Report

of the

Society of Actuaries

Alternative Tools for

Mortality Risk Management

Survey Subcommittee

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Society of Actuaries
475 N. Martingale Rd., Ste. 600
Schaumburg, IL 60173
Phone: 847-706-3500
Fax: 847-706-3599
Web site: http://www.soa.org

Introduction

The attached report presents the results of a survey conducted by the Society of Actuaries Mortality and Underwriting Survey Committee in July of 2008.

The changes in the reinsurance marketplace, regulatory changes and the potential for catastrophic death claims have intensified the focus on mortality risk management. As a result, senior managers are asking how different companies in the life insurance industry are managing mortality risks.

To help answer these questions, the Survey Subcommittee asked for information related to a company's practices with respect to alternative tools for mortality risk management. Twenty-seven companies responded to our survey.

This report includes sections on:

- Modeling mortality risk
- Uses of reinsurance to manage mortality risk
- Retention / large case management
- Catastrophe reinsurance
- Mortality concentration of risk
- Catastrophe bonds

Caveat and Disclaimer

While we anticipate and hope that the results of this survey prove useful for the industry, it should be noted that, while the data the Survey Subcommittee received was fairly comprehensive, it is by no means a look at the whole industry.

This report is published by the Society of Actuaries (SOA) and contains information based on input from companies engaged in the U.S. life insurance industry. The information published in this report was developed from actual historical information and does not include any projected information. The SOA and the participating companies do not recommend, encourage or endorse any particular use of the information provided in this report. The SOA makes no warranty, guarantee or representation whatsoever and assumes no liability or responsibility in connection with the use or misuse of this report.

The Survey Subcommittee thanks all of the companies who participated in this survey. We also thank those who helped us review this document and offered helpful suggestions and comments. Finally, the Survey Subcommittee thanks a number of the Society of Actuaries staff for their help in completing this project, especially Jack Luff and Korrel (Crawford) Rosenberg, without whose help this could not have been completed.

Comments on this report and suggestions for other surveys are welcome and can be addressed to the Mortality and Underwriting Survey Committee c/o The Society of Actuaries.

Alternative Tools for Mortality Risk Management Survey Subcommittee
Connie Dewar, Chair
Mary Broesch
David Bruggeman
Michael Choate
Steve Douglas

SOA Staff Liaison: John A. Luff
SOA Research Liaison: Korrel E. Rosenberg

Executive Summary

The key results of the Alternative Tools for Mortality Risk Management Survey are highlighted below. The statements and numbers in this executive summary reflect what was reported by the companies participating in the survey during July of 2008. The percentages reflect the proportion of all respondents answering a particular question and may or may not reflect broader industry practices.

Company Information

- Twenty-seven companies participated in the survey, 24 life insurance companies and three reinsurers. Based on life insurance inforce, the companies can be split into large (70%), medium (15%) and very small (15%) sized insurers and reinsurers.
- The split between individual and group business inforce was 78% and 22%, respectively. In 2007, 55% wrote primarily term new business and 26% wrote primarily group new business.

Modeling Mortality Risk

- Seventy-four percent of the respondents used models to project future mortality risk for a variety of purposes aside from cash flow testing, with financial planning the most common purpose.
- Of those companies that used models for projecting mortality risk:
    - Ninety percent of modeling was performed internally.
    - Models were seen as effective for validating against experience and projecting mortality risk.
    - About half of the respondents cited their models as very sophisticated or sophisticated and the other half as basic or very basic.
    - A majority of respondents modeled catastrophic death claims for pandemics, but not for terrorism and natural disasters.
    - While 86% of respondents sensitivity tested mortality, only 48% of respondents performed stochastic testing.

Use of Reinsurance to Manage Mortality

- Survey results show reduced reinsurance utilization over the last several years. The number of responding companies ceding more than half of their business declined from 48% in 2003 to 41% in 2005 and to 30% in 2007.
- Results of new business reinsured varied significantly between the group life, individual term life and individual permanent life types of business. Term life was reinsured the most and group life the least.

- Reduction in reinsurance utilization was accomplished in part by a change from first dollar quota share to excess of retention and, in part, by an increase in retention limit. From 2003 to 2007, the percentage of responding companies that ceded more than half of their business on an excess basis increased from 39% to 58%. This trend is driven by the Term life writers.

<u>Retention / Large Case Management</u>

- Various types of retention limits were used, with overall corporate limits used by a majority of respondents. Of these, 50% reported corporate retention greater than $2 million compared to 35% at those levels previously.
- Since 2006, 46% of respondents increased their corporate retention and 59% increased their U.S. individual life retention.
- Companies have been retaining more of their business – one key reason was a change in risk tolerance.
- Thirty-three percent of companies who made a retention change also initiated a recapture program.
- Over seventy-four percent of respondents were not considering a retention change in the next two years.
- The most critical factor driving mortality considerations when setting retention was issue age.
- A vast majority of respondents believed they had effective or very effective controls in place to manage over-retention situations.
- Over one-third of the respondents offered special programs to issue business within their retention. Most of this business was written on amounts using simplified issue underwriting.

<u>Catastrophe Reinsurance</u>

- About three-fourths of the companies surveyed either used, or were considering using, some type of non-proportional reinsurance to manage mortality risk.

<u>Mortality Concentration of Risk</u>

- Most respondents do not limit exposure in a single location. For those that do, mortality concentration limits for exposure to a single location have appeared to increase versus the 2005 Risk Management Survey.
- Zip code and single campus were the most popular terms to define a single location.

Catastrophe Bonds

- Catastrophe bonds were not widely used among the companies surveyed. The vast majority had either not considered purchasing a catastrophe bond or had considered, but decided not to purchase.
- The main reason for not considering catastrophe bonds was that there was no need.
- Price and mismatch risk were noted as the key reasons for some of those who considered, but decided not to purchase a catastrophe bond.

Other

- The vast majority of the respondents had not considered hedging mortality risks against other risks.

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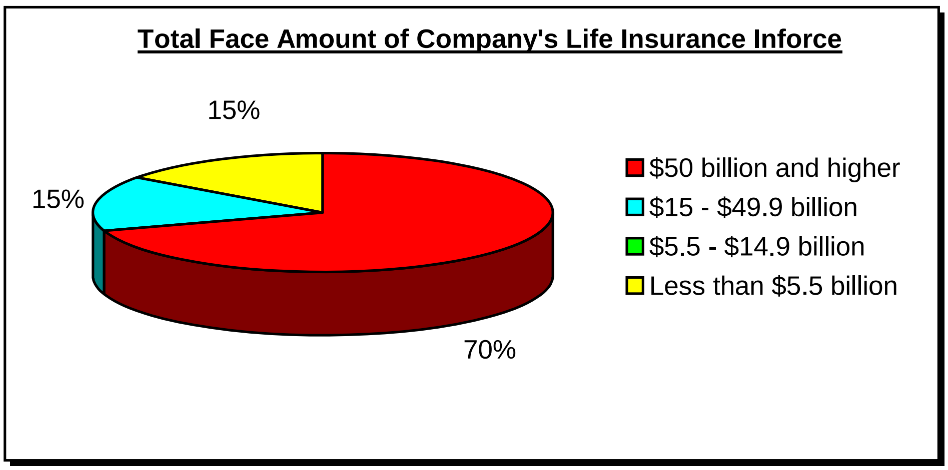
Alternative Tools for Mortality Risk Management

Section 1 – Company Information

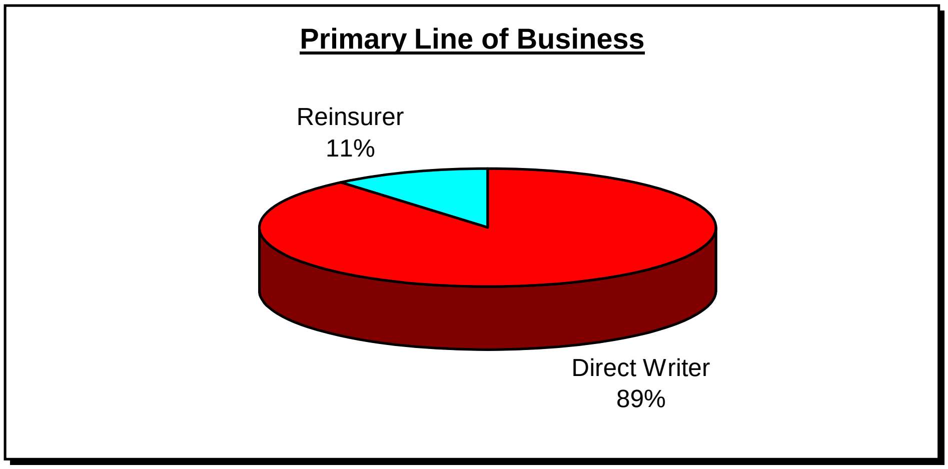
The survey requested information from U.S. life insurance companies and reinsurers in July of 2008 with respect to alternative tools for mortality risk management. The questions in this section were used to provide background information and to further analyze the subsequent sections. To ensure confidentiality, results are not shown if individual companies could be identified or if only one or two companies responded in a particular way.

What is the total face amount of your company's life insurance inforce?
(There were 27 respondents.)



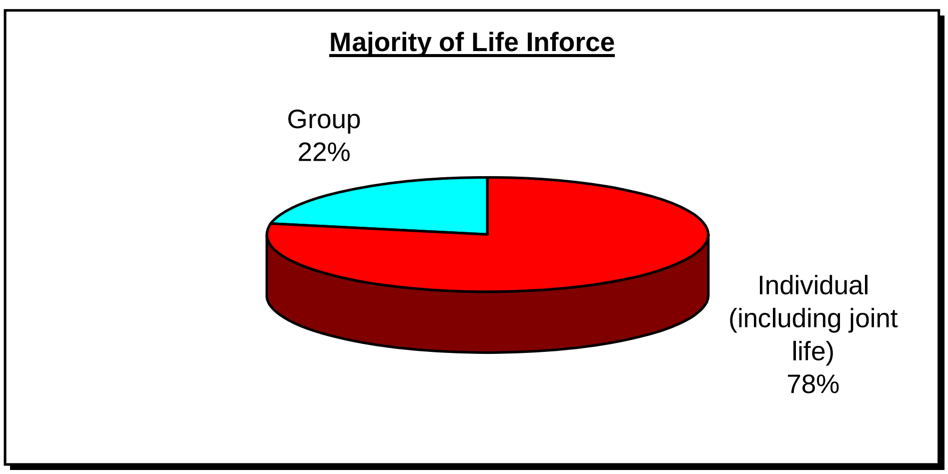
The majority of respondents (70%) had life insurance inforce amounts of $50 billion and above. The remaining respondents were equally split between the categories of $15 - 49.9 billion of life insurance inforce and less than $5.5 billion of life insurance inforce. None of the respondents reported life insurance inforce between $5.5 and $14.9 billion.

What is your company's primary line of business?
(There were 27 respondents.)



Most respondents (89%) were direct writers, with the remaining ones reinsurers or retrocessionaires (11%).

What is the majority of your company's total life inforce?
(There were 27 respondents.)



Individual life represents the majority of life insurance inforce for 78% of respondents, while group life is dominant for the remaining 22% of respondents.

What was your approximate distribution of life sales by face amount in 2007?

a) Direct operations

Distribution of 2007 Life Insurance Sales by Face Amount	0%	1-25%	26-50%	51-75%	76-99%	100%
Term	19%	15%	11%	33%	22%	
Universal Life – with secondary guarantee	44%	56%				
Universal Life – without secondary guarantee	26%	59%	15%			
Other Permanent	30%	59%	11%			
Group	59%	4%	11%	11%	7.5%	7.5%
Other		11%				
# of Respondents	**27**					

The table shows that 55% of responding companies wrote primarily term business and 26% of responding companies wrote primarily group business, while 59% of companies did not write any group business in 2007. The table also shows that 56% of the responding companies wrote universal life with secondary guarantees and that this product type accounted for no more than 25% of their 2007 sales. No companies wrote UL (with or without a secondary guarantee) or permanent coverage as more than half of their total 2007 sales.

