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To join the section, SOA members and non-members can locate a membership form on the Health Section webpage at http://www.soa.org/health/.

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2017 SECTION LEADERSHIP

Letter from the Editor

By Greg Fann

Like most boys, I grew up with a love of sports. When the weather was right, I enjoyed competitive games outside with my brother and like-minded friends in the neighborhood. When it was raining or after the sun had set, my passion was relegated to viewing the three local channels that were captured by the antenna attached to a heavy, wooden television that my parents owned. Growing up in South Carolina, there were no local professional teams and our allegiances were formed around the two large universities in the state. We dreamed of athletic heroism and legendary accomplishments on the gridiron, court and ball fields.

Like most actuaries, my notable athletic accomplishments were fleeting and ultimately surpassed by academic pursuits. As my mental abilities and intellectual curiosity grew naturally, my ability to compete athletically in team sports waned. However, my sports interest always remained high and the recent resurgence of "my team" has led to a deeper interest in future performance and attention to the various recruiting profiles and rankings of incoming college athletes.

As I think about my college journey, it occurs to me that there were no recruiting services tracking either my academic or athletic abilities or speculating where I might attend college. I imagine an academic profile, if it existed, would have read something like "quick with computation, strong memory, poor sentence construction, weak vocabulary." I share all of this with you to submit that becoming editor of a professional newsletter was a bit of an unexpected outcome, and perhaps it offers some encouragement. It would certainly raise the eyebrows of those who knew the youthful me that I became editor of anything. Nonetheless, here I am, humbled and honored to be on this voyage with each of you. I want to thank Marilyn McGaffin for her dedication as *Health Watch* editor over the past year and for assisting me through the transition.

While this may sound counterintuitive from an outsider's perspective, the actuarial profession has significantly improved my writing skills. As we grow in our careers, we recognize that it is a professional necessity to communicate clearly, fully and accurately with appropriate documentation, while at the same time highlighting key points for busy executives. I would like to suggest that developing articles for *Health Watch* publication is an edifying and rewarding process that sharpens those necessary skills. Realizing that your words will be read by millions (OK, that's an exaggeration) and on the internet forever (that might not be) creates a little more pressure to express thoughts just right and be sure that nuanced formula is technically correct; but it's a great endeavor, with the added benefit of constructive editorial and content review. Consider this an invitation to propose an article if you have an idea stirring that would be of interest to section members, even if it would be your first submission. On that note, this is a rookie issue in several respects. In addition to my new role, many articles in this issue are written by first-time *Health Watch* authors.

I know it is an overused phrase, but I'm going to say it anyway: The health insurance industry is in the midst of transformational change. As we analyze the impact of the first major federal overhaul of the individual and small group commercial markets, our nation recognizes a need to pivot but we lack agreement on the appropriate direction and necessary solutions. An assortment of policy and technical viewpoints to maintain viability in these challenging markets will dominate public discussion for the foreseeable future. In my view, actuarial input is crucial and will likely be more highly regarded than in the past but still will remain underutilized.

Writing *Health Watch* articles is a great endeavor, with the added benefit of constructive editorial and content review.

On a broader scale across all markets, modeling capabilities, technology and changes in provider reimbursement methodology are occurring at a rapid pace. It's a fascinating time to be a health actuary. It's also a fascinating time for *Health Watch*.

In this issue, William Bednar leads off with an exploratory discussion about nontraditional uses of actuarial cost models. He describes the value of the enormous amount of data that actuaries have at their disposal and highlights strategic uses that should not be overlooked.

The valuable and important work arising from the Health Section's strategic initiatives are highlighted in the next three articles. Joan Barrett writes a condensed version of the final report of the Evolution of the Health Actuary initiative, which is followed by introductory pieces from leaders of two new initiatives. Sara Teppema provides a framework of how actuaries can get involved in the public health arena. David Dillon explores the actuarial purview around what possibilities we might see

5 NUMBERS

1. 13 percent worldwide obesity in 2014; 35.7 percent in the United States in 2010
2. $56 billion on sepsis care in U.S. hospitals *every day* in 2011
3. 30 percent projected PMPM trend for anti-inflammatory drugs through 2019
4. 52,404 drug overdose deaths in the United States in 2015
5. 9.6 percent babies born pre-term in the United States in 2014

1 *http://www.who.int/mediacentre/factsheets/fs311/en/; https://www.niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx#b*

2 *https://blogs.cdc.gov/safehealthcare/the-cost-of-sepsis/*

3 *http://lab.express-scripts.com/lab/drug-trend-report/commercial-drug-trend-report*

4 *https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm*

5 *https://www.cdc.gov/nchs/fastats/births.htm*

with Affordable Care Act (ACA) related legislative and regulatory changes in the commercial markets.

This leads into two articles that explore reactions to the ACA, one from a legislative perspective and the other based on market response. First, Lawrence Mitchell discusses the implications of allowing the sale of health insurance across state lines. Second, Dustin Tindall and I collaborate to discuss the market advantages of developing gap insurance products to supplement major medical coverage in the commercial market.

Shifting to activities from Health Section subgroups, Joanne Fontana previews the ongoing development of dental diagnosis codes and discusses similarities to the medical world. Next, the team of Evan Morgan, Robert Lang and Michael Gillespie discuss the actuarial considerations of utilizing technology and the often-disregarded need to begin with a transparency focus.

Building on technology gains, Jackie Lee and Traci Hughes focus the medical delivery transformation discussion with insights on how telemedicine is becoming a cost-effective way to provide quality care with added patient convenience. Rebecca Owen's article on the Center for Health Care Strategies profiles a nonprofit organization focused on providing access and coordinated care for individuals with complex needs.

In addition to quality articles, the Health Section continues to provide live opportunities to be engaged on the latest developments in the health industry. To close this issue, Karen Shelton provides an overview of available continuing education opportunities for the remainder of the year. I hope you find this issue both interesting and informative, whether you read it in your office, at home or from the comfort of a lounge chair on a South Florida beach. Happy reading! ■

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Chairperson's Corner

By Brian Pauley

As a busy professional, I attend many meetings. I'm sure you do as well. I recently attended a day-long strategy planning meeting. After I left the meeting and went back to my hotel room, I spent time thinking about just how complex health care is. It is complex across the board—for providers, health plans, governments, customers and so on. This complexity is a huge opportunity for health actuaries to have a seat at many tables working to develop solutions. The Society of Actuaries (SOA) Health Section is well-positioned and is doing many things to assist health actuaries become trusted, expert partners at those tables.

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My hope is that you take advantage of what the Health Section offers in terms of education, research and resources to you, the health actuary, while you engage in the complexity of health care solutions. My leadership team and I met in January to examine the Health Section Council's body of work to ensure it had the right strategies in place to deliver on our promise to give you the most value for your membership. Here are some of our key objectives for 2017.

- We must offer **relevant, engaging continuing education opportunities** for health actuaries. We will continue to put a great deal of effort into making our sessions at the Health Meeting, SOA Annual Meeting & Exhibit, Valuation Actuary Symposium, Boot Camps for health actuaries and more the best we can. We had record-breaking attendance at the 2016 Health Meeting and came within one-hundredth of a rating point of having the highest-rated Health Meeting ever. Breaking records means you are getting value. In addition, we will continue driving for effective webcasts with quality speakers and for insightful *Health Watch* articles.

- We must offer **effective forums for actuaries to engage in meaningful dialogue** among industry experts as well as those who are trying to build expertise. We have topical subgroups (e.g., Medicaid) in place that have frequent discussions about pertinent industry topics. These groups also discuss and create content for our meetings to ensure sessions are cutting-edge.

- We must deploy **strategic initiatives linked to those set forth by the SOA Board of Directors as well as emergent issues deemed as critically important to health actuaries**. This year, my team is focused on public health, self-insurance, value-based care and commercial health care. Each of these initiatives has a clear deliverable and is on a path to completion in an appropriate time frame.

- We must **communicate effectively with our membership** so that you can take advantage of the great value that we strive to offer. Clear email communications, an easy-to-find-and-navigate webpage, *Health Watch* articles, and updates at key actuarial meetings are forums that we utilize to communicate with you. And, we are working to improve every single one of these.

Finally, I want to welcome in the new *Health Watch* editor and member of the Health Section Council, Greg Fann. Greg is a prolific health care actuarial author and has written several great pieces for this publication. I'm excited to appoint Greg to this role for the next three issues. He replaces Marilyn McGaffin, who successfully stepped in one year ago as the very first editor under our new editorial board structure of managing the *Health Watch* publication cycle.

If you ever have any questions or have ideas of ways the council can better serve you, please let me know. I love hearing from our members.

Have a great summer! ■

Brian Pauley, FSA, MAAA, is chairperson of the SOA Health Section Council. He can be reached at *bepauley@gmail.com*.

Up Front With the SOA Staff Fellow

By Joe Wurzburger

I write this article in late March, on the date the U.S. House of Representatives intends to vote on the American Health Care Act. *(Editor's note: Which is at least four days after he should have been writing this, but who's counting?)* I have a web browser open with *The New York Times*' running tally of anticipated "no" votes, and as has been the case so often lately in the health care world, the future is very much unknown.

As you read this, you already know how this particular vote turned out. Regardless of the outcome, I'm sure there have been other twists and turns that have maintained the heavy burden on you as health actuaries to stay current with regulations and expectations that shape your professional lives.

It is with this in mind that I want to make sure you are aware of what might be the best-kept secret in continuing education for health actuaries: the Society of Actuaries (SOA) Boot Camps. These boot camps have existed in one form or another for more than a decade, but never have they been more relevant than they are in today's dynamic health care environment.

THE BASICS

First, so we don't bury the lead too far, here are the essential details. The 2017 Health Boot Camps will take place on Nov. 6 and 7 in New Orleans. Three concurrent boot camps will be available as options:

- Advanced Commercial Pricing
- Medicare Advantage: Part C and Some Part D Pricing
- Provider Risk Sharing

I want to make sure you are aware of what might be the best-kept secret in continuing education for health actuaries: the Society of Actuaries (SOA) Boot Camps.

Each course runs for two full days, allowing for in-depth learning that just isn't possible in most other settings. Additionally, a working lunch on Day 2 will cover professionalism topics, enabling all attendees to earn continuing education credits for professionalism along with those they earn in their chosen primary topic. Find more details at the SOA events calendar.[1]

Now let's answer some of your important questions.

WHAT MAKES THE SOA HEALTH BOOT CAMPS SO GREAT?

Let's start with the format that makes these boot camps so distinctive. Each topic is covered over the course of two full days. This allows for a depth of learning that simply can't be replicated in the 90-minute sessions you may experience at other continuing education events. Instructors may utilize pre-work, hands-on case studies and other immersive teaching techniques in order to maximize learning.

Additionally, attendees are able to interact individually with our highly regarded faculty as well as other attendees to build meaningful relationships. Networking is further encouraged during meals and at the evening reception.

WHY ARE THE SOA HEALTH BOOT CAMPS ESPECIALLY RELEVANT THIS YEAR?

Preparing roughly 16 hours of syllabus material is challenging enough under normal conditions. This year, with the nearly

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Certified Actuarial Analyst

Meeting the Growing Need for Professional Analysts

The Certified Actuarial Analyst (CAA) is an international professional qualification offered by CAA Global to qualify those who excel in technical and analytical skills as trained analysts, giving financial institutions qualified professionals to fill key roles.

The CAA qualification equips professionals with financial business, analytical and modeling skills. The qualification ensures that those working in technical roles within the insurance and financial services industries have the required skills and methodologies to allow businesses to provide assurance to regulators, stakeholders and the public at large.

Becoming a CAA

The CAA is most suited for those interested in financial and statistical work.

Whether you are currently working in an analytical role as a pricing analyst, data modeler or finance analyst, or trying to break into the analytics and data world, then the CAA qualification is ideal for you.

For more information visit caa-global.org or email info@caa-global.org

constant changes coming out of Washington, DC, the challenge is especially intense. Our top-notch faculty is more than up for the challenge, though. And this means that you are able to receive in-depth training on the topic of your choosing that includes the latest news and developments. Instead of feeling as if you're trying to find what to read—and find the time to read it—just to keep your head above water, you can go back to your respective offices after two days and feel like experts.

COULD YOU TELL ME MORE ABOUT THE TOPICS COVERED?

Gladly! The Advanced Commercial Pricing Boot Camp will return for its fourth edition. The reviews for the first three versions of this boot camp have been stellar, and this year's edition is sure to impress. This fast-paced seminar will tackle nearly everything you can imagine related to pricing health insurance products, particularly in the individual and small group markets. Changes are coming fast and furious for health actuaries in this arena, and this boot camp will feature timely information including all of the latest changes, whether we are talking about the Affordable Care Act, the American Health Care Act or something else entirely.

The Medicare Advantage Boot Camp has been around for close to a decade, and it has developed quite a reputation as a premier source of Medicare Advantage education. This boot camp makes effective use of pre-work, and attendees will get hands-on experience with the Bid Pricing Tool (BPT). Medicare Advantage evolves annually. New rules are announced each year and product changes occur. These new developments do not typically lessen the actuaries' workload or otherwise make things easier during the limited time of the bid season. Presenters will cover recent changes in the bid instructions and other regulations that affect BPT development. By updating the curriculum to reflect recent changes, instructors ensure that this a valuable learning experience even for those who have attended in prior years.

The newest addition to the boot camp slate is the Provider Risk Sharing Boot Camp, and we are so excited to bring you such a high-quality session on what is a truly hot topic. Changes introduced by various Medicare Alternative Payment Models and the Medicare Access and CHIP Reauthorization Act (MACRA) have accelerated an existing market trend of shifting some of what has traditionally been considered "insurance risk" to providers. The Provider Risk Sharing Boot Camp will give attendees deeper insights into methods, current thinking and alternative solutions that actuaries can use to help providers understand and manage the financial and actuarial risks that they are taking, many for the first time. Instructors will utilize case studies and interactive exercises to make for an immersive and thorough learning experience for attendees.

ISN'T NEW ORLEANS A REALLY FUN PLACE TO VISIT?

Why, yes. Yes it is.

SO WHY HAVEN'T I REGISTERED YET?

Good question. Go to *SOA.org* to remedy that situation now. And of course please spread the word to your colleagues and other actuarial friends.

I'll see you in The Big Easy. ■

Joe Wurzburger, FSA, MAAA, is Health staff fellow at the Society of Actuaries. He can be reached at *jwurzburger@soa.org.*

ENDNOTE

1 *www.soa.org/calendar*

Building Actuarial Cost Models From Health Care Claims Data for Strategic Decision-Making

By William Bednar

Health care spending across the country generates billions of claim records annually. Claim records originate as a form of invoice for health care providers to bill for services rendered. Providers submit the claims to the liable payer (typically a health plan, government agency or the patient). The health plans adjudicate the claims, pay the providers, and then store the electronic claim records in data warehouses. Regulations require that health plans keep claim records for several years, typically ranging from five to 10 or more years depending on the state. Many health plans choose to keep their records indefinitely and expand their storage capabilities as needed. The IT infrastructure required to hold and maintain electronic records is one of the biggest administrative expenses for health plans. Since health plans incur significant expense to store their claim records, is there a way that health plans can use the data to help run their business more effectively or help in achieving the Triple Aim (i.e., patient satisfaction, population health and cost containment)?

