Untapped Opportunities for Actuaries in Health Care: Market Research Summary Report to Membership
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Introduction

With health reform a reality and sweeping changes to the health care industry on the horizon, this is a perfect time to assess the opportunities for health actuaries and how well our skill sets match them. The Society of Actuaries (SOA) has recently done just that. This report presents the results of a market research study commissioned by the SOA, as part of its strategic initiative to explore Untapped Opportunities for Actuaries in the health care industry. This initiative was first presented to the SOA’s Board of Directors in 2007, based on results from a survey of Health Section membership. Work continued with a series of interviews with chief health actuaries, and continued into 2008 with interviews of actuaries (and their managers) who had made a mid-career transition into health practice. An article in the June/July 2009 issue of The Actuary provides a summary of the work done through mid-2009.

In early 2009 the SOA Leadership Team approved an external market research project to give a more in-depth analysis of potential roles for actuaries in the broader health care industry. After an extensive Request for Proposal (RFP) process, the SOA selected the firm GfK Healthcare to perform the study. With SOA volunteer and staff assistance, GfK began work in August 2009, and concluded in January 2010.

In 2010, the SOA recommitted this initiative to its strategic portfolio, and a work group has been meeting regularly to fuse the market research results with their own experience and strategic thought, in order to recommend actions that the SOA should consider to help actuaries tap into the broader health care market.

This report is an executive summary of the results of GfK’s analysis. GfK’s final report is provided as an appendix to this report. This executive summary presents high level implications to you as an actuary, as you work through your career. We have tried to present these implications as they related to a variety of situations—career status, business skills, technical skills and SOA-related activities.

At the very highest level, the market research results have made clear that we have an excellent Health Actuarial Value Proposition, but that we can and should strengthen this value proposition.

**HEALTH ACTUARIAL VALUE PROPOSITION**

- Actuaries have a neutral and objective voice.
- We are excellent with modeling and data—not just the technical aspects, but also our level of sophistication, rigor, discipline and transparency.
- “The Health Actuary” is a brand that has value and should be strengthened in the industry.
- We are poised to contribute strong business and analytic skills to an industry that will continue to be highly data-driven.
Implications to YOU as an Actuary

Details of the market research can be found in GfK’s report, included as the appendix of this report. We have pulled out the key findings, as they relate to you, a practicing actuary or candidate, and organized them into focused areas of interest: Career Opportunities, Skills Needed, Research, Basic Education, Continuing Professional Development and the Branding of the Health Actuary.

CAREER OPPORTUNITIES

The market research points to several areas that have had limited or no actuarial representation in the past, but appear to be a good fit for our skill set. These areas include:

- management consultants (who work on large-scale health care projects),
- wellness and disease management companies,
- clinical outcomes organizations,
- comparative effectiveness research firms,
- providers—particularly large hospital systems, and
- health care analytics groups within health plans.

Actuaries who have taken on nontraditional roles have had to stretch out of their comfort zones, and adapt quickly to seize these opportunities. The health care industry is changing, and actuaries will be needed to analyze more than just financial data. Models will be needed to assess health outcomes, compliance, quality of care, comparative effectiveness research and clinical study design.

It should be noted that roles at these organizations might not be full-time, on-staff actuarial roles. Instead, actuaries working for consulting firms may take on project-based opportunities to fulfill the needs of these companies. Alternatively, an actuary might be hired to do a multifaceted role at a company; for example, the actuary’s job description might include marketing, client management or financial duties in addition to analytical (traditional actuarial) work.

Difference for early career versus later career?

Actuaries early in their careers may find the best nontraditional fit with smaller organizations that are looking for agile professionals who can hit the ground running with little or no training. These companies may also require a lower current salary in a trade-off for long-term financial upside. Small and/or startup biotech firms and health IT companies fall into this category.
Many health care executives are looking for analytical professionals with extensive experience in the health care industry. Actuaries with such a background would be welcomed into such organizations as health care management consulting, disease management and wellness companies, hospital systems or pharmacy benefits managers (PBMs). This is especially true if they can also bring a broad base of business skills such as big picture thinking, flexibility, adaptability and strong communication skills.

Barriers to new opportunities

- Knowledge of health actuaries is generally limited, except by those working for health plans. Health care executives were very interested in a professional who has the analytical skills of an actuary combined with experience in health care. We are working to find ways to brand “The Health Actuary” to the broader health industry.
- The market research confirmed the perception that actuaries command higher salaries than other similarly experienced professionals. The study did not include a comprehensive analysis or survey of compensation, so although we cannot prove or disprove this perception, we do need to be aware that the perception exists. Any major career change will come with risks, and compensation levels (present and future) should be considered when evaluating all of the risks involved in change. Just as our organizations evaluate risks, we professionals must continually perform our own personal enterprise risk management assessment!
- Actuaries must compete with other professionals for these nontraditional roles. Some of these competing professionals are health economists, statisticians (with PhDs), MBAs, public health professionals and public policy professionals.

**SKILLS NEEDED**

**Technical skills**

The market research confirmed the need to develop or enhance several skill sets to compete in nontraditional areas. These skills include:

- Clinical knowledge—understanding of diseases, especially chronic diseases, and especially related to alternative treatments and drugs.
- Study and clinical trial design—developing the statistical rigor and understanding of studies that can affect treatment of conditions and outcomes, and comparative effectiveness research study design.
- Accountability for results—ensuring a thorough understanding of how our results will be relied upon, and learning how to follow through on our work. Although this may not seem like a skill, actuaries tend to be perceived as very “black and white” in their presentation of results, and accountability involves giving consideration to the grey areas, and assessing and communicating their impact. Our known competencies of objectivity and integrity will also serve us in this area.
- Overall health care knowledge—an understanding of all facets of the market and financing, and the impact of health reform and policy.
Business skills
Executives interviewed and surveyed in the market research study pointed to several key business skills that they seek in any professional working on forecasting and analytics in their organizations. These skills align with other studies that the SOA has conducted, proving that the health care marketplace is seeking the same skills as other markets where actuaries work. Health care executives want analytical professionals with the following skills.

- **Strategic thinking**—the ability to think about the bigger picture of an organization is a skill that health care executives say is critically important, and is also currently lacking in their existing staffs. Actuaries who can demonstrate abilities as both detailed analysts and strategic thinkers will have the greatest potential to develop in a nontraditional role.
- **Problem-solving ability**—actuaries are typically excellent problem solvers, and while health care executives find this to be among the most important skills, it is also found among existing professionals in nontraditional health areas. Actuaries will need to demonstrate the value of our unique training and perspective.
- **Communication skills**—oral and especially written communication.
- **Decision-making skills**—the need to be flexible and adaptive, and not necessarily always have the “right” answer.

SOA RESEARCH
SOA health research has historically been executed with an actuarial audience in mind; consideration of the downstream value of our work to the broader health care industry has been secondary. Yet our research has considerable value to a wider audience—for example, our 2007 report on health risk assessment tools, and our 2009 Quality & Efficiency tool inventory.

The Untapped Opportunities Work Group has allocated a significant portion of its budget to promoting actuarial research and funding researchers to attend and present their results at new forums. In addition to sponsoring research on traditional actuarial topics, we are targeting new areas that will appeal to academics and health professionals with the ultimate goal of submitting our work to broad-reaching, peer-reviewed health care journals.

The SOA is committed to helping get the word out about our research. Through our research, we will be working to establish and strengthen our relationships with academic institutions, health care organizations, professional associations and other organizations involved in health care research.
BASIC EDUCATION
The health-track exam committees are constantly working to revise the format and content of the Modules and Fellowship exams to reflect current topics. The FSA Modules especially allow for considerable flexibility to introduce cutting edge material. As an example, the Module committees are planning to add more material on the clinical aspects of common chronic diseases. More clinical education will be added to the modules and syllabi over time.

