SOCIETY OF ACTUARIES Health Section

1 The Actuarial Profession and Complex Models: Knowing the Limits of Our Knowledge
By Kurt Wrobel

2 Letter from the Editor
By Mary van der Heijde

3 Chairperson's Corner
By Kevin Law

10 New Models of Disease Management Offer Opportunity
By Ian Duncan

14 Obesity and Health
By Sam Gutterman

19 A Study on Emerging Health Conditions among the Elderly in India and the Sufficiency of Medical Framework and Health Insurance
By N. V. Subramanyan

26 Soundbites from the American Academy of Actuaries' Health Practice Council
By Heather Jerbi and Tim Mahony

29 The Zen of Actuarial Science
By Richard Tash

31 Brazilian Private Health Care Market—Ready for Liftoff
By Ronald Poon Affat

36 Recruiter Roundtable
By Sara Teppema and Jim Toole

ISSUE 68 JANUARY 2012

Health Watch

The Actuarial Profession and Complex Models: Knowing the Limits of Our Knowledge

By Kurt Wrobel

In very simple terms, actuaries are in the business of predicting future liabilities associated with financial products. In attempting to quantify this future cost, we use historical experience and then make adjustments to account for expected changes in unit cost and utilization to estimate future liabilities. And, in keeping with our professional standards, we follow the best statistical methods available to impartially predict future costs. As I will highlight in this article, I believe that gradual changes in the business environment have made this impartial prediction process much more difficult for our profession, but still possible to achieve. Following the initial discussion, I will outline some steps that we can follow to ensure a more rational and productive approach to data analysis.

The Problem: So What Has Changed?

Over the past several years, we have seen changes in the business environment that have impacted our ability to ensure that our organizations make appropriate decisions based on the available data, including:

CONTINUED ON **PAGE 5**

Letter from the Editor

By Mary van der Heijde

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Looking ahead at 2012, it is exciting to ponder the various challenges and opportunities which are ahead of us. Understanding the federal and state regulations and their implications remains a moving target. Because of the influx of information, and the ability we have in our roles to influence and interpret these changes, I think it is more important than ever for us to each proactively learn about what is happening, so we and our companies can stay ahead of the curve. I heard a colleague compare staying on top of health care reform to "drinking from a fire hose," and I think that's about right.

The American Academy of Actuaries (AAA) and Society of Actuaries (SOA) have remained active in terms of providing input and guidance surrounding various aspects of health care reform. One of my favorite references to help stay current is the health page on the AAA website[1], where the AAA reports on recent events, and provides a series of short papers touching on various concepts within health care reform.

In this issue's "Soundbites from the Academy", Heather Jerbi and Tim Mahony describe the range of recent health care reform related activity, and the influence many dedicated volunteers have had in this context. In this issue's "Chairperson's Corner" feature, Kevin Law shares information about the recent launch of the Health Care Cost Institute (HCCI) at the Brookings Institution in Washington, DC. This non-profit entity will give researchers access to large volumes of consolidated claim data.

Recent changes in the business environment have changed the expectations and ways in which we perform modeling work. Kurt Wrobel discusses these recent challenges, common pitfalls, and recommendations for how to best address these issues. As well, Richard Tash shares with us an enlightened path to the Zen of actuarial science.

Ian Duncan's article, "New Models of Disease Management Offer Opportunity," provides us with information about new models of disease management, with particular focus on new ways in which pharmacists are engaged in quality improvement efforts and disease management. Obesity is an increasingly important issue in the United States, from both a cost and public health perspective. Read about trends in the prevalence of obesity, and the resulting impact on morbidity, mortality, disability rates, and health care costs in Sam Gutterman's "Obesity and Health."

We have included two articles this issue focusing on issues outside of the United States. Ronald Poon Affat details the massive changes the private health care market in Brazil is experiencing, and N. V. Subramanyan writes about the emerging health conditions among the elderly in India.

The SOA sat down with three health care recruiters who do not typically place actuaries, to learn more about opportunities in the broader health care industry. Sara Teppema and Jim Toole summarized the key insights resulting from this discussion, including what credentials recruiters are looking for, the barriers actuaries face in moving into non-traditional or executive roles, and other advice about how to increase our market value.

We hope this information is interesting and valuable for you, and welcome your thoughts and comments. ■

[1] http://www.actuary.org/health.asp

Chairperson's Corner

By Kevin Law

A warm welcome is extended to the four new members of the Health Section Council:

Nancy Hubler	Regence BlueCross BlueShield
Donna Kalin	Milliman New York
Valerie Nelson	Blue Cross/Blue Shield of Illinois
Greger Vigen	Independent Consultant

We look forward to their contributions to the Health Section during the next three years.

Thanks are due to the Health Section Council members who are rotating off after completing their terms that began in October 2008. **Judy Strachan** served as the council's chairperson during the 2010-2011 year, and was instrumental in the progress made in the Untapped Opportunities for Actuaries in Health initiative. **Bob Cosway** functioned this past year as the council's basic education liaison and organized the survey distributed recently to the section's members. **Beth Grice** served as the council's Continuing Education Team coordinator and as our liaison to the Casualty Actuarial Society's Committee on Health Care Issues. **Scott Haglund** led the employee benefits special interest group and managed the section's web portal.

The SOA meeting cycle continues relentlessly. Before the annual meeting in October 2011, the Health Section Council was already gearing up to begin the planning process and identify session topics for next year's SOA health meeting, which will be held June 13–15, 2012 in New Orleans, La. We are expecting to sponsor 52 sessions at the meeting, with other SOA sections contributing about 20 sessions. The Health Section is fortunate to have former council member, **Dan Bailey**, heading up our health meeting effort for the second consecutive year.

The section was heavily involved in two meetings in the recent past: the SOA Annual Meeting in Chicago and our Boot Camp in Nashville. Thanks to all of the volunteers who worked diligently behind the scenes to create the session topics, write the session descriptions and recruit the presenters. The efforts of the superb SOA staff are very much appreciated, as they play indispensible roles in making these meetings happen.

We contributed a total of 16 sessions to the annual meeting. **Karl Volkmar** did an excellent job functioning as our representative to the annual meeting committee, managing and coordinating our efforts to create, define and staff these sessions.

Our Boot Camp included four and a half days of presentations, and attendees had the opportunity to select any or all of four distinct modules:

- Health pricing
- Medical school for actuaries
- Ethics and professionalism for actuaries
- Health valuation

DeWayne Ullsberger was instrumental in organizing and recruiting for these teaching sessions.

This column is being written about one month after the exciting development of the September 20th launch of the Health Care Cost Institute (HCCI) at the Brookings Institution in Washington, DC. HCCI is a non-profit entity that will provide qualified researchers access to a huge quantity of health plan and government payer utilization and cost data consisting of health care claims totaling more than $1 trillion. Initially the four data contributors are Aetna, Humana, Kaiser Permanente and United Healthcare, and the intention is to include additional health plans as data contributors—in fact, HCCI's website[1] already has an invitation

[1] http://healthcostinstitute.org/

CONTINUED ON **PAGE 4**

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Health **Watch**

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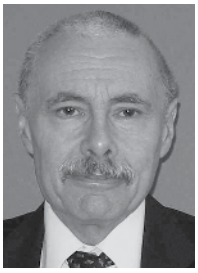
This publication is free to section members. Current-year issues are available from the Communications Department. Back issues of section publications have been placed in the SOA library and on the SOA website: (www.soa.org). Photocopies of back issues may be requested for a nominal fee.



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Educational Outreach Method	Dissatisfied	Neutral	Satisfied	Total
June Health Meeting Professional Development (PD) offerings	3%	34%	63%	100%
Annual SOA Meeting PD offerings	9%	38%	53%	100%
Health Watch	3%	18%	79%	100%
Seminar PD offerings (e.g., Boot Camp, Predictive Modeling Symposium, etc)	6%	41%	53%	100%
Health E News	4%	22%	74%	100%
Webcast's	4%	31%	65%	100%

and a link to contact the institute for those health plans that are willing to contribute data to foster important research. Primary purposes for the use of the HCCI data are to inform the public policy process and to assist in developing new solutions to long-term problems confronting the U.S. health care system.

It will be interesting to follow the developments related to the HCCI, and the research studies based on its data. A major benefit touted for this data base is that it will contain the first comprehensive, national set of claim cost data generated by the privately insured population, including those covered under both employer sponsored health plans and individual insurance products. As such, it has the potential to yield new insights into health care utilization and cost, and lead to more effective solutions and polices. The data base will be kept fresh via semi-annual updates. Research standards governing who will have access to the HCCI data are being developed.

We appreciate the time 436 of our section members took to complete the biennial Health Section survey in September. Although the survey response rate was only about 12 percent, we received valuable input for planning future services to be provided to our membership.

Since a future issue of *Health Watch* will communicate the results of the survey, I'll mention just a few brief highlights here.

First, three topics were ranked in the top five in both the list of subjects requiring an increased educational focus, and the list of health issues requiring additional research:

- health reform – payers & exchanges,
- trend analysis, and
- risk adjustment/risk assessment.

Not surprisingly, the health reform selection was identified as the clear #1 in both lists.

As demonstrated by the table below, our methods of disseminating educational information and materials to our membership are perceived to be generally effective, although there is room for improvement. Less than 10 percent are "dissatisfied" in any given category. The two written forms of communication, *Health Watch* and *Health e-News*, received the highest ratings, while our annual meeting presentations and specific topic seminars received the lowest ratings.

It was interesting to note that 49 percent of respondents indicated that they would participate in a LinkedIn subgroup if one were to be created—something that the Health Section Council will consider for 2012.

We received a number of thoughtful comments and ideas in the "other" input entry fields in the survey, as well as offers to volunteer from 81 Health Section actuaries, both of which will be very helpful in our future work. Should additional ideas for our section occur to you, or if you decide to volunteer, do not hesitate to contact any member of the section council. ■

- Easy access to data and the growth of software packages that allow more sophisticated data analysis and the appearance of more sophisticated data analysis.

- Increasing expectation for the usefulness of data as popularized by several books and movies.

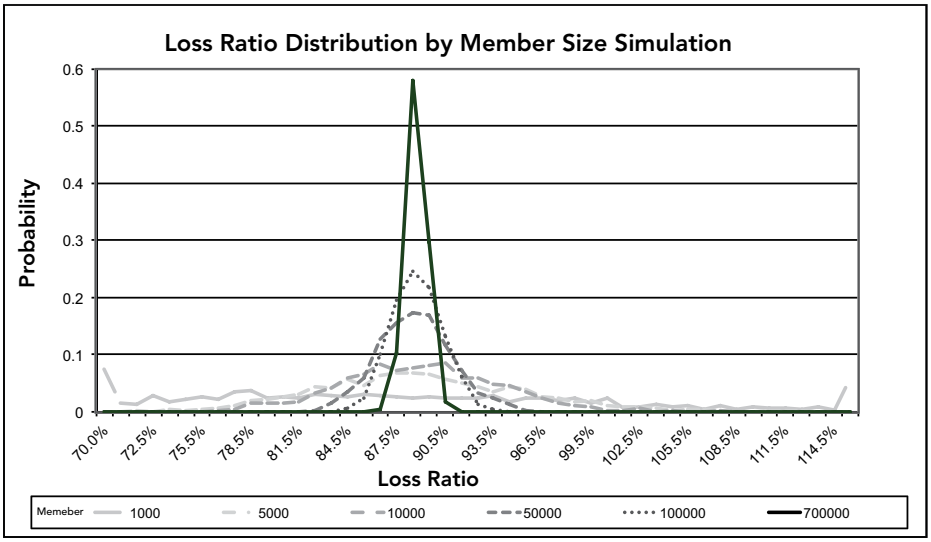
- The degree of dislocation and change in our economy has made historical data less useful in predicting future results.

Easy Access to Data and Software Tools

With the remarkable progress in software and access to data, companies have effectively democratized data analysis across large organizations giving access to a significant number of individuals with less intensive statistical training and without the same degree of professionalism applied to impartial data analysis. In many respects, this can be a real positive for a company. The actuarial profession certainly does not have a lock on the appropriate use of data in a business environment and a company could benefit from more people analyzing data. That being said, the increased democratization of data analysis has a serious downside as less sophisticated individuals present data analytics. Although the problem can take on many forms, I have highlighted some of the more challenging problems.