Actuaries have traditionally used health plan claim records to build actuarial cost models. Actuarial cost models are a staple tool used by health actuaries to assist with financial forecasting, which is then used for financial planning and pricing benefit coverage. Using historical claims data, the actuary constructs cost utilization reports by splitting the data into homogeneous service categories, and then summarizing metrics such as claim frequency, unit costs, provider discounts, per-member per-month (PMPM) cost, actuarial value (AV), medical loss ratio (MLR) and risk score. The reports can be further partitioned by line of business, market segment, time frame, or any other desired attribute of the covered population. The information in the reports is then incorporated into the Actuarial Cost Model to estimate future health care costs and serve the traditional actuarial functions of pricing and forecasting. However, while these functions are vital to the financial stability of health plans, they do not *influence* health care costs or the way health care is delivered.

Actuarial cost models can be powerful tools to help influence health plan decisions. Actuaries can dig deep into the claims data to explore solutions to myriad medical economic problems related to total cost of care. Even though the claim records are intended mainly for invoice purposes, they contain valuable clinical and financial information that can be used to help guide health plan leadership in making smart business decisions. The first step to getting at this information is to create actuarial cost models that help health plan leadership understand the total cost of care. The second step is to create more detailed models that highlight the areas that most influence the total cost and will help guide health plan leadership to make actionable business decisions to lower the cost of care.

In the remainder of the article, I explore six example applications of actuarial cost models. In each example, health care claim records are a critical element of the model, and in several of the examples it is imperative that actuaries work closely with clinicians to either help build the model or help interpret the model results.

1. **Provider specialty cost model.** Supports the analysis of provider efficiency, benchmarking and network adequacy.

2. **Primary care physician (PCP) cost model.** Supports the analysis of attribution, PCP performance and value-based contracting.

3. **Clinical cost model.** Supports the analysis of treatment plan costs, and the evaluation of care management programs.

4. **Enterprise risk management (ERM) cost model.** Supports the analysis of quantifying the financial risk associated with risk-bearing contracts.

5. **Site-of-service cost model.** Highlights the opportunity to shift procedures to a lower-cost setting.

6. **Inpatient diagnosis-related group (DRG) cost model.** Highlights the opportunity to reduce inpatient lengths of stay.

PROVIDER SPECIALTY COST MODEL: EFFICIENCY AND NETWORK REVIEW

Claims data can be used to create actuarial cost models that track the cost of care for every provider within a network. This provider specialty cost model will produce separate cost profiles for each individual provider (or provider group), and then compare to other providers within the same specialty category. The specialty categories are homogeneous groupings based either on the provider taxonomy code or Centers for Medicare & Medicaid Services (CMS) specialty code that is typically found in the claims data. This modeling may be limited to physician specialties, but it can also be applied to health care facilities (e.g., hospitals, clinics, ambulatory surgical centers) as well as non-physician practitioner (e.g., dentists, physical therapists, nurse practitioners). The provider cost profile reports will give actuaries important information to help them better understand the provider landscape, such as:

- Number of providers within each specialty
- Total volume each provider receives
- Types of services each provider performs
- Comparison of utilization metrics (visit frequency, unit cost, and mix of procedures) for each provider within each specialty

Actuaries can then use that information to identify cost differences between providers. They will need to consult with a clinician to most effectively interpret the meaning of the model results (e.g., understanding various treatment plans for common ailments), and, together, draw conclusions on how to best make actionable decisions from the results. Such actions may include:

- Creating provider benchmarks that can be used to help guide contract designs and negotiations

- Developing treatment plan "playbooks" that represent cost-efficient practices

- Identifying a lack (or surplus) of access of certain specialties within an area, which can guide leadership in how to address an underlying deficiency (or surplus) in the network. If the network needs to be expanded, the model can be used to track the performance of new providers; if the network needs to be contracted, the model results can help with the decision-making.

PCP COST MODEL: VALUE-BASED CONTRACTING

The PCP cost model has many of the same attributes as the provider specialty cost model, but has a couple of important distinct features. First, the model is limited to just PCPs. Second, each member is attributed to a unique PCP for a defined time frame. Third, all the member's claim experience for that time frame is credited toward the attributed PCP. Attributions are typically defined on either a monthly or annual basis. There will be some members who do not get attributed because they either have no claims in the study period or have claims but just not any PCP claims. It is very important to note that the PCP is credited for all the claim experience of his attributed members. This includes all specialist visits, prescription drugs, emergency room visits, hospital admissions and out-of-network utilization. Certain costs may be excluded from the attribution. The excluded costs are usually limited to services that the PCP is not able to influence. Typical examples are transplants, mental health, skilled nursing and out-of-area claims. Like the provider specialty cost model, monitoring reports can be created, benchmarks can be established, and comparisons between PCPs can be made.

The results of this model will help health plan leadership make informed decisions regarding their network of PCPs. Decisions can range from whether to expand or reduce the number of PCPs within a region, choosing PCPs to be part of a tiered network, or how to approach negotiations for risk-based contracts and value-based payment (VBP) programs. PCPs have the most influence over their patients' health care costs, and because of this, are the best targets for VBP. The results of the PCP cost model give health plan leadership the information needed to help design and negotiate contracts that will reward the quality of care instead of rewarding the quantity of care. The actuary and clinician together can review the details of PCP attribution costs and develop budget targets for the PCP to receive bonuses and withhold refunds. A well-designed VBP arrangement should incentivize PCPs to manage and direct the care of their patients in a cost-efficient manner while maintaining high-quality care and patient satisfaction. A clinician's expertise is vital to ensure any goals related to cost efficiency do not sacrifice the quality of care delivered to patients. The PCP cost model will help health plan leadership with the financial aspects of designing a quality VBP arrangement, including budgeting and monitoring emerging results.

CLINICAL COST MODEL: INTERVENTION PROGRAM EVALUATION AND TARGETING

The clinical cost model is constructed by mapping health plan members into homogeneous clinical condition categories based on the diagnosis codes that are present on each member's claim experience. Since a member may have various diagnoses, the categories can either be hierarchical, where the member is placed into the category corresponding to the most serious condition, or the categories can be subdivided based on a member's various co-morbidities. This model helps to illustrate the number of members within each clinical category, the total cost of treatment, the mix of services, and the incremental cost of

co-morbidities. The actuary can use this model to help evaluate the financial impact of offering various medical intervention programs to guide health plan leadership in narrowing down their choice of programs to offer.

Actuaries would use the model results as a starting point in their evaluation, but may need to go back to the claims data and adjust the model depending on the type of members the program is intended to target. For example, an intervention program may be designed to target members who had a heart attack within the past six months but do not also have diabetes (perhaps because diabetics are already eligible for an alternate program). The clinical cost model would have a category for members with heart disease, but would not have a category specific to the target population. The actuary must go back to claims data to find members who have a principal diagnosis code for acute myocardial infarction within the specified time frame, and make sure to exclude any member who also has diagnosis codes related to diabetes. Now that the member list has been narrowed to the targeted population, the actuary can develop an actuarial cost model to financially evaluate the program. Next the actuary will summarize the historical claim experience for the target members and develop claim reduction estimates by applying assumptions such as member take-up rate, claim trend, and adjustments for clinical intervention (including regression to the mean).

In addition to helping with the evaluation of disease management programs, this model will also help to monitor the acuity of a population over time, the progression of disease, and the cost difference between various treatment plans. The actuary and clinician together can review the model results to develop treatment plans based on the observed historical cost and outcomes of the various treatment plans for a specific condition.

ERM COST MODEL: RISK SIMULATION

Past claim experience is a good predictor of future claim experience, but there is variance from year to year that can be difficult to foresee. Unpredictable future costs associated with catastrophic events (e.g., epidemics), benefit changes (e.g., new mandates and high-cost drugs) and new populations (e.g., previously uninsured) may destabilize claim trends and lead to significant financial losses. To help quantify a potential range of financial outcomes, claims data may be used to create an ERM cost model that stochastically simulates annual claim cost for a block of business. First, the actuary needs to construct a claim probability distribution from the claims data, then use Monte Carlo simulation to randomly sample the distribution thousands or even millions of times, with each sample representing a single member's annual claim cost. If a block of business has 100,000 members, the model would sample the distribution 100,000 times independently to simulate the total claim costs for the block.

The actuary and clinician together can review the model results to develop treatment plans based on the observed historical cost and outcomes of the various treatment plans for a specific condition.

Since this is a stochastic model, the results will vary every time the model is run. To create a range of plausible results, the sampling process should be repeated several times. For example, 100 independent runs (each run simulating the claims for 100,000 members) will give the actuary a good feel for the range of risk for a block of business. The result of each run would represent a different percentile of the distribution of total claim cost risk (e.g., the scenario with the 10th highest aggregate claims would represent the 90th percentile of risk).

Different claim distributions should be used for blocks of business with distinct characteristics and utilization patterns. For example, Medicare claims should not be used to simulate risk for a commercial population, and vice versa. The actuary may also introduce additional random variables into the model to recognize that the assumed claim distribution may change from year to year. For example, a random variable can be used to scale either the mean or dispersion of the distribution. The model may also run simulations for multiple blocks of business together, or multiple years in succession. Many health plans like to produce three- to five-year forecasts, so running a simulation for all lines of business for three to five years in succession will provide a better understanding of the aggregated risk than running separate simulations for each line of business for each year.

The output of the model is a distribution of potential financial outcomes and the statistical likelihood of each outcome. The results will help health plan leadership become more aware of the aggregated risk of their business and provide critical information for them to decide their appetite for risk. Plan leadership may use the results to:

- Decide to either increase or decrease their exposure in certain markets
- Decide if reinsurance is appropriate, at what attachment level; individual or aggregate, or both
- Create financial forecasts
- Fulfill risk reporting requirements, such as Own Risk and Solvency Assessment (ORSA)

SITE-OF-SERVICE COST MODEL: MOST EFFICIENT PLACE OF SERVICE

Claims data can be used to create site-of-service cost models that help to identify which services have the most opportunity to shift to a lower-cost place of service, and then model the financial impact of the shift. First the actuary will need to identify the applicable procedural codes for a common set of services (e.g., a common set of surgeries, cancer treatment, preventive services). Next the actuary will need to identify all claims containing the relevant set of procedural codes, and then summarize the data into an actuarial cost model that shows cost and utilization metrics for those visits by the place of service. Most acute medical services are performed either in a doctor's office, hospital inpatient setting, hospital outpatient setting, or at a non-hospital facility (e.g., ambulatory surgical center, clinic). The cost for a given procedure will typically be the lowest if it is performed in an office and the highest if performed in the hospital inpatient setting, with the hospital outpatient and non-hospital facility costs falling in between the two extremes. The model will show the number of procedures performed in the various settings and the cost difference between each. The actuary can then model the potential cost reduction by shifting a percentage of the procedures to a lower-cost setting.

The model results will help guide health plan leadership to implement medical policies that require certain procedures are to be performed in the lowest-cost setting unless there is a medical necessity for a higher-cost setting (e.g., procedure carries a higher-than-normal risk due to patient co-morbidities or frailty). For example, the model may show that certain treatments in Region A are expensive because they are mostly performed in the outpatient setting, whereas the same treatments are cheap in Region B because they are mostly performed in offices. A clinician will then assess why Region A is using more outpatient treatment and decide if it is feasible to shift more treatment to the office setting. Combining the results of the provider specialty cost model with the results of the site-of-service cost model, health plan leadership may see a need to expand their network or the need for a new facility in the region. For example, if Region A has a high frequency of low-level emergency room visits compared to Region B, the reason may be because there is an urgent care facility in Region B but not in Region A, or because Region B has PCPs with weekend office hours and Region A does not. Depending on the situation, health plan leadership has the information needed to make decisions.

DRG COST MODEL: INPATIENT LENGTH OF STAY REDUCTION

Hospital inpatient stays are typically reimbursed through a bundled payment referred to as a DRG (Diagnostic-Related Group) payment. A DRG payment is designed to reimburse the hospital for a patient's entire stay at the hospital regardless of the length of stay (LOS) or the amount of resources consumed. The DRG covers only hospital expenses and does not cover the costs associated with physicians that bill for services separately (e.g., surgeon expenses). The two most common DRG systems used in the United States today are the Medicare Severity (MS-DRG) and All Payer Refined (APR-DRG). Both systems determine a bundled payment based on a combination of diagnoses and procedure codes. The combination of these codes will reflect the case complexity and the required course of treatment, which then correlates to an expected consumption of hospital resources and length of treatment.

An actuarial cost model can be created from claims data that compares the average length of stay (ALOS) by DRG code between all the hospitals within a network. The actuary can then work with a clinician to create benchmark ALOS for each DRG and model the claim cost reduction by assuming the ALOS for each hospital will converge toward the benchmark (assuming cost per day remains the same). For example, if the actual LOS for a certain DRG is 6.0 days at Hospital A, and the benchmark LOS for that DRG is 4.0 days, then a 25 percent marginal improvement would reduce the LOS by 0.5 day. If Hospital A had 500 admissions for that DRG averaging $5,000 per day, then there would be a cost savings potential of $1.25 million. The patient will consume fewer hospital resources with a shorter LOS (reducing costs for the hospital), but the health plan will not realize any immediate savings because DRGs are bundled payments. However, if the hospitals are successful in reducing the ALOS, health plan leadership may be able to use the model results to negotiate a better DRG weight and share the savings with the hospitals. Aside from the financial implication, reducing ALOS will get patients home sooner, and will free up hospital resources for other patients.