CONTINUING PROFESSIONAL DEVELOPMENT
One of the most logical outcomes of the Untapped Opportunities initiative will be educational opportunities that provide actuaries with the cutting edge knowledge—both technical and soft-skills-focused—to enable them to succeed in nontraditional areas in the health care industry. An outcome immediately available for implementation will be to offer sessions at meetings and webcasts to educate actuaries on topics that the market research has uncovered, such as clinical topics and study design. In fact, the upcoming SOA ‘10 Health Meeting (June 28–30 in Orlando) has a planned session on study design.

We are also exploring more comprehensive outlets for health care education. At this year’s Health Pricing and Valuation Boot Camps, we will offer a half-day session called “Medical School for Actuaries,” in which a physician will provide an in-depth education on several key chronic conditions that actuaries may encounter. This sort of clinical training will hopefully be continued in future meetings and webcasts, since there is considerable interest in this particular topic. The work group has discussed other possible CPD ideas, including more collaborations with other organizations for symposia and seminars.

BRANDING OF THE HEALTH ACTUARY
As we develop new research and education opportunities, we will be looking for ways to expand the reach of these activities, to include professionals outside the traditional actuarial profession. This expansion will enable “The Health Actuary” to become known to professionals all over the broader health care industry.

This brand expansion might come from partnerships with other organizations, to deliver robust educational content. For example, in the past we have joined with the DMAA: The Care Continuum Alliance to co-sponsor the Predictive Modeling Symposium, bringing disease management professionals together with actuaries for a common networking and educational event.

Brand expansion might also come from presenting our thought leadership at conferences or in publications of other organizations, and from continuing to bring non-actuarial thought leaders to our conferences and publications. The SOA’s health meeting each year brings many professionals to speak, and these sessions are highly rated, proving that there is great value in enabling actuaries to hear from the broader industry.

The brand expansion will also come as we present our research to other organizations and top-tier health care journals. We may also work in partnership with other organizations for research as well as education.
Market Research Overview

BACKGROUND
As described in the introduction to this report, the early market research in health care opportunities was performed by the SOA. It was primarily qualitative research (see definitions on the next page), and also somewhat subjective, since it is difficult to be critical of one’s own profession. It was decided that an outside market research firm could provide a much more comprehensive and objective analysis, and so the SOA conducted an RFP for firms to bid on the Untapped Opportunities market research project. A team of volunteers and SOA staff selected GfK Healthcare for the project, because of their extensive experience in health care, as well as their strong quantitative research analysis abilities. Work kicked off with GfK in August 2009.

The objectives of the project outlined in the RFP were:

- Understand the current roles of actuaries working in the health care industry.
- Match potential roles with traditional actuarial skills.
- Explore other roles within the health care industry related to risk assessment and risk management.
- Identify future needs, anticipating beyond where actuaries practice today, including:
  - skills that will be needed,
  - number and growth potential of the roles, and
  - employers who will hire these actuaries in new jobs.
- Assess the current role and anticipate the future role of consultants filling in the niches that hold potential for growth in their number of full-time jobs in the future.

SCOPE
The project was broken into three phases, and employed both Qualitative and Quantitative research (see sidebar).

Phase 1—Qualitative research
GfK conducted interviews with consulting actuaries, actuarial thought leaders and actuarial recruiters. The goals of these interviews were to explore growth opportunities for actuaries and identify target audiences for subsequent phases of research. The interviews also informed the framework for Phases 2 and 3.
Phase 2—Qualitative research
During Phase 2, GfK interviewed non-actuarial executives in various health care sectors. These interviews identified future needs, roles and employers for forecasting and analytic professions. These interviews helped set the framework for the Phase 3 Quantitative study design.

Phase 3—Quantitative research
Phase 3 consisted of a detailed survey, completed by 224 executives, recruiters and hiring managers in various traditional and nontraditional health care companies. The respondents were asked questions about:

- Current roles in their health care analytics and forecasting environment.
- The importance and performance of current and desired staff on key attributes.
- Other questions related to roles in their organizations, regarding experience, education, compensation and anticipated shortages.
- Perceptions of actuaries.

Final report
GfK issued reports on all the phases of the projects, with a final report summarizing all findings. The final report is included as the appendix to this document. The interim reports are available upon request to SOA staff (please contact Jill Leprich, jleprich@soa.org).
Appendix: Market Research Results Report from GfK Healthcare
Exploring Opportunities
For Actuaries
Prepared for: Society Of Actuaries
February 18, 2010
AGENDA

1. Introductions
2. Research Objectives
   - Study Design
3. Key Findings
4. Conclusions and Recommendations
5. Q & A
6. Appendix - Detailed Phase 3 Study Findings (Quantitative)
1. Introductions
Introductions

- **Susan R. Wild, Senior Vice President**
  - Sue assisted in the research design, supported the research team, coordinated teleconferences, debriefs, etc. to ensure all research objectives were met.

- **Linda Krank, Vice President, Custom Research**
  - Linda was responsible for the quantitative portion of the research study. She designed the quantitative questionnaire, provided oversight for the fielding, and analyzed the quantitative findings. To ensure seamless execution from the qualitative to the quantitative research, Linda provided input into the qualitative discussion flow and observed a portion of qualitative interviews.

- **Katie Fordyce, Associate Vice President, Research and Consulting**
  - Katie provided complete oversight and execution of the qualitative interviews. She wrote the screeners and discussion guides, managed the recruitment of respondents, conducted the interviews and analyzed the qualitative findings. In addition, Katie provided insight into the quantitative questionnaire.
2 Research Objectives
Study Design
Research Objectives

- The Society of Actuaries is looking to expand opportunities for actuaries outside traditional roles
  - Focus was on the US healthcare industry, which is one of the fastest growing segments of the economy

- The SOA has commissioned marketing research to examine the untapped opportunities for actuaries in healthcare

- The overarching strategic objective of this research program is to expand job opportunities for members of the SOA within the healthcare industry
  - Additional objectives include:
    - Define the skills and education required to manage healthcare forecasting/analytics, and identify gaps or perceived gaps in these skills and educational requirements
    - Determine if perceptions differ across disciplines and industry groups
    - Uncover potential future hiring needs and the skills needed to fill them
    - Identify perceptions of credentialed actuaries and how these perceptions may impact their perceived value for key healthcare positions
    - Explore specific reasons for perceptions of actuaries across industry groups
    - Determine the degree to which healthcare experience changes the perceived value of actuaries
    - Assess the salary potential for individuals hired to undertake healthcare forecasting/analytics and the specific earning potential of actuaries who fill these positions
Study Design

- **GfK Healthcare conducted multiple phases of research utilizing both qualitative and quantitative methodologies**
  - Each phase allowed us to explore the untapped opportunities in the healthcare industry
  - Initial phases of research assisted in the study design for subsequent phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Type of Research</th>
<th>Respondent Types</th>
<th>Sample Size</th>
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<tr>
<td>Phase 1</td>
<td>Qualitative</td>
<td>Actuarial Thought Leaders</td>
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<td>Phase 1b</td>
<td>Qualitative</td>
<td>Healthcare Recruiters</td>
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<td>Qualitative</td>
<td>Hiring Managers</td>
<td>n=30</td>
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<tr>
<td>Phase 3</td>
<td>Quantitative</td>
<td>Practicing Actuaries, Healthcare Recruiters, Hiring Managers</td>
<td>n=224</td>
</tr>
</tbody>
</table>
Study Design- Qualitative

