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High Face Amount Mortality Study—April 2012

By Al Klein and Michelle Krysiak

The Society of Actuaries (SOA) engaged Milliman to complete a high face amount study based on data from a recently completed industry experience study called the Milliman Industry Mortality Study and Analysis (MIMSA). Among other things, MIMSA analyzed mortality and cause of death experience data provided by 29 companies covering 10 study years (2000 through 2009).

One of the purposes of this study, which was initiated by the Reinsurance Section, was to replace the old Manulife high face amount study. The Manulife study, last completed in 2002 using experience from 1997 and 1998, was based on face amounts of \$1,000,000 and higher. This 2012 SOA high face amount study was also based on face amounts of

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Current issues are available on the SOA website (www.soa.org).

To join the section, SOA members and non-members can locate a membership form on the Reinsurance Section Web page at <http://www.soa.org/reinsurance>.

Reinsurance news

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Call for Articles for next issue of Reinsurance News.

While all articles are welcome, we would especially like to receive articles on topics that would be of particular interest to Reinsurance Section members.

Please e-mail your articles to Richard Jennings (richardcjennings@gmail.com) or David Xia (dxia@scor.com).

Some articles may be edited or reduced in length for publication purposes.

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Winners and Losers

By Scott Meise

Greetings from London! At the time of writing this, it's just past Black Friday in the United States. We didn't get Thanksgiving off, although we get Boxing Day and the Queen's Diamond Jubilee, so I guess I can't complain. I was happy to see that there weren't any major incidents of chaos on Black Friday, until my co-workers pointed out the 100-car pileup in Texas that day. I tried to explain to them that, unlike London, there are places in the United States where traffic actually moves, which is why things like this can happen.

One of the big things going on here is Solvency II, which is supposed to put reserves and capital on a fully principle-based system. It was recently postponed to, at earliest, the end of 2015. Due to the current issues in the EU, there is a lot of debate about discount rates and how to come up with a system that works for everybody.

The underlying issue with discount rates is the risk-free rate used for discounting the liabilities. Many companies over here invest a lot of their assets in sovereign debt, which has lost a lot of its value in the PIIGS (Portugal, Ireland, Italy, Greece and Spain) countries. As a result, unless the risk-free rate used to discount the liabilities is consistent with the "risk-free" rates on their sovereign debt, they'll find themselves very challenged from a capital position.

However, another goal of Solvency II in the EU is to put everyone on a consistent basis, which means that their risk-free rates should be consistent. Otherwise, companies with high discount rates would have a capital advantage over companies with low discount rates if they both had the same strategy.

One other issue with discount rates is allowing for the long-term, illiquid nature of certain liabilities. Solvency II has tried to tackle this with the introduction of a matching adjustment, but many argue this doesn't go far enough. Also, the idea of a "cyclical premium," which allows firms to use higher discount rates in times of stress, has been introduced to help the discount rates be more consistent with the economic environment, but this doesn't solve all of the problems currently being debated.

Regardless of where this eventually comes out, it illustrates how any new regime creates winners and losers—the winners already have a strategy that is more consistent with the new rules, and the losers have to adapt to the new rules or change their strategy.

One of the reasons I like working in the reinsurance industry is that I enjoy being part of the process where we help insurers adapt to the rules,



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rather than having to abandon their strategy. That doesn't mean that I think reinsurers should prop up a strategy that objectively isn't working, but it is good to be a part of relationships that help manage the risk profile of insurers to where they want it to be, while at the same time helping them pursue strategies that are good for them and their clients; to help the "losers" have a chance at winning as well.

As far as current initiatives for the Reinsurance Section go, here are some updates:

LEARN: We're wrapping up another successful year with our LEARN initiative, where we send people out to state insurance departments to give presentations on reinsurance to help keep open the lines of communication between the reinsurance industry and regulators. In 2012 we visited seven states, bringing us to 20 so far. We're in the process of beginning to set 2013 appointments, so if you are or know anyone at a state insurance department that might be interested, I encourage you to discuss it—the schedule fills up fast!

Intro to Reinsurance Boot Camp: As mentioned in previous newsletters, we'll be hosting a boot camp on May 8, 2013 in Toronto, the day after the Life and Annuity Symposium. Look for details on that soon. We're also actively looking into one on June 13 after the Health Meeting, since health and life material don't necessarily intersect for the purposes of the boot camp. We'll keep you posted with details on that possibility.

Research: The Reinsurance Treaty Terms project has a researcher, and good progress is being made.

Please let me and/or the Reinsurance Section know if you have thoughts or questions on the things we're doing or that you'd like us to do! ■

\$1,000,000 and higher but had a significantly larger amount of data, as shown in the table below.

High Face Amount Studies

| Study | Exposure (\$Billion) | Claims | |
|----------------|----------------------|--------|--------------------|
| | | Number | Amount (\$Million) |
| Manulife 1997 | 64 | 168 | 77 |
| Manulife 1998 | 77 | 353 | 101 |
| SOA (Milliman) | 7,600 | 7,700 | 15,000 |

Links to the last Manulife study and the current Milliman study are shown below.

Manulife

<http://www.soa.org/professional-interests/reinsurance/papers-presentations-research-and-resources/rein-2001-manulife-reinsurance-mortality-studies.aspx>

Milliman

<http://www.soa.org/Research/Research-Projects/Life-Insurance/research-high-face-amount-mortality-study.aspx>

The current high face amount study provided mortality and cause of death results in a number of different categories, including policy size, risk class, gender and product type. A few of the highlights of the study include:

- The overall actual-to-expected (A/E) ratio was 82 percent by face amount and 84 percent by policy count. The 2008 VBT primary tables served as the expected underlying mortality basis.
- Study years 2005 (89 percent A/E ratio) and 2008 (91 percent) had the worst experience.
- While there was substantially more male (78 percent) than female (22 percent) exposure by face amount, the average size was similar and actually slightly higher for females than males (\$1.58 million \$1.57 million). Males had a lower A/E ratio (79 percent by face) than females (89 percent), but

this is likely due to the fit of the underlying table rather than males having better mortality experience than females.

- Cause of death was studied by policy count, and results were based on the ratio of the number of claims for a specific cause to the total number of claims for all causes. The top five causes of death were cancer (37.1 percent), cardiovascular disease (21.8 percent), non-motor-vehicle-related accidents (6.9 percent), suicides (6.1 percent) and respiratory-related causes (6.1 percent). These results differed from the overall MIMSA results where the top five causes, in order, were cardiovascular disease, cancer, respiratory-related causes, other causes not specifically identified, and mental and nervous causes. Possible reasons for these differences include:

- The life insurance industry is better at underwriting cardiovascular disease than cancer.
- Higher face amounts receive more scrutiny.
- Those who can afford higher face amounts live riskier lifestyles, leading to more accidental deaths.
- Those who can afford higher face amounts live more stressful lives and commit suicides more frequently.
- Those who intend to commit suicide may buy as high an amount as permitted.

There were a number of other interesting findings from the study. The rest of this article will discuss a few of these.

A/E RATIOS BY POLICY SIZE

While the study focused on high face amounts of \$1,000,000 and more, the analysis by policy size grouping included amounts as low as \$100,000. The table below shows several measures by face amount groups. The A/E ratios used the 2008 VBT primary tables as the expected mortality.

The A/E ratios decreased with increasing policy size, as would be expected. However, the A/E ratios were relatively flat between \$500,000 and \$10 million. A few possible explanations for the pattern include:



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Actual-to-Expected Mortality by Policy Size

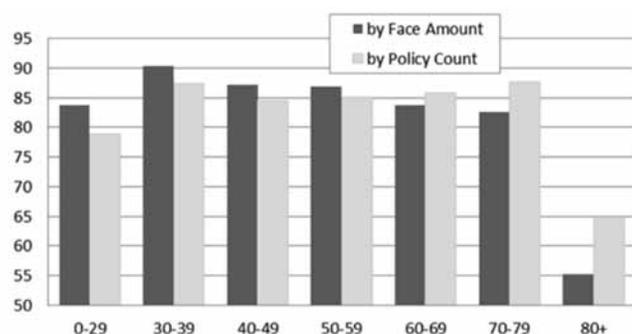
| Policy Size | Exposure (\$Millions) | Average Face (\$Millions) | Actual Claims (\$Millions) | Expected Claims (\$Millions) | A/E Ratio (%) |
|-------------------|-----------------------|---------------------------|----------------------------|------------------------------|---------------|
| \$100K To <\$250K | 4,226,043 | 0.13 | 10,942 | 11,716 | 93 |
| \$250K To <\$500K | 4,668,454 | 0.29 | 7,294 | 8,499 | 86 |
| \$500K To <\$1M | 4,946,488 | 0.56 | 6,728 | 8,043 | 84 |
| \$1M To <\$2.5M | 5,241,775 | 1.20 | 8,026 | 9,527 | 84 |
| \$2.5M To <\$5M | 1,039,472 | 3.14 | 2,680 | 3,237 | 83 |
| \$5M To <\$10M | 730,796 | 5.70 | 2,418 | 2,933 | 82 |
| \$10M+ | 622,315 | 14.09 | 1,705 | 2,373 | 72 |
| Total | 21,475,343 | 0.34 | 39,793 | 46,327 | 86 |

- Older individuals with higher and more uncertain mortality are included in the higher face amount bands disproportionately to the lower face amount bands.
- The additional underwriting done at the higher face amounts doesn't provide as much additional protective value as one might expect.
- Anti-selection occurs at the higher face amounts.