Presentation of data with little or no credibility. This is an issue that is self-evident to most actuaries. Throughout my career, I have consistently seen people draw inferences from data that lacked almost any credibility. Alternatively, in response to a concern about credibility, someone will ask about a specific break point where the data suddenly becomes credible rather than think about the underlying distribution associated with different population sizes. For example, the following stylized chart highlights the distribution of medical loss ratios at different underlying membership levels using a simulation process.

As highlighted above, the distribution of potential outcomes becomes more tightly centered around the mean as membership increases, but there is not a specific break point where the data suddenly become credible. In addition, a single observed loss ratio with a small membership base provides little information on what the true underlying mean would be if the simulation were run numerous times.



Mistaking Correlation with Causation. As we have all learned in basic statistics, correlation does not necessarily imply causation. Some interesting examples include:

- A win for the Redskins in their last home game prior to Election Day coincides with the incumbent party being reelected.

- Greater sun spot activity produces an increase in the stock market or GDP.

- When a team from the old NFL wins the Super Bowl, the stock market will rise.
- U.S. stock markets are weakest following the election of a new president

The problem, of course, is that less sophisticated people will present and draw inferences without adequately controlling for other variables that could be driving the underlying causation.

CONTINUED ON **PAGE 6**

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Biased data mining. Without the same degree of professionalism and commitment to impartiality, some data analysts will sift through data to find specific data points that will support their particular position. For example, in a linear regression, an analyst could engage in "regression fishing" where several regressions are run with numerous explanatory variables with only the most favored result—as measured by the strength of the fit—presented. By not accounting for the inherent biases associated with running several regressions to find the best fit, the conclusions drawn from a partial presentation of the facts are biased and inaccurate.

Narrative Bias. While biased data mining involves the abuse of statistics to develop a particular conclusion *before* the prediction, the narrative bias problem represents conclusions or "sound bites" drawn *after* an event has occurred. In this case, a data analyst or commentator will draw a conclusion to the perceived event that is consistent with the broader story he wants to tell to the organization. The problem is that the perceived event was likely the result of a complex model that could have just as likely produced this or several outcomes.

In a simple example of this problem, one could think of someone drawing inferences on why a random throw of the two dice produced a particular result—say a three—after the roll has occurred. While actuaries or more sophisticated analysts may attribute this result to an event that could have occurred given the distribution of possible outcomes, less sophisticated analysts may attempt to explain this result with an elaborate explanation. In a business environment, this story will typically support a particular business policy that they had been advocating.

This problem is especially troublesome for actuaries. Using the dice example, while we could have correctly said that the most likely outcome was a seven and that we would expect an entire distribution of outcomes, we could be perceived as incorrect in our prediction and our reputation compromised because the most likely event did not occur. With the perception then created that the actuarial prediction was incorrect, this could then provide an opportunity for someone else to introduce their own simplifying narrative on why a particular event occurred. Using the dice example, someone could say that their lucky rabbit's foot or dice throwing technique produced the three and that the actuary who predicted the seven did not adequately account for their abilities. As a result, in the next prediction cycle, the story now becomes that the actuary should better account for their skill or luck in throwing the dice. Continuing with the story, if the next throw of the dice produces a more likely result—say a seven—then nothing will be heard from data analysts who criticized the prior prediction. Of course, if another three is produced, the criticism will be immediate and our prediction abilities questioned once again.

Increasing Expectations for the Usefulness of Data

We live in a business world that has come to increasingly worship data analysis and its potential to answer important business questions. In many respects, this represents an effective strategy. We have seen many companies (Capital One) and even sports team (the Oakland A's) effectively deploy strategies to dramatically improve results. (Admittedly, I wrote an article several years ago discussing *Moneyball* and its potential applications to the actuarial profession.) While the media and business books have popularized the potential uses of data with compelling narratives, they have not adequately highlighted the limitations associated with data analysis—particularly as it applies to complex models that attempt to predict future human behavior.

A simple comparison between predicting the average height in a large population and predicting the price movement in the stock market provides an extreme example of the problem. For example, If we have physical data on a large number of Americans (including height, weight, and demographic data), we have a number of statistical techniques that would allow us to accurately predict the height of another large population. In this case, the data analysis works largely because we are predicting a biological attribute that is more limited and less complex. The price movement in the stock market, on the other hand, is driven by a wide range of factors that make

prediction and the deployment of mathematical models much more difficult. One only needs to look at the hubris of many technical analysts who have attempted and ultimately failed to predict future stock market movements. As chronicled in the book *When Genius Failed*, the catastrophic failure of the Long Term Capital Management hedge fund and their two Nobel Prize winning economist advisors provides a clear example of this problem.

The above example highlights the problem associated with worshipping data analysis in all situations. While it is absolutely appropriate to use and expect significant prediction power in some situations (predicting height in a population, quantifying the value of baseball players, segmenting credit card customers), assuming that this approach will be equally effective in predicting more complex models is simply not appropriate. In saying this, I'm not suggesting that models or analysis should not be employed, but I am suggesting that the analysis should clearly highlight the prediction limitation and the potential for a wide range of factors to impact results. As I will highlight in the last section, I also believe that business decisions dependent on complex environments should be more holistic and less dependent on the simple results from a model.

Environmental Change

Ultimately, the basis of our work depends on applying sophisticated statistical techniques to historical data to make predictions about the future. To the extent historical data no longer accurately represents a given phenomenon—human behavior in utilizing services, for example—even the most sophisticated data analysis will not adequately predict the future. As a result, unless we can quantify this change in future behavior, the models built up using this historical data will inherently produce inaccurate predictions.

By most measures, we are now in an economic and regulatory environment that is much different than our historical experience. Considering the dislocation and severity of our economic challenges along with the enormous change in health care regulation, the historical data and experience is not sufficiently robust to account for all the factors that could impact human behavior. Although we still need to employ sophisticated modeling and attempt to quantify behavior in this new environment, we also need to acknowledge that our prediction accuracy will not be the same as our historical pricing accuracy.

Consistent with this, we need to provide quantitative and *qualitative* opinions of the potential distribution around an expected outcome. In addition to highlighting the potential variation, this process also helps maintain our reputation if an unforeseen event or change does occur.

A Proposed Response to the Problem

First and foremost, we need to approach data analysis with humility and a certain degree of skepticism when attempting to predict the future of complex systems (stock price changes, future GDP growth, election results, human behavior in utilizing services in an environment with significant economic change). We need to openly

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As part of our qualitative discussion, we need to consider the broader business strategy and have a philosophy toward expected changes in human behavior.

acknowledge that predicting the future is difficult and subject to an infinite number of unforeseen events and changes that could impact results. Consistent with this view, we also need to openly acknowledge the limits of our statistical predictions and provide both quantitative and qualitative analysis in outlining potential outcomes. As part of our qualitative discussion, we need to consider the broader business strategy and have a philosophy toward expected changes in human behavior. While this approach may run against the grain of those worshiping data and its potential to solve business questions, I believe this provides an honest appraisal of data and its implications that underpin our profession. This approach also helps maintain our credibility if an unforeseen event or change does occur that impacts our results.

In addition to acknowledging our limits, I also think that the most common pitfalls to data analysis need to be openly discussed including presenting data with almost no credibility, mistaking correlation with causation, biased data mining, the problems with developing a narrative bias, and presenting data without proper caveats.

In considering the challenges in our profession, I can't help but think of a famous quote from the economist Friedrich Hayek: "The curious task of economics is to demonstrate to men how little they really know about what they can imagine they can design." Like economists, in addition to making unbiased predictions about the future using actuarially sound statistical techniques, I also think our profession has an obligation to clearly articulate the limits and potential variation in our predictions of complex systems. ■

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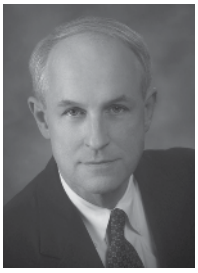
New Models of Disease Management Offer Opportunity

by Ian Duncan



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Chronic disease management, as we know it, had its start in services offered by the pharmaceutical companies in the 1990s. These services, in turn, were often aimed at improving compliance with the many new drugs coming onto the market at the time, such as Lipitor (cholesterol), Zoloft (depression) and Prilosec (gastrointestinal). What began as a small initiative funded by pharmaceutical companies and frequently executed within health plans quickly grew to a major industry with companies like Healthways, Health Dialog, Lifemasters and CorSolutions providing outsourced services. These services centered around an outbound call center model in which a nurse made calls to patients to perform assessments, provide education on chronic disease and coach the patient on the importance of compliance and self-monitoring.

While a lot of the focus of outsourced disease management (DM) was on clinical improvement, programs were sold, and the industry grew, based on a financial, rather than a clinical, value proposition. Fundamentally, DM companies told clients that they would be assured (or in some cases guaranteed) that they would earn at least $2 for every $1 spent on DM services. For a while this financial justification led to significant growth in the industry, despite continuing skepticism from purchasers who frequently were unable to discern any noticeable impact on their trends.

Outsourced, telephonic DM reached its zenith with the Medicare Health Support program. Section 721 of the Medicare Modernization Act of 2003 (MMA) authorized development and testing of voluntary chronic care improvement programs, called Medicare Health Support, to improve the quality of care and life for people living with multiple chronic illnesses. Chronic conditions are a leading cause of illness, disability and death among Medicare beneficiaries and account for a disproportionate share of health care expenditures. About 14 percent of Medicare beneficiaries have heart failure, but they account for 43 percent of Medicare spending. About 18 percent of Medicare beneficiaries have diabetes, yet they account for 32 percent of Medicare spending. The initiative assessed whether the benefits of better managing and coordinating the care of these beneficiaries would result in reduced health risks, an improved quality of life and savings to the Medicare program and the beneficiaries.

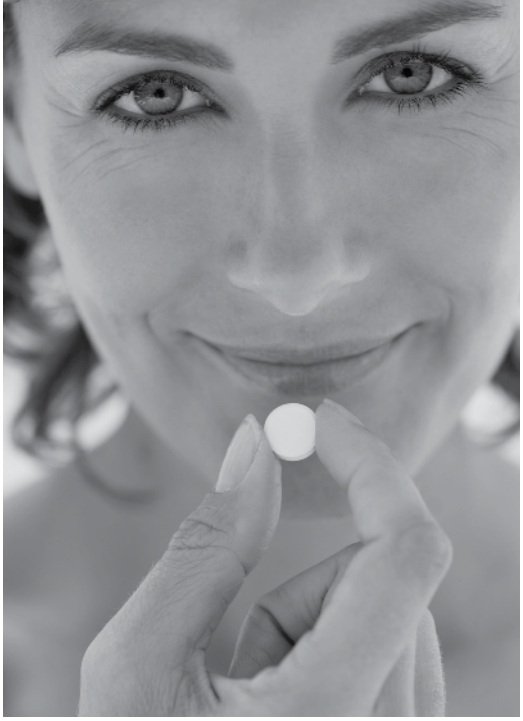
The programs were overseen by the Centers for Medicare & Medicaid Services (CMS) and operated by health care organizations chosen through a competitive selection process. Phase I program operations began between August 2005 and January 2006. Phase I ended in 2008. Results were not encouraging: while some improvements in clinical measures were seen, the financial improvement responsible for so much of the industry growth was not found.

Following these and similar results elsewhere, the industry has undergone considerable change: several companies have merged and many health plans have brought functions in-house that were previously outsourced. At the same time, there is an increase in focus on those patients who are likely to demonstrate improvement rather than a population-wide intervention. There is also an increased interest in new models of care. One of these is pharmacist-delivered interventions.

The Pharmacist in Chronic Disease Management

The pharmacist practicing today provides a much broader range of services than was offered even 10 years ago. Pharmacists are engaged in efforts to improve the quality of the drug use process and to identify ways to reduce medication errors. The role of pharmacists expands as medications become increasingly complex and diverse, and the potential for their misuse continues to grow. In addition to counseling patients on the proper use of medication, the role of today's pharmacist includes:

- Drug monitoring and disease management for defined conditions;
- Participating in multidisciplinary clinical care teams;
- Consulting on drug utilization programs;
- Supporting health services research on outcomes of care;



- Providing drug information;
- Patient education;
- Formulary management, and furthering public health initiatives such as smoking cessation programs diabetes education and immunizations.