Other responses that were specified by 11% of respondents included:
- *COLI / BOLI*
- *Credit life*
- *Variable universal life*

b) Reinsurance / Retrocession operations

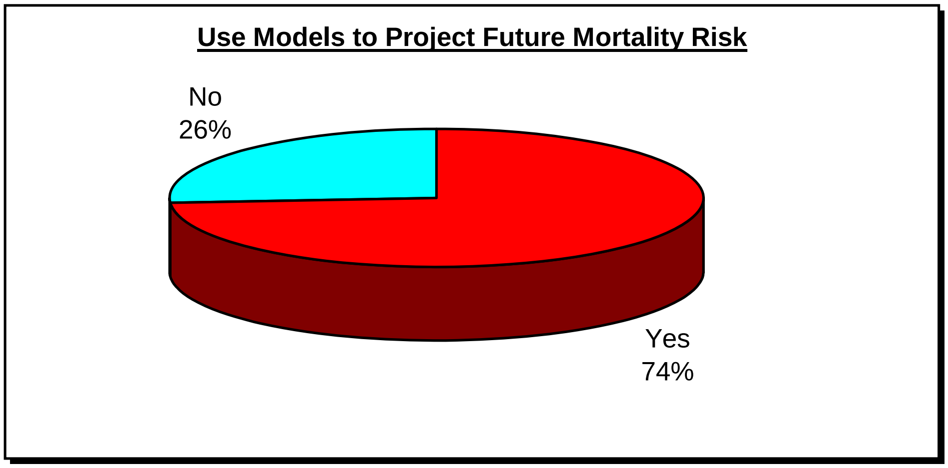
Distribution of 2007 Life Insurance Sales by Face Amount	0%	1-25%	26-50%	51-75%	76-99%	100%
Term		67%	33%			
Permanent				67%	33%	
Group		50%				50%
Other						
# of Respondents	**5**					

For the five respondents with reinsurance or retrocession operations, there were two that reported 100% of their 2007 life insurance sales by face amount to be group business. Of the remaining three respondents, two wrote a combination of term, permanent and group, while the other one wrote only the term and permanent business. Furthermore, it appears that two respondents have both direct and reinsurance/retrocession operations.

Section 2 – Modeling Mortality Risk

The following questions were meant to gather information about companies' ability to model their mortality risk.

Does your company use models to project future mortality risk, aside from pricing or cash flow testing?
(There were 27 respondents.)



The majority (74%) of the respondents use models to project future mortality for purposes other than pricing and cash flow testing.

For what purpose are the models used?

Purpose	% of Respondents
Financial planning	48%
Determining economic capital	41%
Validation against pricing assumptions	41%
Management reporting	37%
Risk tolerance	37%
Embedded value metric reporting	33%
Risk based capital analysis or reporting	30%
Calculate economic reserves	22%
Evaluation of new retention limits	22%
Support reinsurance transactions	22%
Other	4%
# of Respondents	**20**

Almost half of the respondents that use models to project future mortality do so for financial planning purposes. Percentages total more than 100% since a number of the respondents indicated more than one purpose.

Other responses included:

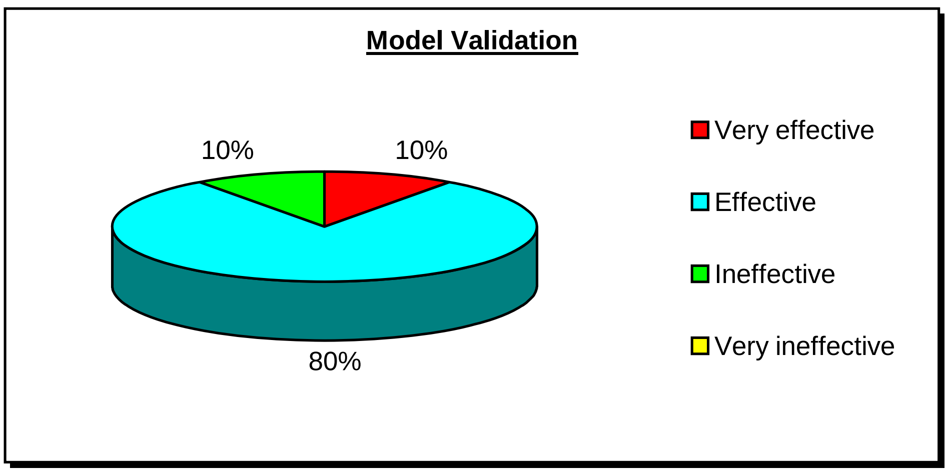
- *US GAAP*
- *ALM*

Who does the modeling?

Who does the Modeling	% of Respondents
Internal	90%
Consultants	24%
Reinsurers / Reinsurance Brokers	14%
# of Respondents	**21**

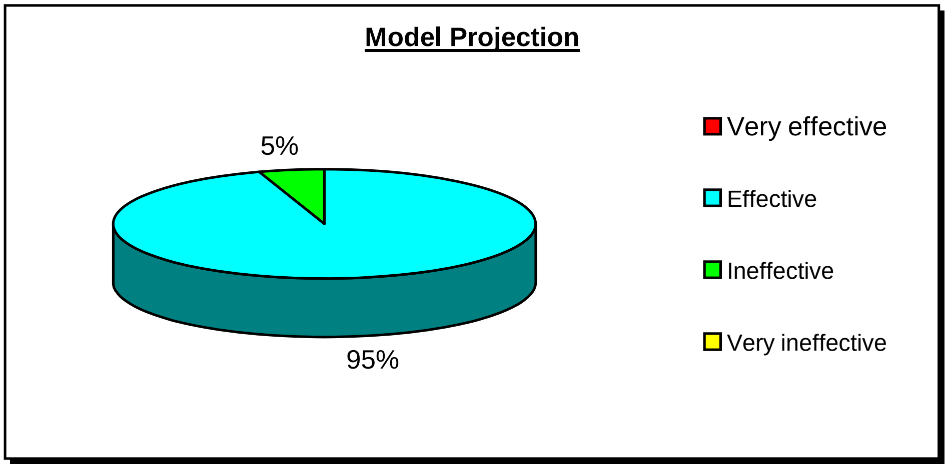
The vast majority (90%) of respondents who use models to project future mortality do so internally. Percentages total more than 100%, since a number of respondents indicated modeling is done more than one way.

How would you categorize how well your company's models validate against actual experience?
(There were 21 respondents.)



The vast majority (90%) of respondents categorize their model validation as effective (80%) or very effective (10%), while 10% categorize their model validation as ineffective. None of the respondents categorized their model validation as very ineffective.

How would you categorize how well your company's models project mortality risk? (There were 20 respondents.)



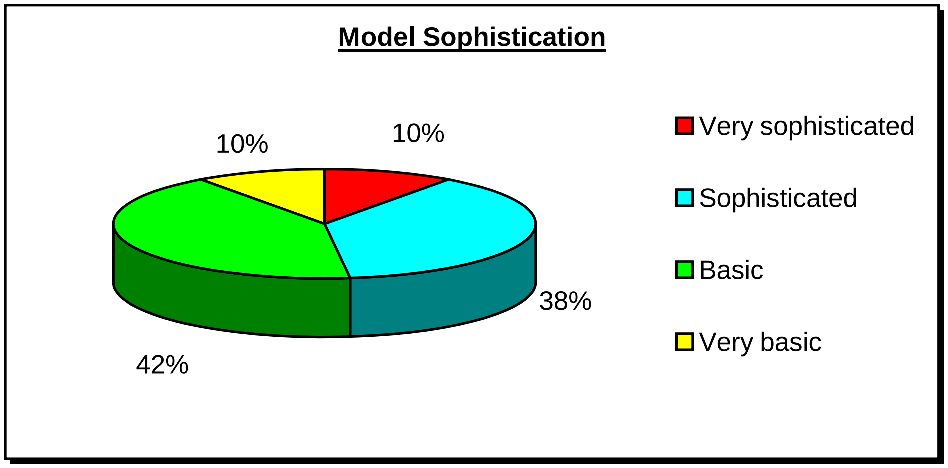
The vast majority (95%) of respondents categorize their models as effective in projecting mortality risk, while 5% reported this as ineffective. None of the respondents categorized their model's ability to project mortality risk as very ineffective or very effective.

What items were considered to support how well the models validate against actual experience and project mortality risk?

Items Supporting Model Validation and Projection	% of Respondents
Previous year expected mortality aligns well against actual mortality	70%
Major products validate well	50%
Reproduce starting values reasonably well	45%
Older products validate well	25%
Experience not credible yet	5%
Dynamic validation not done	5%
# of Respondents	**20**

The majority (70%) of respondents reported that their "Previous year expected mortality aligns well against actual mortality," which supports their answer that their model validation is effective or very effective or that their models project mortality effectively. Percentages total more than 100%, since a number of respondents indicated more than one item.

How would you categorize the sophistication built into your company's models? (There were 21 respondents.)



Almost half of the respondents categorized their models as very sophisticated (10%) or sophisticated (38%). The other half categorized their models as basic (42%) or very basic (10%).

What items support the response to question above?

Items Supporting Model Sophistication	% of Respondents
Populations based on actual distributions	76%
Each product line has its own model	71%
Major products routinely updated for actual experience	62%
Model robust with material product options and applicable reinsurance structures	38%
All products rolled into one projection	10%
Adjust for data credibility	5%
# of Respondents	**21**

About half of the respondents reported all of the top three items as supporting their response to model sophistication. Of these, model sophistication was categorized as 20% very sophisticated, 50% sophisticated and 30% basic. Percentages total more than 100% since a number of respondents indicated using more than one item.

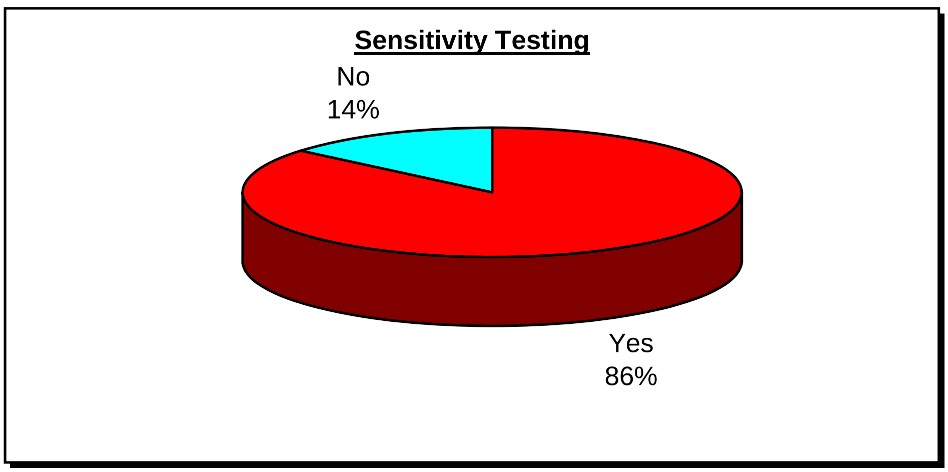
Does your company model catastrophic death claims for terrorist attacks, pandemics, natural disasters or other systemic risks?