A/E RATIOS BY ISSUE AGE GROUPS

The chart below illustrates the A/E mortality results for seven issue age groups by face amount and policy count for the policy sizes of \$1 million and higher.

Actual-to-Expected Mortality by Issue Age



The A/E ratio comparison illustrates a pattern that was unexpected—the A/E ratio by face amount was greater than that by policy count up through issue age 59.

There are a number of possible explanations for this observation:

- The higher face amount policies have more volatility in mortality experience due to fewer claims.
- As previously mentioned, more anti-selection occurs at the higher face amounts.
- While additional underwriting requirements are added for higher face amounts, even more underwriting requirements are added for the older age, higher face amount applicants.
- Nonmedical deaths, the largest drivers of mortality under 50, are difficult to account for in the underwriting process.
- More suicides (as a percentage of all claims) by younger individuals occur at the larger face amounts possibly due to more stress from large financial losses during the economic downturn and fewer assets to buffer the losses.
- The younger, high face applicants are over-insured. Financial underwriting at the younger ages allows for a projected growth in need, often resulting in more insurance coverage than necessary in the early years.

// MEDICAL CAUSES INCREASED WITH AGE AND NONMEDICAL CAUSES DECREASED WITH AGE FOR BOTH THE HIGH FACE GROUP AND THE POPULATION DATA. //

CAUSE OF DEATH BY ATTAINED AGE GROUPS

The following graph illustrates cause of death percentages by attained age. The causes of death are split by Medical (Med), Nonmedical (Nonmed) and Other (causes not specifically defined which could be either medical or nonmedical). It also compares the high face amount (HFA) results to the Population (Pop) as represented by the 2006 National Vital Statistics Report.

Various comparisons were made, and the observations are discussed below.

Other Causes—High Face Amount vs. Population

Population cause percentages are higher than high face amount cause percentages because underwriting helps to reduce the number of claims of many of the “Other” causes. Note “Other” does not include unknown causes.

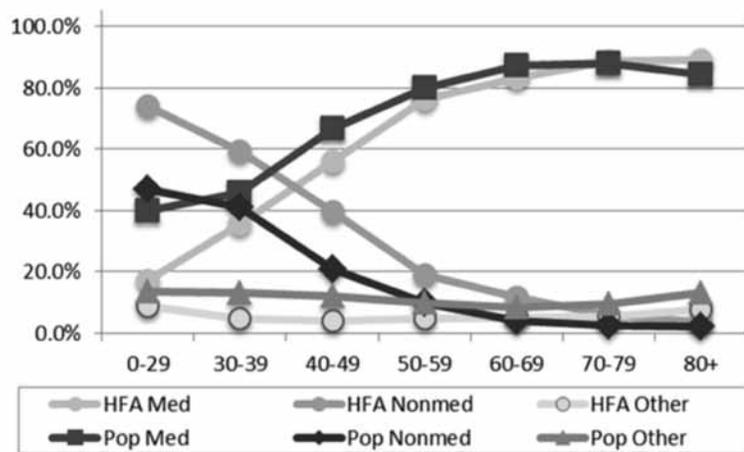
Medical and Nonmedical Causes—High Face Amount vs. Population

For Medical causes, the population percentages were higher than the high face percentages until the mid-70s. For Nonmedical causes, the population percentages were lower than the high face percentages but converge at about the same time. These patterns can be explained by the fact that the high face amount insureds are typically healthier than the general population due to good underwriting on medical issues while nonmedical issues (e.g., accidents) are more difficult to underwrite.

High Face Amount and Population—Medical vs. Nonmedical

Medical causes increased with age and Nonmedical causes decreased with age for both the high face group and the population data. The crossover point between Medical and Nonmedical percentages for the population data was in the early 30s. The crossover point for the high face amount group was in the early 40s. Thus, it appears Medical causes become more significant than Nonmedical causes for high face amount insureds approximately 10 years after those for the general population. Again, underwriting is responsible for producing an insured group that is healthier than the general

Attained Age: Percentage of Medical, Nonmedical and Other Causes of Death High Face Amount versus Population Data



population. Underwriting for medical risks lowers not only the Medical cause of death percentages, but also the Other cause of death percentages for the insured group. It was not surprising that this occurred later for high face amount insureds, but it was surprising to the authors how much later it occurred.

It is our hope that this article provides valuable insights for both direct writers and reinsurers in managing high face amount business. Those interested in learning more about the latest high face amount experience and other findings should click the link above to access the full report. ■



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Interview with Jack Lay, CFO of Reinsurance Group of America

By Reinsurance News

First, thank you, Mr. Lay, for taking the time to speak with us. For our readers who may not be familiar with your company, could you begin by telling us about yourself and what you do at Reinsurance Group of America (RGA)?

Thanks for the opportunity to offer my thoughts on the industry and the changes taking place across a number of the markets.

I currently serve as the chief financial officer for Reinsurance Group of America, Incorporated, our holding company, as well as a number of our subsidiary companies. Like many financial executives, my educational background was focused on finance and accounting. I have a degree from the University of Missouri, and practiced as a certified public accountant for years before taking on responsibilities in private industry.

My responsibilities at RGA are fairly broad. They include all external financial reporting, including our filings with the Securities Exchange Commission here in the United States since RGA has gone through several issuances of equity and debt securities to the public over the years. As you can imagine, we also have a significant number of other financial filings around the world with various regulatory and taxing authorities, since the company now has subsidiary companies, branches or representatives offices in 25 different countries.

I also have responsibility for a number of other financial functions aside from the finance and accounting team. Those include our valuation function, which develops our reinsurance treaty reserving and related reporting, and more broadly any enterprise modeling efforts related to our various business projections and economic capital framework. We have a strong team of actuaries involved in these efforts, upon which I depend a great deal since I'm not trained as an actuary (even though I sometimes think I am).

Additionally, our tax department reports through the office of the CFO, as well as our investment and internal audit functions. That audit function also reports on a direct-line basis to our board of directors, so my

involvement in that regard could be better characterized as administrative rather than strategic oversight. The investment department oversees the company's portfolio of investments that now totals over \$30 billion.

Could you tell us about your career path? What are the highlights of your career that you remember most?

As I indicated, my background was in public accounting before joining what was the parent company of RGA's operations over 20 years ago. I was a partner in the financial institution practice of the KPMG office in St. Louis. The experience gained in public accounting during that part of my career has really served me well in my current role.

One of the highlights of my career relates to the genesis of RGA. That involved extracting the life reinsurance business from RGA's prior parent company in 1993 and transferring it to a newly created holding company, the current Reinsurance Group of America, Incorporated. The process was quite complex, but we were able to accomplish that transfer of all the existing reinsurance business, which paved the way for the initial public offering of the stock of RGA in May of 1993. Since that time, the majority ownership was transferred to MetLife in 2000, and ultimately the majority shares were transferred to broad public ownership in 2008. At this point, RGA has no parent company as all of the shares are openly traded in the public market.

You joined RGA in 1994, just as the company began entering international markets. What were some of the challenges you faced during this time of expansion?

There were a number of challenges associated with the expansion of our business into a number of international markets. Financial reporting systems needed to be broadened to accommodate internal and external reporting; new risks to which the organization became exposed needed to be thoroughly analyzed; and enterprise corporate governance needed to be continually expanded. These efforts are ongoing, and likely will always be subject to refinement as business environ-



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ments change, regulatory regimes continue to evolve, and lessons learned call for changes in our systems, policies and structure.

For a business that has been traditionally dominated by European reinsurers, how has RGA been able to grow so successfully in international and even European markets?

RGA brought a different focus to many of the international markets it has entered over the last 15 years or so. We believe in a very client-centered approach to delivering business solutions. That means doing everything possible to find an appropriate solution to a particular client's risk management needs. We believe that sort of open-minded approach serves our clients well. Of course, there are instances when the nature of the risks being discussed aren't a good fit for a solution involving RGA, or when the commercial terms associated with a solution just don't fit a client's needs. In those instances, we at least have demonstrated to our client a willingness to exhaust our full regimen of ideas and potential risk mitigation structures, even if we couldn't ultimately assemble a transaction that worked for all parties.

How does RGA differentiate itself from the major European reinsurers?

We think we have differentiated our business approach somewhat from that of the large European reinsurers in subtle ways that are apparent to our clients. We have described our approach as a relentless focus on client service. That doesn't mean our European reinsurance competitors don't likewise have a client service focus, but in many markets we think the degree to which we try to work with our clients sets us apart.

Execution of reinsurance transactions has historically been accommodated at the local business level. That includes the identification and discussion of the need, the negotiation of pricing and related commercial terms, etc. But, as everyone knows, markets and business practices continually change, and we see more and more centralization of reinsurance decisions within our clients' operations. Like many of our European competitors, we need to consider this sort of shifting business practice as we determine how to best serve the market.

Since RGA is headquartered in the United States, do you believe that your company has an advantage over your European counterparts because of the ongoing issues with Solvency II? Will Solvency II have much of an effect on RGA, outside of your European legal entities?