New drugs are appearing on the market at a faster rate. Some of these new drugs have gained almost immediate widespread acceptance, requiring continual updating of the pharmacists' information base and maintaining ongoing skills in counseling patients and other members of health care teams. Studies have shown that pharmacists can contribute to reducing the cost of health care, while at the same time improving patients' use of medications and health outcomes. The savings have been demonstrated both in the hospital and ambulatory settings. Studies have also shown that pharmacists have an important role in preventing medication errors.

Pharmacists' expertise with prescription drugs enables them to perform successful medication therapy management. Several studies indicate that such drug management can improve a patient's adherence to drug therapy. However, pharmacists are increasing their role in the provision of health care. They are presented with unique opportunities that enable them to provide essential counseling and education to patients with chronic illness. Pharmacists can effectively and adequately screen patients for chronic illness, as well as assess and monitor patients already diagnosed, all of which can lead to life-altering improvements in clinical outcomes.

Today pharmacists are partnering with physicians (family, internal medicine) and are involved in medication optimization, poly-pharmacy and medication safety, or in preventative work like lipid control, osteoporosis, vaccination and smoking cessation.

Pharmacists add value because:

- Patients often have more interaction with their community pharmacist than with their physician;
- Pharmacists are trusted clinical professionals, less intimidating and do not require an appointment; and
- Pharmacists are more readily able to engage with patients than remote call-center nurses.

This last point (the ability of pharmacists to engage with patients) distinguishes pharmacist-based DM from the traditional nurse outbound call center model, which has demonstrated the increasing difficulty of reaching and engaging with targeted patients.

There are some well-known case studies like Asheville, PharmacistCare or Diabetes 10-City Challenge that illustrate the effectiveness of pharmacist-led interventions. The best-known is probably the Asheville project, in which the employees of the city of Asheville, N.C. were enrolled in a face-to-face pharmacist-led DM program. Pharmacists coached patients to adhere to their treatment plan, regularly assessed, monitored and recommended changes when the treatment plan was not working, and provided convenient access and expert advice. Results were significant: it was found that after one year, the patients with asthma emergency room visits dropped by 8.6 percent (from 9.9 percent to 1.3 percent), missed workdays per year dropped by 8.2 (from 10.8 to 2.6), the levels of HbA1C in diabetic patients fell by 1.4 (from 8.0 to 6.6[1]), LDL levels dropped by 15 mg% (from 123 to 108), mean systolic blood pressure was reduced by 11 points (from 137 to 126) and diastolic blood pressure by five points (from 83 to 78), and cardiovascular events per 1,000 members dropped by 39 (from 77 to 38). Additionally, 43 percent more patients had a foot exam (from 36 percent to 79 percent) and 29 percent

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Pharmacists can effectively an adequately screen patients for chronic illness, as well as assess and monitor patients already diagnosed, all of which can lead to life-altering improvements in clinical outcomes.

more patients (from 70 percent to 99 percent) tested blood sugar at home. The percentage of smokers in the population decreased by 13 percent (from 23 percent to 10 percent).

The Asheville results illustrated that a pharmacist-based, face-to-face program could do several things:

- It extends the care provided by other professionals (primary care physicians; nurses) who are in short supply (and likely to become even more constrained as a result of health care reform);
- It indicates how the focus of DM has shifted over the years from a financial program to take more account of the importance of clinical values; and
- The results achieved in Asheville have been replicated in similar programs throughout the United States, including the Diabetes 10-City Challenge and PharmacistCare (University of Kentucky).

Concerted efforts of many health care providers over many years have resulted in some improvement in the health status of the population. However, the coming wave of baby boomers entering Medicare, and the expansion of Medicaid to millions of newly insured lives due to the Affordable Care Act (ACA) will significantly increase demand for medical services, particularly for the chronically ill. To serve this growing need we will need innovative solutions, one of which is provision of services in the neighborhood pharmacy.

More detailed discussion of the value of the pharmacist in DM may be found in Murphy, P., et al.: "The Value of Pharmacists in Healthcare" to be published later this year in the journal *Population Health*.

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[1] Glycosylated hemoglobin (HbA1c) is a measure of the average concentration of blood sugar over time. In a non-diabetic, the percentage of HbA1c in the blood is between 4 percent and 6 percent; the American Diabetes Association targets 7 percent or less for diabetes control.

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Obesity and Health

by Sam Gutterman

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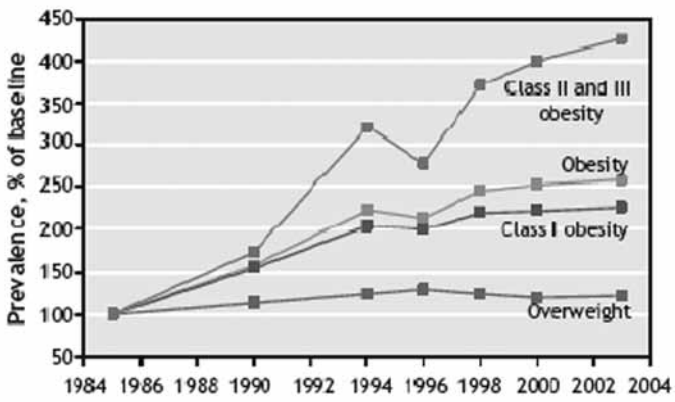
Today's abundant calorie-rich food often overwhelms the body's weight regulatory system, with many individuals' genetic make-up unable to regulate this input, resulting in what has been a massive societal weight gain over the past 35 years by all population segments. The current era of obesity and inactivity is threatening the substantial progress made in postponing illness and death.

Adult Overweight and Obesity Trends



Source: National Health and Nutrition Examination Surveys

The fundamental causes of the increase in obesity are rooted in the nature of current Western culture with its wealth, incentives to live in a sedentary manner and to consume a high-fat, energy-dense diet, spending an ever-smaller share of income on food. Although historically people were mostly consumed by simply obtaining food, they now think more about how to enjoy it.

Although possibly between 40 percent and 50 percent of the incidence of obesity has genetic origins, the recent rapid changes point to a major role played by behavioral shifts influenced by ineffective personal control mechanisms, and environmental, lifestyle and nutritional factors (e.g., size of servings, lack of fruits and vegetables, excessive fructose sugar-flavored drinks, lack of physical activity and dieting failures). These factors, possibly interacting with genetic susceptibility, contribute not only directly to an individual's weight, but are themselves risk factors contributing to chronic disease.

The prevalence of obesity (for adults, a body mass index (BMI) greater than 30; the "overweight" category is between 25 and 30 BMI) of over a third of the adult population in the United States is a significant concern to society and to practicing actuaries. The trend in childhood obesity is also adverse, with its potential serious long-term effects.

Not only has average weight increased, but the percentages in excess of given weight levels have shifted the prevalence distribution. Although overall it has recently been stabilizing, the morbidly obese (class II and greater—a BMI of at least 35) category continues to get worse as can be seen in the graph above. This BMI prevalence curve shift is of significant concern, because the morbidly obese experience extremely high mortality and health care costs. This is an area in which Americans stand out.

Obesity operates on some conditions, such as diabetes and hypertension, directly, while others as a consequence of indirectly, such as stroke and heart disease. Diseases and conditions often associated with obesity include:

- Type 2 diabetes; associated with a doubling of the risk of heart disease and stroke as well as a leading cause of blindness, kidney failure and non-traumatic amputations; almost 90 percent of diabetes sufferers are overweight or obese.
- Cardiovascular and heart disease; associated with numerous cardiac complications such as coronary heart disease, congestive heart failure and sudden death.
- Cardiovascular risk factors, including hypertension and adverse cholesterol.
- Cancers; the American Cancer Society has indicated that overweight and obesity contrib-

uted to between 14 percent and 20 percent of all cancer-related mortality.

- Kidney and liver diseases.
- Psychological disorders, including depression, anxiety, stress, bipolar disorder, schizophrenia, sleep apnea, sex disorders, weight stigma and dementia.
- Others, including musculoskeletal problems, arthritis and asthma.

Although these associations generally relate to all of the obese, they particularly apply to the extremely obese. Compared with those in the normal BMI category, extremely obese adults have seven times the risk of diabetes, six times the risk of hypertension, four times the risk of arthritis and three times the risk of asthma.

It can be difficult to attribute premature mortality and health-related costs directly to obesity; in 2002 a quarter of the obese had six or more adverse medical conditions. This difficulty in attribution, in part as a result of the complex nature of and interrelationships among health processes, affects the precision of the findings of any study of the sources of mortality and medical costs.

Many studies of obesity and mortality have either found J-curve or U-curve relationships between BMI and mortality hazard rates relative to an ideal BMI benchmark (usually assigned to BMIs between 22.5 and 24.9). These curves indicate additional mortality for both those underweight and obese, particularly in extreme cases. This is especially evident in those studies with a long observation period, demonstrating a lag between obesity and subsequent mortality, especially when cardiovascular conditions are involved. Other studies have reported on an obesity paradox, in which mortality for those overweight and mildly obese is lower than for those in the "ideal" BMI category, but these studies have mostly involved limited follow-up periods, not reflecting the lags involved.

The results of the Framingham Heart Study indicated that being overweight can be an independent, long-term predictor of cardiovascular disease. This study has found that being overweight or obese is associated with large decreases in life expectancy and increases in early mortality.

Studies have shown that the relationship between BMI and mortality weakens at advanced ages, such as over 75. However, BMI may underestimate the extent of adverse adiposity tissues in older adults, as waist circumference may be a better at-risk measure.

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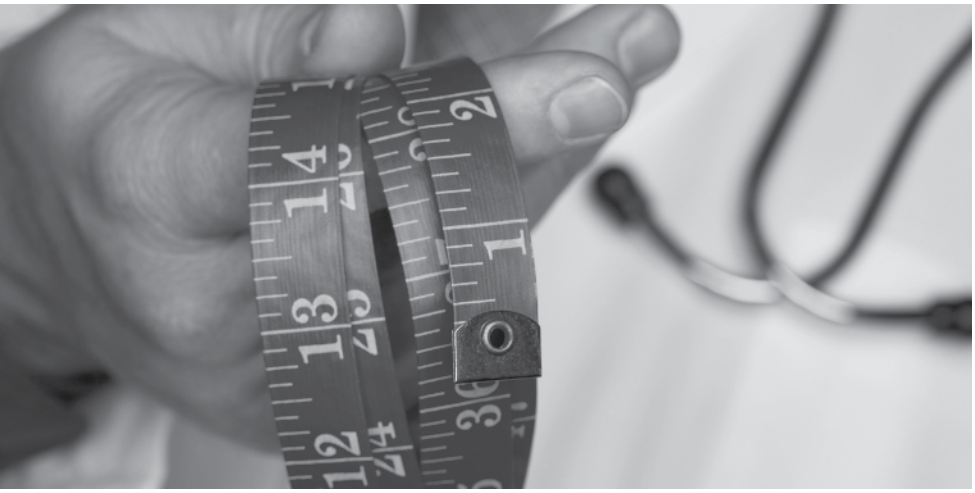

Many of these studies have found little additional mortality for the elderly, particularly for those overweight or at moderate obesity levels.

In some cases it is the cumulative exposure to additional weight and adiposity tissues, rather than the status at a particular point in time, that contributes to higher mortality rates. For example someone who was obese at age 40 might become diabetic at age 50, have a heart attack at age 60, subsequently lose weight and then die at age 65; this person's BMI at 40 would be more significant to health than a measurement at age 62. This long latency period may hide the long-term effects of the recent increase in obesity prevalence. Some studies may not have had a sufficiently long follow-up experience period to properly recognize the cumulative effect of the overweight and obesity surge over the last 30 years.

Health Care Costs

Morbidity can result in both human suffering and adverse financial consequences, including the cost of medical care services, loss of income and needed assistance in performing activities of daily living (ADLs). Although the focus on obesity has been on its adverse effects on mortality, a growing concern is its contribution to health care costs. Although some studies indicate that being overweight may not constitute a significant mortality risk, being overweight is often a stage in becoming obese, and a health risk factor itself. In fact, over the last several decades almost simultaneous improvement in mortality rates and increase in health care costs have occurred, in part as a result of improvements in and aggressive treatment of, for example, cardiovascular disease risk factors.

