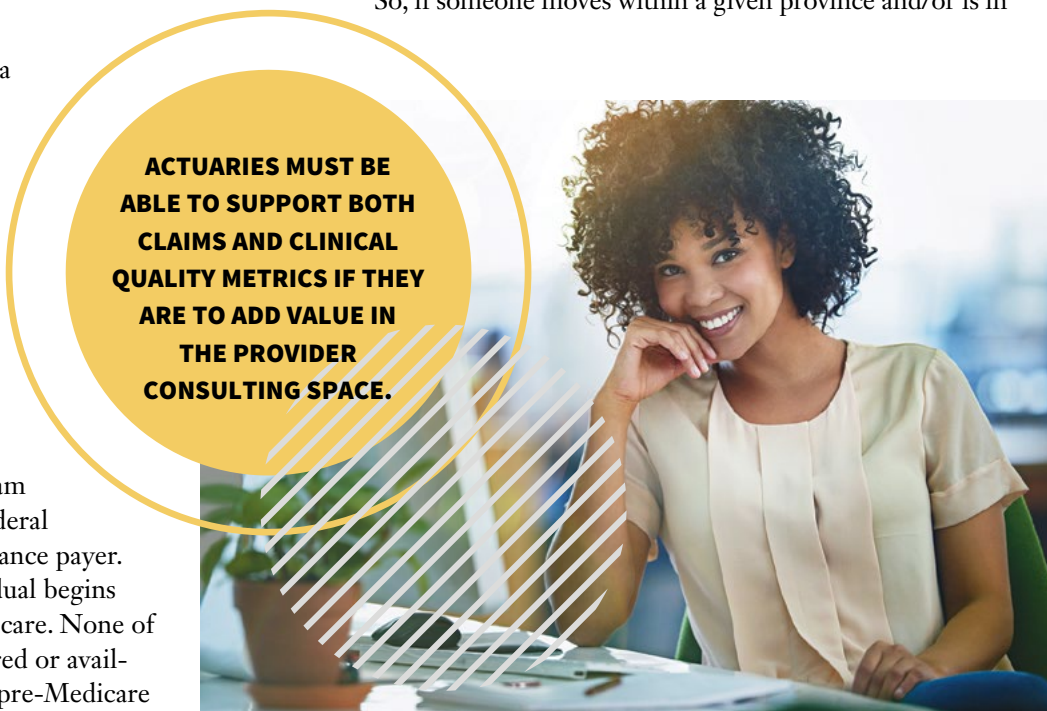
providers, prior longitudinal clinical data is available in the EHR system.

The lack of historical information from the claims system presents issues for analysis. For example, consider new enrollees to Medicare. If actuaries had access to their EHR data and were able to fill in the gaps in the claims records, then the analysis could more accurately reflect what is known about them.

CANADIAN PERSPECTIVE

Many nations are struggling to find an optimal blend of structures, frameworks and payment mechanisms to ensure patient outcomes are maximized for the resources expended. All have their own challenges. One challenge that is alleviated in universal-payer systems (like the one in Canada) is the inception-built infrastructure to capture utilization data that is both wide and deep, yielding comprehensive, longitudinal administrative data. That is, for all citizens, data around all physician encounters is captured, including diagnoses, prescriptions ordered, prescriptions filled, and tests ordered and conducted (though often not with test results). Encounter data is captured for as long as an individual lives in the health care system jurisdiction and retained potentially forever.

In Canada, health care is a provincial responsibility. Most of the system is paid through transfers from the federal government, but it is the provinces that decide how best to use those funds to achieve federal and provincial objectives. So, if someone moves within a given province and/or is in



**ACTUARIES MUST BE
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CONSULTING SPACE.**



Canada and has not left that province for longer than what the provincial plan allows, all of his or her health care utilization is captured (even from other Canadian provinces). There are some gaps, such as for hospital pharmacy dispensing and physicians who are not fee-for-service (FFS), and there is variability among the provinces. However, the data is very comprehensive—much is known about trends, patterns and utilization costs by almost whatever cohort criterion one would like to apply. Accurate predictions may be made at the citizen level by leveraging this great store of information.

This is great—for taxpayers, patients, providers, researchers and others, such as actuaries. These data stores mean the potential for highly accurate and robust model results. To date, few actuaries have been involved with detailed analytics work with these great data warehouses, so many opportunities exist to derive value-added information with analytics. However, it may not be so great for EHRs. That is because unless any additional data collected by EHR adds significant value, then the cost involved with collecting, storing, securing, extracting, linking and analyzing it may be difficult to justify. In addition, before embarking on such a journey, a clear plan must be articulated around what will be done with any resulting analysis to better the system and outcomes for patients. This has been a major obstacle. Identifying a problem—and often an already known problem—is good, but if the causes and/or improvement plans cannot also be explored and feasible, then the value proposition is greatly reduced.

The universal-payer administrative data shows if and when patients visit multiple providers, and what occurs, such as prescriptions, diagnoses, test orders, emergency room (ER) visits, hospital admissions, specialist referrals, etc. This information would not be in one given provider's EHR, as that provider would not know if a patient had been accessing other services unless that patient were to disclose it. A lack of sharing such information may not be intentional, as patients with cognitive issues may simply not remember these events during their next regular visit. One option for providers in universal systems is to use administration data stores more fully to improve patient care.

This is not to say that EHRs do not add value, especially for a given provider or group of providers in running their practice versus traditional methods, such as paper charting. In addition, being able to extract additional data elements from an EHR, such as test results, in a timely way could enable much better analytics results. However, from a population health and/or utilization/actuarial analytics lens, they have a high bar to surpass to show value.

CONCLUSION

Having access to and using the clinical data from an EHR can be expensive and unwieldy, and should not be entered into without a clear objective or business reason. Data analysis for the sake of data analysis is not what actuaries are known for or how they add value. Delivering high-quality insights into critical business problems for their employers and clients is how actuaries deliver value. EHR data, when used purposefully and with an understanding of the challenges it presents, can be a significant value-add for actuarial work. ■

background

EHR DATA COMPOSITION

Electronic health record (EHR) data is primarily grouped into three types of data: structured, unstructured and images.

Structured data is data that is entered into a specified field for a specific purpose, often with prescribed options for entering the data. Smoking status is a good example of structured data, as are vital signs.

Unstructured data is all of the free text that providers enter into a patient's chart during or after an encounter. This data typically contains what the doctor did or observations about the patient. Items that could be seen in the free text block include "counseled patient on importance of medication adherence."

The third type of data is images. These can be radiological images or scanned pathology notes.

In addition to clinical data (labs, vitals, diagnosis, procedures, etc.), EHRs also include billing information, demographic information, medical history, allergies and immunizations for encounters that occur in that medical system.

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EXTRA COVERAGE

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A REGULATORY IMPACT ASSESSMENT ON BRAZILIAN INDIVIDUAL HEALTH PLANS

BY DANIELA R. FURTADO DE MENDONÇA

The Brazilian Constitution states, “*Health is a right of all and the duty of the State.*” Thus, in order to meet the demands of the more than 200 million people in the country, the Brazilian government established a program called Sistema Único de Saúde (SUS) more than 25 years ago.

To operate this program, the State has set up a network of public, philanthropic, and private hospitals and clinics. In this system, the pay grade table SUS offers to its partners has a gap of up to 1,300 percent¹ when compared to the pay grade table of the market. Not only does this pay gap weaken the established partnerships among hospitals and clinics, but it also discourages new entrants into the system, which has led to a shortage of medical staff and patient beds.

For these reasons, the SUS has been unable to satisfy the tremendous demand for medical procedures, resulting in 25 percent² of the Brazilian population acquiring some kind of supplementary health plan, i.e., a plan that is a substitute for public health. Components of this system include the regulatory agency Agência Nacional de Saúde Suplementar (ANS), companies that sell supplementary health products (health insurance and health plan companies), and members and providers (physicians, hospitals, laboratories, etc.).

Supplementary health products have existed in Brazil since the 1960s. However, delays in the formation of operational regulations caused the majority of health plans selling these products to operate without any consumer guarantee until 1998, when the first regulations came about. Since then, ANS has published more than 500 new rules, with the goal of making the market more professional and safer for the consumer.

Due to the new legislation, Brazilian supplementary health products no longer were permitted to establish limits of any kind—quantitative or financial—and ANS monitored all of the companies selling these supplemental products very closely to ensure cooperation. In addition, these companies were required to begin setting up certain reserves.

Forcing all of the companies that sell supplementary health products to conform to these rules caused severe decapitalization of the sector. Strong measures to

compensate this decapitalization were taken. In the case of individual products, these regulations caused a massive extinction; although these products were never the priority of these companies, they have dropped to the lowest market share since September 2005, at just 20 percent. Companies selling supplementary health plans are finding many difficulties in this line of business, which unlike the group health plans, is strongly regulated and monitored by ANS.

With respect to individual plans specifically, many legislative points must be assessed as factors that discourage their continuity in the market. Consider the following examples:

- The prohibition of the insurer’s ability to terminate the contracts, which makes the products valid for an indefinite period (i.e., lifelong).
- The regulation of the annual rate increases is based on group plan experience.
- The prohibition of risk selection or underwriting on the basis of age or preexisting conditions at the time of enrollment.
- Frequent updates in the list of mandatory medical procedures that must be covered, which extends to all contracts established since 1999 that do not have a counterpart to the price reevaluation.

Moreover, these practices work poorly for the market because they do not always employ the basics of good actuarial practice. These plans often are considered to be

a true market destabilizer, similar to what happened to the Brazilian individual life insurance market in the past, in which a similar model damaged many insurance companies financially.

For all of these reasons, the analysis of ANS data for individual plans indicates that the loss ratio of these products has increased steeply over the years. From here forward, we will examine some of the legal issues that affect the loss ratio for these supplemental products.

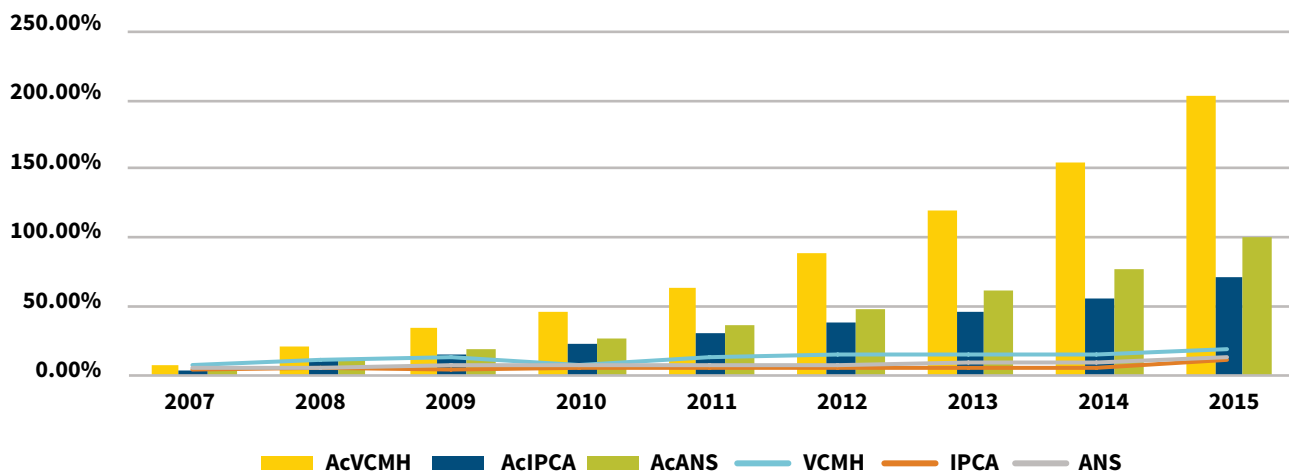
VARIATION OF MEDICAL AND/OR HOSPITAL COSTS (VARIACÃO DE CUSTOS MÉDICOS E HOSPITALARES)

The ANS has imposed rate increase restrictions on the individual market. For several years, the rate increase regulations—although higher than the Consumer Price Index (called IPCA or Brazilian Inflation)—did not increase fast enough to keep up with the Variação de Custos Médicos e Hospitalares (VCMH or Brazilian Medical Trend).

