

ISSUE 78 MAY 2015

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## A Modern Approach to Traditional Reserving

By Peter Horman

**F**or over 20 years health actuaries have had the computing power and software to apply advanced statistical methods to set reserves and eliminate more traditional reserving approaches. In practice most reserving actuaries, auditors and insurance examiners employ the traditional lag triangle and forecasting methods, which have changed very little in the last 40 years. Today's reserving actuaries often struggle with tight timelines, increased reporting needs, and more actuarial liabilities (3Rs, medical loss ratio (MLR) rebates, provider risk contracts, and more). In this article, I will outline four modern conveniences that could help keep traditional reserving methods relevant for years to come. To start, I will define what I mean by a traditional reserving approach.

*Traditional Reserving Approach:* The common actuarial practice of using a claims lag triangle to estimate claims completion, assess recent trends, and impute seasonal patterns. The goal for each month is to estimate the ultimate incurred claims level and then net out any paid claims to calculate the reserve. For most months the ultimate incurred per member per month (PMPM) is estimated using the completion factors. For the recent and very incomplete months, the actuary forecasts ultimate claims PMPM using completed months, a trend estimate, and any observed seasonal pattern. In addition, it is common to have multiple reserve cells—one for each business line and with multiple claims categories (inpatient, outpatient and other non-facility medical, Rx, and mental health).

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# Letter from the Editor

By Valerie Nelson

I hope everyone is enjoying the spring!

This issue's cover article is on reserving—modern approaches that is! Written by Peter Horman, this piece discusses the changing world of the valuation actuary and ways to address that change.

Ed Cymerys and Sean Duffy have contributed a very interesting read on the latest U.S. Preventive Services Task Force requirements and how health plans can think and act creatively to become compliant with these requirements.

Private exchanges have been picking up a lot of interest in the employer benefits community. Karen Shelton and David Petta have written a study note on this topic, which is being printed in this publication, since it will benefit all actuaries to understand this growing platform.

Basic Health Programs were discussed in the feature article in the January publication. In this publication, Karan Rustagi, Tim Courtney and Julia Lerche follow up on this topic using the lens of the state and the considerations from that perspective.

Jeffrey Petertil's article covers the impact of a recent Supreme Court of the United States decision on the assumed duration of employer-sponsored retiree health benefits. This article is also being featured in *Pension Section News*.

*The North American Actuarial Journal* (Volume 19, Issue 1) contains two health articles that would be of interest to the *Health Watch* readership. Please check out: "Multi-State Actuarial Models of Functional Disability" by Michael Sherris et al, and "Anatomy of a Slow-Motion Health Insurance Death-Spiral" by Ted Frech and Michael Smith.

Finally, in this installment of "Examining the Evidence," Tia Goss Sawhney and Bruce Pyenson deliver a great read on the subject of cause and effect.

Also, an exciting special edition of *Health Watch* is coming out this summer with a sole focus on a five-year retrospective since the passage of the Affordable Care Act and how our world has changed. Please look for this publication in your mailbox and on SOA.org. ■



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# Chairperson's Corner

By Andie Christopherson

I have been stalling for weeks in writing this segment, having no idea what to write about! It's challenging to measure up to the high quality of the articles in each edition of *Health Watch*, given the excellent leadership of our editor and the outstanding articles our members continue to submit. I'm getting tired of saying it, but it is a crazy time to be in our profession. I both love what I'm doing, and feel like my hair is on fire on a daily basis. There is so much to learn, keep up with, do and review. So I'm going to keep this corner short and sweet.

We have a number of outstanding events on which council members and friends of the council have been working hard to plan. Knowing how people's time is in such short supply, I highly recommend you take advantage of the opportunities to cram as much thought leadership and learning in, as efficiently as possible. I know I will be!

First, our 2015 Health Meeting is coming up. It's being held June 13-15 in Atlanta. The schedule is packed with interesting, forward-looking topics and key note speakers. We will also be offering a new seminar immediately following the meeting—Best Actuarial Practices in Health Studies. There are a plethora of topics which need further analysis and explanation in our field, and this seminar should provide the tools on how to message and present the findings to practicing actuaries in a meaningful and succinct way.

Looking into the second half of the year, we are making great strides in expanding the health offerings at both the Valuation Actuary Symposium (August 31-September 1 in Boston) and the Annual Meeting & Exhibit in Austin, October 11-14. As spring becomes a busier time for a larger portion of our profession, we recognize the need for deeper offerings to work around busy schedules. As this issue goes to press, we are in the process of lining up a trio of in-depth boot

campus on Valuation, Advanced Commercial Pricing, and Medicare Advantage for late in the year, with a half day of professionalism to get that continuing education requirement box checked.

Whatever choice you make for continuing education, I know it's time to get back to work for me! So without further ado, I'll let you dive into this edition of the newsletter, and I wish you the best of luck with whatever your particular flavor of busy is this time of year. ■



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While the traditional approach has many variations and is unique to each actuary, for this article I am assuming a model with 36 months of data, where the most recent two months use the PMPM forecast and older months use completion factors. The numbering system I will use assumes the most recent and most incomplete month is Month 1. For example, at year-end 2014, December 2014 is Month 1, November 2014 is Month 2, and January 2012 would be Month 36.

In order to effectively address today's health reserving challenges, this article will explore the following tools: automation, data storage, use of risk scores, and statistics. These four tools can help beat timelines, increase reporting and improve accuracy.

## Automation and the Eight-Day Close

Most of us have moved to the eight-day financial close, meaning the reserve is likely due to the accountants by the fifth business day. In response, many actuaries have applied some degree of automation. This article is not going to go into depth about how and why to automate except to state that aside from possibly the actuarial judgment, most of the process can be automated.

A more interesting discussion is how actuaries should behave in an automated environment. I find there are three important questions each actuary should address when using an automated process:

1. How much can you rely on an automated process (in other words, do you need to check every cell)?
2. Is robo-reserving (relying 100 percent on automated calculations) an actuarial sound practice?
3. Do the answers to questions 1 and 2 change depending on if it is quarterly statutory reports, year-end orange blank, or managerial reporting?

These questions are open for interpretation, and are based on each individual's comfort level, resource availability, and quality of automation. However, I have found the following guidelines are effective in

addressing the questions. First, a good rule of thumb in automation is to spend the time you saved checking the results (this is also a good way to minimize staff fears of automating their job away). Second, robo-reserving may lead to some embarrassing professional moments; at a minimum I recommend a simple reasonableness check to all automated work. For the third question, not all projects carry the same financial risks or professional liability, so the reality is there will likely be some trade-offs.

Automation is a must in today's world. In addition to speed, automation generates the accuracy, consistency and detail data required to advance traditional reserving to the next level.

## Space Is Cheap and Data Is Valuable

With an automated process an actuary will have organized data elements that can be retained and used. As research for this article I counted the number of components in my standard reserving workbook—over 17,000 data points. Compounding the 17,000 times the number of business lines and claims categories, I had 2.5 million reserving data points per month. This creates a need to structure an entire database out of just information in the reserving workbooks.

I am not suggesting storing all the data, but the following are some examples of projects and data elements that could be stored for reserving:

- Tracking restatements (requires reserve and paid claims)
- Estimating your durational accuracy (requires incurred estimates by month)
- Comparing lag factors (requires storing all reserve factors, not just actuaries' picks)
- Simulating reserve volatility and fitting statistical distributions (see examples in later section).

Having a well-structured database of reserving data will speed up standard recast analysis and open the door to many new and useful reporting applications. Organized data storage is the starting point to the modern approach and enables important advances like the integration of risk scores or applications of statistics.

## Member Level Reserve Allocation

A reserving actuary's biggest resource drain may be the detailed reporting requirements requested by senior management. Building an extra reserve model for each reporting cell creates work and lowers credibility of that model. Most actuaries have prospective risk scores readily available. These are a great tool to allocate the reserve to the individual member level. With a member level allocation of reserve, reporting can be efficiently and easily performed at any level. Some examples where this method has assisted me include:

1. Reporting to detailed lines of business—for example, at the employer account level
2. Developing provider-level allocations for provider bonus accruals
3. Affordable Care Act (ACA) 3Rs—reinsurance and allocating claims to exchange vs. non-exchange products.

A benefit of the member-level allocation that should not be lost is the ability to calculate all the accruals and directly tie them to the incurred but not reported (IBNR) for the auditors.

The goal is to allocate the reserve for months with zero, one or two months of run-out to each member (older months can use the lag factors or a uniform PMPM). The method can be straightforward to complex—I will introduce the simplest form, and then outline some ideas for developing more complex allocations.

The simple method assumes all members have a full month of eligibility and a valid risk score. Using the **simple assumptions in this formula ensures an algebraic equivalence** between the total monthly reserve in any reserve cell and the sum of the member-level reserve allocation across that reserve cell.

$$Reserve_{month_i}^{month=k} = Reserve^{month=k} \times \frac{RiskScore_{member_i}}{\sum_{j=1}^M RiskScore_{member_j}}$$

Where

$Reserve_{member_i}^{month=k}$  = The member reserve allocation for month  $k$  for member  $i$

$Reserve^{month=k}$  = Total dollar portion of the IBNR reserve due to month  $k$

$RiskScore$  = Prospective risk score (I will leave it to the actuary on appropriate risk score selection). The calculation assumes there are  $M$  members and member  $i$  is one of those members.

Conceptually the simple method is a great way to understand the risk score allocation, but many may find it is too simple to effectively work in practice. Members have different plan designs; some providers have lower costs; and not all members have an available risk score—hence the need for more complex methods. I will not outline the formulas here except to say that while they add complication they are fairly straightforward to address. Some items to consider include:

1. Addressing partial risk scores—It is key that actuaries understand the risk scores they are using. Modern risk score models adjust for members with fewer than 12 months of experience; however, some older versions do not. In addition, new members may not have a risk score so you may need to build an algorithm to default to a demographic factor.
2. Experience cells—Allocating the reserve to a provider or employer group may require adding an experience adjustment factor. A possible approach might be taking the most recent 12 months of experience and adjusting for credibility (a good start is the credibility formula used in large group underwriting).
3. Plan design—Adding a benefit factor is fairly easy in the reserve allocation, but even this can get complex if you try to adjust for specific benefit seasonality. Don't let perfection be the enemy of the good.

The list of refinements is never-ending, but the **most important item to remember using complex methods is that you may lose the algebraic equivalence the simple method relied upon**; complex methods require a conservation of reserve factor. A formula to conserve the total reserve is below:

$$Conservation\_Factor^{month=k} = \frac{Reserve^{month=k}}{\sum_{j=1}^M Reserve_{member_j}^{month=k}}$$

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With the work automated and the financial reporting benefits of the member-level reserve obtained, we can shift focus to understanding and improving the accuracy of the reserve. The next section discusses how, with a good database and application of probability and statistics, you can start that process.

