SOCIETY OF ACTUARIES

Predictive Analytics and Accelerated Underwriting Survey Report

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Introduction

The purpose of the Predictive Analytics and Accelerated and Enhanced Underwriting Survey was to get feedback on several hot topics in the industry – predictive analytics, accelerated underwriting, and enhanced underwriting programs that have been adopted by companies. It was our intent to try to avoid proprietary items so that companies would feel comfortable answering the full survey. The Survey consisted of two sections, one on predictive analytics and the other on accelerated and enhanced underwriting. The Subcommittee only asked those who had actually implemented a program to complete the remaining questions in that section.

The Subcommittee provided two definitions/explanations to help clarify what it was looking for when completing the Survey.

- Implemented – This meant that, at the time of the survey, a company was using the type of predictive analytics or underwriting program in production, even if on a limited basis or as a pilot program.

- When answering whether a company used predictive analytics to determine the underwriting risk class for stretch criteria for selecting the underwriting class, for table shave, or for business decisions, this meant that the use of predictive analytics in any of these circumstances may be creating a new paradigm. For example, if predictive analytics was used for determining which applicants would qualify for a table shave program, this is no longer technically a table shave program as everyone who was previously eligible may or may not qualify under the new program. The Subcommittee was interested in learning whether this was being done (i.e., implemented) or was being considered.

The Survey was conducted in June/July of 2016. The Committee on Life Insurance Mortality and Underwriting Surveys conducted a survey on predictive modeling in April of 2011 and published January 2012. The two surveys are different in enough aspects that they are not easily comparable.

Thirty-six companies responded to this Survey. Two companies were eliminated from the Survey results because one was an annuity company that sold no life insurance business and the other was a closed block reinsurer. Thirty-four companies responded to Section A and 26 responded to Section B; some answered each section completely and some answered just a portion. While the Subcommittee requested that only those who implemented a program answer the remaining questions, some who implemented a program did not respond to some or all of the questions (these are included in the results of this report) and some who had not yet implemented a program answered the remaining questions about their program (these results are not included in the results of this report).

Unfortunately, only three companies indicated that they implemented an enhanced underwriting program, so the Subcommittee is not able to share these results.

The Survey was completed by both direct companies and reinsurers. The Subcommittee decided to combine these results as the reinsurers who responded appeared to be responding on behalf of their client(s) who they had helped implement one or more of the programs.

The Subcommittee would like to thank all who responded to this Survey as it knows the industry is interested in what is happening in these growing fields of both predictive analytics and accelerated underwriting. The participants of this Survey are shown in Appendix 1. The Subcommittee would also like to thank Korrel Rosenberg of the Society of Actuaries for all of her help on this project, including but not limited to finalizing the survey and report, compiling the vast volume of responses, and following up with companies when the Subcommittee had questions on the initial responses.

Questions on this report can be addressed to Korrel Rosenberg at krosenberg@soa.org or Al Klein, chair of the Subcommittee, at al.klein@milliman.com.

Comments about this report and suggestions for future surveys are welcome and can be addressed to the Committee on Life Insurance Mortality and Underwriting Surveys c/o The Society of Actuaries.

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Executive Summary

The Predictive Analytics and Accelerated Underwriting Subcommittee Survey, henceforth referred to as the "Survey," was designed to get feedback on several hot topics in the industry – predictive analytics, accelerated underwriting, and enhanced underwriting programs that have been adopted by companies and was conducted between June and July 2016. We received 34 responses from direct life insurance carriers in the United States and Canada.

This Survey consisted of two sections. A brief description and the highlights of each are as follows:

Section A – Predictive Analytics

Respondents were asked about potential uses of three broad types of predictive analytics (PA) programs:

- Marketing
- Underwriting
- Post-Issue Management

Thirty-four companies responded to at least some aspect of these programs, although not all provided answers to all questions. Of the 34 companies, 26 implemented one or more PA applications.