FIGURE 1 is a comparison chart showing the percentage rates of VCMH, IPCA and ANS adjustment, as well as their accumulation (AcVCMH, AcIPCA and AcANS) over the years. See the background sidebar on page 30 for a complete list of acronyms in this article.

It should be noted that during a period of only nine years, if the VCMH is compared to the mandatory rate by the ANS, individual plans lost 50 percent of their value, which had a direct impact on the increased loss ratio.

FIGURE 1 RATES OF BRAZILIAN SUPPLEMENTARY HEALTH INDEX (VCMH, IPCA AND ANS)



Source: Based on data from VCMH, IPCA and ANS readjustment data history

DEMOGRAPHIC AGING

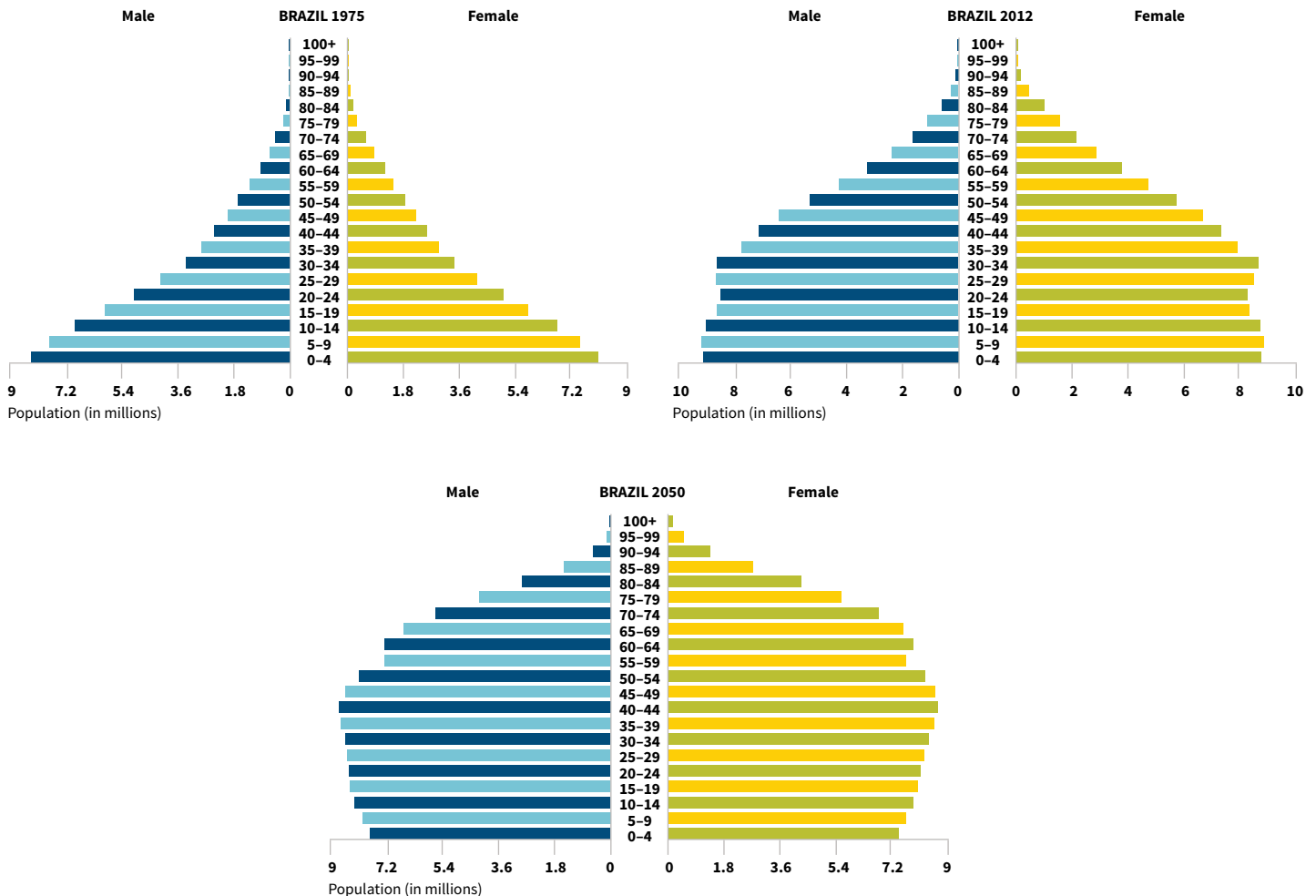
In the last 30 years, Brazil has experienced a strong demographic transformation. Data from the Brazilian Institute of Geography and Statistics (IBGE) indicates that in a maximum of 40 years, the Brazilian age pyramid will be older (similar to that of France at present). In other words, we expect a quick shift in the ages of our population, as can be seen in **FIGURE 2**.

Aging, by itself, could be considered a big problem Brazilian health plan companies will need to face.

However, the application of existing Brazilian rules will only exacerbate the issue.

According to the ANS regulations, health plans have limitations on how much the premiums are allowed to vary or increase by age within the 10 required age bands. Specifically, those companies must make sure the oldest age band's premium level does not exceed six times the first age band's premium, and that the percentage increase between the premiums of the seventh and the 10th age bands does not exceed the percentage increase between the first and the seventh age bands' premiums.

FIGURE 2 AGE PYRAMID OF THE BRAZILIAN POPULATION THROUGH THE YEARS



Source: Brazilian Institute of Geography and Statistics

Consider **FIGURE 3** for an example of these limitations:

FIGURE 3 EXAMPLE PREMIUM TABLE

Age Band	Premium (R\$)	%	Percentage Increase
0–18 years old	100,00		171%
19–23 years old	110,00	10%	
24–28 years old	126,50	15%	
29–33 years old	158,12	25%	
34–38 years old	173,93	10%	
39–43 years old	226,12	30%	121%
44–48 years old	271,34	20%	
49–53 years old	352,74	30%	
54–58 years old	451,51	28%	
59+ years old	600,00	33%	

If we take a careful look at Milliman’s Brazil Health Cost Guidelines, we can verify the difference in cost between the first and the last age band is much more than six times, which is inconsistent with the ANS guidelines. To fill this gap, health plan companies had to charge more to their younger enrollees in order to reach greater values in the higher ranges.

LIST OF PROCEDURES

In order to follow the technological developments in medicine, every two years the ANS determines a new list of appointments, exams and treatments with mandatory coverage in health plans. Since 1998, this list has represented the minimum coverage required for consumers according to the coverage of the signed contract (out-patient, inpatient or both).

It would be most actuarially appropriate if companies that sell supplementary health products could pass the extra cost to consumers. However, as seen earlier, the allowable increases are regulated by the ANS and have never been set high enough to cover costs of the new procedures.

TECHNICAL RESERVES DEFICIENCY

ANS requires that these health plan companies set up only the incurred but not reported reserve, the unearned premium reserve, and the due and unpaid reserve; however, individual plans require more reserves than just these in order to stabilize the loss ratio over time. These include

the contract reserve, the active life reserve and the premium deficiency reserve (PDR).

The contract reserve is established when some portion of the premium collected in a contract’s early stages is intentionally designated to help pay for anticipated higher claims costs in later stages, like in Brazil contracts.

The active life reserve is the combination of contract reserves and unearned premium reserves; the latter already is mandatory in Brazil and represents premiums that have been collected and entered in the ledger, but actually are allocated to a period of time after the valuation date.

The PDR is set up when it is determined that future premiums are not sufficient to cover future claims payments and expenses. The distinction between the PDR and the contract reserve lies in the initial pricing intent. Contract reserves are established when the product is priced initially, with the knowledge that the incidence of premiums and claims will not match. A PDR is required when a gross premium valuation determines there is a contractual obligation to fund future losses, but the liability cannot be recognized by an experience adjustment to contract reserve entries because it has already been sold, leaving you in a bind.

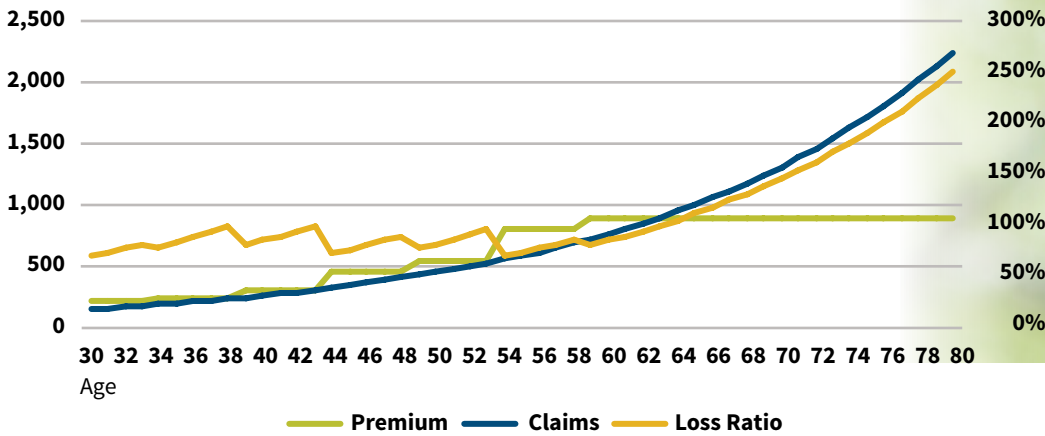
Joining all of the rules together, we can create a simulation for an individual plan and its evolution through the years. We will assume an expected initial loss ratio of

background

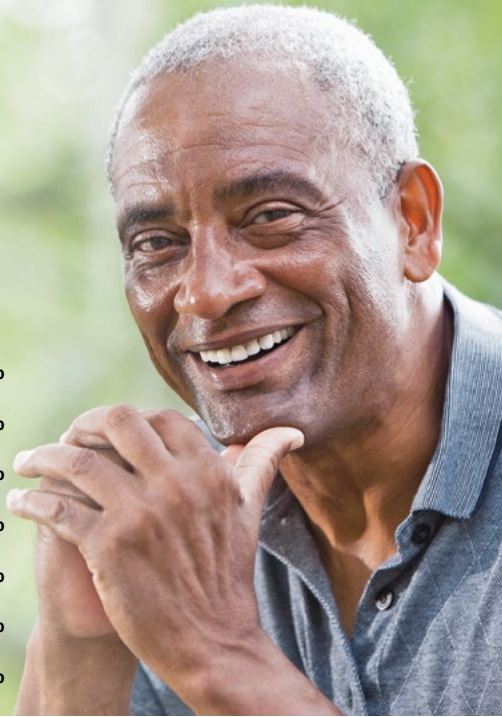
ACRONYMS LIST

Acronym	Definition
AcANS	Accumulated ANS rates
AcIPCA	Accumulated IPCA rates
AcVCMH	Accumulated VCMH rates
ANS	Regulatory Health Agency
IBGE	Brazilian Institute of Geography and Statistics
IESS	Supplementary Health Research Institute
IPCA	Brazilian Inflation
PDR	Premium Deficiency Reserve
SUS	Brazilian Government health program
VCMH	Brazilian Medical Trend

FIGURE 4 SAMPLE INDIVIDUAL PLAN EVOLUTION BY AGE



Source: Author's own elaboration



70 percent for a 30-year-old, a claim cost increase of 1.5 percent for each additional year of age (e.g., a 31-year-old costs 1.5 percent more than a 30-year-old), and a readjustment gap of 4 percent per year (taking into account the list of new procedures every two years). The readjustment gap is essentially the difference between the real increase in costs (e.g., 10 percent), and what ANS will allow these premiums to increase by (e.g., 6 percent), which results in a gap between the real cost and the premium level (e.g., a readjustment gap of 4 percent).

Observing **FIGURE 4**, it is clear the detachment of the premium curve and the events curve begins at age 62, but the loss ratio already has reached alarming levels by age 38.

To meet the financial needs wrought by these regulations, the health plan companies set the premium payment of the products so new entrants partially subsidize the older ones, which changes the underlying premium model to use cross-subsidization and premiums that do not align with costs.

Undercapitalized and discouraged, as well as lacking the needed reserves, the insurance companies in this market gradually are moving toward a more practical solution: stop selling individual plans in order to limit the damage generated by this portfolio. Because of this approach, many of the individual plan portfolios of health insurance companies are in decline.