It isn't always clear to what extent any changes in reporting, solvency and regulatory standards will provide opportunities or challenges to our business over time. For instance, some types of business may look more attractive when reported under a particular solvency regime. That doesn't necessarily mean there will be significant movements of one type of risk into a particular reinsurance market, as there are a number of aspects considered by a primary life company in assessing options. They include, among other things, underlying business strategy and counterparty risk appetite. However, changes in solvency standards such as those that are a part of Solvency II typically do create opportunities for reinsurers, and RGA will be quite active in offering support where there seems to be a fit. Aside



// MY VIEW IS THAT A FEDERAL REGULATORY BODY MAY ULTIMATELY BE MORE EFFECTIVE AND EFFICIENT GOING FORWARD. ... //

from these market dynamics, we don't think Solvency II will significantly affect RGA's reporting structure or the way it does business.

There has been friction between the federal government and the National Association of Insurance Commissioners (NAIC) over regulation of the insurance industry. Do you believe the public would be better served if insurers were regulated by a federal agency rather than a standard-setting body of state regulators?

This is a tricky issue, as one can argue the public and the industry have been well served over time by the state insurance regulators. However, one drawback in the state system is that the use of 51 different insurance departments can sometimes lead to inconsistent regulation. Additionally, it is my understanding that the state insurance departments cannot individually enter into agreements with foreign countries. For a global insurer or reinsurer, there is considerable value in having a single body vested with regulatory authority over the U.S. industry. My view is that a federal regulatory body may ultimately be more effective and efficient going forward for these reasons. I think regulators in various international markets would likely have more confidence in their ability to work with a single federal regulatory agency in the United States.

In the U.S. market, what is RGA doing in response to declining cession rates?

While RGA continues to maintain a leading position in the U.S. reinsurance market, there is no question that primary companies are ceding mortality risk at a significantly lower rate than was the case a decade ago. We have broadened our business in the United States to include group and various health reinsurance services, as well as asset-intensive reinsurance solutions associated with annuity portfolios. These actions have mitigated, to some extent, the effect of declining cession rates associated with traditional life reinsurance in the United States.

How has the increased consolidation in the U.S. life reinsurance market affected RGA?

The continued consolidation of the U.S. life reinsurance market has allowed RGA as well as the other remaining reinsurers to benefit from gains in market share. Reinsurance programs in the United States are typically split among a number of reinsurers, so the consolidation of the market generally benefits those reinsurers who remain active in the market.

Do you see any avenues of growth in the U.S. market for life reinsurers?

There are still opportunities for growth in the U.S. market, although the rate of growth will certainly be lower than what was typical in the recent past. Some of the growth opportunities are outside of traditional mortality reinsurance. Those include various forms of group and health-related reinsurance, as well as financial reinsurance.

There are also a considerable number of opportunities associated with companies wanting to reinsure blocks of in-force business or sell existing businesses or companies. Those sale transactions can be significantly supported, in whole or in part, by reinsurance structures.

RGA is a leader in providing financial reinsurance to insurers, and other reinsurers have also expressed interest in providing more capital relief transactions. Why do you believe reinsurers are a better choice to provide this service than investment banks or other financial institutions?

The structuring and modeling of financial reinsurance transactions are what reinsurers typically do well. While other institutions, such as investment banks, are skilled in the structuring aspects of such a transaction, the understanding and modeling of the expected product cash flows are of primary importance in any such transaction. There is a strong argument that reinsurers have the experience and capabilities to best determine the appropriateness of underlying assumptions driving any business valuation models. RGA has been involved in this part of the industry for years, and has a deep understanding of how to effectively structure a transaction that works for all parties involved.

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With the growing longevity reinsurance market, do you believe that current mortality improvement rates capture the speed of future health care advances?

The longevity reinsurance opportunities are expansive, and we have seen a number of such transactions in recent years, particularly in some of the international markets. It's hard to say whether any particular assumptions used will turn out to be appropriate over the long run, but all indications are that the parties accepting the longevity risk have prudently assessed the various possibilities, including the expected rate of health care advances over time.

Do you foresee any major changes to our industry over the next 30 years?

The life and health insurance industry will continually evolve, and address the challenges that it currently faces. Those include revitalization of the distribution force and the need to more effectively serve the middle market. It remains to be seen how effective the indus-

try will be with respect to these issues, but it is highly likely the business will be transacted differently in the future. In particular, automated underwriting systems will likely play a broader role in risk selection. And, I believe distribution through electronic sources will play an increasing role in reaching the underserved middle market.

What are your priorities now? What are your plans for the future?

My priorities relate to addressing the increasingly complex nature of running RGA's finances. The rate of change in our industry, in terms of both domestic and international reporting and solvency requirements, is somewhat daunting. The needs of the capital markets, where we finance our ongoing operations, grow each year. Fortunately, we have a very strong team here to address those challenges as they arise.

As for my future, I enjoy what I do, and plan to leave an effective finance operation behind whenever I determine it's time to transition to something else. ■



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Entrepreneurial Actuaries in Action—A Global Perspective of the Health Insurance Market

By Michael L. Frank

GENESIS OF THE JOURNEY

While serving as president of the Actuarial Society of Greater New York, a student at Bard College contacted me requesting an information session at her school on the actuarial profession. This request expanded to visits to five college campuses, including Bard, Columbia, St. John's, SUNY-Albany and Vassar, with a significant number of the attendees being graduating math and business students in the actuarial profession.

Columbia University, one of the largest actuarial programs in the group, offered my business partner at Aquarius Capital, Don Rusconi, and me the opportunity to teach a course as adjunct professors and develop a course that would give students a perspective of what it would be like to work as a health actuary or a health insurance professional—e.g., chief financial officer, insurance broker, venture capitalist—as well as providing experiences applicable to both their resumes and future careers.

COURSE "BLUEPRINT"

In January 2012, we developed a course called "A Global Perspective of the Health Insurance Market." The objective of the course was to provide an overview of the health care insurance industry, including different products available, various delivery systems (U.S. vs. international), health care reform, reinsurance and capital markets. We expanded the course to position students for improving their long-term chances to attain C-suite roles (e.g., CEO, CFO, COO), covering material such as how publicly traded HMOs manage business; how rating agencies evaluate companies; the role of insurance/reinsurance brokers; consulting on international health care systems; and politics and its tie to local health insurance. Health care reform was addressed, but was not limited to the United States—we also covered reform in 12 additional countries. Actuarial standards of practice (ASOPs), traditional health actuarial projects, and professionalism issues were also incorporated into the course.

Material was developed as the classes progressed, as we observed what students could absorb over a short period of time (2.5 hours per week for 14 weeks). Rather than a traditional textbook, the course included

a 700-plus-slide PowerPoint presentation and 200-plus articles on the industry in order to tailor material on current and emerging health industry issues at hand, with the majority of the 200-plus articles less than a few years old. The course objective was for students to hit the ground running on their first job if they chose the health care profession or any job in the insurance profession (the course covers other actuarial disciplines, although the primary focus is on health care). Students also benefited by expanding their resume through research and experience, which is critical in a difficult job market.

STUDENTS CONTRIBUTED TO THE COURSE

Columbia provided a unique opportunity, with the class having 39 international students from a variety of countries and backgrounds. Many students contributed significantly to the course, including providing questions that were focal points of future lesson plans, and completed research projects benefit the class as well as the insurance industry. For example, students coordinated a poll survey on health care reform, which was used for teaching the course and served as a resource document to several insurance industry task forces in health care. See <http://ce.columbia.edu/Actuarial-Science/Student-Work> for details.



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“SOME STUDENTS OBSERVED THAT ALTHOUGH OTHER COUNTRIES ARE RANKED HIGHER THAN THE U.S. SYSTEM IN CONTROLLING COSTS, THEY ALSO HAD LONGER WAITING PERIODS AND LESS ACCESS TO CARE THAN THE U.S. SYSTEM.”

Many students published multiple pieces of research in the industry. Students worked in teams, contributing and presenting research material, often taking them out of their comfort zones with experiences in public speaking, project management and team building. As part of the course, students were given homework assignments and readings to critique, and asked to provide opinions of items they liked/disliked. This effort ultimately became the framework of future research projects and class assignments. Students were also given traditional actuarial projects in pricing, reserving and underwriting as part of the course.

INTERNATIONAL HEALTH CARE SYSTEMS

For the final exam, students researched the health care system of a specific country, wrote a paper (many were later published), and presented a 20- to 30-minute lecture to the students and professors on their research.

Students were assigned to 11 teams with three to four students per team and each team representing a different country. The 11 countries selected by students were Australia, Brazil, Canada, France, Germany, India, Japan, Singapore, South Korea, Sweden and the United Kingdom. As part of the project, students reached out to other students outside their own team to serve as peer review of their final paper/research. Based on their own critiquing of other articles that they reviewed (e.g., articles on the China system), the students developed the guidelines and framework on what they wanted their presentations to cover. Students used videos, humor, graphics, foreign language and social media as part of their presentation to teach the class.

Students contacted actuaries in their assigned country to obtain insights and research (e.g., the Brazil team

contacted Ronald Poon Affat, a practicing actuary in Brazil). We highly encouraged this activity to both expand students' knowledge in a local market and provide valuable networking opportunities, an important tool for future actuaries.

Overall, the international research project was a success. Although the research done by the students has its limitations (they are NOT practitioners with prior experience), their enthusiasm and interest to contribute to the profession at the beginning of their actuarial careers was very positive and students learned a lot about 11 health care systems in addition to the United States and China. To access students' work, visit <http://ce.columbia.edu/Actuarial-Science/Student-Work>.