Of the three types of PA programs, marketing was the type most commonly used, and 21 companies indicated that they had implemented at least one type of marketing PA program. Fourteen companies indicated they had implemented at least one type of underwriting PA program and 10 indicated they had implemented at least one type of post-issue management PA program.

Marketing

Respondents were asked about seven marketing PA programs and the most frequently implemented were:

- Customer more likely to buy (12 companies)
- Cross selling (10)
- Target market determination (9)
- Up selling (9)

If one adds in those companies also working on a program and planning to implement one, the top programs were:

- Customer more likely to buy (17)
- Customer less likely to lapse (15)
- Target market determination (15)
- Cross selling (12)
- Up selling (11)

Underwriting

Respondents were asked about five underwriting PA programs and the most frequently implemented were:

- Underwriting risk class (12 companies)
- Deciding on underwriting requirements (9)

If one adds in those companies also working on a program and planning to implement one, the top programs were:

- Underwriting risk class (20)
- Deciding on underwriting requirements (19)
- Stretch criteria for selecting an underwriting class (9)

Post-Issue Management

Respondents were asked about seven post-issue management PA programs and the most frequently implemented were:

- In force management – pre-lapse (7)
- Targeted conversion (5)

If one adds in those companies also working on a program and planning to implement one, the top programs were:

- In force management – pre-lapse (10)
- Agent monitoring/management (8)
- Post level-premium term conservation (7)

Other PA Responses

Most PA programs were implemented within the last few years; however, some marketing programs were implemented earlier.

Most PA programs were first implemented as a pilot and many of the underwriting and post-issue management programs remain as a pilot.

Of the 46 responses on the PA programs, no programs affected more than 75% of the business. The most common level of impact across all programs was 0-10%.

The most common individuals involved in the development of the PA programs were:

- Marketing – internal actuary and marketing
- Underwriting – internal actuary and underwriter
- Post-issue management – internal marketing and data scientist/statistician

The top areas of improvement due to the PA programs were:

- Marketing – sales, persistency and acquisition costs
- Underwriting – acquisition costs and time to issue

Six sources used for developing PA models received ten or more responses:

- Vendor data (17)
- Financial data (16)
- Lifestyle data (13)
- Application (12)
- Internal experience study (12)
- Internal data from other lines of business, e.g., P&C (10)

Of 37 responses, 22 PA programs were either fully or partially reinsured.

The top obstacles to developing the PA programs were:

- Data sources (20)
- Agent buy-in (13)
- Internal user buy-in (13)
- Implementation (12)
- Designing/building the model (11)
- Model validation (10)

The obstacles rated as most important in the development of marketing PA programs were:

- Data sources (8)
- Internal user buy-in (6)
- Model validation (4)

The obstacle rated as most important in the development of underwriting PA programs was Model validation (3) and the most important for post-issue management was Justifying cost/benefit analysis (3).

Section B – Accelerated Underwriting

This section was intended to also include enhanced underwriting. Unfortunately, only three companies indicated that they implemented an enhanced underwriting program, so the Subcommittee was not able to share these results.

Twenty-six companies responded to this section on accelerated underwriting. Ten companies indicated that they had implemented a program and another ten indicated that they plan to implement a program within the next two years. Of the ten companies that had implemented an accelerated underwriting program, nine responded to follow-up questions.

Seven of the nine respondents indicated that they implemented their program within the last few years.

Five of the nine respondents indicated that they began their program as a pilot and one program continues as a pilot.

The maximum issue age on accelerated underwriting programs ranged from 35 to 85 and the most common maximum issue age was 60.

The maximum face amounts on accelerated underwriting programs ranged from $100,000 to $3,000,000 and the most common maximum face amount was $1,000,000.

Of the nine responding companies, four indicated that they randomly checked some applicants to test their assumptions and/or model.

Of the eight respondents, the most common individuals involved in the development of accelerated underwriting programs were:

- Internal underwriter (all 8)
- Internal actuary (7)
- Internal marketing (4)

Those leading the effort were typically:

- Internal underwriter (4)
- Internal actuary (3)

External consultants were typically not involved in the development of accelerated underwriting programs.