Model Catastrophic Death Claims	Terrorist Attacks	Pandemic	Natural Disasters	Other Systemic Risks
Yes	35%	65%	30%	9%
No	65%	35%	70%	91%
# of Respondents	**20**	**20**	**20**	**11**

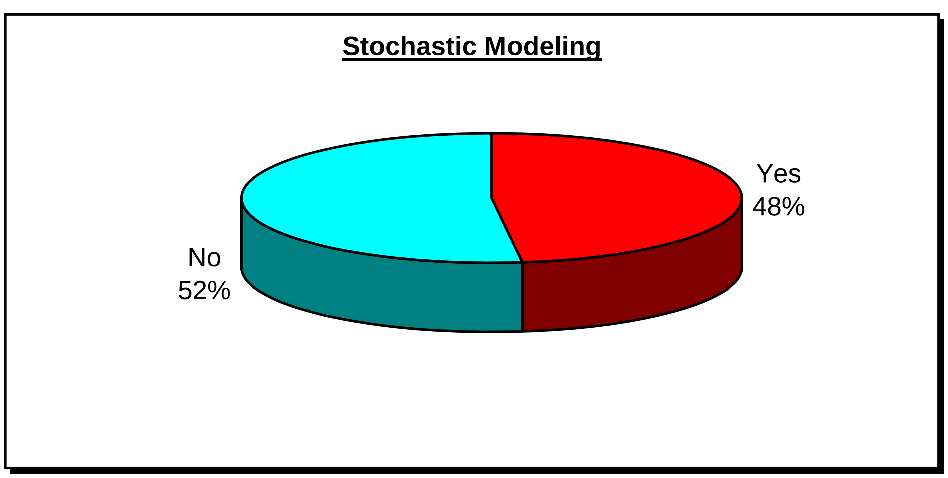
One respondent included the following in "Other":

- *Mis-estimation*
- *Incorrect trend*

When using models for projecting mortality risk, is sensitivity testing done? (There were 21 respondents.)



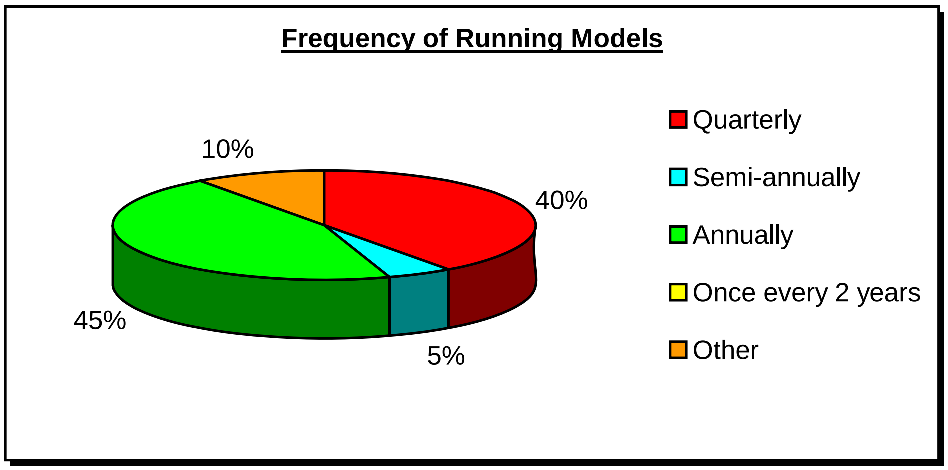
When using the models for managing mortality risk, is the model run stochastically? (There were 21 respondents.)



If so, how many scenarios are run?
On the survey, this was a write-in question; results were grouped for this report.

Number of Scenarios	% of Respondents
Less than 5	11%
Hundreds	22%
1000	33%
Thousands	33%
# of Respondents	**9**

How frequently are the models run?
(There were 21 respondents.)



The most common frequency for running the models is annually (45%), followed by quarterly (40%).

Other responses included:

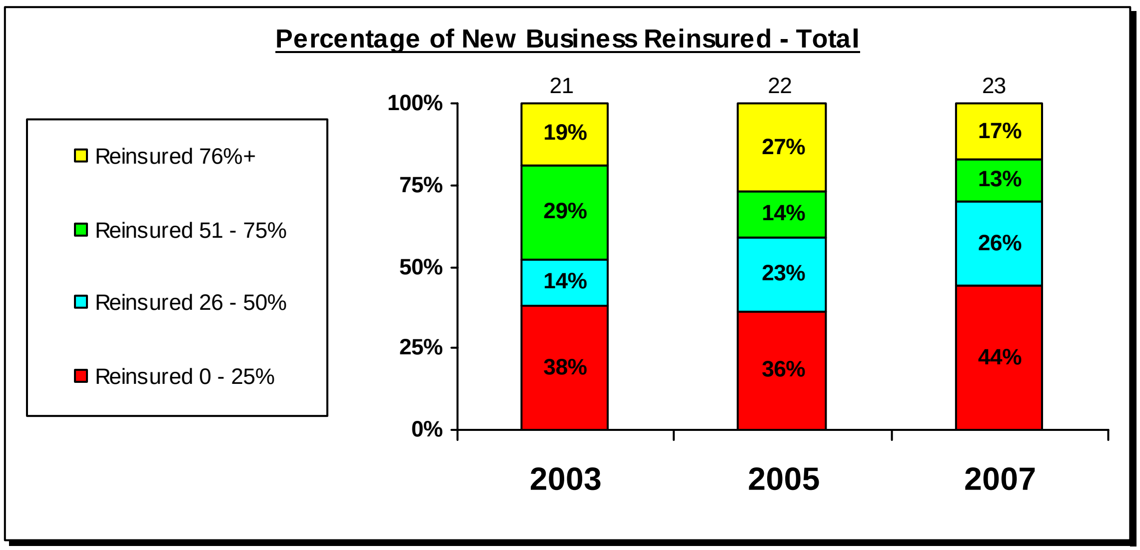
- *Prior to renewal of reinsurance treaty*
- *New effort, expect annually in the future*

None of the respondents noted that the frequency of running their models was once every two years.

Section 3 – Use of Reinsurance to Manage Mortality

The following questions were designed to gather information about companies' uses of reinsurance to manage mortality. Reinsurers were asked to answer these questions based on the business they cede to their retrocessionaires.

What percentage of your company's new business (measured by face amount) was reinsured in the following years?
(The number of respondents is included above the bar.)

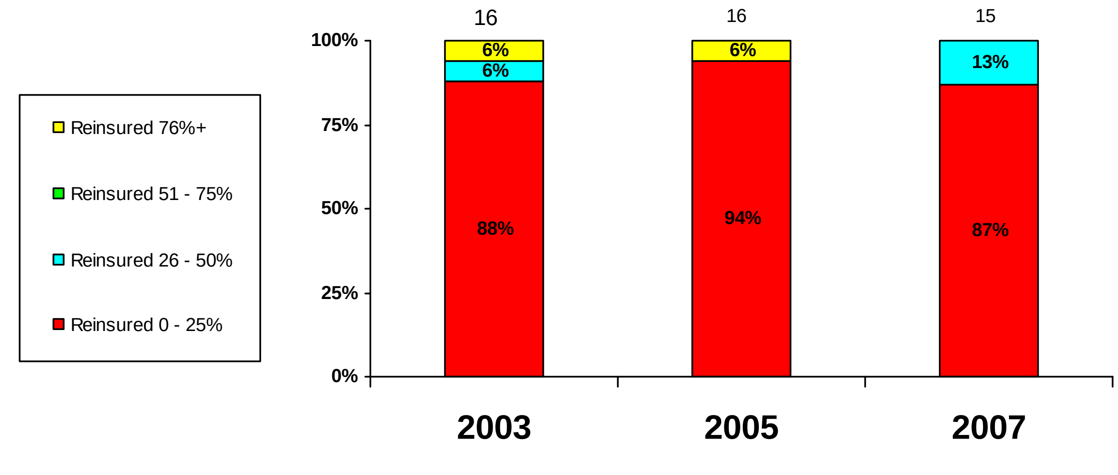


The survey results show that companies reinsured less total new business over the past five years. Those repondents reinsuring 51% or more of their total new business decreased from 48% in 2003 to 41% in 2005 and to 30% in 2007.

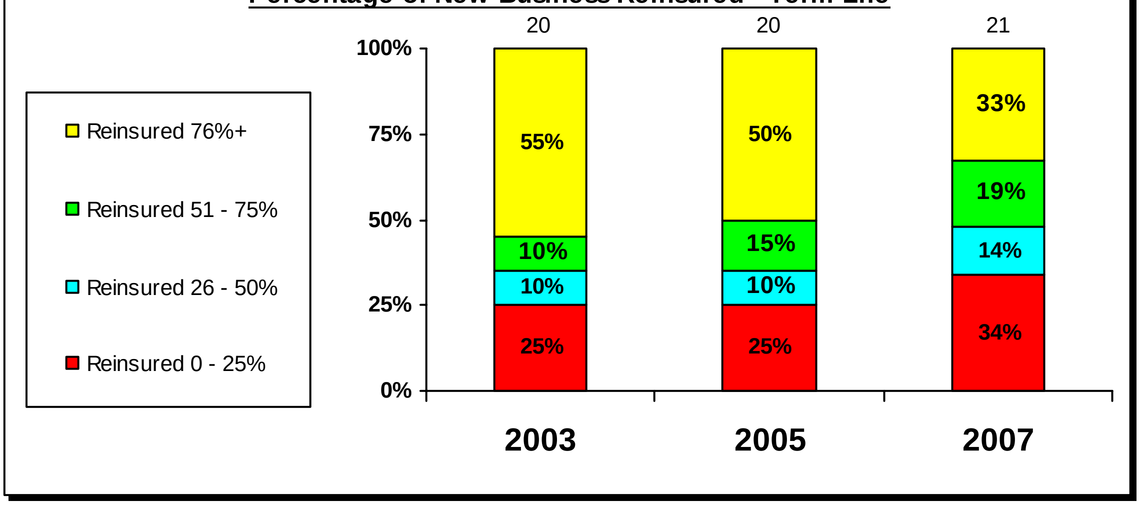
Additional breakdowns by product line below show:

- Low utilization of reinsurance among the group respondents
- While utilization of reinsurance for the term respondents remains high relative to the other product lines, trend in utilization is declining
- No real trend in permanent life reinsurance utilization; however highest level of utilization (76%+) declined from 20% to respondents in 2003 to 14% in 2007

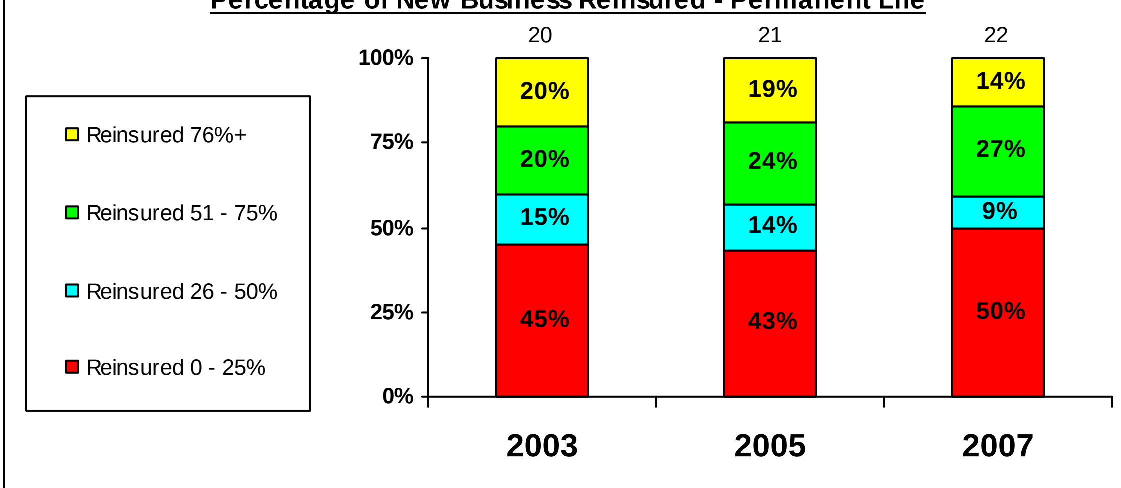
Percentage of New Business Reinsured - Group Life



Percentage of New Business Reinsured - Term Life



Percentage of New Business Reinsured - Permanent Life



Did the percentage of new business change because of a change in the terms of your reinsurance?