### Apply Probability and Statistics

With the time saved from automation and the data maintained in the reserving process, you can start to incorporate more complex statistical processes (many of which can be performed in Excel). While the applications are limitless, I will outline a few that I have found work well in practice—simulating reserve volatility, monitoring provider payment patterns, and applications of more advanced statistics.

*Monte Carlo Simulation of Reserve Volatility:* From the data storage we have a host of information at our fingertips. One great example of how to leverage that data is to use a Monte Carlo simulation to address and justify “good & sufficient” margin. The following is an example of a Monte Carlo simulation using historic reserving data that can be performed in Excel.

Formula: To start, reserve volatility needs to be defined. Here, I define it as the distribution of the difference between the reserve incurred estimate

and the ultimate incurred estimate. A simplified version of the formula:

$$\text{Reserve Volatility} = \text{Members} \times \sum_{n=1}^{36} \epsilon_n$$

**Where**

$$\epsilon_n = \text{Reserve Inc PMPM}_n - \text{Ultimate Inc PMPM}_n$$

In this simulation *Reserve Inc PMPM<sub>n</sub>* is fixed, but *Ultimate Inc PMPM<sub>n</sub>* is an unknown random variable making  $\epsilon_n$  a random variable as well. *Members* is a simplifying assumption that all months have the same membership. In this case, *n* represents the month of the claims estimate (as stated earlier, *n*=1 is the most recent month, *n*=2 is the second month, etc.).

The next step is to develop a probability distribution around each  $\epsilon_n$ ; for this example we can use the database we have built in the prior section to identify historic values. See Table A for an example:

In the table below, there are 10 observations from 10 reserve estimates, comparing the initial incurred PMPM estimate versus the ultimate incurred PMPM estimate. Example, Observation 1 was from the January 2014 financial close (performed early February 2014), and the estimate of the error for January 2014 is \$3 PMPM, which is the difference between the ultimate incurred PMPM at May 2015 and the initial incurred PMPM. In practice, the actuary would want to simulate over more observations.

**Table A:** Example of Month 1 Error Distribution

Obs #	Reserving	Month 1 Estimate		Ultimate Estimate		$\epsilon_n$
	Close Month	Initial Time	Incurred PMPM	Ult Time	Incurred PMPM	
Obs 1	Jan-2014	Jan-2014	\$353	May-2015	\$356	\$3
Obs 2	Feb-2014	Feb-2014	\$354	May-2015	\$364	\$10
Obs 3	Mar-2014	Mar-2014	\$355	May-2015	\$353	-\$2
Obs 4	Apr-2014	Apr-2014	\$356	May-2015	\$358	\$2
Obs 5	May-2014	May-2014	\$357	May-2015	\$353	-\$4
Obs 6	Jun-2014	Jun-2014	\$358	May-2015	\$357	-\$1
Obs 7	Jul-2014	Jul-2014	\$359	May-2015	\$364	\$5
Obs 8	Aug-2014	Aug-2014	\$360	May-2015	\$358	-\$2
Obs 9	Sep-2014	Sep-2014	\$361	May-2015	\$357	-\$4
Obs 10	Oct-2014	Oct-2014	\$362	May-2015	\$356	-\$6

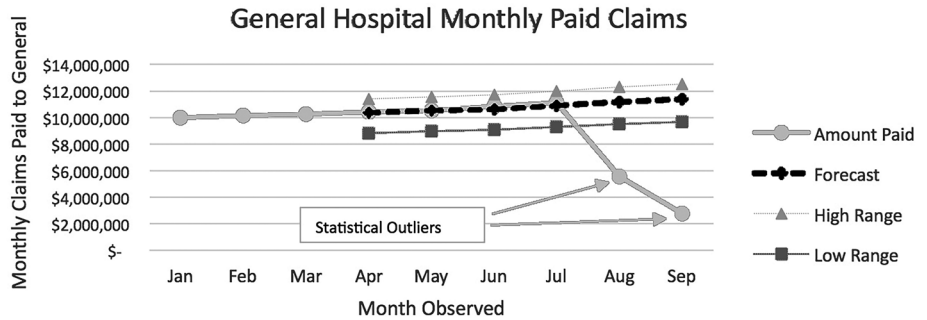
With the formula and distribution in hand the simulation steps are easy:

1. Generate a random number and use it to select an observation and its prediction error. In Table A, assume the random number is 7 then the  $\epsilon_t = \$5$  (for Excel users try = int(Rand()\*10)+1 to generate a random integer).
2. Replicate the experiment for each run-out month.
3. Sum across all months and multiply by membership; this is the first simulation.
4. Repeat Steps 1 to 3 about 100 times.
5. Evaluate the distribution of reserve errors. The simplest way is to sort high to low, then with 100 observations you can easily view percentile ranges.
6. The last step is to use the historical reserve recast numbers to validate that the simulated distribution is reasonable.

This simulation is a nice way to quantify the reserve volatility; however, in my experience, reserve restatements often are caused by non-random claims processing issues. The next application describes using statistics to monitor claims processing issues.

*Statistical Monitoring:* Often the random reserve volatility is manageable, but reserve volatility from operational risk, such as claims processing or provider reporting errors, may not be. Statistics can be a great tool to monitor many small items to identify processing issues—one such example is a statistical monitoring report of each hospital’s monthly paid claims. In the right hand column above is a graphical example of a hospital’s paid claims reported to the insurer over nine months.

Using the historic period, the actuary can develop a statistical distribution and range around the standard monthly volatility. From the example it is easy to see that General Hospital had low outlier August and September claims reported. If these errors were not caught early, the traditional reserving actuary would likely set the reserve too low. While this example is graphical, it is possible to build algorithms to identify and triage statistical outliers across all providers.



*Stochastic Reserving Techniques:* The entire premise of this article is that actuaries do not need stochastic reserving techniques to set the reserve. That said, there are some benefits to using black box statistical software for fitting stochastic functions to claims and then using them to estimate the reserve. Here are a few:

- Compare man vs. machine—Compare accuracy of statistical reserves versus the actuaries’ reserve picks.
- Develop regression formulas to estimate utilization counts from the reserve PMPM pick.
- Another solution for dealing with very small lines of business.

Statistics and statistical processes do have a big role to play in the traditional reserving process. However, it is unlikely they will replace the actuary anytime soon.

## Conclusion

Is there a better reserving approach? I am not sure, and traditional actuaries may constantly need to look over their shoulders. In order for the traditional reserving approach to meet today’s demands, the actuary will need to take advantage of automation and data storage capacity. Then to meet sophisticated and detailed analysis, actuaries will also need to embrace statistics and risk scores to supplement the reserving process. With or without these adjustments, the traditional reserving approach is likely to be around for years to come. However, these modernizations may improve accuracy, add functionality, and protect your weekend. ■

# Implementing USPSTF Recommendations on Behavioral Counseling for Cardiovascular Disease

By Ed Cymerys and Sean Duffy



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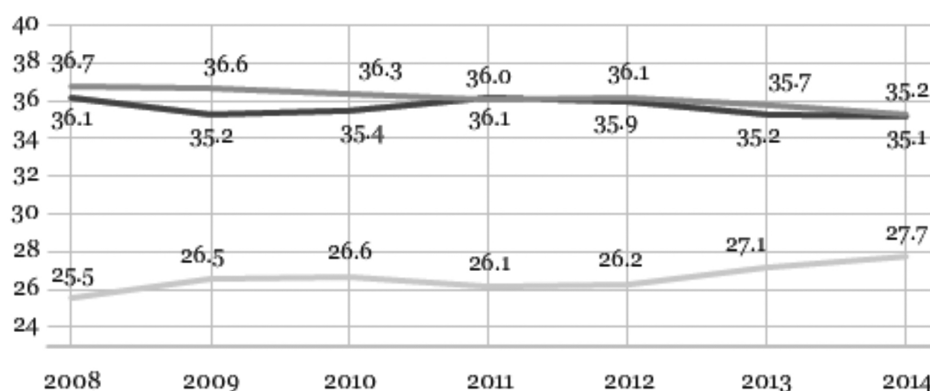
In 2009, the Centers for Disease Control and Prevention (CDC) labeled chronic disease the “public health challenge of the 21st century.” Their report detailed the corrosive effects—for both individuals and society—of a series of creeping epidemics: obesity, diabetes, heart disease, and other conditions caused primarily by lifestyle or behavior. Three of four Americans will die prematurely of a disease that could have been prevented by changing unhealthy habits.

These trends aren’t new, especially when it comes to obesity; 78.6 million Americans are now considered obese (body mass index > 30), with 60 percent of all Americans falling into either overweight or obese categories based on BMI.

## American Adults, by Weight Category

Weight category as determined by BMI

■ % Normal weight (BMI 18.5 to <25)    ■ % Overweight (BMI 25 to <30)  
 ■ % Obese (BMI 30 or above)



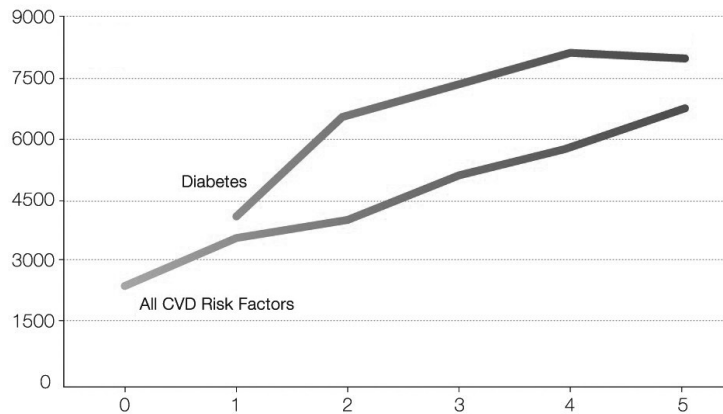
Source: Gallup-Healthways 2014 Well-Being Index. U.S. Obesity Rate Inches Up to 27.7% in 2014. Accessed February 2015. [http://www.gallup.com/poll/181271/obesity-rate-wins-2014.aspx?utm\\_source=CATEGORY\\_WELLBEING&utm\\_medium=topic&utm\\_campaign=tiles](http://www.gallup.com/poll/181271/obesity-rate-wins-2014.aspx?utm_source=CATEGORY_WELLBEING&utm_medium=topic&utm_campaign=tiles). Jan. 26, 2015. Copyright © 2015 Gallup, Inc. All rights reserved. The content is used with permission; however, Gallup retains all rights of republication.

After a stunning 37 percent increase from 1998 to 2006, obesity rates have continued to rise. While middle-aged adults currently have the highest rates of obesity, rates among teenagers and children are equally alarming, especially in some regions of the country. Obesity-related conditions like Type 2 diabetes, heart disease and stroke represent some of the most pervasive and deadly diseases in the United States.

Health plan actuaries understand obesity both as the health crisis it is, but also as a key cost driver for their plan beneficiaries. CDC estimates that direct medical costs for obese individuals are \$1,723 per year higher than for those of normal weight.<sup>1</sup> That’s without considering additional health care costs based on conditions connected to obesity—conditions that now affect 34 percent of Americans. Individuals with other obesity-related metabolic syndromes can cost plans an additional \$4,000 or more per year when compared to those in normal weight ranges.