Companies were asked whether they used PA in the decision-making process. Results were evenly split between companies using or not using PA.

Of the eight respondents, the top Data Sources used for accelerated underwriting decision-making were:

- MIB checking service (7)
- MVR (7)
- Prescription history (7)
- Application (6)
- Lifestyle data (5)
- MIB Insurance Activity Index (5)

Companies indicated that the most important Data Sources were:

- Prescription histories (6)
- Application (5)
- MVR (5)
- MIB checking service (4)

The top Data Sources used in risk class decision-making were:

- MVR (7)
- Prescription history (7)
- Application (6)
- MIB checking service (6)
- Financial data (5)

The most important data sources in risk class decision-making were:

- Prescription history (7)
- MVR (6)
- Application (5)
- MIB checking service (5)
- Personal history report/Background check (4)

Seven of the eight respondents indicated that the time to issue a policy under the accelerated underwriting program decreased.

Six of the eight respondents indicated that they were not sure if the mortality changed after the implementation of the accelerated underwriting program.

Seven of the eight responding companies indicated that they plan to expand their accelerated underwriting program.

Of the eight respondents, half indicated that some of their reinsurers participated in this program and the other half indicated that none of their reinsurers participated.

The biggest challenges encountered in developing an accelerated underwriting program by the eight respondents were:

- Data sources (4)
- Justifying cost/benefit analysis (4)
- Implementation (3)

Of five respondents, the percentage of applicants qualified to be issued without fluids varied widely.

Section A – Predictive Analytics

Question 1 is shown in its entirety in Appendix 2.

This question asked respondents to fill out an extensive table on three broad potential uses of predictive analytics (PA), namely:

1. Marketing
2. Underwriting
3. Post-Issue Management

The table asked for separate responses for various subcategories of each of the broad categories and asked the user to identify which of a broad range of choices from "implemented" to "not working on it and not considering it" was applicable. Specifically, the choices were:

- Implemented
- Working on and plan to implement within 1 year
- Working on and plan to implement in 1-2 years
- Working on and plan to implement longer than 2 years
- Working on but not sure if will implement
- Not currently working on but considering it
- Not currently working on but considered it and/or worked on it and decided not to proceed
- Not currently working on but not considering it

Thirty-four companies responded to at least some aspect of Question 1, although not all provided answers for each of the broad potential uses. Twenty-seven to 34 companies responded to each of the broad potential uses of PA. Some of the responses included "not considering" or "not applicable". Twenty-six companies indicated that they implemented one or more types of PA programs.

Marketing

The first broad potential use for PA was marketing. The Subcommittee asked about the seven types of marketing PA uses, as shown in Table A.1 below.

Totals have been provided for each of the marketing types of PA because no companies provided more than one response for these. Overall, 21 companies implemented one or more types of marketing PA programs.

Table A.1 shows the responses to the application of PA to marketing. All 34 companies responded to some or all of these items.

Table A.1 – Predictive Analytics – Marketing

Type of PA	Implemented	Working on and plan to implement			Working on but not sure if will implement	Not working on but…			Total
		< 1 year	1-2 Years	>2 Years		Considering It	Considered it and/or worked on it and decided not to proceed	Not Considering It	
Agent selection/hiring	4	2	2	0	2	4	1	8	23
Customer more likely to buy	12	2	3	0	1	6	1	4	29
Customer less likely to lapse	7	4	3	1	1	5	1	7	29
Customer health profile	5	3	1	0	1	11	0	7	28
Target market determination	9	4	1	1	2	4	1	6	28
Cross selling	10	1	1	0	0	7	1	8	28
Up selling	9	1	1	0	1	7	3	7	29
Other	4	0	0	0	1	0	0	7	12

Of the seven marketing PA programs the Subcommittee asked about, the most frequently Implemented were:

- Customer more likely to buy (12 companies)
- Cross selling (10)
- Target market determination (9)
- Up selling (9)

If one adds in those companies also Working on a program and planning to implement one, the top programs were:

- Customer more likely to buy (17)
- Customer less likely to lapse (15)
- Target market determination (15)
- Cross selling (12)
- Up selling (11)

The PA programs most companies are Not Considering or were Considered and it was decided not to proceed were:

- Up selling (10)
- Customer less likely to lapse (9)
- Cross selling (9)
- Agent selection/hiring (9)
- Customer health profile (8)

Answers for the respondents indicating Other were:

- “Attract new reinsurance business”
- “Prospecting models”
- “Identifying prospects”
- “UL vs. Term prospecting”

It is possible that some or all of these marketing PA uses may have been more widely selected had they been included in the list.