CONCLUSION

At the end of the course, students learned the day-to-day role of a health care actuary (technical aspects of the job) and a health care executive (e.g., CFO). The overall experience was very favorable for both the students and the instructors. Several students volunteered to be a teacher's assistant for the next course, while many other students either obtained internship or full-time employment opportunities through the networking that took place throughout the course.

Students learned first-hand how local health insurance is, which is an important lesson usually only learned through many of years of experience. They also studied and observed how government and health care systems interact. Some students observed that although other countries are ranked higher than the U.S. system in controlling costs, they also had longer waiting periods and less access to care than the U.S. system.

THE FUTURE

This course will continue in 2013, expanding to study additional countries chosen by the future students, and hopefully including more actuarial practitioners as student mentors. The course instructors will also be doing a similar course internationally, including the fall of 2012 in the Dominican Republic and China in 2013. Following this course, Columbia University piloted an internship program in the summer of 2012, with practicing actuaries creating projects for students to gain

relevant experience and research. The overall impact was very positive based on student evaluations, practitioner feedback, and the resulting successful student transition into the workforce.

ACKNOWLEDGMENTS

A special thanks is owed to Noor Rajah, program director and actuary at Columbia University for his assistance in getting this course off the ground, including trusting us to test pilot on his students, and Donald Rusconi, vice president and CFO at Aquarius Capital for his work in this joint effort. We also want to thank Ronald Poon Affat, vice president and CRO of Tempo Assist, Sao Paulo, Brazil, for his efforts in assisting students on the international project (his contribution for Brazil) and his encouragement/peer review of this arti-

cle. His participation was valuable for the course, and we hope other actuaries will participate in the future.

Most importantly, a special thanks to the Columbia University graduate students who went on this unchartered course called a “Global Perspective of the Health Insurance Market,” since they made the program go. Visit <http://ce.columbia.edu/Actuarial-Science/Student-Work> for a full list of student names. Lastly, thank you to Weiyang Liu, a college student at Bard College for her LinkedIn email that set this ride in motion. ■

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AEGIS 2012 Medical Stop Loss Premium Survey

By Ryan Siemers

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Ryan Siemers, CEBS, is principal for AEGIS Risk. He can be contacted at ryan.siemers@aegisrisk.com.

AVERAGE STOP LOSS PREMIUM — AN ELUSIVE BUT MEASURABLE FIGURE

Stop loss coverage amongst plan sponsors varies greatly—causing development of an average premium cost a difficult, if not irrelevant, task. Each group has an individual stop loss (ISL) deductible contract type and lifetime maximum that varies from another—all with significant impact on premiums. Enrollment size and group demographics are other variables.

However, normalization of responses can be reasonably attained: larger plans typically select higher ISL deductibles, and contract type can be accounted for by underwriting ratios. *For this survey, all contracts are equated to a mature 'Paid' contract.*

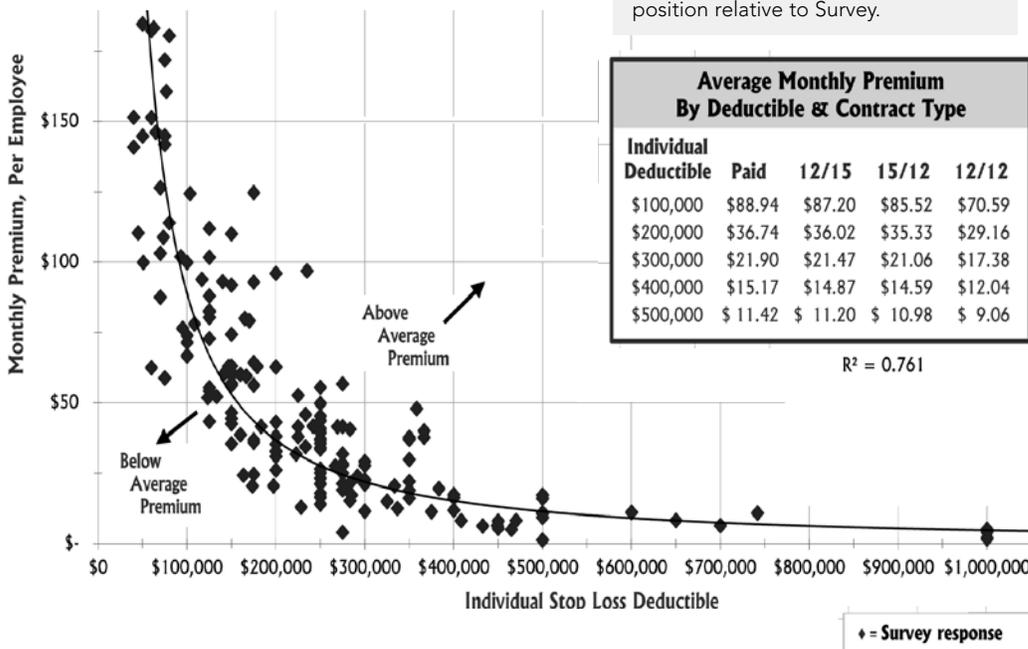
When plotted on a graph, a trend line can be drawn showing average premium cost by size of deductible for the continuum of coverage. Further variation may still exist due to lifetime maximums, pharmacy coverage, broker commissions and group demographics, however, a strong approximation can still be made.

EXECUTIVE SUMMARY

This year's Survey, in its sixth year, further reflects the impact of health care reform and the resulting prevalence of unlimited lifetime maximums on stop loss coverage. Of surveyed plans, 88% report such coverage – a steep increase from 13% in 2010. About half pair an unlimited lifetime with an interim annual maximum of \$5 million or less. Premiums continue to rise (to no surprise) and are 60% to 70% higher than levels reported in our initial Survey in 2007. The primary focus of the Survey, current premium rates, is shown in the following graphs and tables.

Exhibit 1

2012 Monthly Premium, ISL, By Deductible (Adjusted to 'Paid' contract)



Make your own comparison

See the next page for a focused illustration of this graph for the most common deductibles. Gather your coverage data to calculate your own position relative to Survey.

A FOCUS ON RENEWAL DECISIONS

Leveraged trend on unchanged deductibles, and wider interest in stop loss inspired two focused questions:

Do you plan to change your ISL deductible?

No. Prefer to keep at the current level: 51%
 Yes. Will seek a moderate increase to offset rate increase: 7%
 Uncertain. Will review a range and make a determination: 40%
 None of the above: 2%

Which internal audiences are involved in the review and final decision? Check all that apply:

Benefits/HR 89%
 Risk Management 13%
 Finance 56%
 Other (Exec. Mgt. most often cited) 18%

INDIVIDUAL COVERAGE SPECIFICATIONS

Contract Type (or Claims Basis)

Contract type varies widely, with Paid and its close equivalents 24/12 and 12/24 accounting for 63% of plans. All are choices for ongoing, comprehensive coverage.

Pharmacy Coverage

88% of surveyed plans cover pharmacy, consistent with recent years.

Individual Annual and Lifetime Maximums

Reflecting the implementation of health care reform, unlimited lifetime maximums are the most common, reported by 88%—a significant increase from 13% in 2010. For the 49% of respondents reporting an interim annual limit, amounts above \$1 million to \$2 million are the most prevalent.

Lifetime Limits:

- \$1 million or less: 3%
- >\$1 million to \$2 million: 5%
- >\$2 million to \$5 million: 4%
- Unlimited: 88%

Annual Limits:

- \$1 million or less: 7%
- >\$1 million to \$2 million: 33%
- >\$ 2 million to \$5 million: 9%
- Not specified or none: 51%

Exhibit 2

Contract Type, ISL, 2012

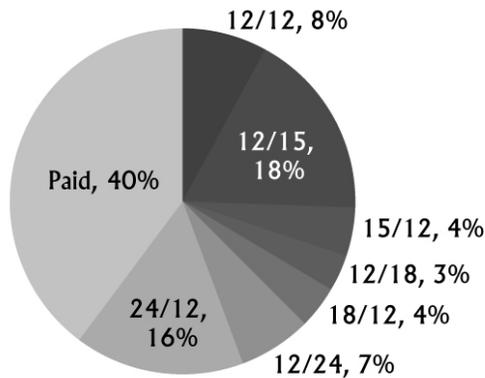
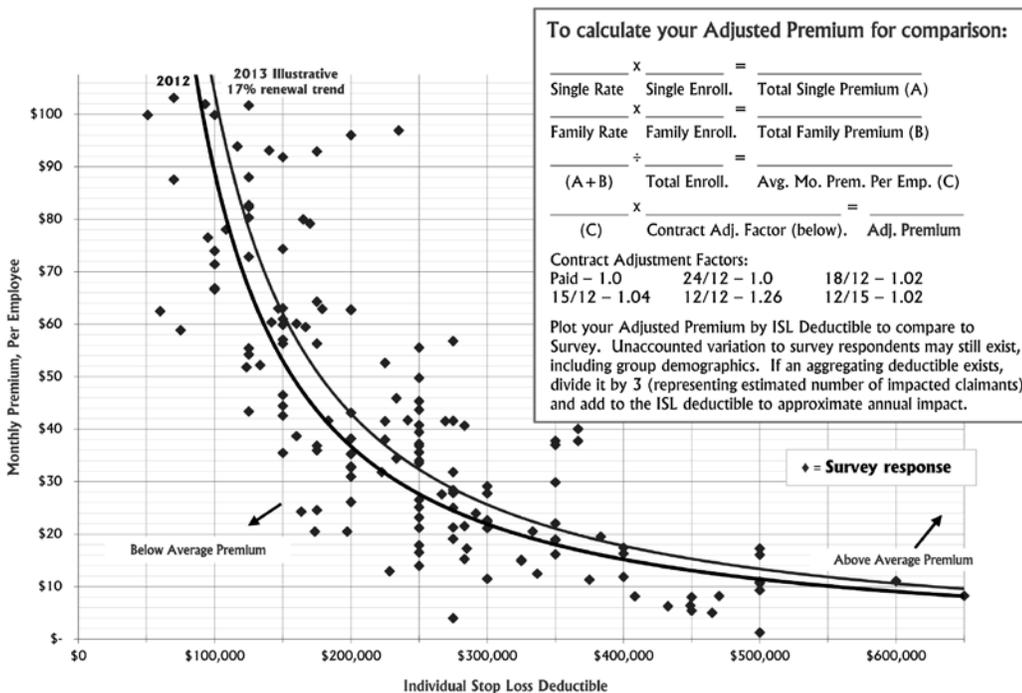