CONCLUSION

These examples are just a starting point for all the valuable analysis that can be done with health care claims data. The actuarial models that can be created, combined with a clinical perspective, will provide health plan leadership with the analytics needed to monitor their business and make the decisions necessary to transform health care into a high-quality and cost-efficient delivery system. I cannot stress enough how important it is for actuaries to team up with clinicians. Actuaries are experts at modeling data, but clinicians are experts at delivering care. The combined technical expertise of actuaries and medical expertise of physicians are critical to addressing issues related to the Triple Aim (i.e., patient satisfaction, population health and cost containment). ■

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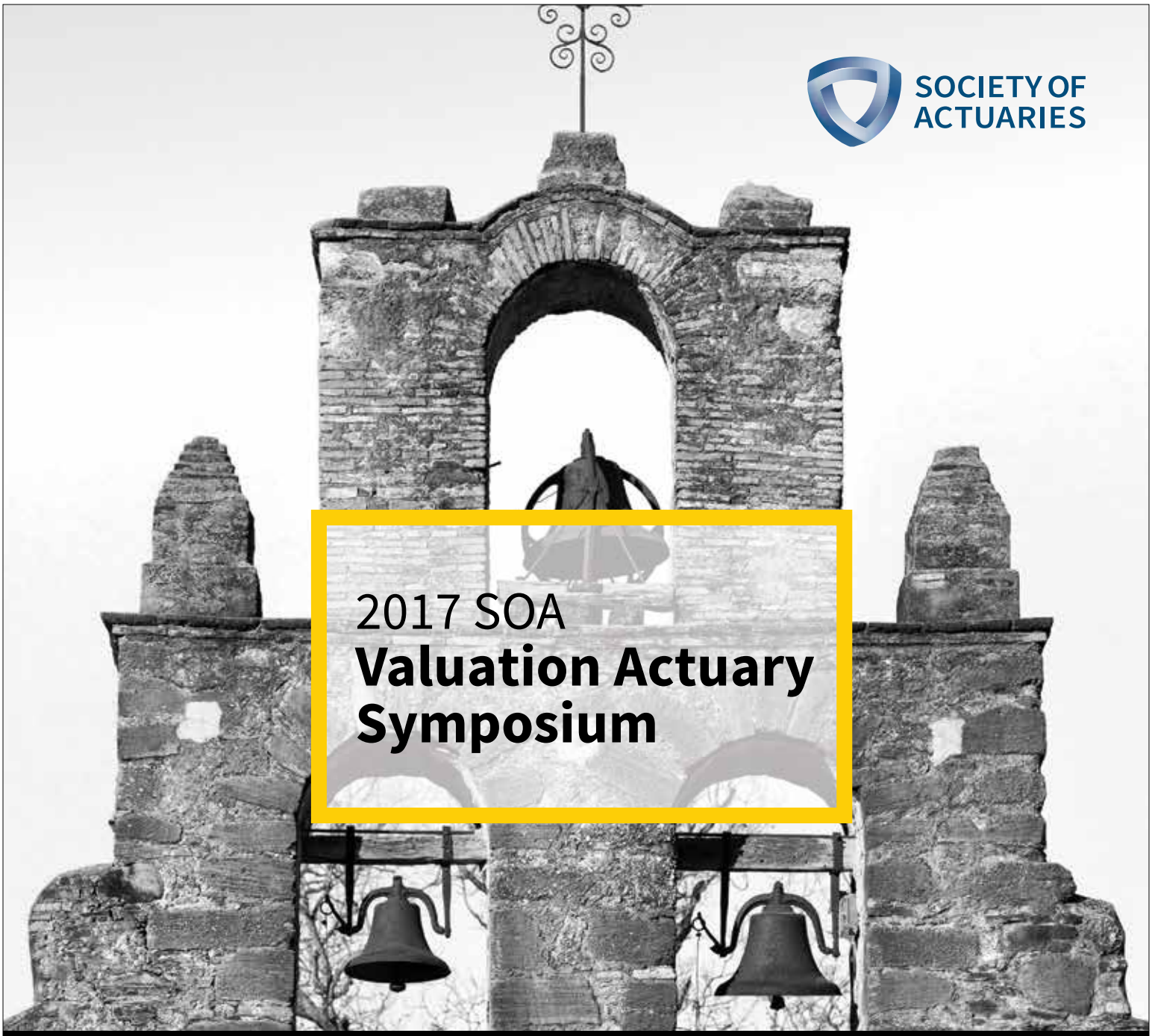

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Evolution of the Health Actuary

A Health Section Strategic Initiative

By Joan Barrett

What an exciting time to be a health actuary! There is so much going on: health care reform, big data, MACRA and so much more. Surely, these changes will create both risks and opportunities for us. The question is: How can we get our arms around all these changes, and what do we need to do to make the best of the situation? To assist in this effort, the Health Section Council (HSC) of the Society of Actuaries (SOA) created the Evolution of the Health Actuary Task Force to identify the key disruptors to the health insurance industry and to recommend a strategy for dealing with these changes.

Although there are countless issues that could be addressed, the task force decided to focus on three major disruptors. The first disruptor is the American Health Care Act (AHCA) or whatever alternative replaces or amends the Patient Protection and Affordable Care Act (ACA). The main focus for both the ACA and the AHCA is the financing of health care. In this article, we will continue to use the abbreviation AHCA to refer to this alternative, although the bill that was recently introduced is no longer being actively considered at the time this article is being written.

The other two disruptors deal with the cost of care:

- A major change in the business model on the part of providers, spurred in part by the enactment of the Medicare Access and CHIP Reauthorization Act (MACRA)
- An acceleration of efforts to reduce the chronic disease burden

The HSC has chartered several strategic initiatives to make sure members have the information and tools they need to do their day-to-day work and to build their careers. In addition, these initiatives will address ways to make sure the voice of the actuary is heard during this time period.

THE DISRUPTORS

The AHCA

The ACA, including Medicaid expansion, was successful in reducing the number of non-elderly uninsured from a high of 18 percent in 2010 to 10 percent in 2015.[1] Recently, however, there has been a lot of controversy due to the high rate increases in the exchanges and the fact that health plans are dropping out of the exchanges in certain areas. In both cases, these issues are generally attributable to a lack of predictability and stability in the exchange risk pools. Specifically, some of the reasons cited for this lack of predictability and stability include inadequate enforcement of the special enrollment period rules and the 3:1 age-rating rule that may have discouraged younger consumers from entering the marketplace.

In March, the House of Representatives introduced the AHCA. Although this bill was touted as a "repeal and replace" of the ACA, many provisions, like the exchange marketplace concept, are carried over in the AHCA. This bill was criticized and is no longer under consideration as of the writing of this article.

Regardless of the structure of the final bill, health plans will be faced with some immediate strategic decisions such as whether they will participate in the exchanges and, if so, which ones they will participate in. Once a health plan has decided to participate in an exchange, a pricing strategy must be determined for each exchange. From an analytical viewpoint, one of the most difficult parts of this process will be estimating the change in the risk pool, net of rating factors and risk adjustments, and similar changes. Although several health plans have developed some models to address this, there is still a lot to learn about

this process, especially as it pertains to consumer behavior. In addition, health plans will likely require a more precise estimate of the risk associated with the final pricing decision. Since the pricing process will be more complex than in the past, the risk measurement and monitoring process will need to be more sophisticated. Again, we have a lot to learn about what that will mean in practice.

Overall, this change will create opportunities for health actuaries as we help health plans develop their overall strategy, price plans, implement systems changes, file rates, and measure and monitor risk. There will also be a reputational risk given the innate volatility of the rates.

The Chronic Care Burden

One of the most pressing health care issues facing the United States is the high cost of health care. The cost of care in the United States is about twice that of other developed countries and almost 50 percent higher than the second costliest country.[2] According to the Centers for Disease Control and Prevention (CDC), 86 percent of all health expenditures are for individuals with one or more chronic diseases, such as diabetes, heart disease and cancer. In addition, 75 percent of the expenditures are for the direct treatment of these diseases.[3] Although there are certainly genetic and environmental factors causing these diseases, there are also several behavioral contributors like tobacco use, poor diet and lack of physical exercise.

Most patients rely on their doctors for treatment and prevention advice. Physicians in turn rely on published research and evidence-based medicine rules. In addition, other organizations like employers, health plans and public health organizations provide services like:

- Population health and employee wellness programs that encourage a specific population to adopt a healthier lifestyle or receive preventive care. Examples include anti-smoking campaigns, biometric screenings in the workplace and free immunizations.
- Disease management programs designed to assist an individual with a chronic disease or at risk for a chronic disease in getting the information and support services they need.
- Save-as-you-go programs, like concurrent inpatient reviews that reduce length of stay by coordinating post-discharge care.

Although these methods have shown some signs of success, the expectation is that there will be an accelerated interest in finding solutions to control costs. Some examples include:

- Many vendors, like IBM, are currently promoting the notion that predictive analytics will be the key to lower costs by developing more sophisticated techniques for identifying people at risk and gaps in care. We expect to see an acceleration in this regard as new data sources, like electronic health records, become more available and as health plans and providers build infrastructures to do this type of analysis.
- New technologies like tele-monitoring and 3-D printing will provide lower treatment costs. These techniques are still under study but should move to the mainstream in the next few years.
- Consumer health applications will encourage consumers to take a more active role in the management of their health care. Some applications, like Fitbit, will lower costs by encouraging people to exercise; others will result in over-utilization of resources.

Each of the efforts described holds great promise for reducing the cost and increasing the quality of care. For health plans, providers and others whose financial fortunes are at stake, however, it is important to be able to predict the savings accurately and on a timely basis so that the results can be reflected in premium rates, fee schedules and budgets. Historically, the value of new techniques for generating savings has been greatly overstated. For example, when high-deductible health plans were first introduced in the early 2000s, many private studies projected savings well over 10 percent. More recently, the private studies show savings in the 1 to 2 percent range. Although these long-term savings are material, the overstatements caused short-term pain in the form of financial losses and missed budget projections.

Historically, medical economics, the field associated with calculating medical savings and evaluating program effectiveness, has been the purview of data scientists, epidemiologists and other near professions, rather than actuaries. There are, however, some weaknesses with the techniques currently in use. In addition to the inaccuracy of initial estimates, which was noted earlier, they are not readily adaptable to actuarial control cycle functions, like monitoring experience, measuring

Historically, medical economics, the field associated with calculating medical savings and evaluating program effectiveness, has been the purview of data scientists, epidemiologists and other near professions, rather than actuaries.

risks and taking corrective actions in a timely manner. This may provide a major opportunity for health actuaries if we can adapt our current methods to reflect the specific needs of medical economics.

Provider Strategy Shift

According to a recent survey from the Economist Intelligence Unit (EIU), almost 60 percent of U.S. hospital executives say that they must make substantial changes to their business models if they are to survive.[4] Most say that the major reason for this change is the movement from a fee-for-service (FFS) reimbursement methodology to a value-based reimbursement (VBR) methodology. In particular, there are concerns about the impact of MACRA, which requires a VBR for most Medicare professionals.

Providers are also facing more demands for transparency and personalization of medicine from consumers. This trend is being reinforced through quality strategies like the Centers for Medicare & Medicaid Services (CMS) strategy and the Triple Aim, which has been adopted by the American Hospital Association. Both strategies emphasize the need to reduce clinical errors and increase patient communication.

To deal with the macro-trends described, providers, especially hospitals, will have to restructure their business models, including:

- Developing an overall reimbursement strategy that provides the right balance between income level and stability of income
- Investing in new technologies such as electronic health records, which will accommodate the reporting needs for VBR, identify inefficiencies in the system, and determine the needs of patients. This effort will include both a capital investment and a human resource effort.
- Developing strategies for talent retention that include not only new compensation formulas but ways to engage staff

Disruptive changes will create opportunities for health actuaries as we help health plans develop their overall strategy, price plans, implement systems changes, file rates, and measure and monitor risk.

Most of CFOs surveyed say they should do a better job of leveraging financial and operational data to inform strategic decisions. They are also concerned that constrained resources and outdated processes stand in the way of achieving their organization's goals. This will provide many opportunities for health actuaries if we can adapt our analytics to meet the needs of providers.

Health plans, consumers and employers may benefit from this strategic shift, especially if providers make significant efficiency improvements. There is always the risk, however, that as Medicare puts more pressure on providers, the providers will cost-shift to commercial carriers as they have done in the past.[5] Either way, this creates new opportunities for actuaries as health plans enhance their analytical capabilities in both traditional areas, like pricing and reserving, and nontraditional areas, like network contracting.

RECOMMENDATIONS

During the development of this report, the task force worked closely with the HSC on developing recommendations. As a result, the HSC chartered the following initiatives to make sure member needs are met during this time:

- The Value-Based Care strategic initiative, designed to develop a framework of actuarial skill sets to assist providers
- The Commercial Health Care: What's Next? strategic initiative, designed to focus on providing updates as various bills move through Congress
- The Self–Insurance strategic initiative, designed to provide members with the information needed to support actuaries in this field

- The Public Health strategic initiative, designed to not only provide members with the information they need regarding public health, but also to form partnerships outside the profession

THE TASK FORCE

Finally, the HSC wishes to thank the members of the task force:

- Joan C. Barrett, chair
- Kara Clark
- Elaine Corrough
- Chris Coulter
- Gabriela Dieguez
- David Dillon
- Kevin Dotson
- Ian Duncan
- Greg Fann
- Roy Goldman
- David Hayes
- Brett Heineman
- Mac McCarthy
- Bill O'Brien
- Tim Robinson
- Alice Rosenblatt
- John Stark
- Kelsey Stevens
- Jim Toole ■

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ENDNOTES

1 EBRI Issue Brief No. 419, "Sources of Health Insurance Coverage: A Look at Changes Between 2013 and 2014 From the March 2014 and 2015 Current Population Survey" by Paul Fronstin, Ph.D., *https://www.ebri.org/publications/ib/index.cfm?fa=ibDisp&content_id=3280*

2 *https://www.oecd.org/unitedstates/Country-Note-UNITED%20STATES-OECD-Health-Statistics-2015.pdf*

3 CDC, *http://www.cdc.gov/chronicdisease/overview/index.htm*

4 *http://www.beckershospitalreview.com/finance/survey-almost-60-of-hospital-executives-say-hospitals-must-transform-business-models.html*

5 *http://www.aha.org/research/reports/tw/chartbook/2015/15chartbook.pdf*

Public Health: The New Frontier

A Health Section Strategic Initiative

By Sara Teppema

Spurred on by a new and exciting partnership, and inspired by the community involvement of a Society of Actuaries (SOA) leader, the Health Section has kicked off a new strategic initiative called "Public Health and the Role of the Actuary."

WHERE DID THIS IDEA COME FROM?

In 2015 SOA volunteer leaders and staff met with the Centers for Disease Control and Prevention (CDC) to understand how we might find common ground between the CDC's many public health initiatives and research, and actuaries' quantitative payer focus. This partnership has led to several educational opportunities in which SOA research actuary Rebecca Owen, along with a few SOA volunteer members, have met with stakeholders at the CDC, especially related to the CDC's prevention program called the 6|18 Initiative.[1]

In order to keep momentum for this work, the Health Section decided to prioritize public health as a strategic initiative to be kicked off in mid-2016. They asked me to lead it because I am a self-proclaimed public health geek, and we began to map out what this initiative would look like.

Then, at the 2016 SOA Health Meeting in Philadelphia, SOA board member and public health hobbyist Jim Toole shared his passion and experiences working in his community on several local public health initiatives. His inspiring message, paired with an overview of the 6|18 Initiative by the CDC's Laura Seeff, brought several more volunteers into a task force to move forward the Health Section's public health initiative.

> Understanding public health can broaden our view in these emerging areas, and expand our practice as actuaries.

The overarching objective of the task force is twofold: first, to educate actuaries on the importance of public health and how it can inform and affect our work as actuaries—we call this the "inward" focus; and second, to open channels to enable actuaries to contribute to public health efforts—we call this the "outward" focus.