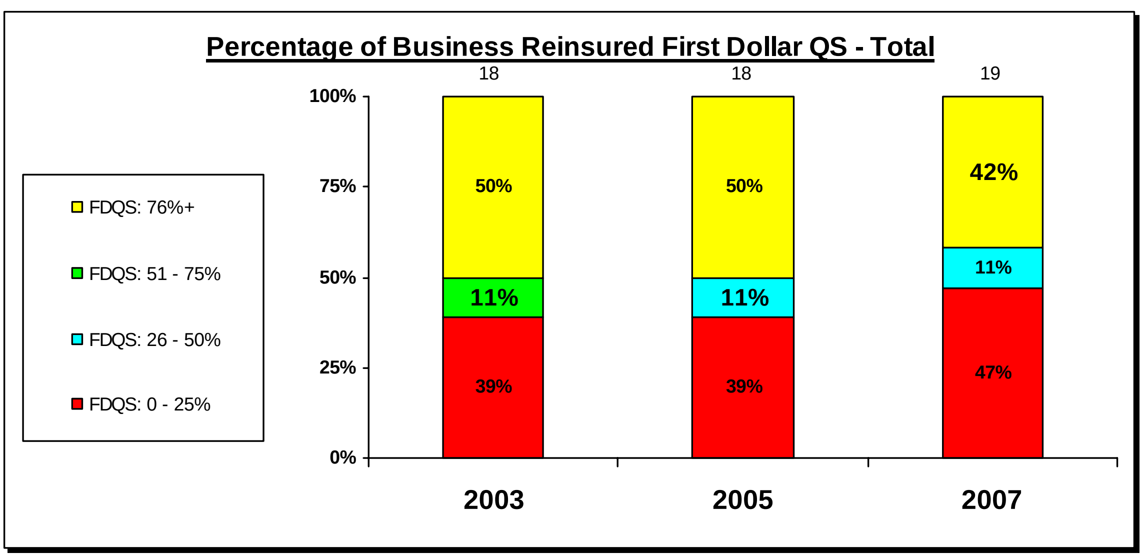
Change in New Business Being Reinsured	% of Respondents		
	Group Life	Individual Life – Term	Individual Life - Permanent
Increased retention	15%	43%	44%
Decreased retention	0%	9%	0%
Increased reinsurance rates	0%	17%	27%
Change in treaty terms	0%	35%	41%
No change	62%	35%	23%
Other	23%	9%	9%
# of Respondents	**13**	**23**	**22**

Percentages total more than 100% because a number of respondents indicated using more than one change.

Other changes included:

- *Change from quota share to excess*
- *Change from excess to quota share*
- *Changes in mortality assumption*
- *Change from YRT to coinsurance*

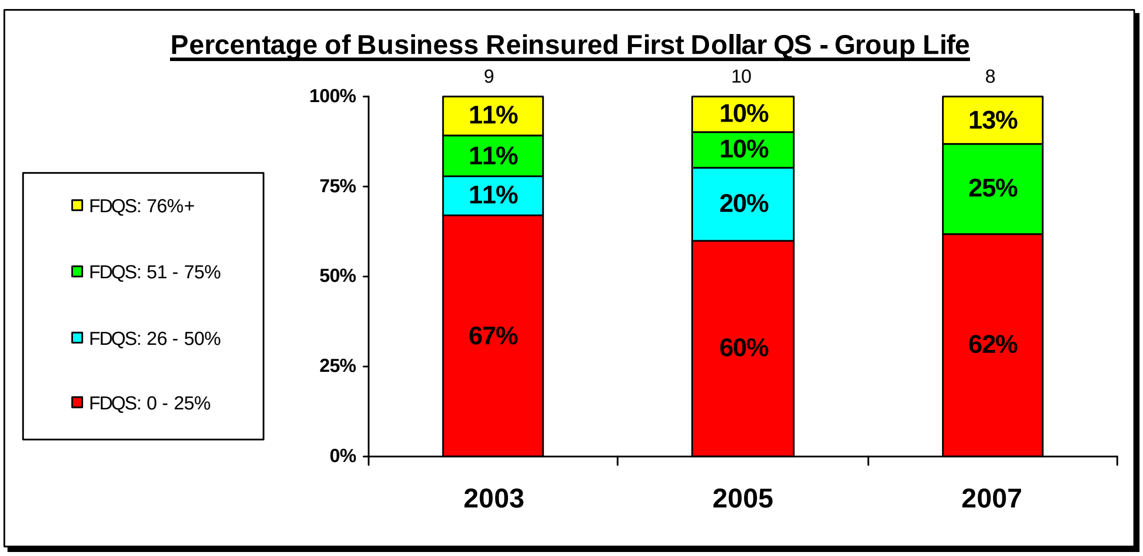
What percentage of your company's new business (based on face amount) was ceded on a first dollar quota share basis versus excess basis in the following years?

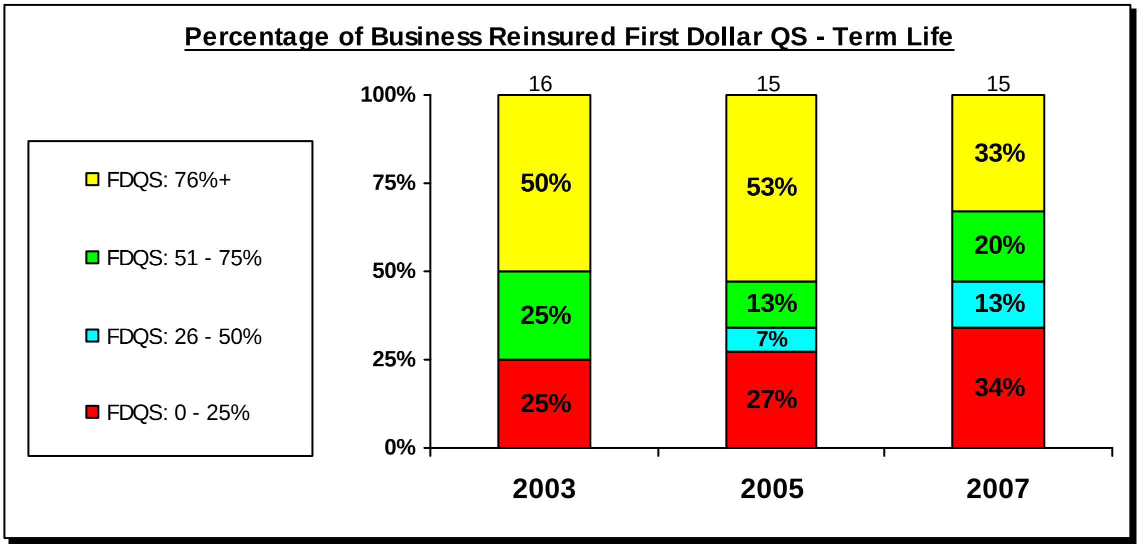


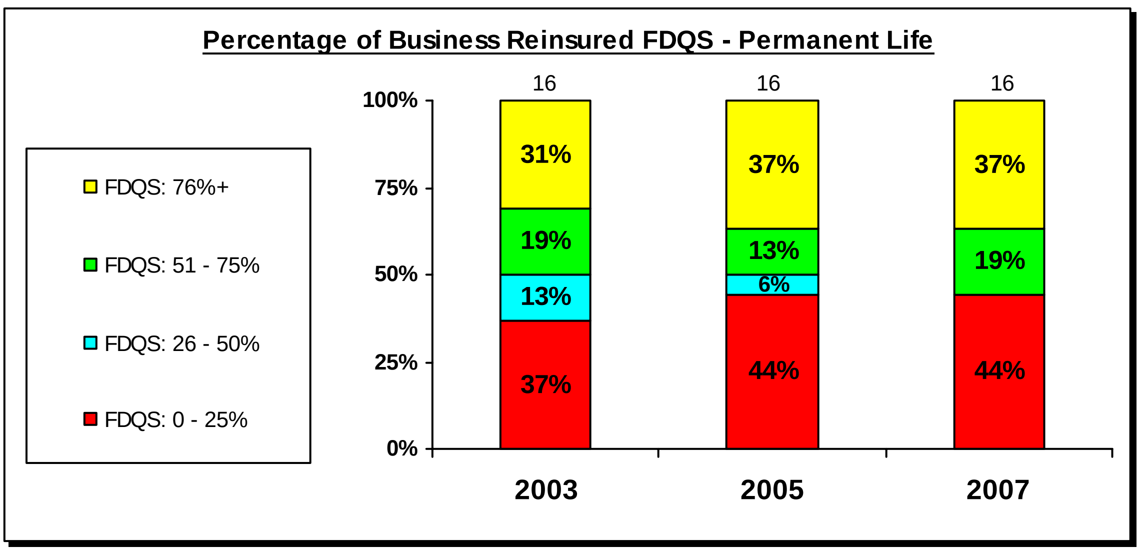
The graph shows a trend from quota share to excess of retention basis from 2003 to 2007. In 2003, 61% of respondents reinsured the majority of their new business on a first dollar quota share basis (50% in 76%+ category, 11% in 51-75% category). That figure decreased to 42% in 2007 (42% in 76%+ category, 0% in 51-75% category). Alternatively, the percentage of responding companies that ceded a majority of their new business on an excess basis increased from 39% in 2003 to 58% in 2007.

Responses by product line are shown below:

- For Group Life, reinsuring on an excess basis is more common. The number of respondents ceding more than half their business on a first dollar quota share basis increased from 22% in 2003 and 20% in 2005 to 38% in 2007.
- Term Life showed the most dramatic changes – respondents ceding 51% or more reinsurance on a first dollar quota share basis declined from 75% in 2003 to 68% in 2005 to 53% in 2007.
- Permanent Life showed opposite trend from term – respondents ceding 51% or more reinsurance on a first dollar quota share basis increased from 50% in 2003 to 56% in 2007.







If the split has changed, provide the reasons why.

Reasons Split Changed	% of Respondents
Increased retention limit	56%
Change in treaty terms	31%
Increase in reinsurance rates	25%
Increase in quota share percentage	19%
Decreased retention limit	13%
Decrease in quota share percentage	13%
Other	38%
# of Respondents	**16**

Percentages total more than 100% because a number of respondents indicated using more than one reason.

Other reasons included:

- *Change from quota share to excess*
- *Change from excess to quota share*
- *Change from YRT to coinsurance*
- *Retain more business where reinsurance rates are uncompetitive*
- *Sold business*
- *Arrangements with marketing organization*

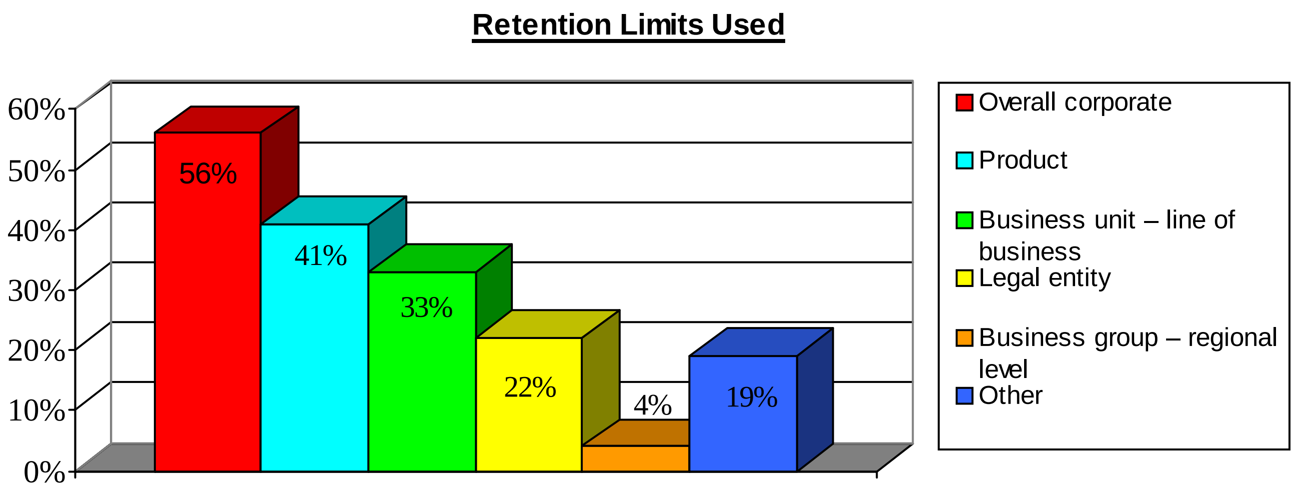
Is this split expected to change in 2008 due to a change in reinsurance terms?