Exhibit 3

A FOCUSED ILLUSTRATION OF MORE COMMON DEDUCTIBLES, 2012 Monthly Premium, ISL, By Deductible (Adjusted to a 'Paid' contract)



CONTINUED ON PAGE 18

AGGREGATE COVERAGE

This coverage is most prevalent alongside ISL deductibles of \$175,000 or less. It becomes less common at higher deductibles. 125% is the prevalent level, chosen by 92% of those with coverage, with 120% covering the balance.

Average monthly premium varies. If alongside an ISL of \$175,000 or less, the average is \$5.61. At higher deductibles, the average is \$3.51. Median premium overall is \$4.85.

2013 PROJECTIONS

Stop loss typically renews at higher than underlying medical trend due to leveraging—whereby an unchanged deductible bears a larger percentage of future claims. We illustrate a 17% leveraged trend increase for 2013 premiums. Recent moderation in underlying medical trend, as well as an ongoing softness in the reinsurance markets, may allow some plan sponsors to gain more favorable results.

RENEWAL STRATEGIES

Actions to reduce your stop loss premium:

- Index deductible to medical trend.
- Be aggressive! Ask for reductions or review competitive offers.
- Avoid early renewals (prior to October for a 1/1)—you'll pay for extra margin.
- Review your risk tolerance and consider an annual reimbursement maximum alongside any unlimited lifetime maximum.
- Be knowledgeable. Identify the best carrier options, leverage data, and use an experienced broker or consultant—stop loss is a highly specialized coverage, fully distinct from other employee benefits. ■

THE SURVEY

The 2012 Aegis Risk Medical Stop Loss Premium Survey represents 178 plan sponsors covering approximately 450,000 employees with over \$130 million in annual stop loss premium. Respondents range in size from 36 employees to over 24,000. It is completed in partnership with the International Society of Certified Employee Benefits Specialists.

The 2013 Survey opens in Spring 2013, with release in late Summer. Visit aegisrisk.com to participate.

All respondents receive an immediate copy of the Survey results, as well as an exclusive supplement with further analysis and an exhibit showing ISL deductible by employee size.



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Was It a Useless Survey or Just Useless Conclusions?

By Ross A. Morton



Ross A. Morton is reassurer, advisor and mentor to a variety of people and companies. Ross can be reached at ross@rossmorton.com.

The August 1994 edition of *Reinsurance News* contains an article I wrote titled “Reinsurance in the Face of Change.” In the process of “decluttering” my home office I came across this article and remember all too well giving a presentation that spring at the Canadian Reinsurance Conference and then writing the article at the request of the Reinsurance Section. Not sure why I read it again since I was trying to “declutter” my office and mind of trivia no longer relevant.

The year was memorable as reinsurance growth was just approaching numbers that defied logic and that were to climb higher over the following years. The amount of risk reinsured in Canada in 1994 was up 250 percent from 1984 and was to continue to grow to 1650 percent by 2004 and ultimately to 2600 percent in 2011. The United States, on the other hand, saw its magnitude of new risk reinsured grow to 101 percent in the decade 1984-1994, then spike up to 630 percent by the early 2000s and then plummet to a mere 280 percent of the 1984 figure in 2011. Looks like Canadian operations of the reinsurers were the big winners as they stripped the risk taking from the insurers operating in Canada.

Did the survey predict any of this for the North American life reinsurance market? Not really, but if you read that old article you will note I apologized to the 54 respondents for the vagueness of some of the questions. I wrote the survey questions as a risk taker or risk selector and not as an actuary, yet over 80 percent of the respondents were actuaries either still practicing or having moved on to management. In my usual rush to get things moving I remember not asking anyone to edit my questions prior to mailing.

Given that 26 of the respondents were from Europe, it was not surprising to find their priority was focused on international standards and international expansion. The North Americans were more worried about their own backyard and left the world to others with broader visions. Also of note was the fact that 43 of the respondents were reinsurers, so taking on risk was more their focus.

Based on the written responses of the Canadians and Americans, the worrisome features of the future, as speculated on in 1994, were capital, high competition, increased regulation, globalization, and the “shakeout” of some players. Canadians specifically said customer service would play a significant role in the future. The details and the succinct written responses, though, elaborated on what the boogeymen (are there boogeywomen?) were in the future. Looking at each of the six categories I noticed their vision, or nightmare, of the future was pretty accurate!

Under the heading of governmental influences, risk-based capital and return on capital was the No. 1 issue for 90 percent of respondents! factual today as a No. 1. Just below that single item was reinsurance regulation, but I think that we did not see much of that other than as reaction to dubious reinsurance schemes that landed companies in trouble. Lastly was the worrisome trend to lower interest rates, which they saw as a potential disaster. Let us all applaud their vision, for interest rates are a big issue today as interest rates flounder at prolonged low levels even the 1994 visionaries would not have predicted!

The second category was “company structure,” and to no one’s surprise, technology ran away with the win-



// THE ONLY STREAMLINING I SEE NOW IS THAT IT TAKES ONLY 11 DIFFERENT TELEPHONE PROMPTS TO GET ME TO THE RIGHT PERSON ... WHEREAS BEFORE IT TOOK 13. //

ner's trophy. Some 85 percent felt this to be a huge factor in the future and they were right; but, regrettably, they did nothing about it, as our industry still talks the talk but has failed to walk the walk. The only winners with technology were our highly paid consultants and the IT department.

In the same vein of thought, the third category was "business objectives" and the "streamlining of administration," which were ranked as No. 1 fear factors or great to have objectives by 81 percent of the wise respondents. We probably fared better with this one than with technology, but again process reengineering, right sizing and the general administrative improvements have not been addressed successfully. I cannot change my address on my universal life policy or find out what my values are without using the telephone or email to ask and then wait six weeks for a solution or answer! The only streamlining I see now is that it takes only 11 different telephone prompts to get me to the right person or department whereas before it took 13. Following the streamlining vision were the very important items of return on capital and demand for profit. Now, really, even in 1994 did you have to be a wise visionary to predict companies would demand better return on capital and demanding more profit?

In the last categories of "product," "culture" and "economy," the only standout prediction would be the emergence of "advanced age applicants," an overcapacity in the industry of reinsurance, and recession in the West! All were very good visions or predictions for those years 1994 to 2011.

I must admit the section of that survey I felt was the best then and still do today was Section 7. The statements on which to agree or disagree were succinct and left little to the imaginative and furtive minds of the actuarial respondents. What I did not expect then, and still reflect upon today, is how definitive in terms of numbers the responses were to four out of five statements. I am not sure what happened with the missing couple of respondents, but my guess is they are still doing computer simulations to validate any answer they are still working on!

| Statement | Agree | Disagree |
|---|-------|----------|
| There will be a shrinkage of capacity in life reinsurance. | 9 | 42 |
| Some reinsurers are competing without an understanding of the market. | 43 | 9 |
| Reinsurance actuarial assumptions are still conservative. | 8 | 44 |
| Reinsurers must become more innovative in conceiving reinsurance structures to respond to new products and administrative complexity. | 43 | 8 |
| The industry should standardize administrative reporting. | 27 | 13 |

Responses to Section 7 Statements

Most of the respondents did feel that, yes, there would not be shrinkage of capacity in the life reinsurance industry, but I wonder if they realized how it would shift. The exhilarating days of retrocessionaires have certainly declined to also-rans, but the capacity they had has been more than made up for by reinsurers themselves increasing retentions to exorbitant levels. Mortality has been exceedingly profitable up to now, so why not gobble up as much as you can? Also, did they have any inkling back in 1994 that reinsurance demand in the United States would soften and thus the definition of how much capacity is enough would change? In Canada, even with the insurers' addiction to the drug of reinsurance pricing, the insurers' need for capacity is more directed at the breadth and not the height of risk—taking quota share from dollar one has its own capacity need versus that of excess risk taking for the jumbos. I give those respondents a check mark for disagreeing, but perhaps they were lucky as the support for such thinking was not what I would consider today.