A few other observations from the data include:

Twenty-four of the responding companies have implemented, are working on, or are at least considering PA involving “Customer more likely to buy." On the other hand, only five of the companies indicated they are not considering it. This type of program also had the most actual implementations within the Marketing category.

The areas where one might see the most new programs, based on applications being worked on or considered, are Customer health profile (16) and Customers less likely to lapse (14).

Customer health is an active new area with 11 companies currently Considering it. This represents at least four more companies than any other marketing PA use.

There appears to be less interest in the use of PA for Agent selection compared to that for Customer selection.

Underwriting

The second broad potential use for PA was underwriting. The Subcommittee asked about five types of underwriting PA uses.

Totals have been provided for each of the underwriting types of PA because no companies provided more than one response for these. Overall, 14 companies indicated that they had implemented one or more types of underwriting PA programs.

Table A.2 shows the responses to the application of PA to underwriting. All 34 companies responded to some or all of these items.

Table A.2 – Predictive Analytics – Underwriting

Type of PA	Implemented	Working on and plan to implement			Working on but not sure if will implement	Not working on but…			Total
		< 1 year	1-2 Years	>2 Years		Considering It	Considered it and/or worked on it and decided not to proceed	Not Considering It	
Deciding on underwriting requirements	9	6	4	0	1	8	0	2	30
Underwriting risk class (i.e., preferred, standard, substandard)	12	4	3	1	1	7	0	5	33
Stretch criteria for selecting underwriting class	5	1	2	1	0	10	2	11	32
Table shave	1	0	0	1	0	1	1	20	24
Business decisions	1	0	1	1	0	4	1	17	25
Other	2	1	0	0	0	0	0	8	11

Of the five underwriting PA programs the Subcommittee asked about, the most frequently Implemented were:

- Underwriting risk class (12 companies)
- Deciding on underwriting requirements (9)

If one adds in those companies also Working on a program and planning to implement one, the top programs were:

- Underwriting risk class (20)
- Deciding on underwriting requirements (19)
- Stretch criteria for selecting an underwriting class (9)

The PA programs most companies are Not Considering or were Considered and it was decided not to proceed were:

- Table shave (21)
- Business decisions (18)
- Stretch criteria for selecting an underwriting class (13)

Answers for the respondents indicating Other were:

- “Implemented another type of underwriting PA” (2)
- “Working on something” (1)

The only item mentioned under Implemented was "determining rating class to maximize placement and ROE.”

A few other observations from the data include:

Twenty of the companies have Implemented or are Working on PA applications for Deciding on underwriting requirements and 21 for Underwriting risk class. Adding in those Considering these programs, there are 28 companies Implemented, Working on or Considering each.

Nineteen of the companies responding are engaged (implemented, working on, considering) in PA as it applies to stretch criteria for selecting the underwriting class.

The areas where one might see the most new programs, based on applications being worked on or considered, are Deciding on underwriting requirements (19) and Underwriting risk class (16). Note that these are already the most Implemented of the underwriting PA programs.

There is very little other involvement in the use of PA for other types of underwriting applications.

Post-Issue Management

The third broad potential use for PA was post-issue management. The Subcommittee asked about six types of post-issue management PA uses.

Totals have been provided for each of the post-issue management types of PA because no companies provided more than one response for these. Overall, 10 companies indicated that they had implemented one or more types of post-issue management PA programs.

Table A.3 shows the responses to the application of PA to post-issue management. All 34 companies responded to some or all of these items.

