



ISSUE 65 JANUARY 2011

Health Watch

Medicare Supplement: Critical Factors for Success

By Sudha Shenoy, Kenneth L. Clark, James P. Galasso, and John S. Cathcart

The year 2010 is a milestone year for the Medicare Supplement industry. This is of course attributable to recent legislation called the “Medicare Improvements for Patients and Providers Act of 2008,” referred to as MIPPA. While MIPPA regulation represents a significant change to the Medicare Supplement industry, the critical factors for success remain the same today as has been the case for as long as federal standardization has been around (starting in the early ‘90s) if not longer. This article will provide the background and basics of the Medicare Supplement product line and the critical factors of managing it to a profitable level.

Basics of Medicare Supplement

As the name implies, Medicare Supplement provides insurance benefits that supplement Medicare fee-for-service (FFS) benefits, typically known as Parts A and B. It is important to note that Medicare Supplement is not a replacement for Medicare FFS. Another way of saying this is that a Medicare Supplement policy covers much of the Medicare beneficiary obligation (Medicare doesn’t cover everything after all!) that would otherwise result in out-of-pocket expenses. These expenses could consist of everything from manageable and budgetable deductibles or co-pays to expensive catastrophic hospital charges in the event Medicare benefits are exhausted. Medicare Supplement is also commonly referred to as “MediGap.”

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Letter from the Editor

by Mary van der Heijde



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I'm sure that we have all heard a wide range of bad jokes about being an actuary: An actuary, an underwriter and a marketing director are riding together in a car. The marketing director has his foot on the gas; the underwriter has his foot on the brake; and the actuary is looking out the back window giving directions for where to go. I could go on and on—you know what I mean!

As we kick off 2011, we can see an eventful and exciting year ahead. We expect (and look forward to meeting) new challenges, both technical and nontechnical, as we navigate this new terrain in which we operate. While we have to be math nerds to some extent to enjoy our work and survive the exams, it is critical that we branch out and make sure that our image as key risk management professionals shines through. The numbers on the page only tell part of the story, and it is up to us to make sure to be able to communicate the rest of the story well to those non-actuaries around us. I encourage you to take a look at the new SOA Competency Framework on www.soa.org, and continue to challenge yourself and the actuaries around you to focus on the “soft skills” important to our success.

Both the SOA and the American Academy of Actuaries have been quite busy lately, supporting a wide variety of health-care-reform-related issues. This issue's “Chairperson's Corner” and “Soundbites from the Academy” provide more information about these efforts. For this issue's “Navigating New Horizons” feature we have included an interview with Jack Bruner, an actuary working as the executive vice president of marketing and strategic development for CVS Caremark. Bruner shares with us about how his career has evolved, from traditional actuarial work into his current nontraditional role.

State employer health plans are facing increasing challenges. Bob Cosway and Barbara Abbott provide information about observed trends for state employer plans, as well as additional state-by-state information.

We have included an article by Shelley Brandel about the potential for significant membership changes related to changes in Medicare Part D prescription drug plans, and Kristi Bohn shares with us some interesting conclusions she had upon review of family tier factors.

For those working in Medicare Supplement, an article in this issue provides insight into critical factors for success. As well, for Medicare Advantage, we have included an article by Corey Berger and Eric Goetsch about hierarchical condition categories and chart reviews within the context of risk scores.

A recent hot topic has been the increased use and coverage of bariatric surgery. John Dawson, Pierre-Yves Crémieux and Arindam Ghosh share more information about potential opportunities for patients and payors related to bariatric surgery. We are pleased to include information about population health management, from Rob Lieberthal at the Jefferson School of Population Health. Tzu-Chun Kuo and Philipp Vetter have summarized some of their recent research about the impact of disease and treatment on life expectancy.

We hope you find this issue interesting and relevant, and encourage you to contact us with your thoughts and opinions. ■

Chairperson's Corner

by Judy Strachan

Welcome to the new section council members! With the latest elections, Kristi Bohn, Pat Kinney, Dewayne Ullsperger and Karl Volkmar have joined the council. They will be contributing their energy and their ideas to the council for the next three years.

Health Reform

The past year has been another eventful year for the Health Section. With the passage of the Patient Protection and Affordable Care Act in March of 2010, health care reform continues to play a central role in Health Section activities. A survey of actuaries on "Bending the Cost Curve" identified the need for greater transparency in the health care system and provider payment reform as keys to reducing future health care trends. The council has recently completed a call for papers on provider payment reform. The current health care payment system in the United States does not always include incentives for providers to provide quality, cost-effective and efficient health care; in fact it is often viewed as a hindrance to these health policy goals. Submitters were asked to provide their vision of a financially sound, equitable health care provider payment system and their ideas of how a reformed provider payment system, in part or whole, would be achieved. The winning four articles were featured in the September newsletter along with additional articles addressing the topic of provider payment reform.

To further the work of the SOA on health reform, the SOA Board of Directors recently funded three large research projects on the topics of risk adjustment, employee benefit design and provider payments. The Health Section Research Committee is looking forward to assisting with these projects in the coming year.

Complexity Science

Another major initiative of the Health Section Council in 2010 was the funding of a text on complexity science by Alan Mills. Complexity science is a group of relatively new modeling techniques applicable to complex systems. Exactly what is a complex system is difficult to define precisely. Complexity science looks at dynamic systems with multiple types of agents whose behavior is continually adapting and changing in response to the changing behavior of the other agents within the system. Clearly the U.S. health care system fits that definition with health insurance companies, health care providers, government, employers and consumers continually adapting to each other's behaviors in a complex dance. Complexity science provides new and exciting ways to model the behavior of the agents in the U.S. health care system.

The work by Alan Mills, "Complexity Science—An Introduction (and Invitation) for Actuaries," includes not only an excellent and very readable text explaining complexity science, but also several Excel spreadsheets with examples and models to get you started in your exploration of these new and exciting techniques. The text and the models can be found at: <http://www.soa.org/research/research-projects/health/research-complexity-science.aspx>. Use of these modeling techniques has the potential to totally revise the way actuaries model and study the health care system. I urge you to read and familiarize yourselves with Alan Mills' work.

As an added incentive to encourage people to learn and to use complexity science to analyze health care systems, the Untapped Opportunities Task Force sponsored a call for complexity models of a component of a health care system. Details on the call for models can be found at: <http://www.soa.org/research/>

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research-ops/data-request/2010-10-health-complexity-models.aspx. The models must be submitted by March 31, 2011. I look forward to seeing the submissions!

Strategic Planning

During a meeting that included representatives from the SOA Health Section Council, the Academy of Actuaries Health Practice Council and the SOA Board of Directors, the Health Section Council began a strategic planning process with a Strengths/Weakness/Opportunities/Threats (SWOT) analysis. A number of initiatives were identified at that

meeting and will be explored further by the Health Section Council over the next few months. To keep the momentum going from the SWOT analysis, a new Health Section Council Strategic Planning Group has formed with Sudha Shenoy as the chair. She brought a planning framework plus issues and ideas to the board at their December meeting.

If you are interested in participating in the strategic planning process, please reach out to Sudha, me or Sara Teppema. We welcome your ideas and your assistance! ■



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So, in general, a Medicare Supplement policy could provide coverage for the various Medicare cost-sharing components provided below:

Part A

- Inpatient deductible (\$1,100 for 2010)
- Inpatient coinsurance—days 61–90 (\$275 for 2010)
- Inpatient coinsurance—lifetime reserve days (\$550 for 2010)
- Skilled nursing facility (SNF) coinsurance—days 21–100 (\$137.50 for 2010)
- Hospice coinsurance—limited amount for outpatient drugs and inpatient respite care
- First 3 pints of blood
- Inpatient charges beyond lifetime reserve days

Part B

- Part B deductible (\$155 for 2010)
- Part B coinsurance—generally 20 percent of Medicare allowable
- Charges in excess of Medicare allowable

In addition, there are some potential non-Medicare-related benefits that typically only apply to certain older (1990 Standardized) policies. One such common benefit is the foreign travel benefit that provides coverage for emergency care outside the United States.

Some people confuse Medicare Supplement coverage with Medicare Advantage, also known as Part C. Medicare Supplement coverage is provided through a private insurance contract between the insured and the issuing carrier. This is independent of any arrangement with Medicare, although there is the prerequisite that the insured be signed up with Medicare as well as the fact that coverages and benefit terms do coordinate with Medicare benefits. This is unlike Medicare Advantage, which is essentially an arrangement with the Center for Medicare and Medicaid Services (CMS) as an alternative to traditional Medicare FFS provided through an independent insuring entity as a contractor for CMS.

Federal Standardization

Beyond just the general concept of Medicare Supplement is the reality that this line of business

is heavily regulated at the federal level with respect to benefit design in terms of what standardized plans are allowed to be sold. This is often referred to as “standardization.” Standardization has gone through various changes over the last several years, the most recent being effective June of last year with the implementation of MIPPA legislation passed in 2008. The scope of the change affects any policies sold with effective dates of June 1, 2010 or later. These policies are referred to as the 2010 Standardized Plans. However, in-force policies sold with effective dates prior to June 1, 2010 may be based on the standardization requirements in effect when they were sold. Table A provides a side by side overview of the allowed standardized plans designs, commonly referred to as the alphabet plans. Completely new for 2010 (actually since June) are low-cost plan options M and N. They join other low-cost options (such as A, K, L and a high-deductible version of F) which have not had much impact on the market overall up to this point. However, at this point there appears to be quite a bit of interest in these new plans as they are being introduced into the market. Plan N in particular has generated interest as a comparable alternative to Medicare Advantage due to the fact that it has office visit co-pay cost-sharing features.

Unique Aspects of Medicare Supplement Line of Business

The Medicare Supplement line of business has some unique features in comparison to commercial accident and health (A&H) business, which we will discuss briefly.

• Access to and Eligibility for Coverage

Most Medicare Supplement policyholders enroll in Medicare Supplement under either open enrollment or guarantee issue provisions. Open enrollment applies to individuals who are first eligible to sign up for Medicare Part B, generally when they turn 65. Guarantee issue eligibility is triggered under various qualifying events, such as termination of employer coverage or the termination of a Medicare Advantage plan.

The distinction is not important given that

The Medicare Supplement line of business has some unique features in comparison to commercial accident and health (A&H) business

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the practical effect of both is that an applicant is not subject to medical underwriting for the purpose of rating and/or issuing a policy. In addition, prior creditable coverage can be used to satisfy any pre-existing condition exclusionary periods. Importantly, however, a Medicare Supplement policy itself is not considered creditable coverage. This effectively locks many Medicare Supplement policyholders into their existing Medicare Supplement policy.

And finally, all Medicare Supplement policies are guaranteed renewable.

- **Rating Structures and Limitations**

Rate structures based on attained age, issue age and even community rates can be found in the marketplace. Most carriers rate on an attained age basis where allowed. There are as many as 15 states that do not allow attained age rating and some that require community rating or some form of modified community rating.

One rating aspect of Medicare Supplement that is different from some commercial business is the inability to rate by duration within a policy form. In other words, there is no new business rate versus renewal rate distinction.

- **Loss Ratio Standards**

Medicare Supplement business is subject to minimum loss ratio standards of 65 percent for individual plans and 75 percent for group plans. The applicable loss ratio must be met over the lifetime and by the third policy duration.

In addition to filing rates every year, in every state, to certify that the minimum loss ratio standards are being met, a refund calculation form must be filed by plan and state. This refund calculation form is a formula-driven, credibility-adjusted calculation that indicates the amount, if any, of premium refunds that are required.

- **Impact of Health Care Reform**

Interestingly, the health reform laws enacted in 2010 had minimal impact on Medicare Supplement policies. In fact, the largest impact will likely be the indirect impact to the extent health reform places greater restrictions on

Medicare Advantage plans to the relative benefit of Medicare Supplement policies.

The only section of the Patient Protection and Affordable Care Act (PPACA) that specifically addresses Medicare Supplement is Section 3210, which calls for the review and revision of Plans C and F to “include requirements for nominal cost sharing to encourage the use of appropriate physicians’ services under part B.”

Pricing Implications

The primary pricing issue today facing existing Medicare Supplement carriers is the rating relationship between the 2010 Standardized Plans (policies sold with effective dates on or after June 1, 2010) and the 1990 Standardized Plans (the term used for all standardized plan policies sold with effective dates prior to June 1, 2010). There are benefit differences which vary in significance by plan, but these are relatively straightforward.

Of much greater significance is the regulatory environment, specifically the extent to which rates for the 2010 Standardized Plans must be consistent with the rates for the corresponding 1990 Standardized Plans. Language has been added to the *Draft NAIC Medicare Supplement Compliance Manual* which states that the experience of the 1990 Standardized Plans shall be pooled with the experience of the 2010 plans of the same letter designation for all rating purposes (or, NAIC-defined equivalents for plans without comparable letter designations). The phrase “rating purposes” includes both initial pricing as well as rate increases.

One of the key components of a pooling requirement will be how states interpret the *Compliance Manual* language. The intent of the language does not require identical rates between the 2010 Standardized Plans and the 1990 Standardized Plans. In fact, it seems clear that different rating structures should be allowed.

Additional language added to the *Compliance Manual* notes that rates should be equal between plans to the extent that all other factors are equal. The “other factors” noted, but presumably not exclusive, are lifetime target loss ratio and underwriting. Therefore, it seems clear that differences in the assumed impact of underwriting or commission/



expense levels can be utilized in the pricing process and provide adequate justification for rate level differences.