- For Phase 1, the SOA provided GfK Healthcare with a list of Actuarial Thought Leaders
  - This list included those individuals who had made in-roads into the healthcare industry outside of traditional roles

- The Healthcare Recruiters included in Phase 1b were recruited from lists within GfK Healthcare

- In Phase 2, GfK Healthcare recruited Hiring Managers employed in the following industry segments:
  - Biotech manufacturers
  - Healthcare Consulting
  - Wellness Companies
  - Large Hospital Systems
  - Health Plans
  - Health Economics
  - Pharmaceutical Manufacturers
  - Health IT
  - Disease Management
  - PBM's
Study Design- Quantitative

- For Phase 3, GfK Healthcare recruited professional Healthcare Recruiters and Hiring Managers employed in the following industry segments:
  - Pharmaceutical and Biotech
  - Healthcare Consulting
  - Large Hospital Systems
  - Health Plans/Health Policy
  - Wellness Companies
  - Health Economics
  - Disease Management
  - PBMs
  - Clinical Research Organizations

- Additionally, the SOA requested the participation of key opinion leaders from within their membership in this phase of research
Study Design- Quantitative

- Recruitment of respondents for the quantitative portion of the research (Phase 3) was accomplished through a variety of methods:
  - Healthcare Recruiters and Hiring Managers were recruited through purchased industry lists
  - GfK Healthcare provided the SOA with unique access codes to allow the Association to personally invite their membership
  - To ensure the overall sample included representation from larger, more prestigious firms within the key industry groups, telephone recruitment was used to augment the internet sample
Study Design - Screening

- All respondents in Phases 1b, 2, and 3 were screened for participation in the study based on criteria developed jointly by SOA and GfK
  - Years in current industry (Hiring Mgrs - min of 3; Recruiters – min of 5)
  - Title level (emphasis on C-suite, senior management, director levels)
  - Work in one of four key analysis areas (strategic/business intelligence, finance/risk, clinical outcomes, health analytics)
  - Attitude toward importance of forecasting/analytics (very or extremely important)
  - Be responsible for or involved in hiring process

- Respondents in Phase 1 were not screened but came from a list provided by the SOA
Study Design - Qualitative

- All of the qualitative interviews lasted approximately 30 minutes

- In Phase 1, the conversation was focused on:
  - Respondents' background and how they came to be where they are today
  - Opportunities for actuaries
    - Including positive and negative traits of an actuary, current roles for actuaries, roles for the future, skills needed for these new roles, and barriers to success
  - Effect of healthcare reform on opportunities for actuaries
  - SOA role

- For Phase 1b, the interview covered the following topics:
  - Respondents' background and the challenges they experience in their jobs as recruiters
  - Recruiting Information
    - Including types of companies for whom they typically recruit, type of candidate these companies are looking for, skills needed for these roles
  - Assessment of Profiles
    - Including initial reactions, where they would look to place this person, what additional skills would be needed by this person, reaction if this person were a credentialed actuary
Study Design- Qualitative

- In Phase 2, the interviews focused on the following:
  - Respondent’s background and primary responsibilities in their current organization
  - Skill Set Information
    - Skills most important for analytical positions
    - Pertinent backgrounds
    - Educational requirements
    - Training provided
    - How candidates for open positions are found
  - Future Needs
  - Actuarial Assessment
    - Familiarity with actuaries
    - Positive/negative perceptions
    - Use of actuaries in their department
    - Best fit within the organization
Study Design - Quantitative

- The Phase 3 quantitative interviews lasted between 15 and 20 minutes and focused on:
  - Current healthcare forecasting/analytics environment
  - Importance/performance of staff on key attributes
  - Experience and/or education required to fulfill job responsibilities
  - Reasonable salary expectations for forecasting/analytics positions
  - Anticipated industry shortages of qualified employees
  - Perceptions of actuaries and their “fit” within the healthcare industry
3 Key Findings
Key Findings

- Skill sets developed in the actuarial profession are seen (by those who know the profession) as pragmatic and applicable for fields as diverse as advertising, health policy, and marketing/market research.

- However, actuaries are competing against other highly qualified candidates for roles outside of their traditional responsibilities:
  - In the current marketplace (and presumably in the future), actuaries compete with the following candidates for nontraditional roles:
    - Health economists—especially when it comes to government employment and health policy roles
    - PhD’s in statistics
    - MBAs—especially for primarily strategic positions (it was explained that MBAs do the strategic work and actuaries do the underlying data analysis)
    - Masters in Public Health/Masters in Public Policy—for health policy positions
Key Findings

- **The positive attributes associated with actuaries include:**
  - Strong technical skills
  - Trained in mathematics and risk analysis
  - Very analytical
  - Focused on risk
  - View world in black and white
  - Ability to convert “data” into “analysis/forecast”
  - Understand the data and can predict the financial risk
  - Could do modeling for large hospital systems if they understand the business and understand health reform

- **The negative attributes associated with actuaries include:**
  - Viewed as number crunchers with no personality
  - Lack good communication skills
  - The models they create may not reflect real life as they are unable to take into account all of the nuances within healthcare
  - Viewed as not being able to “play in the grey” and interpret data as well as people with finance backgrounds
  - Potentially overqualified for analyst positions—unlikely to take these positions for pay reasons
  - Have capability but not clinical knowledge to understand outcomes
Key Findings

- There was limited familiarity among most respondents in Phase 1b and Phase 2 about actuaries, especially among those who do not currently work with actuaries
  - They typically viewed actuaries as people who worked for insurance companies who calculated the odds of certain events happening
  - Some described actuaries as those individuals who determine who gets healthcare and who lives and dies

- According to several respondents, actuaries make decisions based on population trends

- Hiring managers from health plans, health IT, and PBMs were the most familiar with actuaries and viewed them most favorably
  - Among the few companies with actuaries already on staff, the work of actuaries is highly valued
  - Some respondents who were familiar with actuarial work but had no personal experience believed actuaries commanded a very high salary
Key Findings

- **Actuarial thought leaders described a need to broaden their experience in order to gain nontraditional roles**
  - Each of these respondents took the initiative to stretch their horizons. They were provided opportunities and had the ability to learn quickly and adapt to these new roles

- **Future analytical roles within the healthcare industry will likely focus more on clinical data with less emphasis on purely financial data**
  - Healthcare is becoming more data driven and actuaries are thought to be uniquely qualified with the skills required to analyze these data and build models
    - These data may not be purely financial data but also include health outcomes, compliance data, and cost/effectiveness of care
  - However, this will put more pressure on those doing the analysis as important decisions will be based on their work and analysts will be held accountable
  - Additionally, outcomes trials will be much larger with more risk and expense associated with them and more meta-analysis will need to be done to combine results across trials
    - Therefore, knowledge of clinical study design will be critical

- **In order to meet these future opportunities, current actuaries must stretch their horizons, increase their visibility and become a stronger voice while still remaining objective**
  - The future skills needed for actuaries to attain nontraditional roles involve becoming less narrowly focused and more flexible
Key Findings

The fundamental skills that will be useful for actuaries to have in order to compete for nontraditional healthcare roles include:

- A broader background which might include a more well-rounded college program (so that the candidate is thought of as more than just a number crumber)
- A better understanding of the “big picture”
  - For business-related opportunities, this perspective can be attained through several pertinent business classes (at a minimum) or an MBA degree
  - For health policy positions, a Masters in Public Policy or Public Health would be an advantage
- Business “curiosity” which includes asking a lot of questions about what the data is used for above and beyond what the actuary personally does with the data
- Knowledge of what impact their work has on the organization
- The ability to employ nonlinear thinking— to be flexible and adaptive
- Improved communication skills— the ability to communicate effectively outside of an actuarial audience (i.e., take a complex situation and explain it to most other people “in plain English”)