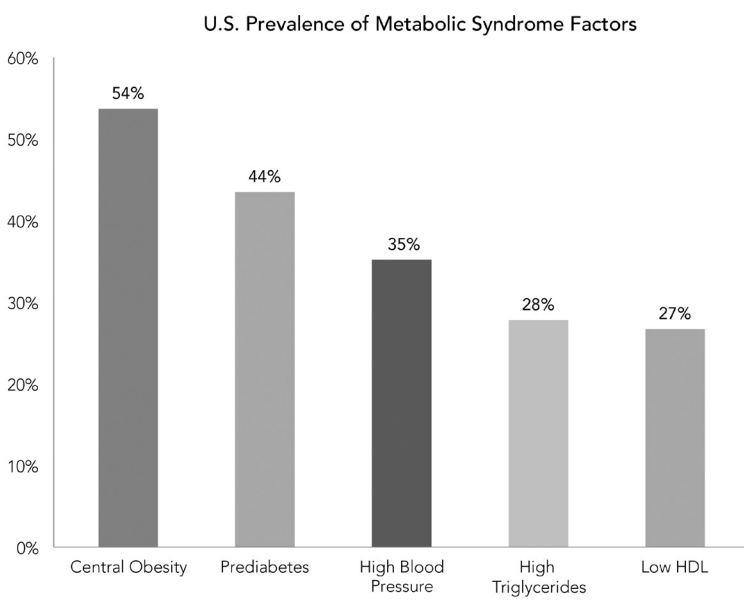
Health care policy experts agree that the key to reversing trends on obesity, obesity-related conditions, and other chronic diseases is behavior and lifestyle change. Policies incentivizing these types of treatment options are finally beginning to catch up to the need. In the process, these policy shifts are creating opportunities for health plan actuaries to deliver solutions that improve both the health of their beneficiaries and the financial health of their plans.



Source: Boudreau, D.M., D.C. Malone, M.A. Raebel, et al. Health Care Utilization and Costs by Metabolic Syndrome Risk Factors. *Metabolic Syndrome and Related Disorders* 2009; 7(4):305-14.

Last year, the U.S. Preventive Services Task Force (USPSTF)—an independent body of primary care physicians, scientists, and other medical professionals empowered by the Affordable Care Act to better integrate preventive care into commercial health plans—took a critical step in addressing the obesity epidemic in America. In August 2014, the USPSTF issued a final recommendation that doctors should provide or refer overweight or obese individuals with any other cardiovascular disease risk factors for “intensive behavioral counseling” to promote healthy diet and physical activity. The USPSTF assigned this recommendation a “B” rating—meaning that for *any commercial health plan (CHP) year beginning August 2015 or later, behavioral counseling must be covered as a preventive benefit*. CHPs with plan years beginning on Jan. 1 will need to comply with the recommendation by January 2016.

This requirement represents a challenge for many plans, but an opportunity for others. Actuaries will play a key role instituting this new preventive benefit—and can do so in a way that both provides effective interventions for beneficiaries and remains cost-effective for their plans. This will include evaluating which programs should be implemented, along with estimating the cost and benefits of these programs over time.



Source: Analysis of NHANES Data, 2005-2012. Prediabetes prevalence based on FPG or A1c.

In its final recommendation on the topic, the USPSTF relied heavily on evidence from a landmark trial first published in the early 2000s—the Diabetes Prevention Program (DPP). The study tested how intensive exercise and dietary counseling could delay the onset of Type 2 diabetes among those already designated “prediabetic.” The study included more than 3,000 participants, divided into three segments—those receiving lifestyle interventions, those receiving medication and nothing else, and those receiving a placebo. The study ultimately concluded that lifestyle interventions were the most effective treatment—lowering the incidence of Type 2 diabetes by 58 percent when compared to the placebo group (and besting the medicated segment). In follow-up analyses of DPP data, participants in the lifestyle intervention trial also saw an improvement in high blood pressure, triglycerides, HDL cholesterol, and other risk factors for heart disease. In 2010, based on the results of the study, Congress authorized the CDC to create a National Diabetes Prevention Program, and establish standards that meet the DPP criteria.

In its August recommendation, the USPSTF specifically cited the DPP as a potential solution for those individuals needing intensive behavioral counseling.

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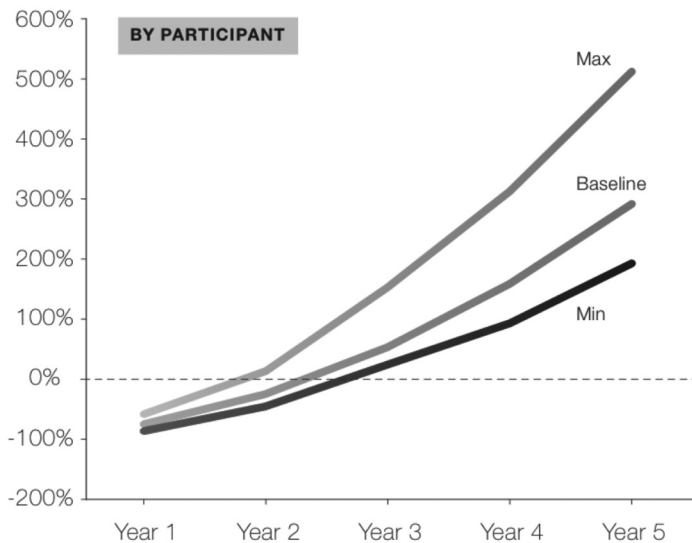
However, to date, the DPP has only been offered in face-to-face settings—limiting its scope and reach for large population segments, and making it costly for health plans to initiate their own programs. While some health plans have developed their own versions of the DPP, these programs have been both costly and largely ineffective in reaching the needed populations. But just as the USPSTF has made these types of interventions mandatory preventive care benefits, the federal government has offered commercial plans an innovative way to comply.

In January 2015 the CDC broadened the DPP criteria, recognizing online and digital programs for the first time. These programs still must meet the clinical standards of the DPP—a rigorous set of criteria that requires licensed DPP programs to meet or exceed the standards achieved by the in-person DPP. But the CDC has recognized the power of the digital health industry in addressing one of the nation’s most pressing health programs, and a new branch of medicine—digital therapeutics—may hold the key to delivering lifesaving interventions to those who need them the most.

Digital therapeutics deliver clinically proven behavioral interventions over an Internet connection. In telemedicine, technology acts as a delivery channel for medical treatment; in contrast, digital therapeutics leverages the unique opportunities created by technology, integrating design and behavioral insights to motivate effective lifestyle change. Additionally, digital therapeutics track and collect data, allowing operators to effectively measure outcomes of their programs.

As the USPSTF mandate takes effect later this year, the CDC’s embrace of digital tools provides a potential road map for health plans and actuaries to comply with the upcoming guidance. Sean Duffy—CEO of Omada Health, a former M.D./MBA candidate at Harvard with a degree in neuroscience from Columbia University, and co-author of this article—was one of the first to effectively translate behavioral interventions like the DPP to an online setting. Developing his company’s first digital therapeutic, he focused on small-group support, personal health coaching, personalized and engaging design, DPP curriculum adherence, and progress tracking—leveraging unique aspects of the technology to enhance key elements of successful behavioral interventions with the company’s first product, *Prevent*.

Projected Cumulative % Return on Investment (ROI) of the *Prevent* Program



Source: Omada Health Prevent Health Economic Monograph. December 2014.

In his book *Leaders Make the Future*, Bob Johansen of the Institute for the Future makes the case that industries should nurture companies that benefit multiple players within the same ecosystem. As chronic conditions like Type 2 diabetes become major cost drivers for health plans, multiple players within the health care industry have a vested interest in developing and scaling the most effective preventive behavioral intervention tools possible. Managed care companies across the health care landscape can benefit from an independent actor developing scalable solutions that prevent beneficiaries from developing costly and deadly chronic conditions. This is exactly the reason some, like Kaiser Permanente, have put capital into health venture funds: to seed companies that can develop treatments that bend the cost curve across the industry.

Health plan actuaries are beginning to model the economics of intensive behavioral counseling solutions, as well as the implementation of interventions that must be both effective and cost-effective. Now is the time for actuaries to be proac-

tive—discussing how plans will meet the coming requirements, and deciding whether to build programs from scratch, or to employ solutions proven effective. Digital therapeutics offer the opportunity to deliver results that are both clinically validated *and* provide demonstrable economic benefits for beneficiaries and plans alike. Initial economic projections for the digital therapeutic pilots, like Omada’s *Prevent*, demonstrated a break-even at the end of year 2 and a projected savings of \$1,300 to \$3,500 over five years.

Health plan actuaries will be charged with evaluating the effects of the new USPSTF requirements, and options for compliance. Digital therapeutics offer the opportunity to deliver clinically validated results — including better health outcomes for beneficiaries, and lower cost outlays for plans. ■

#### END NOTES

- <sup>1</sup> Tsai, A.G., D.F. Williamson and H.A. Glick. Direct Medical Cost of Overweight and Obesity in the USA: A Quantitative Systematic Review. *Obesity Reviews* 2011; 12(1):50-61.



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# A Practical Guide to Private Exchanges

By Karen Shelton and David Petta



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**W**ith the implementation of the Affordable Care Act (ACA), public health insurance exchanges are providing Americans with another channel for purchasing health care. These exchanges provide plan offerings that comply with actuarial value thresholds and cover essential health benefits (EHBs). On the individual exchange, premium and cost-sharing subsidies may be provided to individuals meeting certain income requirements.

There are also private exchanges, which are separate from the public exchanges established under the ACA. These exchanges are operated by consultancies, health insurers and technology platforms that enable employers to offer more choice to employees for their health benefits through an online marketplace. Private exchanges have experienced rapid growth in the shadow of the ACA as employers look for creative ways to manage cost while providing competitive health benefits.

The chart below illustrates core attributes of the public and private exchanges.

The remainder of this article will focus on the private exchanges and their impact on employers who may be considering offering coverage to their employees through this channel.

## Elements of a Private Exchange

Private exchanges are quickly evolving and can take many forms. The following are common attributes that are central to private exchanges:

**Employee Choice**—Private exchanges often offer more plan design options than traditional employer-sponsored plans. While not required, these plans will often be labeled in a consistent approach to the metallic levels used on the public exchange and target similar actuarial values. Depending on the private exchange, the available plan design options may be standardized.

**Employer Subsidies**—Employers will subsidize the cost of coverage, often through a defined-contribution approach where the employee can “buy-up” for lower-cost-sharing provisions or “buy-down” for lower premiums.

**Ancillary Product Offerings**—The private exchange will often offer ancillary products like dental and vision alongside the medical and pharmacy benefits via the exchange so that it’s a complete “one-stop-shop” for health-related benefits.