Every time I see a survey of actuaries and or executives and a question or statement is made resembling the second statement of Section 7, I chuckle at the answer. The majority of the respondents agreed that some reinsurers are competing without an understanding of the market. That is similar to the survey that asks actuaries if other actuaries are using the right mortality assumptions, and

CONTINUED ON PAGE 22

the majority says no. Putting the question in context to the era I remember, there was tremendous growth at a time when many of the wise reinsurance leadership were retiring. The men and women of the handshake era were gone or going, and a new breed of upstarts came on like gangbusters flailing at the status quo and any semblance of a handshake deal.

This is a question I would like to ask today just to compare the mind-set of the two generations. Perhaps the plethora of accountants and lawyers who overwhelm the reinsurance industry would answer far differently since they at times are perceived to be arrogant enough to feel history means nothing and everything can fit before or after the “whereas” or “wheretofore.”

To no one’s surprise there was a surge of support for the disagree side of the ledger on the question of rates. They were not seen as conservative then and that conclusion of rates would prevail through to 2011 and, for the slow, perhaps 2012. I believe we have said for 20 plus years the rates are too aggressive and it is only recently that the industry, both insurer and reinsurer, has decided to not ignore aggressive pricing and the lunacy of the downward spiral. This question would give the same ratio of respondents in agreement and disagreement if not even more lopsided.

Any statement to do with innovation leaves lots to the imagination. I see innovation as great if it leads to sound use of financial resources and has clarity of purpose for all to appreciate from insurer to reinsurer to regulator to the public. Since 1994 we have seen some innovation that is more akin to corruption of financial

resources clouded in verbiage and subterfuge that almost is criminal. Well, I should say that in some cases it has been judged as criminal. Have reinsurers become more creative in their offerings? I would say yes in the United States but not really in Canada. Why innovate in Canada when you are already the real risk taker at 74 percent of all risks written? It has become too easy to just lower rates, take a majority of a treaty and milk the insurers’ sales success. I am not sure I see any value in throwing that statement out today for responses unless I surround the statement in definitions that imply only financially and morally correct innovation that is transparent to all qualifies.

The survey was not useless and nor were the conclusions. Intelligent people gave intelligent responses. At the time it was a much-in-demand survey; it gave me material for speeches and articles, and I like to think none of those were useless. On looking at the list of respondents, it appears all are either retired or are safely ensconced on boards of directors where they stand in judgment of today’s leadership. Glad I did the survey. Very glad I found it again in 2011, chuckled over the results and pondered on the health of all 56 leaders from a bygone era.

I would be remiss if I did not conclude with the same final sentence that continues to beguile me with its simplicity. Knowing the source, I know what he was alluding to and I think he was right, especially taken from the era he was a graduate of and the merits of the handshake. I quote the following from 1994: The vision that respondent had was that the reinsurance industry would see “*less pure underwriters and actuaries.*” ■

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Synopsis of the Reinsurance Section's Sponsored Research Paper on Extreme Event Risk

By H. Michael Shumrak

// Recognizing When Black Swans Aren't: Holistically Training Management to Better Recognize, Assess, and Respond to Emerging Extreme Events," by Guntram Fritz Albin Werther, Ph.D., professor of strategic management, Fox School of Business, Temple University and Thomas Herget, president, Risk Lighthouse LLC.

This paper aims to help financial and insurance practitioners better recognize, assess and respond to large-scale, large-impact, rare events (LSLIREs), which are occurrences currently often wrongly labeled as being unpredictable black swans. A black swan, as Nassim Taleb defines it in his popular book, *The Black Swan: The Impact of the Highly Improbable*, Random House & Penguin (2007-2010 Ed.) is 1) an outlier event, which 2) carries extreme impact, and 3) "makes us concoct explanations for its occurrence after the fact." Elsewhere, Taleb says it is unpredictable, which is why people concoct explanations. Other people use the term in many and various ways, to enfold events missed by most people because they are rare, missed by computer models and/or experts, and to include events they simply seem personally to have misunderstood.

The paper also discusses building better ways to assess such events' background characteristics, emergence dynamics, logics and other foreseeable attributes. A secondary focus is educating practitioners to better respond—whether to limit damage or to take advantage of the opportunities that arise from what others are likely to miss or misjudge during and after the emergence of LSLIRE (aka black swan) events.

"True" black swan events (TBSEs) are: large-scale, large-impact, rare events that are unpredictable using current assessment and forecasting methods. Taleb's arguments about black swans are based upon various assumptions and assertions he makes about complexity and the nature of change, societal driving and shaping forces, human and practitioner limitations (even when he is confronted by forecasters' successes), using philosophy, history and experience as guidance, the limitations of learning and of being worldly learned, human cognition limits, the hard-deck limitations on the potentials of the art and science of forecasting, and, therefore, the overall advice of what constitutes best practices

The essay is organized to sequentially cover the following four topics:

1. Define true black swans LSLIREs;
2. Assess the strengths and weaknesses of Taleb's approach to explaining black swan events;
3. Better ways to forecast LRLIREs and recognize LRLIREs and TBSEs;
4. Reducing the time scale required for recognizing and assessing LRLIREs using analysts' cognitive dynamics to gain competitive advantage.

There is a risk of decreased skepticism about the correctness of models as they gain in their complexity and their perceived as well as real robustness. The most important question about any financial model is how wrong it is likely to be, and how useful it is despite its assumptions. It is not that statistics and models are wrong in any usefulness sense, but rather that every single assessment method frames one particular biased view into reality, each with very particular cognitive and philosophical assumptions embedded within it. The key takeaway from these points is that every model is most likely to misguide when it is needed most: at its statistical extremes.

Holistic approaches are inherently superior to any single-discipline assessment, be it a model or not, first because they endlessly test and enfold more views—more systemically biased assessment approaches. Before an LSLIRE emerges, more than quantities change as internal and external relationships also qualitatively change. LSLIRE forecasting involves assessing shifting system-specific patterns leading to insights about shifting forms: *syncretism* ("the fusion of two or more originally different inflectional forms; the combination of different forms of belief or practice"). Syncretism as a skill goes beyond mere analysis and beyond even synthesis in its orientation to subjects and their changes

If teaching and doing effective forecasting of complex events and change were impossible, whether due to the difficult, ever-changing complexity of the world, due to an inherent lack of human capacity to predict complex events well, or due to a philosophical and empirical claim that unpredictable black swans define



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the world order, it would be difficult to explain why, for example, particular stock analysts, using the same tools and information that is broadly available to competitors working in the same organizations, can achieve “Best on the Street” status six, seven, or eight times each within a career, and do so even in very unsettled times.

Because finance, economics and other market-oriented disciplines are social sciences, a broad, general education in human affairs and knowledge/experience of many things is required of those who would aspire to effectively identify LSLIREs. It is better when it includes knowledge of the world, especially comparative histories, philosophies, religions and psychologies, comparative political, economic and legal systems, including knowledge of how these factors differentially integrate to form their particular societal systems. A common characteristic of people who have shown special skills repeatedly producing correct foresight about emerging change within complex human systems is broad and deep education about many things combined with a solid grounding experiences in one’s areas of interest. They are well-grounded cognitively, philosophically, experientially, educationally and judgmentally in their knowledge and understanding. They all have a string or guiding thread that ties knowledge, facts, intuition, experience and understanding together. From this non-random grounding, they assess better than most.

A black-swan-dominated world is at severe odds with the very notion of analysts having any worth (if everything of significance is unpredictable), of their performance improvement (if everything, as Taleb argues, is only luck plus retrospective justification), and of the very possibility of there being serially successful analysts who can, up to eight times in the 20 years of the survey, actually perform outstandingly correct forecasts so as to be the “Best on the Street.” If most people think an event is a black swan while better trained people recognize it as merely a rare, large-scale, large-impact event that others missed, significant comparative advantage accrues to the latter at the expense of the former.

LSLIRE emergence recognition, assessment and management can be thought of as a special case of futures

forecasting, assessment and change management. One way to get better overall is to study people who are good at the latter—normal range forecasting—as a way to approach discussion of the skills needed in better doing the former. There are three ways LSLIRE forecasting significantly differs from best-practice, normal-time complex systems forecasting:

- 1) Being farther out on the probability tail than routine forecasting targets, the risk of punishment for deviating from disciplinary, industry or societal consensus is typically far greater, so fewer mainstream people risk it;
- 2) Timing an LSLIRE is harder; and
- 3) The qualitative element of judgment increases in importance as the quantitative data becomes increasingly opaque prefatory to an LSLIRE syndrome shift. Yet, beyond the normal range of forecasting excellence—way out on the probability tail—there are often people who predicted these supposed black swans while the masses failed.

It is historically common in LSLIREs that someone forecast it when the many did not. This correct forecaster had good, solid grounds for his/her expert opinion and forecast, and most people ignored the forecast resulting in the LSLIRE, emerging as a “surprise” to most of us.

In his book, Taleb said “had the risk of 9/11 been reasonably conceivable on September 10, it would never have happened.” This ignores the fact that noted security expert Rick Rescorla correctly conceived that an airplane attack on the World Trade Center towers was far more than conceivable. In fact, he planned on and trained people for exactly that, and died trying to limit loss of life after the event.