The Surgeon General in 2001 indicated that morbidity due to obesity in the United States may be as great a problem as poverty, smoking or drinking. Effective control of obesity is needed for there to be a hope of controlling health care costs. Three factors contribute to health care costs associated with obesity: (1) the increase in the number of obese; (2) the aging of the obese population that will increase co-morbidities and increase health care costs; and (3) the increase in treatment costs for obesity-related conditions. Certain studies have asserted that health care costs for obese persons may be equivalent to costs for those 20 to 25 years older.

The overall cost of obesity includes (1) direct health care costs including preventive, diagnostic and treatment services, bariatric surgery and weight reduction and dieting products and services; (2) indirect costs that include wages lost, decreased productivity, absenteeism and future lost earnings caused by premature death; and (3) intangible costs, such as quality of life, psychological harm and public costs. Most health care cost studies have attributed higher health care costs associated with the obese to the use of more prescription drugs (several studies have indicated that the obese have between 70 percent and 80 percent more drug dispenses or costs, especially those relating to cardiovascular, asthma, ulcer, diabetes, thyroid and analgesic drugs) and primary physician visits. Some of these studies have also found that the obese use more emergency department/outpatient clinic visits, specialty care clinics, inpatient visits and diagnostic services.

Physical disabilities resulting from obesity include: (1) skeletal and joint problems such as orthopedic disorders and carpal tunnel syndrome; (2) respiratory problems such as sleep apnea, respiratory muscle inefficiency and decreased functional reserve capacity; and (3) an increased use of cesarean deliveries. Approaches taken to estimate the cost attributable to obesity evaluated health care costs by either: (1)

certain medical conditions, such as diabetes, cardiovascular disease and cancer associated with obesity; (2) source of spending, such as by type of prescription drugs; and (3) funding source, in the United States including Medicare, Medicaid, private health insurance and out-of-pocket expenditures.

Certain recent studies have found a significant, nonlinear, relationship between health care expenditures and degree of obesity. Notably, Cawley and Meyerhoefer (2010), based on the 2000-05 wave of the Medical Expenditure Panel Survey (MEPS), found very heavy additional costs associated with the morbidly obese, the fastest-growing category of obesity, resulting from greater use of physician services, outpatient and inpatient visits, and prescription drugs.

Obesity may have a larger effect on health care costs than smoking because of its effect on heart disease, hypertension and diabetes, all of which tend to be chronic in nature with long-term drug regimens. Smoking has its strongest effects on cancer and lung disease that, while costly, generally have lower frequency and lead to death more quickly.

Unlike mortality, health care costs for those obese over age 65 (or just as importantly their earlier obesity status) are significantly higher than those of normal BMI. For example, Daviglus et al. (2004) reported fee-for-service Medicare charges for those severely obese were about 95 percent higher, for those obese class I 50 percent higher, and for those overweight 20 percent higher than those with standard BMI.

Although earlier studies (in the 1990s) indicated that obesity-related health care expenditures were between five percent and seven percent of annual U.S. health care expenditures, two recent studies have estimated that these were 9.1 percent (Finkelstein et al. (2009)) or 16.5 percent (Cawley and Meyerhoefer (2010)) of total health care costs can be directly attributed to being overweight or obese. Given that 2009's total American health expenditures (hospital, physician and prescription drugs) were about $1.5 trillion, obesity is costly at any percentage. Up to a third of the increase in overall health care costs as a percent of U.S. gross domestic product (GDP) over the last two decades has been due to the increased prevalence of obesity. This contrasts with four percent of total health care costs in Canada that have been associated with obesity.

Disability

Excess weight has been reported to increase the rate of disability and work limitations. According to National Health Interview Survey (NHIS) results, obesity accounts for about one-half of the increased rates of disability in those aged 18–29, one-quarter for ages 30–39 and one-tenth for ages 40–49.

Tucker and Friedman (1998) found that obese employees are 1.74 and 1.61 times more likely to experience higher (defined as seven or more absences due to illness per six-month period) and moderate levels (three to six more absences), respectively, than their lean counterparts.

Bhattacharya and Bundorf (2009) found that incremental health care and productivity costs associated with obesity are passed through to obese workers in the form of lower cash wages. They estimated that obese men earn $1.21 an hour less than non-obese men, while obese women earn $1.66 less than non-obese women. The wage penalty in firms providing health insurance was higher by $2.64 an hour. This difference in expenditure increases with age and is greater for women.

Lakdawalla et al. (2004) found the rate of more severe personal care limitations was 50 percent greater for the obese. They speculated that (1) the obese have co-morbidities and thus tend to have more intense disabilities; (2) lifesaving medical techniques have resulted in more disabled who might otherwise have died; and (3) less-than-average wages and wage growth for the obese can provide a greater incentive to present disability insurance claims.

The increase in obesity over the last several decades has and will increase the rates of disability by 20

Fee-for-service Medicare charges for those severely obese were about 95 percent higher, for those obese class I 50 percent higher, and for those overweight 20 percent higher than those with standard BMI.

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percent for those between ages 50 and 69 due to increasing ADL limitations. This may lead to greater disability income and workers' compensation costs. In addition, several studies have found that dementia is associated with high BMI and visceral adiposity.

What Can Be Done?

The causes of obesity are heterogeneous; therefore, a multi-faceted program to achieve a healthy body has to be tailored to the individual. It should focus not only on weight, but also on contributing behaviors, primarily those relating to nutrition and physical activity. The development of effective weight management programs, including dieting and general education campaigns, will remain a challenge, as human behavior is quite resistant to change.

The future effects on mortality, morbidity and health care of those who are now overweight and obese should not be ignored. The resulting health care costs are shared by the public. It took decades of intense government efforts to gain modest control over smoking; it will take at least as long to win a fight against obesity and sedentary living. In a society in which food is plentiful and affordable, and exercise is no longer necessary for immediate subsistence, only long-term approaches on both an individual and societal level will lead to an effective solution.

This article is adapted from a paper presented at the Society of Actuaries' 2011 Living to 100 International Symposium, which was held Jan. 5–7 in Orlando, Fla. To read the original paper, go to the symposium monograph at: *http://livingto100.soa.org/monographs.aspx.*

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A Study on Emerging Health Conditions among the Elderly in India and the Sufficiency of Medical Framework and Health Insurance

By N. V. Subramanyan

Introduction

The number of elderly in India has steadily increased in the past six decades. Their percentage to total population recently has been declining but is masked by the increasing number of younger members. The gradual shift from an agrarian to an industrialized economy has been telling. For instance, the prevalence of lifestyle diseases such as diabetes mellitus and cardiovascular disease has increased manifold. Medical and health care infrastructure is perhaps inadequate to meet the challenge due to the large population. Absence of a social health care policy and health insurance setup complicates matters. The present paper is an attempt to study the situation; analyze and estimate the effect on the economy with particular focus on the present and future elderly segment of the population; identify opportunities for insurers; and finally to suggest remedial measures to deal with the situation.

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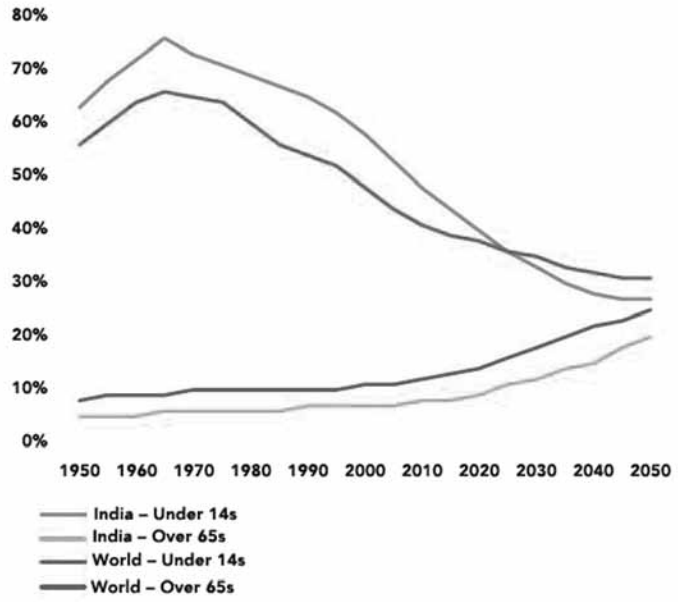
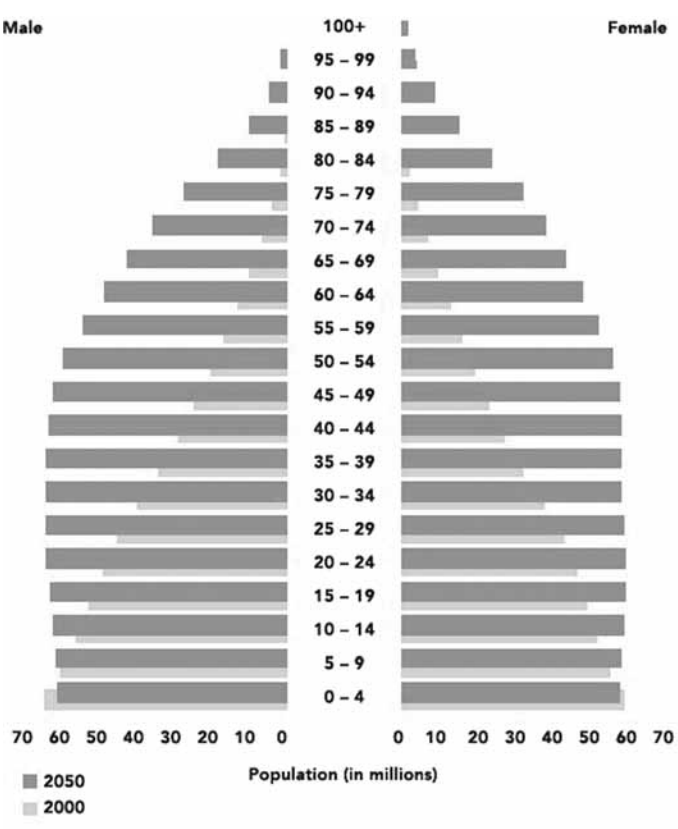


Incidence of Lifestyle Diseases

The incidence of lifestyle diseases has increased manifold at more than a linear rate. Most notable has been the spiking of diabetes and cardiovascular diseases (CVD). Approximately 10 percent of adults suffer from hypertension and 37 million have Type 2 diabetes, which is projected to reach 57 million by 2025. With an aging population, non-communicable diseases (NCDs) such as CVD, diabetes, cancer, stroke and chronic lung diseases have emerged as major public health problems, accounting for 5.5 million, or 53 percent of nearly 10.3 million, deaths in India. The impact of some major diseases is detailed below.



Diabetes

Present Situation

India has the world's largest diabetic population, estimated at 50.8 million. The largest age group currently affected by diabetes is 40–59 and, by 2030, this is expected to move to 60–79 with 196 million cases. Given increasing obesity prevalence, it is likely that future prevalence is underestimated.

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Estimated Numbers of Diabetics for 2000 and 2030 and Population Changes						
	2000	2030	2000–2030			
Region	No. of Diabetics		% rise in diabetic	% rise in population	% rise in population > 65 years	% rise in diabetics
India	31705	79441	150.56	40	168	101
China	20757	42321	103.89	16	168	115
Developed West	44268	68156	53.96	9	80	NA
World	171228	366212	113.87	37	134	61

Source: World Health Organization (WHO)

Diabetes is a major cause of premature illness and death, and with NCDs accounts for 60 percent of all deaths. Less than 50 percent of diabetics are diagnosed. However, 80 percent of Type 2 diabetes is preventable by changing diet, increasing physical activity and improving living conditions. Diabetic prevalence is increasing due to population growth, aging, urbanization and increasing obesity. Patients bear almost the whole cost of medical care. Estimated medical expenditure is $28 billion in 2010 and will rise to $61 billion in 2030. An estimated $878 per person will be spent in 2010 on diabetes. WHO predicts net losses in national income from diabetes and CVD at $336.6 billion in India between 2005 and 2015 and projects that

Candidate	Trial Phase	Formulation	Technology	Company
Alveair	Phase I-II	Inhaler formulation	Polymer/ bio-adhesive	
drug-delivery platform	Coremed Inc.			
Oral-lyn	Phase III and commercially launched in some countries	Buccal spray	RapidMist delivery technology	Generex Biotechnology
IN-105	Phase I-II	Capsule formulation	Conjugated insulin molecule	Biocon Ltd.
Undisclosed	Preclinical phase: animal trials	Capsule formulation	Biodegradable novel polymeric nanoparticles	Transgene Biotek Ltd.
Technosphere	Phase III	Inhaler formulation, inhalant micro particle formulation	CPE-215 permeation enhancement technology	MannKind Corp.
U-Strip	Preclinical phase: animal trials	Insulin patch	U-Strip patch technology	Encapsulation Systems Inc.
Nasulin	Phase II	Intranasal insulin spray		Bentley Pharmaceuticals

deaths by diabetes and NCDs will increase by 20 percent over the next decade.