In addition to these adverse conditions, which have been in place since 2005, the situation is getting worse today as

Brazil experiences serious economic problems. With the collapse of the economy, unemployment rates consistently have set new records every month. Because these people have no backup plan, the government tries to remediate part of the problem by mandating that all employers keep their dismissed and retired employees in the portfolio for some time, since the employees help pay for the cost. However, this practice is tied directly to the increase in post-employment liabilities (International Accounting Standards), which causes dissatisfaction with the employers, in turn producing a negative impact on the group health plans.

We conclude that for the market to regain interest in individual plans and to wholly rebalance itself, it would require radical changes in legislation, including the requirement of the aforementioned reserves. ■

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- ² Agência Nacional de Saúde Suplementar. Caderno de Informação. March 2016.

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ASPECTS OF THE ACA MARKETPLACE

BY KURT J. WROBEL

Tim Jost's article on page 34 introduces the web-exclusive series—available at theactuarymagazine.org—on various topics surrounding the Affordable Care Act (ACA). The articles dive deeper and highlight several viewpoints from actuaries and other policy experts on the most important aspects of the ACA marketplace. These opinions are particularly unique because the authors come from many different organizations and have had many different experiences with the ACA, including those with co-ops, blues plans, consulting firms, smaller health plans and large national payers.

Authors and topics include:

- **Kurt J. Wrobel, FSA, MAAA**
A Review of Emerging Data: The Long-Term Sustainability Question for the ACA Marketplace
- **Timothy Stoltzfus Jost, JD**
Stabilizing Forces: The Difference Premium Stabilization Programs Make in the Affordable Care Act Marketplaces and Medicare Part D
- **Scott Brockman, ASA, MAAA**
Transfer Problems: Exploring the Imbalance in the ACA's Risk Adjustment Transfer Formula
- **Roy Goldman, Ph.D., FSA, CERA, MAAA**
Five Areas of Concern: Comments on Risk Adjustment Under the ACA
- **Andrea B. Christopherson, FSA, MAAA**
Market Dynamics Under ACA Risk Adjustment: Looking for Solutions to Maintain the Viability of the Overall Risk Pool
- **Gregory Gierer**
The ACA Risk Adjustment Program: A Critical Element in



Assuring Market Stability and Affordability

- **Kristi M. Bohn, FSA, MAAA**
Financial Fairness: Looking for Ways to Level the Playing Field Among Health Insurance Carriers Under the ACA
- **Victor Davis, FSA, MAAA**
Toward Sustainable ACA Markets: Overcoming the Challenges Caused by Risk Adjustment

To provide an analytical grounding for the articles, Rebecca Owen, FSA, MAAA, health research actuary for the Society of Actuaries, begins by offering a general background on the most important emerging risk adjustment information released by the Centers for Medicare & Medicaid Services (CMS). This information is particularly important because it starts to highlight the successes, as well as the most important challenges, in ensuring the long-term sustainability of the program.

With Owen's research report—"An Examination of Relative Risk in the ACA Individual Market" as background—several of the authors highlight the long-term challenges with the program, including the stability of the risk pool, the magnitude and timing of the risk adjustment payment, and the problem of member turnover.

For the full complement of articles in the ACA Exchange Initiative Program collection, visit *The Actuary* online at theactuarymagazine.org.

While each author approaches these issues with a different perspective, each article has themes with a similar underlying current that tie back to the program's high-level challenges.

In addition, several authors detail specific technical facets of the risk adjustment program. The technical aspects of the program are very important, particularly because risk adjustment will be the sole remaining risk protection in the program beginning in 2017. Many authors see opportunities to improve the program—including better accounting for partial year enrollees, the inclusion of pharmacy data adjusting for premium differences for lower-cost plans and using credibility for smaller insurance companies.

Overall, the authors highlight the many challenges we face as we continue to make improvements in the program. These improvements are an important part of ensuring that we have a sustainable program that provides stable premiums for the members of the ACA marketplace. ■

Kurt J. Wrobel, FSA, MAAA, is chief financial officer at the Geisinger Health Plan.

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FEATURE
ACA MARKETPLACE



STABILIZING

THE DIFFERENCE PREMIUM STABILIZATION PROGRAMS MAKE IN THE AFFORDABLE CARE ACT MARKETPLACES AND MEDICARE PART D

BY TIMOTHY STOLTZFUS JOST

FORCES

WEB EXCLUSIVE!

Tim Jost's article is one of eight articles in the ACA Exchange Initiatives Program collection. For the full complement of articles, visit *The Actuary* online at theactuarymagazine.org.

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More than six years after its adoption and nearly three years since its insurance market reforms went into effect, the Affordable Care Act (ACA) remains intensely controversial in the United States. Although its achievements are undeniable—coverage of more than 20 million Americans and reduction of the level of uninsured to the lowest levels in history¹—the House of Representatives has voted to repeal it dozens of times, and the full Congress once, while scores of lawsuits have been filed challenging its provisions or implementation. Although premiums in the ACA marketplaces initially were set at lower rates than expected, premiums have grown rapidly in many markets, particularly for 2017, contributing to continued discontent.²

By contrast, Part D, the Medicare outpatient prescription drug benefit program, largely has been considered a success. Although its approach to covering prescription drugs was controversial at the time it was adopted by a Republican Congress, it quickly garnered bipartisan support. Congress has never voted to repeal Part D; in fact, a Democratic Congress expanded its coverage through the ACA. Part D premiums have remained largely stable, initially set at lower levels than expected, and growing much more slowly than anticipated.

THE ACA'S PREMIUM STABILIZATION PROGRAMS WERE MODELED CLOSELY AFTER PROGRAMS THAT HAVE BEEN IN EFFECT FOR A DECADE UNDER MEDICARE PART D.



ACA PREMIUM STABILIZATION PROGRAMS

Among the ACA's most controversial provisions are those establishing its premium stabilization programs, the "3Rs"—risk adjustment, reinsurance and risk corridors. Each of these programs serves separate, although related, functions.³ The risk adjustment program collects assessments from insurers that enroll lower-risk individuals in the individual and small group markets, and transfers these funds to insurers that cover higher-risk individuals in those markets. Risk adjustment was intended to encourage insurers in the individual and small group markets to cover high-cost individuals, who often were excluded from coverage before the market reforms, and to discourage plans from engaging in risk selection to avoid these individuals.

The temporary reinsurance program, which is in place for the first three years of the market reforms (2014–2016), imposes per capita fees on group health plans and insurers in the individual and group market, and uses the funds raised through this fee to reinsure insurers that incur high-cost claims in the individual market. Like the risk adjustment program, it is intended to provide an incentive

to insurers to enroll high-cost individuals. But it is also grounded in recognition that, in general, the ACA's health insurance market reforms disproportionately will attract high-need individuals to the individual market in the early years of the reform, and it is intended to cushion the burden of these cases on insurers as the individual market stabilizes.

Finally, the temporary risk corridor program, also only in effect for the first three years of the market reforms, applies a statutory formula to collect funds from insurers that offer qualified health plans (QHPs) in the marketplace and enjoy excessively large profits, and to make payments to QHP insurers that suffer exceptionally large losses. The risk corridor program is intended to limit the risk faced by insurers that are willing to offer plans in the new and largely unknown guaranteed issue and modified community-rated individual marketplaces during the first three years of the program.

CONTROVERSIES SURROUNDING THE ACA PREMIUM STABILIZATION PROGRAMS

Each ACA premium stabilization program has provoked controversy. The risk corridor program has been criticized as an insurer bailout and was crippled by legislation enacted by Congress in the program's first year of operation that made the risk corridors revenue-neutral. That is, the legislation limits program payouts to the amount collected from insurers.⁴ For 2014, the Department of Health and Human Services was only able to pay out 12.6 percent of the amount owed to insurers under the statutory formula because of this constraint. This in turn contributed to the insolvency of a number of insurers and has resulted in numerous lawsuits as insurers attempt to collect the full amount they claim they are due under the statute.

The reinsurance program, on the other hand, has been able to pay insurers the full amount owed under implementing regulations (indeed, at a higher coinsurance rate than initially projected), but only by directing the full amount of the fees collected under the ACA's reinsurance provision to provide reinsurance and by not paying out the full amount that also was supposed to be returned to the Treasury from program fees. This has provoked criticism from ACA opponents who claim the administration is robbing the Treasury by not making the repayment.⁵

Finally, the formula used by the risk adjustment program to redistribute funds has been criticized as favoring large, established insurers and penalizing smaller and newer insurers. Insurers that fared poorly under the risk adjustment program have filed a lawsuit challenging the risk

adjustment formula. Insurers disfavored by the program also have appealed to state and federal regulators for relief.⁶

MEDICARE PRESCRIPTION DRUG BENEFIT PREMIUM STABILIZATION PROGRAMS

Given the controversial nature of the ACA's premium stabilization programs, it may surprise some that these programs were in fact modeled closely after premium stabilization programs that have been in effect for a decade under the Medicare Part D drug program. Medicare Part D, like the ACA, also has a risk adjustment program. Like the ACA's risk adjustment program, the Part D program is based on the risk profile of enrollees, although the Part D program adjusts the premiums paid to insurers prospectively based on the projected risk scores of their enrollees rather than adjusting payments retrospectively based on their enrollees' actual risk profiles.

Part D's reinsurance program is much more generous than the reinsurance program established under the ACA. The program pays 80 percent of all covered costs incurred by an enrollee above a threshold amount of \$7,515 (in 2016).⁷ By contrast, the ACA program only covers, for 2015, 55.1 percent of claims costs exceeding \$45,000 but less than \$250,000.⁸ The ACA reinsurance program paid out \$7.9 billion in 2015 for 2014 claims—its most generous year.⁹ This was less than a quarter of the estimated \$32 billion paid out under the ACA for premium tax credit and cost-sharing expenditures for 2014.¹⁰ By contrast, the Part D reinsurance program paid out \$31.2 billion in 2015, compared to \$44.8 billion in direct, low-income and retiree subsidies paid out by Part D.¹¹

For its first two years of operation, the Part D risk corridor program was more generous than the ACA program currently is.¹² A decade after it began, the Part D risk corridor program bears the same proportion of risk borne by the ACA program for plans that have exceptional losses, but the payments kick in when actual spending exceeds 5 percent of anticipated spending, as opposed to 3 percent under the temporary ACA program. Under the Part D program, however, Congress has not restricted payments to funds collected (although in every year since the program was adopted, insurers have, for reasons I will explain, paid into the program rather than collected from it).

But the most remarkable feature of the Part D 3R programs is that they are permanent. Like the ACA's premium stabilization programs, the Part D programs were intended to reduce and share the risk borne by insurers that were willing to enter a new market with unknown risks. While the ACA's risk corridor and reinsurance programs will be

eliminated after three years, the Part D programs have continued long after the risks of participating in the market have become quite knowable and manageable.

Moreover, the Part D programs have attracted very little controversy. No lawsuits have been filed over the Part D premium stabilization programs. Congress has never voted to repeal the Part D premium stabilization programs; in fact, the Part D premium stabilization programs rarely have been mentioned in congressional oversight hearings. The Part D reinsurance and risk corridor programs are not denounced as bailouts, even though they are just as, if not more, generous to insurers than the ACA programs. Year after year, the federal government has continued to subsidize private insurers through the Part D program with little controversy.

THE KEY ROLE OF PREMIUM STABILIZATION PROGRAMS AND SUBSIDIES IN PART D

Although the Part D premium stabilization programs have not been controversial, they have played a major role in ensuring the success of the Part D program. Indeed, they have contributed much to the popularity of the program with insurers, enrollees and politicians. To understand why, one must understand how the Part D program works.

Each year, participating insurers submit bids for their Part D rates for the following year.¹³ These bids are based on each plan's projected claims, administrative costs and profits for the coverage year. Bids are based on enrollees of average health status. Bids do not include expected reinsurance payments.

Each month, the Centers for Medicare & Medicaid Services (CMS) pays Part D plans a prospective payment amount for each enrollee (the direct subsidy). The direct subsidy is a per enrollee amount based on a plan's approved bid, which has been adjusted through the Part D risk adjustment program for the enrollee's case mix. The payment amount is adjusted further to provide additional payments for low-income enrollees and for the long-term institutionalized status of enrollees.