We can use one of Talib’s black swan stories to make our point. According to Taleb’s “turkey farm” black swan example, past is no predictor of future. How, then, can we know the future, given knowledge of the past? A turkey is fed every day. Every single feeding firms up the bird’s belief that it will be fed every day by friendly members of the human race until on the afternoon of the day before Thanksgiving, something unexpected happens to the turkey. We can easily normalize Taleb’s

// MEMBERS OF A HERD FOLLOW THE THING IN FRONT OF THEM. TO SEE THE LANDSCAPE YOU NEED TO BE FREE OF THE HERD, WHILE KEEPING THE HERD IN MIND. //

turkey farm black swan example as an LSLIRE rather than a black swan. We might even consider it to be a normally expected event. We can do this by applying and/or considering some very simple philosophical, cognitive/perspective and analytical behavior shifts. Likewise, this black swan to LSLIRE mind-set shift is quite doable for a range of economic, socio-political and global crises. The idea is to facilitate black swan reduction to LSLIRE status rather than argue over whether machines or humans are better at being blindsided. The objective is to render both more effective in this context.

Being excellent, even in familiar, normal waters, is serious work. One must start with broad, trans-system common sense and experience using models and herd-like analyst consensus in a very uncommon way. This is because far out on the statistical tail is where models and herd-like analysis routinely fail. All human-based systems are constrained, shaped, embedded and entangled and not legacy-free. Their expected and normal behaviors can be change profiled. Interactions, though complicated, are also not legacy-free, and can be change profiled.

You cannot recognize a rare event if you don't recognize what normal looks like in each different complex system, and among them. If such better machines and better models exist, and they are understandable to people, by all means use them. Some serious difficulties are likely to remain because the meanings of facts and of patterns are usually context-specific, especially when different systems are interacting. But more importantly, since many soft plus hard factors are always brought to bear in recognitions forming judgments within specific dynamic contexts, machine intelligence answers will likely still need sophisticated human intelligence to interpret output meanings. Giving a Stradivarius to an average musician is simply an average musician with a Stradivarius. The top-ranked "Best on the Street" experts mentioned earlier are all, to one degree or another, within-system patternists focusing on patterns of information to better understand how complex systems are defined, evolve and react in specific circumstances.

For example, Bob Glasspiegel, (age 56; an eight-time "Best on the Street" winner) has been an analyst since

1998. He switched to insurance analysis from his earlier work covering firm technology stocks for a mutual fund. He has deep connections in the industry. He speaks of trying to "zero in on the important variables," explain macro-level industry "difficulties," and he often speaks of these factors' implications for the micro-level operations of various firms he analyzes. In explaining how he does this, Glasspiegel speaks of industry "headwinds ... of what matters to life insurers ... he scrutinizes industry data closely; talks to brokers, agents and other sales people; and draws on a long list of former company executives and employees for insights. Like Glasspiegel, each of the other eight-time "Best on the Street" winners shows an integrated thinking style with context specificity across time, macro-, micro-, firm-specific, and industry trends, within their industry's changing contexts.

A willingness to non-conform is critical to LSLIRE recognition expertness. As previously said, people skilled in synthesis are, according to Howard Gardner, author of *Five Minds for the Future*, on average older simply because it takes time to accumulate the knowledge and experience base from which to synthesize. Excellence in understanding complex systems and forecasting is a sustained, sunk-cost enterprise with endless topping up. Building up synthetic sense (common sense) comes with time. Sensible synthetic capacity is not something one has early or learns quickly so much as something one becomes capable of given sustained learning and experience. Knowing why something works is at least as important as knowing what is happening and how, especially in different human-involved, thus differently shaped and maintained, complex systems. A key to success with LSLIREs is mastering multiple perspective thinking and analysis from different cognitive assumptions, especially integrating "soft" psychological, sociological and philosophical perspectives and their changes in relation to the "hard data." The proper thinking process is open, emergent, and is essentially archaeological: facts and patterns emerge to your understanding as you iteratively scan, dig, assess and judge. These experts do not predetermine or pre-judge which variables are context relevant. The idea is to think like you drive and constantly integrate and reconsider as the drive evolves.

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Things exist within particular contexts and are shaped by them. They are, in any particular societal system, neither free, nor random, but advantaged and/or constrained in knowable ways. This embedded and entangled system legacy can be profiled. Seeing and understanding the “fit” of things, one can better judge potentials and limits, possibilities and impossibilities. This particular competency is profiling more than modeling. Since no complex human-involved system has only one way to see it or understand it, multiple personal experiences and capacities improve comparative abilities in recognition.

Most excellent complex systems forecasters have varied, rather than specialized, learning, work and experiential backgrounds. Human experience shows that it is usually easier to promise to do something than to do it; to try something, than achieve it. That means that the desires, goals, and, above all, the change agendas, of actors, whether they are governments, firms or persons, are to be treated with skepticism. Each of the serial experts explained why and how a given change or accomplishment was likely to occur. If you cannot foresee a plausible and likely path, you are wishing and/or guessing.

Members of a herd follow the thing in front of them. To see the landscape, you need to be free of the herd, while keeping the herd in mind. To navigate the emerging landscape, one needs to understand what was and is likely coming, to appreciate why and how, and to use synthetic ability and syncretism to form and defend a judgment. The herd-like behavior of analysts and their linked near-event failure to foresee the emerging, changing landscape is very useful in helping illuminate an emerging LSLIRE and in helping time the event’s “trigger point.” One needs to approach LSLIRE recognition in such a way as to avoid being a casualty of the tendency of any system to protect the status quo using mainstream models, methods and analyst’s judgments creatively. Successful analysts show deep study across those realms of knowledge that can normally impact their topic of interest. Another differentiating characteristic is that “within the system” analysts are solidly grounded in the study of their relatively narrow form and its change patterns while “between the

systems” analysts require understandings about and between multiple systems, their unique perspectives, goals and potentials. LSLIRE experts are merely a special segment within the broader category defined as comparative systems patternists. Because their interest is in LSLIRE recognition, their principal focus is more on change processes, on the profiling change of processes, and ultimately on recognizing syncretism (changing forms) within and among different systems. In a real sense, it is the study of the re-patterning of patterns. Perhaps one might describe it as comparative syncretism. Models pre-choose variables of interest to someone, as do other analytic constructions wherein the builder of it preselects fit elements for the futures assessment. These typically fail when needed most—when something is actually changing. Philosophically, cognitively and operationally, this choice to focus upon patterns first, and facts only within their context, is critical.

To integrate a vast amalgam of constantly changing, perpetually overlapping data is to see the data as elements of a single pattern. For one to effectively see the pattern’s implications in terms of past and future possibilities is to see them pragmatically. One must grow antennae. Learn to recognize things and processes in environments other than one’s own and among different interacting environments. If knowledge of the “board” (system) is critical to attaining expert judgment and foresight, then the characteristics and nature of each relevant “board” influences what understanding must be accumulated to gain expertness. This suggests that nobody is a good prophet everywhere, but only in familiar areas.

There are several techniques that one might apply to recognize LSLIREs when considering them at the earlier, “normal” crisis pattern state.

Approach #1: Use Multiple Methods Arrayed Around the Assessment Target

All methods bear weaknesses, biases and errors, but different methods bear different weaknesses, biases and errors. Used as arrays, or as accumulations of many different qualitative and quantitative methods, the multiple of these different methods “patterns” a system

// PART OF SURVIVAL IS SITUATIONAL AWARENESS ... FORESEEING WHAT MIGHT HAPPEN EVEN IF IT DOES NOT. //

quite well during normal times, but more importantly, each fails differently during emerging abnormal times. This dynamic array of method failures can be used to 1) recognize impending system instability and 2) triangulate, using iterative polling of the many different methods' outputs, on underlying, even causal, issues.

Approach #2: Triangulation and Patterning Emerging Change

1. Provide simultaneous empirical data from many methods, both qualitative and quantitative, that something out of the ordinary is happening at systemic levels
2. Iterative polling of many arrayed methods over time and iterative triangulation of their deviations from former readings of system stabilities can highlight general emerging system

Triangulation of multiple method outputs that suddenly deviates provides one kind of warning of incipient large-scale pattern change path dynamics, both as to type and direction.

Approach #3: Folding In and Laying the Onion

The visual is "layering the onion," with new data, patterns and context understanding constantly folded in to the pre-existing. Iterated, this produces a second kind of holistic calculus of error reduction. It yields improvements in understanding how that system is arranged, its bias systems, how it normally works, and its change process flows, as seen by folding in, layering up, and ever reintegrating the onion. A second benefit is that the more deeply, broadly and consistently over time one folds in patterns to layer the onion, the more obvious becomes any individual pattern that does not fit. It may not fit because it is wrong, your understanding is wrong, or it may be a precursor of coming system change. Avoid pre-determining.

Approach #4: Consider a Preference for Qualitative Insights to See Change Gaps

Identify shifts in societal dynamics. One historic example of this qualitative and "idea" shift: In years just prior to the outbreak of the Civil War, de Tocqueville noted a higher willingness of Americans to escalate to the use of weapons against each other in domestic disputes.

Approach #5: Focus on Seeing Undergirding Socio-Psychological and Style Changes

People and societies usually respond to momentary, typical, and even longer-term change pressures via their normal biases and ways. When, why and how such normally stable qualitative psychological patterns begin to change is more illuminating, pre-crisis, than are metrics or variables changing.