New Business Reinsured	Total New Business	Group Life	Individual Life – Term	Individual Life - Permanent
Yes – more business on a first dollar quota share basis	8%	0%	14%	0%
Yes – more business on an excess basis	8%	6%	9%	10%
No	83%	94%	77%	90%
# of Respondents	**24**	**16**	**22**	**21**

Section 4 – Retention / Large Case Management

The following section asked questions to gather information about companies' retention management processes.

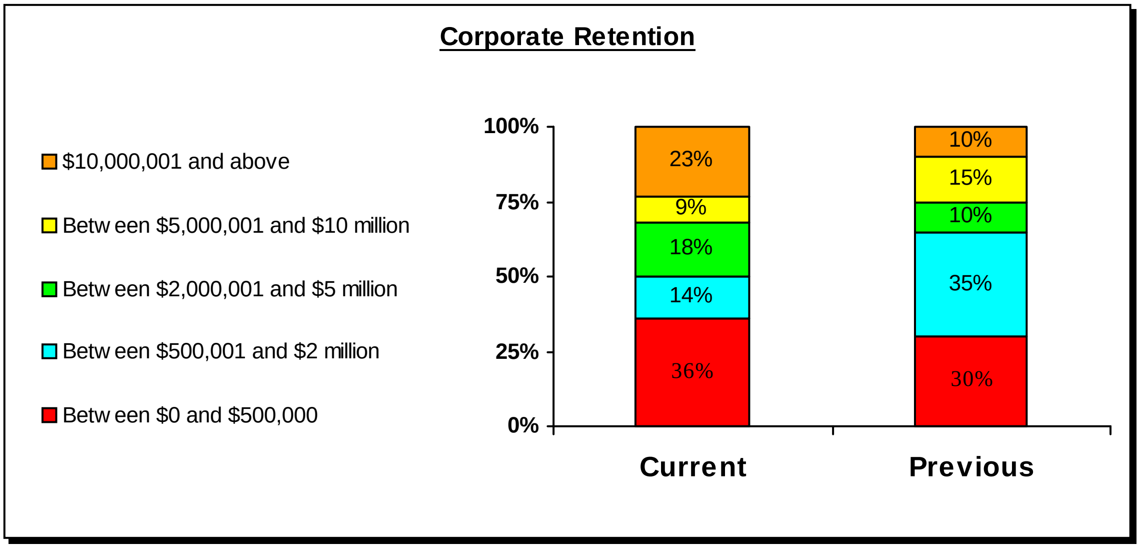
What are the various retention limits that your company uses?
(There were 27 respondents.)



Percentages total more than 100% as a number of respondents indicated using more than one type of retention limit. Other comments were specified by 19% of respondents as shown below.

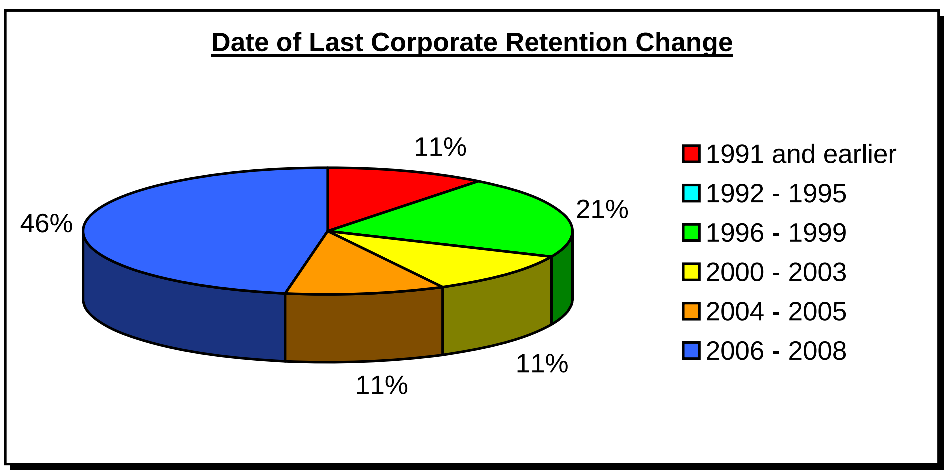
- *Avocation, occupation*
- *Issue age (2 responses)*
- *Group wide*
- *Underwriting type: SI/GI differs from full underwriting*
- *Within a product, retention is per person/per loss*

What are your company's maximum current corporate retention and previous maximum retention?
(22 respondents provided their current retention, 20 provided their previous retention.)



Current retention limits have increased; 50% of respondents reported retention limits greater than $2 million compared to 35% at that level previously. The results also included one decrease in corporate retention.

What was the year of your company's last retention change?
(There were 19 respondents.)



A majority (57%) of respondents changed their corporate retention within the past five years. About one-third of the respondents last changed their corporate retention in the years 1996-2003.

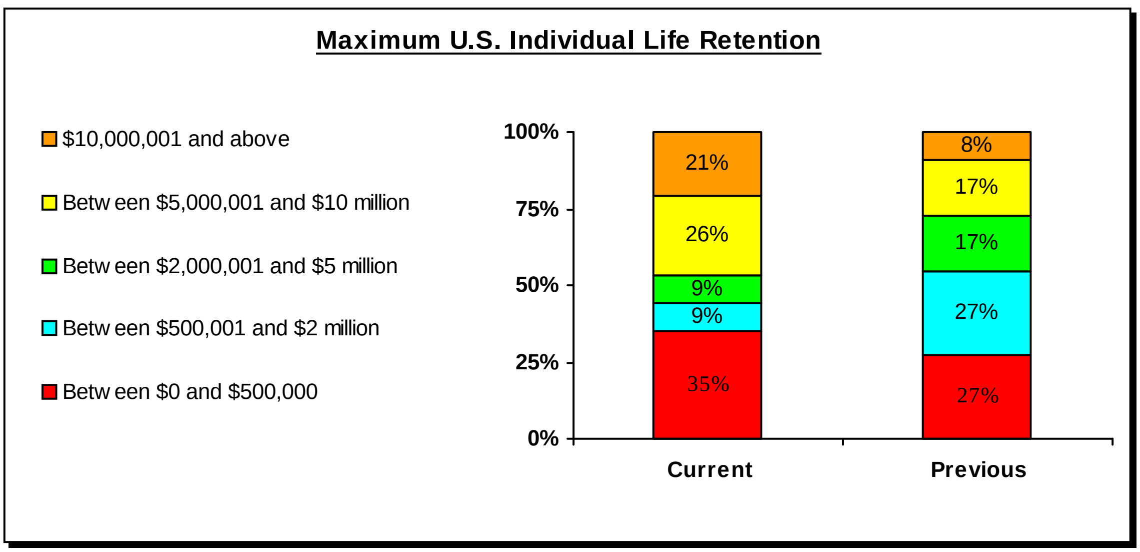
Magnitude of Retention Change

Magnitude of Retention Change	% of Respondents
Increased between 1 – 99% of previous retention	40%
Increased between 100% - 199% of previous retention	25%
Increased between 200% and 499% of previous retention	10%
Increased 500% higher from previous level	20%
Decreased retention	5%
# of Respondents	**20**

The largest percentile increases occurred among the respondents with $50 billion or more life insurance inforce. Only one company indicated a **decrease** in their corporate retention limits**.**

The survey also asked similar questions for companies with maximum retention limits for U.S. individual life business.

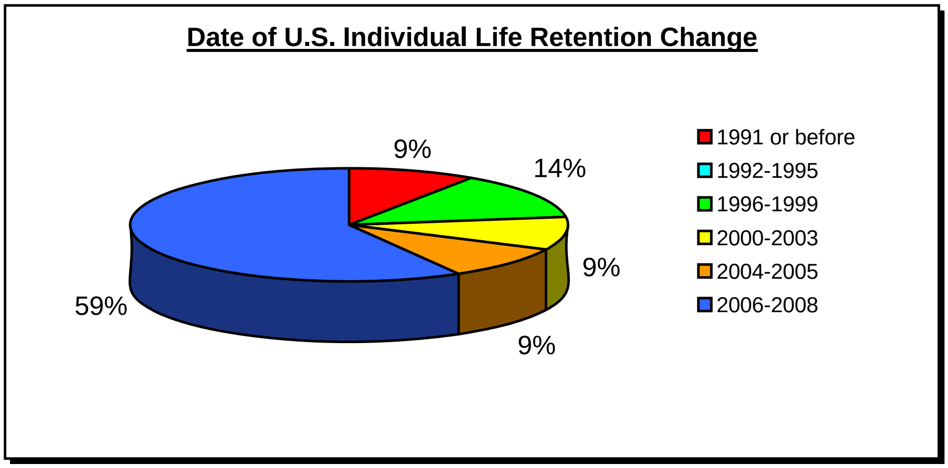
For your U.S. individual life business, what is your company's current maximum retention and previous maximum retention?
(23 respondents provided current retention, 22 provided previous retention.)



A majority (56%) of respondents reported current retention limits for U.S. individual life retention limits greater than $2 million. The results show both increases (23%) and decreases (14%) from previous levels of U.S. individual life retention.

It was not possible to draw any meaningful conclusions from comparing corporate retentions and U.S. individual life retention; any perceived differences are due to the different make up of the respondents. While 74% of companies reported both corporate and U.S. individual life retention limits, the vast majority (90%) reported the same limits for both. The remaining (26% of companies either reported their limits as corporate <u>or</u> individual life, not both. This influenced the results more than those companies who reported limits for both.

What was the year of your company's last retention change?
(There were 22 respondents.)



Two-thirds have changed their U.S. individual life retention within the past five years. Another 23% changed their retention in the years 1996-2003.

What were your company's reasons for changing its retention?

Reason for Change	% of Respondents	
	Corporate	U.S. Individual Life
Change in risk tolerance	43%	44%
Change in reinsurance structure	9%	15%
Change in reinsurance costs	17%	26%
Merger / acquisition	13%	4%
Improve financial metrics	13%	26%
Other	17%	15%
# of Respondents	**23**	**27**

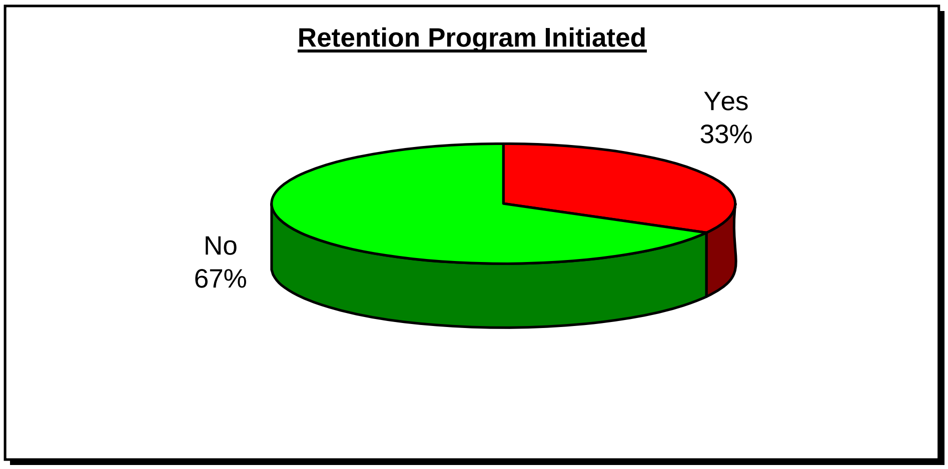
Percentages total more than 100% as a number of respondents provided multiple reasons for their retention change philosophy.

- Other reasons for changes to corporate retention were *to attract larger cases by offering increased capacity*, and that *capital and surplus increased.*

- At the U.S. Individual Life level, *increased competitiveness* and *increased new business placement opportunities* were listed as other.