GfK Healthcare
Marketing research built for you™
February, 2010
Key Findings

- From the quantitative phase, the two skills reported to be the most important for individuals managing healthcare forecasting/ analytics are problem-solving and strategic thinking
  - Most of these respondents feel the current pool of professionals possesses the problem-solving skills needed, but there is a need-gap in terms of strategic thinkers

- The need for strategic thinkers (and not just number crunchers) came across clearly in the qualitative research as well
  - “Always have to have some ability to think strategically—looking at how what you are doing fits into the big picture” – Pharma
  - “We need strategic thinking to stay ahead of the pack and create different ways of moving forward” – Health Economics
  - “There is a need for strategic planning and the ability to pull a lot of things together” – Large Hospital System
Problem-solving is a much-desired characteristic, and seems to be a readily available skill, while strategic thinking is important but not as well-fulfilled.

Base: Total respondents

Q2. Please rate the following attributes in terms of their importance for fulfillment of all aspects of healthcare forecasting/analytics.

Q3. How well do your employees who currently manage healthcare forecasting/analytics (does the available pool of healthcare forecasting/analytics professionals) fulfill these attributes?
Key Findings

- In the qualitative phase, most respondents believe that it is easier today than in the past to find qualified candidates for open positions.
  - This is due to a number of factors including:
    - A smaller number of currently open positions
    - Previous layoffs which have provided a large number of experienced candidates looking for new opportunities
    - Outcomes research and health IT are industries that have been around a little while now, so there are more people with previous experience in these areas

- Health IT positions that require frequent travel tend to be difficult to fill as turnover is high and employees burn out quickly.
  - Therefore, it is difficult to find interested candidates with a lot of previous experience

- However, when looking out five years, about three in five respondents in the quantitative phase believe there will be a shortage of qualified candidates for healthcare forecasting/analytics positions.
  - Healthcare reform and changes in technology are expected to expand the market for qualified healthcare forecasting/analytics specialists.
Supporting the consensus that good candidates are hard to find, a majority of respondents in all groups believe there will be a shortage of qualified candidates in the next few years.

- There are no significant differences across industry groups in this belief, although, directionally, more respondents from Health Plan/Policy organizations (65%) anticipate a shortage (not charted).

Q10. Do you anticipate a shortage of qualified candidates for positions in healthcare forecasting/analytics over the next 5 years?
Nearly all Healthcare Consultants anticipate changes in federal healthcare reform, and three-quarters foresee state healthcare reform, as well.

More respondents from Pharma/Biotech than others anticipate changes in FDA policy.

<table>
<thead>
<tr>
<th>Event</th>
<th>Pharma/Biotech (n=39) (%)</th>
<th>Large Hospital (n=57) (%)</th>
<th>Healthcare Consulting (n=46) (%)</th>
<th>Health Plan/Policy (n=54) (%)</th>
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<td>Changes in information technology</td>
<td>73</td>
<td>49</td>
<td>81&lt;sup&gt;A&lt;/sup&gt;</td>
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<td>Increasing use of meta-analysis</td>
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Base: Total respondents
Ranked on total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q11. Which of these events do you believe will occur in the healthcare industry in the foreseeable future?
Key Findings

Suggestions of ways the SOA could support their members in the future include:

- Brand the profession outside of traditional insurance companies – educate firms on the value of actuaries and how they can be beneficial for companies that may not traditionally hire actuaries

- Use the association’s credibility and knowledge of leaders to connect different groups to do research in nontraditional areas such as health outcomes

- Publish research in journals that are not strictly focused on actuaries in order to broaden exposure

- Spend time at annual meetings focusing on nontraditional roles for actuaries – potentially have a health actuary explain how they take traditional actuarial skills and do things differently

- Add webcasts or podcasts so that attendees do not have to be away from their offices but are still able to get information
  - Include information about the major issues in the healthcare reform debate and what it might mean for the actuarial profession
# Key Findings

<table>
<thead>
<tr>
<th>Segment</th>
<th>Opportunities</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotech Mfgr</td>
<td>• Financial risk analysis (i.e., profit/loss, new product development risk analysis, etc.)</td>
<td>• Smaller companies with limited budgets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New employees will have to hit the ground running/ little to no training</td>
</tr>
<tr>
<td>Healthcare Consulting</td>
<td>• More flexible projects– many skills needed</td>
<td>• Many require previous consulting experience</td>
</tr>
<tr>
<td></td>
<td>• Likes “logical thinkers” with strong business skills</td>
<td>• Need to bring in a book of business in most cases</td>
</tr>
<tr>
<td></td>
<td>• Analysis functions from other companies (especially pharma and biotech) are being outsourced to consulting companies</td>
<td>• Prefer to hire HC professionals</td>
</tr>
<tr>
<td>Wellness Company</td>
<td>• Growth industry</td>
<td>• Requires clinical knowledge</td>
</tr>
<tr>
<td></td>
<td>• Looking for individuals with strong analytical skills</td>
<td>• Headed by medical professionals</td>
</tr>
</tbody>
</table>
### Key Findings

<table>
<thead>
<tr>
<th>Segment</th>
<th>Opportunities</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Hospital System</td>
<td>• Analysis and modeling of large healthcare databases</td>
<td>• Requires clinical knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Staffed by MDs licensed in foreign countries</td>
</tr>
<tr>
<td>Health Plans</td>
<td>• Have knowledge of and high respect for actuaries</td>
<td>• MBA+ desired</td>
</tr>
<tr>
<td></td>
<td>• Less healthcare experience required</td>
<td>• Use consultants to monitor government policies</td>
</tr>
<tr>
<td>Health Economics</td>
<td>• Outcomes research</td>
<td>• Need more knowledge of clinical trial design</td>
</tr>
<tr>
<td>Disease Mgmt</td>
<td>• Modeling &amp; cost analysis</td>
<td>• Requires strong communication skills</td>
</tr>
<tr>
<td></td>
<td>• Clinical outcomes analysis</td>
<td>• Little training available</td>
</tr>
<tr>
<td></td>
<td>• Background in health plans is useful in understanding claims data</td>
<td></td>
</tr>
</tbody>
</table>
## Key Findings

<table>
<thead>
<tr>
<th>Segment</th>
<th>Opportunities</th>
<th>Barriers</th>
</tr>
</thead>
</table>
| Pharmaceutical Mfgr | • Clinical studies  
• Financial risk analysis (i.e., profit/loss, new product development risk analysis, etc.) | • Clinical staff looking for PhD in Statistics  
• Knowledge of study design needed |
| Health IT | • Less healthcare experience required  
• Familiarity with actuaries  
• Growth industry | • May not be willing to pay high salary  
• SQL database language needed |
| PBM | • Familiarity with actuaries  
• Growth industry  
• Training usually offered | • Must be SQL trained  
• HC (i.e., nursing, medical, pharmacy, etc.) background preferred |
Key Findings

- There is consensus across respondent groups that analytical experience, healthcare experience and/or previous employment as a healthcare analyst are desirable qualifications for a healthcare forecasting/analytics candidate.
  - No respondents from Pharma/Biotech or Large Hospital Systems would make actuaries their “first choice” for this type of position.
  - Although nearly two in five respondents employed by Health Plan/Policy organizations find actuaries to be a good fit for this type of position, there is some concern about the lack of clinical knowledge:
    - “Actuaries have capability but not the clinical knowledge to understand outcomes” – Health Plan
All groups agree that analytical experience is required; prior experience in the healthcare industry is also valuable.