Plan bid amounts are reduced by the premium amount paid by enrollees. Finally, CMS adds to direct subsidy prospective payment additional amounts for reinsurance covering 80 percent of costs greater than the catastrophic level. At the end of the year, CMS reconciles these prospective payments, taking into account actual levels of enrollment, risk factors, actual allowable drug costs, adjustments for rebates and other discounts, reinsurance, low-income subsidies, and risk corridor contributions or payments.

The premiums paid by Part D enrollees for prescription drug coverage consist of a “base premium” based on total national Part D per capita expenditures plus the difference between the amount bid by their plan and the national bid average, to which the charge for any benefits provided by the plan beyond those covered by Part D is added. The base premium is supposed to cover 25.5 percent of allowable program costs, with the federal government covering the remaining 74.5 percent. Part D premiums also are adjusted upward for higher-income enrollees. Most beneficiaries with incomes below 150 percent of the federal poverty level and with assets below specified levels do not need to pay a premium, because the Medicare low-income subsidy (LIS) covers their premium up to a regional threshold amount, which is based on an enrollment-weighted average premium for each prescription drug plan region.

The Part D program is highly competitive. Enrollees have 19–29 Part D insurers from which to choose (plus, typically, nine Medicare Advantage plans with drug benefits).¹⁴ Insurers have a strong incentive, therefore, to keep their premiums low. By underestimating the cost of their high-cost enrollees in calculating their bids, insurers can lower their premiums.¹⁵ They can do so confidently, with the assurance that the reinsurance program will bail them out at the time of reconciliation if they incur high claims costs. By overestimating to some extent the cost of their enrollees with costs below the catastrophic level in their bids, insurers can increase their direct subsidy payments relative to their non-catastrophic coverage expenses, and thus their profits. Of course, if Part D insurers make too much from their premiums, direct subsidies and reinsurance payments relative to their claims costs, they may need to return some of their profits through the risk corridor program.

Part D reinsurance payments have increased dramatically in recent years, while premiums have grown more slowly. Moreover, a higher percentage of insurers over the years—78 percent in 2013—have paid into the risk corridor program from their excess profits.¹⁶ This data suggests Part D insurers are in fact actively manipulating the bidding process and the reinsurance and risk corridor programs to maximize profits and keep premiums low.

All of this is to say that the Part D premium stabilization programs have played a key role in allowing insurers to keep premiums low and profits high, even though insurers have had to return some of the profits to the program. Low premiums (and premium increases) and high profits have made the program popular both with consumers and

insurers. The Part D 3Rs thus have supported the stability of the program, both politically and in terms of insurer participation.

ACA PREMIUM STABILIZATION PROGRAMS AND SUBSIDIES: LESS GENEROUS AND PHASE OUT TOO QUICKLY

By contrast, although the ACA reinsurance program significantly reduced premiums in the first three years following the implementation of the market reforms, it was phased out quickly and will cease to exist as of 2017. The risk corridor program, which was supposed to stabilize premiums as insurers got their sea legs in the new market, was cut dramatically by Congress and also will be gone at the end of 2017. Whereas the Part D reinsurance and risk corridor programs have helped to reduce and stabilize premiums for almost a decade, the ACA premium stabilization programs hardly had a chance to do so before they were eliminated.

The Part D program also has remained affordable and popular because of the large subsidies the program enjoys. As already noted, federal subsidies cover 74.5 percent of program costs for individuals with incomes up to \$85,000, and \$170,000 for couples. This has made Part D affordable for almost all moderate and higher-income eligible enrollees.

The LIS offers free coverage to 12 million enrollees without cost sharing.¹⁷ Because this low-income population tends to suffer worse health problems than the general population, and because both insurers and low-income consumers face reduced incentives to control drug spending for those who receive low-income subsidies, low-income subsidy recipients, who make up about 30 percent of Part D enrollees, account for 37 percent of Part D spending.¹⁸

Although ACA subsidies also are quite generous for very low-income individuals (whose incomes exceed 100 percent of poverty, the lower-end cutoff), they phase out quickly and only reduce cost sharing for individuals with incomes below 250 percent of the poverty level and premiums for individuals with incomes below 400 percent of the poverty level. Individuals with incomes above these levels receive no help at all with their premiums or with their cost-sharing obligations. Many of them have remained uninsured.¹⁹

LESSONS TO BE LEARNED

There is a clear lesson to be gained from our experience with Part D and the ACA. Reinsurance and risk adjustment programs can be designed to encourage insurers to cover high-cost individuals. Reinsurance programs can be

designed to keep premiums—and premium increases—low. Risk corridor programs can be designed to reduce the risk of an insurer participating in a new market and to recapture excessive profits while cushioning excessive losses. Stable premiums and insurer participation—and generous subsidies—result in consumer satisfaction and political support. We know this because they have worked for Medicare Part D.

Of course, there are other reasons why Medicare Part D enjoys broader public and political support than the ACA. It is part of the popular Medicare program and primarily covers senior citizens, a politically engaged and active group. Its benefits are enjoyed broadly by all economic classes and are not focused primarily on the poor. It covers only a small subset of medical expenses, and thus is less costly than the broad coverage offered by the ACA. But in the end, Part D's generous premium stabilization programs and subsidies explain much of its success, while the limits placed on the ACA 3Rs and subsidies undoubtedly have contributed to many of the program's problems. ■

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FEATURE
VALUE-BASED REIMBURSEMENT


POSITIVE

**CMS INCENTIVIZES VALUE-BASED REIMBURSEMENT
IN A LEERY U.S. HEALTH CARE MARKET**

BY MARLA PANTANO



CHANGE



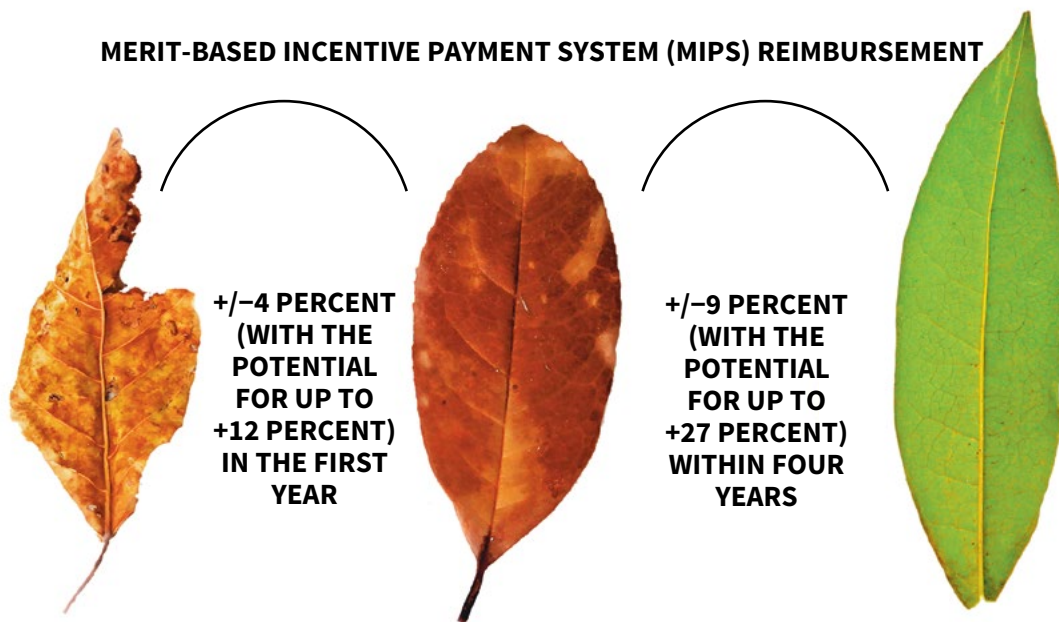
The U.S. health care marketplace is in the midst of revolutionary change. The Centers for Medicare & Medicaid Services (CMS), primarily through the work of its Center for Medicare and Medicaid Innovation (CMMI), is reforming how health care is financed and delivered. CMS already has reached its stated goal of tying 30 percent of traditional Medicare payments to quality or value through alternative payment methods (APMs), such as accountable care organizations (ACOs) or bundled payment arrangements, and plans on tying 50 percent of payments to these models by the end of 2018. Because Medicare payments represent almost 4 percent of the nation's gross domestic product (GDP) at over \$600 billion per year, these changes affect a substantial sum of dollars.

Health insurers, employer groups and other payers have noted the advantages of CMS's payment reform and have proliferated their own value-based reimbursement arrangements with providers. Both the government and private payers appreciate the increased focus on the quality of outcomes these new reimbursement models emphasize, as well as the newly-imposed accountability for cost containment. There is no doubt that the payment models currently being introduced will continue to evolve as the health care delivery system transforms. However, it is no longer viable for providers to not embrace value-based payment. Their largest payer, CMS, is no longer making it optional.

MACRA—WIDESPREAD IMPACT

CMS's recent changes regarding value-based payments that have had the greatest widespread impact are the Merit-Based Incentive Payment System (MIPS) and the Alternative Payment Model (APM) incentive programs, which were introduced through the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). These programs introduce significant change for the reimbursement structure for most clinicians under traditional Medicare. Under MIPS, beginning in 2017, clinicians

EDITOR'S NOTE: FOR AN OVERVIEW OF THE U.S. HEALTH CARE SYSTEM TERMINOLOGY USED IN THIS ARTICLE, PLEASE SEE THE BACKGROUND SIDEBAR ON PAGE 44.



will be evaluated based on quality, resource use, clinical practice improvement and meaningful use of certified electronic health record (EHR) technology, which will impact their reimbursement for the 2019 payment year. How they perform in these four areas can change their reimbursements between +/-4 percent (with the potential for up to +12 percent) in the first year, and expands to +/-9 percent (with the potential for up to +27 percent) within four years—with the total reimbursement mandated to be revenue-neutral, except for high-performing providers that are eligible for bonus payments. The magnitude and swift implementation of these changes surprised many and underscores the serious nature of provider payment reform.

Through the APM incentive program, providers that more aggressively embrace movement toward value-based reimbursement and are accountable for the overall cost of care for their patients by participating in Advanced APMs will avoid some of the financial uncertainty associated with MIPS. In addition, they are guaranteed 5 percent bonus payments. For a program to be considered an Advanced APM, providers must bear more than a nominal amount of risk for the cost of care. Also, providers will need to demonstrate that a significant portion of their overall Medicare fee-for-service (FFS) revenue or patient volume is part of the Advanced APM arrangement. This likely will be much more feasible for primary care physicians (PCPs) than specialists, based on the methodology employed to assign beneficiaries to Advanced APMs. These programs also bring along their own sets of requirements and financial risks, and should be carefully evaluated.

For PCPs, perhaps one of the more appealing CMS Advanced APM models, the Comprehensive Primary Care Initiative (CPC+), was announced recently. CPC+ incentivizes both the private and public payers to come together in paying for primary care under value-based reimbursement methods, and assists clinicians in transforming their practices to be focused on improved population health management, care coordination, and quality and resource use improvements. In designated markets where multiple payer alignment exists, PCPs will be given the option to join CPC+, where CMS will pay significant care management fees—\$15 or \$28 per beneficiary per month (PBPM), depending on the model chosen. These guaranteed payments should empower providers to develop new and innovative ways of interacting with their patients, including the use of telemedicine, care coordinators and other alternative methods of connecting with patients. They also will be eligible to earn additional performance-based incentives (up to \$2.50 or \$4.00 PBPM) for improved quality and cost efficiency.

Along with CPC+, certain Medicare ACO models also will be eligible for Advanced APM status. These models include the Next Generation ACO Model, as well as Medicare Shared Savings Program (MSSP) Track 2 and Track 3 participants. Both of these models require the provider to be financially accountable if costs are higher than the set Medicare benchmarks. The most popular current option in which providers have participated, the MSSP Track 1, does not include downside risk and will not meet the requirements for exclusion from MIPS—but it may reduce some of the reporting burden.