I'VE HEARD OF PUBLIC HEALTH BUT I'M NOT SURE WHAT IT IS …

According to the American Public Health Association,[2] public health promotes and protects the health of people and the communities where they live, learn, work and play. There can be a fair amount of confusion between public health and population health; I look at population health and public health as similar. Population health can refer to any population, such as a group of retired teamsters, an active employee population, a physician's attributed panel or a group of HIV patients in a specialized medical home. Public health prioritizes a different (and broader) list of concerns that affect an entire community population such as clean water, environmental hazards or community safety. In addition, we need to recognize that the term "public health" is a vast repository for many important disciplines such as epidemiology, environmental health, occupational health, nutrition education, research and many others.

Actuaries have been working in population health for a long time, by using data to design and evaluate health care programs and investments in health care services. However, most actuaries have not been involved in evaluation of non-health-care-related data, initiatives and costs (for example, workplace gyms or air conditioners for asthmatics), nor have we typically been involved in evaluating data for broader public health initiatives like improving water quality, reducing gun violence or other more community-focused initiatives. The SOA task force will attempt to bridge this gap from population health into public health by providing examples (which have worked in either population health or public health) that create a framework to prime actuaries to think about broader issues that are more full-community-focused.

HOW WILL THIS HELP ME IN MY WORK AS AN ACTUARY?

The first phase—the "inward" focus of the task force's work—is to educate actuaries about public health. Our world is getting bigger, just like everyone else's, and we need to expand our view. It is no longer possible to make predictions about future cost and utilization by simply looking at last year's claims data. We are learning more about populations with more sophisticated tools in risk adjustment, care management, and research on social determinants of health. Understanding public health can broaden our view in these emerging areas, and expand our practice as actuaries.

The task force hopes to bring to light these opportunities through examples of public health and population health initiatives that have been quantified and have demonstrated reduced cost or increased efficiency. We will be writing about these examples in upcoming SOA communications.

I WANT TO USE MY SKILLS TO HELP SOLVE PUBLIC HEALTH PROBLEMS IN MY COMMUNITY!

As part of our second phase—the "outward" focus of the task force's work—we hope to expand the work we are doing with the CDC, and provide high-level actuarial expertise to stakeholders and organizations in the public health space. Pushing further outward, we also hope to provide a mechanism for health actuaries to get involved in their communities on both a volunteer and professional basis.

HOW CAN I LEARN MORE?

The task force is planning to build a Health Section subgroup, similar to the Medicaid and payment reform subgroups, to facilitate online discussion and educational conference calls. If you are interested in being added to that group, please contact Dee Berger, SOA section specialist, at *lberger@soa.org*. You can also reach out to any of the task force members. All of them are passionate about this topic and would love to share their stories.

The members of the Public Health Task Force include actuaries from a wide range of backgrounds, plus several non-actuaries from the public health community, including Arlene Ash, professor at University of Massachusetts Medical School; Laura Seeff from the CDC; and Lisa Harrison from the Granville Vance District Health Department in North Carolina. SOA members include Julia Lerche (vice chair), Bethany McAleer, Jim Mange, Rebecca Owen, Margie Rosenberg, Geoff Sandler, Shereen Sayre, Norm Storwick, Junee Tan-Torres, Sara Teppema (chair) and Jim Toole. The task force is supported by Health Section Council members Greg Fann and Jackie Lee, and SOA staff Joe Wurzburger and Dee Berger. ■

Sara Teppema, FSA, MAAA, is DVP, Care Model Development at Health Care Service Corporation in Chicago. She can be reached at *sara_c_teppema@bcbsil.com*.

ENDNOTES

1 For more information, see *http://www.cdc.gov/sixeighteen/*.

2 *https://www.apha.org/what-is-public-health*

Commercial Health Care: What's Next?

A Health Section Strategic Initiative

By David Dillon

The stated purpose of the Affordable Care Act (ACA) was to provide affordable health care to all Americans. The ACA has seen many successes since its passage in March 2010, including a marked reduction in the number of uninsured and a reduction in uncompensated care. While the ACA has reduced the uninsured rate, the health insurance markets have produced much higher premium increases, significant volatility and instability with much less insurer participation than initially expected. With this as the background, the new administration has an opportunity to reshape the health insurance market.

On March 6, the U.S. House Energy and Commerce Committee and the Ways and Means Committee released the American Health Care Act (AHCA) to repeal and replace the ACA. While the AHCA may not ultimately become law, many of its proposed provisions are attempts to address key issues that are still impacting the commercial health insurance market.

UNDERSTANDING THE PROPOSED CHANGES

Some initial insight regarding the AHCA includes:

> Even though the AHCA may not ultimately become law, this initiative is designed to be an anthology series that will focus on education and research for health actuaries and other interested parties regarding all outstanding issues that remain with the ACA.

- Enhanced benefit flexibility could create a higher number of enrollees; however, anti-selection issues would still likely be present.
- The 30 percent continuous coverage penalty is likely not severe enough to spur additional enrollment.
- Tax credits may help young enrollees, but they may not be enough to prompt enrollment.
- Tax credits may provide less financial relief for lower-income enrollees than the current subsidized structure.
- The proposed age curve shift from 3:1 to 5:1 may reduce rates for younger enrollees; however, rates for older insureds may increase.
- The HSA and FSA contribution provisions may give certain segments of the population enhanced financial security for funding of health care.
- The state health program stability fund will allow states financial control, which can be viewed as positive due to the highly distinct populations across states.
- The proposed reductions in prevention and public health funding may impact the ability to control current and future costs of care.

EDUCATION AND RESEARCH

It is in this climate of impending change that the Health Section Council is introducing a new initiative: Commercial Health Care: What's Next? Even though the AHCA may not ultimately become law, this initiative is designed to be an anthology series that will focus on education and research for health actuaries

and other interested parties regarding all outstanding issues that remain with the ACA.

The initiative will focus on the following key underlying issues that all health actuaries should understand about the current health insurance market and where it may go in the future:

- High risk/reinsurance pools
- The impact of age rating limitations
- Impacts to the small employer market
- The impact of the individual mandate
- Modified benefit structures/changing the definition of health insurance
- Health savings accounts/high-deductible health plans
- Market stabilization
- Tax credits/subsidies

The intent of this anthology is to provide substantial educational material for practicing health actuaries, and, where possible, to share research findings related to these topics. Other topics may be added as the health insurance market evolves over the coming year.

THE TEAM

The Health Section has been fortunate enough to receive commitments from an outstanding group of volunteers to help inform and educate other health actuaries about upcoming health care reform. The current initiative team includes:

- David Dillon, vice president and principal, Lewis & Ellis Inc.
- Christopher Coulter, actuary, Cambia Health Solutions
- Greg Fann, senior consulting actuary, Axene Health Partners
- Jackie Lee, vice president and principal of Lewis & Ellis Inc.
- Liz Leif, president, Leif Associates Inc.
- Doug Norris, principal and consulting actuary, Milliman Inc.
- Julie Peper, principal and senior consulting actuary, Wakely Consulting Group
- Trey Swacker, senior director and actuary, Aetna

In addition to this team of volunteers, insight will be provided through the efforts of SOA staff: Joe Wurzburger, Health staff fellow, and Rebecca Owen, Health research actuary.

LOOKING FORWARD

Over the next few months, this series of education and research articles will be released and updated in the online version of *The Actuary* magazine, the *Health Watch* newsletter and the Health Section website.

We look forward to you joining us as we begin to inform and educate about such an important issue that affects everyone's lives. ■

David Dillon, FSA, MAAA, is partner and consulting actuary at Lewis & Ellis Inc. He can be reached at *ddillon@lewisellis.com*. David has been appointed to chair the Commercial Health Care: What's Next? strategic initiative by the Health Section Council.

Selling Health Insurance Across State Lines

By Lawrence Mitchell

Editor's note: This article was originally published by the Conference of Consulting Actuaries. Reprinted by permission.

There is considerable discussion concerning the revision or replacement of the Affordable Care Act (ACA). One of the revisions is to allow an insurance company to get a policy approved in any state[1] and then sell it in any other state without having to meet any of the requirements imposed by the other state. The proponents assert this will lead to more competition, which will lead to lower premiums for health care services.

Although the topic entails all health insurance, this paper concentrates on the confluence of these principles as they apply to the small group and individual market, with additional focus on individual health insurance premiums. In most instances, large group plans have the ability to enroll eligible persons across state lines, as long as they are members of the group.

This paper discusses various aspects of the suggested revision and comes to the conclusion that, absent changes in the uniformity of benefit, rate and underwriting reforms required by the ACA, cross-state selling in and of itself:

1. Will produce no change in health care costs, and
2. Could result in less competition.

PROLOGUE

A basic tenet of the free market school of economic theory is that competition leads to more efficient production of products, which, therefore, results in lower costs to the consumer.

One of the continuing problems involved in the financing of health care services is the persistent rise in the cost of premiums charged by insurance companies to provide health insurance.

Applying the basic tenet concerning competition to the problem of rising premiums, many observers have proposed to encourage competition by allowing any company licensed in any state to market health insurance in any other state if the product was approved in any state.

A basic premise of capitalism is that the sale price of an item should be sufficient to cover the cost of the product, including its costs of developing, manufacturing, marketing and distributing, plus an amount for profit or risk or for the development of other products.

With respect to health insurance, the premiums charged by an insurance company must be sufficient to pay the benefits promised plus the costs of doing business, with a margin for risks, contingencies or addition to surplus.

In the larger group market, we assume the buyer or its consultants are sophisticated and can negotiate a fair premium rate for a given set of benefits. In this market, purchasers have the means to hire specialized employees or consultants to represent their interests when negotiating with insurers.

On the other hand, in the smaller group and individual markets, the sophistication leans heavily in favor of the insurance company, with very little ability of the consumer to negotiate on his or her own. Therefore regulators have a role to play to even the playing field between consumer and insurer.

CURRENT STATUS

Currently each state has the right to and does issue its own laws concerning health insurance and insurance companies. These laws detail, to varying degrees, almost every aspect of the business of insurance. These include such things as financial requirements for entry into the market as well as remaining in the market, limits on who may be involved in ownership or management of the company, types of policies that may be offered, types of providers that must be covered, whether these policies and their premium rates need to be approved by regulators, the ability of consumers to appeal, and mandating not only what benefits must be included, but what may be excluded.

For insurance intended to cover the wide range of medical needs, the federal government, through the ACA, has mandated a minimum set of benefits (which are very comprehensive compared to the pre-ACA market in most states), a restriction on the variation in rates by age, and a limit upon the portion of the premium that may be allocated to anything other than the benefits or taxes. For individual policies, this latter limit is approximately 20 percent of the premiums charged to all policyholders in the individual market in the state.

Individual states retain the right to approve policies and their rates and to require broader benefits.[2] However, the ACA removed the ability of states to allow the sale of medical policies that offer fewer benefits than those mandated by the federal law, thereby resulting in significantly less variation in benefits among the states than prior to implementation of the ACA.

The ACA allows the U.S. Office of Personnel Management (OPM) to oversee the selling of health insurance in a manner similar to that of selling across state lines.[3] It does require the states to agree to participate. Approximately 36 states are participating in this.

In summary, under the ACA, we have a federally mandated set of benefits,[4] a federally mandated limit on the gross profit of an insurance company, and a federally mandated set of rating rules[5] and underwriting rules as well as variations in premium rates presumably reflecting differences in costs.

Currently, there are many insurance companies that sell across state lines even though they must modify their policies to meet the standards of each state in which the policy is sold.

ADVANTAGES TO AND OTHER EFFECTS UPON THE INSURANCE COMPANY

What are the advantages to an insurance company of being able to get a health insurance policy approved in one state and sell it in any other state without meeting any of the requirements of the other states?

Among the states and territories, there is a widespread variation in laws and regulations concerning such items as:

- Financial requirements of the insurance company
- The relationship between premium rates and expected claims. The ACA has a retrospective restriction, the Minimum Loss Ratio, that requires the insurance company to pay 80 percent of the premium as claims or refund to the policyholder. In setting premiums, the states (and insurance companies) vary in the approach they take toward the estimates of prospective claims. This results in a variation in the acceptable premium rates.
- Types of medical providers (hospitals, doctors, pharmacies, etc.)
- Breadth of coverage

In addition to the ACA standard benefits, some states have added a few of their own.

- Process for claims appeal
- Policy language (what must be included)
- Advertising of policy benefits
- Size of type used in policy

By requiring approval in only one state, the insurance company eliminates the expenses it would have in filing in other states. It eliminates the variations in benefits, premium rate requirements and all the other variations needed to meet the other state's requirements. On the other hand, it still must meet the benefits and premium rate limits that are mandated by the ACA.

Theoretically, an insurance company whose policy is approved in a state with the fewest number of additional mandates can price the product at a lower premium than the insurance company whose policy is approved in a state with additional mandates.

The reduction in premium level is achieved on a number of fronts, including:

1. The elimination of the costs involved in filing in each state
2. The elimination of the marginal costs for mandated benefits
3. For some, the reduction in the capital and surplus required of the insurance company. Some territories have very low capital and surplus requirements.
4. Avoidance of paying premium taxes in the other states. States may have difficulty collecting premium taxes from an insurance company that is not licensed to do business within that state.

In the individual and small group market, insurance companies that do not provide coverage for the additional mandated benefits will have a price advantage. If they do not have to pay premium taxes in those states, the advantage is compounded.

As a result, insurance companies, large and small, will be forced to gravitate to the jurisdiction with the least amount of oversight and regulation in order to take, maintain or attain a competitive advantage.

Eliminating mandated benefits does not, by itself, decrease the overall costs of health care. It only decreases the portion of health care expenses to be covered by the insurance policy. On the other hand, requiring health insurance companies to cover these benefits usually increases the utilization of these

Eliminating the requirement to be licensed in other states will allow smaller, regional companies to compete in other states.

benefits, the charges made by providers for these benefits, and the administrative expenses of the insurance companies. This results in a need for an increase in premium rates.

Eliminating the requirement to be licensed in other states will allow smaller, regional companies to compete in other states. However, they will face a major obstacle, which is the establishment of a provider network with competitive reimbursement levels.

A primary factor in reducing the costs of health care, while maintaining the good health of the individual, is to limit services to those doctors and other medical professionals who will provide the right service at the right time for a reasonable cost. Insurance companies' networks should be established within that framework.

It will be extremely difficult for a small regional insurance company to enter a new market and find a significant number of providers who will agree to the discounts and limitations similar to those granted to those insurance companies with large blocks of insureds.

It is also difficult for a new insurance company to be able to initially price its product appropriately. There are a number of factors causing this, including:

1. Health care costs vary dramatically from one community to the other. The data used by an insurance company to price its policy is based upon its own experience. The claim costs in another state will not be the same, and the insurance company will have to estimate the differences. Companies can hire consultants who have information on costs across the country, but this will be an additional expense, and their estimated costs may not reflect those that the company will incur because of differences in claims practice and enrollment.