Element	Public Exchange	Private Exchange
Who sponsors	Government	Employer
Who can enroll	Individuals and small groups	Employees and retirees of sponsoring employer
Types of coverage available	Medical and prescription drug	Medical, prescription drug, dental, vision and other voluntary benefits at the employer’s discretion
Plan designs available	Plans must provide actuarial values of 90 percent, 80 percent, 70 percent or 60 percent as defined by the federal Actuarial Value Calculator.  Individuals may be eligible for income-based reduced cost-sharing.	Exchange operator or employer defines the plan designs.
Who pays for coverage	Individuals and small employer groups pay the premiums for coverage.  Individuals may be eligible for income-based government subsidies.  Small employers may be eligible for small business tax credits.	Employers provide a subsidy toward the cost of coverage and covered members pay the balance.

**Online Enrollment and Decision-Making Tools—**

Online tools are becoming more sophisticated and user-friendly, allowing for members to evaluate their health care needs, understand their employer’s subsidy, and elect benefits that meet their needs.

**Benefits Administration—**Most private exchanges offer end-to-end benefits administration including enrollment, eligibility, customer service and billing.

**Different Models and Approaches**

The two most distinct differences between private exchange models are carrier approach (single-carrier vs. multi-carrier) and funding methodology (self-funded vs fully insured). Single-carrier models typically offer a range of plan options and are offered primarily by the insurance carriers themselves. These models tend to offer more control over the plan, flexibility in funding mechanism, and in-depth carrier reporting that is consistent across the entire population.

Multi-carrier exchanges offer a choice of plan options from several insurance carriers. Depending on the exchange, either the employer or the employees have the choice between multiple carriers. In a multi-carrier model, carriers may compete side by side, offering plans with various price points, provider networks and coverage levels.

A fully insured, multi-carrier model will also include a risk-adjustment mechanism to offset additional costs borne by carriers who attract members with greater health risks. The risk adjustment is a “net-zero-sum” where the amount of premium transferred to carriers with higher risks will equal the premium paid out by carriers with lower risks.

A private exchange model has many potential advantages and disadvantages that will need to be taken into account by an employer who is considering implementing a private exchange approach to benefits offering.

**Advantages:**

- Increased employee choice
- Cost-savings potential from increased competition across carriers and best-in-class carrier pricing in a multi-carrier model

**Carrier Model**

		Carrier Model	
		Single Carrier	Multi-Carrier
Funding Model	Fully Insured	Risk transfer— but cost increase	Leveraged competition, best-in-market efficiencies, employee choice, risk transfer—but less control over your plan design
	Self-Insured	Traditional model	Employee choice, best-in-market efficiencies—but less leverage over carriers

- Increased consumerism from members buying-down benefits as a result of a transparent defined-contribution approach
- Robust online decision-support tools and customer service
- Benefits administration simplification
- Shift financial and regulatory risks (fully insured model)
- Cost predictability under a fully insured model
- Improved cost transparency

**Disadvantages:**

- Additional expenses for exchange operator financing and risk assumed by carriers in a fully insured model
- Less control/flexibility over plan design, clinical management, member outreach, etc.
- Need to increase defined-contribution amount over time, otherwise plan cost could become overly burdensome to beneficiaries
- Other member concerns such as loss of plan-sponsor support, less generous benefits and general fear of change

**Cost Impacts via the Private Exchange**

One of the major advantages often being cited for the implementation of a multi-carrier private exchange is the potential cost savings that comes from two primary areas: carrier best-in-class pricing and increased carrier competition.

CONTINUED ON PAGE 14

### Carrier Best-in-Class Pricing

Provider and facility contracts can vary significantly across carriers and by region, resulting in a carrier who may be very competitive in one region and less competitive in another. Many employers do not have a “best-in-class” approach where the most competitive carrier by region is offered because of the resources required. Multi-carrier private exchanges can offer best-in-class pricing that’s administratively simple, which may provide meaningful savings.

#### Illustrative Example I

Employer X currently has one insurance carrier providing health insurance to its employees in two regions with rates and subsidies as follows:

	Region A		Region B		Total
	Carrier 1	Carrier 2	Carrier 1	Carrier 2	
Annual Plan Cost	\$4,500	\$5,000			\$470,000
Employer Defined Contribution	\$3,400	\$3,400			\$340,000
Annual Employee Payroll Contribution	\$1,100	\$1,600			\$130,000
Enrollment	60	40			100

Another insurance carrier may have a more efficient network in Region B and (all things equal) will have more competitive pricing in that region.

	Region A		Region B		Total
	Carrier 1	Carrier 2	Carrier 1	Carrier 2	
Annual Plan Cost	\$4,500	\$4,800	\$5,000	\$4,500	\$461,500
Employer Defined Contribution	\$3,400	\$3,400	\$3,400	\$3,400	\$340,000
Annual Employee Payroll Contribution	\$1,100	\$1,400	\$1,600	\$1,100	\$121,500
Enrollment	55	5	20	20	100

In Region A, Carrier 2 has a higher cost but is still expected to attract a small portion of the membership in that region. In Region B, the cost for Carrier 2 is 10 percent lower than Carrier 1, resulting in 50 percent of

the employees in this region choosing Carrier 2. The net impact on plan cost is a savings of ~1.8 percent.

### Increased Carrier Competition

Within a fully insured, multi-carrier model, carriers compete for business directly from the employee through price, networks, and other items such as customer service or brand identity. Insured contracts align incentives between carriers and encourage carriers to choose more innovative approaches since they are marketing to the consumers at a retail level (not a benefits department who represents the employee population as a whole).

### Items Increasing Costs

While we’ve discussed areas of potential savings from the private exchange, it’s important to note that there are costs of moving from a self-funded to a fully insured model. These include items such as premium tax, insurer tax, state-mandated benefits and insurer risk charges. The exchange operator will also charge for resources needed to effectively run the exchange.

### Member Buy-Downs

Early experience from the private exchanges indicates that members tend to enroll in options with higher cost share and lower premiums when compared to traditional employer-sponsored group insurance, with a majority choosing a high-deductible health plan (HDHP).

The primary reasons a member would be more inclined to buy-down on the private exchange are twofold. First is the premise that there can be no cross-subsidization between gross premium rates as each plan is intended to stand on its own. This means that the full impact of member selection (net of risk adjustment, if applicable) must be included in the premium rates, as well as differences in actuarial values and expected utilization due to higher or lower member cost share (price elasticity). This could produce rates for the most generous plan (Platinum) that are considerably higher than the rates for the leanest plan (Bronze),<sup>1</sup> even after accounting for risk-adjustment transfers.

The more traditional approach to setting premium/

premium equivalent rates under group insurance has been to reflect only the actuarial value difference of the plan offerings and price elasticity. This is particularly the case for self-funded plans where determination of the premium equivalent rates is at the discretion of the employer.

The second reason employees tend to buy-down coverage on the private exchange is that employers are using a defined-contribution approach to determine employee payroll contributions, requiring the member to pay the full additional cost of the more generous plan design. Currently many employers pay a flat percentage of the plan cost, essentially providing a higher subsidy for more generous coverage.

### Illustrative Example II

Employer X currently offers a 60 percent Bronze plan and a 90 percent Platinum plan. Under a traditional self-funded approach, the employer sets the premium equivalent rates to reflect the differences in actuarial values. The employer also currently subsidizes 63 percent of the premium rates.

If the employer were to move to the private exchange and offer similar plans, the premiums between the plans would be wider, in order to be self-supporting. Assuming this employer provides a \$3,300 defined contribution for single coverage (\$275 per month), the chart above shows how the single member's payroll contribution would be impacted.

In this example, the payroll contribution difference changes from \$65 per month under the current approach to rate setting to \$300 per month under the private exchange. Given these dramatic differences in price, it's likely that many members will now enroll in the less-costly Bronze plan.

Also under a defined-contribution approach, the employer may choose to express costs on an annual basis rather than per pay period or per month. Should the employer in the above example choose to illustrate costs on an annual basis, the member would see a \$3,600 per year difference, which is likely to attract an even greater portion of members.

It is often part-science-part-art to determine the optimal defined-contribution amount. As with any

### Illustrative Example 2

	Current		Private Exchange	
	Platinum 90% AV	Bronze 60%AV	Platinum 90% AV	Bronze 60%AV
Monthly Premium Rate for Single Coverage	\$525	\$350	\$600	\$300
Employer Subsidy				
%	63%	63%	46%	92%
\$	\$330	\$220	\$275	\$275
Monthly Employee Payroll Contribution	\$195	\$130	\$325	\$25
Bronze-Platinum Contribution Difference	\$65		\$300	

contribution strategy, an employer will want to consider a number of items, including:

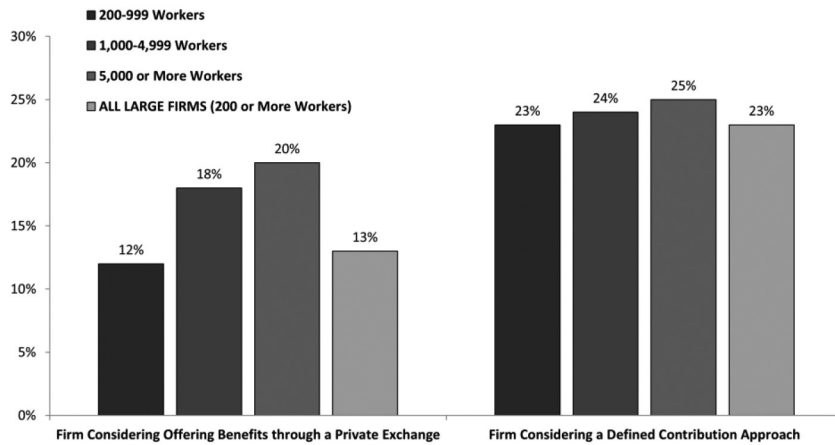
- Current funding approach—What is the employer's current philosophy around subsidies and how does it compare to a defined-contribution approach? If they are very different then the employer may need to ease into a defined-contribution approach over a few years, if allowed by the exchange operator.
- Variations by coverage tier—Does the employer want to subsidize dependents at a different level than the employee?
- Member impact—How does this impact the member payroll contributions and what sort of dissatisfaction could arise? Defined contribution may need to be phased in over a number of years, if allowed by the exchange operator.
- Financial goals—Does this change meet the employer's financial goals?
- Competitive pressures—How does the subsidy compare to the benefits provided by other organizations that compete for similar talent?

It's likely that all these considerations will need to be evaluated in order to determine the most appropriate level of subsidy which, in-turn, affects member buy-downs in the private exchange.

Additionally, many of the exchanges provide consumer-centric decision-making tools in an easy-to-navigate format, making it easier for employees to understand the differences in price and coverage,

CONTINUED ON PAGE 16

**Exhibit 2**  
**Among Large Firms (200 or More Employees) Offering Health Benefits, Percentage of Firms Considering Offering Health Benefits Through a Private Exchange, by Firm Size, 2014**



NOTES: A private exchange is one created by a consulting company, not by either a federal or state government. Private exchanges allow employees to choose from several health benefits options offered on the exchange.  
 SOURCE: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 2014.