Trends in Diabetes Research

There is active research in India, and the emphasis is now on novel agents. Sixty percent of insulin now is available in injectable form, which has inherent disadvantages. Research is focused on introducing inhalable insulin, topical patches, buccal spray and nasal/intranasal spray formulations. The capsule formulation is a result of indigenous research.

Cardiovascular Diseases

Indians have a greater prevalence of CVD and coronary conditions characterized by smaller coronary arteries, diffuse distal disease and multi-vessel disease, at younger ages with higher female incidence. According to recent estimates, CVD may increase from about 29 million in 2000 to 64 million in 2015. Deaths from CVD will also more than double. Though prevalence rates of CVD in rural populations will remain lower than urban, they will continue to increase, reaching 13.5 percent of rural population of 60- to 69-year-olds by 2015. Prevalence rates among adults are also likely to increase. Prevalence rates among women will keep pace with men across all age groups. Prime statistics of the CVD situation are given in the tables below.

Geriatric Health in India

Present Situation

As per the 2001 census, the number of people aged over 60 was 76 million compared with 20 million in 1951, and is projected to reach 324 million by 2050. There is a sharp decline in death rates from 28.5 in 1961 to 7.8 in 2001, while the birth rate fell from 47.3 to 21.9 over the same time period. Problems being faced by the elderly and strategies for improving the quality of life also should be explored.

Prevalence Percent of CVD in India

Year	Area	20-29 years		30-39 years		40-49 years		50-59 years		60-69 years	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
2010	Urban	7.92	7.67	8.54	8.84	10.06	14.22	13.23	13.95	21.25	21
	Rural	1.8	1.3	4.45	2.9	3.94	8.23	5.22	13.38	12.28	12.37
2015	Urban	9.3	8.98	9.73	10.18	11.01	16.19	13.77	15.28	22.99	22.87
	Rural	1.8	1.3	5.13	2.9	4.32	9.08	5.5	14.89	13.31	13.71
2020	Urban	11.47	11.04	11.64	12,31	12,65	19.35	15.05	17.57	26.12	26.15
	Rural	1.98	1.43	6.51	3.19	5.21	11.02	6.37	18.23	15.87	16.71
2025	Urban	14.85	14.25	14.62	15.63	15.26	24.28	17.27	21.21	31.16	31.4
	Rural	2.4	1.73	9.09	3.86	6.91	14.71	8.12	24.55	20.81	22.4

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Estimated Mortality Due to CVD in India					
Year	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years
2010	332687	363820	438981	512452	2250378
2015	419680	498062	572402	780488	2946268
2020	555891	715928	783693	1248155	4050217
2025	787852	1101131	1148086	2135771	5957556

Source: Ministry of Health, India

Socio-Demographic Profile

Seventy-five percent of the elderly are rural, of which 48.2 percent are women; out of whom 55 percent are widows. Seventy-three percent are illiterate, depending on physical labor. Ninety percent were from the unorganized sector without regular income. The number of centenarians is about 0.2 million in India and the sex ratio of elderly favors males.

Medical and Socio-Economic Problems

The prevalence of tuberculosis is higher among the elderly. Among those older than 60, 10 percent suffer from impaired physical mobility and 10 percent are hospitalized at any given time. Among those older than 70, over 50 percent suffer from chronic conditions including hypertension, CVD and cancer. CVDs account for one-third; respiratory disorders account for 10 percent; while infections including tuberculosis account for another 10 percent of mortality. The elderly belonging to middle- and higher-income groups are prone to obesity and related complications due to sedentary lifestyle.

Rapid urbanization has led to a breakdown in family values and support, economic insecurity, social isolation and abuse; leading to a host of psychological illnesses. The problems are aggravated due to lack of social security, inadequate health care and rehabilitation facilities. Pension and social security are restricted to those who are working in the public or organized sectors.

India's government has launched policies like the National Policy on Older Persons, the National Old Age Pension Program, etc. However, their benefit has been questioned due to meager budgets, improper beneficiary identification, lengthy procedures and irregular payments.

The Implications

Economic

The chief problem is loss of available capital and loss of workforce due to the need of taking care of the elderly. The government plans to increase health expenditure to 6 percent of gross domestic product (GDP), with 2 percent contributed as public health investment by the year 2010. The government needs to increase its commitment to the health sector to 8 percent of GDP. Provisioning higher public health investments also depends upon an increase in the absorptive capacity to utilize funds gainfully.

Social

In 2050, the number of dependent adults will equal the number of dependent children. World Bank has established a model with three pillars of old age provision: the state, occupational and the individual. Traditional reliance on social provision (Pillar 1) has made the state the main provider. Now the government has sought to develop the personal provision (Pillar 3) and the findings reveal that Indians have embraced this well. However, as with other societies with a youthful population profile—the average age in India is just 26—people are more likely to see saving for their children (35 percent) as more important than saving for retirement (12 percent).

Some implications of the present scenario are:

1. Raise taxes to pay for better state pensions/ social security.
2. Increase retirement age.

The Indian Pension Pillars			
The Pillars	Pillar 1: the state	Pillar 2: occupational	Pillar 3: the individual
India	Largely pay-as-you-go social model providing retirement benefits at 60 for women and 65 for men.	DB and DC mixed system providing benefits through an employee provident fund which can be cashed at 58. Allows for lump sum payments to be made.	The new Pension System (NPS) sees the introduction of a DC arrangement with tax relief and flexibility at retirement. Will eventually provide benefits for 87% of Indian workers.

***DB** = Define Benefit; **DC**=Defined Contribution.*

3. Encourage private savings through tax relief.
4. Encourage private savings through workplace schemes.
5. Compulsory pension contributions.

Humanitarian

Components of old age care strategy could be an iterative process of policy and strategy formulation, focus on primary health care, etc. There are humanitarian and charitable organizations in India such as HelpAge India and Age Ventures India that take care of the elderly population.

Present Health Care and Health Insurance

Private and Government Bodies

Health care expenditure for 2008–2009 was about 5.9 percent of GDP. More than three-fourths of all health spending is private, and 70 percent is from households. Less than 15 percent of people have health coverage. More than 40 percent of those hospitalized had to borrow or sell assets to meet expenses.

Health insurance is the fastest growing segment in the non-life insurance industry. Health insurance purchased constituted only 0.7 percent of health expenditure in 2001–2002, covering one percent of the population. Health insurance grew 60 percent during 2007–2008 to command a market share in non-life insurers of over $1.275 billion as against $800 million in 2006–2007, producing an annual growth rate of almost 53 percent.

Reach and People Covered

Insurance and other organized health provisions cover less than 15 percent of the population. From 25 million people in 2006–2007, it increased sharply on large-scale government health insurance programs but still pays less than one-tenth of expenditures.

Product Variety

Product variety increased substantially, though the indemnity-based annual contracts predominate. Though insurance availability was limited for those over 60 until recently, it is now offered even for life.

Regulatory Initiatives

The Insurance Regulatory & Development Authority set up a national health insurance

$ Millions	2008-2009	2007-2008	Growth
Non Life Insurers (excluding standalone health insurers)	3106.84	2242.63	39%
Standalone health insurers	247.49	44.58	455%
Total	3354.33	2287.21	47%

Source: Insurance Regulatory & Development Authority

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working group in 2003 which has subgroups on data, stand-alone health insurers and product innovation. Efforts are on to create the health data repository. It has taken up development of acceptable and reasonable standards of care for common causes of hospitalization and is taking initiatives on renewability of health insurance for senior citizens.

Trends for the Near Future

Though growth could continue, there is a need for product, delivery and distribution innovations, specialization and professionalization to ensure quality and cost optimization.

Institutions in the Unorganized Sector

There are a few institutions in the unorganized sector, like HelpAge India and Age Ventures India, which take care of the following:

- Independent living (where elders can live without worries of housekeeping, cooking and other domestic duties)
- Assisted living (where elders need assistance for meals, housekeeping, transportation, dressing, toileting and medications)
- Nursing care facilities (where mostly seniors having significant health care issues will move in)
- Short-stay facility for those requiring rehabilitation post surgery, caretakers on vacation or children visiting them from outside.

Other Indigenous and Holistic Systems

There are indigenous organizations taking care of the elderly. Most are religious in nature and are unregulated.

Remedial Measures

Various remedial measures are being taken as mentioned below.

By Government

Government formulated the National Health Policy, built infrastructure and initiated national health programs. Major policy prescriptions are:

- Increase the public expenditure for health from 0.9 percent to two percent
- Increase the allocation of investment in the order of 55 percent for primary health sec-

tor, 35 percent to secondary and 10 percent to tertiary sectors

- Convergence of health programs, except those (like tuberculosis, malaria, HIV/AIDS, reproductive and child health care) needing to continue until they moderate prevalence
- Levying charges for certain health services, for those who can afford
- Mandatory two-year rural posting before awarding medical degrees
- Decentralizing implementation of health programs to local autonomous bodies
- Setting up a medical grants commission for new government medical colleges
- Promoting public health discipline.

At Social Level

Priority is placed on parents saving for children to help them up the social ladder. Studies reveal the importance of family as a source of education about financial matters. Several studies show how the financial behavior and attitudes of parents shape children's future financial behavior.

Institutional

Indian culture traditionally emphasizes personal financial security, placing particular importance on the well-being of one's family. Indians want "well-designed" insurance plans with comprehensive coverage without gaps. Other moves from the insurers that could help are:

- Considering lenient tax treatment of insurance costs. Another path is structuring financing alternatives like medical savings accounts, combining higher-deductible insurance coverage with money set aside in tax-favored accounts.
- To make prudent purchases, consumers should be able to choose among hospitals and health care providers along with coverage scope and insurers. Not every situation is similar, nor does every person need similar coverage. Providing for outpatient services encourages smarter buying. Fairly priced products will ensure more accessibility.
- Educating consumers is important. Beyond awareness of coverage, information on diseases, treatment cost and options must be available.
- Health insurance through employer-sponsored programs is likely to improve coverage.

By Individuals

The old "cliff edge" of retirement where people stopped working overnight is being replaced by a transition. Many wish to remain active, whether by continuing their occupation or with voluntary work.

Conclusion

An aging population coupled with inadequate health care and insurance is a big problem. Steps are being taken to counter this, but their comprehensiveness is debatable. India's government has launched policies to promote the health, well-being and independence of senior citizens. However, a lot remains to be done. As existing social security and overall preparedness is low, much depends on these steps and efficient implementation. Funding needs to be increased, and financial literacy should be improved and private participation encouraged. Other countries' experience and expertise might help, but care is necessary to ensure that society can absorb the changes. New opportunities are many, and major players such as AIG, ING and Allianz are waiting to enter the pension and health care market. As India is cautious in accepting foreign players and their expertise in sensitive areas, these companies could face challenges of acceptance and building a mutually beneficial relationship. It is safe to conclude that while there is a road map, it is the execution that shall decide success. ■

Soundbites

from the American Academy of Actuaries' Health Practice Council Activities

By Heather Jerbi and Tim Mahony

What's New

In Washington, influence is often measured in terms of political action committees and special interests. But on Oct. 14, a joint work group of the Academy's Health Practice Council and the Society's Health Section Council proved that influence also can be achieved through perseverance and math. On that date, Health and Human Services Secretary Kathleen Sebelius announced that the administration would not be pursuing the implementation of the Community Living Assistance Services and Supports (CLASS) Act, a voluntary long-term care program included in the Affordable Care Act (ACA). The reasons? It could not be self-sustaining and actuarially sound for 75 years, and still be affordable for consumers.