The *Compliance Manual* also notes that if initial 2010 Standardized Plan rates are equal to the comparable 1990 Plan rates, then subsequent rate adjustments will be uniform going forward. However, it goes on to state that if they are not equal (presumably due to these other factors), then the goal is for the rates to become identical over time, subject to state regulation. This appears to be inconsistent with the justification of initial rate differences in the first place. As an example, if rates are different because of justifiable differences in lifetime loss ratio (a specifically recognized exception in the *Compliance Manual*) then why would this require rates to become identical in the future? We can expect the interpretation of this language to vary significantly on a state-by-state basis.

With respect to claim-level analysis, it is important to recognize the geographic, demographic and, if significant, the durational mix of business in order to uncover the inherent claim cost levels for pricing new plans.

Of course, the second, but not any less important, stage of the proposed pooling requirement is for rate increases going forward. Again, it comes down to interpretation regarding the extent to which rate increases must be identical. An argument can be

made that benefit differences could result in different claim trends, although the differences would most likely be minor.

Ongoing Rate Management

Successful Medicare Supplement plans should be profitable while delivering good value to policyholders. Important contributions to profitability for insurance companies include good underwriting, claims management, an efficient administrative process, investment income and an effective rate management process. Of these, the most important for Medicare Supplement business is having an effective rate management process.

Rate management requires regular analysis of pricing assumptions by conducting scenario testing, experience analysis, impact of rate increases on future experience (projections) and impact of inadequate rate management. Rate management should take into account regulatory and market considerations while reflecting changes in benefits, medical inflation, utilization and corrections to expected trends. Rate adjustments should not reflect aging and underwriting wear-off assuming that these components are properly reflected in the initial pricing. It is important to develop a regular process for reviewing experience, developing and filing annual rate increases, as well as rate implementation. The timing and amount of rate adjustments will not always equal claim trend increases due to many reasons including regulatory and market considerations as well as differences between actual and expected trends from prior rate filings.

Rate development and filing is affected by state-specific requirements, loss ratio standards, credibility standards, pooling, actuarial equivalence and turnaround time for the rate filing review and approval process. Unanticipated changes in federal or state regulations such as MIPPA, Health Care Reform, NAIC Model Regulations, etc., can also impact rate development.

Market considerations such as distribution channel issues can impact in-force and new business. To ensure a stable long-term presence in the market-



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The impact of recent legislation has resulted in a renewed interest in the Medicare Supplement market.

place, a carrier needs to strike a balance between reasonable and competitive yet adequate premium rates. Strategies need to be developed to deal with competitive pressures on commissions as well as other Medicare Advantage/Medicare Supplement products offered by carriers in the marketplace.

Scenario testing should include sensitivity analysis of lapse rates, claims trend and rate increase approvals relative to claims trend. A study of actual-to-expected claim experience should include cumulative claims since inception, by duration and by calendar year. A deeper study of claim trends, lapse rates and distribution of business can provide insights into action steps for future rate and business management actions.

Factors that affect experience include open enrollment/guaranteed issue, aging, underwriting, inflation, utilization, lapse rates, changes in Medicare and distribution of business. In-depth analysis of these factors will help shape a unique rate management strategy for individual organizations.

High rate increases, relative to claims trend and the marketplace, may lead to high lapses, resulting in an assessment spiral and eventual decline of the product line. On the other hand, low increases relative to claim trend may lead to higher-than-expected loss ratios, which are also not conducive to the profitable growth of business. Good rate management can have a positive impact on profitability leading to a stable block of business. It is therefore important to understand profit expectations and causes of deviation

in experience, and to take appropriate and timely corrective actions.

Rate management is not an initial pricing action but an iterative process that involves analyzing variance of actual versus expected experience taking into consideration variance in assumptions and the interactions between these assumptions. Many forces like the commission structure and the regulatory environment can affect persistency and the profitability of the book of business. Therefore, to develop and maintain a profitable book of business, it is important to plan strategically, conduct key sensitivity analysis and remain vigilant to forces that can impact the book of business.

What Lies Ahead?

The impact of recent legislation has resulted in a renewed interest in the Medicare Supplement market. Some companies have taken notice of the Medicare Supplement market as a new opportunity and/or financial hedge relative to other lines of business. Of course, the Medicare Supplement market has its challenges, especially with respect to maintaining profitability in a very price-sensitive competitive market.

If history is any lesson, change is always on the horizon. This fact may never be more apparent than now, with the present focus in Washington on the health care financing crisis. Regardless of how the Medicare Supplement market changes and evolves, there is a good likelihood that the critical factors for success today will be just as relevant, if not more so. ■

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Table A
Medicare Supplement—2010 Standardized Plans
Summary Chart of Benefits by Plan

Benefit	Plan A	Plan B	Plan C	Plan D	Plan F*	Plan G	Plan K	Plan L	Plan M	Plan N
Medicare Part A Services:										
Inpatient Hospital:										
Days 1–60		X	X	X	X	X	a	b	c	X
Days 61–90	X	X	X	X	X	X	X	X	X	X
Lifetime Reserve Days	X	X	X	X	X	X	X	X	X	X
Days Beyond Lifetime Reserve	X	X	X	X	X	X	X	X	X	X
First 3 pints of blood	X	X	X	X	X	X	a	b	X	X
Skilled Nursing Facility:										
Days 21–100			X	X	X	X	a	b	X	d
Medicare Part B Services:										
Hospital Outpatient:										
Deductible			X		X					
Coinsurance	X	X	X	X	X	X	a	b	X	d
Physician:										
Deductible			X		X					
Coinsurance	X	X	X	X	X	X	a	b	X	d
Excess					X	X				
Other Services:										
Foreign Travel Benefit			e	e	e	e			e	e
Hospice	X	X	X	X	X	X	a	b	X	X

X - 100% Covered

a - Subject to 50% plan coinsurance and OOP limit (\$4,620 in 2010)

b - Subject to 75% plan coinsurance and OOP limit (\$2,310 in 2010)

c - Only 50% covered

d - Covered, subject to co-pays (Maximum \$20 per office visit and \$50 per emergency room visit)

e - Covers medically necessary Medicare-eligible emergency care in a foreign country for 80% of billed charges subject to a \$250 calendar year deductible and \$50,000 lifetime maximum benefit

* - High deductible version is available—annual deductible for 2010 is \$2,000

Soundbites

from the American Academy of Actuaries' Health Practice Council

by Heather Jerbi and Tim Mahony

What's New

Implementation of the provisions in the Affordable Care Act (ACA) continues to be a priority for the Academy's Health Practice Council (HPC). The council has created a number of work groups charged with providing input and responding to requests for information from the Department of Health and Human Services (HHS), the National Association of Insurance Commissioners (NAIC) and other interested parties, as well as commenting on proposed and final regulations issued on the various provisions of ACA.

While the HPC is now looking at some of the provisions that will be effective in 2014, most of its recent work has been focused on those provisions that go into effect in 2010 and 2011. These provisions include medical loss ratio (MLR) reporting and rebates, rate review and disclosure of "unreasonable" rate increases, and many near term changes to benefits and eligibility.

During the summer and fall, members of the HPC's health reform implementation work groups had conversations with HHS representatives, senior White House officials, Government Accountability Office (GAO) and congressional staff to discuss a variety of topics including MLR issues such as the potential for disruption in the individual market and credibility concerns; rate review and the type of information available in actuarial memoranda that could be used to inform consumers about the factors behind premium increases; the temporary reinsurance program (Sec. 1341); and the effect of the elimination of annual and lifetime limits on premiums.

While health reform implementation is a significant priority, HPC work groups continue to work on other relevant issues, as well. The Medicaid Work Group continues to engage with the Centers for Medicare & Medicaid Services (CMS) regarding the development of a new rate-setting checklist for Medicaid. In addition, several HPC work groups are working with the NAIC on various projects including the development of a long-term care valuation table, an update of the cancer cost tables and a review of the MedSupp refund formula.

Some of the more recent communications to HHS and the NAIC on many of these issues are highlighted below.

Medical Loss Ratio Reporting and Rebates

The Academy's Medical Loss Ratio Regulation (MLR) Work Group has been active since the enactment of ACA, providing input to both HHS and NAIC. Most recently, the activity has focused on clarifying concerns and recommendations highlighted in the work group's initial comment letters. On Aug. 20, the work group submitted a comment letter to HHS as a follow-up to a conference call on credibility issues for the purpose of calculating rebates under the new MLR requirements. The work group provided HHS with input on a NAIC proposal that would have created a hierarchy for applying credibility and pooling techniques in the implementation of these rebates.

On Oct. 4, the NAIC's actuarial subgroup approved draft regulation on medical loss ratios, which would promulgate uniform definitions and a standardized calculation methodology for rebates in accordance with ACA. The draft regulation was sent to the NAIC's B Committee, which then exposed the draft for additional comment. On Oct. 8, the Academy's MLR Work Group sent a letter to the NAIC identifying areas of agreement with the draft regulation, as well as issues that deserve further consideration (e.g., magnitude of credibility adjustments and methodologies for contract reserves) or still need to be addressed (e.g., transition guidance and identification of rebate recipients).

Editor's Note: since this article was drafted, HHS has released the interim final regulation related to medical loss ratio rebates and reporting, as well as proposed regulations on rate review and disclosure of unreasonable rate increases.

Premium Review

Sec. 2794 of PHSA, which was created by the enactment of ACA, requires the HHS secretary to work with states to establish an annual review of unreasonable rate increases, to monitor premium increases, and to award grants to states to carry out their rate review processes. As noted, the members of the Academy's Premium Review

Work Group have had conversations with HHS regarding rate review and, in particular, the information available in actuarial memoranda. As a follow-up to those conversations, members of the work group provided examples of publicly available rate filings and actuarial memoranda from different states and markets. In addition to providing input to HHS, on July 14, the work group offered comments to the NAIC on its exposure draft of a rate filing disclosure form, which is intended to facilitate the reporting of “unreasonable” rate increases to HHS.



On a related issue, the work group also sent a letter to the leadership of the Massachusetts legislature on Senate bill 2447, which included a provision that would deem “excessive” any health insurance premium increase that exceeds 150 percent of the percentage increase in medical CPI. The work group’s comments noted some of the limitations of medical CPI as a measure of the reasonableness of a premium increase.

Reinsurance

On Sept. 22, the Academy’s Risk Sharing Work Group sent a letter to HHS on Section 1341 of ACA, which tasks the Academy with providing recommendations related to the 2014 temporary reinsurance mechanism. In its letter, the work group provided initial input on potential approaches for identifying high-risk individuals and determining reinsurance payments.

Benefit and Eligibility Changes

A number of ACA provisions related to changes to certain benefits and eligibility requirements became effective on Sept. 23. As such, the Academy’s Benefits and Eligibility Work Group actively responded to the release of interim final regulations (IFR) on many of these provisions. On July 12, the work group submitted a comment letter to HHS on the IFR related to the extension of dependent coverage to age 26. The work group’s comments focused on age-rating for dependents, limitations on coverage to dependents not eligible for employer-sponsored insurance, and the definition of dependent. In addition, the work group noted some concerns related to the economic impact section of the IFR, specifically whether the financial impact of the issues addressed in

the letter actually were reflected in the economic impact analysis.

On Aug. 27, the work group provided comments to HHS on the IFR regarding the elimination of preexisting condition exclusions for children younger than 19, the elimination of lifetime benefits and the restriction on annual limits, and other patient protections.

On Sept. 17, the work group submitted a letter with comments on the IFR related to the requirement that preventive services be covered without cost sharing. The letter requested clarification on the services covered and the frequency at which they are covered. The letter also examined the economic impact of first-dollar coverage of these services.

On Aug. 16, the Grandfathering Provisions Work Group responded to the IFR that addressed the status of health insurance coverage as a grandfathered plan. In addition to responding to specific requests for comments within the IFR, the work group provided comments on transitional rules, the maintenance of grandfathered status, and the applicability of the IFR to individual coverage and plan rolls.

Exchanges

On Oct. 4, the Academy’s Exchanges Work Group responded to a request for comments from HHS on the exchange-related provisions in Title 1 of

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ACA. The letter included responses to questions related to qualified health plans, actuarial value, increasing and facilitating participation in the exchanges, enrollment and eligibility, quality standards and risk adjustment.

NAIC and other Academy Activities

On Oct. 4, the Joint Committee on Retiree Health and the Pension Accounting Committee sent a joint letter to the NAIC to provide comment on the exposure draft of Statement of Statutory Accounting Principles (SSAP) 92 and the proposed revisions to SSAP 89, which are intended to replace existing standards governing accounting for pensions and OPEBs. The comments focused on the potential need for SSAP accounting treatment to distinguish between long-term benefits that are binding and those that are not.

On Sept. 30, the Academy's Deferred Tax Assets (DTA) Bridge Group submitted a requested final report to the NAIC Capital Adequacy Task Force showing the appropriate treatment of the DTA in the risk-based capital formulas for life, property/casualty and health.

In September, the Academy's Health Practice Financial Reporting Committee issued a new practice note, Practices for Preparing Health Contract Reserves.

Ongoing Activities

The Academy's Health Practice Council has many ongoing activities. Below is a snapshot of some current projects.

Health Practice Financial Reporting Committee (Darrell Knapp, Chairperson). The committee has updated the practice note on actuarial opinions to reflect recent changes by the NAIC.