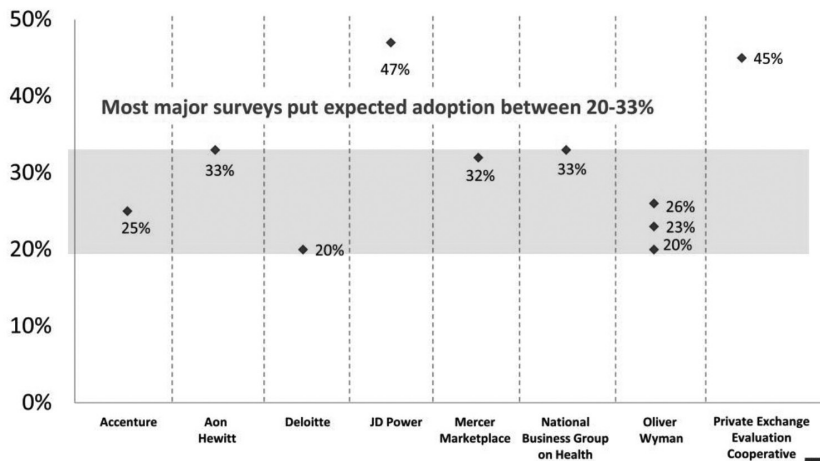
and can encourage employees to fund an HSA with the difference in premiums.

The growth in enrollment in HDHPs is important as these plans increase consumerism, which will cause members to engage more with their providers on care and cost decisions, ultimately putting more pressure on providers and facilities to provide higher-quality care for a lower price.

## Exchange Outlook<sup>2</sup>

According to the Kaiser Family Foundation, private exchanges include approximately 1.7 million group plan enrollees (2 percent of employers) and this is expected to grow into the future. The 2014 Kaiser HRET Employer Health Benefits Survey (EHBS) found that employers with 200 or more workers who currently do not offer benefits through a private exchange were considering this marketplace. Additionally, this survey also indicates that even more employers are considering a defined-contribution approach rather than moving to a private exchange. (See Exhibit 2.)

**Exhibit 4**  
**Employers adopting private exchanges within 5 years**



SOURCE: Accenture (2013), Aon Hewitt (2014), Deloitte (2013), JD Power (2012), Mercer (2013), National Business Group on Health (2013), Oliver Wyman (2012), Private Exchange Evaluation Cooperative (2013)



Though 2 percent of employers currently offer coverage through this marketplace, most major surveys expect this to grow to 20 to 33 percent by 2018. (See Exhibit 4.)

Whether or not the private exchanges grow to these anticipated levels, they are changing the way employers are looking to provide benefits and insurance carriers are looking to sell coverage to members.

*For more information on the private exchanges please see the Kaiser Family Foundation Report, Examining Private Exchanges in the Employer-Sponsored Insurance Market, September 2014.*

### END NOTES

- 1 Platinum and Bronze plans in this article represent a private exchange offering that will have approximately a 60 percent actuarial value for Bronze and 90 percent actuarial value for Platinum; these are not meant to reference the metallic plans on the individual exchange required by the ACA.
- 2 Alex Alvarado, Matthew Rae, Gary Claxton, and Larry Levitt, Examining Private Exchanges in the Employer-Sponsored Insurance Market, The Henry J. Kaiser Family Foundation, September 2014. <http://files.kff.org/attachment/examining-private-exchanges-in-the-employer-sponsored-insurance-market-report>, accessed on March 10, 2015.



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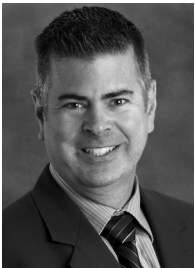
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# Basic Health Program: Why Do Some States Bother and Others Don't?

By Karan Rustagi, Tim Courtney and Julia Lerche



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The Affordable Care Act (ACA) provides several policy alternatives for states. One of these options, which we explore in this article, is the Basic Health Program (BHP). The January issue of *Health Watch* introduced the key features of the BHP and the federal payment methodology from a technical viewpoint. This article is intended to move the conversation forward by sharing insights into the decisions and challenges that states face when deciding whether or not to implement a BHP. While we draw heavily from our experience in Massachusetts and Oregon, we also refer to experience of other states that have considered the BHP.

The BHP allows states the option of providing alternative coverage to individuals with household incomes below 200 percent of the federal poverty level (FPL)<sup>1</sup> who would otherwise have been eligible for subsidized coverage through the exchange. The BHP must provide covered benefits and cost sharing that are at least as rich as those available through the exchange, at a premium that is no more than what the individual would be required to pay for exchange coverage after applicable subsidies (for both premiums and cost sharing). Federal funding is provided to states to offset the costs of the BHP, which is based on the amount of federal subsidies that would have been available had the BHP population been covered through the exchange. States were eligible to begin BHP implementation in 2015. At this time, only Minnesota has implemented a BHP.

## Potential Benefits of a BHP to States

**Richer benefits at a lower cost to consumers than subsidized qualified health plans (QHPs).** These richer benefits are achievable either through care delivery savings (lower provider reimbursements, better care management and/or lower administrative costs), or through additional state funds. Massachusetts and Minnesota had state-subsidized plans for the BHP-eligible population prior to the ACA going into effect in 2014. In the absence of BHPs, these members would have to move to QHPs. The QHPs are significantly leaner (even after considering silver plan cost-sharing subsidies) than these state-subsidized plans and the transition

would have resulted in a reduction in both benefits and affordability for this population. If there is political will in a state to continue offering coverage with richer benefits and lower out-of-pocket costs to this population, then BHPs can provide a means.

**Reduced Medicaid churn.** Because of income fluctuations, especially among low-income households, Medicaid members gain and lose Medicaid eligibility throughout the year. During the periods when they are not eligible for Medicaid, QHP plans can cushion the impact of increased out-of-pocket expenses through premium and cost-sharing subsidies. However, these plans will likely have a different network of providers and covered benefits than the Medicaid plans. When BHPs are set up to leverage Medicaid provider networks and reimbursement contracts, they can offer continuity of care and can simplify navigating a complex health care system for the low-income population. The ease of access and continuity of care could also offer incentives for the beneficiaries to continue enrolling in coverage.

**Increased coverage take-up rates.** BHPs must offer covered benefits and cost sharing that are at least as rich as what are offered through the exchange. The improved affordability and benefit richness increase the value proposition for more members, which presumably results in higher take-up of coverage among those who might otherwise go uninsured, even with the availability of subsidized QHP plans. At income levels where a person is eligible for a BHP, the penalty for not purchasing coverage is approximately \$325 for a single-person household. This penalty may not be a sufficient motivator to purchase QHP coverage that still entails out-of-pocket expenses. In addition, some people in the BHP income range are exempt from the penalty because their incomes are below the filing threshold. To the extent that the lower-cost and richer-benefit BHP plan increases take-up rates, there will be added benefits of a bigger risk pool and reduced uncompensated care.

**Coverage for legal immigrants.** Immigrants legally residing in the United States for less than five years are generally not eligible for Medicaid coverage. Though these immigrants are eligible for subsidized coverage through a QHP on the exchange, the premi-

um and cost sharing required for these plans may pose a significant financial barrier for this population to receive care. The BHP provides states with an option to improve the benefits available to this population.

**Savings to the state.** Some states like Massachusetts have offered a subsidized plan for the BHP-eligible population prior to the ACA. Previously, these states paid for the entire subsidy out of state funds. Offering the same coverage through a BHP will enable these states to receive federal funding for the program through the BHP and result in lower state spending. Of course, if the state ceased to offer the state plan for BHP-eligible members and transitioned them into QHPs, the state could drastically reduce its spending. However, as we have seen, the political will in some states is such that these states seek to maintain the former levels of coverage for these income groups. The BHP may also provide states with an option to cover mental health and other benefits that are currently covered through state-funded programs. In January 2014, Wakely completed financial analysis of a BHP program for the Massachusetts Connector. We believe a final decision regarding the program is still pending.

## Challenges Associated with the BHP

The BHP benefits discussed above also come with challenges that may lessen the appeal for some states. Some of the key challenges are summarized below.

**Disrupting the rest of the commercial individual market.** Removing the BHP group from the QHP single risk pool could significantly alter the risk profile of the single risk pool. The single risk pool contains all members in the individual market and enrolled in a QHP. For example, if the BHP population is younger and healthier than the rest of the individual market risk pool, BHP implementation could have a negative impact on rates in the individual market. The BHP is not included in the federal risk adjustment program, so there would be no mechanism (unless established by the state) to offset any negative impact on the risk pool. In California,<sup>2</sup> one of the reasons cited by government officials for not implementing a BHP was that a BHP could disrupt the risk profile of the single risk pool as it draws members with incomes between 138 and 200

percent of FPL out of the exchanges. A Kaiser study<sup>3</sup> estimated that up to 677,000 members fall within this income category. Additionally, changes in individual market premiums will affect BHP revenues because the BHP federal funding is determined using second-lowest-cost silver premiums on the exchanges.

**Disrupting the exchange operations.** In California,<sup>4</sup> implementing a BHP was viewed as a risk that might interfere with the success of the exchange. The reduced membership on the exchange would lower the base to fund the exchange operations and could have an impact on the number of carriers interested in participating. Insurers and providers in California expressed significant concerns about the disruption a BHP would cause. California was focused on seeing the exchanges succeed and the concerns over BHP disrupting the exchange operations shelved the BHP discussions for the time being.

**Financial risk to the state.** States are liable for any difference between premiums quoted by insurers for the BHP members and the federal payments for the BHP. The federal funding for BHPs is 95 percent of the premium tax credits and cost-sharing reduction subsidies the BHP population would have received had they enrolled in QHPs. The state has to find savings to offset the 5 percent reduction.

It is important for states to model the potential cash flows and risks of a BHP program to determine if the savings from implementing a BHP offset some of the risks. States that had a program covering this population prior to ACA such as Massachusetts and Minnesota are in a better position to conduct this modeling since they will have claim experience for this population. Most states, however, do not provide coverage for this population and as such have little reliable information on the cost of providing health care coverage to them; such states risk entering into a BHP arrangement without a good understanding of the potential size and variability of financial results.

Beyond estimating claim costs for this population, revenues can also fluctuate. In particular, BHP federal payments are based on the second-lowest-cost silver plan premiums in the commercial market,

CONTINUED ON PAGE 20

which can be volatile year to year. The volatility could be driven by new carriers entering the market, current carriers rolling out plans with narrow networks, or carriers correcting pricing from early years of ACA when little information was available on newly insured. While low trends in commercial premium levels would typically be celebrated, a BHP program would now be faced with lower revenues that may not necessarily be related to the underlying population costs, which could create unanticipated expenses for the state.