HOSPITALS AND POST-ACUTE PROVIDERS

ALSO FACE CHANGE

CMS also has made significant changes to reimbursement for hospitals, both through modifications in diagnosis-related group (DRG) reimbursement for things such as readmission rates and frequency of hospital-acquired conditions, as well as quality and efficiency measurements. In addition, many facilities (acute and subacute) have participated in the voluntary Bundled Payment for Care Improvement (BPCI) models. The BPCI models measured how well patients were managed across the care continuum for a specific episode of care, such as a major joint replacement or coronary artery bypass graft (CABG) surgery.

The early indication of success in BPCI, particularly in major joint replacement surgery, led CMS in April 2016 to roll out a mandatory program for the Comprehensive Care for Joint Replacement Model (CJR) in approximately 25 percent of hospitals. CJR progressively holds hospitals at risk for most of the care individuals require after a lower extremity joint replacement surgery for 90 days post-discharge. This requires hospitals to create programs that ensure individuals are provided the highest-quality care, as well as most cost-efficient care, after the surgery takes place.

NEW MODELS TRANSFER RISK TO PROVIDERS

Central to these new programs are the “Triple Aim” goals of improving the patient care experience, improving the health of populations and reducing per capita costs. While these programs target valuable goals, they also introduce much more complex financial models with a focus on shifting the financial risk to entities with little or no experience or expertise in this area. Where traditionally the health insurer, whether CMS or commercial insurance, was almost entirely responsible for financing the care delivered, more of this risk now is being reassigned to the provider community. Providers not only need to reimagine the delivery and focus of health care, but they also must gain expertise in risk management and analytics.

The majority of the models employed are retrospective models in which providers continue to be paid on a FFS basis. Their performance, however, is evaluated retrospectively both on cost and quality. A determination is made on whether they are to be paid additional incentive bonuses or potentially owe a penalty. Often, the costs that are included in these measures were paid to other providers within the system, which they may or may not be able to control. A deep understanding of what actions can be



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taken to influence or change both the individual patient's behavior, as well as the behavior of other providers, is important in order to be successful under these contracting approaches. In addition, ensuring the risk of these patients is accounted for properly in the risk scoring is imperative, because almost all of the models employ a form of risk adjustment to account for the morbidity of the population evaluated.

SKILLS AND KNOWLEDGE NECESSARY FOR SUCCESS

The skills necessary for providers to be successful as they take on much more of the insurance risk, either through global capitation, shared risk agreements or bundled payments, are opening up tremendous opportunities for actuaries to join provider organizations or offer their services as consultants. The reimbursement models have significant similarities to pricing health insurance products by forecasting medical costs, normalizing for different risk populations and determining the best methods to spread risk through stop-loss and reinsurance programs.

Actuaries are able to assist providers in determining which of the different programs will be most financially advantageous, based on the provider's own unique abilities and strengths. In addition, they can ensure the contracts with payers include necessary provisions to prevent providers from taking on risk for which they are not yet prepared.

In addition, actuaries' contributions also expand to many analytics needs, including medical cost and trend analysis, population health analytics, risk score analysis and quality score optimization. As providers also look even further into offering their own insurance products or networks to employers and individuals, they will need the more traditional actuarial skills of pricing and reserving.

The U.S. health care market will certainly look much different 10 years from now compared to what it is today. CMS is driving this evolution by incentivizing providers to enter into new and challenging financial models of reimbursement. These new financial challenges to the provider community are opening up new opportunities for actuaries to provide their leadership and expertise to ensure these challenges are met in a way that brings success. ■

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background

U.S. HEALTH CARE SYSTEM TERMINOLOGY

Accountable Care Organization (ACO): A group of doctors, hospitals or other providers that is responsible for the quality and cost of overall care for patients assigned or attributed to it.

Advanced Alternative Payment Model (APM): A Centers for Medicare & Medicaid Services (CMS) defined term that is granted to certain types of payment models that include the provider taking more than nominal financial risk for the quality and cost of patient care.

Bundled Payment: A single comprehensive payment made to health care providers for a group of related services, based on the expected costs for a clinically-defined episode of care.

Episode of Care: All services provided to a patient with a medical problem within a specific period of time across a continuum of care.

Medicare Shared Savings Program (MSSP): Rewards ACOs that lower their growth in health care costs for original Medicare fee-for-service (FFS) beneficiaries while meeting performance standards on quality of care and putting patients first. Participation in MSSP is purely voluntary. There are three different financial tracks from which to choose to participate, with Tracks 2 and 3 including not only rewards, but also potential financial penalties.

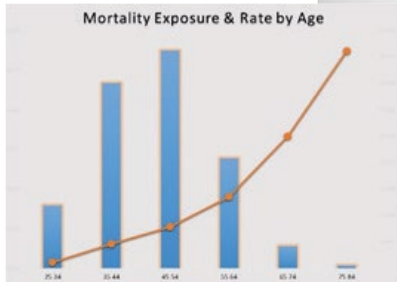
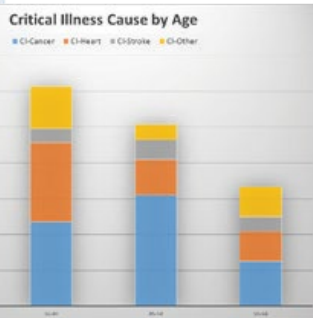
Next Generation ACO: The newest Medicare voluntary ACO arrangement. The goal of the model is to test whether strong financial incentives for ACOs, coupled with tools to support better patient engagement and care management, can improve health outcomes and lower expenditures for original Medicare FFS beneficiaries.

INSIGHT ENTERPRISE ...EXPERIENCE STUDIES for Insurance

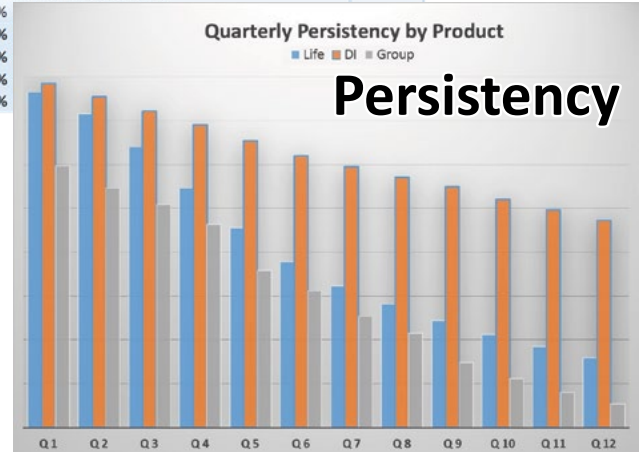


The Insight Enterprise suite includes dynamic, interactive studies as part of a flexible, modular analytical system built on data warehouse technologies. It can be implemented as an enterprise solution including operational reporting and financial management, or more locally as a stand-alone actuarial system. The system includes full set of audits; tracking data through the system, integrity, job execution and error reporting. Visit our website for more information, call us for a demo or email us at info@insightdecision.com

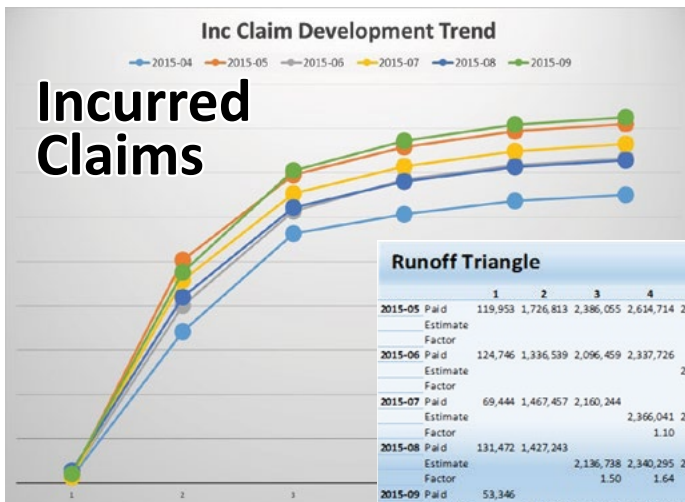
Mortality by Date					
	2013	2014	2015	Total	
			2015-Q1	2015-Q2	2015-Q3
Exposure	55,759	57,051	14,439	14,525	14,620
Actuals	281	332	57	78	
Expecteds	201	212	54	55	
A/E	140%	157%	105%	141%	



Persistency by Issue Date							
	2011	2012	2013	2014	2015	2015 Total	
					2015-Q1	2015-Q2	2015-Q3
Y1	88.38%	88.19%	87.91%	88.14%	89.54%	91.61%	90.04%
Q1	96.96%	96.63%	96.16%	97.06%	96.68%	97.35%	97.41%
Q2	94.61%	94.47%	93.81%	94.96%	94.48%	95.97%	
Q3	91.91%	91.44%	91.18%	91.77%	92.16%		
Q4	88.35%						
Y2	77.79%						
Y3	70.90%						
Y4	65.72%						
Y5	60.67%						



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**LEARNING OPPORTUNITIES IN
FUNDING PUBLIC HEALTH CARE**

BY CHRIS PALLOT AND JENNIFER GERSTORFF

The United Kingdom's National Health Service (NHS) and the United States' Medicaid program were both developed to provide comprehensive health care benefits, with the general goal of finding a balance of quality and efficiency that promotes access to appropriate and financially sustainable medical care. This article lays out the history, current environment and direction of the two systems, including how they parallel.

BACKGROUND

The NHS and Medicaid both provide publicly funded medical services to

a broad population. The NHS offers coverage to all U.K. residents, whereas Medicaid is intended to provide coverage only for certain low-income cohorts of the population who have the greatest need for low-cost care.

U.K. NHS

The National Health Service was born on July 5, 1948. There have been many changes in its structure and function, but the underlying principle of health care for everyone has remained. Funding is raised through general taxation. The vast majority of primary, secondary, community, mental health and ambulance care is



HEALTH IS DEFINITELY AN AREA WHERE THE SPECIAL RELATIONSHIP BETWEEN THE TWO COUNTRIES COULD LEAD TO EXCITING DEVELOPMENTS THAT COULD BENEFIT SEVERAL MILLIONS OF PATIENTS.

FIGURE 1 NHS AND MEDICAID: COMPARISON OF SPENDING AND COVERAGE

NHS	Medicaid
£116.4 billion 2015–16 budget	\$554.3 billion FFY 2015 spend
54.3 million residents	68.9 million residents

Source: NHS and Department of Health and Human Services

provided without charge at the point of access. Some charges apply for prescribed drugs and dental treatment, but there are exceptions for children, pregnant or immediately post-natal women, seniors or those on low incomes.¹

The 2015–2016 annual budget for the NHS was £116.4 billion, and it is expected to rise to £133.1 billion by 2020–2021. Much of this will be needed to fund inflation, leaving a real terms increase of circa £11 billion, a real annual increase of 0.9 percent.²

The NHS is seen as one of the most important political issues in the United Kingdom, often attracting both positive and negative media interest.

U.S. Medicaid

Medicaid was established July 31, 1965, with an amendment to the Social Security Act (SSA).³ Medicaid covers low-income children, pregnant women and disabled citizens, and provides comprehensive benefits, as outlined by the Centers for Medicare & Medicaid Services (CMS). Each state must offer certain mandatory services; all states offer the optional prescription drug coverage, and other optional service coverage varies by state.

U.S. health care is a main focus in the political arena, as expenditures continue to rise as a percentage of gross domestic product (GDP),

growing to 17.5 percent in 2014, or more than \$3 trillion. Medicaid made up approximately 16 percent of U.S. health care spending, or a half-trillion dollars, in 2014, doubling in total expenditure amounts since 2002.⁴

FUNDING

In both systems, health care expenditures have been rising faster than GDP since the 1990s,⁵ making it difficult for funding to keep pace.