- The most common reason for changing both corporate and U.S. individual life retention was due to a "Change in risk tolerance."

If your company increased its retention as indicated, was a recapture program initiated?
(There were 24 respondents.)



Is your company considering a change in its retention in the next 12 – 24 months and if so, which direction?

Considering Change	% of Respondents	
	Corporate	U.S. Individual Life
Increase	17%	18%
Decrease	0%	5%
No	71%	72%
Don't know	12%	5%
# of Respondents	**24**	**22**

Most respondents do not expect a change in their companies' retention in the next 12 – 24 months.

The survey asked for the following drivers of mortality (Issue Age, Attained Age, etc.), to be categorized in terms of importance when setting retention.

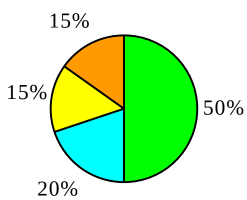
Which have an impact on mortality, when setting your retention?
(The number of respondents ranged from 19 to 22.)

Please note that in each pie chart below, the legend starts at 12:00 with Very Important and goes clockwise. A few charts show no responses or 0% for Very Important.

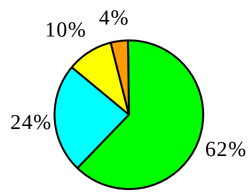
Very Important | Somewhat Important | Less Important | Not Important

Issue Age

Corporate



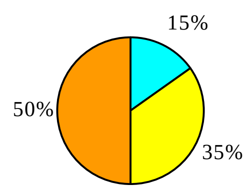
U.S. Individual Life



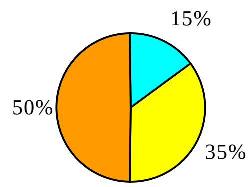
Issue age was VERY IMPORTANT, for at least half of the respondents, more so for U.S. individual life retentions.

Attained Age

Corporate



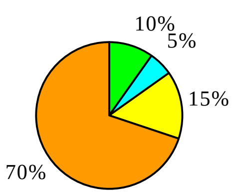
U.S. Individual Life



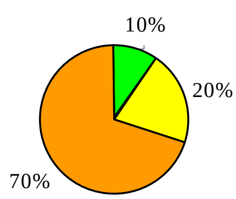
Attained age was NOT IMPORTANT for half of the respondents. The results were the same for both types of retention

Gender

Corporate



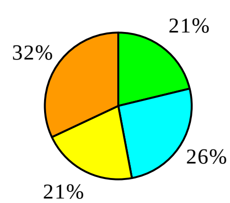
U.S. Individual Life



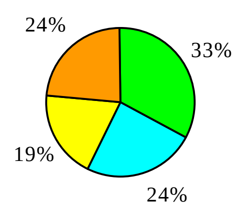
Gender was NOT INPORTANT for 70% of respondents.

Underwriting Class

Corporate



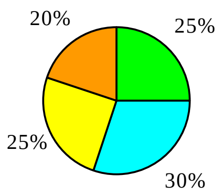
U.S. Individual Life



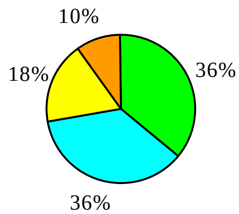
Results were almost evenly distributed, with underwriting class more important for U.S. Individual life retention.

Rating / Flat Extra

Corporate



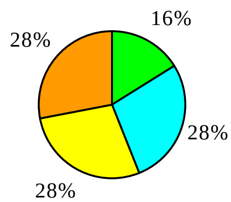
U.S. Individual Life



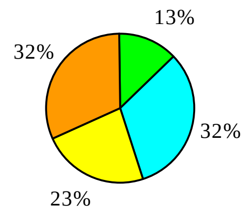
Rating / Flat Extra was viewed as VERY IMPORTANT or SOMEWHAT IMPORTANT by a majority of respondents for both types of retention limits, and much more so for U.S. individual life retention.

Product

Corporate



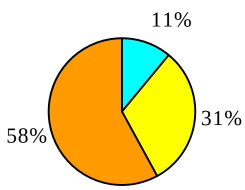
U.S. Individual Life



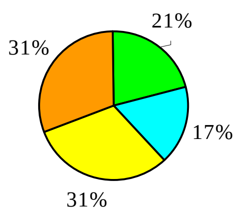
Product was mostly NOT IMPORTANT or LESS IMPORTANT to more than half of the respondents.

Foreign Residence / Travel

Corporate



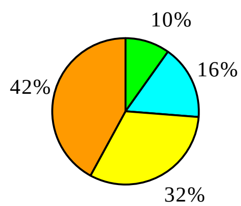
U.S. Individual Life



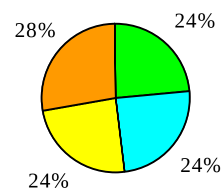
Foreign Residence / Travel was viewed as VERY IMPORTANT or SOMEWHAT IMPORTANT by 38% of respondents for U.S. life retention and 11% for corporate retention. This criterion was NOT IMPORTANT for setting corporate retention.

Special Underwriting Program

Corporate



U.S. Individual Life



Almost half of the respondents reported that Special Underwriting Program was VERY or SOMEWHAT IMPORTANT in setting U.S. individual life retention. Nearly 3/4 of the respondents found this criterion LESS or NOT IMPORTANT for setting corporate retention.

Of all the criteria, the most important for setting U.S. individual life retention limits were issue age, rating / flat extra and underwriting class. These were also the most important considerations for setting corporate retention limits, albeit to a lesser extent. Gender and attained age were by far the least important criteria followed by foreign residence / travel, even though 21% of respondents found this criterion Very Important in setting U.S. individual life retention.

Other categories or factors mentioned as VERY IMPORTANT or SOMEWHAT IMPORTANT included:

- *Avocation*
- *Private aviation*
- *Reinsurance costs*
- *Expected overall volatility greater than retention*

Does your company have a process to regularly identify cases when the company exceeds its retention?

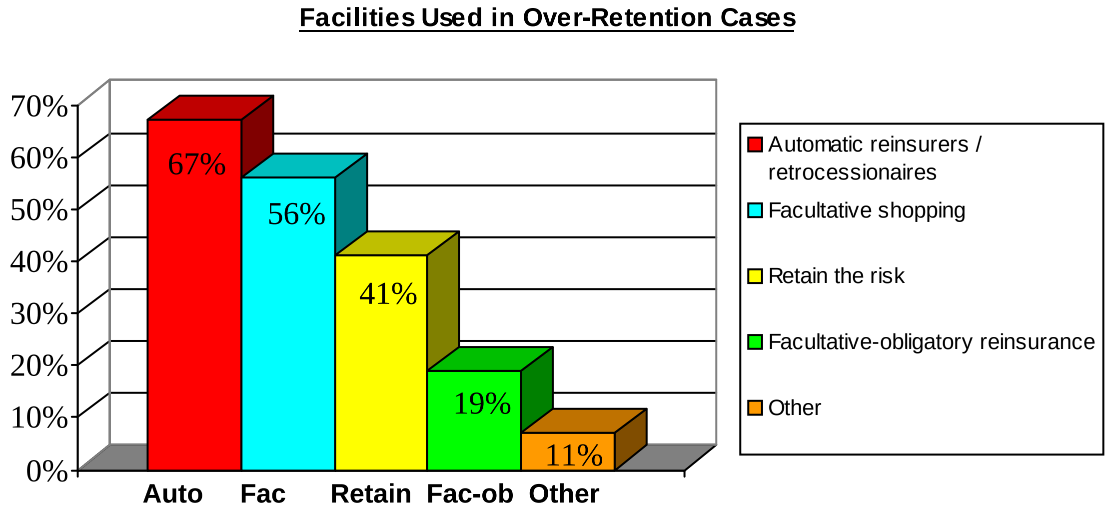
Process to Identify Over-Retention Cases	% of Respondents	
	Corporate	U.S. Individual Life
Yes	83%	96%
No	17%	4%
# of Respondents	**23**	**23**

How would you categorize the effectiveness of your company's retention management process?

Retention Management Effectiveness	% of Respondents	
	Corporate	U.S. Individual Life
Very effective	25%	30%
Effective	67%	61%
Ineffective	0%	0%
Very ineffective	8%	9%
# of Respondents	**24**	**23**

A vast majority (over 90%) of respondents view their retention management process as Effective or Very Effective.

What facilities has your company used in over-retention cases?
(There were 27 respondents.)



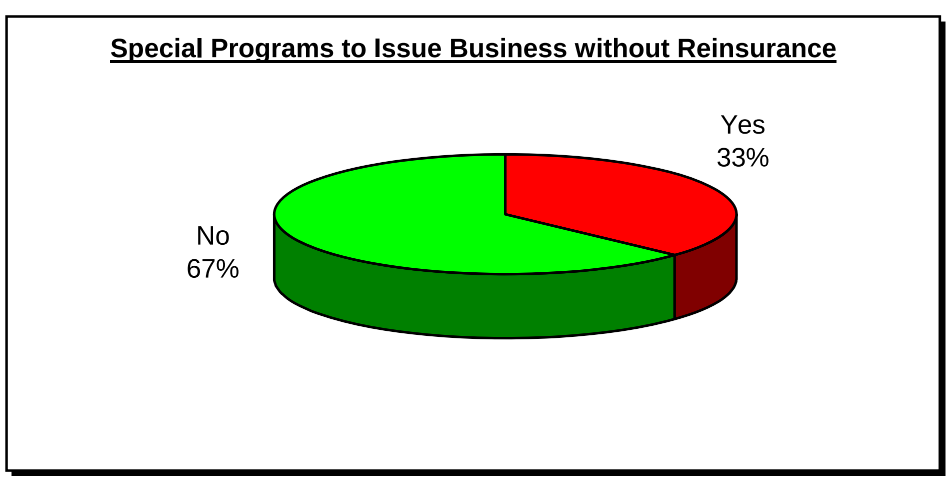
Percentages total more than 100% as some respondents selected more than one facility.

Other responses included:

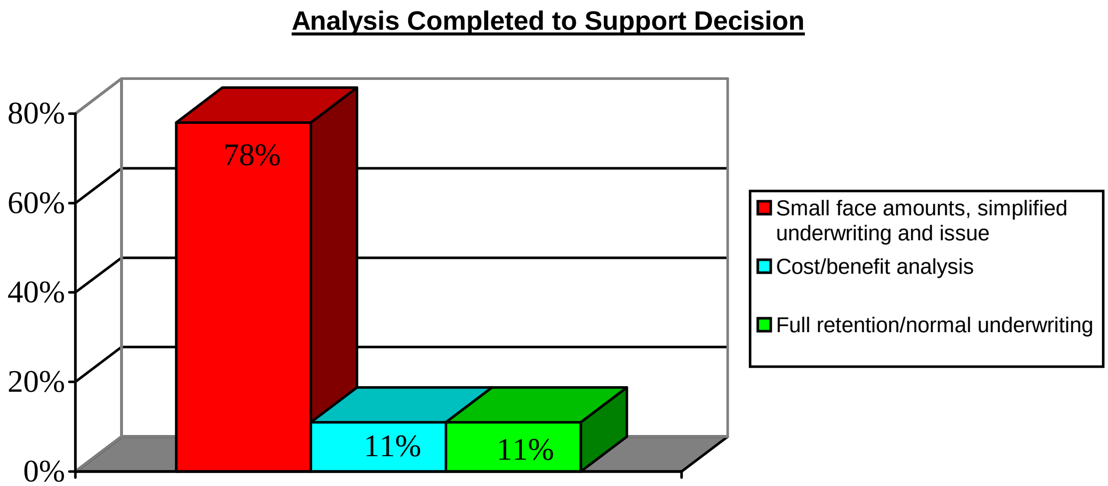
- *Decline excess over retention*
- *Excess pool*
- *Over retention cases not allowed*

The next several questions were intended to find out if companies do things differently for certain business issued within their retention, i.e., "special programs."

Does your company have any special programs in place to issue business without reinsurance support?
(There were 27 respondents.)