Long-Term Care Principles-Based Work Group (Bob Yee, Chairperson). This work group has formed a joint Academy/SOA task force to develop and recommend valuation morbidity tables for long-term care insurance at the request of the NAIC's Accident and Health Working Group. The group is working with a company to help solicit the data for, and determine the structure

of, the morbidity tables.

Stop-Loss Work Group (Eric Smithback, Chairperson). This work group is continuing to update a 1994 report to the NAIC on stop-loss factors, and is currently checking data calculations prior to restarting the modeling phase of their work.

Disease Management Work Group (Ian Duncan, Chairperson). This work group is in the final stages of developing a public statement on evaluating wellness programs.

Medicare Supplement Work Group (Michael Carstens, Chairperson). This work group has submitted recommended changes to the Medicare Supplement Refund Formula to the NAIC's Medicare Supplement Refund Formula Subgroup, of the Accident and Health Working Group, and continues to work with the NAIC to develop a refund formula.

Solvency Work Group (Donna Novak, Chairperson). The work group continues to evaluate the current health RBC covariance calculation for potential changes to the calculation or methodology and the impact of health reform on the health RBC formula.

Academy/SOA Cancer Claims Cost Tables Work Group (Brad Spenny, Chairperson). The work group has been charged with evaluating and updating the 1985 cancer claims cost tables.

Health Practice International Task Force (April Choi, Chairperson). A subgroup of the task force published articles in the September issue of Contingencies on the health care systems in Japan and Singapore. The task force is finalizing an article on risk adjustment that would be included in the January/February issue of Contingencies.

If you want to participate in any of these activities or if you want more information about the work of the Academy's Health Practice Council, contact Heather Jerbi at Jerbi@actuary.org or Tim Mahony at mahony@actuary.org. ■

Getting Actuaries More Engaged in Population Health

by Robert Lieberthal

Today's health actuaries are expected to be experts in managing the health of insured populations. It is no longer sufficient to select assumptions, calculate premiums and manage deviations from expectations. Health insurance plans include new benefits, such as disease management programs, and the new health law includes new forms of health insurance, such as accountable care organizations. Learning more about these population health programs will give actuaries the opportunity to have a "seat at the table" when the programs are designed, and give actuaries an inside view of the actuarial implications of the new health care landscape.

Population health is a collaborative discipline that seeks to leverage all the determinants of health to maximize the health of populations. Population health inputs include personal behaviors, medical care and the public health infrastructure, as well as the social and economic context at the community and national level.¹ The debate over insurer rating of doctors for cost and quality is driven by the complexity of separating provider performance from other population health factors outside doctors' control.² Those opposed to rating schemes are correct that genetic factors, peer effects and other outside influences all affect health, and that claims data is necessarily limited to insured medical care. However, actuaries know that claims data can be a powerful tool for monitoring health as well as costs and is often more accurate than clinical records or patient perceptions of physician quality. Justifying the use of retrospective claims analysis data could improve population health and reward high quality care.

Population health determinants like public health and health policy often have actuarial implications. The public health system is delivering

behavioral interventions, focusing on environmental health issues and developing community care systems, which have the potential to change the health care costs of insured populations. Health policy changes may also drive costs up (or down). In Philadelphia, the Department of Public Health received an American Recovery and Reinvestment Act (ARRA) stimulus grant to promote healthy lifestyles through neighborhood-level interventions, including working with the owners of corner stores to encourage them to carry more fresh produce.³ If these microlevel population health interventions lead to healthier behaviors, they could lead to reduced short-term health care costs as utilization decreases or increased costs in the long term as people live longer. Actuaries have the chance to engage with the people designing interventions, to help predict the financial consequences of health interventions and maximize bang for the buck.

My university started a new school to serve as a locus for the research and teaching needed to improve population health. Thomas Jefferson University, located in downtown Philadelphia, is widely known for its large private medical school and elite care by clinician-researchers. The Jefferson School of Population Health, led by our dean, David Nash, M.D. M.B.A., includes a research faculty from fields as diverse as pharmacy, public health, epidemiology and health economics, with a common goal that "... interdisciplinary collaboration will strengthen the foundation of the population health infrastructure and lead to improved population health management."⁴

Our teaching offerings include novel continuing professional education and academic programs centered on population health. Our College for Value Based Purchasing is "...a practical, inten-



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¹ Kindig, D. and Stoddart, G. 2003. What is Population Health? *American Journal of Public Health* 93(3): 380-383, March.

² Yee, C.M. 2010. AMA Battles Insurers over Doctor Ratings." *Minneapolis-St. Paul Star Tribune*, July 19. <http://www.startribune.com/lifestyle/health/98797709.html>

³ Mallya, G. 2010. "Get Healthy Philly: Policy and System Change to Promote Healthy Eating, Active Living and Tobacco Control." Presentation, Jefferson School of Population Health. Health Policy Forum, Oct. 13.

⁴ Nash, D.B., et al. 2011. *Population Health: Creating a Culture of Wellness*. Sudbury, Mass.: Jones and Bartlett Learning.



sive 3-day program to help employee benefit managers meet the growing challenges of providing high quality health benefits and managing rising benefit costs.” We developed the program by partnering with the National Business Coalition on Health and HealthCare 21 to fill an unmet educational need of benefits managers. Our master’s in chronic care management is a first-in-the-nation program designed specifically for managed care and disease management leaders struggling to deal with a new world of pay for performance.

Our research projects are focused on population health problems that are of interest to both payers and providers. One example is our migraine quality measurement project. The aims of the project were to improve quality measures for migraine care to improve care and to reduce preventable health care and disability costs.⁵ The end result is a set of outcome measures in diagnosis, utilization and volume of care, and other quality indicators that is being tested in health plans for usability and effect on costs. We are also responsible for editing four peer-reviewed journals, including *Population Health Management*, the official journal of DMAA: The Care Continuum Alliance.

Our School of Population Health is one of a growing number of settings where researchers, payers and practitioners are collaborating to improve health. Many population health priorities are the same nontraditional practice areas that the Society of Actuaries has identified as growth areas with limited actuarial representation.⁶ Our teaching goal is to work with health professionals who want to “develop and enhance” population health skills to help them identify and learn these skills. Our research goal is to partner with the ideal set of collaborators for all population health research projects. I see opportunities for many such teaching and research collaborations with actuaries looking to become more engaged in population health. ■

⁵ Leas, B.F., et al. 2008. Assessing Quality of Care for Migraineurs: A Model Health Plan Measurement Set. *Population Health Management* 11(4): 203–208, August.

⁶ Society of Actuaries. “Untapped Opportunities for Actuaries in Health Care: Market Research Summary Report to Membership.” <http://www.soa.org/files/pdf/prof-int-health-untapped-opp.pdf>

Medicare Advantage Hierarchical Condition Categories:

Targeting Chart Reviews

by Corey Berger and Eric Goetsch

One of the keys to a successful Medicare Advantage (MA) plan is ensuring that the plan's payment from the Centers for Medicare & Medicaid Services (CMS) appropriately reflects the health status of the plan's population. The majority of the revenue received by MA plans is based on the risk scores of their members. CMS assigns a risk score to every MA member based on the member's characteristics, including age, gender, disability status, Medicaid status and "health" status. The "health" status of the member is based on the diseases the member had in the prior year. For 2010 and 2011, the CMS risk adjustment model has 70 unique hierarchical condition categories (HCCs) with an additive "risk adjustment factor" assigned to each HCC. A member is "flagged" with an HCC if an ICD-9 diagnosis code has been submitted to CMS for the prior year that maps to the HCC. For example, ICD-9 code 250.00 (diabetes mellitus without mention of complication) maps to HCC 19. If a member has this ICD-9 code submitted (and has no other diabetes-related ICD-9 code), then that member's risk score would increase by 0.162. This would result in an additional payment to a typical MA plan of about \$100 per member per month (PMPM). Hence, identifying and submitting all appropriate ICD-9 diagnosis codes to CMS will result in a higher risk score for the member and an increased payment to the MA plan.

The Revenue Opportunity in Accurate Diagnostic Coding

Ensuring that all appropriate diagnoses for its members are submitted to CMS is very important, as this is one of only a few areas where an MA plan can affect its revenue. Because CMS allows MA plans 13 months after the end of the year to submit diagnoses, MA plans can review physician and hospital charts, submit additional diagnoses to CMS and receive a retroactive payment for those additional diagnoses. Reviewing charts, however, requires paying coders as well as cooperation from the physicians and hospitals to allow the coders access to their charts. Hence, MA plans want to make sure that the cost of "chart review" is reason-

able relative to the expected increase in revenue. Understanding where the MA plan's diagnosis coding effort stands relative to the "upper limit" or to competitors is therefore important in determining the level of investment in chart review.

To help determine the "upper limit" as well as the variation in the market, we reviewed data for more than 80 unique CMS contract numbers (H numbers) that included more than 1 million unique members. The analysis is based on 2009 members and their 2008 diagnoses. The results are focused primarily on coordinated care plans (local HMOs, local PPOs and regional PPOs) and exclude private fee-for-service (PFFS) plans as well as chronic and institutional special needs plans (SNPs). In addition, we excluded new enrollees (because they do not have any published HCC information) and members who are flagged as institutional or end-stage renal disease (ESRD).

Study Results

The HCC analysis revealed a number of characteristics that can help an MA plan evaluate whether its population (or segments of its population) justify the cost of chart review. Key findings include:

- **Dual members have a significantly higher number of HCCs than non-dual members.** On average, non-dual members (non-duals) have 1.43 HCCs while dual members (duals) have 1.99 HCCs. Excluding employer group members in the non-dual category does not meaningfully affect these results.
- **The average number of HCCs varies meaningfully by organization, even after normalizing for age/gender and geography.** In organizations at the 25th percentile, non-duals have 1.31 HCCs and duals have 1.90 HCCs. In organizations at the 75th percentile, non-duals have 1.53 HCCs and duals have 2.21 HCCs. For both non-duals and duals, organizations at



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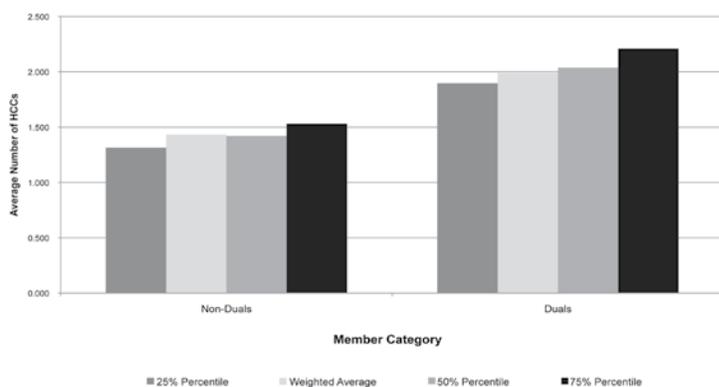


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CHART 1
HCC Survey Results
Coordinated Care Plan members (1)
Includes All 70 HCCs (2)

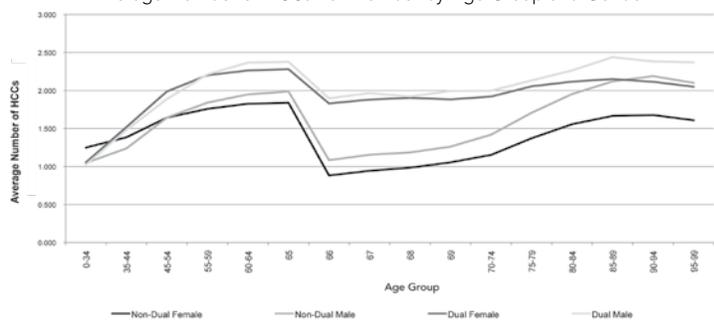
Average Number of HCCs Per Member by Percentile based on CMS Contract



(1) Excludes Chronic SNP, Institutional SNP, and PFFS Members and New Enrollee, Institutional, and ESRD members.
(2) Percentiles and Weighted Averages are after normalizing for age/gender and region.

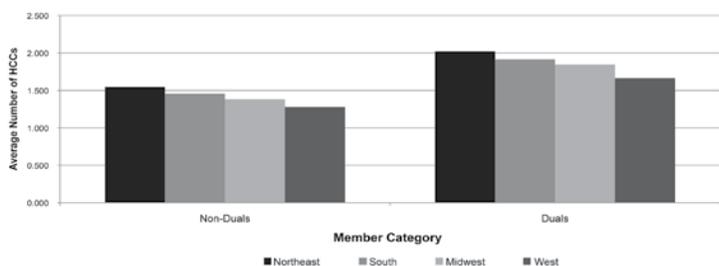
CHART 2
HCC Survey Results
Coordinated Care Plan members (1)
Includes All 70 HCCs

Average Number of HCCs Per Member by Age Group and Gender



(1) Excludes Chronic SNP, Institutional SNP, and PFFS Members and New Enrollee, Institutional, and ESRD members.

CHART 3
HCC Survey Results
Coordinated Care Plan members (1)
Includes All 70 HCCs



(1) Excludes Chronic SNP, Institutional SNP, and PFFS Members and New Enrollee, Institutional, and ESRD members.
(2) Regions are based on the U.S. census definitions.

the 75th percentile have about 16 percent more HCCs per member than organizations at the 25th percentile. Assuming an average risk score increase of 0.35 per HCC, this would indicate a difference in risk scores of 0.08 for non-duals and 0.11 for duals between organizations at the 25th and 75th percentiles. Chart 1 summarizes the average number of HCCs for non-duals and duals at the 25th, 50th and 75th percentiles, as well as the overall weighted average for all plans.