U.K. NHS

The funding for the NHS is decided by Parliament each year, and then

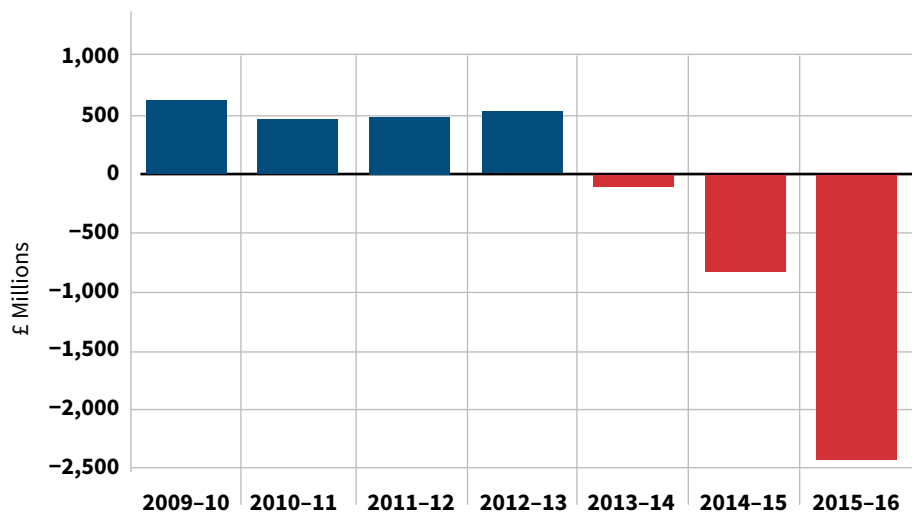
allocated to the Department of Health. For 2016–2017, this is £120.4 billion. The issue for the NHS is its ability to live within this allocation, and the increasing deficits that its medical providers are facing. The financial problems within the NHS are well documented; the provider sector (excluding payers) finished the last financial year with a deficit of circa £2.4 billion—which is the highest level ever observed.

The NHS is responding with new planning and is seeking to integrate care on an unprecedented scale. There is a desire to incorporate pay-for-performance mechanisms, a point where the U.K. and U.S. systems can learn from each other.

U.S. Medicaid

Medicaid is a jointly funded federal/state partnership. Unlike the NHS, annual budgets vary based upon population size and utilization, although a block grant system has been proposed. When states follow federal program guidelines, they

FIGURE 2 NHS TRUSTS, END-OF-YEAR FINANCIAL RESULTS



Source: NHS Improvement

receive federal contributions somewhere between 50 percent and 75 percent of traditional Medicaid service cost (as of federal fiscal year 2017).⁶ This amount is updated each year and is based on a formula that compares average state per capita income with the national average.

Medicaid's primary funding source comes from federal and state taxation, but also includes other sources, such as taxes on Medicaid providers or upper payment limit (UPL) payments. Payments from Medicaid enrollees are a marginal source of funding, as premiums and cost sharing are limited by law. It is standard, however, for Medicaid beneficiaries who require long-term care services, such as residents of custodial care nursing facilities, to contribute a significant portion of their monthly incomes toward the cost.

CONTRACTING

For the NHS and Medicaid, government entities contract directly with

medical providers on either a national or local level. Payment rates are also set by government entities, though in the United Kingdom this is done at a national level and in the United States it is performed by each state. The levels of reimbursement also differ considerably between the United States and the United Kingdom, as illustrated in **FIGURE 3**.

U.K. NHS

Each general hospital typically will hold two key contracts with its payers,

for the provision of clinical services. One is for the provision of general services, which make up the vast majority. The second is for treatments that are considered specialist in nature and are paid for at a regional or national level by NHS England.⁷ The principle is that the whole hospital sector is contracted on the same basis, using a payment mechanism that is identical except for some fluctuation to account for differing input costs, such as salary costs in urban centers versus rural areas.



FIGURE 3 LEVELS OF REIMBURSEMENT

Procedure	NHS Tariff	Medicaid (Low)	Medicaid (High)	Medicare Fee
Carpal tunnel surgery	£865 / \$1,211	£668 / \$935	£1,078 / \$1,509	£1,191 / \$1,668
Cataract surgery	£982 / \$1,375	£647 / \$906	£1,233 / \$1,726	£1,454 / \$2,036
Varicose vein surgery	£1,113 / \$1,558	£624 / \$874	£1,224 / \$1,713	£1,266 / \$1,773
Prenatal, delivery and postpartum care	£4,120 / \$5,768	£2,600 / \$3,640	£3,753 / \$5,254	N/A

Notes: Exchange rate of £1:\$1.40 was used for conversion (pre-Brexit rates).

Source of NHS Tariffs: <https://www.england.nhs.uk/nhs-standard-contract/16-17>.

Source of Medicaid range of fees is an informal survey among state and health plan actuaries who work in Medicaid, representing multiple states.

Source of Medicare fees is the national average from the calendar year (CY) 2015 CMS 5 Percent Sample claims database.





U.S. Medicaid

Unlike the NHS national tariff, each state works with local providers to develop fee schedules. Even within a state, the reimbursement will likely vary from provider to provider. This is most clearly the case with safety net providers, local organizations that serve uninsured and other low-income populations. Medicaid reimbursement is well-known in the United States to be far lower than commercial or Medicare fees. Medicaid also has hired managed care organizations (MCOs) to educate Medicaid members on service use and guide better utilization practices than a fee-for-service (FFS) delivery system. MCOs have been increasing their presence over the recent decades, and now more than 80 percent of enrollees receive benefits through managed care.⁸

INNOVATIONS

U.K. NHS

New models of care are emerging in the NHS similar to Medicaid’s MCOs, with the aim being to integrate provision, reducing barriers between health

sectors and increasing efficiencies. This strategy is one of the key strands of the Five Year Forward View.⁹ Two aspects of the NHS Standard Contract offer strong incentives to providers. The first is the requirement to comply with minimum access standards (waiting times) for treatment, with noncompliance attracting considerable fines and penalties. In some instances, the penalties exceed the income for that particular intervention.

The second key area is the use of value-based reimbursement metrics. For the past few years, the contract has included Commissioning for Quality and Innovation metrics, referred to as “CQUIN schemes.” They provide the opportunity for providers to earn an additional 2.5 percent of their annual contract values. Some schemes are nationally mandated, and others can be agreed locally.

In primary care, the Quality and Outcomes Framework is a well-established mechanism to incentivize the delivery of services that improve overall health and increase efficiencies.¹⁰

U.S. Medicaid

Several initiatives have been made in Medicaid to achieve savings over the years, including the pharmacy rebate program; employer-sponsored insurance premium assistance; aggressive pursuit of waste, fraud and abuse; holding fee schedules at low or flat rates each year; and care management models. The most widespread savings instrument has been the shift to delivery of benefits under managed care. However, now that a majority of Medicaid beneficiaries are enrolled in managed care, states and CMS are trying to determine where to go next.

In addition to expanding eligibility criteria, the ACA also amended the SSA to establish the CMS Innovation Center. The goals of the Innovation Center are to test new payment and service delivery models, evaluate and advance best practices, and engage stakeholders to develop new test models.¹¹ There are seven Innovation Models that can be pursued: accountable care; episode-based payment initiatives; primary care transformation; and initiatives focused on the Medicaid and CHIP populations, Medicare-Medicaid enrollees, testing new payment and service delivery models; and best practices.

SUMMARY: COMPARE, CONTRAST AND OUTLOOK

Drawing the previous sections together, we can observe many similarities:

- The overarching principles of the Triple Aim are featured in key NHS strategy documents, such as the Five Year Forward View.
- Medical expenditures have been growing faster than the GDP.
- Cost sharing is limited for most benefits and population groups.
- The majority of hospital services are funded on a FFS basis.

ONLINE!

For a more in-depth look into the NHS and Medicaid, see the full article at [theactuary magazine.org](http://theactuary.com).

- ➔ Funding discussions are widespread in the news and are a key platform for political debate.
- ➔ Contracts are developed between government entities and medical providers (which may be government-owned or private sector providers).
- ➔ Government entities are responsible for setting reimbursement amounts paid for medical services.
- ➔ Development of innovative ways to improve quality outcomes and reduce cost are crucial to future sustainability.
- ➔ Several model categories are currently being tested in both countries. In the United Kingdom, a range of models is being piloted in “vanguard” organizations, with the view of rolling them out across the United Kingdom. Full details can be found in the Five Year Forward View.

We also observe differences:

- ➔ The NHS is responsible for the national population, while Medicaid is responsible for primarily low-income individuals.
- ➔ Eligibility for services in the NHS is consistent nationally, as listed in the NHS Constitution with minor variations by some local payers, while eligibility requirements for Medicaid vary state by state.
- ➔ The NHS covers one package of benefits for all citizens, while Medicaid has flexibility to modify benefits to include or exclude optional services, which creates varied benefits by state.
- ➔ The NHS is appropriated a fixed lump sum by Parliament regardless of population size, while Medicaid funding may vary based on population size and individual state budgets.
- ➔ The NHS is funded by the central government, while Medicaid is

funded jointly by national and state governments.

- ➔ The NHS sets a national tariff for medical services, while Medicaid fee schedules vary by state and provider.
- ➔ While delivery of care through managed care integrators is relatively new with the NHS, Medicaid has been using managed care organizations for decades.

One thing is for sure: There is much for both systems to learn from each other. Health is definitely an area where the special relationship between the two countries could lead to exciting developments that could benefit several millions of patients. ■

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Q&A



BREAKING THE MOLD

Q&A WITH CHRISTINE HOFBECK, FSA, MAAA, VICE PRESIDENT AND ACTUARY AT PRUDENTIAL

Q: Why did you become an actuary? What attracted you to the actuarial profession?

A: I have loved math my entire life. I pursued a degree in mathematics at the University of Pennsylvania, with the intent of becoming an actuary or heading to Wall Street. I decided to try the actuarial profession first because I thought the hours would be more manageable. As an actuarial consultant at a powerhouse firm in the 1990s, the hours weren't much better—but I loved it. I worked hard, studied incessantly and developed lifelong friendships with my colleagues. We solved complex problems for our customers, while supporting each other completely. We learned quickly and deeply. I was surrounded by positive, strong leadership that fostered creativity, innovation, experimentation and a deep-seated work ethic.

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“Building a great model doesn’t impact a business; implementing the right model does.”

I think being an actuary is the greatest profession in the world. Even with a background in life, I was able to succeed across the property and casualty (P&C) space. I firmly believe the opportunities for actuaries are vast and growing, and we can move into any area that needs bright, quantitatively-minded innovators to create solutions to challenging business problems.

Q: How did your professional experience lead you to a career that is somewhat less traditional?

A: I’ve been an actuary for more than two decades, yet I’ve often been told that I “don’t seem like an actuary.” While I find this curious, it’s true that I tend to push the boundaries of traditional actuarial work.

Early in my career, I discovered an Employee Retirement Income Security Act (ERISA) nondiscrimination issue that led to the building of a new defined benefit plan for a global oil company’s service station employees. Besides the actuarial work required to build the plan—formula development, valuation, minimum required and maximum tax-deductible contributions—I wrote the participant communications, the technical specifications and the Summary Plan Description. My cubicle was the “customer service center,” and I spent months taking calls from participants, while simultaneously completing my

“real” actuarial work. This was a beautiful, simple lesson that actuaries need not be pigeonholed into a typical role. Find a problem? Well, solve it.

As my career has unfolded, I’ve found myself repeatedly revisiting this lesson. I often move beyond the typical role to “fix” nonactuarial challenges, like optimizing home inspection schedules through behavioral modeling, improving loss prevention efforts through operations management and reducing expenses with sophisticated staffing and claims models. Actuaries often are uniquely positioned to apply their quantitative acumen beyond the traditional pricing and valuation roles. You just need to see, and grab, the opportunities as they present.

Q: How did you segue into work in predictive analytics?

A: I had been hired to build out actuarial reporting at a large global insurance company. Shortly after I started, I learned the company was experiencing a difficult implementation of a new P&C underwriting risk selection predictive model. Namely, the underwriters refused to use it, believing the model to be flawed. Having outsourced the build, no one internally understood the underlying data and assumptions; how the scores were calculated; or how to interpret results, modify variables and revise business rules. The company was facing a big loss if this model failed.

I volunteered to fix it. I had no predictive modeling background whatsoever—I didn’t even know what a predictive model was. But my consulting experience taught me how to learn anything fast, and with supplemental training from expert consultants in the P&C modeling space, I quickly got to work.

Q: How did you learn the tools and techniques of modeling?