**Program administration.** States would need to dedicate resources to administer the BHP. In many states, the BHP could leverage existing capabilities within the Medicaid program, including plan contracting and eligibility functions. Federal funds for the BHP cannot be used to directly cover program administrative expenses. States could presumably assess the carriers providing BHP coverage to cover state administrative expenses, in which case the additional cost would be included in the premiums that could in turn be paid for with federal funds.

**Consumer disruption.** In states that implement the BHP, BHP-eligible consumers are no longer eligible for subsidies through the exchange. Transitioning from a non-BHP to a BHP environment could create disruption for consumers enrolled in subsidized QHPs through the exchange. These consumers may need to change providers and/or health plans, and may prefer the choice of commercial plans to the BHP options defined by the state. Consumer impact will vary based on each consumer's personal circumstances and preferences.

**Provider negotiations.** Provider reimbursement is a key component in making a BHP viable. In

the absence of a BHP, the BHP-eligible population would be covered under federally subsidized QHPs. The QHPs typically pay commercial reimbursement rates to providers. As a result, providers would get reimbursed more for the same services for a member with insurance through the exchange relative to a member with a BHP plan. Based on our experience in Massachusetts and Oregon, the ability to negotiate a lower provider reimbursement rate than commercial was found to be key to making a BHP financially viable for the state. The insurers would need a good business case to bring providers to the table and discuss alternative reimbursement rates. A higher take-up rate due to BHP and, hence, lower uncompensated care, may be motivators for providers to accept lower reimbursements on BHP members. Providers may also be motivated by reduced uncompensated care and reduced churn as members gain or lose Medicaid eligibility.

## Conclusion

The BHP provides states with the ability to provide more affordable coverage to its low-income population and expand Medicaid-like benefits to individuals whose incomes exceed Medicaid eligibility. As discussed, there are many considerations for states in determining whether to implement a BHP. For states that have existing programs for the BHP-eligible population, the BHP clearly offers an opportunity to take advantage of federal funding to continue to offer similar benefits as the existing program. For all other states, the decision to implement a BHP will depend on the state's goals and political environment and its ability to become comfortable assessing and taking on the financial risks associated with the program. ■

### END NOTES

- <sup>1</sup> For 2015, 200 percent of FPL is \$11,770 for a single household and \$24,250 for a four-person household in all states except for Hawaii and Alaska.
- <sup>2</sup> <http://www.californiahealthline.org/insight/2012/why-basic-health-plan-failed-and-why-coops-may-succeed>
- <sup>3</sup> <https://www.statereforum.org/sites/default/files/estimating-federal-payments-and-eligibility-for-basic-health-programs-an-illustrative-example-report.pdf>
- <sup>4</sup> <http://www.californiahealthline.org/insight/2012/why-basic-health-plan-failed-and-why-coops-may-succeed>

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# Retiree Health Benefits and the U.S. Supreme Court

By Jeffrey Petertil



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**O**n Jan. 25, the Supreme Court of the United States (SCOTUS) issued a unanimous opinion on a rare retiree health benefit (RHB) case that reached the highest court, (*M&G Polymers USA v. Tackett*, No. 13-1010). The headlines were variations on “High Court Rules for Employer in Retiree Benefits Case.” SCOTUS indicated that when an employer gave retirees health care in a collective bargaining agreement (CBA) but was ambiguous about the duration of the benefit, there should not be an inference of lifetime benefits.

In so doing, SCOTUS overturned a ruling that followed a 1983 Appeals Court precedent (*UAW v. Yard-man*, 6th Cir. 1983) in finding that a CBA that was silent (or ambiguous) about whether the retirees’ benefit terminated, should be construed to confer vesting for the retirees’ life. The Appeals Court validated that, but SCOTUS disavowed it.

The SCOTUS decision closes a few doors that have been open too long, while also providing some openings. This ruling gives me a springboard for a dive into several topics related to the always uncertain world of RHBs.

Let’s start with a question: Why has the vesting and duration of RHB been left unresolved for so long? The question of whether RHB can be changed has affected millions of people, and the *Yard-man* precedent dates from 1983. The *M&G Polymers* case decided this year involved a handful of people, but the question decided was asked in countless forums for decades. The lack of a definitive answer from SCOTUS left uncertain not only a segment of the actuarial profession but also a fair portion of the country’s aging population—and stock analysts. Yet the nine justices of SCOTUS, often thought to be as split along partisan lines as Congress and the electorate, were unanimous in setting aside the *Yard-man* precedent. Justice Thomas’ opinion went to some length to condemn that 6th Circuit Appeals Court opinion as having been applied indiscriminately across industries for all these years. Why didn’t they tell us 30 years ago?

SCOTUS has not had a case before it that provided the platform on which to give an opinion. There were plenty of cases that seemed to hang on the interpretation of the sponsor’s commitment to paying the ben-

efit for the long term. The parties reached settlement, however, rather than go to the highest court.

In November’s oral argument, Justice Scalia said, “...this thing [the duration of health benefits] is obviously an important feature. Both sides knew it was left unaddressed....” Scalia went on to say twice: whoever loses deserves to lose. This garnered headlines in November and some commentary to the effect that the justice was uncaring. In the larger context of the three or four decade lead-up, however, he was right. Employers and employees, corporations and unions, HR people and CFOs, have known this was important, but, to a large extent, they left it for someone else to decide. When that happens, don’t be surprised if you are on the losing side.

The January SCOTUS decision sent the *M&G Polymers* case back to the Appeals Court, which was told not to rely on the *Yard-man* precedent, but rather to look to ordinary principles of contract law. SCOTUS refrained from deciding what this particular CBA meant; it usually rules based on principles, rather than analysis of the facts in a case. The case could come back to SCOTUS, as some justices gave indication that further fact-finding might lead to an inference of vesting.

The reason no case was pushed to SCOTUS is probably because the stakes are too high, higher than most want to admit. Having someone else pay for health care as we grow old is extremely valuable, hence the popularity of Medicare. But no feasible legislation addressed the private sector issue.

In the early 1980s, actuarial firms began valuing long-term costs of RHBs, which seemed to parallel pension benefits. Results stunned our clients, as long-term projections had a magnitude far higher than they expected. While the Financial Accounting Standards Board (FASB) proceeded with deliberations that eventually led to accrual accounting for RHBs, the U.S. Congress only tinkered at the edges, resisting the imposition of ERISA-like rules and providing little encouragement for advance funding. Employers began dropping or severely limiting RHBs; lawsuits were brought by unions and retiree groups.

As to common-law recognition of who owed what to whom, here too much was (and is) at stake. Many

employers made plan changes that would be considered minor if imposed on active employees—an increase in deductibles or premiums—but they were sued when the changes affected retirees because of the precedent set and union fears that further reductions lay ahead. The employers were willing to continue some benefits if not tied to perpetual support. But a court case going to judge or jury was a wild card—there might be a finding that would give one side total victory in RHBs, but leave in tatters the trust needed to operate the business. So litigation was brought and settled, in a feint-and-parry sequence substituting for negotiations. Settlement might come just before the judgment of a District Court judge or before an Appeals Court ruling, but for 30 years settlement always came before a SCOTUS ruling. This was especially true for the Sixth Circuit (Michigan, Ohio, Kentucky and Tennessee), where the Yard-man decision had put a burden of proof on employers to show that a retiree benefit that was ambiguous about change was not vested.

By 1991, when FASB mandated accrual accounting, several lawsuits had gone to federal Appeals Courts, but with mixed results, some favoring employers as having a right to unilaterally change benefits, others favoring retirees, including Yard-man. Despite this mix, no appeal was taken to SCOTUS. Settlements out of court were the usual result, with neither side getting a “full loaf.” The usual actuarial valuation model would overstate the employer’s commitment to RHBs, since it assumed that retirees, like pensioners, would get their full loaf, with employers funding trusts in advance to finance lifetime benefits. Settlement terms do not usually disclose how dollar figures are determined, but there were indications that retirees were persuaded with optimistic views of investment returns. Stock markets are not the safest place to invest retirement assets, but only there could sufficient potential returns be found to have the diminished employer financial commitment blossom into full payment of future benefits.

Though most employers were sticking with their RHB programs, they were also tightening eligibility requirements and making other changes. The employer commitment looked like a shaky promise, and I was among those who suggested modeling

with a higher discount rate. FASB seems to have never seriously considered allowing high risk rates, although it had pegged pension discounts to observable bond market yield rates. FAS 106 became conventional wisdom for most actuaries. Its reasoning is worth tracing, as is that of the Governmental Accounting Standards Board (GASB), but let’s save discussion of accounting for another time. For the remainder of this article, we will consider the implication of the most forceful statement in the SCOTUS opinion: “... when a contract is silent as to the duration of retiree benefits, a court may not infer that the parties intended those benefits to vest for life.”

Many RHB programs are loosely ordered, without an explicit contract or with a contract that is silent or ambiguous about duration. Yet the sponsor continues to pay the benefits, and it is foolish to consider them as having no value. Actuarial valuation models are built for those purposes and have a number of ways of addressing the ambiguity of RHB programs. Quantifying uncertainty in financial projections, through present values determined with risky discount rates, was commonplace in the finance world by the 1980s, with insurance actuaries being involved—although few pension actuaries had that experience, as the pension promise was not considered ambiguous, but rather guaranteed. The improved ability of computers to analyze massive amounts of financial market data led to many an MBA student knowing historic relationships between stock and bond yields and identifying equity risk premiums. Actuaries in for-profit insurance companies, given the task of finding which products would have profits sufficient to meet investor requirements, became familiar with the research of Ibbotson and Sinquefeld at the University of Chicago’s Center for Research in Security Prices and helped set internal rates of return accordingly. Seeking equity profits meant seeking risk and potentially reaping an equity risk premium. Future profits were projected forward and then discounted back to the point of investment with an internal rate of return, to see if the present value of the profits justified the investment.

Insurance regulation (and prudent management) requires reserves to be invested in low-risk assets, but investors in insurance company stocks want

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The actuarial community's understanding of discount rates is not as rigorous or comprehensive as it might be, which is unfortunate because there is a similar vacuum in the economics profession.

returns associated with higher risk. Retirement annuities offered by insurers had similar constraints, but for large industrial corporations that sponsored pension plans, and saw prophecy in the research studies, funding with stocks would be expected to provide higher investment returns. Thus, less cash would be needed upfront to fund pensions and more would be available for other corporate goals. Actuarial consulting firms finding present values of future pension payments used Ibbotson to determine discount rates, based on sustainable expected rates of return for equity and bond investment. Insurance actuaries were using equity discount rates to value uncertain profits, and pension actuaries were using equity discount rates to value pension payments considered certain. Whether payments were certain or uncertain, guaranteed or not, didn't seem to make a difference. Eventually FASB and financial economics moved pension discount rates to the less-risky discount rates more appropriate for guaranteed benefits, but now SCOTUS is reminding us RHBs are often not guaranteed.