- **The number of HCCs increases steadily as members age.** From age 67 to 77, the average number of HCCs for both non-dual males and females increases by about 50 percent. The increase is less dramatic for duals, probably because they have more HCCs initially. Chart 2 provides a detailed summary of the average number of HCCs by age and gender for non-duals and duals. The decrease in average HCCs at age 66 is due to the inclusion of members eligible for Medicare due to age as opposed to disability. The data through age 65 is for disabled members only. The data does not include “aged” members in the age 65 bucket since most members who become eligible for Medicare by turning 65 do not have the required 12 months of historical diagnosis data to determine their HCCs.
- **Non-dual males have more HCCs than non-dual females.** The average number of HCCs for non-dual males is about 20 percent greater than the average for non-dual females. Dual males and females have approximately the same number of HCCs.
- **Geographic location has a significant impact on the average number of HCCs.** The average number of HCCs is materially impacted by the geographic location of the members. Both non-duals and duals in the Northeast have about 20 percent more HCCs than members in the West. Chart 3 provides a summary of the variation in HCCs by region.

- **Individual disease states also vary by age/ gender and geographic location, although not at the same magnitude as HCCs in total.**

What Should MA Plans be Reviewing?

Based on the data we reviewed for this study, MA plans need to first understand their current membership mixes in order to understand their potential for finding “missing” diagnoses. Key questions for an MA plan to ask are:

- Is the MA plan seeing a significant difference in the number of HCCs between dual and non-dual members? If not, it may want to focus on the dual members because those members are more likely to have “missing” diagnoses. If the gap is too wide relative to the gap in Chart 1, then maybe non-dual members are where the plan should focus its efforts.
- In what geographic location is the plan operating? An average of 1.4 HCCs per non-dual member may be closer to an upper limit in California than in New York, where 1.4 would be below average.
- Is the plan seeing an increase in the average number of HCCs by age? How much of an increase? If the increase is significant, then focusing on younger (and potentially newer) members may be better than focusing on older members, and vice versa if there is little increase by age.

Other Considerations

One additional significant consideration is that CMS will likely change the HCC model in 2012 to the model originally proposed for 2011. This new model has 87 HCCs instead of the 70 in the current model and will include ICD-9 diagnosis codes not included in the current model. MA plans need to begin planning now for that new model in order to ensure that physicians and hospitals are submitting those additional diagnoses so that their

payments are not negatively impacted in January 2012. Because the January 2012 payment will include diagnoses from both 2010 and 2011 dates of service, plans should focus on both years, not just 2011, or risk not receiving the appropriate payment for the first six months of 2012. ■

Key Methodological Considerations

Please note the following important information in reviewing and interpreting these results:

- For many of the plans included in this analysis, we received the “final” Model Output Report (MOR) data file which includes all 2008 diagnoses submitted through January 2010. Where available, this was the source of determining the HCCs for members included in the analysis. For plans that did not provide the “final” MOR file, we relied on MOR data from July through December of 2009. Any final Risk Adjustment Processing System (RAPS) data submissions would not be included for plans that did not provide “final” MORs, in which case their HCC counts may be slightly understated depending on the additional RAPS data submissions between March 2009 and January 2010.
- Because we did not observe significant differences in the overall average number of HCCs between employer group and individual members, we included both individual and employer group members in the analysis.
- The data included in this report was accumulated across organizations with different corporate structures (e.g., staff model HMOs versus independent practice associations), different membership volume/demographics/geographic location and other pertinent differences. Hence, the information may not be directly comparable to any specific organization. The survey authors did not verify the accuracy or completeness of the data included in the analysis. However, the data is considered fairly representative as a whole, such that reasonable conclusions may be drawn from it.
- In order to make the data more comparable, we also “normalized” the average number of HCCs included in the percentile chart for age/gender and geography. For example, all plans in the West had their average numbers of HCCs adjusted by the West geographic factor before being assigned a percentile.

Navigating New Horizons ...

an Interview with Jack Bruner

By Sarah Lawrence



Jack Bruner, FSA, is executive vice president of marketing and strategic development for CVS Caremark, in Nashville, Tenn. He can be reached at 615.310.1019 or jackbruner@gmail.com.

It's a well-known fact that many college graduates go on to work in fields that have little, if anything, to do with the degree they've earned. While many actuaries would never dream of switching occupations after years of schooling and grueling exams, a few, such as Jack Bruner, know from firsthand experience that a background in actuarial science can be an easy stepping stone to a successful career in any number of different fields.

Bruner currently acts as executive vice president of marketing and strategic development for CVS Caremark, a Fortune 20 company that serves more than 50 million covered members through Caremark and interacts with 5 million consumers every week through CVS pharmacies. Bruner said he was not planning on a marketing career when he was just starting out with a master's degree in actuarial science more than 30 years ago, but the progression happened naturally as his own unique talents and work preferences carved the way.

"Actuarial science is an industry where you have a very high probability of getting a job and you have a very solid set of skills that serve as a foundation," he said. "... It really does provide a

tremendous opportunity to learn what that business does and to acquire new areas of expertise. So for me that has been in marketing. It's been in product developments and innovation. And I think having a very solid technical foundation is extremely well respected. It gives you that base of knowledge to build bridges to other fields."

Early Aspirations

Bruner said his life and career path would have been completely different if it had not been for a major life-changing event that occurred when he was a senior attending high school in his hometown of Yorktown, Ind.—the death of his father from a heart attack. It was at that time that Bruner changed his focus from pursuing a degree in business from Indiana University to seeking a more specific major. "I think it probably focused me much more quickly on the need to have a career that actually produced an income," he said.

So Bruner turned to a close friend named Kent Levihn, whom he considered to be one of the best students in school, for advice. "I said, 'Kent, what are you going to do?' and he said, 'I'm going to be an actuary.' Anyway, once I found out what it was—and at that point job prospects were phenomenal for actuarial science—I actually found out that a family friend who went to the church that I grew up in, Dr. John Beekman, had headed one of the very few programs at that point in actuarial science in the United States at Ball State."

Located in nearby Muncie, Ind., attending Ball State allowed Bruner to stay close to home while earning his degree. The actuarial program was a nice fit since he had always been an astute math student. "I would have to acknowledge that when I started it was based on a limited amount of information, but it seemed like a good place to start and, frankly, I think I got lucky because it's been a tremendous profession for me," he said. By the time he graduated with his master's, he had already completed two internships and served as a teaching graduate assistant.

First Jobs

Bruner said he had no problem landing his first job out of college. He had already passed four of the actuarial exams. "Those were the days when an

actuarial student would interview with 15 companies and have 15 offers,” he recalled. He decided to accept a position as an assistant actuary with The Wyatt Company in Chicago, where his main activities involved doing pension valuations and administrative system programming.

“I had only had one computer programming course in college and it turned out to be challenging, but a great learning experience,” he said. “I learned a lot. I also learned that staying in an office every day doing technical work all day was probably not going to be the long-term track that I was interested in.”

After almost two years on the job, Bruner heard from his old friend Levihn who had accepted a consulting position with a company in Pittsburgh called Johnson & Higgins. Levihn mentioned that there were other positions available as well and Bruner jumped at the opportunity.

“The Wyatt Company was a consulting company, so technically I was consulting, but I wasn’t out of the office with clients on a frequent basis,” he said. “At Johnson & Higgins I had the chance to be actually sitting down and working with clients a couple of days a week. So that turned out to be a great experience for me.”

Bruner said Johnson & Higgins put him to work on many interesting projects regarding pensions, Social Security and cash or deferred arrangements. “We helped a hospital system actually withdraw from Social Security and set up private pension and other programs for its employees to replace it,” he said. “We implemented a 401(k) plan before 401(k) plans existed. There had only been a reference to cash or deferred plans in the Internal Revenue Code and regulations hadn’t come out yet, but we forged forward with it.”

Bruner served in this position for three years before being offered a job by Towers Perrin. It was in this position that Bruner said he got his first major exposure to marketing. After writing a paper on anticipating the funding requirements for postretirement welfare benefits, Bruner and his boss began a campaign to educate all of the major employers in Pittsburgh on the benefits of combining a change

in their pension plans to incorporate a 401(k) benefit and adding a 401(k) matching plan. They also encouraged businesses to begin scaling back their health care benefits, adding contributions and copayments to try to begin to rein in or reduce the escalation of health-care-based cost.

“I realized that one of the largest sources of employers in the Pittsburgh area was hospitals and that nobody in the company at that point was focusing on talking to anyone in the health care market,” Bruner said. “So I got permission to lead our effort to try to develop the hospital market and started developing material specifically for hospitals on these issues, but then spent the next two or three years really focused on bringing in hospitals as clients and doing projects for them.”

The idea was successful and, as a result, Bruner was subsequently put in charge of marketing for all of Towers Perrin’s services in the Pittsburgh marketplace. There he gained a national reputation for the new programs he was introducing to clients and was eventually recruited to join Chicago company Hewitt Associates as a global health care practice leader.

New Opportunities

When Bruner joined Hewitt it was very developed in the flexible benefits area, but wanted to establish and grow a health care business. Bruner was assigned this task and during his 13 years in the position managed to grow the health care practice from a revenue of \$1 million to \$100 million with total health business of \$1 billion. His final two years with the company were then spent as a global health care practice leader working on global consulting practice strategy, product development and marketing.

When Hewitt went public in 2002 and started paying out the partner’s equity in 2006, Bruner saw it as a natural time to start thinking about a transition. It was around this time that he was approached by a recruiter to join Caremark, a pharmacy benefit manager, as its chief marketing officer in charge of product development.

I also learned that staying in an office every day doing technical work all day was probably not going to be the long-term track that I was interested in.

CONTINUED ON PAGE 20

“Thinking about the position of the company going forward was an exciting new chapter in a career and an exciting set of new opportunities and new challenges, but it also was dealing with a lot of the clients or customers and contacts that I’d had historically,” Bruner said. “And it really leveraged to my actuarial knowledge in addition to my marketing and health care industry knowledge. So it was kind of the perfect fit for me at that point.”

One day before Bruner was to start in his new position with Caremark, he attended a board meeting in which the board began to consider a merger with CVS. “That was both exciting and somewhat chaotic because CVS was a comparable-sized organization and it would become one of the larger mergers in the health care and benefits industry that ever occurred,” he said. “And instead of combining two businesses that kind of did the same things to get more scale and take out cost, the idea was really to create a different kind of health care company.”

Once the merger was complete, Bruner was given his current title of executive vice president of marketing and strategic development for CVS Caremark.

Current Projects

Since joining the company, much of Bruner’s marketing expertise has been focused on reducing health care costs by taking advantage of the company’s combination of providing both health insurance and pharmacy services. Much of this has been done through a process called consumer engagement, which involves using marketing techniques to make sure the consumer is educated about both the proper course of treatment for his or her condition and the cheapest method to receive that treatment.

“CVS Caremark has succeeded in significantly reducing the cost of prescription benefits to our clients by leveraging our industry-leading purchasing power, generic prescription usage, promoting over-the-counter therapies and offering mail pricing at retail,” Bruner said. “We’re also significantly reducing health care costs by improving adherence to therapies, safety interventions, screenings and acute care at Minute Clinics and the use of real time health information connectivity.”

Bruner said although marketing and actuarial work do not traditionally seem to go hand in hand, his background experience with that industry continues to become more and more important in his marketing career. “Almost all of marketing is evolving into how you use predictive analytics to understand which customers are the most profitable, how you can be the most effective in getting them to change a behavior, how many times you have to contact them to get them to change that behavior and what change in cost prompts people to take different actions,” he said. “So in lots of ways while there is a lot of creative activity in marketing, such as creating messages and brand images and all those kinds of things. It’s growing very quickly in terms of using predictive analytics to model alternate strategies and say what will be most impactful for your business.”

Words of Advice

Bruner offered several pieces of advice to those who would seek a similar career path, the first being to “look for the white space” and embrace innovation. “Stepping into situations where change is occurring creates opportunities,” he said. “You don’t have to be old to be an expert in a field if it has only existed for a year. If it’s existed for a year and you’ve worked in it for a year, you’re a world class expert.”

Bruner said the changes in both health care and retirement plans for public employees that are going to be taking place in the next couple of years will offer many opportunities for innovative actuaries who want to go places. “Build bridges, or understand that your current expertise in analytics, health care or administration may allow you to be part of a project or job that will allow you to learn new skills like marketing, product development or behavioral analytics.”

Finally, Bruner advised that the best strategy is to do what you enjoy and recognize that people are the constant. “I purposefully pursued people, subjects, clients and career opportunities that I had fun working with,” he said. “Actuarial consulting and management careers demand a lot of time and energy. It’s easy to find when you’re working with nice people and learning something new every day.” ■

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Estimating the Impact of Disease and Treatment on Life Expectancy

by Tzu-Chun Kuo and Philipp Vetter



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Introduction

Health status and life expectancy reflect a nation's demographic, socioeconomic and public health conditions. One of the ultimate goals of economic and social development is to achieve better health outcomes and improve overall population welfare. Equipped with proper tools and measures, a forward-thinking government may identify populations at risk, allocate resources appropriately, and design health and wellness intervention programs to achieve better outcomes.