That was the exact message delivered by the joint Academy/SOA work group in July 2009 when the CLASS Act was initially being considered as part of the ACA. The work group warned that the program, as designed, would suffer significant adverse selection due to the lack of an effective underwriting mechanism, a limited vesting period, and a lifetime cash benefit, among other design features. To meet the requirement for the program to be actuarially sound for 75 years, the group argued the premium would have to be prohibitively expensive, particularly for relatively healthy individuals. Along with its recommendations for addressing some of the potential for adverse selection in the program's design, the work group's analysis has been quoted consistently by policymakers and media outlets, even after the ACA was passed and CLASS was expected to be implemented. The administration's final report shuttering the program referred to the work group's analysis as one of the factors in its decision.

This is influence. And this is why the work of our many dedicated volunteers is so critical to the missions of both the Academy and the SOA. Over the past two years, members of the Academy's Health Practice Council and the various work groups that fall under its umbrella, have worked diligently to ensure that the actuarial perspective on ACA-related and numerous other issues is heard by the Department of Health and Human Services (HHS), the Centers for Medicare & Medicaid Services (CMS), the National Association of Insurance Commissioners (NAIC), and other interested parties.

In addition to the shuttering of CLASS, several high-profile regulations were released last summer and fall, including proposed rules on the implementation of the exchanges and the standards associated with the risk adjustment, reinsurance and risk corridor mechanisms, as well as final regulations implementing accountable care organizations (ACOs). In addition, the Institute of Medicine (IOM) released its long-awaited report on essential health benefits. While the report did not contain any specific recommendations for what should be included in any benefit package, the IOM did suggest that HHS determine what the national average premium for a small employer plan would be in 2014 and use that as a threshold, meaning the scope of benefits could not exceed that amount. The IOM's report will lead to the eventual promulgation of proposed regulations defining the package, which is a crucial part of preparing for the 2014 implementation of health insurance exchanges. As always, though, health reform is not our only priority. We continue to focus on Medicare reform, particularly in the context of deficit reduction, and provide input to NAIC on non-ACA-related issues.

The following publications represent a sampling of some of our most recent (as of the time this article was written) communications to Capitol Hill, HHS, CMS, and the NAIC.

Medicare

In August, the Academy's Medicare Steering Committee urged the newly-created Joint Select Committee on Deficit Reduction, which was formed to recommend $1.5 trillion in savings over the next 10 years, to consider options that would improve the long-term solvency and sustainability of the Medicare program. The letter stressed the need to evaluate the effect that any potential Medicare reforms—made in the context of deficit reduction—would have on the viability of the program. The letter also asked the committee to be mindful of how the reforms could affect the cost, access to, and quality of care. It further warned against simply shifting costs from one payer to another. The 12-member bipartisan panel is charged with making its recommendation before the Thanksgiving recess; however, if the committee's proposal is not enacted by Jan. 15, 2012, automatic spending cuts totaling $1.2 trillion will be implemented. The reductions will be split evenly between defense and non-defense spending, with the excep-

tion of Social Security and Medicaid. Medicare cuts to beneficiaries also would be exempted, although provider cuts would not.

Risk-Sharing Mechanisms
On Oct. 28, the Academy's Risk-Sharing Work Group submitted comments[1] to CMS on the proposed regulation implementing the risk-adjustment, reinsurance, and risk-corridor provisions in the ACA. In addition to section-specific comments, the work group provided a number of general comments including a request for clarification on whether "plan year" and "benefit year" are the same as "calendar year," the need for information on methodologies in advance of 2014, the tradeoffs related to the timing of the risk-spreading programs' results, and the need for additional safeguards against risk selection.

Exchanges
On Oct. 6, the Academy's Exchanges Work Group submitted comments[2] to CMS in response to proposed regulations establishing health insurance exchanges and qualified health plans under the ACA. The work group urged CMS to consider several general comments: first, the need for the regulations to ensure consistency between in-exchange and off-exchange market environments to mitigate adverse selection; second, the effect of choice on adverse selection; and third, the need for more clarity and transparency related to administrative responsibilities.

NAIC Activities
On Oct. 4, the Academy's Medicare Supplement Work Group sent comments[3] to the NAIC's Medigap PPACA Subgroup on its discussion paper, *Medicare Supplement Insurance First Dollar Coverage and Cost-Shares.*

In August, the work group also sent a letter to the NAIC's Medicare Supplement Refund Formula Subgroup with a proposed charge to have the work group review the Medicare Supplement Refund Formula for potential changes that may need to be addressed. Specifically, the work group will be looking at revising the formula, making a recommendation regarding pooling, and evaluating the tolerance formula.

On Aug. 23, the Academy/SOA Long-Term Disability Work Group updated the NAIC's Health Actuarial Task Force on the work group's progress on the creation of a valuation table for group long-term disability. The joint work group has created three subgroups (margins, table development, and company experience) to assist in the development of the table and completion of the project. The work group expects the table to be completed by March 2012.

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 reviewed the list of Academy health related practice notes that need updating and is currently updating the Large Group Medical Business Practice Note and will be updating the 1995 Long-Term Care Insurance practice note in 2012.

Medicare Steering Committee (Ed Hustead, Chairperson) – The committee is developing a series of public statements related to specific Medicare-related provisions included in recent deficit reduction proposals.

Academy/SOA Cancer Claims Cost Tables Work Group (Brad Spenney, Chairperson) – The work group has been charged with evaluating and updating the 1985 cancer claims cost tables. Last November, the work group submitted a survey to companies that write cancer insurance to get their opinions about the table. Not enough companies have submitted responses, so the group is working with the SOA to submit a smaller data call in early 2012.

Disease Management Work Group (Ian Duncan, Chairperson) – This work group is in the final

[1] *http://www.actuary.org/pdf/health/RSWG_comment_letter_on_3R_proposed_rule_111028.pdf*
[2] *http://www.actuary.org/pdf/health/Academy_comments_on_NPRM_on_exchanges_100611_final.pdf*
[3] *http://www.actuary.org/pdf/health/Academy_MSWG_Comment_Letter_to_NAIC_Subgroup_100411.pdf*

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stages of developing a public statement on evaluating wellness programs.

Group Long-Term Disability Work Group (Darrell Knapp, Roger Martin, Co-chairpersons)-This work group has been charged with developing a valuation table for group long-term disability insurance. The work group expects to complete the table by the first quarter of 2012.

Health Practice International Task Force (April Choi, Chairperson) – The task force has created two subgroups, one focusing on long-term care systems in foreign countries and one on types of wellness initiatives in foreign countries. The long-term care subgroup is considering conducting a session on LTC at the 2012 SOA Health Meeting in June as well as publishing an article on international long-term care challenges in the March/April 2012 issue of Contingencies. The wellness subgroup is planning to conduct a session on international wellness programs at the 2012 SOA Health Meeting in June.

Health Receivables Factors Work Group (Kevin Russell, Chairperson) – This work group is reviewing current health care receivables factors for the NAIC's Health RBC Working Group and providing guidance.

Long-Term Care Principles-Based Work Group (Al Schmitz, 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 work group is summarizing results from various scenarios to determine the structure of the morbidity tables. The project is expected to be completed by first quarter 2012.

Long-Term Care Valuation Work Group (Bob Yee, Chair) – This group is developing valuation morbidity tables for LTCI. The work group is working with the Medical Information Bureau (MIB) to finalize the data and will construct the tables in March 2012 and compile a draft report by July 2012.

Long-Term Care LTCI Practice Note Update (Warren Jones, Chairperson) – This work group has been formed with updating the Academy's 2003 LTCI practice note. The work group is going over peer review comments and expects to complete the practice note update by early 2012.

Medicaid Work Group (Mike Nordstrom, Chairperson) – This work group conducted a presentation in June to CMS regarding the Medicaid rate setting process. The ASB has approved the work group's request to have the 2005 Medicaid Managed Care practice note developed into an ASOP and has formed a task force to complete this task.

Medicare Part D RBC Subgroup (Brian Collender, Chairperson) – This subgroup is recommending changes to Medicare Part D RBC formula and has asked the NAIC's Health RBC Working Group to assist with administering a survey of companies that write Medicare Part D business. The subgroup is awaiting further guidance from the NAIC.

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. The NAIC is compiling a database of selected states for this project and will update the work group when it is finished. The subgroup also submitted a comment letter to the NAIC's Medigap PPACA Subgroup on its discussion paper entitled *Medicare Supplement Insurance First Dollar Coverage and Cost-Shares.*

Health 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. The work group will be predominantly focused this year on the NAIC's Solvency Modernization Initiative (SMI). The report was submitted on Jan. 31. The work group has been asked by the NAIC's Health RBC Working Group to look at various missing health risks related to the RBC formula.

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 currently is in discussions to have someone from the University of Connecticut transform the data results into a loss ratio variance model.

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

The Zen of Actuarial Science

By Richard Tash

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When I think about the differences between left- and right-brain thinkers, left-brain thinkers tend to be more analytical and structured in their approach to problem solving where right-brain thinkers tend to be creative and intuitive at finding solutions. Actuaries are known to be left-brain thinkers. Is there a place for right-brain thinking in a left-brain world? Maybe being left-brain is a necessity due to the nature of our work. We are numerically oriented, analytic, and at the end of the day we need to have "an answer." We know that there is no one right answer usually but a range of correct answers. This has led me to say, "I may not know when a number is right, but I can certainly tell when a number is wrong." What methods do we go through to check our values? Should you go into a project with a preconceived idea of what the answer should be, maybe within a range of values?

In this article, I will use client as anyone who requests work from you, whether it be your boss, cohort, volunteer project coordinator or external customers.

Testing the Results

I once had a boss who gave me some very good advice. There were two expressions she often used:

- Kick the tires.
- Give it the sniff test.

Basically what she was saying was to use my "intuition" or "gut feel" to determine if results were making sense. This also suggests using creativity to "stress" the project to make sure results make sense. These are traits that might feel like fingernails on a chalkboard to many actuaries, but they have a place in what we do.

For example, I was asked to calculate actuarial values for 15 different health care plan designs and display them in order of highest to lowest on a histogram. It seems very straightforward for one to take the various plan designs, run them through a model, and come up with actuarial values. Of course, along the way, wrong inputs may be entered. I gave this project to an actuarial student and suggested that before running the model, he look at the plan designs and rank them purely on what was provided. My suggestion wasn't followed and some of the designs were out of order. Before sending the report to the client, I reviewed it and caught the errors. Could these errors have been avoided if the non-analytic view was done ahead of time? Maybe—and maybe this is the power of peer review, to look at a project in a different way to determine if it makes sense. However, building the habit of self-review by looking at a project from various perspectives before peer review may provide deeper understanding and new insights.

Maintaining Credibility

The value of self-review prior to going to the next round of review may improve your reputation for

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providing accurate work. Even though my example above was simple, the importance of building and maintaining credibility with our clients can never be overstated. If relative actuarial values went out incorrectly, with a seemingly simple exercise, how would our work be viewed when more complicated projects come through? Another of my favorite expressions highlights this principle: "It is so hard to build the bridge (of confidence) with clients and so easy to destroy it." Maintaining your credibility with clients occurs with every project. People are more likely to remember the projects that go poorly than those that were successful.

Accuracy and completeness are paramount to what we do. In all projects, the goal is to be accurate and timely. I've maintained that if one of these goals has to be sacrificed, then it is better to be accurate than timely. It seems better to have the reputation that "His or her work is good, but doesn't always get it in on time" versus "We get the work completed timely but it is unreliable." There are situations, such as with government contracts, that work must be provided by a deadline and the actuary must plan for this. I don't want to imply that being constantly late is acceptable, just that taking a little extra time is preferable to being wrong.

What is the Story?

I believe every set of results has a meaning behind it. Sometimes one can infer what is behind the numbers and at other times the results are obvious. Our value to the industry is the story we can tell about the numbers we produce and what they mean in the context for which they were derived. We may have regular reports that we produce for clients. It is easy to produce reports that have been done every month, knowing they are accurate, and then give them to our client without providing any insights. What I discuss with my student actuaries is to look at and review the results to determine if there are any changes that may indicate patterns or emerging trends. This process is not menu- or textbook-driven since I cannot tell the students what they will find ahead of time. You just have to look at the data and see what comes up.

How can we infer information from the data? One trick, which I admit isn't perfect but more of an indicator, is to review demographic changes to infer worsening or improving risk. One simple statistic is the change in members per contract for a group. Large changes in either direction may suggest a reduction or increase in child members, which could have an impact on a group's health risk. Children individually tend to have better risk scores, so a decrease in the ratio may suggest worsening population risk if the change is large. Without other information available, this becomes an indicator of the direction of risk for rating a group. Knowing the story allows you, as the actuary, to provide better input and direction to your clients.