2. The market is such that insureds tend to stay with the company with which they are familiar. The newly arrived insurance company will find its initial policyholders include a large number of persons who are discontented with their previous company and who have higher-than-average claim costs.

If, as a result, the insurance company has underestimated the costs, it can face a large loss from which it may take a long time, if ever, to recover. The ability to replace capital resulting from losses is limited by the minimum medical ratios in the ACA. Therefore, once a loss is sustained, it may require multiple years to replace this capital via normal business practices because the insurance company cannot raise future premium rates to include a recapture of the amounts it lost in prior years.

In the free market business of insurance, the companies with the biggest surplus will be able to subsidize their health insurance line. By undercutting the premium needed, they will force the smaller companies to leave the market. This is contrary to one intention of the proposed revision.

The bigger surpluses of the larger insurance companies give them another advantage in having the capital to establish the provider networks needed to be competitive.

Based upon examinations of minimum loss ratio exhibits, the amounts attributed to general overhead, excluding claim administration and marketing, were less than 4 percent of premium. Therefore, if we eliminate the state-mandated benefits and eliminate the need for insurance companies to get approvals in every state, it would be surprising if the initial effect would be to reduce the premiums materially. However, this will not stem the overall health care cost trends. After the initial dip, the premium rates necessary to cover the costs of the benefits will continue to rise.

Some states, such as New York, do not allow insurance companies to charge a rate that varies by age. They require a rating basis that averages the costs of all the persons insured by the insurance company within the community, often referred to as pure community rating.

A company subject to this pure community-rating requirement will be at a tremendous disadvantage in competition with a company selling across state lines. The latter is allowed to vary premiums by age. As such they can charge younger persons less than older ones.

If both insurers provide the same benefits, younger persons will buy coverage from the out-of-state insurance company. This will drive the average claim costs of the domestic insurance company higher and result in an increase in the pure community rate. The cycle continues. As the pure community rate goes higher, more people gravitate to the out-of-state insurance company. Eventually, the domestic insurance company will be left with only the very old and sick persons.

The domestic insurance company is left with three choices:

1. It withdraws from the state, leaving the market to the out-of-state insurance company.

2. It withdraws its health insurance policies from the state's approval and, if its domestic state permits it, develops a policy that is approved in another state that can be age-rated. It then returns to its domestic market as if it was a foreign insurance company.

3. It moves its state of domicile, which is a drastic measure and one that would not be taken lightly, or forms a subsidiary in the other state and allows the subsidiary to sell using the parent's provider network and marketing and administrative resources.

STATE OF UNINTENDED CONSEQUENCES

The intent of permitting insurance companies to sell across state lines is to increase competition and reduce the costs of health insurance. There is a good possibility the most likely scenario will be to decrease competition and, without affecting the cost of health care, allow premium rates to increase faster than required by the rise in health care costs.

Competition will decrease because the larger insurance companies are in a better position to:

1. Buy business (by subsidizing premiums in order to increase their market share)
2. Maintain the networks of providers needed to reduce costs and improve the quality of health care
3. Market the product

These practices will make it extremely difficult for smaller companies to make a profit in these markets. As a secondary result of the lack of competition, premium rates will rise even if the 20 percent cap on gross profits remains in effect.

Many states have strict controls on the premium rates a company can charge. There are a number of jurisdictions concerned only with whether the premium rates are sufficient to pay the expected benefits and are not concerned with the level of expected loss ratios.

Therefore, once an insurance company has the major share of insureds in a state, it can increase its premium beyond that which might be reasonable for an expected 80 percent loss ratio. Even though it must return 80 percent of the gross premium as either claims or premium refunds, it keeps a larger dollar amount.

For example, let us assume the health care benefit costs are $76,000,000 for the year. In a competitive environment, the insurance company may have charged $100,000,000. In this case, it refunds $4,000,000 and keeps $20,000,000 expenses and profit. Without competition, the insurance company might charge $125,000,000. The refund becomes $24,000,000 and the insurance company retains $25,000,000 for expenses and profit. In this scenario, the insurance company has incurred almost no additional expense and the extra $5,000,000 goes directly into surplus. Though the insureds' refund is increased by $20,000,000, they had to pay an extra $25,000,000 in premiums to receive it.

EPILOGUE

As noted in this paper, premiums must be adequate to pay the costs. This was true before the ACA. It is true during the ACA and it will be true with whatever, if anything, replaces or revises the ACA.

If we want to lower the costs of health care, we must focus on those factors involved in the cost of providing health care. When health care costs are lowered, then premium rates will follow. ■

This article was authored by Larry with inspiration from discussions generated from the Conference of Consulting Actuaries (CCA) Healthcare Community and is being submitted to further the conversation among actuaries and non-actuaries alike. These comments do not necessarily reflect the views of the CCA, the CCA members or any employers of CCA members, and should not be construed in any way as being endorsed by any of the aforementioned parties. We welcome other opinions and thoughts on the subject.

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ENDNOTES

1 A state means the 50 states of the United States of America, the District of Columbia and the U.S. Territories.

2 From Kaiser Health News: State coverage mandates vary widely. They may require coverage of broad categories of benefits, such as emergency services or maternity care, or of very specific benefits such as autism services, infertility treatment or cleft palate care. Some mandates require that certain types of providers' services be covered, such as chiropractors. They may apply to all individual and group plans regulated by the state, or they may be more limited.

3 *https://www.federalregister.gov/documents/2015/02/24/2015-03421/patient-protection-and-affordable-care-act-establishment-of-the-multi-state-plan-program-for-the*

4 Technically there is slight variation across state lines for ACA-mandated benefits because each state was allowed to establish its own essential health benefit benchmark plan. However, since the 10 required essential benefits were identified in federal legislation, the variation among states due to variation in benchmark plans is minimal.

5 There are a few states that have adopted even stricter rating rules than those required under the ACA (New York and Vermont have pure community rating), and a couple of states have adopted unique age curves.

A Side Order of Health Insurance

By Greg Fann and Dustin Tindall

"What comes with the crab-crusted grouper?" is a reasonable question that might be asked by an actuary enjoying a coastal dinner while attending the Society of Actuaries Health Meeting in Hollywood, Florida. It is our dietary custom to eat multiple items in one sitting, usually a large entrée accompanied by several "side orders." In our culture, a meal is generally not regarded to be complete unless several food sources are represented.

Contrary to our customary meals, major medical insurance has traditionally provided a complete spectrum of benefits through a single product. Recent developments, spurred by the Patient Protection and Affordable Care Act (ACA), are changing that dynamic. The amalgamation of individual and small group major medical products with gap insurance products to provide complete coverage is becoming an attractive option for individuals and employers alike. Gap insurance, or supplemental insurance, has some history in commercial markets but the ACA has created a new relevance. As medical costs increase and average benefit values of major medical plans decrease, out-of-pocket costs are growing to levels that warrant additional insurance consideration. Gap insurance products provide coverage for out-of-pocket costs that may complement major medical benefits to offer comprehensive coverage.

A similar concept exists with private insurance in Canada and with Medicare Supplement products in the United States. Over time, Medicare Supplement products have become more standardized and uniformly regulated. Gap insurance products in the commercial market are in the development stage from both a product and regulatory standpoint. The prescribed allowance of small employers to fund health reimbursement accounts to provide individual coverage[1] may add an additional layer of complexity for employers utilizing multiple sources to customize complete health benefit packages.

Might it become customary to ask an insurance broker, "What pairs best with a Bronze PPO?" perhaps with a wine-snob voice impression? Will employers be interested in providing multiple and complementary benefits to their employees if there are cost savings to be achieved? This article explores the developing gap insurance market and offers some considerations for health plans, actuaries, employers and individuals.

BACKGROUND

Medical gap insurance is an insurance policy designed to cover out-of-pocket costs not covered by a member's major medical insurance policy. We will refer to this as the primary product throughout the article. There are many different designs and they are often labeled under different names including supplemental insurance, gap insurance and hospital indemnity. Throughout the rest of this article we will collectively refer to these products as gap insurance even though they do have differences in the way they are administered.

As out-of-pocket expenses for health care continue to increase, gap policies are seen a viable option to help shield members from these expenses. Historically, most gap policies have been sold through channels not connected to a primary major medical policy, which adds a layer of complexity for the member. This often requires having the members wait for their explanation of benefits (EOB) from their primary plan before they can submit their claim to the gap insurer for reimbursement. This process can take weeks or even months as claims are processed by the primary insurer. Alternatively, a member may be required to carry two insurance cards to a physician's office to have multiple coverages timely applied.[2]

BENEFIT DESIGNS

Gap policies should be recognized and marketed as supplemental products to complement major medical plans. They should not be confused with mini-med products or short-term policies that are alternatives to major medical coverage.

Gap insurance labeled under hospital indemnity products pays a defined benefit per service (e.g., per day, per visit) up to a maximum benefit. The products range in the covered services,

with some only covering hospitalization while others have a benefit for MRIs, labs, office visits or other services. Products more traditionally labeled gap insurance cover all or partial amounts of members' out-of-pocket expenses related to their primary policies. Typically, gap insurance that covers a member's cost-sharing is designed around a maximum benefit that is chosen by the member. However, only certain services might be covered up to the maximum benefit, while others might have a specific dollar cap or a cap as a fraction of the maximum benefit. Traditionally, inpatient hospital services will have coverage up to the maximum benefit, and outpatient and professional services will be covered as a percentage of the maximum benefit or at a fixed dollar amount.

Gap policies from traditional supplemental insurers are designed not to be specific to any one primary plan.

RISK MITIGATION

Depending upon enrollment mechanisms and regulatory requirements, gap issuers have taken different steps to protect against anti-selective risk. Products sold through voluntary employer channels assume some benefit from "actively at work" and sometimes require minimum group participation rates. Individual sales are more likely to be underwritten and usually have waiting periods for pre-existing conditions. Rates typically vary by age bands that are not constrained by the ACA. Legal status of "excepted benefits" means that gap products are exempt from the market rules and other mandates imposed by the ACA. Essential benefits are not required and individuals have more flexibility to tailor insurance coverage to their perceived needs.

GROWTH AND OPPORTUNITIES

Cost-sharing provisions serve several purposes within a health insurance policy. First, they reduce premium costs and allow insureds to manage some of the risk associated with health care costs. Second, they provide some transparency and responsibility, and are intended to incentivize a responsible use of health care services. Third, cost-sharing is sometimes varied by benefit level to provide incentives for cost-effective services or site of service.

The rise in cost-sharing levels warranting additional insurance considerations is due to several factors. As we all know, medical costs increase each year at higher rates than other consumer goods. The ACA market rules and essential benefits have given rise to additional costs within ACA markets. Employers often use benefit adjustments to lower annual increases in health insurance premiums. Health savings accounts have increased the prominence of high-deductible plans in the market.

Some commentators have described the potential "sticker shock" of high deductible as a need for additional risk mitigation. In addition to the need for insurance, the rise of consumerism and customized benefit options allow individuals to choose insurance policies based on their needs, preferences, risk tolerance and lifestyle.

The rise of consumerism and customized benefit options allow individuals to choose insurance policies based on their needs, preferences, risk tolerance and lifestyle.

The growth in the gap insurance market has some attribution to the supply side as well. Some insurance agents have been squeezed out of the exchange markets or have accepted lower commissions. Growth is driven externally by agents who may be less active in the new exchange markets and corporate advertising.

As discussed earlier, most gap policies have been sold without an administrative connection to major medical insurance, generally by third-party gap insurers. This creates an opportunity for traditional health insurers. First, having the same insurer hold both the primary and gap product will be simpler from the insured's perspective. No longer will they have to manually submit their own claims as the gap policy can be administered alongside their primary product. However, the degree of integration between the two might be limited due to regulations that may vary by state. Second, the primary insurer has another avenue to get its members the level of coverage they prefer. If you think about it from a group setting, an insured individual may only be offered a limited number of plans. If an insurer offers several gap policies that are a derivative of the primary plans offered in the group market or individual market, individuals can now pair one of those with the primary policy to create a synthetically richer plan that provides the coverage they want.

As an example, an individual wanting gold-level coverage but not all the essential benefits may appreciate the opportunity to purchase a bronze plan and a gap plan that provides the other 30 percent of desired coverage. The opportunity may translate to lower prices through bundled coverage. Some brokerages have taken proactive steps to pair ACA product coverages with gap plans and build holistic coverage for employers through different channels.[3]

With this in mind, a traditional major medical insurer entering the gap insurance market should be designing products to integrate with their primary policies. As an example, if a primary plan has reasonable copays for imaging and other outpatient services, the related gap product doesn't need to cover these

services and might only need to cover inpatient services. This in turn lowers the rate of the gap policy and helps prevent the member from overpaying for duplicated services that the traditional supplemental insurer cannot do.

BENEFIT/PRICE OPTIMIZATION

In ACA markets, the annual calendar cycle combined with a finite number of benefit plans and associated premium rates allows a comparison of plan options. These plans can be extracted and paired with gap plans to compare coverage and premium rates. For example, the premium sum of a bronze plan and a gap plan that equate to the coverage of a gold plan can be compared to the gold plan premium. With fixed plan designs and prices in place for an entire year, optimization can be applied to achieve the targeted benefit level at the lowest price. Alternatively, a fixed contribution could be applied to achieve maximum benefit value.

Actuaries will need to rethink how they measure benefit values. Typically, models have been built off traditional group experience and compressed into an Excel file or two with the output being a single allowed and paid per member per month (PMPM) and the ratio between the two with no distinction between classes of members. When it comes to pairing ACA products with gap insurance, only certain classes of members may benefit, and one will need to find these arbitrage opportunities. Therefore, the next generation of benefit models will need to keep all the member details (e.g., age, gender, risk class) as well as the detailed claims data to model how the different classes of members perform under single primary coverages vs. primary plus gap coverage.

CHALLENGES

There are several challenges a major medical insurer is likely to face as it enters the gap insurance market, with regulatory being the most significant. This article is not intended to be an exhaustive expose of the regulatory hurdles an insurer is likely to face as regulatory challenges are likely to vary by state. In summary, the challenges an insurer is likely to face are stipulations on what supplemental coverage qualifies as group health insurance. Regulators might also have concerns and reservations surrounding dual marketing of gap insurance with major medical policies. In addition, there are myriad unsettled tax considerations for both employers and employees that are beyond the scope of this article.

Other challenges an insurer is likely to face include claims processing and billing, as well as administration of a new product. An insurer is already doing claims processing and billing, but getting an insurer's existing claims processing billing system to handle multiple products efficiently is likely harder than it sounds and may even require a new system. In addition, selling gap insurance is going to require additional training to customer service representatives as well as to any individual involved with the distribution and sales of the gap product.

CONCLUSION

The ACA has created opportunities for the emergence of new products. Proposed repeal legislative efforts suggest a continued trend toward leaner major medical benefit options. Gap insurance gives individuals the opportunity to seek a portion of their coverage outside of the more heavily regulated market. It provides agents the opportunity to educate consumers on new options and earn commission volume that may have been reduced by ACA regulations.