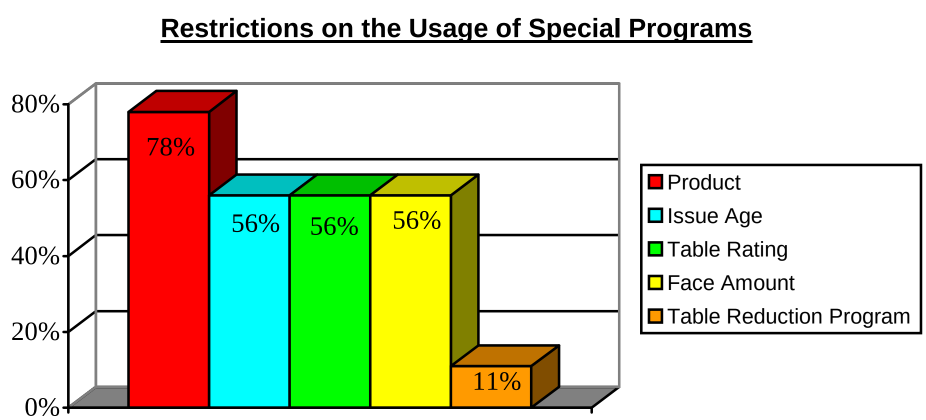


What analysis was completed to support the decision to write this business? (i.e., smaller face amounts, limited ages, etc.)
(There were 8 respondents.)



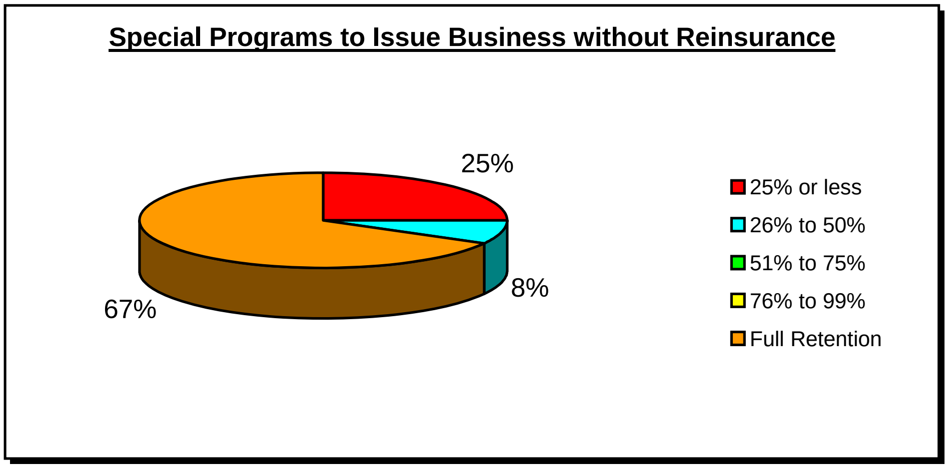
Most special programs (78%) were written on small face amounts and/or using simplified issue underwriting.

Does your company restrict the usage of these special programs based on any of the following?
(There were 10 respondents.)



Most respondents limit their special programs to certain products, issue ages, table ratings and face amounts. Percentages total more than 100% as some respondents selected more than one restriction.

What is the maximum face amount as a percentage of your <u>U.S. individual life retention</u> you would offer without reinsurance support?
(There were 9 respondents.)



What processes or controls are in place to manage the additional mortality risk from this business?

There were 10 write-in responses, with multiple controls for some respondents.

Processes or controls included (with number of responses noted in parentheses):

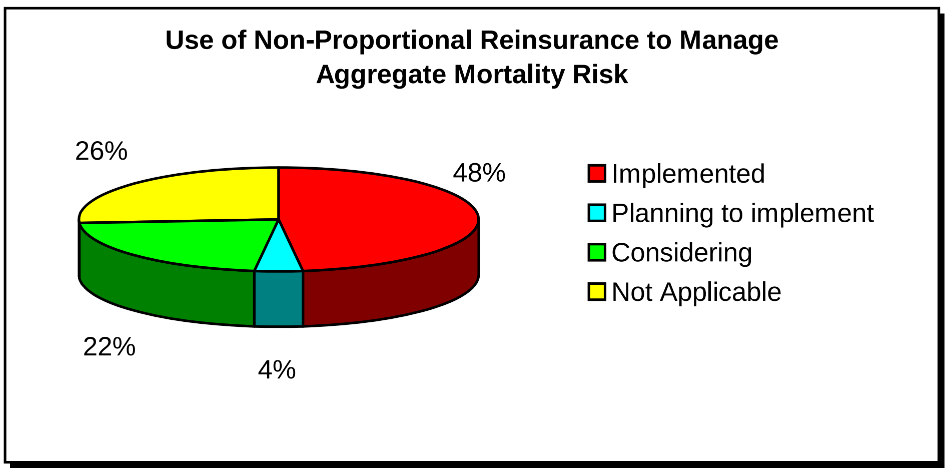
- *Monitoring of experience; (3)*
- *Limit face amount; (2)*
- *No underwriting exception; (2)*
- *None; (2)*
- *Group-wide pooling; (1)*
- *Internal / external audits; (1)*
- *Reinsurance; (1)*
- *Explicitly reflected in financial results; (1)*

Section 5 – Catastrophe Reinsurance

Terrorism, pandemics, climate changes, natural disasters and political instability are events that present catastrophic mortality potential. While catastrophic events may have been recognized in the past, they have not played a significant role in most risk management schemes. Recent events have brought them to the forefront. Not only have they been recognized, but also their potentials have been quantified and actions have been considered.

This section focuses on tools that can be used to manage mortality risks due to catastrophic events. Section 6 deals specifically with concentration of risk.

Do you use non-proportional reinsurance to manage your aggregate mortality risk? (There were 27 respondents.)



Fifty-two percent of the respondents have implemented or are planning to implement a non-proportional reinsurance program to help manage aggregate mortality risk. Another 22% are considering implementing a program.

If used, which of the following describes your company's reinsurance coverage?

Non-Proportional Reinsurance Coverage Type	% of Respondents
Traditional catastrophe reinsurance (per occurrence excess of loss)	42%
Accidental death carve-out	8%
Abnormal mortality stop loss	0%
Catastrophe reinsurance pool	58%
Other	0%
# of Respondents	**13**

Percentages total more than 100% because one company noted participating in more than one coverage type.

Traditional Catastrophe Reinsurance

Five of the respondents who noted purchasing reinsurance coverage indicated that their companies purchased traditional catastrophe reinsurance. Three of these indicated that group was their major line of business.

What is your company's retention / deductible for the lowest layer of catastrophe protection?
The retentions / deductibles ranged between $1 million and $50 million.

What is the total per occurrence limit purchased (all layers combined)?
The total per occurrence limit purchased varied from between $10 and $25 million to more than $100 million.

What is the rate on line (total estimated premium divided by total reinsurance limit per occurrence) that your company pays for all layers combined?
The rate on line ranged from less than 1% to more than 5% based on the amount of coverage purchased and the deductible.

What is the maximum reinsurance limit on any one life?
The maximum reinsurance limit on any one life ranged from a low of $250,000 to more than $1 million.

Does the coverage include terrorism?
All of the respondents' coverage included terrorism, with most covering the nuclear, chemical and biological risks.

Accidental Death Carve Out

Only one respondent indicated that they purchased accidental death carve out. To protect the confidentiality of the company, no details will be provided.

Abnormal Mortality Stop Loss

None of the respondents indicated they purchased abnormal mortality stop loss.

Catastrophe Reinsurance Pool

Seven of the respondents who indicated their companies had non-proportional reinsurance answered that their companies participated in a catastrophe reinsurance pool. Five indicated that individual was their major line of business.

In which pool does your company participate?

All seven of the respondents indicated past participation in the Special Pooled Risk Administrator Pool (SPRA), with only four that continued to participate at the time of the survey.

Was your company a participant in this pool on September 11, 2001?

Four of the respondents indicated participating in the pool on September 11, 2001.

What were your company's reasons for participating in the pool?

The reasons for participating in the pool included an inexpensive alternative to catastrophe reinsurance and pooling of risks.

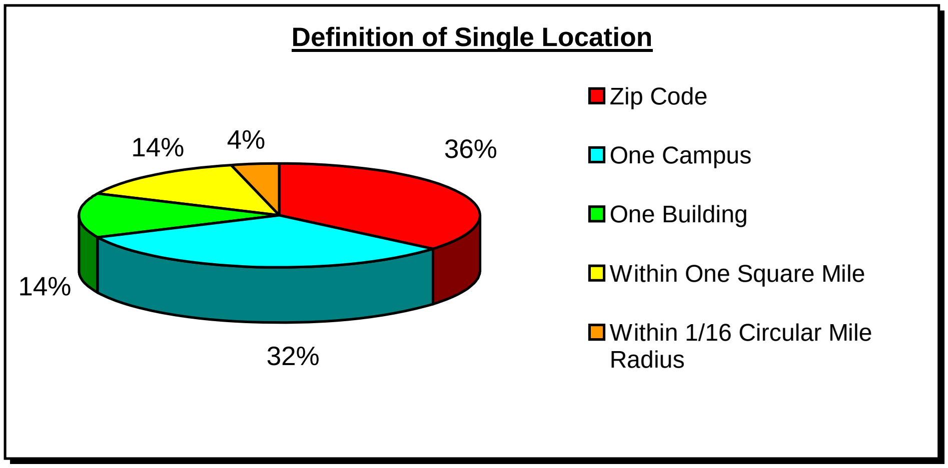
If your company is no longer a participant in the pool, what were the reasons for withdrawing?

All of the respondents whose companies no longer participated indicated their reason was the withdrawal of other participants.

Section 6 – Mortality Concentration of Risk

Mortality concentration of risk was one of the topics of the 2005 Risk Management survey. Despite a difference in respondents between the surveys, in most cases, the responses were similar. Differences between the surveys are noted below.

What is your company's definition of a single location?
(There were 22 respondents.)

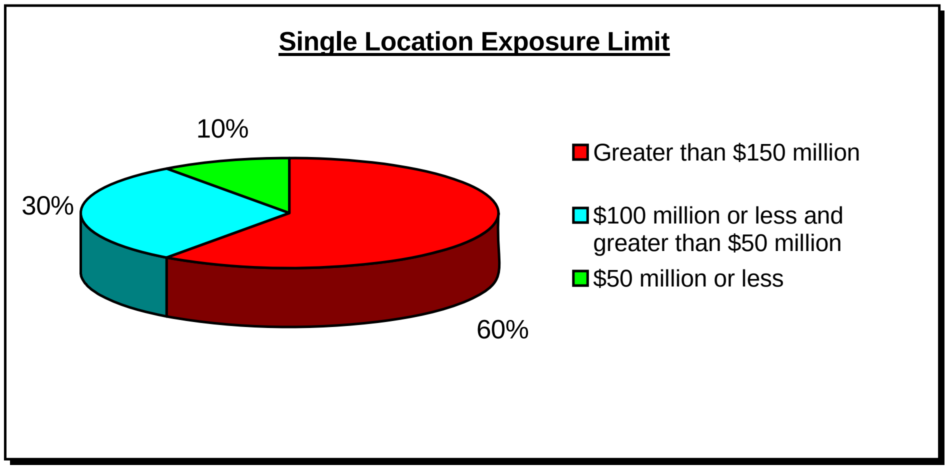


In the 2005 Risk Management Survey, 53% of respondents defined single location as 'One building' versus 14% in this report. Zip code (36%) had the largest response in the 2008 report, but was not a choice in the 2005 Survey.

Does your company limit exposure in a single location?