- Actuaries and Hiring Managers feel strongly that specific experience in healthcare forecasting is key.
- Significantly fewer respondents from Pharma/Biotech agree that healthcare experience is necessary (not charted).

<table>
<thead>
<tr>
<th>Experience Type</th>
<th>Practicing Actuaries</th>
<th>Healthcare Recruiters</th>
<th>Hiring Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical experience</td>
<td>86%</td>
<td>78%</td>
<td>68%</td>
</tr>
<tr>
<td>Healthcare experience</td>
<td>55%</td>
<td>68%</td>
<td>68%</td>
</tr>
<tr>
<td>Previous work in healthcare analytics/forecasting</td>
<td>40%</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>Presentation skills</td>
<td>24%</td>
<td>53%</td>
<td>53%</td>
</tr>
<tr>
<td>Previous financial management experience</td>
<td>38%</td>
<td>47%</td>
<td>47%</td>
</tr>
<tr>
<td>Experience with study design</td>
<td>24%</td>
<td>41%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Base: Total respondents
Ranked on total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q4. What type(s) of work experience is required for healthcare forecasting/analytics positions?
Significantly more respondents from Health Plans/Policy organizations than from other groups would be “most likely” to select an Actuary to fill an open healthcare forecasting/analytics position.

- Respondents from Large Hospitals would first select a Financial Analyst, while Pharma/Biotech respondents favor Biostatisticians.
- Regardless of which title is selected as “most likely”, the most common reasons cited are analytical abilities and experience/familiarity.

### Table: Most Likely to Consider

<table>
<thead>
<tr>
<th>Title</th>
<th>Pharma/Biotech (n=39)</th>
<th>Large Hospitals (n=57)</th>
<th>Healthcare Consulting (n=46)</th>
<th>Health Plan/Policy (n=54)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Most Likely</td>
<td>Least Likely</td>
<td>Most Likely</td>
<td>Least Likely</td>
</tr>
<tr>
<td>Financial analyst</td>
<td>23%</td>
<td>3%</td>
<td>40%</td>
<td>2%</td>
</tr>
<tr>
<td>Health economist</td>
<td>15%</td>
<td>3%</td>
<td>19%</td>
<td>2%</td>
</tr>
<tr>
<td>Clinician</td>
<td>10%</td>
<td>15%</td>
<td>18%</td>
<td>11%</td>
</tr>
<tr>
<td>Actuary</td>
<td>0%</td>
<td>5%</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Biostatistician</td>
<td>41%</td>
<td>3%</td>
<td>11%</td>
<td>4%</td>
</tr>
<tr>
<td>Statistician</td>
<td>3%</td>
<td>0%</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Econometrician</td>
<td>3%</td>
<td>10%</td>
<td>2%</td>
<td>14%</td>
</tr>
<tr>
<td>Mathematician</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>Sociologist</td>
<td>0%</td>
<td>54%</td>
<td>0%</td>
<td>53%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Base: Total respondents
Ranked on total respondents – “Most likely”
Uppercase letters denote significant differences at the 90% confidence level

Q6. If there were only one mid- or senior-level opening for a healthcare forecasting/analytics management position...which one of the following would you be **most likely to consider**?
Q7. Which one would you be **least likely to select**?
Key Findings

- Healthcare Recruiters and Hiring Managers place a higher value on business education than on professional accreditation
  - Business degrees and/or MBAs are also strongly desired by respondents from Pharma/Biotech and Large Hospital Systems
    - “I like to pull kids out of college or grad school and train them” – Biotech
  - Professional credentials are held in higher esteem by Healthcare Consultants and respondents from Health Plans/Policy organizations, compared to other industry groups

- Whether or not an open position requires an advanced degree or professional credentials, more than half of all respondents report “experience in a related field” is what differentiates one candidate from another
  - “If we need a person to hit the ground running, we will lean toward experience over education” – Health Economics
  - “It doesn’t matter what their educational background is as long as they have experience in a similar industry” – Pharma
Whereas an MBA or other business degree is desirable for Recruiters and Hiring Managers, Actuaries strongly favor professional credentials or an advanced degree in statistics.

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business degree</td>
<td></td>
</tr>
<tr>
<td>Professional certification/credentials</td>
<td></td>
</tr>
<tr>
<td>Scientific healthcare degrees</td>
<td></td>
</tr>
<tr>
<td>MBA</td>
<td></td>
</tr>
<tr>
<td>Advanced degree in statistics</td>
<td></td>
</tr>
<tr>
<td>Advanced degree in economics</td>
<td></td>
</tr>
<tr>
<td>Other advanced degree</td>
<td></td>
</tr>
<tr>
<td>No specific degree/credentials required</td>
<td></td>
</tr>
</tbody>
</table>

Base: Total respondents
Ranked on total respondents
Upper case letters denote significant differences at the 90% confidence level
Respondents from Large Hospitals and Pharma/Biotech put stronger emphasis on advanced business degrees than other respondents.

- Professional credentials are valued more by Healthcare Consultants and respondents from Health Plans/Policy organizations.

### Business degree
- MBA: A
- Professional certification/credentials: AB
- Scientific healthcare degrees: AB
- Advanced degree in statistics: C
- Advanced degree in economics: A
- Other advanced degree: A
- No specific degree/credentials required: D

Base: Total respondents
Ranked on total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q5. When you are looking to [hire {place}] individuals in analytical positions, what specific academic or professional degrees/credentials do you look for, if any?
Key Findings

- Familiarity with actuaries is low, with only 23% of Hiring Managers and Healthcare Recruiters saying they are “very” or “extremely” familiar
  - Not surprisingly, familiarity is highest among respondents from Health Plans/Policy organizations where actuaries have already made inroads
  - Among those with familiarity, however, actuaries are viewed positively

- About one-quarter of Hiring Managers and Healthcare Recruiters would be highly likely to hire/recommend a credentialed actuary for a position in healthcare forecasting/analytics management
  - Nine out of 10 respondents from Healthcare Consulting and Health Plans feel actuaries would fit best in finance/risk and/or health analytics departments
  - More than half of Pharma/Biotech respondents see strategy/business intelligence, finance/risk and/or health analytics as a good fit
One in 10 Hiring Managers, but no Recruiters, say they are “extremely familiar” with the training/background of Credentialed Actuaries.

Three out of five Recruiters and Hiring Managers with some familiarity have a highly positive impression of Credentialed Actuaries.

Q12. How familiar are you with the training/background of the following?

Hiring Mgr = 10%; Recruiter = 0%

Q13. Please rate your impression of … [Very positive=7; very negative=1]
About 9 out of 10 respondents from Healthcare Consulting and Health Plans/Policy feel Actuaries would fit in finance/risk and health analytics departments.

- More than half of Pharma/Biotech respondents think Actuaries would fit in strategy/business intelligence, finance/risk and/or health analytics departments.

Base: Total respondents who answered question
Upper case letters denote significant differences at the 90% confidence level

Q15. Whether or not you would personally consider this candidate, in what department(s) do you feel a credentialed actuary would fit into your organization based on skills and credentials?
Key Findings

- The majority of respondents believe actuaries would be hired at mid-level in an organization, but nearly one-quarter of respondents from Large Hospital Systems and Healthcare Consulting feel they could start in a senior management role.