Packaging your Results

I often see work that is done well but is hard to follow or doesn't support "the story." Even if all your work is correct, it should be presented in a manner that the client can understand. Little things are important—such as including headers on an Excel spreadsheet so that each page has a title. The old adage that a picture is worth a thousand words applies with actuarial presentations as well. Charts, line graphs, histograms or other visual presentations can often better demonstrate the story than bullet point or script explanations. There is a role for each type of presentation, and the key is to know your audience and the purpose of the presentation.

Each actuary needs to develop his or her style after trying different presentation approaches. Reuse those that work and discard those that don't. Experience will give you the ability to determine what types of reports, graphs and charts are appropriate for the various projects being performed.

Conclusion

According to Wikipedia, "Zen emphasizes experiential wisdom in the attainment of enlightenment." We can learn from the Zen emphasis in the work we do as actuaries where the "experiential wisdom" is achieved through completion of projects presented to us and the "enlightenment" results from accurate and meaningful deliverables. Incorporating right-brain thinking can result in more understandable deliverables while keeping the focus on our customers' needs. ■

Brazilian Private Health Care Market—Ready for Liftoff

By Ronald Poon Affat

The Brazilian private health care market ended 2010 with U.S.$48 billion worth of premium. This already makes it Latin America's largest health care market and sixth in the world ranking. Even though less than a quarter of the population have a private plan, consumer surveys consistently say that after home ownership, private health care is now the second most desired product for the growing and socially mobile middle class. Brazil's leading investment bank, BTG Pactual, is projecting a remarkable compound annual growth rate (CAGR) of between 9 percent and 12 percent. This translates to premium of between U.S.$110 billion and U.S.$150 billion for 2020. This article will discuss the facts and figures behind such an audacious estimate.

Quick Facts and Figures (U.S.$1 = Brazilian Real R$1.6)

Brazil's population stands at 200 million. Just 23 percent of the population (46 million people) has private health care insurance. The industry is subject to strict government regulation by the Agência Nacional de Saúde Suplementar (ANS). Health care companies include insurance companies (e.g., Bradesco, Sul America, Tempo), HMOs (e.g., Amil, Omint), self-funded plans (e.g., Petrobras, Citibank), cooperatives (e.g., Unimed) and philanthropic entities (e.g., Santa Casa). Table 1 sets out the membership distribution of just over 1,000 providers but one can see that it is very concentrated with 37 companies having a 50 percent market share. Table 2 shows that corporate policies dominate the market with a 75 percent share. The average monthly premium that clients pay for health insurance is U.S.$88. Last, but not least, Table 3 shows that the health care sector's share valuation rose by 52 percent in 2010, substantially above the local stock market's (Ibovespa) less-than-impressive 1 percent. This is the reason investment bankers are sitting up and taking notice of health care in Brazil.

Table 1. Health Care Market Growing, But Still Concentrated (in 000's).

Health Care

Total	Number Operators	Number Average Lives
4.490.194	709	6.333
4.477.050	156	28.699
4.489.099	83	54.086
4.447.335	46	96.681
4.297.091	30	143.236
4.543.175	17	267.246
4.469.864	9	496.652
4.074.495	5	814.899
4.851.271	4	1.212.818
4.644.192	2	2.322.096

Source: ANS

Facts and Figures behind Projected Growth

Table 4 shows that there is a 93 percent correlation between formal job creation and health care plan membership. Table 5 tracks the growth of middle-class consumers (households whose monthly income is between U.S.$625 and U.S.$3,100) from 63 million in 2005 to 93 million in 2010. If current employment and real wage trends continue, the middle class will grow 10 percent per year over the next four years. This will directly translate to a boost in health care plan penetration.

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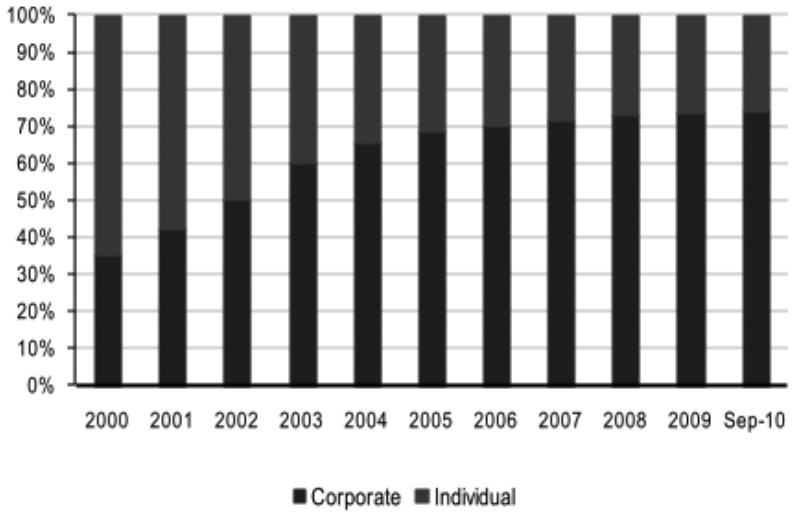
Table 2. Corporate Health Care Plans Reached 75% of Total Market in 2009.



Source: ANS, 2010

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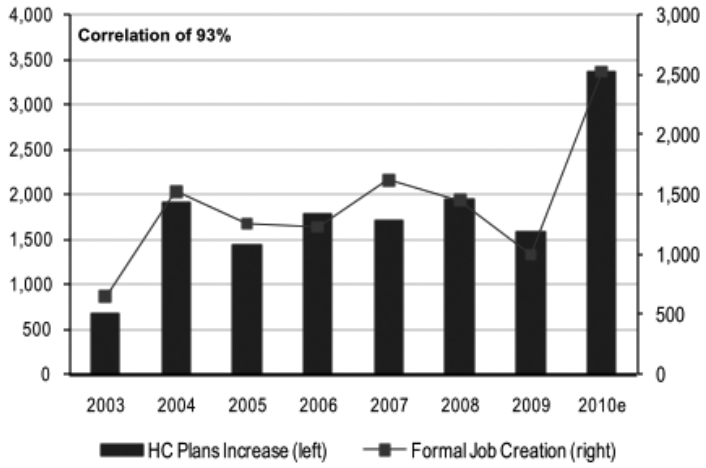
Table 3. Health Care Companies and Ibovespa.

Source: Bloomberg and BTG

Table 4. Formal Jobs: A Key Factor to Growth in HC Plan Members.



Source: Caged and BTG Pactual

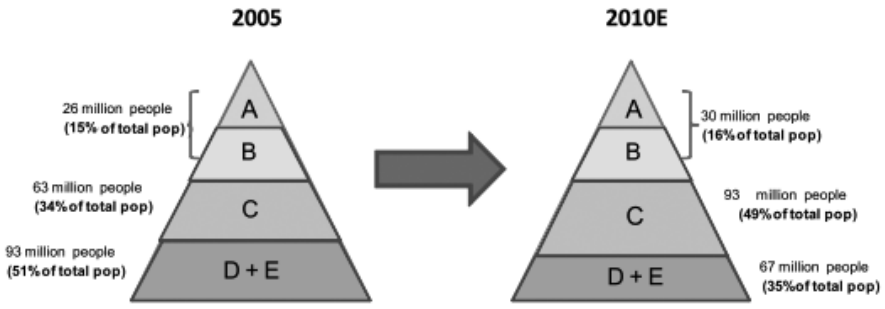
Brazil currently has a young population. The median age is 29.3 years (males 28.5 and females 30.1). The decrease in birth rate will contribute to a gradual aging of the population. The over-60s represent 10 percent of the population, but this group is projected to rise to 14 percent by 2020. This will also be a driver for expanded health care per capita consumption. The average life expectancy stands at 73 years, and this is estimated to steadily increase to 81 by 2050. The combined demographic impact of population growth and aging (shown graphically in Tables 6 and 7) is estimated to contribute an additional 2 percent CAGR in health care premiums in real terms.

There is a very low penetration of health care plans. As we said before, only 23 percent of the Brazilian population has private health care coverage, compared with 77 percent in the United States and 60 percent in Mexico. Brazil's health care as a percentage of GNP is 5.2 percent compared with 16 percent in the United States. The dominant source of growth in health care penetration is expected to come from lower income groups.

Private health care in Brazil has a limited geographic footprint. A Brazilian historian once referred to colonial life in Brazil as a "civilization of crabs," with most of the population clinging to the shoreline—and few were willing to make inroads into the terrifying interior. Today the same could be said for private health care. Geographically the main players are still fixated on large metropolitan areas focused on high-income regions. There is still plenty of growth potential in the interior. Table 8 confirms the distribution of plan membership.

Sales channels are also quite limited. As mentioned before, the majority of current plans are sponsored by large companies via the traditional corporate brokers; this market is already considered to be a highly penetrated market. The next growth phase will be centered on small and medium enterprises (SMEs) and in the retail market. Even though there are 131 registered banks with 125 million clients, just one bank (Bradesco with 24 million banking clients) has its own health care insurance company. But the present landscape is about to suffer a seismic event. The largest state-owned bank in Latin America, Caixa Economica Federal (with more than 51 million clients), is about to launch its own health care company this year, 2011.

Table 5. Emerging Middle Class Consumers.



Source: Raymond James

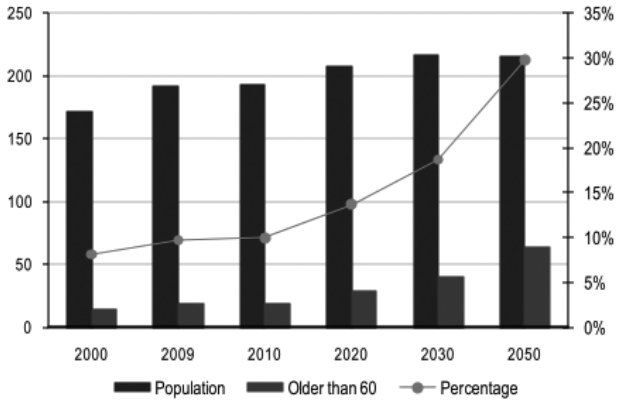
Beyond the health care specifics, global investors are attracted to Brazil for the potential to earn high rates of investment return. Short-term annual risk-free rates are 12 percent (JP Morgan projects an increase of rates to 12.5 percent by December 2011) with inflation projected to be 6.5 percent this year. Investors recognize that Brazil is the BRIC (Brazil, Russia, India and China) country that holds the best record for free and fair democratic elections, exhibits economic stability and has a government that is respectful of company law/shareholder rights and human rights.

The Challenges?

While global multinationals are well-positioned in the life, pensions, property and casualty (P&C) and reinsurance markets, the only multinationals that dare to venture into the health care insurance market are Allianz, ING (via a minority investment) and MetLife (but only in dental). So why is that?

Regulation. The ANS provides micromanaging oversight that defines minimum coverage, plan rules, general policies, transfer of plan members' rights between health care plans, monitoring of financial strength and even the annual rate increase for individual plans. When it comes to coverage, the plans are basically the same, with the main differentiator being the quality of the health care network or reimbursement level provided. Regulation prohibits lifetime annual aggregate limits, no limits may be applied to benefits during a single year, and annual deductibles cannot be incorporated within the plan design. Also individual policyholders and senior citizens' rights are well-protected, leading to the acceptance of only corporate plans by many carriers, which are less rigorously regulated. Keeping this in mind, it can be argued that Brazil provides the world's most generous form of private health care benefits.

Table 6. Increasing Share of Elderly People in Total Population.