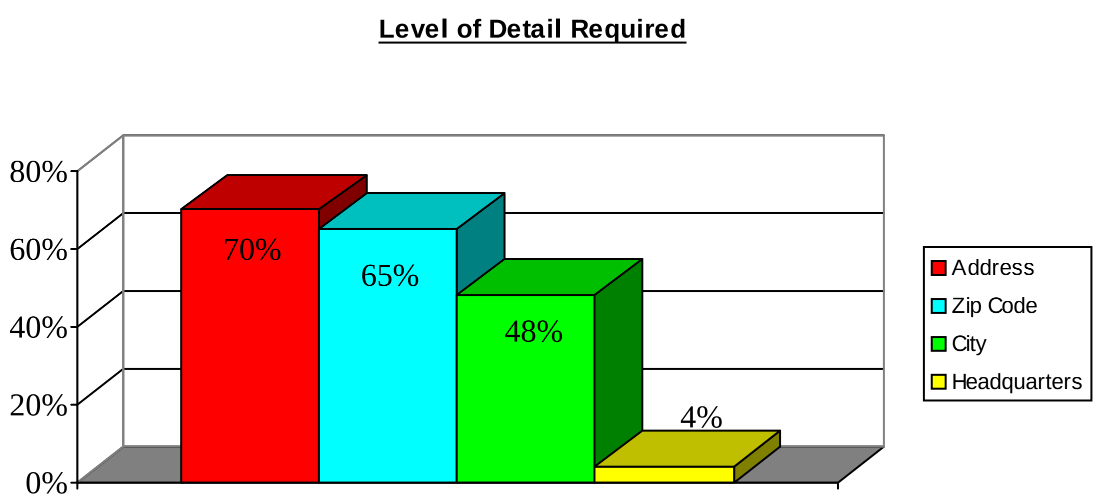
Limit Exposure in Single Location	% of Respondents
Yes	12%
Yes – but mostly just for COLI / BOLI	28%
No	60%
# of Respondents	**25**

If yes, what are the limits?
(There were 10 respondents.)



Limits appear to have increased since the 2005 Survey. Only 19% of the respondents had limits greater than $150 million in 2005 versus 60% in this report. No respondents reported "$150 million or less and greater than $100 million."

At what level of detail does your company require information?
(There were 23 respondents.)



Percentages total more than 100% because respondents indicated requiring more than one level of detail.

Does your company charge higher premiums to those clients who don't provide detailed information by location?

Higher Premiums	% of Respondents
Yes	4%
No	96%
# of Respondents	**24**

Do your reinsurers (or retrocessionaires, if you are a reinsurer) make providing location information a requirement for placing reinsurance (retrocession business)?

Location Information Required	% of Respondents
Yes	40%
No	60%
# of Respondents	**25**

If you are a reinsurer / retrocessionaire, do you require your clients / reinsurers to provide location information as a requisite for placing reinsurance?
Includes responses from reinsurers/retrocessionaires where reinsurance is not the primary line of business.

Require Location Information	% of Respondents
Yes	50%
No	50%
# of Respondents	**6**

Does your company cross-reference your assets for mortality exposure? (*Example: if your company has a mortgage on the building where your mortality concentration is located or if your company holds stocks or bonds in the company whose employees are being insured?)*

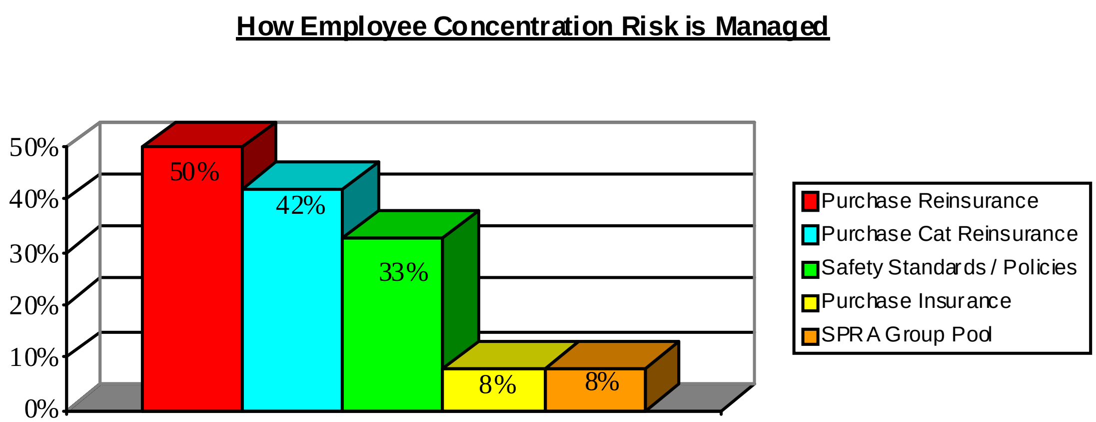
Cross Reference Assets	% of Respondents
Yes	9%
No	91%
# of Respondents	**23**

Many companies insure their own employees and, thus, have concentration issues. Does your company do anything to manage this risk?

Manage Employee Concentration Risk	% of Respondents
Yes	48%
No	52%
# of Respondents	**25**

There has been an increase in those that do something to manage this risk compared to the 2005 Survey where 33% of respondents replied 'yes.'

If yes, what does your company do?
(There were 12 respondents.)



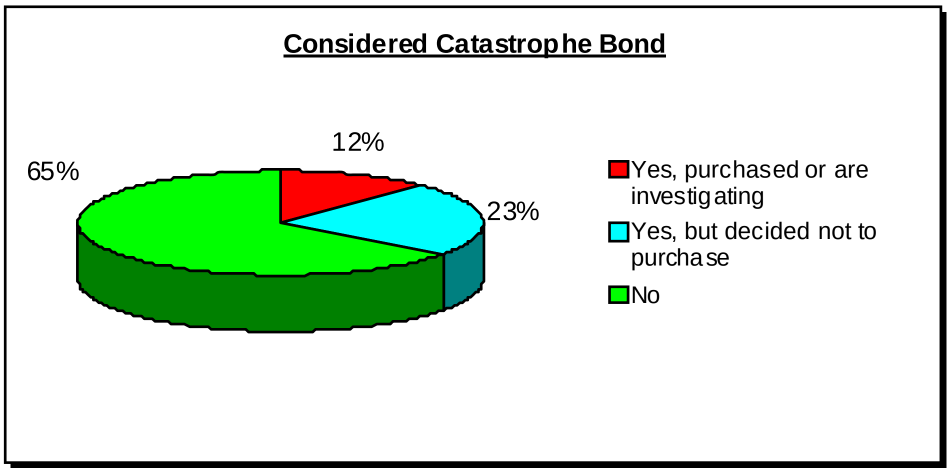
Percentages total more than 100% because respondents indicated more than one action.

Compared to the 2005 survey, less purchased insurance (8% in 2008 versus. 28% in 2005) and more purchased catastrophe coverage (42% in 2008 versus. 11% in 2005). However, this could be somewhat misleading as catastrophe coverage could be considered a form of insurance.

Section 7 – Catastrophic Bonds

Companies are looking at alternatives to use reinsurance as a tool to manage their mortality risk. The following questions consider one such alternative – mortality catastrophe bonds.

Has your company considered purchasing a catastrophe bond to manage your mortality risk?
(There were 26 respondents.)

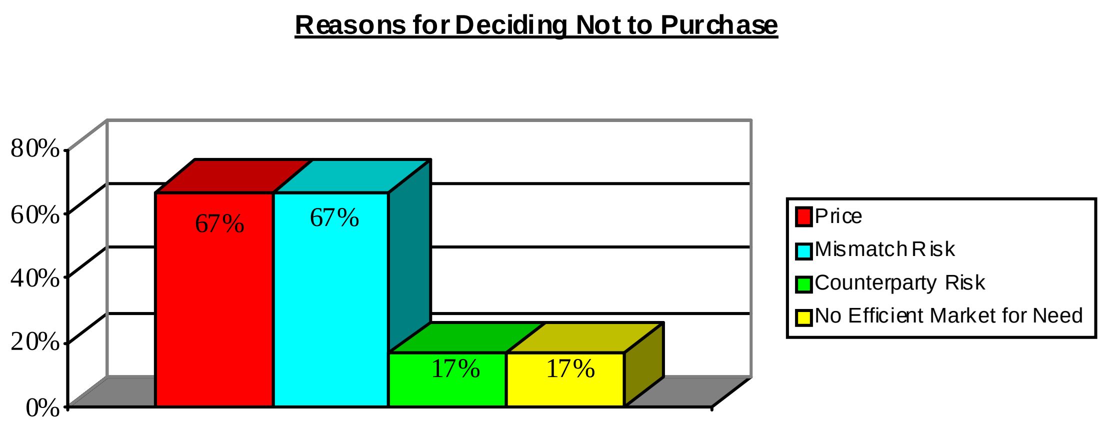


Sixty-five percent have not considered purchasing a catastrophe bond, while 23% have considered it, but decided not to purchase.

For those answering "Yes, purchased bond / are investigating," what are the reasons why?

Reasons for Purchasing / Considering	% of Respondents
Risk tolerance / risk appetite concerns	67%
Best tool to manage risk	33%
# of Respondents	**3**

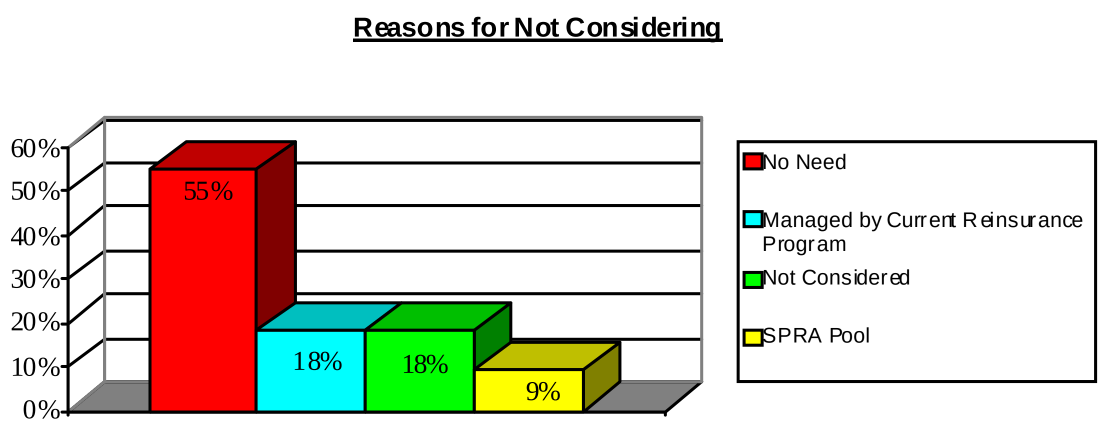
For those answering "Yes, but have decided not to purchase," what are the reasons?
(There were 6 respondents.)



Percentages total more than 100% because respondents indicated more than one reason.

Price and mismatch risk were the major considerations in the decision not to purchase for two-thirds of the respondents.

For those answering "no", what are the reasons?
(There were 11 respondents.)



The main reason for not considering catastrophe bonds was that it was felt that they were not needed (55%).

Section 8 - Other

Has your company considered or implemented hedging mortality risk against other risks?

Hedge Mortality Against Other Risks	% of Respondents
Yes	16%
No	84%
# of Respondents	**25**

The majority of respondents (84%) have not considered hedging mortality risk against other risks.

If yes, which risks?

All respondents considered hedging mortality risk against longevity risk.

Are there any other alternatives under consideration to manage mortality risk that have not been covered in this survey? If so, please explain.

Other alternatives noted included:

- *Swaps*
- *Life settlements*
- *Catastrophe premium options*

Appendix A – Participating Companies

ASD Consulting Services
AEGON Canada
Beneficial Life
Gen Re
Genworth Financial
ING Retail Life
John Hancock Life Insurance Company
Kansas City Life
Life Insurance Company of North America
Lincoln Financial Group
MassMutual
Mennonite Mutual Aid Association
Minnesota Life Insurance Company
Munich American Reassurance Company
NTA LIFE
Ohio National Financial Services
Phoenix Life
Prudential
State Farm Life Insurance Company
Sun Life Financial
Symetra Life Insurance Company
The Catholic Aid Association
The Hartford
The Lafayette Life Insurance Company
The Standard Life Assurance Company of Canada
Western and Southern
Woodmen of the World