Court decisions regarding RHBs gave wide interpretation to the certainty of sponsor commitment. There were few incentives to get employers to pre-fund trusts for the benefits. Few assets were dedicated to future payments of RHBs. This lack of asset-backing is important, of course, but the second most salient aspect of RHBs is the uncertainty of employer commitment. (The No. 1 aspect is that it is incredibly valuable to have another person, or entity, share the cost of your health care as you get older.) As years passed, more employers reduced or terminated the benefits. Mergers-and-acquisitions specialists were not valuing the liabilities at an FAS 106 level, and it did not appear rating agencies or the stock market were either, but quantification methods they used, if any, remained their proprietary secret.

With few actuaries addressing this uncertainty for RHBs of a "lifetime" cash flow, I began speaking and writing about ways to affix present values to promised but uncertain benefits. An approach using a higher risk-adjusted discount rate seemed obvious to me, as I had been one of those insurance actuaries using equity discount rates. There were few RHB assets, so the expected-return-on-assets approach was out, plus FASB had rejected the idea

for pensions, tying FAS 87 discount rates to bond yields, regardless of assets. Bonds, with certain cash coupons, were an apt match for the pension promise, but the RHB promise was far less certain, so a discount rate matching bond yields seemed inappropriate. Use of an equity risk premium in the discount seemed a viable alternative.

I detailed several approaches in a 1991 *Contingencies* article. One was to use an annual plan termination decrement. Later I realized this had a kinship with an options pricing model, where probabilities would be assigned to all cash-flow possibilities using some type of lattice model and discounting all of them at a risk-free rate. A 2012 Society of Actuaries (SOA) monograph on valuation volatility published a piece I co-authored that specified positive aspects of a valuation method that explicitly recognized the tentative nature of an employer promise. Advantages were quantified, using examples of typical employer RHB program changes. An appendix addressed discount rates under certainty and uncertainty. (Unfortunately, the version published omitted discussion of RHBs as an employee/retiree asset with an employer put option.)

The recent SCOTUS decision underscores the point about financial obligations based on unilaterally changeable promises. The usual approach seems flawed, and a "terminable," or "rescindable," approach better estimates economic value. Litigation concerning whether specific benefits are permanent and unalterable has been settled for dollar amounts well below FAS 106 values. Actuarial documentation for such amounts, if it was available, seemed to use solid payment projections, but with settlement proceeds invested to yield future asset return indicating high risk. The practical effect is present value based on a risky discount rate.

Assuming the parties to negotiation and settlement also understood that the economic value of RHBs is much lower than shown in financial reports, we have an answer as to why it took so long for SCOTUS to decide a question that had been hanging for three decades. No party to litigation wanted to conclude their case without something to show for it. Both sides want to claim some victory and not be on Justice Scalia's losing end.



As noted above, SCOTUS remanded the M&G Polymers case to the 6th Circuit Appeals Court and a decision there might lead back to another SCOTUS hearing. I suspect there will be a settlement before that happens. Of the several ways for an actuary to aid in arriving at settlement amounts, the easiest modeling approach is probably the use of risk-adjusted discount rates.

The actuarial community's understanding of discount rates is not as rigorous or comprehensive as it might be, which is unfortunate because there is a similar vacuum in the economics profession. In the early 1990s, an Academy task force recognized the problem and advocated a research study, which the SOA sponsored but could not find an academic to complete. In the late 2000s, a more limited RFP

went out from the SOA to economic researchers, but again the academic response was inadequate and no work was commissioned.

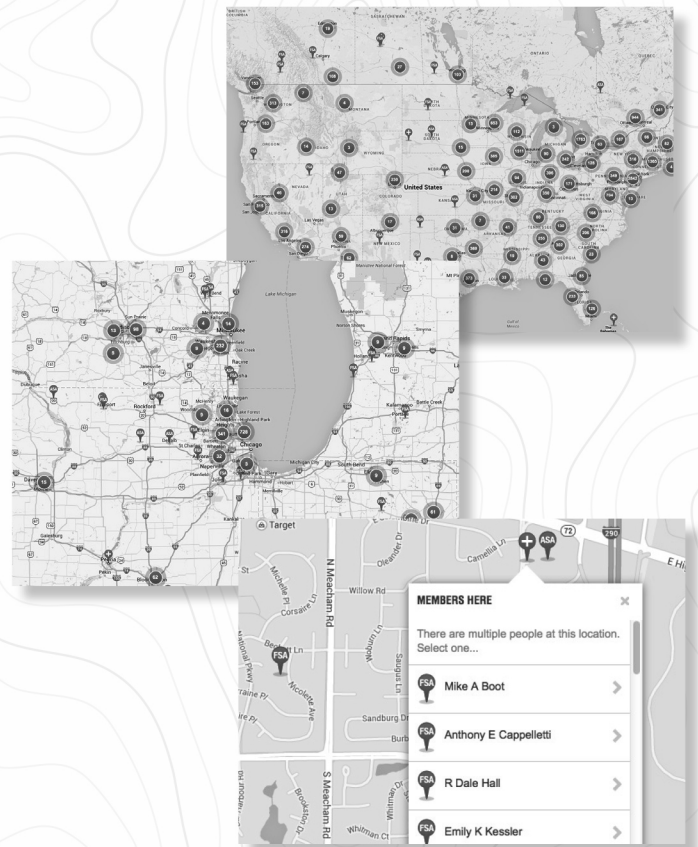
SCOTUS has given strong indication that RHBs are not to be considered vested unless that was the intention of the employer. The benefits will not disappear overnight, because their value to retirees is significant and an employer's cancellation of benefits sends a signal to employees, customers and investors that most employers would rather avoid. The retirees' benefit will continue to erode, more in troubled industries than in prosperous ones. In the face of the erosion and general uncertainty about the benefits that continue, the actuarial profession should find ways to place a value on the benefits commensurate with that uncertainty. ■

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# Articles in the *North American Actuarial Journal* of Interest to Health Actuaries

By Ian Duncan



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**T**he *North American Actuarial Journal (NAAJ)* has recently been publishing an increasing number of health-related articles. The most recent issue (Volume 19, Issue 1) contains two such items: “Multi-State Actuarial Models of Functional Disability” by Michael Sherris et al, and “Anatomy of a Slow-Motion Health Insurance Death-Spiral” by Ted Frech and Michael Smith. The first paper is one of a growing number of applications of relatively new actuarial theory of multi-state (Markov) models that is part of the Life Contingencies exam (MLC). Interested readers may wish to note that I will be moderating a session at the June Health Meeting on applications of newer techniques that will include example of multi-state models. The death-spiral paper may be a timely reminder to actuaries managing exchange products of things that can go wrong with self-paid health insurance.

## Multi-State Actuarial Models of Functional Disability

### Abstract

Long-term care costs are expected to significantly increase over the coming decades as the baby boom generation nears retirement. Recent policy discussions in the United States have focused on expanding the private long-term care insurance market so as to alleviate some of the pressure on public programs. An important and fundamental input to the pricing of long-term care insurance products is a set of age- and sex-specific functional status transition rates that can flexibly take into account alternative benefit trigger specifications.

We apply generalized linear models to evaluate disability transitions for individuals in old age based on a large sample of U.S. elderly. We estimate a multi-state model for long-term care insurance applications, and find significant differences in disability rate patterns and levels between our set of estimates and those separately estimated using an earlier approach developed by the Society of Actuaries. Our results suggest that the elderly face a 10 percent chance of becoming long-term care disabled only at ages past 90, rather than in their 80s. Furthermore, age patterns of recovery are found to differ significantly between the sexes. We also show that these estimates of transition probability are sensitive to the definition of “long-term care

disability,” which has implications for the design of benefit triggers for private and public long-term care insurance programs.

## Anatomy of a Slow-Motion Health Insurance Death Spiral

### Abstract

Adverse selection death spirals in health insurance are dramatic, and, so far, exotic economic events. The possibility of death spirals has garnered recent policy and popular attention because the pricing regulations in the Affordable Care Act of 2010 make health plans more vulnerable to them (though some other aspects of the ACA limit them). Most death spirals tracked in the literature have involved selection against a group health plan that was dropped quickly by the employer. In this paper, we empirically document a death spiral in individual health insurance that was apparently triggered by a block closure in 1981 and developed slowly because the insurer partially subsidized the block. Indeed, we show that premiums rose dramatically from around the time of the block closure to at least 2009 (the last year of available data). By 2009, some, but very few, policyholders remained in the block and premiums were roughly seven times that of a yardstick we developed. The history of this slow-moving event is directly relevant to current policy discussions because of both adverse selection in general and the particular problems induced by closing a block. ■

# EXAMINING THE EVIDENCE

## When Do Cause and Effect Matter for Health Actuaries?

By Tia Goss Sawhney and Bruce Pyenson

Health actuaries are increasingly being asked to opine on whether a particular health intervention improved health or saved money. Tough questions almost always follow:

- Are the observed results based on the right metrics (a very different question than whether the metrics were calculated correctly)?
- Did the intervention actually cause the observed results, or are they merely correlated? Or perhaps positive results happened but, for some reason, did not appear in the data?
- Do the results make sense?

Actuaries who are charged with figuring out if interventions improve health or save money are stepping into territory where causality rules. Because correlation methods work so well for so much actuarial work, actuaries may not recognize situations where relying only on correlation will get them into trouble.

Fun examples of spurious correlations can be found on a popular website,<sup>1</sup> but the genre long predates the Internet. Statisticians have been warning us against assuming causality for a long time. A widely referenced paper from 1926 has a chart “proving”

that fewer marriages in the Church of England caused a decline in the death rate.<sup>2</sup>

And the comedy continues. When a 2013 study by the German Institute for the Study of Labor found that more sexual activity was associated with higher wages,<sup>3</sup> the popular media coverage enthusiastically assumed causality. While *The Washington Post* coverage acknowledged that only correlation may be at play,<sup>4</sup> the science section of *Cosmopolitan* declared that “regrettable one-night-stands are actually helping us save for our European vacays.”<sup>5</sup> Perhaps comedians, more than statisticians, are our best defense against such hubris.