- When a credentialed actuary is hired to manage healthcare forecasting/analytics, almost 9 out of 10 respondents feel they would be entitled to an equal or higher salary than someone coming from a different discipline.
  - This perception of higher value could pose a problem, however:
    - “I don’t think actuaries would apply. The demand for their training would make them more money to stay in the comfort zone of traditional roles” – Healthcare Consulting
    - “They could do the job but wouldn’t want it for pay reasons and are potentially overqualified for my analytical positions” – Health Plans

- If a credentialed actuary presented with specific training or experience in the healthcare field, interest in that candidate would increase, according to 9 out of 10 respondents overall.
Nearly one-quarter of respondents from Large Hospitals and Healthcare Consulting organizations feel Actuaries could start in a senior management role, but most see Actuaries entering in mid-level positions.
86% of respondents believe a credentialed Actuary would be entitled to a salary equal to or greater than one paid to others in a similar role.

Base: Total respondents who believe salary range is appropriate for a manager of healthcare forecasting/analytics
*Caution, small base size
Upper case letters denote significant differences at the 90% confidence level

Q16a. Earlier, you said [INSERT SELECTION FROM Q6B] would be a reasonable salary range for a/an individual hired to manage your organization’s healthcare forecasting/analytics. Do you think a credentialed actuary hired for a similar position would be entitled to a higher salary, lower salary or the same salary?

Base: Total respondents who believe salary range is appropriate for a manager of healthcare forecasting/analytics
*Caution, small base size
Upper case letters denote significant differences at the 90% confidence level

Q16a. Earlier, you said [INSERT SELECTION FROM Q6B] would be a reasonable salary range for a/an individual hired to manage your organization’s healthcare forecasting/analytics. Do you think a credentialed actuary hired for a similar position would be entitled to a higher salary, lower salary or the same salary?
There is little question that an Actuary with training or experience in the healthcare field will have a greatly increased chance of being hired for a healthcare forecasting/analytics position.

Base: Total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q16b. If a credentialed actuary presented to you with additional training or experience specifically aligned with the healthcare field (health actuary), would this increase your interest in this candidate?
Conclusions and Recommendations
Conclusions and Recommendations

- Many of the actuaries who currently have nontraditional actuarial roles obtained these positions by taking the initiative to step “out of the box”
  - In order to be more competitive for future employment opportunities outside of health insurance firms, there is a need for current and future actuaries to broaden their horizons
  - Improving communication skills as well as strategic thinking will greatly enhance their competitiveness in the marketplace

- There is little recognition of actuarial credentials outside of traditional roles
  - The actuarial brand needs to be strengthened in other areas of the healthcare industry
  - To be competitive in obtaining nontraditional roles the focus of actuaries should be less on conveying pure credentials and instead showcasing transferable skills
Conclusions and Recommendations

✓ Strategic thinking is a very desirable trait but is in short supply
   
    Include this element in all resumes presented for employment, regardless of industry

✓ Graduate degrees are highly valued, but experience trumps an MBA
   
    Look for opportunities to place new graduates in entry-level healthcare positions as part of “healthcare” credentialing

✓ Changes in federal healthcare reform and technology will expand the market for healthcare forecasting/analytics
   
    Prepare current members to fill this impending void through targeted continuing education

✓ Actuarial skills are a good fit for healthcare, but awareness is low
   
    Seek high visibility speaking engagements or articles in business publications; tout “strategic thinking” and introduce the idea of credentialed “healthcare actuaries”
Questions and Answers
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Senior Vice President
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Appendix A - Detailed Study Findings for Phase 3 (Quantitative)
Current Business Environment
A majority of respondents working in strategy/business intelligence come from Pharma/Biotech, while health analytics departments are dominated by respondents from Health Plans/Policy groups.

- Two-thirds of responding Actuaries are employed in departments handling finance/risk data (not charted).

Base: Responding Actuaries and Hiring Managers (excludes consultants)

Uppercase letters denote significant differences at the 90% confidence level

S4. Which of the following best describes the department in which you currently work?
More respondents from Large Hospitals manage financial analysis, while utilization and claims data analysis is dominated by managers from Health Plans/Policy organizations.

Base: Total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q1a. What type(s) of healthcare forecasting/analytics [does your company/department currently conduct? (is most often required by clients?)]

Pharma/Biotech (n=39) (A)
Large Hospital (n=57) (B)
Healthcare Consulting (n=46) (C)
Health Plan/Policy (n=54) (D)
Importance vs. Performance = Needs Gap
Gaps of 50 basis points or more exist for 5 of the 6 “most important” attributes, according to Practicing Actuaries.

- The largest gap is reported for the attribute “strategic thinking”, which, although not one of the most important attributes among Actuaries, is significantly more important to Recruiters and Hiring Managers.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Performance</th>
<th>Importance</th>
<th>Need Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td>-6.0</td>
<td>6.5</td>
<td>-0.5</td>
</tr>
<tr>
<td>Knowledge of health systems/financing</td>
<td>-5.4</td>
<td>5.9</td>
<td>-0.5</td>
</tr>
<tr>
<td>Financial acumen</td>
<td>-5.6</td>
<td>5.9</td>
<td>-0.3</td>
</tr>
<tr>
<td>Verbal communication</td>
<td>-5.0</td>
<td>5.8</td>
<td>-0.8</td>
</tr>
<tr>
<td>Decision-making</td>
<td>-5.0</td>
<td>5.6</td>
<td>-0.6</td>
</tr>
<tr>
<td>Scientific curiosity</td>
<td>-5.4</td>
<td>5.5</td>
<td>-0.1</td>
</tr>
<tr>
<td>Strategic thinking</td>
<td>-4.6</td>
<td>5.6</td>
<td>-1.0</td>
</tr>
<tr>
<td>Cross-functional coordination</td>
<td>-4.5</td>
<td>5.3</td>
<td>-0.8</td>
</tr>
<tr>
<td>Written communication</td>
<td>-4.7</td>
<td>5.4</td>
<td>-0.7</td>
</tr>
<tr>
<td>Study design</td>
<td>-4.8</td>
<td>5.3</td>
<td>-0.5</td>
</tr>
<tr>
<td>Knowledge of clinical issues</td>
<td>-4.1</td>
<td>4.7</td>
<td>-0.6</td>
</tr>
<tr>
<td>Programming languages</td>
<td>-5.6</td>
<td>4.6</td>
<td>+1.0</td>
</tr>
<tr>
<td>Leadership</td>
<td>-4.3</td>
<td>4.8</td>
<td>-0.5</td>
</tr>
<tr>
<td>Knowledge of regulatory issues</td>
<td>-5.0</td>
<td>4.7</td>
<td>+0.3</td>
</tr>
<tr>
<td>Knowledge of policy issues</td>
<td>-4.3</td>
<td>4.6</td>
<td>-0.3</td>
</tr>
<tr>
<td>Supervisory skills</td>
<td>-4.6</td>
<td>4.2</td>
<td>+0.4</td>
</tr>
</tbody>
</table>

Base: Total Actuaries (n=29)

Q2. Please rate the following attributes in terms of importance...
Q3. How well do your employees [available pool of professionals] fulfill these attributes?
Large gaps exist across the top three attributes rated highly important by Healthcare Recruiters.

- Once again, the attribute “strategic thinking” is seen to be relatively lacking among the available pool of professionals.