In 2009 the Health Authority–Abu Dhabi (HAAD) set out to improve quality of care and overall population health. The agency partnered with Verisk Health to understand and predict future costs, disease progression and the life expectancy of its residents. Utilizing data from large U.S. commercial and Medicare databases, we developed mortality and disease progression models specifically adapted to this international setting.

At the 2010 SOA Health Meeting in Orlando we presented preliminary results of modeling life expectancy on the basis of disease progression and treatment. This topic may be of interest not only to those working in health care, but also to those in life insurance. To address a broader audience, this article gives an overview of the high-level conceptual modeling and its implications.

Advances in Predictive Modeling

Business needs in the health care payer industry have led to the development of strongly quantitative models of medical risk. Historically these needs were focused on projecting one year into the future, but recent changes are shifting some of the emphasis to a multiyear perspective, matching members and patients. This study outlines a set of innovative predictive models that project medical and mortality risk simultaneously several years into the future.

Why Project Life Expectancy?

The burden of life-related noncommunicable chronic conditions is increasing significantly and presents a major challenge in the 21st century.

As shown in related studies,¹ nearly one out of every two Americans—or 140 million people—has a chronic medical condition of one kind or another. This is projected to increase by more than 1 percent per year until 2030. Chronic diseases account for \$3 of every \$4 spent on health care, and they cause seven out of every 10 deaths.

HAAD understood the impact of chronic patients on the Emirate's health care system. HAAD sought a quantitative way to analyze the situation and to project it into the future in an actionable way—to improve the quality of health care and increase life expectancy for residents. In particular, it was important conceptually to bring together the public health and the financial perspective, and to align health and health care policy.

In this research project for HAAD, we develop several innovative predictive models based on a set of demographic and clinical information, which can project both medical and mortality risk several years into the future. We also assess treatment patterns to identify the best services or medications that may slow down disease progression and increase longevity. Deploying such tools will allow not only HAAD, but also other health care organizations, to spot trends and target programs most effectively.

Abu Dhabi Health Care System

Abu Dhabi is the largest of the seven emirates in the United Arab Emirates. Starting in 2005 the Emirate's leadership aligned on an ambitious shared vision for the health care system. One major effect of this vision has been the full implementation of mandatory employer-financed health care insurance for the entire population of about 2 million, 75 percent of which are expatriates. There are over 30 payers, 40 hospitals and more than 1,000 health care facilities in the Emirate, with public and private entities participating in the scheme on equal terms. HAAD, created in 2007, sets policies such as the public health agenda and acts as a one-stop shop regulator of health care, but does not itself provide health care.

¹ Kung, H.C., Hoyert, D.L., Xu, J.Q. and Murphy, S.L. 2008. Deaths: Final Data for 2005. National Vital Statistics Reports 56(10).

To discharge its functions effectively, HAAD needs timely, comprehensive coded clinical and financial data on the health behavior of its residents. HAAD used the introduction of mandatory health insurance to become the electronic clearing house for all health care claims. As shown in its health statistics (www.haad.ae/statistics), a large percentage of the people have common chronic conditions, for example, diabetes, hypertension, hypercholesterolemia, obesity, etc.

HAAD seeks to improve the quality of care and increase life expectancy for its residents. To this end, we designed several tools that are able to project the disease progression over time and compute the impact on the medical risk and life expectancy based on the current health status. Furthermore, we modify the morbidity and mortality assessment based on medical and surgical treatments for specific diseases. Our goal is to identify optimal treatments to slow down disease progression and increase the life expectancy.

Estimating the Impact of Disease and Treatment on Life Expectancy

Instead of using a time series technique on an entire population, this study derives individuals' health status from coded diagnoses in administrative claims data (which is available for most health care organizations). Health Status H is defined as a state vector of 184 conditions, which is additionally characterized by age and gender, and calculated with DxCG's hierarchical condition category (HCC) classification system. The main assumption of predicting Health Status H , is that the future health status one year from now is related probabilistically to the current health status. The relationship between the current and future health status can be described by a state transition matrix. To increase the predictive power, the condition categories are augmented by comorbidities, as the latter contain rich information to understand an individual's severity and the trend of medical risk. As shown in the following table, the numbers in the first column can be treated as baseline parameters for future medical conditions. They assign the chances of having one specific condition in the next period even if someone may not have any medical

Health Status Overview	Adult Prevalence	Male		Female	
		National	Expatriate	National	Expatriate
		Diabetes	19%	20%	19%
Hypercholesterolemia	18%	20%	13%	13%	
Hypertension	34%	21%	35%	25%	40%
Obesity	23%	29%	18%	37%	31%

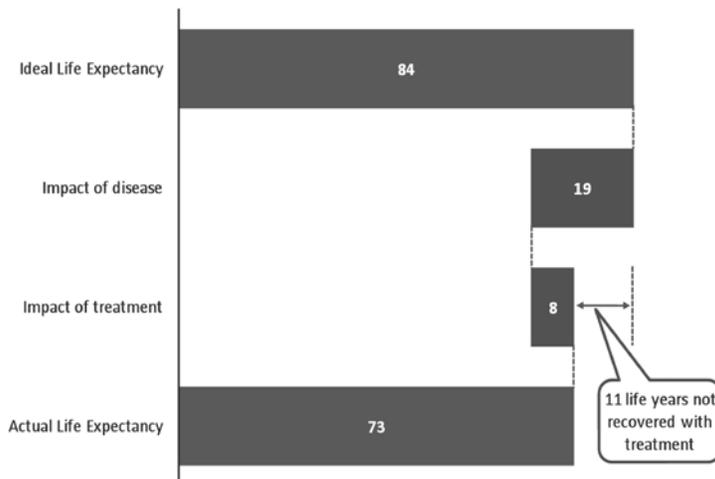
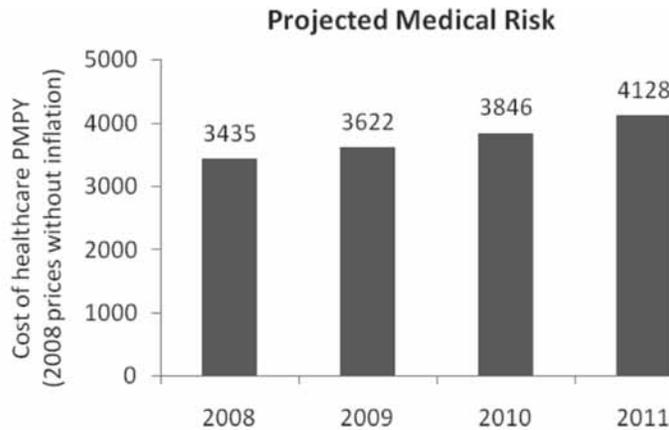
Source: Abu Dhabi Statistics 2007

		State Transition					
Current State →	Future State ↓	Baseline	Cold	Diabetes	DM side effect	DM progression	Depression
Baseline	Baseline	1					
	Cold	$\beta_{A 0}$	$\beta_{A A}$	$\beta_{A B}$	$\beta_{A C}$	$\beta_{A D}$	$\beta_{A F}$
	Diabetes	$\beta_{B 0}$	$\beta_{B A}$	$\beta_{B B}$	$\beta_{B C}$	$\beta_{B D}$	$\beta_{B F}$
	DM side effect	$\beta_{C 0}$	$\beta_{C A}$	$\beta_{C B}$	$\beta_{C C}$	$\beta_{C D}$	$\beta_{C F}$
	DM progression	$\beta_{D 0}$	$\beta_{D A}$	$\beta_{D B}$	$\beta_{D C}$	$\beta_{D D}$	$\beta_{D F}$
	Depression	$\beta_{E 0}$	$\beta_{E A}$	$\beta_{E B}$	$\beta_{E C}$	$\beta_{E D}$	$\beta_{E F}$

conditions now. The diagonal parameters refer to condition persistence factors. The rest of the values represent the positive/negative impact of the existing conditions on future state.

After each year of simulation, hierarchical restrictions are applied to avoid different severity levels of a coexisting condition. For instance, it is not possible to have diabetes without complications coexist with diabetes with renal manifestation. Only the most severe manifestation of each distinct type of condition is credited. A diagnosis assigning a person to a higher-ranked HCC excludes the person from all lower-ranked HCCs.

CONTINUED ON PAGE 24



With the simulated medical profiles, we then summarize the collective impact in a prospective relative risk score. The model uses linear, additive formulas obtained from weighted least squares regressions to combine the medical risk associated with clinical groups (184 HCCs) and demographic factors (age and sex). We then investigate the impact of simulated medical profiles on the mortality, which can be used to compute life expectancy.

The ability to make early, accurate predictions about disease outcomes is extremely valuable, because it enables shorter clinical trials for drugs and other therapeutic interventions. Based on the above disease progression methodology, we used the Berenson-Eggers Type of Service (BETOS) procedure codes provided from the Centers for Medicare

& Medicaid Services (CMS) and DxCG’s pharmacy groupers to investigate the optimal treatments by calculating the deviation of actual medical profiles from the average treatments. We further estimate the statistical impact of deviations on the relative risk score and mortality to identify these treatments which may slow down the disease progression and achieve better health care outcomes.

Applications

There are several useful applications: This approach enables an insurance tool to be used to provide a quantitative public health perspective, and it provides an alternative to project population disease-based morbidities several years into the future.

We can also quantify the impact of diseases and impact of treatments in terms of life years. As shown in the following chart, assume that the ideal life expectancy for someone is 84 years. From the current health status, we can estimate a reduction of approximately 19 life-years. However, with appropriate treatments this person can gain back 8 life-years. That will help to estimate someone’s actual life expectancy (73 years).

What makes this approach appealing comes from our inclusion of both the individual’s comprehensive medical information and the comorbid conditions. Such an approach can help to identify people at risk early rather than later in their disease progression. This study has myriad applications to other state planning initiatives. The ability to make multiyear morbidity predictions is highly relevant for budgeting and health system financing purposes. The ability to make multiyear mortality predictions would likely be useful for life insurers. Public health policy would benefit from being able to model both simultaneously to evaluate policy decisions relating to public health versus health system restructuring. ■



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Potential Membership Shifts for Medicare Prescription Drug Plans

by Shelly Brandel



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In the fall, the Centers for Medicare & Medicaid Services (CMS) released premium and benefit information on 2011 Medicare Part D prescription drug plans (PDPs). CMS imposed additional bid requirements for 2011 by requiring larger benefit differences between plan offerings and restricting the number of plans overall. The 2011 open enrollment process could result in significant membership swings depending on how members react to these PDP plan changes.

Background

Prior to 2011, CMS allowed a maximum of three plans per carrier per PDP region, at least one of which needed to be a basic plan with benefits actuarially equivalent to the Medicare Part D benefit. CMS required meaningful differences between plans that could be demonstrated through premium, benefit or formulary differences.

For 2011, CMS strictly enforced existing and additional requirements aimed at reducing the confusion surrounding the PDP selection process by making plan differences more visible to seniors. The most significant requirements include:

- Each parent company is allowed only one basic plan per region.

- Each enhanced plan offering must have \$22 lower out-of-pocket cost (OOPC) per CMS' prescribed method relative to the basic plan (excluding premium differences).
- If two enhanced plans are offered, the second plan must cover at least some brand drugs in the coverage gap.

These requirements appear to have had a significant impact on carriers' 2011 bid strategy:

- **Plan consolidation:** Many carriers offered more than one basic plan in 2010 which needed to be combined for 2011. For example, UnitedHealthcare offered two basic plans (AARP MedicareRx Preferred and Saver) in 2010, each with over 1.5 million members, which were combined in 2011.
- **Richer enhanced plan benefits:** Many carriers needed to increase benefits for their enhanced plans to comply with CMS' OOPC requirements. In 2010, about 30 percent of members enrolled in enhanced plans chose "skinny enhanced" plans with supplemental premiums under \$5. These plans have benefits that by definition in the bid model were enhanced but from a consumer perspective were minimally more favorable than other basic plans. Coventry and Humana in particular had significant enrollment in these "skinny enhanced" plans, as shown in Table 1. For 2011, carriers had to decide whether to increase benefits on these plans or combine them with other basic plans. It appears that most carriers chose the latter strategy.

Table 1: National 2010 PDP Plans with Supplemental Premiums Under \$10 in All PDP Regions¹

Carrier	2010 Plan	Members (SEPTEMBER 2010) ²	Supplemental Premium Range
Aetna	Medicare Rx Plus	120,000	7.90–9.30
Coventry	Advantra Rx Value	440,000	1.40–4.50
	First Health Part D-Secure	320,000	1.70–6.00
Humana	Enhanced	540,000	4.90–9.40
	Value	40,000	1.20–5.00
Universal American	Community CCRx Choice	90,000	2.50–5.40
	PrescribaRx Gold	50,000	1.20–7.90
Subtotal		1,600,000	1.20–9.40

¹ Includes PDP plans with more than 40,000 members offered in more than five regions (excludes PDP regions outside of the United States).

² Source: Monthly CMS Enrollment File dated Sept. 7, 2010 (<http://www.cms.gov/MCRAdvPartDEnrollData/>)

2011 Results

Plan Consolidation

As expected, there are far fewer PDP plans in 2011 due to CMS' new guidance. The total number of plans is down about 30 percent from 2010. Noteworthy observations include:

- Most carriers combined basic and low additional value enhanced plans into their basic plan offering for 2011. As Table 1 shows, there were approximately 1.6 million members enrolled

in low additional value plans in 2010 (using supplemental premiums as a proxy for benefit enhancement).