A: I credit my manager for believing in me, and my company for investing in me. They hired a well-known consulting firm to give me a personal crash course in modeling in just a few days. I drank it all in. When I returned to work the following week, I dug into that risk selection model. I read the specs, calculated formulae and crunched spreadsheets until I thoroughly understood the workings of the model. I talked to the underwriters about their concerns, the actuaries who provided the requested inputs and the consultants who built it. At that point, I could understand and explain the technical aspects of an *existing* model.

It turned out the underwriters were right—there was an assumption error in the underlying data that skewed the interpretation of results. I removed the questionable variable, recalibrated the model and worked cross-functionally to implement the now-acceptable solution (facilitating the building of

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“Actuaries shouldn’t just be looking for a bigger piece of pie. We should be creating a bigger pie.”

Continued from page 54

the scoring engine and user interface, and developing business rules and outcome reports). It was a big win for our organization in a relatively short time frame.

Wanting to push this concept further, I campaigned to improve our auto book’s pricing with predictive modeling techniques. But I didn’t know how to *build* a model, and neither did my small team. I contracted a work-share arrangement with another top consulting firm, agreeing that they would teach my team and me while we built together. We learned how to select variables for inclusion, test for interactions, refine splines and bins, and validate the models. I learned how to understand competitive market positioning using predictive modeling techniques, and when to consult with subject-matter experts based on output.

The rest I learned through observation and execution, and often just used good sense.

Q: Where do you think the greatest opportunities exist for actuaries in predictive analytics?

A: We need leaders. Predictive analytics within the life space is in dire need of leaders who understand the complete modeling process, and can build capabilities and lead teams. Currently, there are many great modelers without the necessary leadership and visionary skills, and many great leaders without modeling skills. Our leaders don’t need to actually build models (personally, I haven’t built one

myself since that original auto book model), but they need to understand the details and translate the language.

Q: Why do you think some companies struggle to develop predictive analytics capabilities?

A: Building a great model doesn’t impact a business; *implementing the right model does*. Some typical reasons that companies—and actuaries—may struggle with predictive analytics efforts are:

- ➔ *Few leaders in the industry understand how to build the capability.* Building a capability is more than hiring modelers. It also includes understanding techniques, technology and data privacy; identifying the right opportunities; and influencing change.
- ➔ *Building models that don’t solve a problem.* It is actually quite common to see models built because there is data, not necessarily because there is a problem. The problems to be solved should be agreed upon by the business, not simply supposed by the data scientists.
- ➔ *Building models that are not implementable given the current technological environment.* It is critical to consult your IT experts frequently. Once during a model build, my team was advised that using more than two external variables would freeze our systems. That was great advice to hear on the outset.
- ➔ *Not seeing the big picture.* I once encountered a profitability model (based on loss ratios) mid-build. I quickly suspended this model,

as the actuaries simultaneously were rebuilding the underlying pricing formula. That profitability model would have been obsolete before it was ever implemented. Modeling activities should complement other business priorities, not exist in a vacuum.

- ➔ *Engaging in a power struggle.* Avoid the “us” and “them” when building a team. Solicit expert feedback from your business partners throughout the build. It will result in a better model, and your partners will be invested in its use.

We can build great models all day long, but if they aren’t actually implemented and used to improve decision-making, then we haven’t really made a dent in the solution after all.

Q: What kinds of challenges can actuaries solve using data analytics?

A: Actuaries can expand their reach and improve their work product by supplementing traditional methods with predictive analytics capabilities, and by solving problems not typically considered actuarial in nature.

The opportunities are vast: Price optimization. Lifetime value and retention models. Price elasticity. Risk selection optimization. Predictive underwriting. Enrollment optimization. Target marketing. Understanding drivers of policyholder behavior. Propensity to buy. Lapse and churn analysis. Likelihood to bind. Understanding market changes on customer behavior. Market segmentation.



Broker segmentation. Finding hidden pockets of the population to develop niche products ... I could keep going—the opportunities are endless.

As head of pricing, I want to do everything I can to price my risks accurately. If I can use nontraditional data sources and techniques to better define any or all of the above, then we'll continue to keep the better risks and thank the competition for taking the rest.

Q: What advice do you have for actuaries who may wish to expand their reach?

A: Predictive analytics is an incredibly interesting area, but there are many opportunities beyond modeling in which innovative actuaries can apply their expertise and harness their skills.

➔ *Always be a little bit uncomfortable.* Stretch yourself every day. When

exams are done, find other opportunities to learn. I recently completed my MBA at the Massachusetts Institute of Technology, while working full time. While completely life-consuming, I learned more than I ever knew was possible. It is like “drinking from a fire hose.”

- ➔ *Learn to walk before you run.* Start small. Build a model you can complete in a few months that doesn't cost millions to implement. See modest results. Then go bigger.
- ➔ *Relationships matter:* Whenever possible, attend meetings in person instead of over the phone. Meet actuaries both inside and outside of your organization. The opportunities and knowledge you will gain by growing your network are vast.
- ➔ *Believe in yourself and in your profession.* Actuaries shouldn't just be looking for a bigger piece of pie. We should be creating a bigger pie.

We are uniquely positioned to do anything. Tell the world.

➔ *Listen. Think. Take a risk.* Remember, “risk is opportunity.” ■

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Read Q&As with other predictive analytics leaders at theactuarymagazine.org.

ON THE MOVE



ONLINE

SOA'S NEW WEB-BASED REGULATORY RESOURCE

This new resource offers members an easy way to search for recently-released regulatory changes. It will provide regulatory updates for U.S. actuaries practicing in health and life. The web-based resource was developed in response to input from members about the challenges of responding to regulatory change. As part of its work to advance actuarial knowledge, the Society of Actuaries (SOA) seeks to inform public policy development and public understanding through research and education.

SOA.org/regulatoryresource

Looking to be a leader in your workplace or in your profession? Here are some resources that can help you in that quest.



ONLINE

NEW RELATIVE RISK TOOL

The SOA developed a resource for actuaries when working with preferred class structure programs. The Relative Risk Tool (RR Tool) is used to determine the preferred class relative risk value, referred to as a relative risk score. Actuaries can use this score to determine an appropriate mortality table to use for valuation purposes. This score accompanies the 2015 Valuation Basic Tables and 2017 Commissioner's Standard Ordinary (CSO) Tables.

RRtool.SOA.org

2015 Valuation Basic Tables

➔ bit.ly/SOA2015VBT

2017 CSO Tables

➔ bit.ly/SOA2017CSO



BOOK

LEADERS MAKE THE FUTURE: TEN NEW LEADERSHIP SKILLS FOR AN UNCERTAIN WORLD

Leaders Make the Future, by Bob Johansen, presents a 10-year forecast of the key future forces that will impact our world, pointing to the shift toward a global well-being economy, the growing impact of digital natives and the emergence of cloud-serve supercomputing. Johansen states that we live in a world characterized by volatility, uncertainty, complexity and ambiguity, where traditional leadership skills will not be enough.

“Bob Johansen, formerly of the Institute for the Future, based in Silicon Valley, makes the case in his book, *Leaders Make the Future*, that we have to be willing to help nurture companies that benefit multiple players,” explains Edward Cymerys, FSA, MAAA, chief actuary at Collective Health. “Some of the Silicon Valley startups have achieved dramatic improvements in areas that have been intractable problems areas for the industry. The health plans that partner with these companies will get a lift from their solutions and be able to focus their resources on other areas of competitive advantage.”

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STAGES OF GROWTH

HOW WE GOT FROM 10 EXAMS TO HERE

BY STUART KLUGMAN

Ask an actuary of a certain age or a person on the street how you become an actuary, and the answer is likely to be “pass a bunch of exams—10, I think.” Starting in 2018, the answer will be “to become an associate you must pass three validation by education experience courses, five multiple-choice exams, one exam that is a combination of multiple-choice and written-answer, a predictive analytics project, an online course with six end-of-module exercises and two assessments, and a seminar on professionalism; and then earn fellowship with four online modules, each with an exercise, three written-answer exams (or four, for some tracks), and a seminar on communication and professionalism.” This article will walk you through the history of the SOA’s qualification system so you can see how and why we got from where we were then to where we are now.

There are four distinct eras in SOA education history, each with a major change in how we educated and assessed prospective members. But before diving into that, it is worth noting two policies and a trend that have been consistent throughout the decades.

The first policy is that exam credits are never lost, unless the topic itself is removed from the pathway. Credits earned in prior systems are carried through each subsequent transition to reveal the credits a candidate currently possesses. For example, had I stopped

exams with my ASA in 1970, today I would have credit for all of the current ASA requirements except the Fundamentals of Actuarial Practice (FAP) Course.

This leads to the second policy. While no member loses an ASA when the ASA requirements change, those changes can affect the path to FSA. When a person who has an ASA under a prior system wants to continue to FSA under a current system, the requirements are not only those that are in the current FSA part of the pathway. Rather, all missing components, be they ASA-level or FSA-level, must be completed. In my case, I would need to complete the FAP Course along with all current fellowship-level requirements to earn an FSA.

The trend is that as the profession advances, we expect more and more from our new members. Subjects once tested are now either assumed as prerequisites or no longer considered relevant. Examples include English, Calculus, Numerical Analysis, Operations Research, and Sources and Characteristics of Mortality Tables. In turn, we added Enterprise Risk Management, Asset/Liability Management, Stochastic Modeling and a host of track-specific advanced topics.

Now, on to the retrospective.

THE 10-EXAM ERA

This period runs from the dawn of the profession through 1987–1988.



There weren’t always exactly 10 examinations during this period.¹ But there were definitely exams. The only differences were that some exams were exclusively multiple-choice, some exclusively written-answer and some a combination of both. The only innovation during all this time was the introduction of tracks in 1964.

FLEXIBLE EDUCATION SYSTEM (FES)

From the spring 1987 exam session to the fall 1988 exam session, a radical change was instituted. Rather than a handful of large exams, the system was broken into numerous small pieces.



Often, each was on a single topic. For example, Exam 5 was split into Exams 151 (Risk Theory), 160 (Survival Models), 162 (Construction of Actuarial Tables) and 165 (Mathematics of Graduation). Exams were assigned credit values based mostly on length. It took 200 credits to earn an ASA and 450 (total) to earn an FSA. Some exams were required, while others were elective. This was viewed as a college catalog approach—where the ASA was the general education core and the fellowship track the major. A candidate needed to complete about 25 exams to earn the 450 credits.

This era also saw the introduction of non-exam means of earning credit. Thirty elective credits could be earned by writing a research paper. Ten elective credits could be earned by passing a one-week intensive seminar (seminars in applied statistics and applied risk theory were available at this time). The other new element was the Fellowship Admissions Course (FAC), a multiday capstone seminar. Of these innovations, only the FAC exists today.

The benefits seemed clear at the time. With small pieces and electives, innovations like these could be added.

Candidates would have more flexibility with their progress. Subjects no longer needed could more easily be dropped and new ones added. The results turned out a bit differently. Candidates tended to focus on only one or two exams at a time, as that provided the ability to over-study and increase the odds of passing something. Travel time increased, which was not a goal of the system. Also, exams were added, but few were subtracted. This put a strain on the volunteer system.

There was one major change during the FES era. In 1995, the requirement for ASA was increased to 300 credits. This meant ASAs had more than just the mathematical background; they also were introduced to each practice area, along with finance and investments.

THE 2000 SYSTEM

No, this was not a reaction to the Y2K problem. The SOA's systems were perfectly capable of dealing with three-digit exam numbers. It was a reaction to the problems discovered with FES. So it was back to a small number of large exams. The FES

innovations, other than the FAC, were dropped. Aside from recombining the exams, there were three major changes.

The big one was the removal of nation-specific material. The idea was that an FSA should represent a thorough grounding in actuarial principles at the highest level, but without coverage of how those principles are applied in a particular jurisdiction. As a simple example, the need for and the concept of modified reserves could be covered, but not the Commissioners Reserve Valuation Method. The expectation was that each local actuarial association would provide appropriate education to fill that gap, and it would become each actuary's professional development responsibility to acquire that knowledge.

The second was the introduction of the Course 7 Seminar in Applied Modeling. This multiday seminar ended with a project and written report. It was similar to the intensive seminars developed in the FES era, but was mandatory.