### Need Gap

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Performance</th>
<th>Importance</th>
<th>Need Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic thinking</td>
<td>-5.2</td>
<td>6.1</td>
<td>-0.9</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>-5.1</td>
<td>6.1</td>
<td>-1.0</td>
</tr>
<tr>
<td>Decision-making</td>
<td>-5.3</td>
<td>5.8</td>
<td>-0.5</td>
</tr>
<tr>
<td>Knowledge of clinical issues</td>
<td>-5.3</td>
<td>5.7</td>
<td>-0.4</td>
</tr>
<tr>
<td>Knowledge of regulatory issues</td>
<td>-5.3</td>
<td>5.6</td>
<td>-0.3</td>
</tr>
<tr>
<td>Verbal communication</td>
<td>-5.3</td>
<td>5.7</td>
<td>-0.4</td>
</tr>
<tr>
<td>Written communication</td>
<td>-5.3</td>
<td>5.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>Knowledge of policy issues</td>
<td>-5.5</td>
<td>5.4</td>
<td>+0.1</td>
</tr>
<tr>
<td>Knowledge of health systems/financing</td>
<td>-5.2</td>
<td>5.4</td>
<td>-0.2</td>
</tr>
<tr>
<td>Financial acumen</td>
<td>-5.4</td>
<td>5.1</td>
<td>+0.3</td>
</tr>
<tr>
<td>Cross-functional coordination</td>
<td>-5.0</td>
<td>5.3</td>
<td>-0.3</td>
</tr>
<tr>
<td>Leadership</td>
<td>-5.1</td>
<td>5.3</td>
<td>-0.2</td>
</tr>
<tr>
<td>Study design</td>
<td>-4.9</td>
<td>5.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>Scientific curiosity</td>
<td>-4.9</td>
<td>4.8</td>
<td>+0.1</td>
</tr>
<tr>
<td>Programming languages</td>
<td>-5.0</td>
<td>4.3</td>
<td>+0.7</td>
</tr>
<tr>
<td>Supervisory skills</td>
<td>-4.9</td>
<td>4.9</td>
<td>---</td>
</tr>
</tbody>
</table>

Base: Total Recruiters (n=38)

Q2. Please rate the following attributes in terms of **importance**...
Q3. How well do your employees [available pool of professionals] **fulfill these attributes**?
There is more parity between importance and performance among Hiring Managers compared to the other groups.

Among Hiring Managers, the largest gap is also reported for the attribute “strategic thinking”.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Performance</th>
<th>Importance</th>
<th>Need Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td>-5.7</td>
<td>6.1</td>
<td>-0.4</td>
</tr>
<tr>
<td>Strategic thinking</td>
<td>-5.4</td>
<td>6.1</td>
<td>-0.7</td>
</tr>
<tr>
<td>Written communication</td>
<td>-5.6</td>
<td>5.9</td>
<td>-0.3</td>
</tr>
<tr>
<td>Decision-making</td>
<td>-5.4</td>
<td>5.8</td>
<td>-0.4</td>
</tr>
<tr>
<td>Verbal communication</td>
<td>-5.6</td>
<td>5.7</td>
<td>-0.1</td>
</tr>
<tr>
<td>Knowledge of health systems/finance</td>
<td>-5.5</td>
<td>5.7</td>
<td>-0.2</td>
</tr>
<tr>
<td>Financial acumen</td>
<td>-5.4</td>
<td>5.6</td>
<td>-0.2</td>
</tr>
<tr>
<td>Knowledge of clinical issues</td>
<td>-5.4</td>
<td>5.6</td>
<td>-0.2</td>
</tr>
<tr>
<td>Cross-functional coordination</td>
<td>-5.2</td>
<td>5.5</td>
<td>-0.3</td>
</tr>
<tr>
<td>Knowledge of regulatory issues</td>
<td>-5.4</td>
<td>5.4</td>
<td>---</td>
</tr>
<tr>
<td>Knowledge of policy issues</td>
<td>-5.3</td>
<td>5.4</td>
<td>-0.1</td>
</tr>
<tr>
<td>Leadership</td>
<td>-5.4</td>
<td>5.3</td>
<td>+0.1</td>
</tr>
<tr>
<td>Study design</td>
<td>-5.1</td>
<td>5.3</td>
<td>-0.2</td>
</tr>
<tr>
<td>Scientific curiosity</td>
<td>-5.0</td>
<td>5.0</td>
<td>---</td>
</tr>
<tr>
<td>Supervisory skills</td>
<td>-5.1</td>
<td>4.8</td>
<td>+0.3</td>
</tr>
<tr>
<td>Programming languages</td>
<td>-4.5</td>
<td>4.2</td>
<td>+0.3</td>
</tr>
</tbody>
</table>

Base: Total Hiring Managers (n=157)

Q2. Please rate the following attributes in terms of importance...
Q3. How well do your employees [available pool of professionals] fulfill these attributes?
Respondents from Pharma/Biotech report few gaps in performance for the most important attributes.

Q2. Please rate the following attributes in terms of their importance for fulfillment of all aspects of healthcare forecasting/analytics.

Q3. How well do your employees who currently manage healthcare forecasting/analytics (does the available pool of healthcare forecasting/analytics professionals) fulfill these attributes?
The attribute “strategic thinking” , which is deemed extremely important, can be improved somewhat in terms of performance.
There is a need for more strategic thinkers and healthcare analytics managers who have strong writing skills, according to Healthcare Consultants.
Strategic thinking is also a skill lacking among managers of healthcare analytics according to respondents who work for Health Plans/Policy organizations.

Base: Total respondents from Health Plan/Policy organizations (n=54)

Q2. Please rate the following attributes in terms of their importance for fulfillment of all aspects of healthcare forecasting/analytics.

Q3. How well do your employees who currently manage healthcare forecasting/analytics (does the available pool of healthcare forecasting/analytics professionals) fulfill these attributes?
Experience vs. Education
Whereas an MBA or other business degree is desirable for Recruiters and Hiring Managers, Actuaries strongly favor professional credentials or an advanced degree in statistics.

Q5. When you are looking to [hire {place}] individuals in analytical positions, what specific academic or professional degrees/credentials do you look for, if any?
Clinical, supervisory, IT and specific industry experience, along with prior consulting assignments, are significantly more important to Recruiters and Hiring Managers than to Actuaries.

Base: Total respondents
Ranked on total respondents
Uppercase letters denote significant differences at the 90% confidence level

Q4. What type(s) of work experience is required for healthcare forecasting/analytics positions?
Opportunities
Nearly all Healthcare Consultants anticipate changes in federal healthcare reform, and three-quarters foresee state healthcare reform, as well.

- More respondents from Pharma/Biotech than others anticipate changes in FDA policy.
While only two out of five total respondents anticipate changes in the use of meta-analysis, most agree any change will result in increased employment opportunities.

- It is interesting to note that net increases, and not decreases, in need are foreseen when any change is anticipated.