In 2011, the Humana Enhanced plan includes “few generics” in the gap and is the only enhanced plan with supplemental premiums under \$8 in all regions.

- Most carriers are offering only one enhanced plan in 2011; therefore they do not need to offer any plans with brand gap coverage. Exceptions include Anthem, Humana and a couple of regional Blues plans.
- UnitedHealthcare’s AARP MedicareRx Preferred plan is the only basic plan offered in 2011 with no deductible, which may prove to be a competitive advantage.
- Most enhanced plans offer partial gap coverage in 2011 in addition to the mandated 7 percent generic gap coverage. There are only a few enhanced plans that do not include any additional gap coverage (examples include Aetna, Health Net, Universal American and WellCare). In contrast, over 70 percent of members enrolled in enhanced plans in 2010 did not have any gap coverage.

Potential Membership Shifts During 2011 Open Enrollment

Premium Disruption

In general, PDP carriers have kept their plan offerings and premium changes relatively stable over the last several years. As a result, we have not seen big annual open enrollment shifts in the past couple of years (outside of the low income auto-assign market).

However, the plan consolidation for 2011 caused significant premium decreases for some members and increases for others. It is difficult to predict at which point members will start comparison shopping, but we estimate there are approximately 2.6 million members whose 2011 monthly premiums will increase over \$10 and another 2.7 million members with premium increases between \$5 and

Table 2: Summary of Premium Increases for the 10 Largest PDP Carriers

Company Name	Total Enrollment (SEPTEMBER 2011)	Members with 2011 Premium Increases over \$10 ¹	Members with 2011 Premium Increases between \$5 and \$10 ¹	Percentage of Members with at least a \$5 Premium Increase
UnitedHealthcare	4,490,000	310,000	360,000	15%
Universal American	1,910,000	170,000	290,000	24%
Humana	1,690,000	0	90,000	5%
Coventry	1,620,000	590,000	350,000	58%
CVS Caremark	1,110,000	60,000	0	5%
WellCare	760,000	260,000	210,000	62%
Wellpoint	700,000	260,000	290,000	79%
Aetna	560,000	270,000	220,000	88%
CIGNA	540,000	20,000	210,000	43%
Total—Top 10	13,380,000	1,940,000	2,020,000	30%
Total—All Carriers	16,710,000	2,620,000	2,700,000	32%

¹ Based on an analysis of the 2011 Part D crosswalk file (<https://www.cms.gov/MCRAdvPartDEnrolData/>) and 2011 PDP landscape file (<http://www.cms.gov/PrescriptionDrugCovGenIn/>) from CMS. Assumes members will remain in the same plan between 2010 and 2011. Excludes PDP regions outside of the United States.

\$10. Table 2 shows the distribution of premium increases for the top 10 PDP carriers:

Humana and CVS Caremark were able to keep premium increases low (or negative) for most members. Coventry in particular implemented significant premium increases on its First Health Part D plans as a result of plan consolidation. WellCare, Wellpoint and Aetna also have a large percentage of members with premium increases over \$10. While the consolidation of UnitedHealthcare’s AARP Preferred and Saver plans caused significant premium increases on the Saver plan, these members will also have no deductible in 2011 compared to a full \$310 deductible in 2010, which could help mitigate the impact of these premium increases.

Formulary Disruption

Not to be overlooked, the consolidation of plans could mean significant formulary disruption for many members. Many plans had different formularies in place for their basic and enhanced plans in 2010. In 2011, plan/formulary consolidation will create even more possible incentives for members to shop around.

Table 3: Summary of the Number of PDP Plans with the Lowest Premiums for 2010 and 2011

Carrier	Number of Plans in 2010 with:			Number of Plans in 2011 with:		
	Lowest Premium	Premiums in the Top 3	Premiums in the Top 5	Lowest Premium	Premiums in the Top 3	Premiums in the Top 5
Aetna	2	9	16	0	0	0
CIGNA	1	7	13	0	1	2
CVS Caremark	0	0	1	0	27	44
Coventry	24	30	38	0	7	8
Health Net	0	1	4	0	3	12
HealthSpring	0	2	5	0	6	9
Humana	1	8	14	34	34	34
UnitedHealthcare	2	16	24	0	2	13
Universal American	3	22	36	0	20	26

Source: Analysis of 2010 and 2011 PDP landscape files from CMS (<http://www.cms.gov/PrescriptionDrugCovGenIn/>)

Humana’s Walmart PDP Plan

Humana is introducing a new PDP plan for 2011. The Humana Walmart-Preferred Rx plan is offered in association with Walmart and will be the lowest cost plan in every PDP region at \$14.80. This plan may be particularly attractive to the members in the table above, who are currently in low premium plans and whose premiums may be increasing significantly for 2011.

Increased Choice for Low Income Members

Despite the decrease in the number of total PDP plans offered in 2011, low income members eligible for low income premium subsidies will be able to choose from among more plans in 2011. The number of PDP plans under the low income benchmark (LIB) increased 8 percent from 2010 to 2011. This is due largely to CMS’ “de minimis” policy for 2011 that allows PDP plans to waive up to \$2 to remain under the LIB and avoid losing their auto-assigned low income members, as well as the introduction of Humana’s Walmart plan which is under the LIB in every region.

Mixing up the Winners/Losers (in Terms of Lowest Premiums)

Table 3 changes in the distribution of plans in terms of premium rankings within each PDP region for

2010 and 2011 for some of the largest PDP carriers (note that PDP regions often include more than one state).

The biggest winner is Humana, going from only one state with the lowest premium and eight regions ranking in the top three in 2010 all the way to the lowest premium in every region with the Walmart-Preferred Rx plan. CVS Caremark also improved its competitive position by keeping premiums generally flat (with some decreases), with premiums in the top five nearly nationwide (sometimes

with two options in the top five).

Coventry lost the most ground, going from 38 plans with premiums in the top five (with 24 of these being the number-one plan) down to eight top-five plans in 2011. UnitedHealthcare also fell back competitively, with only two top-three plans (down from 16) and 13 top-five plans (down from 24). CIGNA and Aetna slipped considerably as well.

Conclusion

It appears that 2011 may produce the biggest PDP membership changes since the inception of the program. Fewer plans will be offered but changes to members’ premiums, formularies, benefits and preferred vendor options could have a significant impact on open enrollment and age-in enrollment during 2011. ■

Complexity Science – A New Frontier for Actuarial Exploration

by Steven Siegel

“I think the next century will be the century of complexity.”

—Stephen Hawking, 2000

“Wanna get it right this time.

Complicated is all right.

Complicated it’s all right”

—lyrics from Poi Dog Pondering’s “Complicated”

What comes to mind when you see the acronym: **KISS**? Perhaps, a rock band of a certain vintage that was fond of face paint and flamboyant outfits. Me, too, but that’s a topic for another article. No, I’m referring to an acronym first coined by Kelly Johnson, lead engineer at the Lockheed Skunk Works (creators of well-known spy planes) for the design principle: **Keep It Simple Stupid**. The message of this well-known phrase is that simplicity should be a key goal in design and that unnecessary complexity should be avoided. This certainly seems like a worthy goal. But, how many of you would say that the current health care system has adhered to this principle? I’m confident there are none or very few who would. Furthermore, even if you know nothing about Complexity Science, I’m also willing to wager that you would describe the health care system in the United States as a complex one, as opposed to simple. If you don’t agree with this observation, I’d be interested in hearing why not.

At the SOA’s 2009 Health Spring meeting, Alan Mills gave a thought-provoking presentation on Complexity Science and its relationship to the health care system. One of the attendees at that session, Judy Strachan, who is also current chair of the Health Section, saw the potential importance of Complexity Science for the work of health actuaries. As a result, she proposed that the Health Section sponsor Mills to write an introduction to the field. With that was launched for me a fascinating journey into Complexity Science with the end result being Mills’ brilliantly written primer on the topic and cool (no other word for it) software that accompanies it.

The report and software, which are available at: <http://www.soa.org/research/research-projects/health/research-complexity-science.aspx>, include an overview of the field’s key results, detailed instructions for building complexity science models, examples of working models, a review of practical models applicable to the work of actuaries, an extensive literature review, and a discussion of how actuaries can apply complexity science in their work. All of this is presented in an engaging style that presumes no previous background in the subject on the part of the reader. Particularly enjoyable to read are the sidebars that help to set the context for the narrative with quotations from seminal works in the field and other relevant descriptions.

As quoted below, Mills presents five themes throughout the primer:

- 1. Social systems are complex systems.** The social systems in which actuaries work are complex systems, with mechanisms dramatically different from those of simple systems such as planets and dice. To understand and manage the behaviors of such systems—this is society’s greatest challenge.
- 2. We must study complex system behavior from the bottom up.** The behavior of a complex system arises from the bottom-up, from its components, the relationships among its components, and the behavior rules that the components follow. To understand and manage such systems, we must model them from the bottom up, using special methods of Complexity Science, rather than top-down traditional actuarial methods.



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I would strongly encourage readers to learn more about Complexity Science.

3. **Long-term prediction of complex systems is impossible.** The long-term behavior of complex systems—such as the fluctuations of financial market prices and health care trend rates—cannot be accurately predicted for more than short periods. Actuaries pursuing long-term prediction of complex systems are wasting time.
4. **Understanding and effectively managing complex systems is possible.** Though the long-term of complex systems cannot be predicted, their behavior can be understood and managed, like a farmer manages the cultivation of crops.
5. **Actuaries can help solve society's great problems.** Using our unique skills and knowledge—along with the tools and insights of Complexity Science—actuaries can effectively address the great problems of complex social systems, and lead the development of new social policy, rather than merely administer existing problematic systems.”

For much of the primer, Mills leads readers through the four archetypal models that are used in Complexity Science: (1) Networks, (2) Cellular Automata, (3) Artificial Societies and (4) Serious Games. These agent-based models are the heart of Complexity Science. The primer devotes a chapter to each of these model types and shows how the models become progressively more sophisticated. And to really solidify your understanding of the models, there is no better way than to play around with the software that illustrates each of them. For example, the beautifully elaborate cover art

depicting a gene ontology network can be readily reproduced using the software that accompanies the chapter on networks.

Besides the primer itself, Mills provides summaries of a list of the top 10 books on Complexity Science as well as other essential resources. These resources are a great way to expand your knowledge in the area and a next step towards familiarizing yourself with the concepts. In addition, actuaries who are unfamiliar with conducting a literature search will find it valuable to follow the process that was used to seek out and assess the relevant sources.

The Health Section is continuing to explore Complexity Science through sponsorship of a call for models that applies Complexity Science to a component of a health care system. Cash awards will be presented for the top three models submitted. You can find out more about the call for models at: <http://www.soa.org/research/research-ops/data-request/2010-10-health-complexity-models.aspx>

I would strongly encourage readers to learn more about Complexity Science. There are a number of ways to do this including reading the material on the SOA website, the other resources noted in the report and perhaps, even developing a model that you apply to your own work. I think you'll find the concepts not only stimulating, but surprisingly intuitive, for while a **KISS** may still be a **KISS**, the world is undoubtedly growing ever more complex. ■

Rethinking Family Tiers

by Kristi Bohn

A few years ago, a very large union proposed to its management that it would be fairer if many tiers were added to its plan in order to charge more for each and every child who was covered. The question we were asked: simply, what is the average cost of a child?

We requested data on the average claims of this employer's children, but by a stroke of luck we received data in a format that instantly showed us a big flaw in the initial presumption. The data was summarized by averages per contract, with a description of the contract makeup and how many contracts were represented within the average.

Displayed this way, we quickly saw that, after accounting for the first child, the number of additional children mattered little to the average cost of this employer's contracts. Further, after digging into the adults' claims for this particular employer, the adults on the employee-only and employee-plus-spouse contracts were much more expensive than the adults on the contracts with children.

There are a few reasonable hypotheses that could explain this phenomenon. First, it is possible that parents of multiple children have less time to take themselves and their children to the doctor, and may be less worried about the daily accidents and illnesses that their children experience, because they have more experience with parenthood. Second, perhaps parents with their own health issues or seriously ill children have smaller families. Finally, adults with no children covered may be older, and thus have a higher prevalence of chronic conditions than adults with children.

We later explored whether this phenomenon applied to our larger commercial group population base. In this second study, we noticed that while the additional children generally led to higher contract costs, the incremental costs were not nearly as high as an average child's cost would suggest. Further, we noticed that the contracts with two adults but no children were much pricier than two multiplied by the average adult costs would suggest. The following table shows the claims ratios we experienced, where we indexed each type of contract's cost to the employee-only contract cost average. Note that we did not adjust our rating tiers because of this expe-



rience, but rather used this information to further understand whether this particular employer's experience was unique given the employer's unusual request for additional tiers.

I think about these studies frequently these days because of health care reform's new requirement to cover dependents to age 26. Specifically, while employers cannot charge differently for these newly eligible members than they could for any other child on the contract, some employers have considered implementing one or two additional tiers to their rating structure. When this request comes in, we want to look holistically at their contract makeup and costs.