Gap insurance provides traditional health insurers an opportunity to enter a growing market as well as the opportunity to rethink how they want to provide insurance solutions to their employer groups and members. Modeling techniques that pair coverages to optimize benefits and price may provide the benefit package that will leave employers and individuals completely satisfied, and we haven't even talked about dessert. ■

The views expressed herein are those of the authors alone and reflect current information as of March 2017. They do not represent the views of the Society of Actuaries, Axene Health Partners LLC or its consultants, or any other body.

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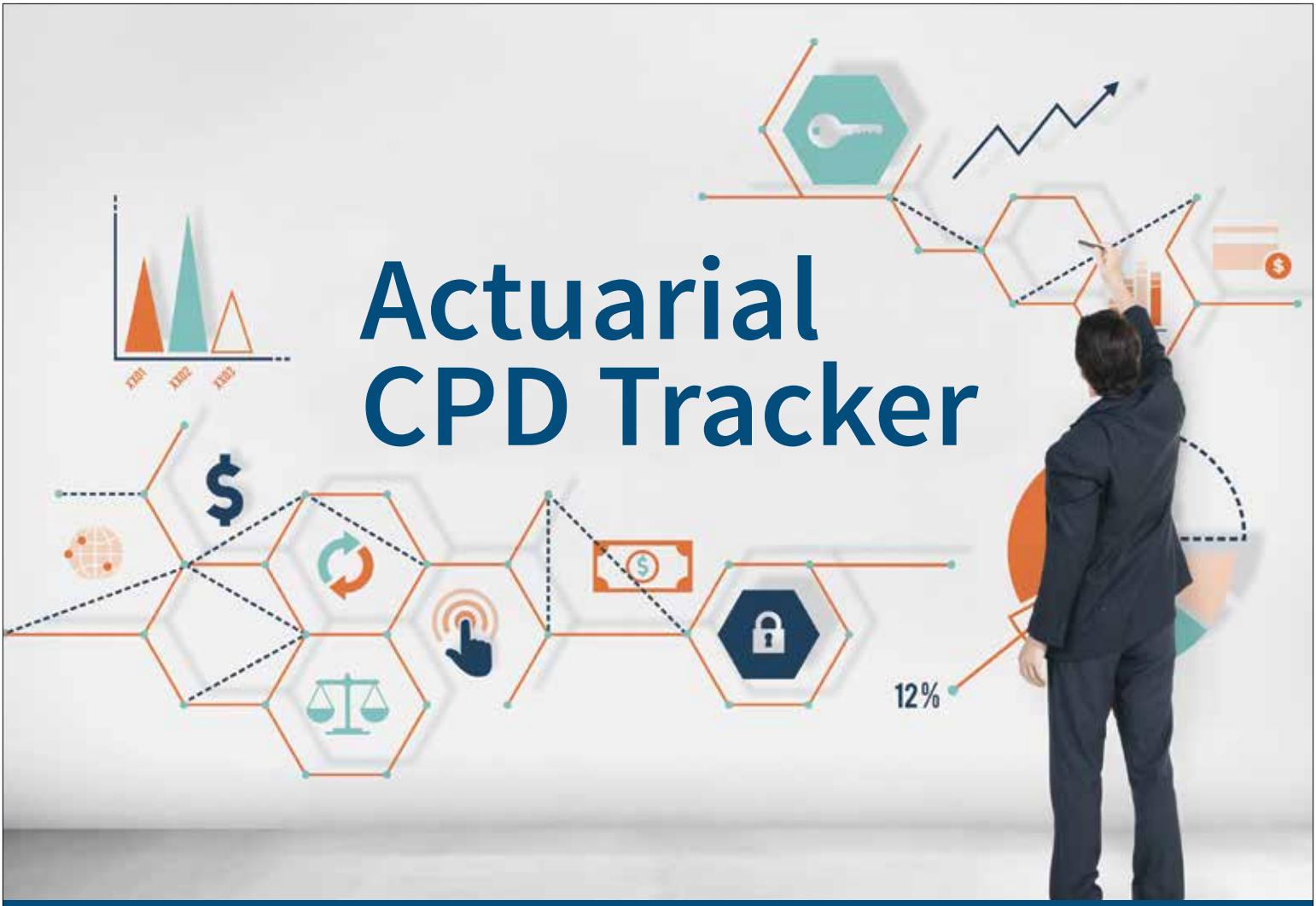

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Dental Diagnosis Coding: The State of the Art

By Joanne Fontana

Diagnosis coding is an integral part of health care. The diagnosis codes on a patient's health record provide critical information to clinicians, insurers, government payers and quality managers alike. Prior to 1966, medical care did not have a standard procedure or diagnosis coding standard, making it difficult to track treatment and diseases. Effective diagnosis coding informs patient treatment plans, claims payment, development of clinical best practices, and population risk assessment and adjustment. While the practice of coding medical diagnoses and the related nomenclature have been established for decades, no such standard has existed for dental care. Work is underway to change this, so that the dental care industry can reap the benefits from clear and consistent diagnosis coding practices. As actuaries, we should be aware of the continuing progress being made with respect to dental diagnosis coding and consider how we can begin collecting and using the information to better manage our business.

HISTORY AND USES OF MEDICAL CODING

At their core, diagnosis codes represent a standardized system by which diseases, disorders, injuries and other medical problems may be classified. In fact, they were initially developed in England during the 1600s to classify mortality rates by cause. Over time, the level of sophistication of coding improved and the uses of diagnosis codes expanded from assessing the cause of death to also tracking clinical diagnoses, eventually leading to an internationally utilized classification system: the *International Statistical Classification of Diseases, Injuries, and Causes of Death*, or *ICD*, maintained by the World Health Organization.[1] The ICD is periodically updated; the 10th revision, ICD-10, is largely in use today, with ICD-11 slated to be released in 2018.[2] In the United States, the National Center for Health Statistics developed an adaptation of the ICD-10 codes called ICD-10-CM, where CM stands for "clinical modification" to indicate the codes' focus on morbidity rather than mortality. ICD-10-CM is, therefore, different from the international ICD-10, and is the code set currently in use in the United States, having replaced ICD-9-CM effective Oct. 1, 2015.[3]

Current Procedural Technology or *CPT* codes were developed by the American Medical Association (AMA) in 1966 to better document professional procedures performed on patients in their medical records. CPT codes later became the standard basis for claims payment when they were designated by the Centers for Medicare & Medicaid Services (CMS) as a requirement for Medicare billing, and today they are widely used in the health insurance industry as a determinant for claims payment.

A companion code set are the Current Dental Terminology or CDT codes, which the American Dental Association (ADA) maintains as of 2010. Prior to that, CDT codes were part of the CMS Health Care Common Procedure Coding System D-codes, known as HCPCS and pronounced "hic pics," which began use in 1978.

Under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), designed in part to protect individuals' health information and provide protections for group health plan participants,[4] CMS mandated a standard code set that included ICD, CPT and HCPCS codes,[5] further solidifying the near-universal use of both code sets in health care diagnosis and treatment in the United States.

Procedure codes such as CPT, HCPCS and CDT codes indicate the services performed on a patient, while ICD codes indicate the symptoms or diagnoses associated with the services; together they provide a more complete picture of each claim. With the information available from ICD and procedure codes, health claims may be studied in many different ways, providing critical knowledge to improve the quality of care, the cost of care, and overall population health.

- Medical coding allows for a *standard documentation nomenclature* across the medical community. Patients' information coded during a visit with a particular provider as a component of their electronic health records may be easily understood and interpreted by different doctors, improving care efficiency and appropriateness.
- By analyzing procedure and diagnosis codes across a large population, health agencies and governments can *track and better understand health trends, epidemics or other broad health issues*.
- Medical providers may use downstream information to understand how health problems or diseases are treated, and the outcomes associated with treatment, in order to *develop best practices* to improve the efficiency, efficacy and quality of treatment.
- Insurers use the information to *determine medical necessity, whether a service should be covered, and to pay providers the appropriate contracted amount* for the service. Providers who do not completely or accurately code services risk not being paid by insurers.
- *Risk adjustment* mechanisms used to adjust payment to entities such as accountable care organizations (ACOs) and Medicare Advantage plans utilize diagnosis codes along with other factors to assess the morbidity of the population served, normalizing payments accordingly.
- Insurers or provider groups can monitor and improve outcomes for high-need groups of people (e.g., those with diabetes, heart disease) via *disease management* programs by properly identifying those plan members using diagnosis codes.

CODING DENTAL CLAIMS

The Code on Dental Procedures and Nomenclature (CDT), developed and maintained by the ADA, represents the standard vocabulary for dental procedure coding. The codes are similar to CPT codes and were designed to "achieve uniformity, consistency, and specificity in accurately documenting dental treatment."[6] Like CPT, CDT is listed as a HIPAA standard code set and is required for HIPAA-compliant electronic claims submission.[7]

While CDT codes describing what dental services have been provided are commonplace, codes indicating dental diagnoses are not frequently used today. Several newer CDT codes include an indication of diagnosis within them. For example, the 2017 version of CDT includes code D4346, "scaling *in the presence of generalized moderate or severe gingival inflammation*—full mouth, after oral evaluation."[8] While these additions are somewhat useful they are not a substitute for a comprehensive diagnosis coding system.

With the information available from ICD and procedure codes, health claims may be studied in many different ways, providing critical knowledge to improve the quality of care, the cost of care, and overall population health.

ICD codes include a comprehensive set of dental as well as medical diagnoses, but dental providers do not commonly record the ICD codes. There are, however, a few exceptions. Several state Medicaid programs require ICD codes on dental claim forms under certain circumstances. This requirement varies by state. However, most of these programs collect diagnoses on dental claims for the purpose of validating that the recipient falls into a group receiving enhanced benefits (e.g., pregnant or disabled individuals)[9] or has a chronic condition (e.g., diabetes) that requires services such as dental cleanings. As of 2015, only Nevada required ICD codes to be populated on every Medicaid dental claim submitted.[10] In addition, when commercial dental plans allow for differentiated benefits based on a member's medical condition—extra periodontal treatments for a patient with diabetes, for example—those plans may also require the dentist to submit the ICD code to be reimbursed.[11]

While ICD is being used in pockets of the dental industry, another dental diagnosis coding system is also gaining traction. The Systemized Nomenclature of Dentistry, or SNODENT, is owned and maintained by the ADA. A coexisting academically oriented dental coding system, DDS (known previously as EZ codes), has been synchronized with SNODENT. This means that SNODENT now represents the full code set while DDS, which is being renamed SNO-DDS to reflect adherence with SNODENT, will be used in provider interfaces, producing a coordinated, unified standard for dental diagnosis coding.[12]

ICD and SNODENT diagnosis codes may be mapped to each other, but as of today there is not a single source for such a map; in order for dental diagnosis coding to become more universally understood, the two code sets must be coordinated or a single standard code set must be promulgated. The federal Department of Health and Human Services had been considering the relative qualities of ICD and SNODENT with the goal of choosing one standard dental code set. However, it is unclear

More consistent, widespread coding of dental diagnoses at the point of care could transform the way dental care is delivered, dental claims are paid, and dental disease is managed and mitigated.

if that work will be prioritized by the new administration or whether the effort will lose traction.

DENTAL CODING: THE POSSIBILITIES

More consistent, widespread coding of dental diagnoses at the point of care could transform the way dental care is delivered, dental claims are paid, and dental disease is managed and mitigated. Across the industry, leading-edge dental organizations are already promoting the capture and use of diagnosis codes to improve dental care. For example, at the DentaQuest Oral Health Center in Westborough, Massachusetts, diagnosis codes are part of a transition to a disease management culture, allowing for better treatment of patients and clearer communication among clinicians. Diagnoses are captured in the electronic dental record and are used to create a risk-based treatment plan to control a patient's tooth decay and reduce the risk of future disease. In addition to analyzing disease at the patient level, the information also allows for population-level analyses; clinical outcomes and disease prevalence can also be tracked and monitored over time.[13]

The Dental Quality Alliance (DQA), established by the ADA to develop performance measures for oral health, is currently testing a "starter set" of quality measures for adult dental treatment. Included are such services as periodontal oral evaluations and periodontal services for adults with a history of treated periodontitis, topical fluoride for adults with elevated risk for caries, and dental emergency room visits and follow-ups.[14] However, advancements in quality measurement in dentistry are curbed in part because of a "lack of an organized system relating disease risk to diagnostic measures," and understanding oral health outcomes is limited "partly because dentistry does not have a tradition of formally reporting specific diagnoses or associating such diagnoses with specific services, especially through the claims process."[15] Clear, consistently used diagnosis codes would enable easy identification of target populations such as adults with high risk of tooth decay or periodontal disease and allow for outcomes measurement of treatments focused on those patients.

In addition to improving quality via evidence-based patient treatment plans, better tracking and managing a population's oral health, and better outcomes measurement, diagnosis codes could be used to develop risk adjustment methodologies and provider performance management criteria. Providers' scores on quality and outcome measures are dependent on the underlying populations they serve; adjusting providers' performances for case mix allows for comparability of outcomes across providers with disparate patient characteristics. Meaningful outcomes measurement and development of provider reimbursement or reward mechanisms based on clinical quality measures require an understanding of, and adjustment for, the underlying disease profile of patients. In a report for DQA, Dr. Jill Boylston Herndon writes that, in considering implementing risk adjustment protocols for dental, "the single, largest current limitation in dental clinical data is the lack of consistent, standardized, and widespread reporting of dental diagnoses."[16] While medical claims data contains the necessary detail to implement risk adjustment practices, dental claims data is not yet at that point.

MOVING FORWARD

Much of the dental industry recognizes the importance of diagnosis codes to promote progress in oral health, but it will take time for coding of diagnoses to become widespread and for the uses of the new information to be fully explored and implemented. DentaQuest Oral Health Center indicates that, in its experience, moving to a diagnosis-oriented disease management approach to dentistry requires significant commitment, resources, training and time, but it is a critical component of improving quality and delivering evidence-based care.[17] Changes to the industry will be challenging: Information systems will need to be enhanced to allow providers to easily

and accurately capture diagnoses; providers will have to be educated and brought on board regarding the importance of diagnosis information; and claims payment systems may need to be revamped to consider diagnoses as part of the adjudication process. Requirements by dental payers to include diagnosis codes on claims submissions could speed up the implementation process system-wide. Massive opportunity exists for payers to utilize the additional information gleaned from diagnosis codes to improve clinical outcomes, plan costs and provider reimbursement. Potential uses range from streamlining claims adjudication, implementing and monitoring disease management programs, developing new dental plan designs and new dental premium rating methodologies, examining alternative provider reimbursement mechanisms based on outcomes rather than just services performed, and rating provider quality.[18]

Diagnosis coding for dental claims will ultimately lead to transformative changes in dental benefits, claims payment and provider reimbursement, clinical practices, and outcomes and performance measurement, as those elements become standard as they have already in the health care industry. Entities within each component of the dental care system—providers, payers, government agencies, quality managers—who take the leap to adopt diagnosis coding and begin to discover the benefits of doing so will help the industry move farther and faster down the path of improvement. Actuaries working within the dental industry should track this effort and determine whether and how to integrate diagnosis data into their analytical and decision-making processes. ■

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The User Experience

By Evan Morgan, Robert Lang and Michael Gillespie

"I predict that within 10 years computers will be twice as powerful, 10,000 times larger, and so expensive that only the five richest kings of Europe will own them."