<table>
<thead>
<tr>
<th>Event</th>
<th>Decrease</th>
<th>Increase</th>
<th>Total</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing use of meta-analysis (n=90)</td>
<td>5</td>
<td>88</td>
<td>+85</td>
<td>+91</td>
</tr>
<tr>
<td>Shift to evidence-based medicine (n=135)</td>
<td>2</td>
<td>83</td>
<td>+81</td>
<td>+87</td>
</tr>
<tr>
<td>Changes in information technology (n=163)</td>
<td>4</td>
<td>77</td>
<td>+73</td>
<td>+73</td>
</tr>
<tr>
<td>Federal healthcare reform (n=201)</td>
<td>-8</td>
<td>72</td>
<td>+64</td>
<td>+63</td>
</tr>
<tr>
<td>Changes in medical technology (n=146)</td>
<td>-6</td>
<td>68</td>
<td>+62</td>
<td>+70</td>
</tr>
<tr>
<td>State healthcare reform (n=129)</td>
<td>-6</td>
<td>66</td>
<td>+57</td>
<td>+60</td>
</tr>
<tr>
<td>Changes in medical records technology (n=160)</td>
<td>-11</td>
<td>59</td>
<td>+48</td>
<td>+69</td>
</tr>
<tr>
<td>Changes in FDA policies (n=118)</td>
<td>-12</td>
<td>52</td>
<td>+40</td>
<td>+52</td>
</tr>
<tr>
<td>Increased privacy regulations (n=114)</td>
<td>-10</td>
<td>50</td>
<td>+40</td>
<td>+29</td>
</tr>
<tr>
<td>Personal medical information (n=97)</td>
<td>-11</td>
<td>46</td>
<td>+35</td>
<td>+32</td>
</tr>
</tbody>
</table>

Base: Total respondents who expect event to occur

Uppercase letters denote significant differences at the 90% confidence level

Q11a. How do you anticipate these changes in the healthcare industry will increase or decrease the need for qualified healthcare forecasting/analytics professionals?
Significantly more respondents from Health Plans/Policy organizations than from other groups would be “most likely” to select an Actuary to fill an open healthcare forecasting/analytics position.

- Respondents from Large Hospitals would first select a Financial Analyst, while Pharma/Biotech respondents favor Biostatisticians.
- Regardless of which title is selected as “most likely”, the most common reasons cited are analytical abilities and experience/familiarity.

<table>
<thead>
<tr>
<th>Title</th>
<th>Most Likely</th>
<th>Least Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A) %</td>
<td>(B) %</td>
</tr>
<tr>
<td>Financial analyst</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>Health economist</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Clinician</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Actuary</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Biostatistician</td>
<td>41</td>
<td>3</td>
</tr>
<tr>
<td>Statistician</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Econometrician</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Mathematician</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sociologist</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Base: Total respondents
Ranked on total respondents – “Most likely”
Uppercase letters denote significant differences at the 90% confidence level

Q6. If there were only one mid- or senior-level opening for a healthcare forecasting/analytics management position...which one of the following would you be most likely to consider?
Q7. Which one would you be least likely to select?
Credentialed Actuaries: Who are they and where do they fit?
Three out of five Recruiters and Hiring Managers have a highly positive impression of Credentialed Actuaries.

- 29% of Hiring Managers provided “top box” (very positive) ratings for Actuaries (not charted).

**Mean Score**

<table>
<thead>
<tr>
<th>Role</th>
<th>% Top 2 Box</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Public Accountant (n=117)</td>
<td>54</td>
<td>5.5</td>
</tr>
<tr>
<td>Credentialed Actuary (Recs/HM n=46)</td>
<td>59</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Base: Respondents who are somewhat or very familiar with Actuaries

Q13. Please rate your impression of ... [Very positive=7; very negative=1]
Respondents who have worked with actuaries in the past have positive impressions, but perceived intelligence and analytical abilities are also strong motivators of positive impression.

Reasons for Positive Impression of Actuaries

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have worked/Work with them</td>
<td>29</td>
</tr>
<tr>
<td>Smart/bright/knowledgeable</td>
<td>15</td>
</tr>
<tr>
<td>Analytical abilities</td>
<td>15</td>
</tr>
<tr>
<td>Finance abilities</td>
<td>12</td>
</tr>
<tr>
<td>Statistical abilities</td>
<td>9</td>
</tr>
<tr>
<td>Able to take in/deal with a lot of information</td>
<td>9</td>
</tr>
<tr>
<td>Training</td>
<td>9</td>
</tr>
<tr>
<td>Logistics/logical thinking</td>
<td>9</td>
</tr>
<tr>
<td>Good for dealing in cost/insurance setting</td>
<td>6</td>
</tr>
<tr>
<td>Are good (general)</td>
<td>6</td>
</tr>
<tr>
<td>Risk management/evaluation abilities</td>
<td>6</td>
</tr>
<tr>
<td>Important/helpful</td>
<td>6</td>
</tr>
</tbody>
</table>

Base: Respondents who have positive impression of Actuaries (rating 5,6,7)

Q13b. Why do you have a positive impression of actuaries?
Respondents from Large Hospitals assign a lower value to someone who manages healthcare forecasting/analytics compared to other industry groups.

- The majority of other groups feel a salary of $100,000 or more is warranted for this type of position.

Base: Total respondents
Upper case letters denote significant differences at the 90% confidence level

Q6b. What would you consider to be a reasonable salary range for an experienced individual for this healthcare forecasting/analytics position?
Perceptual Mapping
Perceptual Maps – Introduction

- A perceptual map visually displays how various products (or in this case, industry representatives) are related to one another in terms of attributes evaluated.

- Mean ratings of respondents on selected attributes were used to create perceptual maps. In these maps, respondent groups are displayed as points on the map while the attributes are displayed as vectors (directions). By graphically displaying the association between respondents and their corresponding perceived traits, perceptual maps allow marketers to detect points of differentiation, misperceptions, and new positioning opportunities in the market.

- The benefits of the map are threefold: First, respondent similarity and dissimilarity are easily discernible on visual inspection. Specifically, respondent groups clustered closest together are perceived as most similar.
Secondly, respondent attitudes relative to attribute fulfillment can also be determined by visual inspection. Specifically, drop an imaginary perpendicular line from a group label to an attribute vector—the point of intersection is the rating of the group on the attribute (extend the attribute vector backward through the center if necessary). Groups projected closer to the head of the arrow are rated more well-fulfilled on the attribute than groups projected nearer the tail.

Finally, perceptual maps portray the relationships among attributes. The closer two attribute vectors are to each other, the higher the correlation between the attribute means. If attribute vectors are heading in opposite directions, the correlation between attribute means is negative.

At the end of this section is a brief background on how to further interpret perceptual maps.
Summary

- **Pharma/Biotech** employees are perceived to be strong in most areas: *Strategic thinking, Problem solving, Written and Verbal communication skills, Knowledge of clinical issues, Knowledge of policy issue, Leadership skills.* The same is true for **Other Respondents** (Health IT, Electronics record management, Health economics company, Enterprise risk management, CROs).

- **Large Hospitals** and **Health Plan/Policy** members are rated average on the above. They are different primarily in that Large Hospital employees are seen to be poor in *Programming languages*, while Health Plan/Policy respondents see strength.

- **HC consulting** respondents are quite critical and perceive weakness on all the attributes.
Perceptual Map – Performance on Key Attributes

- Strategic thinking/Knowledge of policy & clinical issues/Communication skill set
- Knowledge of programming languages
- Health plan/policy
- HC consulting
- Pharma/Biotech
- All others
- Large Hospital
Perceptual Map – Performance on Key Attributes

Statements that show no significant difference across brands:
1. Supervisory skills
2. Study design
3. Financial acumen
4. Knowledge of regulatory issues
5. Knowledge of health systems/financing
6. Decision-making skills

Leadership skills
Cross-functional coordination
Knowledge of policy issues
Strategic thinking
Written communication skills

Pharma/Biotech
All others

Large Hospital

Health plan/policy

HC consulting

2D Fit = 90.6%
73.9%
16.7%
Appendix: Perceptual Map – Interpretation

1. By drawing a perpendicular line from Product A to the attribute vectors, we see that it rated highly on **Safe long-term** and **Low incidence of side effects**. Product A is closer to the end of these vectors than Product B; thus it is higher rated on these attributes than Product B.

2. Product B is rated moderately on **Safe long-term** and **Low incidence of side effects** compared to products A and C. However, its position is stronger on **Effective** and **Fast onset** than products A and C.

3. Product C is associated with **Low cost**, but is negatively associated with other attributes.
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