Health actuaries often don’t pay attention to cause and effect, and mostly they don’t need to. For example, historically high medical costs in a region can “cause” high premium rates for policies in that region. The people buying insurance in that region might be sicker (in dimensions not fully reflected in risk adjustment) or the providers might be less efficient. An insurer can be successful in that region without the actuary ever figuring out the reasons for



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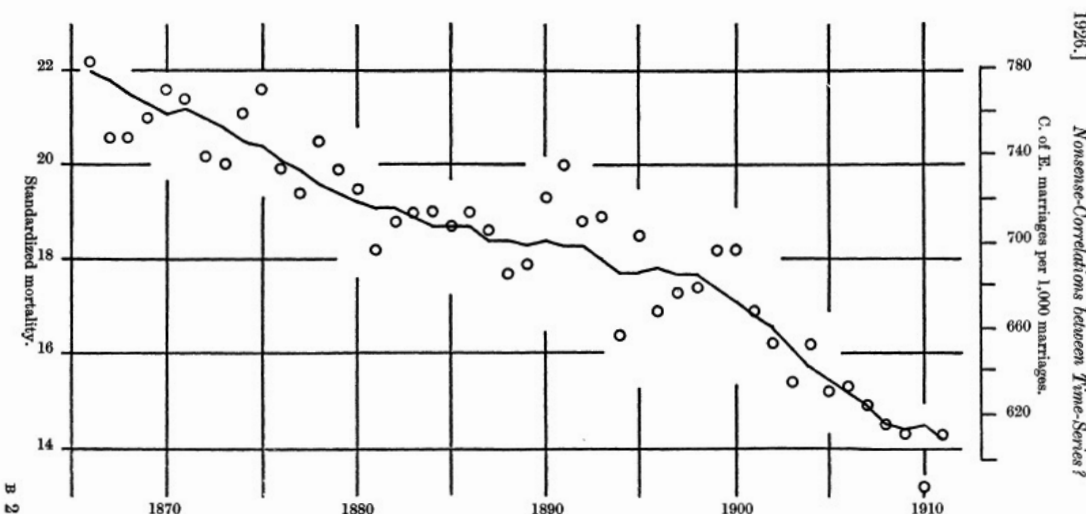


FIG. 1.—Correlation between standardized mortality per 1,000 persons in England and Wales (circles), and the proportion of Church of England marriages per 1,000 of all marriages (line), 1866–1911.  $r = +0.9512$ .

A good program evaluation study builds qualitative and quantitative evidence for causality while ruling out or quantifying the impact of other causes of the same outcome.

the high costs. And when it comes to agreements with providers or vendors that the actuary must evaluate, contract terms become reality—a contract could define success using metrics such as claims processing times or member satisfaction. In this case, the actuary’s job is doing the calculation right, as is (hopefully) clearly defined in the contract.

Causality, however, is essential for some tasks assigned to health actuaries; for example, evaluating the potential or historical savings generated by small or large health care interventions. These evaluation studies often involve changing health care delivery, not necessarily health benefits or health insurance. An actuary may be asked to evaluate the claims of vendors selling “solutions” to health care costs. Such vendors seem to bring a simple proposition of “buy my product (or service, device, drug, IT system, network, etc.) and your company will spend less on health care.” Vendors may promise to improve the health of the insurer’s members (for example, disease management companies), or they may claim to help members avoid expensive services (for example, hospital discharge planning services). On a grander scale, health actuaries are asked to evaluate if big system changes in Medicaid and Medicare health care delivery and payment (such as the promulgation of patient-centered medical homes) have generated savings,<sup>6</sup> or if they are likely to do so.

### What’s an Actuary to Do?

Big system changes can draw media attention and often involve a lot of money. Should actuaries leave the evaluation of such programs to economists? We feel that actuaries with experience in payment systems, delivery systems and populations can take on the challenges of such evaluations, but they need to pay careful attention to causality.

Suppose an actuary is charged with figuring out if a program that managed “high-risk members” did indeed save money. The actuary might try to answer some of these questions:

1. Was the per capita cost trend for the population lower than budgeted?
2. Was the per capita cost trend for the man-

aged members lower than the trend for the nonmanaged members?

3. Did hospitalizations go down for the managed members? Relative to nonmanaged members?
4. Did costs go down for managed members? Relative to nonmanaged members?

Despite the appeal of a narrow quantitative approach, focusing exclusively on answering these and similar questions can easily produce flawed results.<sup>7</sup>

### Doing It Right

A good program evaluation study builds qualitative and quantitative evidence for causality while ruling out or quantifying the impact of other causes of the same outcome. It also looks for special circumstances that might be affecting results.

Causality can seem like peeling an onion—there is always another layer, and by the end you want to cry. For example, cigarettes cause lung cancer, but how? The tobacco industry unscrupulously used the “lack of absolute proof” to continue to promote highly addictive carcinogens for decades after there was overwhelming observational evidence proving tobacco’s harms.<sup>8</sup> As painful and unnecessarily long as the cigarettes and lung cancer debate was, extended debate regarding causality is normative. A single study or even group of studies seldom proves causality to everyone’s satisfaction. Furthermore, evaluators who acknowledge the limitations of their study have more credibility among those concerned with causation than those who don’t.

Fortunately, health actuaries considering causality can find useful and accessible guidance in the epidemiology literature. For more than 100 years, public health professionals, particularly epidemiologists, have been very much concerned with establishing the direct and indirect causes of disease and health, and evaluating the effectiveness of public health interventions. Epidemiology can help actuaries avoid some obvious pitfalls, and help actuaries find out how others have tackled similar problems. Ideally, actuarial analyses that involve causation layer the actuaries’ expertise in payer systems and costs upon a solid epidemiologic framework.

Fifty years ago, epidemiologist Bradford Hill proposed a framework for considering causation that is particularly applicable to health actuaries in the form of nine causality criteria.<sup>9</sup> These criteria are presented much like Actuarial Standards of Practice (ASOPs)—a list of issues that need to be seriously considered, not all of which are applicable all the time. The criteria are:

1. **Strong Associations.** The lung cancer rate among cigarette smokers was much higher than among nonsmokers. While strong associations are more indicative of causality, less strong associations can also be causal; for example, uncommon infectious diseases among people who are unusually vulnerable which may be hard to measure due to low sample size, not nonexistent causality.
2. **Consistency.** Associations that are replicated over time and populations are more likely to be causal. Good outcomes from a program in Hartford have more credibility if the program also works in San Diego and Birmingham.
3. **Specificity.** Single types of interventions or exposures (e.g., exposure to one chemical) and single types of outcomes (e.g., one type of cancer) make for stronger causal arguments. On the other hand, it is well known that some risk exposures (e.g., obesity) are linked to many types of illness.
4. **Temporality.** The intervention or exposure must occur before the outcome. Sometimes temporality is challenging; for example, in order to demonstrate that smoking causes lung cancer, it is not sufficient to show that more smokers die from lung cancer as they may have had the cancer before they started smoking. However, prior to lung cancer screening, there was no way to know when the cancer first appeared. This scenario is particularly relevant for potential evaluations of the negative effects of marijuana as marijuana is being used for a host of therapeutic uses, including symptom management for the terminally ill.
5. **Biological gradient,** also known as the dose-response relationship. A smoking ces-

sation program that reaches 50 percent of smokers should have more impact on the population of smokers than one that reaches 1 percent of smokers.

6. **Plausibility.** If a relationship is believable according to current health theory, causality should be considered; absent supporting theory, causality should be questioned. That said, we are always limited by current knowledge, and the history of medicine is filled with practical revolutions that became understandable only years later. Polluted water was recognized as a cause of disease before germ theory. The process of constructing a theoretical model can help identify other variables (confounders) that may be in play. For example, while it is hard to construct a direct causal connection between compliance with cholesterol drugs and safer driving, it is not difficult to construct a causative model where an individual's tendency to comply with expectations and rules impacts both drug compliance and driving safety.<sup>10</sup>
7. **Coherence.** The idea that obesity can cause diabetes coheres with the historical increase in both obesity and diabetes prevalence. Widespread efforts to reduce hospital length of stay cohere with the observed reduction in length of stay.
8. **Experiment.** Experimentation, when possible, bolsters the evidence for causation. Because confounding variables and the intervention itself are better controlled, evidence from experimentation, especially randomized controlled trials, can be particularly strong. When randomized controlled trials are not possible, ethical or practical, however, we must rely on less-than-controlled and even "natural experiments." Sometimes natural experiments are advantageous, as the causality observed in randomized controlled trials may depend on conditions not generally found in the real world.
9. **Analogy.** The epidemiological evidence against cigarettes was overwhelming before the 1960s. Studies on pipe smoking excluding cigarettes were relatively rare, making popu-

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Our initial Web searches for “actuarial” and “causality” yielded thousands of hits. On inspection, these were almost all related to “causality insurance” and similar mis-entries. Perhaps today’s explosion of data requires adding a 10th criterion to Bradford Hill’s nine: “Humor. Computer systems can create systematic biases that have strong associations, are plausible, appear coherent, and are wonderfully misleading. Researchers should know when to enjoy a good laugh.”

lation studies of the harms of pipe smoking more difficult. However, the analogy to cigarettes was powerful evidence of causality.<sup>11</sup>

While these criteria seem intuitive, considering them requires considerable investigation and typically far more comprehensive analysis than what would be needed to demonstrate correlation. The successful investigator thinks big, starts with a survey of existing literature and potential theoretical models, follows with a careful analysis, and conclusion.

An overly narrow application of the Bradford Hill criteria can cause mistakes (as is the case with the ASOPs). Neither the Hill criteria nor the ASOPs should be viewed as prescriptive.<sup>12</sup> Suppose an intervention should specifically reduce inpatient hospital costs for a particular population, for example, an emergency room diversion program. An actuary may seem to pay homage to the specificity criteria by examining only inpatient costs. But this could miss a scenario where costs decreased across all services. Such a decline may imply other plan changes or simple regression to the mean caused the inpatient decline.

The many forces that affect health care costs make the temporality criteria particularly challenging. An intervention that happens over one year, such as a healthy diet campaign for diabetics, may be associated with a cost reduction the following year. However, if costs were already decreasing before the intervention or if nondiabetics experienced a similar cost decrease, the apparent causality between the intervention and the cost reduction might be illusory.

Selection (adverse or positive) and regression to the mean are common challenges in causality analyses, and they may be subtle. For example, a population composed of enrollees who had at least one claim in the last year is a select population. In the following year, this population will regress toward the mean of having some people without a claim and hence without cost. Likewise, a population of people who are alive at the end of a year is a select population. Over the next year some portion of the selected population will likely die and have end-of-

life costs. We note that patient attribution methods widely used in accountable care organization shared savings programs are often affected by these kinds of selections, and so determining causality among attributed populations can be particularly challenging.

## Actuarial Standards and Causality

Causality is rarely mentioned in the actuarial literature. Some of the mentions actually de-emphasize causality. For example, ASOP 12 “Risk Classification”<sup>13</sup> and the Academy’s “Risk Classification Statement of Principles” explicitly make the point that risk classification systems do not need to be tied to causality.<sup>14</sup>

The actuary who steps into the world of causality must recognize the need to look outside the ASOPs to do competent work. The growth of provider risk sharing and accountable care organizations means actuaries will be increasingly involved in health care delivery and system changes—an environment where many professionals think about causality. Perhaps it’s time to make sure actuaries can recognize and address cause-and-effect situations. We hope actuaries called upon to perform evaluation studies will thoughtfully engage in building solid evidence for or against causality and will not be satisfied with simply reporting correlation, hinting at causality, or warning about potential selection bias. With this in mind, actuaries can be satisfied by giving safer advice than the authors of *Cosmo*. ■

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