—Dr. Frink, *The Simpsons*

"Technology is anything that wasn't around when you were born."

—Alan Kay

"I think complexity is mostly sort of crummy stuff that is there because it's too expensive to change the interface."

—Jaron Lanier

"As far as the customer is concerned, the interface is the product."

—Jef Raskin

There is a sense in which technology is taking greater and greater control of our lives. Cast differently, it can be said that our lives are lived through a multitude of user interfaces. There may come a time in the future when things that are currently identified as user interfaces seem more like paperweights than like useful technological tools. For example, just compare the modern-day laptop to the 100-foot-long, 30-ton ENIAC computer developed in 1946, almost 71 years ago. Seventy years from now, technology may have advanced to a point at which we don't even notice the way we interface with it.

Until then, however, we can try to learn something from all the time we spend semi-consciously engaged with user interfaces. After all, everything we do as actuaries has an end-result for an intended user. Therefore, we should design our work in such a way as to create the optimal user experience (even if that intended user is you!).

As a matter of professionalism, we as actuaries are bound by the Code of Professional Conduct (the "Code") and the Actuarial Standards of Practice (ASOPs). In particular, this falls under Precept 4 of the Code and ASOP 41 for actuarial communications. As a matter of practicality, we like our user experiences to be clear and intuitive. When creating a deliverable, we (hopefully!) don't just paste numbers down into a spreadsheet, and then highlight

and label whatever cell happens to be the last one—say, cell FC10847—as "the answer." What sort of user experience would we be creating by structuring our work in this way? Instead, we take time to create a deliverable that showcases the results and allows the user to quickly understand their importance.

We actuaries should design our work product to create a user experience customized for a particular user—be it your boss, a client, or a reader of *Health Watch*. In the remainder of this article, we consider two case studies of effective user interfaces that have captured the public's attention, identify the common traits or principles necessary to create the ultimate user experience, and then apply them to actuarial work.

iPHONE CASE STUDY

A large percentage of us have an iPhone in our pockets, or in our hands, or within eyeshot at this very moment. Given that so many of us are iPhone users, even right now while you're reading this, it is a prime candidate to review in our discussion of user interfaces. In short, the iPhone is a miniature computer loaded with user-specific applications (apps) in a single menu called "the home screen." One such app allows the user to make phone calls, and despite the name of the device, probably is not the most frequented app by most users. To open an app, the user simply clicks on the home button to turn on the screen and then navigates to the desired app through finger swipes and screen taps. In comparison to other potential user interfaces, it doesn't get much simpler than that. The setup is simple enough that many toddlers can be seen in public using it without instruction—navigating through multiple apps to look at pictures and play games. And yet the interface simultaneously allows enough control to satisfy needy adults (although the neediest may switch to Android).

One of the taglines of the device is: "There's an app for just about anything." Translated for our purposes, this means the iPhone is highly customizable. App developers create apps limited only by their own creativity (and App Store rules and review). And then each iPhone is customized by each user through settings and downloaded apps.

The customizability, however, is limited to whatever is allowed within the iPhone's rigid modular structure. For example, unlike a desktop computer, there isn't a catch-all storage location in which you can stash files. While there have been many complaints about this feature (or lack thereof), this can be considered a deliberate design decision: strategically limited use. The benefit of this decision is that it maintains the simple modular structure of apps on a home screen, and also limits complications due to corrupt files, file types that won't open, and even infected or malicious files. So while this is a limitation that some users may gripe about, it may lead to an improved user experience in which everything works and remains simple.

To generalize, here are the three main design tenets of the iPhone that help create the best possible user experience:

1. Simplicity
2. Customizability
3. Strategically limited use (to maintain simplicity and stability)

FACEBOOK VS. MYSPACE CASE STUDY

Social media platforms provide another example of user interfaces that a large percentage of the population interacts with on a daily basis, perhaps without any thought as to how the features and setup are affecting their experience and time. With more than 200 million users in the United States, Facebook is the perfect example of a social media platform whose user experience draws in people of all ages and backgrounds. The premise is very simple: you create an account, link to your friends, and are able to share and receive updates about your respective personal lives. Additionally, you can follow your favorite companies, sports teams, bands and other organizations in order to receive news updates you might not get elsewhere. Users are in complete control of how they are portrayed on the site. They choose their primary photo, can post updates as often as they'd like, and can even restrict how other Facebook users share information about them.

However, the catch is that all of this control exists within the predefined Facebook structure. Before Facebook became popular, there was a boom in usage of other social media platforms, particularly Myspace. The information was much the same, but the user experience was wildly different. On Facebook, the appearance of your page is predefined and you can only edit existing text boxes or change photos as specified by the site itself. On Myspace, customization was virtually unlimited. Users could move aspects of the page around, assign a new background, and even choose a song to play when other users visited their page. While these features were undoubtedly appealing to a certain subset of the population, they violated the user experience tenet of simplicity and ultimately limited the growth of the site.

Facebook has been successful for a long period of time because of the simplicity of the website. Though additional features have been added over time, Facebook has effectively limited the confusion associated with using the site by maintaining a consistent experience for users. Facebook largely looks the same whether you log on using your computer, cellphone or tablet. The steps to upload a photo or post a picture are the same in any setting and the directions to do so are clearly labeled and easy to understand. The average Facebook user in the United States spends 40 minutes per day on the site. While many of those users might tell you that they'd like to spend less time on the site, they may not realize that the simplicity and consistency of their user experience (often enjoyed through the iPhone user interface) continues to draw them back in.

In summary, if we reference back to the tenets of the iPhone's user experience success, Facebook has also tapped into each of these: it is simple to use, customizable to the needs of most potential users, and strategically limited in its functionality. In comparison, Myspace offered extensive customization at the expense of simplicity and strategically limited use. Which one do you prefer to use?

WHY IS THIS ARTICLE IN AN ACTUARIAL PUBLICATION?

How can the principles and lessons learned from the iPhone and social media networks be applied to our actuarial work? All of our work is created for users—either the party that pays us, a colleague, or even ourselves at a future time. Given that our work often involves a great deal of complexity, conveying that work effectively to a user can be a challenge. How many times have you opened a spreadsheet and had no clue what you were supposed to be looking at? Your eyes jump all over the sheet; you can't distinguish input and output; you don't know which cells are formulaic; and you have to flip sheets endlessly and still don't understand how the workbook is organized. In this case the intended information was not conveyed effectively, and the user experience was negative. This scenario can be avoided by respecting the user and the user experience by making deliberate design decisions.

For example, when developing a model in a spreadsheet, you should consider how easy it is to use. Many analyses are single-use in which ease of use may not be as important as timeliness. (But don't forget how often we repeat analyses that we thought we'd only do once!) Other projects require a model that can be reused by different teams for different goals. It is these

models that require especially thoughtful and forward-thinking design to balance simplicity and flexibility. We list some considerations that the developer should think through when preparing a model, regardless of platform:

1. **Who is the user?** How and by whom will the work be used?
2. **Do I like my technical reviewer?** Don't forget that a technical reviewer is a real person and has feelings and, therefore, counts as a user. Work that is hard to check is generally suboptimal. To this end, don't hide numbers in formulas.
3. **How can I reduce user effort?** Minimize user effort. Equivalently, allow only the desired level of flexibility and customization.
4. **Is the file layout clear?** The organization of the file can enhance the user experience. Does the spreadsheet work left-to-right or right-to-left? Does it contain a "Notes" worksheet explaining how to use the model? Is it appropriate to have a table of contents with hyperlinks to sheets where specific inputs or summaries are located?
5. **How much detail should I display?** If your work is static, make a decision about the level of detail to display centrally. Is there a main user or most important user you'd like to serve first? Consider if it's worth the effort to allow the user to display different levels of detail. Appendixes in the rear are an option.
6. **Are the user controls intuitive?** If your work is dynamic, make sure that the user controls are fool-proof. This may involve clearly defined inputs, limited input ranges, and exhibits flexible enough to account for strange instances. If there are buttons that run code in the background, is it clear to the user when that code needs to be rerun if inputs are changed?
7. **How does your model address version control?** For models built for long-term use, updates are inevitable. Will you track version changes within the model or in an external support document? Can the user easily identify that they are using the latest version? If the user needs to understand what changed between versions, is there a clear way for him to do so?
8. **Is a dashboard needed for inputs/outputs?** Anything more complicated than a small grid of values generally requires some sort of dashboard. Maybe the dashboard will contain inputs and summary output.
9. **How many inputs are needed?** One of your goals should be to achieve reliable accuracy and appropriate precision. In that case, what is the smallest and simplest collection of inputs that will suffice? You may end up including more inputs, but developing the best model requires understanding the extremes. It is possible to have too many inputs in a model. A certain degree of customizability is needed, but it generally comes at the expense of simplicity.
10. **Are formulas and processes efficient?** Respect calculation or run-time efficiency. Computers are getting faster by the day, but they still seem to get bogged down by the complexity of formulas in our models. A bulky and unresponsive workbook is no fun to use—do you need all of that data in the same workbook at the same time?
11. **Is the documentation clear?** Respect future users. Write clear and accurate documentation so that future users can modify the model if you're no longer around.

This list is not exhaustive but instead is intended to briefly illustrate the practice of being mindful of the user experience.

This article focuses on the trade-offs involved in developing user interfaces to create the desired user experience. One of the most oft-proclaimed tasks of an actuary is to convey information to disparate audiences. In the context of this article, that means: Respect the user and respect the user experience. Accomplishing this requires extra time and thought, but the use and impact of your work are limited without it.

Don't let your work control itself. Let the intended use by the intended audience inform deliberate design decisions.

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Telemedicine: What Actuaries Should Look for

By Jackie Lee and Traci Hughes

Smartphones have revolutionized the way we are able to communicate with family members, business associates and friends by being able to send pictures or videos immediately through text or email, even having the ability to hold a face-to-face conversation through Skype, FaceTime or other applications. Why shouldn't this trend impact the way we seek health care services? Telemedicine is the use of modern technology in smartphones or computer webcams to provide health care services to patients without leaving the comfort of their home or office. It is so convenient to be able to handle doctor's office visits and other interactions with physicians using the technology on our phones in a live face-to-face conversation.

TELEMEDICINE BACKGROUND

Oftentimes, the question arises as to the difference between telemedicine and telehealth. The American Telemedicine Association (ATA) has historically considered telemedicine and telehealth to be interchangeable terms, encompassing a wide definition of remote health care. While the term "telehealth" is sometimes used to refer to a broader spectrum of remote health care, it may not always involve clinical services. The ATA uses the terms in the same way one would refer to medicine or health as synonymous terms. Therefore, we will be using the term telemedicine for consistency through the article, but sometimes it could be referred to as telehealth.

Most telemedicine providers have board-certified doctors or physician assistants available 24 hours per day. A few examples include CareClix, ConsultADoctor, Teladoc and meMD. There are also other platforms that work directly with physicians to provide telemedicine to their patients, meaning that when patients have a virtual office visit, they would be talking directly with their primary care physician who knew their specific health background and profile.

TELEMEDICINE COSTS AND ADVANTAGES

A typical doctor's office visit costs between $120 and $250;[1] telemedicine visits cost between $40 and $50.[2] Not only is this a significant savings, but it also keeps patients productive and out of doctors' waiting rooms. Finally, it allows patients to receive the care they need, keeping them healthier overall.

In addition to solving live visit challenges, telemedicine also addresses issues with access to care based on where a patient lives—certain types of care may be unavailable, require travel, or may be too expensive. Living in a rural area makes visiting the doctor challenging. However, with telemedicine, these visits are more convenient for the patient and improve the patient's overall health because the individual is able to seek care when they probably otherwise would not.

TELEHEALTH LANDSCAPE

It is likely that most people have heard of or even used a tele-visit with a primary care doctor or a physician's assistant for a common diagnosis, but the current landscape of telemedicine has broadened to include a large variety of services outside of the typical doctor's office visit. Some examples include tele-ICU, tele-stroke services, tele-psychiatry, telehealth services for chronic disease management, school-based telehealth, tele-emergency, tele-dermatology, tele-ophthalmology, tele-pathology and tele-pharmacy.

To elaborate on one of these examples: Tele-ICU provides the opportunity for rural hospitals that are likely to have a shortage of critical care specialists to have more available access to intensivists and nurses certified in critical care ("ICU specialists"). This availability can allow the on-site doctors to get information and direction from ICU specialists and help identify when a transfer is necessary. Transfers for patients in a rural setting often require long-distance travel, time and cost, as well as less "close-to-home" comfort. Tele-ICU has the potential to limit the amount of transfers to the most serious cases where more resources are needed, while the other ICU patients can remain at the rural hospital with their on-site care providers receiving remote direction from ICU-specialists.

Tele-ICU does not only help rural hospitals; Mercy Health System, a hospital system located primarily in Illinois and Wisconsin, has created a Virtual Care Center, where professionals monitor ICUs remotely 24 hours per day for other hospitals coast to coast. The hospital system has reported that the average length of stay has been reduced by 35 percent and deaths have been reduced by 30 percent.[3] Having professionals able to monitor patients' vitals and other medical records assists the on-site doctors and nurses as they are visiting with other patients or dealing with their other daily assignments.

IMPACTS TO TRADITIONAL PROVIDERS AND THE HEALTH CARE SYSTEM

Research shows that telemedicine improves health care quality and patient outcomes and, therefore, patient health. A September 2014[4] study found that telemedicine improved health when

used for chronic disease management. The study results show decreased hospital admissions and lengths of stay, decreased emergency department visits, decreased mortality, and increased quality of care for patients with congestive heart failure. Better health quality and outcomes were also seen in stroke patients and patients with chronic obstructive pulmonary disease (COPD).

In general, telemedicine helps patients seek care when they may not have otherwise; however, the most commonly used telemedicine has patients seeing doctors that they have never met and will never meet. This phenomenon disrupts the continuation of care. The doctors providing teleservices usually have limited medical history knowledge on the patients they are providing care for other than what the patients provide. Initial care and follow-up care are more challenging in this type of environment.

The convenience factor of tele-visits is incentivizing patients to seek care virtually rather than visiting their doctor. This means that primary care doctors are not receiving payments for these lost services. To address this loss of income, more and more physicians are seeking to replace that income or gain extra income by partnering with telemedicine companies to provide tele-visit services. So, while they may lose a visit from a primary patient to an urgent tele-visit, the doctor can compensate by providing telemedicine services.