In the case I mentioned, the employer decided to maintain its tier structure. I am told by employers that a change in tier structure often poses communication and payroll system challenges that are not "free" in terms of employer resource requirements. Further, by the time these rates reach actual members, the original tiering ratios are often obscured by the employer's philosophy regarding employee



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Ratios of Actual Costs per Contract		
Contract Makeup	Total Cost vs. ee only	Number of Contracts
ee only	1.000	283,786
ee + spouse	2.751	70,287
ee + 1 ch	1.680	22,162
ee + 2 ch	1.787	13,166
ee + 3 ch	2.147	3,991
ee + 4 ch	2.700	944
ee + 5 ch	2.788	293
ee + sp + 1 ch	2.798	38,098
ee + sp + 2 ch	2.743	55,766
ee + sp + 3 ch	3.029	24,865
ee + sp + 4 ch	3.528	7,139
ee + sp + 5 or more ch	4.140	2,604

ee = employee
 sp = spouse
 ch = child(ren)

Blue Cross and Blue Shield of Minnesota, 2005, Commercial Accounts

contributions. That is, many employers choose to subsidize their employee premiums to a higher degree than spouses.

The lesson I learned from this project is that it is worthwhile to test the basic assumptions we work with. I believe that many actuaries use a building block approach when building expected costs for a tier structure, using the average costs of adults and children to build ratios. However, I think there is evidence that this approach might not capture the whole story, at least for the commercial group business.

It would be interesting to explore whether this phenomenon occurs in any of the other market segments, particularly for Individual products. For Individual, I suspect that family circumstances and prior underwriting rules played a more critical role in the costs of members within families. However, health care reform's role in the Individual market will likely dramatically change the family tier structure, at least in terms of actual experience. The actual premium tiers that insurers use will likely continue to be an art as well as a science. ■



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Bariatric Surgery Holds Promise for Patients and for Payors

by John D. Dawson, Pierre-Yves Crémieux and Arindam Ghosh



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Introduction

Obesity's impact on health care spending in the United States will soon exceed the impact of tobacco use. The prevalence of morbid obesity, which generates even higher costs, is growing faster than obesity itself. For many morbidly obese patients, diet, exercise and behavior modification alone are not sufficient to achieve and maintain a healthy weight.

Clinical evidence suggest that bariatric (weight loss) surgery can be effective in addressing morbid obesity and reducing future health care costs. However, such procedures are currently excluded from many health care plans.

In this paper we review new evidence that suggests that because bariatric surgery reduces future health care costs in many instances, the cost of bariatric surgery can be viewed as an investment with high likelihood of financial return over a relatively short time frame.

It may be time to reconsider the value of including bariatric surgery as a covered health plan benefit.

The Toll of Obesity in America

The National Institutes of Health estimate approximately one-third of the U.S. adult population is now obese, with a body mass index (BMI) greater than 30, measured as weight in kilograms

divided by height in meters squared. From 2000 to 2005 alone, the obesity rate increased by 24 percent. Growth in morbid obesity (BMI>40) has been even more alarming, increasing by 50 percent in that time.¹

Health care costs for the morbidly obese are 81 percent above costs for those who are not obese and 47 percent above costs for the non-morbidly obese population,^{2,3} largely because serious comorbidities often accompany morbid obesity, including type 2 diabetes mellitus, osteoarthritis and gallbladder disease.^{4,5}

By 2006, obesity accounted for nearly 10 percent of all medical spending in the United States and nearly 13 percent of total medical spending by private payors, and was rising by more than 9 percent annually.⁶

The Rise of Bariatric Surgery as a Solution

As early as 1998, the National Heart, Lung and Blood Institute recommended bariatric surgery as a treatment option not only for morbidly obese patients but also for select at-risk patients with a lower BMI of 35 or more.⁷

From 1997 to 2008, as surgical techniques advanced, clinical studies in peer-reviewed journals documented bariatric surgery's enhanced safety and efficacy.^{8, 9, 10}

- 1 Sturm, Roland. 2007. Increases in Morbid Obesity in the USA: 2000–2005. *Public Health* 121(7):492–496.
- 2 Flegal K.M., Carroll M.D. and Oden, C.L. 2002. Prevalence and Trends in Obesity among U.S. Adults, 1999–2000. *Journal of the American Medical Association* 288(14):1723–1727.
- 3 Arterburn, D.E., Maciejewski, M.L. and Tsevat, J. 2005. Impact of Morbid Obesity on Medical Expenditures in Adults. *International Journal of Obesity (Lond)* 29(3):334–339.
- 4 National Heart, Lung and Blood Institute. 2000. *The Practical Guide: Identification, Evaluation and Treatment of Overweight and Obesity in Adults*. Online at http://www.nhlbi.nih.gov/guidelines/obesity/prctgd_c.pdf. Accessed June 12, 2007.
- 5 Hensrud, D.D. and Klein, S. 2006. Extreme Obesity: A New Medical Crisis in the United States. *Mayo Clinical Proceedings* 81(10)(suppl):S5–S10.
- 6 Finkelstein, Eric A., Trogdon, Justin G., Cohen, Joel W. and Dietz, William. 2009. Annual Medical Spending Attributable to Obesity: Payer-And Service-Specific Estimates. *Health Affairs* 28(5):w822–w831 (July 27). Online at <http://content.healthaffairs.org/cgi/content/abstract/28/5/w822>. Accessed Nov. 30, 2009.
- 7 National Institutes of Health. 1998. *Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults*. National Institutes of Health Publication #98-4083.
- 8 Encinosa, William E., Bernard, Didem M., Du, Dongyi and Steiner, Claudia A.. 2009. Recent Improvements in Bariatric Surgery Outcomes. *Medical Care* 47:531–535.
- 9 Flum, David. 2009. Perioperative Safety in the Longitudinal Assessment of Bariatric Surgery. *New England Journal of Medicine*.361:445–454.
- 10 Sjöström, Lars, et al. 2007. Effects of Bariatric Surgery on Mortality in Swedish Obese Subjects. *New England Journal of Medicine* 357:741–752.

The American Society for Metabolic and Bariatric Surgery estimates that the number of bariatric procedures rose from just over 20,000 to 220,000^{11, 12} during this time, some covered by medical insurance and some not.

To Cover or Not to Cover

Very little, if any, actuarial analysis has been published on the economic impact of bariatric surgery.

In practice, health plan coverage for bariatric surgery diverges widely. Blue Cross and Blue Shield of Florida excluded coverage in 2004. Starting in 2006, Medicare recipients could obtain coverage for bariatric surgery procedures that met National Institutes of Health criteria. Regional commercial insurers such as Kaiser Permanente and TRICARE routinely offer coverage in their master plan contracts. And while policies of national insurers including Aetna, CIGNA, Humana and United Healthcare typically exclude bariatric surgery in standard coverage specifications, customers may purchase coverage through a policy endorsement or rider.

Economic Analysis of Bariatric Surgery

In 2008, Crémieux et al. published an economic analysis that quantifies the economic impact of bariatric surgery on direct medical costs, calculating the return on investment associated with its use in morbidly obese patients.¹³

The analysis is uniquely designed, using actual patient-level cost data for 3,651 obese patients who underwent a bariatric surgery procedure such as gastric restriction with bypass (73 percent), gastric restriction without bypass (11 percent) or a laparoscopic procedure with (12 percent) or without bypass (4 percent).

The study drew upon a privately insured administrative claims database involving 31 large employers and 5,472,542 lives covered under employment-based health plans from 1999 through 2005. The dataset included 36,384 covered lives with at least one morbid obesity diagnosis. Thus, the analysis is based on a sufficiently large employer-based dataset to offer statistical credibility.

The study matched each bariatric surgery patient with a control subject who was morbidly obese and did not undergo a bariatric procedure during the period of interest. The pairs were observed for six months prior to surgery and afterwards for an average of 17 months for the bariatric group and 18 months for the control group.

The Crémieux et al. study found that payors recover their initial investment in bariatric surgery in as little as two to four years, depending on the surgical approach used. Additionally, the cost savings for bariatric surgery patients relative to control patients continue after the initial investment is recovered.

Using this dataset, we compared the annual cost-per-patient for morbidly obese patients versus the average patient. As shown in Chart 1, the average health care cost for a morbidly obese patient was higher than for the average patient, and was generally increasing more quickly, except in the last year of the study.

The Crémieux et al. dataset as illustrated here provides a benchmark for health plans to assess their own experience with morbidly obese populations.

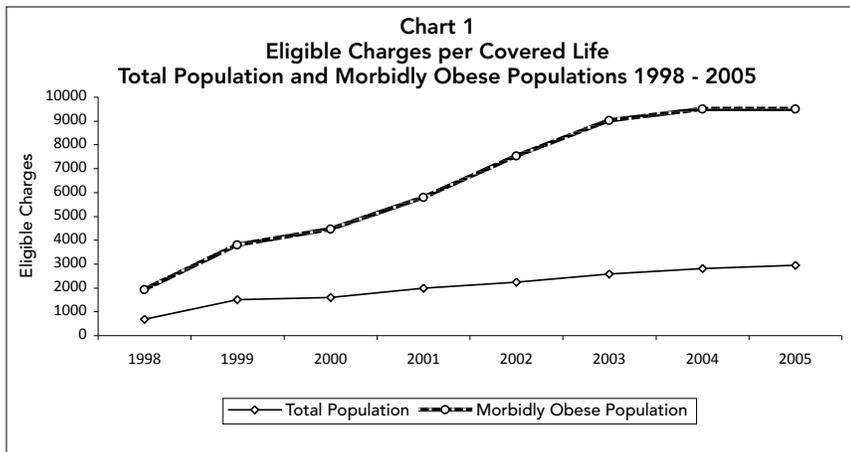
The Crémieux et al. data also revealed that a significant number of morbidly obese patients receive care that seems to address vague symptoms rather than underlying causes. Table 1 illustrates the percentage of morbidly obese patients that received care in

Very little, if any, actuarial analysis has been published on the economic impact of bariatric surgery.

¹¹ García-Zakzuk, Boris. 2005. Medical and Rx Technologies—What's in the Pipeline? *Society of Actuaries Record* 31(2).

¹² The American Society for Metabolic and Bariatric Surgery. 2009. Fact Sheet: Metabolic and Bariatric Surgery. Online at http://www.asmb.org/Newsite07/media/asmb_fs_surgery.pdf. Accessed Nov. 16, 2009.

¹³ Crémieux, P.Y., Buchwald, H., Shikora, S.A., Ghosh, A., Yang, H.E. and Buessing, M. 2008. A Study on the Economic Impact of Bariatric Surgery. *The American Journal of Managed Care* 14(9):589–596.



2005 for selected diagnoses included in the *Signs, Symptoms and Ill-Defined Conditions* diagnostic group.

Table 1 suggests that claims for ill-defined conditions are quite common among the morbidly obese. Services to address these diagnoses are often costly but provide limited value to the patient. Bariatric surgery may be an opportunity to redirect these claim dollars to more effective care for these patients.

ICD-9 Diagnosis Codes and Definitions	Percent of Morbidly Obese Patients
786.50 – Chest pain NOS	33.0%
789.00 – Abdominal Pain, Unspecified Site	30.9%
780.79 – Malaise and Fatigue NEC	24.8%
786.05 – Shortness of Breath	21.8%
786.09 – Other Respiratory Issues	20.1%

Note: ICD-9 Codes per the Centers for Disease Control and Prevention International Classification of Diseases, 9th Revision

Is the Study Reliable?

Validating the cost effectiveness of a surgical procedure is challenging. The Crémieux et al. research methodology and design differ from prior studies of bariatric surgery in several ways.

- First, the study determined cost and savings by comparing bariatric surgery patients to control group patients who did not have the surgery. Surgery patients were matched to non-surgery (control group) patients on the basis of the relevant data (demographics, diagnoses, pre-surgery cost, etc.).
- Second, the study used robust statistical analysis to estimate expected cost savings, and presented statistically valid confidence intervals to quantify the uncertainty associated with the return on investment estimate.
- Third, health care costs were normalized to one standard date to remove the possible distortions caused by medical inflation. This enabled the economists to study the impact of surgery unencumbered by the influence of trend. It also results in valid return on investment estimates and confidence intervals in the context of increasing health care costs.
- Finally, the Crémieux et al. analysis included all medical costs before, during and after bariatric surgery. There was no attempt to segment non-surgery-related claims from the study, so the impact of comorbid conditions and surgical complications was explicitly included.

By considering all costs, including the cost of complications, the Crémieux et al. study showed that savings did emerge, that savings were not eliminated by the cost of complications, and that even with complications, the average return on investment time frame was relatively short.

The authors note that viewing bariatric surgery as an investment—with high likelihood of financial return over a relatively short time—suggests that

health plans that cover this surgery could experience lower claim costs over a reasonably short time frame. In addition to setting frequency and per unit cost assumptions, financial models should include implicit or explicit savings assumptions consistent with the return on investment horizon demonstrated in the Crémieux et al. study.

The authors recommend further review of the medical literature to help inform benefit design. While Crémieux et al. did not specifically investigate the impact of bariatric surgery Centers of Excellence or participation in an appropriate pre- and post-surgery care management program, the authors suggest that these may be important considerations to include in effective coverage for bariatric surgery. ■

Conclusion

Obesity exacts its costs: from employers, from insurers and from individuals who pay the price in daily suffering from chronic disease. Our review of economists' findings suggests that bariatric surgery promises a meaningful solution both for health plans and for their members.

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Cost and Benefit Trends Observed in Jan. 1, 2011 Renewals for State Employers

By Bob Cosway and Barbara Abbott



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State employer health plans face complex cost dynamics as they plan for 2011. This article examines these dynamics and the plan changes that state employers are implementing as they look toward 2011.