Approach #6: Use an Understanding of How Things and Processes Are Embedded

Learn the embedded architectures and ways of systems or topics of interest, and how that limits or favors options and possibilities.

Approach #7: Learn to Understand How Things and Processes Are Entangled

Entanglement refers to a case where two different things, having once been one, carry prior characteristics forward in themselves, such that, though now separate, they still behave relatively similarly. A classic example is former British Commonwealth colonies that became countries, compared to non-British Commonwealth countries. It is not an accident that the United States, Canada, Australia, New Zealand and Great Britain are still similar. Learn the entanglement features of the systems, or topics of interest. From what did they derive, and how does this shape them going forward?

As with the folding in, integration, and iterative synthetic rethinking of holistic assessment in normal-time futures forecasting, the more industry mainstream analyst dissonances and model disturbances one notices, the more consideration of emerging system path deviation.

Using knowable certainty of error creatively, we have an LSLIRE timing tool. More to the point, with recognition, even if nobody knows of what is coming, we can reduce what otherwise might have been considered a black swan a theoretically, practically, knowable, and now researchable LSLIRE status. Part of survival is situational awareness, which includes, at a sane, reasonable level, foreseeing what might happen even if it does not.

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An intelligence system based on making sense of information (facts, data) gets more confused as systems get relatively more complex. Intelligence based upon learning systems' ways, patterns, change processes, legacies, and their embedded to emergent and entangled to emergent change dynamics gets less confused as systems get relatively more complex. This is why serial stock market experts are patternists: it is easier. Information-based intelligence is often different and more confusing than pattern-based, change profiling-based holistic intelligence. Knowing the interaction of ideas (logics), goals, capacities, ways, and their resilience profile yields system-specific insight about how and why certain outcomes are more likely than others, and permits seeing, via pattern shifts, how a system is changing, but NOT WHEN.

More complex systems are harder to understand than simpler ones because there is more information within the former (more facts) to be known. Seen from a patternist and holistic change process perspective, more complex systems are easier to change profile and understand as to changing "big picture" than simpler ones because they have more interlocking parts and processes, hence more recursive features, and that makes them harder to change. Because more complex systems' legacies are harder to change, and are more incremental whenever they do shift, including in an LSLIRE aftermath, patterns are easier to predict at a system response level.

An intelligence system based on making sense of information (facts, data) gets more confused as systems get relatively more complex. Intelligence based upon learning systems' ways, patterns, change processes, legacies, and their embedded to emergent and entangled to emergent change dynamics gets less confused as systems get relatively more complex. This is why serial stock market experts are patternists: it is easier. Taleb's Extremistan is a more common feature of relatively more simple systems' change. This is how and why Taleb misjudges Extremistan as a relevant condition of complex, well-embedded, human-involved, societal systems.

Recognizing an arising LSLIRE-scale syndrome shift involves knowing a system's normal sub-system harmonies and disharmonies and then noticing the quality of the pattern shift. The subsystem change can presage the syndrome (system) shift. As a visual, a known healthy person normally behaves as one syndrome (as this healthy person), but with just one sub-system beginning to shift (an oncoming illness, say), the behavior of the whole system will shift and we can foresee, through learning and experience, a new future syndrome of it even though this system (person) has no prior experience of it. A syndrome shift's recognition can be obvious before the exact cause is known, but once it is known, the emerging syndrome shift can also be change profiled several iterations out based on pattern recognition, analogy, and experience and intuition. As a matter of such syndrome futures, it matters whether the diagnosis is one cancer, liver failure, heart disease, or any another, but all instances have understandable subsequent change profile paths broadly knowable through contextually shaped analogy.

The best cognitive grounding for LSLIRE recognition and for seeing downstream implications is social psychology, comparative philosophy and history, NOT economics. Technology and modeling are invaluable complements to building the best theory and practice of LSLIRE recognition and assessment, and to the management of downstream implications. Machines are a valued complement to a more-than-adequate complex human nature, rather than a replacement for it, and learning, experience, intuition and judgment matter. ■

Reinsurance Conference 1, Hurricane Sandy 0

By Michael L. Frank

The week of Oct. 22 was the first reinsurance conference in the Dominican Republic. The conference was held in Santo Domingo with a focus on educating the insurance community in the Dominican Republic on reinsurance.

The conference kicked off with interviews with the Dominican Republic press, including interviews on two television shows (*Metropolis* and *El Día*) and several radio shows on 95.7, followed by three days of seminars on all facets of the reinsurance industry. Subject matter covered included review of insurance and reinsurance systems internationally with focus on the following areas:

- Overview & History of Reinsurance
- Review of the United States, London, Bermuda, Brazil, China & Other Markets
- Review of Reinsurance Company Structures including Captive Insurance Companies
- Financial Reporting, Reserves & Cash Flow Testing
- Turnkey Solutions Including Underwriting and Claims Management
- Review of Specialty Products & Hybrid Reinsurance Solutions
- Social Media Strategies and New Products in the Reinsurance Market
- Sample Transactions and Case Studies in Life, Health, Annuity and Property/Casualty
- Use of Trusts and Other Creative Finance Solutions
- Discussions of Catastrophe Coverages and Cat Bonds
- Review of Regulations and Opportunities in the Dominican Republic

Presentations were done in multiple languages (English and sometimes Spanish) with translators provided so all attendees could learn and participate in the sessions.

Overall, attendance in the event was significant. Despite Hurricane Sandy's attempt to sabotage the event, close to 100 people attended the conference, including approximately 40 insurance professionals plus a large number of college and high school students studying math, science and business at two of the prominent schools in the

Dominican Republic, i.e., Universidad Iberoamericana (UNIBE) and Grupo Corporativo (GC) New Horizons.

The event was sponsored by a variety of Dominican Republic, U.S. and other international organizations in insurance, banking, education, legal, actuarial and professional associations. Some of the sponsoring organizations, listed in alphabetical order, include:

- ADARS
- ANJE
- Aquarius Capital
- Benedetto Laskay LLC
- El Mundo de las Negocios
- Escuela de Guadados Unibe
- Franco & Acra Tecniseguros
- Fundación Consenso, Renovación y Cambio (CRC)
- GC New Horizons
- Grupo
- Hannover Life Re Company
- Humano ARS
- Langas Abinadar
- LICAS
- Pena Izquierdo
- Presidio
- Society of Actuaries Reinsurance Council
- UNIBE
- University of Michigan
- Vivir Seguros
- WorldCare International Inc.

Many others either contributed content (speakers and material) to the meeting or sponsored events and activities.

The attendees were very engaging, asking a variety of questions with open discussions on the opportunities and need for improvements in the country to grow the reinsurance market. The event hit some speed bumps along the way with Sandy hitting the country and damaging many of the facilities with the staff at UNIBE and GC New Horizons developing creative solutions in order to keep the conference on track.



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Some memorable moments included:

- The first sign of the storm when Don Rusconi (Aquarius Capital) was presenting while the walls of UNIBE started to shake and move.
- The power going out and sounds of broken glass (windows breaking) during one of the event luncheons.
- Individuals on motorboats and water skis driving through the middle of town.
- Fifty-foot-high waves hitting the shoreline and highways while we were driving to the airport (only to land in New York to have Sandy catch up with us two days later)
- Juggling of schedules to manage the challenges of speakers traveling internationally to the conference and their ability/inability to make the conference during their scheduled time slots.
- Flooding into the Hotel Embajador (some may remember this hotel from the scenes in the *Godfather Part II* in Cuba—actually filmed in the Dominican Republic) while a large number of hotel staff worked feverishly trying get the water out of the hotel during Fashion Week. It was interesting to see Fashion Week and Reinsurance Conference occurring simultaneously with a unique blend of insurance professionals and supermodels.

The numbers of memorable moments were too many to count. However, despite the obstacles, the event was successful. There appears to be a significant interest to grow the reinsurance economy in the Dominican Republic. The blend of tourism and commerce makes the Dominican Republic a potential attractive market, though it needs to develop the infrastructure to be a true insurance economy and is not without obstacles and challenges. As an example, certain insurance products (e.g., life insurance) have a high premium tax to consumers.

In addition, improving professional insurance education in the Dominican Republic through exporting expertise and training becomes essential, while promoting organic growth of insurance professionals. The expansion of licensing and continuing education

programs for insurance brokers, claims adjusters, actuaries, underwriters and other insurance professionals through partnerships and universities could be a good starting point.

Furthermore, the feedback of attendees highlighted the need for operational and regulatory changes to encourage compliance of insurance organizations and encourage the marketing/consumption of insurance products. This may include formations of organizations such as Association of Bermuda Insurers and Reinsurers (ABIR) and the National Association of Insurance Commissioners (NAIC), for example, to deal with establishing of public policy and guidelines while working with the local insurance regulators and insurance companies to establish policies and market conduct. At minimum, a first step could be the establishing of work groups within the country and volunteers from outside the Dominican Republic to focus in this area.

SPECIAL ACKNOWLEDGMENTS

In addition to the sponsors, we offer a special thank you to the staff of UNIBE and GC New Horizons for hosting the event and helping manage the chaos resulting from Sandy. I would also like to thank Fauntly Garrido (GC New Horizons), Luis González (CRC) and Jose Flores (LICAS) and their teams for making the conference a success, both in content and safety, and hosting presenters and providing a tour of Santo Domingo. I am looking forward to the next conference, though hopefully the event will be a little less memorable. ■



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