Finally, while the Associateship Professionalism Course had been offered previously, this seminar on the Code of Conduct and Standards of Practice became mandatory in 2000.

TODAY'S SYSTEM

The reaction to the removal of nation-specific material was swift and strong. In late 2001, the SOA's Board of Governors voted to return that material, expand the coverage of track-specific topics and make the system more relevant to actuarial practice. In 2003, after engaging many stakeholders and resolving numerous issues, the Board approved a set of revisions. They were rolled out in stages during 2005–2007.

That framework continues to be in use today. A key change was the introduction of a variety of learning and assessment methods, each designed to be appropriate for the given topic and learning objectives. Innovations included:

- ➔ **Validation by educational experience:** There is no SOA assessment; rather, a grade of B– or better must be earned in an approved university course or equivalent experience. This was deemed appropriate for subjects that do not require a high-hurdle exam or are not easily tested in multiple-choice or short written-answer environments.
- ➔ **Computer-based tests:** Multiple-choice tests delivered at a computer test center. Often, candidates receive unofficial (but highly reliable) pass/fail results upon completion of the test.
- ➔ **e-Learning modules:** Education is provided through an interactive online environment, and assessments are projects done offline.
- ➔ **Communication skills:** The e-Learning modules and the enhanced FAC provide opportunities to learn about and demonstrate effective oral and written communication.

background

HISTORY OF SOA FELLOWSHIP TRACKS

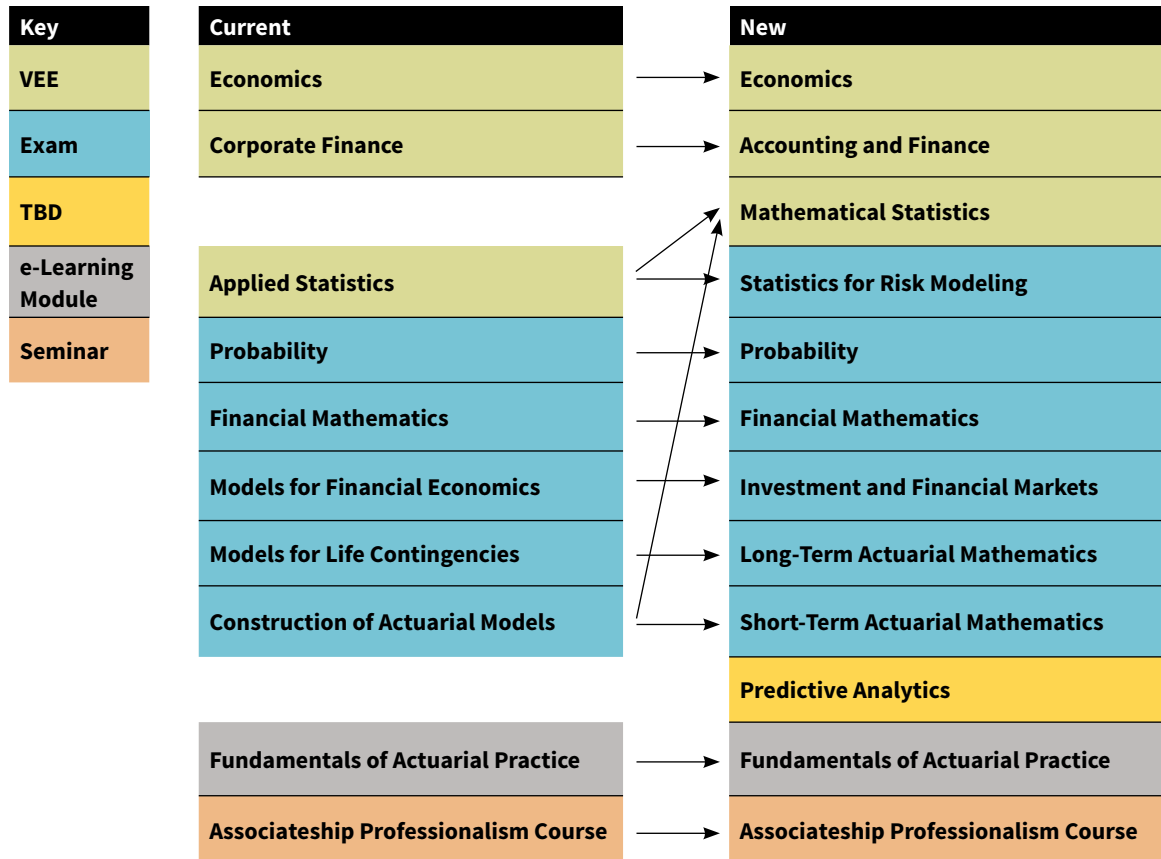
- Life Insurance track:** the only track prior to 1964
- Employee Benefit Plans track:** added in 1964
- Group/Health track:** added in 1981
- Finance track:** added in 1993
- Investment track:** added in 1995
- General Insurance track:** added in 2013



AS THE
PROFESSION
ADVANCES, WE
EXPECT MORE AND
MORE FROM OUR
NEW MEMBERS.

THE FUTURE

This chart displays the transition rules between the components for the 2018 changes. More details are available at SOA.org/curriculumchanges.



This period saw the introduction of a new credential, Chartered Enterprise Risk Analyst (CERA). Originally, it was available only for candidates on the ERM track, but in 2013, the fellowship pathways were changed so that any candidate can earn a CERA by replacing a two-hour exam with a four-hour exam. It also saw the addition of the fellowship track in General Insurance, which means the SOA now offers education in all major practice areas.

THE FUTURE

The SOA Board of Directors approved the latest evolution of SOA education in June 2016. Starting in 2018, candidates earning an ASA will have had extensive education in predictive analytics. This will feature another education innovation, as this topic will be assessed with a large

project to be completed using statistical software and done in a proctored environment. As employer expectations, candidate needs and the practice of actuarial science change, the SOA's education system must change as well. I am eager to find out what is next. ■

Reference

¹ When I earned my FSA in 1978, there were nine exams. When I started taking exams, there were 10. As a result, I had to pass 13 exams.

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ACTUARIAL RESEARCH ON GENERAL INSURANCE

BY R. DALE HALL

The Society of Actuaries (SOA) continues to develop, foster and collaborate on a wide variety of research projects and studies pertaining to general insurance (property and casualty). Here is a snapshot of some of the new activities.

The SOA General Insurance Practice Research Committee is currently developing and reviewing a number of research projects. The SOA General Insurance Practice Research Committee is working with the Casualty Actuarial Society (CAS) Auto Loss Cost Trends Working Party and the Property Casualty Insurers Association of America (PCI) to study trends and contributing factors with auto loss. This new project plans to develop a dashboard framework to identify, measure, monitor and report on insurance and noninsurance factors that may impact state-by-state auto loss trends. Deliverables from this project will include an enhanced analysis and dashboard report that summarizes the analytical findings.

The SOA will also examine takaful insurance, an Islamic co-operative reimbursement system for managing loss, which is seen as an alternative to conventional insurance. Takaful insurance is growing in prominence in international markets, and the research project will look at it from a North American market perspective.

By exploring this research topic on behalf of our members, we can all better understand how to apply this business model.

Through a project with Resources for the Future, an independent economic research organization, the SOA will sponsor research papers on public and private financing of catastrophic risks. Papers will cover a range of topics, such as the National Flood Insurance Program, terrorism risk insurance, state wind pools, the California Earthquake Authority and the federal catastrophe pool, among others. These papers will be presented this November.

We are developing research to quantify the financial implications of extreme climate and also to understand mitigation risk associated with environmental sustainability. In past columns, I have mentioned the SOA's research activities on climate and extreme weather events. We continue to gather volunteers to serve on the SOA Project Oversight Group (POG) on climate, weather and environmental sources, which will help determine future projects.

Earlier this year, the SOA, along with the CAS and the Canadian Institute of Actuaries (CIA), announced a project focusing on past insurer impairments and insolvencies. While this project is still in early stages of development, it is another example of

how we are working within the industry and overall field to help actuaries be better equipped to prevent or mitigate future insolvency situations.

I encourage you to visit SOA.org for updates on our ongoing research projects and new proposals. Also, visit SOA Engage at engage.SOA.org. It is our online community where you can comment on the latest ideas and research, share your perspectives and more. ■



Visit SOA.org/Research for the latest updates on new research opportunities, data requests, experience studies and completed research projects.

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action

GOOD RESEARCH READS

PRACTICAL GUIDE AVAILABLE ON ECONOMIC SCENARIO GENERATORS

The SOA released a practical guide on working with economic scenario generators, including specific applications to insurance, pensions and retirement funding. The guide also describes the use of economic scenario generators for economic capital modeling, stress testing and liability valuation. The guide has been designed for use by several different audiences, from business practitioners and senior financial leaders to students looking for a manual on this topic. Access the guide.

bit.ly/ESG-Guide

bit.ly/ESG-Release

READ RISK SCORING FOR HEALTH CARE INSURANCE PRIMER

The SOA has made available a primer on risk scoring in health care insurance applications. Risk scoring represents the first stage of a risk adjustment program that is used for spreading risk among participating entities. The primer describes the history and methodology related to risk scoring, both in its application to the Affordable Care Act and other settings.

bit.ly/Health-Risk-Scoring

MASSACHUSETTS HEALTH CARE REFORM FOCUS OF REPORT

The SOA has released an extensive research report that describes and analyzes health care reform in Massachusetts between 2006 and the passage of the Affordable Care Act (ACA) in 2010. Health care reform in Massachusetts served as an initial model for the ACA, and the report examines a number of expected outcomes and results.

bit.ly/MA-Health-Reform

NEW TOOL ON RELATIVE RISK

The SOA developed a resource for actuaries working with preferred class structure programs. The Relative Risk Tool (RR Tool) is used to determine the preferred class relative risk value, referred to as a relative risk score. The score can be used as a guide in deciding on the appropriate 2015 Valuation Basic Tables (VBT) relative risk table to use for each risk class for valuation purposes. Access the RR Tool.

For more information about the RR Tool, please refer to the Terms and Conditions and Help links within the RR Tool. In addition, please read the report by the Underwriting Criteria Team.

RELATED LINKS

Relative Risk Tool Background

bit.ly/RRToolBackground

Access the Relative Risk Tool

RRtool.SOA.org

Report by the Underwriting Criteria Team

bit.ly/RRToolReport

TAKE CHARGE

Continue the cycle of continuous improvement and identify new experiences to pursue. Attend a meeting or seminar. Tune in to a podcast. Take an e-course. These are great ways to take charge of professional development and can help you:

- 1 | Develop leadership skills
- 2 | Stay up-to-date with current business trends
- 3 | Expand your network base
- 4 | Make meaningful contributions to your company, your team and the profession

MEETINGS

Equity-Based Insurance Guarantees Conference

Nov. 14–15
Chicago

Sponsored by the Society of Actuaries (SOA) and Annuity Systems Inc., the Equity-Based Insurance Guarantees Conference is the only global event of its kind. It's designed to give risk management, product development and valuation professionals an understanding and appreciation of how to better quantify, monitor and manage the complex risks underlying the variable annuity and indexed annuity products. This innovative conference features experts speaking on relevant issues, including valuation, reserving, product development, sound risk management practice and current market environment.

bit.ly/EBIGC

Advanced Business Analytics

Nov. 30–Dec. 2
Chicago

Don't miss out! This interactive, hands-on seminar will impart practical working knowledge of statistical and machine learning techniques that are broadly relevant in actuarial work. Core techniques, like regression analysis, generalized linear models, survival models, time series analysis and decision tree analysis, and "unsupervised learning" techniques, like principal component analysis and clustering, will be covered.

bit.ly/ABAnalytics



Visit SOA.org/calendar for the full complement of professional development opportunities.



LIVING
to 100

SOCIETY OF ACTUARIES
INTERNATIONAL SYMPOSIUM

Jan. 4–6, 2017
Orlando, Florida

Save the Date

Registration for the 2017 Living to 100 Symposium will open soon. This prestigious event brings together a diverse range of professionals, scientists and academics to discuss longevity.

Learn more at LivingTo100.SOA.org.





Exams



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Support



Professional
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