Each of the 50 states sponsors a health plan for its employees. Some states cover other public employees in the same plan. For example, some states either require or allow counties, cities and school districts to participate in the plan for state employees. In other states these local public employers are either in a separate statewide plan or sponsor their own plans. In this article we look only at the 50 plans covering state employees, recognizing that some of those plans also cover other public employees.

Of the 50 states, 26 renew their employee health plans on Jan. 1. Other renewal dates are July 1 (22 states), Sept. 1 (one state) and Oct. 1 (one state). The appendix shows the 26 states that renew their employee health plans on Jan. 1. For each state we summarize their 2010 plan offerings, their observed premium trends for 2011 and their benefit changes implemented on Jan. 1, 2011.

Observations on Premium Trends

Figure 1 summarizes the trend data for the states in the appendix, and estimates the impact of benefit changes on observed trends.

Plan Type	2010–11 Premium Trend	2010–11 Benefit Change	2010–11 Benefit-Adjusted Premium Trend
HMO	8.2%	-0.2%	8.4%
PPO	8.7%	-0.9%	9.7%
HDHP	8.3%	-1.4%	9.8%

We looked at trend separately for three plan types—HMO, PPO and high-deductible health plan (HDHP). Because the differences between HMOs

and PPOs are becoming less distinct, and point-of-service (POS) plans fall somewhere in between, we defined an HMO plan to be a plan with an in-network deductible less than \$100. HDHP plans were defined to be plans with in-network deductibles of \$1,500 or higher.

The 2010–11 Premium Trend values in Figure 1 are the averages for the plans summarized in the appendix. We applied equal weight to each state, and did not weight plans by their membership.

The 2010–11 Benefit Change values are the average amounts that the premiums were reduced because of benefit changes such as increases in deductibles and copays. For each plan, the percentage premium reduction was estimated by pricing both the 2010 and 2011 benefits using the Milliman Health Cost Guidelines™.

The 2010–11 Benefit-Adjusted Premium Trend values are the estimated average premium trend rates that would have occurred if no benefit changes had occurred. These represent a better estimate of the underlying utilization and cost trends for these plans.

The benefit-adjusted premium trends are generally consistent with the typical trend estimates projected for 2011. The pattern of the three trends—HDHP higher than PPO, PPO higher than HMO—is not surprising, because even if every plan in the United States was subject to the same underlying trend, plans with higher deductibles would see higher premium trends due to deductible leveraging.

Observations on Benefit Trends

Tennessee probably made the most significant benefit changes, by replacing statewide PPO and POS plans, and local HMOs, with statewide PPO options. There were no other introductions of significantly different plan designs in 2011. Twelve of the states feature HDHPs with associated health savings accounts (HSAs) or health reimbursement arrangements (HRAs), although only six of the states contribute to these accounts.

Six states dropped one or more existing options. Missouri dropped its only plan that did not feature a deductible. Some, but not all, of these dropped options were the most expensive options in that state in 2010, suggesting that states may be less willing to offer more expensive options even if the members pay all or part of the premium difference. No states added new options, other than as replacements for dropped options.

The only state to make an option richer through benefit changes was Missouri, by raising the state's contribution to the HRA. Other than this change, no other states made specific options richer through benefit changes. All other changes were net reductions, such as raising a copay from \$15 to \$20 or a deductible from \$500 to \$750. These types of increases represent large percentage changes, and so are often only done every few years. Kentucky made more incremental benefit changes. It raised deductibles for three PPOs from \$300, \$500 and \$2,000 to \$345, \$575 and \$2,300, respectively. These smaller changes to less common amounts may become more common as a way to keep plan designs more in line with inflation, and to avoid large changes that would cause an option to lose grandfather status under the new health care reform laws.

Summary

The forces affecting large public sector plans are similar to those facing all large employers. Analyzing the premium and benefit trends reported by states provides useful data for carriers and large employers.

We intend to update this analysis for the 22 states that renew their plan options on July 1, 2011. If interested, please contact the authors to receive a copy when this becomes available in May 2011. The information on 2010 and 2011 plan designs and premiums summarized in this report was obtained from public sources. All data is believed to be accurate, but we suggest that specific details be confirmed by the reader before acting on this information. This article is intended to be illustrative



of the medical trend increases facing large employers, both public and non-public, around the United States, and the ways in which large public employers are responding to these trends.

Appendix: Details on State Health Plans Renewing Jan. 1

These states represent a variety of plan types and geographic areas. They all share difficult budget situations and the need to minimize the growth of health costs. The premiums they negotiated and the program changes they initiated may be indicators of what to expect for the large group market in general. We present the details to illustrate that underlying the typical 8 percent to 12 percent trend rate estimates for commercial health plans in the United States, plans experience a variety of actual trends, and use a wide variety of strategies to manage those trends.

The premium trends in the following table are based on the total premiums as reported by the states, not just the portion of the premium paid by the employee. Also, these trends are based on the reported premiums, and are not adjusted to remove the impact of benefit changes. Earlier in this article we estimated the impact of benefit changes on the average reported trends for all of these states.

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State	2010 Plan Offerings	Premium Trends for 2011	Benefit Changes for 2011
Alabama	Alabama offers one option, a PPO with a \$100 deductible and dollar copays.	The premiums decreased by about 5% for single coverage and 1% for family coverage.	Only minor changes, including increasing office visit copays from \$30 to \$35, and increasing brand prescription copays by \$5.
Arizona	Arizona offers three option types: exclusive provider organization (EPO), PPO and HSA. The EPO is available through four networks, the PPO three and the HSA one, for a total of eight options.	All premiums increased by an annualized rate of about 16%.	There were no material changes to any of the plan provisions.
Arkansas	Arkansas offers three options to state employees. Two options feature copays/coinsurance, but no deductible, and the third is an HDHP.	The two copay/coinsurance plans saw premium increases of about 2% and 8.5%, while the HDHP premium dropped by about 2%.	There were no material changes to any of the plan provisions.
California	California's CALPERS offers HMOs through two carriers, plus a PPO with several options.	The premiums for the two HMOs increased about 16% for one carrier and 6% for the other, and the PPO premiums went up about 10% for the option with the largest membership.	There were no material changes to any of the plan provisions.
Florida	Florida offers four options: a standard HMO and PPO, and "Health Investor" versions of each that feature higher deductibles and an employer HSA contribution.	Multiple rate changes during the year complicate any analysis of annualized premium increases.	No change to "Health Investor" options. For the standard options, the emergency room copay was raised from \$50 to \$100; the generic drug copay was lowered from \$10 to \$7; and the brand drug copay was raised from \$25 to \$30. The standard HMO also raised physician copays from \$15/\$25 to \$20/\$30.
Georgia	Georgia offers four options, each of which could be elected from either of two carriers, for a total of eight options. The four options are an HMO, a PPO, an HDHP and an HRA. Both the HMO and PPO had in-network deductibles of \$600, whereas the HDHP and HRA plans had \$1,200 and \$1,100 deductibles, respectively. The HRA plan features a state contribution toward the costs subject to the deductible.	The observed premium trends for the three remaining plans after the PPO is dropped in 2011 are 9% for the HMO, 6% for the HDHP and 4% for the HRA. Trends for family coverage were about 6% higher than these single coverage increases. Georgia made significant plan design changes, which resulted in these premium increases not being as high as they would have been absent any benefit change.	In 2011, Georgia is dropping the two PPO options. The HMO deductible is increasing from \$600 to \$1,000 and the prescription drug copays are increasing from \$15/\$40/\$75 to \$20/\$50/\$90. The HDHP deductible is increasing from \$1,200 to \$1,500 and the HRA deductible is increasing from \$1,100 to \$1,300.
Indiana	Indiana offers four options: an HMO and three PPOs with deductibles of \$500, \$1,500 and \$2,500.	Indiana is dropping the HMO option for 2011. The \$500 PPO plan saw a premium increase of about 13%, while the two higher-deductible plan premiums increased by about 6.5%.	The \$500 PPO plan deductible is increasing from \$500 to \$750. Employer HSA contributions for the two higher-deductible plans are being reduced.

State	2010 Plan Offerings	Premium Trends for 2011	Benefit Changes for 2011
Iowa	Iowa offers four options to non-contract and UE/IUP-covered employees: two HMOs with no deductibles and two PPOs with relatively low deductibles, \$250 and \$300.	All premiums increased by about 5.5% to 6.0%.	There were no material changes to any of the plan provisions.
Kansas	Kansas offers three plan design options. All feature coinsurance, and have deductibles of \$0, \$150 and \$1,500 respectively. The two low-deductible options can be elected from any of four carriers, and the high-deductible option can be elected from three of the same four carriers, for a total of 11 options.	Premium increases for the 11 options varied widely, from 6% to 30%. Increases for the two lower-deductible plans were about 6% to 18%, depending on the carrier, and for the \$1,500 plan an additional 10%.	Deductibles for the \$0 and \$150 deductible plan are increasing to \$150 and \$300, respectively. Also, copays and coinsurance for these plans are increasing.
Kentucky	Kentucky offers four plan design options: all PPOs with various levels of deductibles and coinsurance. Two plans have copays for specific services. Two of the plans feature a state contribution toward the costs subject to the deductible. The plans are all offered through the same carrier.	Premiums were unchanged for the standard PPO, and increased by about 4% for the other three plans.	All the plans except the standard PPO raised coinsurance, out-of-pocket maximums and copays. The coinsurance levels remained the same.
Minnesota	Minnesota offers one plan design, but members can choose from three provider networks.	Premiums for all three options increased by 6.7%.	There were no material changes to any of the plan provisions.
Mississippi	Mississippi offers two PPO plans, with \$500 and \$1,150 deductibles.	Premiums for the \$500 plan increased about 11%, and for the \$1,150 plan 7%.	The \$1,150 deductible is increasing to \$1,200. The brand prescription copay is increasing for both plans.
Missouri	Missouri offers a copay plan, a PPO with a low deductible and an HDHP. The plans are all offered through the same carrier.	Premiums for both of the remaining options after the copay plan is dropped increased by about 8.5%.	For 2011, Missouri is dropping the copay plan and replacing it with a PPO identical to the existing PPO except with a higher deductible. The employer contribution to the HDHP spending account is increasing slightly.
Montana	Montana offers three identical PPO plans, featuring some dollar copays. Members can choose from three networks. In addition, a traditional pure coinsurance PPO is available.	Premiums for the two network PPOs increased by about 7% and 11%. Premiums for the traditional PPO are increasing by about 10%.	One of the three networks was dropped. There were no material changes to any of the plan provisions.
New Hampshire	New Hampshire offers two options: an HMO and a POS plan. Both have the same in-network benefits.	Premiums for the HMO increased about 3% and for the POS are decreasing about 1%.	There were no material changes to any of the plan provisions.
New Jersey	New Jersey offers three HMOs—all with the same copays but different carriers.	Premiums for the three carriers increased by 6%-9%.	There were no material changes to any of the plan provisions.

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State	2010 Plan Offerings	Premium Trends for 2011	Benefit Changes for 2011
New York	New York offers 31 different plans—one statewide PPO and 30 regional HMOs.	As of late 2010, 2011 options were not available.	
Oklahoma	Oklahoma offers two HMO plan designs, each of which is available from four different carriers. Three self-administered PPO options are also offered.	Premiums increased for the three HMO carriers by about 0%, 6% and 13%. Premiums increased for the PPO options by 2% to 5%.	One of the HMO carriers is being dropped. There were no other material changes to any of the plan provisions.
Oregon	Oregon offers two HMOs and a PPO.	Premiums increased for the two HMO carriers by about 7% and 12%. Premiums increased for the PPO options by about 11%.	In 2011, the HMO primary care and specialist office visit copays are higher. One of the HMOs also increased its brand drug copay.
Pennsylvania	Pennsylvania offers 10 plans—one PPO, one HDHP and eight regional HMOs.	As of late 2010, 2011 premiums were not available.	No changes were made to the PPO, HMO or HDHP plan designs. The PPO was moved to a new carrier. Four of the eight HMO options were dropped, so that in most of the state only one HMO is available.
South Carolina	South Carolina offers one HDHP and three hybrid plans (deductible/coinsurance/copays).	Premiums increased for the three hybrid plans by about 4%, 9% and 17%. Premiums increased for the HDHP by about 8%.	There were no material changes to any of the plan provisions.
Tennessee	Tennessee offers statewide PPO and POS plans, and HMO options in select counties.	Because of significant changes in all existing options, it is difficult to assess the trend increases on specific options.	In 2011 all current options are being replaced by two PPO options, each of which is available from two carriers.
Vermont	Vermont offers a POS plan, two PPO plans and an HDHP plan, all through one carrier.	Premiums for all options increased about 6%.	Inpatient cost sharing changed for two options, but no other material changes.
Washington	Washington offers six options, with deductibles ranging from \$0 to \$350.	Premiums for the continuing options increased about 13% to 20%.	The Aetna Public Employees and Kaiser Permanente Value Plans will no longer be available in 2011.
Wisconsin	Wisconsin offers about 18 HMO-style plans, with identical benefits, through regional private carriers. Wisconsin also offers a statewide PPO option.	The state reported an average premium increase for 2011 of 5.2%. Premiums for individual carriers increased in a range from 2% to 11%.	There were no material changes to any of the plan provisions.
Wyoming	Wyoming offers four PPOs, all through the same carrier. The deductibles are \$350, \$750, \$1,500 and \$2,500.	Premiums for the four options increased about 20% to 23%, with the higher increased for the higher deductible options.	There were no material changes to any of the plan provisions.

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