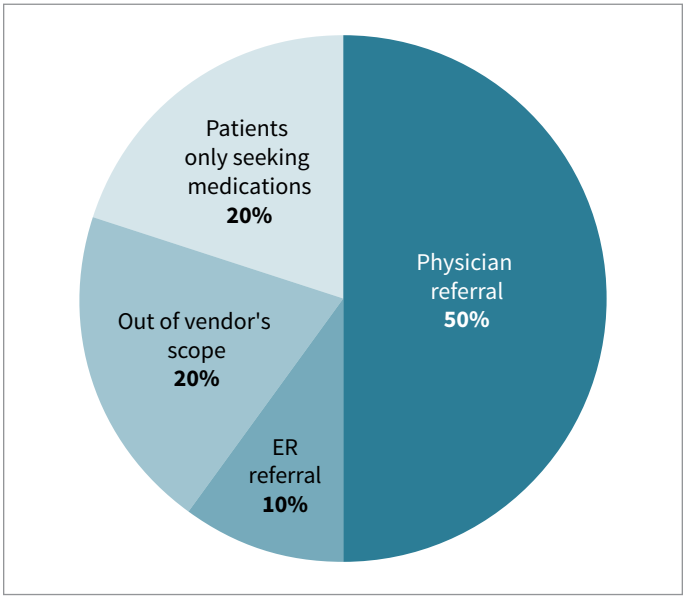
IMPACT ON HEALTH CARE COSTS

A December 2014[5] study found that the estimated savings in the commercial market are $126 per tele-visit and in the Medicare market are $45 per tele-visit. This estimated savings excludes the cost of any necessary follow-up care for cases that could not be resolved via the tele-visit; however, the study found that only 17 percent of cases were left unresolved. Half of these unresolved patients were referred to a physician and 10 percent of those patients were referred to an emergency room (see Figure 1). Twenty percent were out of the scope of the vendors' offerings and another 20 percent were patients solely seeking medications.

Even when accounting for the cost of follow-up care, the estimated cost savings in the commercial market are $96 per tele-visit and in Medicare are $33 per tele-visit.

The amount of cost savings may be changing, though, as more and more states are requiring that telemedicine services be reimbursed at the same rate as any other doctor's office visit through reimbursement parity laws (RPLs). As of 2017, 31 states and the District of Columbia have a parity law to some extent and, currently, there are seven states that have proposed bills to join these other states.[6] Parity laws for telemedicine look different from state to state. Some states require reimbursement for telemedicine on the same basis as an in-person visit but allow for recognition of cost savings. Most states, however,

Figure 1
Tele-visit Follow-up Care



Data from Dale Yamamoto. "Assessment of the Feasibility and Cost of Replacing In-Person Care With Acute Care Telehealth Services." Red Quill Consulting Inc., December 2014. Web. March 2017, *http://www.connectwithcare.org/wp-content/uploads/2014/12/Medicare-Acute-Care-Telehealth-Feasibility.pdf.*

require that health insurers reimburse telemedicine services at the same rate that equal or similar services would be reimbursed in person. This would reduce some of the savings discussed earlier, though it would not eliminate all savings. For example, in the December 2014 study, savings would still be realized for the approximately 51 percent of participants who reported they would have gone to the ER or an urgent care facility if not presented with the tele-visit option. Though the savings may not be as great, a tele-visit would still be less expensive than an ER or urgent care visit. On the other hand, under the RPL, savings would no longer be realized in the approximately 31 percent of participants who reported they would have gone to their primary care physician if not presented with the tele-visit option. This would be due to the equal cost of an in-person visit versus a tele-visit under the RPL.

Those that oppose the RPL argue that it reduces cost savings, as discussed; while supporters of the RPL say that, without the RPL, providers are not incentivized to offer telemedicine services if they are reimbursed more for in-person services. Supporters may also declare that while the RPL reduces cost savings somewhat, there are still many other ways in which telemedicine can provide cost savings aside from a tele-office visit being cheaper than an in-person visit. Cost savings could include reduced hospital admission and readmission rates, reduced lengths of stay, reduced ER visits, prevention outreach, more efficient staff utilization and better health care outcomes.

Additionally, telemedicine provides unconventional cost savings to the patients such as reduced days off work/school for patients or their child's doctor appointment. Patients can save gas money as well, especially in rural areas where primary care providers, specialist doctors or emergency rooms may be more than 30 miles away.

CONSIDERATIONS FOR ACTUARIES

Actuaries who are pricing health products for their companies need to be mindful of the laws and regulations in their states as to how telemedicine is required to be reimbursed. Actuaries should perform internal studies to determine whether tele-visits are creating a savings, if credible and reliable data is available. External studies have suggested that savings are usually achieved with the introduction of telemedicine; therefore, actuaries should consider whether their health plans should provide plan design incentives for members to seek care through these technologically savvy means. Of course, actuaries will also need to consider the cost of providing these services when determining the ultimate savings for these visits.

Additionally, when facets of telemedicine other than tele-visits are present, actuaries will need to develop pricing assumptions regarding reduced ER visits, hospital admission, and length of hospital stays. These types of assumptions will also need to be considered when specifically determining tele-visit savings.

As the adoption, use and coverage of telemedicine continue to grow, the impact of these considerations and assumptions will become more significant. While there is a multitude of readily available information on telemedicine and what it can offer, specific statistics to help develop necessary assumptions are currently limited in their availability. However, as more insurance companies cover telemedicine, there is an optimistic outlook that more research will surface that will help quantify cost savings more accurately.

WHAT'S NEXT?

With telemedicine services crossing state lines in some cases, provider licensure portability will need to be addressed. In February 2015, Wyoming passed interstate medical licensure legislation to expedite a pathway to licensure for qualified physicians who wish to practice in multiple states and increase access to health care for patients in multiple states.[7] Standards of practice for telemedicine will also need to be created, not only to define what types of services are appropriate to deliver remotely, but also to aid in defining malpractice. Most providers have malpractice liability coverage, but telemedicine is still a gray area. Most providers are only covered within their state, while telemedicine services can cross state lines.

In a country where health care costs seem to be ever increasing at higher and higher rates, telemedicine is a practice that can provide some relief. Telemedicine takes many forms, from improved machines that track vitals more efficiently to video conference visits to medical record storage and even wearable health monitors such as the Fitbit. Looking ahead, there are endless possibilities to how current and yet-to-be-developed technologies can help provide health care that is more efficient and cost-effective. ■

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The Center for Health Care Strategies (CHCS)

By Rebecca Owen

As the health delivery system continues to transform to a more integrated delivery system, health insurance means more than just claims payment. Actuarial practice needs to incorporate evaluation methods and models that originate from other stakeholders. There are many fine organizations that can help the profession learn to think differently while maintaining a rigorous and comprehensive evaluation of financial risk. This is one in a series of profiles of organizations working on achieving the Triple Aim[1] whose expertise intersects with the actuarial space.[2]

The Center for Health Care Strategies Inc. (CHCS) describes itself as "nonprofit policy center dedicated to improving the health of low-income Americans." The organization was founded with a grant from the Robert Wood Johnson Foundation in 1995, which means it has a long history of work in this area. The CHCS website enumerates its core tenets:[3]

1. We innovate like social entrepreneurs.

2. We think nationally, but act locally.

3. We live for dialectic. We attend to nuance and embrace ambiguity.

4. We strive to keep "getting it right." We invest in people, relationships, and teamwork. We create opportunities for collaboration and shared learning.

5. We take the long view.

CHCS has three core foci—health care access, delivery system and payment reform, and integrated services for people with complex needs, although its interest incorporates aligned areas as well. CHCS also offers opportunities for states to participate in leadership and capacity-building learning.

Here are some examples of focus work that actuaries may find interesting.

HEALTH CARE ACCESS

Adult Dental Care

Poor dental health can contribute to a number of unfortunate outcomes, from emergency care for pain and dental abscesses to absenteeism and suboptimal employment opportunities. CHCS has looked at ways to improve access and quality for Medicaid beneficiaries.

Coordinating Access to Services for Justice-Involved Populations

Low-income and Medicaid expansion populations include people who are cycling through the justice system. Coordinating their care is not a simple task; lack of medical history can be problematic for risk scoring or population risk stratification or continuity of care programs—not just for physical health, but also for behavioral health issues. CHCS presents analysis and discussion of programs that demonstrated innovation and success with this population.

DELIVERY SYSTEM AND PAYMENT REFORM

Medicaid ACO Programs: Promising Results From Leading-Edge States

CHCS has several resources devoted to the implementation and evaluation of Medicaid ACOs. This winter, the organization released a detailed evaluation of three large integrated delivery programs: Oregon CCOs (1 million lives), Minnesota IHPs (460,000 lives) and Vermont MSSPs (79,000 lives). The presentation and a recording of the webinar are available on the CHCS website.[4]

INTEGRATED SERVICES FOR PEOPLE WITH COMPLEX NEEDS

Complex Care Innovation Lab

CHCS, with the support of the Kaiser Permanente Community Benefit, created an initiative that works with 14 participating organizations whose work has centered on improving the outcomes for low-income individuals with complex needs. The Lab provides information on effective models of care and is a good source of evidences and results.[5]

Promoting Integrated Care for Dual Eligibles (PRIDE)

This effort incorporates value-based purchasing, tele-health, population stratification and care integration to create a knowledge base about the best practices for implementing programs and for disseminating and mentoring other programs that wish to adopt new approaches. An example of the type of program—adding value-added services—is highlighted on the CHCS website.[6]

WEBINARS

Actuaries should take advantage of the public resources the organizations offers, such as publications, technical tools and webinars. Use the resource tab on the website to see a comprehensive list of the materials. CHCS also has a responsive and very knowledgeable staff that can connect you with thought leaders in its sphere of expertise.

CHCS presents many webinars across any given year, usually profiling programs that have been created to address a specific

challenge for organizations that are trying to address issues in the health of low-income beneficiaries. There are often very specific descriptions of how the program was constructed and honest discussions of what did and did not work, as well as the results of the program. For an actuary, these webinars are not only informational about what programs may be contemplated, but will also help in understanding the sorts of results that may be achieved.

TECHNICAL TOOLS

Published technical tools offer Excel models that are open-source and document the questions that need to be considered when evaluating a program. These tools, while they are often developed for a specific program, are good guides for health plans working in the topic area.

An example is a workbook created by Mathematica that estimates the impact of expanding a paramedicine program.[7]

Much of health actuarial work revolves around low-income beneficiaries, be they Medicare enrollees, Medicaid enrollees, ACA exchange members eligible for subsidies (or cost-sharing reductions), or group members whose financial resources are limited. Furthermore, while the focus may be on one portion of the population, CHCS' work has implications for all types of populations. There might be an answer to your questions on the CHCS website, or check out its Listserv, which will keep you informed without clogging your inbox. ■

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2 The March 2017 issue of *In the Public Interest* featured the National Academy of Social Insurance. *https://www.soa.org/sections/social-ins-pub-fin/social-ins-pub-fin-newsletter/*

3 This is a partial list. See *www.chcs.org/about-us/our-core-tenets/*.

4 *http://www.chcs.org/resource/medicaid-aco-programs-promising-results-leading-edge-states/*

5 *http://www.chcs.org/project/complex-care-innovation-lab/*

6 *http://www.chcs.org/resource/providing-value-added-services-medicare-medicaid-enrollees-considerations-integrated-health-plans/*

7 *http://www.chcs.org/resource/community-paramedicine-business-case-assessment-tool/*. There is a button in the upper right to download the tool.

Did You Know? Health Section Events

By Karen Shelton

By this point in the year, you've probably given some thought to where you will be getting continuing education (CE) credits. Many of you will likely be attending the upcoming Society of Actuaries (SOA) Health Meeting in Hollywood, Florida, or the SOA Annual Meeting & Exhibit in Boston. Both events are sure to include timely sessions and engaging speakers. Did you know that the Health Section sponsors many other events throughout the year that can provide relevant and engaging education? (See Figure 1.) Read on for more details on these exciting events!

If you want to add 10 years to your life, you won't want to miss the **Health Meeting**'s opening keynote speaker, Nick Buettner, from Blue Zones. As part of the Blue Zones expedition team, he was provided a first-hand glimpse into cultures that have the greatest life expectancy, where more people reach age 100 than anywhere else in the world (i.e., the Blue Zones). Buettner will share his own observations from the field and provide ideas to immediately increase well-being.

Day 2 of the Health Meeting brings keynote lunch speaker Amy Cuddy. She is a Harvard Business School professor and social psychologist who studies how nonverbal behavior and snap judgments influence people. Cuddy is known around the world for her 2012 TED Talk, which is the second-most-viewed talk in TED's history, and is the author of *The New York Times* best-seller, *Presence*. After her keynote, Cuddy will be a participant in our Women's Leadership Forum.

Figure 1
2017 SOA Events Sponsored by the Health Section

Event	Date	Location
Health Meeting	June 12–14	Hollywood, Florida
Best Actuarial Practices in Health Studies	June 14–15	Hollywood, Florida
Valuation Actuary Symposium	Aug. 28–29	San Antonio, Texas
Influence Methods Seminar	Oct. 15	Boston
SOA Annual Meeting & Exhibit	Oct. 15–18	Boston
Boot Camps for Health Actuaries	Nov. 6–7	New Orleans

Another great addition to this year's Health Meeting is the post-meeting seminar, **Best Actuarial Practices in Health Studies**. During this one-and-a-half-day seminar you will learn effective approaches to communicate results from your studies with proper data visualization tools for the health field. This seminar will showcase some successful reporting programs and discuss what creates the best report.

The **Valuation Actuary Symposium** will be held in San Antonio, Texas, on Aug. 28–29. We anticipate that 12 health-focused sessions will be offered covering a variety of topics including commercial risk adjustment reserves, long-term care (LTC) concepts, market conduct and examinations, accelerated benefits, Own Risk and Solvency Assessment (ORSA), enterprise risk management (ERM) and professionalism. If you are calculating reserves in the health space, this is the conference for you!

The **SOA Annual Meeting & Exhibit** will be held in Boston on Oct. 15–18. Along with relevant sessions, the Health Section is sponsoring a one-day seminar on Sunday, Oct. 15, on influence methods and presentation skills, led by dynamic speaker Andrew Sykes. Communicating with influence is essential to our profession and we are excited to offer this "can't miss" seminar, open to all actuaries.

Another popular CE event that will return this fall is **Boot Camps** for Health actuaries. Returning this year are two popular boot camps: Advanced Commercial Pricing led by Mary Van der Heijde and Medicare Advantage led by Dan Bailey. New to this year's lineup is the Provider Risk Sharing Boot Camp led by Colleen Norris. Check out this issue's "Up Front With the SOA Staff Fellow" for more details on each of these sessions. If you want in-depth, leading-edge education on any of these topics please join us Nov. 6–7 in New Orleans!

For more information on upcoming continuing education events, please check out the Health Section's home page or the SOA events calendar at *SOA.org*. ■

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