Source: IBGE

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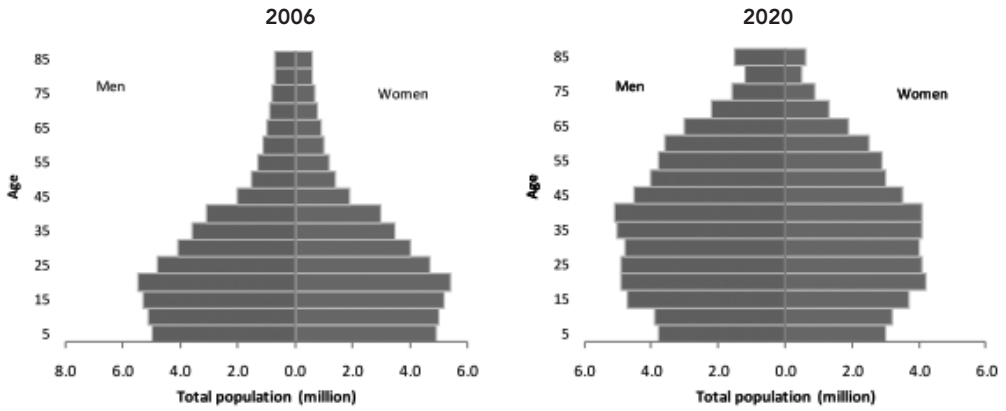
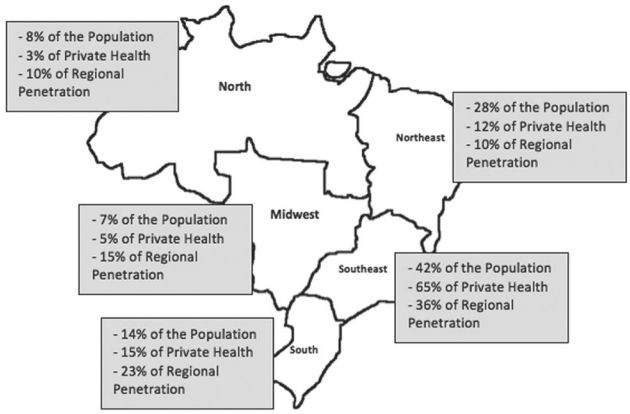
Table 7. Brazilian Population Growth Expectation.



Source: Raymond James

Table 8. Distribution per Brazilian Region.



Source: ANS, 2010

Whenever due diligence is undertaken by an overseas investor, the following points are invariably cited:

- The HMO's technical reserves are not robust compared with international standards, so any acquisition would require capital injection to strengthen reserves. In addition to which, there have been several recent "high profile" bankruptcies in the sector that have left clients without coverage.
- The technical pricing models are simplistic, and underwriting standards are often either undocumented or not adhered to.
- The large players benefit from lower per policy expenses and are able to negotiate preferential discounts with hospitals, clinics and other health care providers. These pricing advantages drive down the smaller players' margins when they try to compete on price and try to grow "at any cost."
- For health care plan operators who attempt to "vertically integrate" their medical administrative procedures, invariably the lack of maintenance investment and professional management lead to loss-making and inefficient operations in both medical facilities and health plan operations.
- The definition of minimum health care coverages by the ANS stifles creativity in product development and limits cost reduction.
- The international reinsurance market is not prepared to follow the local market's pricing margins. Hence not a single reinsurance treaty has been executed with anyone. However, to be fair, the reinsurance law does not really give 'fair and direct' access to international reinsurers.

- Last, but not least, the cost of doing business in Brazil is expensive. Office rentals in the cities of São Paulo and Rio de Janeiro are amongst the world's top-10 most expensive. And São Paulo salaries for the "best and brightest" (usually attracted to the financial sector) are, on average, higher than in either New York or London.

Conclusion

So what is the best sector to invest in? There are many different answers to this question, depending on whom you speak with. Over the last 24 months, there has been a flurry of mergers and acquisitions (M&A) in all areas of the value chain, namely:

- **Health care providers: health Insurance companies, HMOs and specialized dental companies.**
  Key requirements include: having local underwriting expertise, the ability to operate with low expenses, being a tough negotiator with hospitals/clinics, allocating a large investment to raise brand awareness and establishing broker relationships. This sector is heavily regulated by the government and characterized by mega players who seek to protect their market share at any cost.

- **Distribution channels: retailers that specialize in health care products.**
  Lower risk. There are not many specialized health care brokers compared with other insurance lines. There exists the opportunity to expand client base on a national basis with only marginal costs. But very high initial administrative costs are associated with acquiring new business.

- **Service providers: hospitals, clinics, etc.**
  One needs to have proven expertise in managing these services and M&A should be considered to reduce unit costs. There`s fierce competition with low-margin mega players. Existing facilities are likely to be very costly to modernize, and it is difficult to find qualified and experienced professionals. Also the current legislation forbids foreign ownership of hospitals.

- **Pharmaceuticals: The pharmaceutical industry in Brazil is the 10th largest market in the world, the second largest in Latin America, and accounts for a 3.5 percent share of the world market.**
  Brazil's pharmaceutical market is one of the fastest growing markets in Latin America and has enjoyed steady growth since 2004. The government has moved to align the drug regulatory environment with international standards. Also, in 2007, Brazil launched a major 10-year biotechnology initiative that provides incentives for private-sector research and development (R&D) and production (source: Business Monitor International).

All in all, the opportunities greatly outweigh the challenges, and BTG Pactual's projections appear to be both reasonable and attainable. In order to maximize one`s investment, potential investors need to bring to the table specialized skills (e.g., underwriting, financial management, hospital management) or have a proven track record of consolidation and integration. Health care is one of the few products that's actively sought out by consumers, and this sector will most certainly be an integral part of the projected growth in the Brazilian economy.

I would like to thank Joao Carlos Santos of BTG Pactual for his help in providing supporting financial data. *joaocarlos.santos@btgpactual.com.*

The views expressed in this article are solely mine and not those of my employer or organizations with which I am affiliated. ■

Recruiter Roundtable

By Sara Teppema and Jim Toole

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As part of the Untapped Opportunities Strategic Initiative, the SOA sat down with three health care recruiters who do not typically place actuaries, to learn what we could about opportunities in the broader health care industry.

We are grateful for the assistance of the following executive recruiters:

- Deirdre Allison, of Chapel Hill Partners in the Boston area, who works with health plans in recruiting and also consulting. Deirdre can be reached at *dallison@chapelhill-partners.com.*
- Jim Gibson, of Gibson Consultants, based in Connecticut, who specializes in technology and health plans, and has 27 years of experience in the health care industry. Jim can be reached at *jim@gibson-consultants.com*.
- Marc Gouran, of Solomon Page in New York, who works with Managed Care and health insurance companies as well as pharmaceutical and biotech companies. Marc can be reached at *MGouran@spges.com*.

Below is a summary of our discussion.

What types of qualifications and credentials are you looking for when searching for health care analytical roles?

We see descriptions that say MBA, or MPH and once in a while actuarial credentials. Many employers think of health actuaries as very hard to find, so they want them to do actuarial work and not non-traditional work. Actuaries may not have as much perceived value to an employer in a non-actuarial area. This might be why there has been less success placing practicing health actuaries into non-actuarial roles.

That said, peripheral areas like informatics offer more potential than other areas. An area—definitely non-traditional—that is interested in hiring actuaries is the Hospitality and Casino industry. They are looking for analytics and data mining on their customers, and how to make them repeat customers. Hedge funds are another non-traditional area, because they are also looking for data mining. The Pharmaceutical industry doesn't seem to have as strong an interest in actuaries—the hunch is that this is because Pharma is already heavy on scientific types of professionals, and they probably consider actuaries to also be "scientific types."Pharmacy Benefit Managers, however, do need actuaries.

Explain the different types of searches and how they can impact an individual's job search or success in getting hired.

Recruiters are engaged for two basic types of searches: retained and contingent. A retained search is like a consulting gig. The recruiter works closely with the hiring client, usually for a strategic hire that the client can't afford to get wrong. These are typically for higher level positions, such as chief actuaries or other C-Suite positions.

A contingent search is more typical for actuaries. The most prominent aspect is there is no commitment on the part of the hiring client, and there can be multiple contingent recruiters working the same search. So, as a candidate you could get multiple calls for same search.

A third staffing solution is the placement of consulting assignment work. For example, an employer needs someone for a six to 12 month project. The candidate would technically be an employee of the staffing firm, but working for the client. Frequently the candidate will be hired on permanently, and then the recruiting firm would get a "conversion" fee, smaller than a typical contingent fee. There seems to be a market in this area for retired actuaries—chief actuaries especially.

Actuarial searches are interesting. It is more of a closed system, with limited number of recruiters. As a result, actuaries tend to get contacted more frequently, and it can be difficult for a recruiter to get responses. Actuarial recruiting firms tend to develop relationships with candidates, and sometimes actively market the candidate, and it can almost be like the recruiter is working for the candidate. This is very different than other areas of specialization.

A candidate should always ask the recruiter: what is your relationship with the client? Regardless of

contingency or retained, the recruiter is paid by the hiring company. There tends to be a misconception that the recruiters are working for the candidates, but in reality the recruiters are working for the hiring firms.

What are the barriers to actuaries moving into the types of roles you source (i.e., senior level health care executives and chief actuaries)

There is a perception in the health market that actuaries are only technical, and poor people managers and communicators. Actuaries who can differentiate themselves with leadership skills, management skills, and a charismatic personality, are the people who will get the chief actuary roles.

If actuaries want to move into management roles, they need to develop their "operating" skills, meaning understanding the broader business, and being able to bridge gaps, cross disciplines and work with different groups of people. Communication and management skills are also required for senior level roles, as is the ability, and demonstration of the ability, to be strategic and not just tactical. Actuaries are generally thought of as internally-focused. An MBA is a good way to develop these skills, as well as experience working in multiple disciplines in a company.

How can a new health FSA prepare for a senior management role down the road?

It's interesting to look at physicians as an analogy. Many physicians get an MBA to learn to run their practice, manage money, etc., and this has enabled them to move out of their narrow scope—a different type of physician has developed. Today, many physicians say to themselves early in their career "I don't want to be a practicing physician forever," and gear their training to the executive level. As a result, there are many CEOs in health care organizations who are also MDs.

There are not many actuaries at the CEO level, probably because actuaries have not established that goal early in their career. If a 28-year old FSA said "I want to be a CEO someday" they should get an MBA. An FSA/MBA combination is formidable—but rare. They should also seek to learn as much as possible about other functional areas, and whenever possible, work with those areas. Other activities which improve management and communication skills (serving on non-profit boards, Toastmasters, etc.) show that individuals are serious about developing those critical skills.

Many actuaries just want to be actuaries. However, for those who want to move outside the traditional roles, how do they get there? What will the future roles be?

CONTINUED ON **PAGE 38**

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It is very early to tell what the next generation of jobs in health care are going to look like. Health care is in a very uncertain time, including and outside of health reform. Many of the new concepts introduced in the past couple of years are likely to take hold, but it's difficult to say exactly how the jobs will look. No one has the answers; we're in the early stages of potentially revolutionary changes.

Key areas to watch will be:

- Provider organizations. They will need to take on risk, becoming Accountable Care Organizations or other risk-bearing entities. They will need help with predictive modeling, risk assessment, as well as other traditional actuarial skills

- Population health. Because of the stimulus package in the United States, providers are being forced to move to electronic platforms. They will have significant amounts of data without knowing how to manage it. At the same time, providers will be taking on more risk and will need to manage the overall health of their patient populations. Actuaries have an opportunity to apply their actuarial skill set to population health management activities, for providers, health plans, employers and others

- Health exchanges. With exchanges being formed in most states, this is a significant undertaking, and actuaries will be needed to address a broad array of risk and selection issues in many different areas. Risk adjustment models will be especially necessary.

- Informatics and analytics. Health informatics will be a needed skill, because of the growing need for, and availability of, data. The hospitality and casino industries (mentioned above) also need extensive data analysis, and hedge funds will need new ways to use data mining.

Other advice?

With all due respect to ourselves (the recruiters), the best way to get a job is still on your own. Networking is very important, and you can't just rely on recruiters. And it's really easy to network, especially with Linkedin, and especially with Linkedin Subgroups. That said, it's always good to keep recruiters in your network. ■

Mark your calendar and plan to attend the 2012 Health Meeting. We're heading to the Big Easy—and planning more topical sessions to provide you with the latest updates on important health issues. Expect top-notch speakers and numerous of networking events—and the opportunity to earn lots of CPD credit. There'll be plenty to see and do in New Orleans while you're there: Chill out in a blues or jazz club; check out the city's well-known architecture; take a riverboat tour or carriage ride; or—head to the outskirts to see sprawling plantations and the incredible wildlife.

Here's what last year's attendees had to say:

"Thought provoking and extremely worthwhile." **"Gained great industry insight!"**

"Excellent content and thoughtful delivery." **"Ample opportunities to earn professionalism credit."**

"Sessions were great! Loved the smaller groups and wide range of topics!"

http://HealthSpringMeeting.soa.org.

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