Table A.3 – Predictive Analytics – Post-Issue Management

Type of PA	Implemented	Working on and plan to implement			Working on but not sure if will implement	Not working on but…			Total
		< 1 year	1-2 Years	>2 Years		Considering It	Considered it and/or worked on it and decided not to proceed	Not Considering It	
Targeted conversion	5	0	1	0	1	7	2	10	26
For term, post-level premium term, conservation management	2	0	4	1	2	8	1	10	28
In force management – pre-lapse	7	2	1	0	3	7	1	8	29
In force management – post-lapse	2	0	2	0	3	8	1	10	26
In force management – other customer interaction	1	1	0	1	0	4	0	8	15
Agent monitoring/management	2	4	1	1	0	11	2	5	26
Other	2	0	1	0	1	4	0	9	17

Of the seven Post-issue management PA programs the Subcommittee asked about, the most frequently Implemented were:

- In force management – pre-lapse (7 companies)
- Targeted conversion (5)

If one adds in those companies also Working on a program and planning to implement one, the top programs were:

- In force management – pre-lapse (10)
- Agent monitoring/management (8)
- Post level-premium term conservation (7)

The PA programs most companies are Not Considering or were Considered and it was decided not to proceed were:

- Targeted conversion (12)
- Post level-premium term conservation (11)
- In force management – post-lapse (11)

Answers for the eight respondents indicating Other were:

- "Implemented another post-issue management PA program" (2)
- "Ongoing claim study" (1)
- "Working on other post-issue management PA programs" (2)
- "Considering for business considerations" (1)
- "Considering another type of program" (4)

There were fewer Implemented PA applications in the post-issue management than marketing and underwriting.

The areas where one might see the most new programs, based on applications being Worked on or Considered, are Agent monitoring/management (17) and Post-level premium term conservation management (15).

Overall

There are a number of additional observations to be made about implementing PA programs in general.

First, the Subcommittee asked about the expected timing of implementing programs that are currently being worked on. Table A.4 shows the results, summarized by the main type of PA program.

Table A.4 – Anticipated Timing for Future Implementation of PA Programs

Category	< 1 Year	1-2 Years	>2 Years	Not Sure
Marketing	17	12	2	9
Underwriting	12	10	4	2
Post-Issue Management	7	10	2	10

The vast majority of companies currently working on PA programs plan to implement them within two years. However, for marketing and post-issue management, there were 19 applications for which the companies were not sure if they would implement them.

For the 34 companies answering the questions:

- 12 companies have not implemented any PA applications
- Of these 12, eight are not working on any PA applications
- Of these 8, three are not considering any applications

For the 24 companies that have implemented at least one PA application:

- 21 have implemented marketing PA applications
- 12 have implemented underwriting PA applications
- 11 have implemented post-issue management PA applications
- In total, these companies provided 61 marketing, 30 underwriting, and 21 post-issue management responses.

For the 20 companies working on PA applications:

- 14 are working on marketing PA applications
- 11 are working on underwriting PA applications
- 13 are working on post-issue management PA applications
- 9 are working on PA applications in at least two areas

For the 23 companies considering PA applications:

- 17 are considering marketing PA applications
- 16 are considering underwriting PA applications
- 14 are considering post-issue PA applications
- 8 are considering PA applications in all three areas
- 8 are considering PA applications in two areas

Six companies answered they had Considered or worked on applications and then decided not to proceed. Of these six, five had Implemented or were working on other applications.

The Subcommittee believes that, as the applications of PA continue to evolve, future surveys will need to address this.

2. What year did your company begin to implement this program, even on a limited basis or as a pilot program?

Of those 24 companies that indicated they had implemented a PA program, 16 provided an implementation date. The Subcommittee will provide the implementation dates for each type of PA program.

For the marketing PA programs:

- Agent selection (3 of 5 responded)
    - 2005
    - 2006
    - 2013
- Customer more likely to buy (7 of 12)
    - 1995
    - 2008
    - 2010
    - 2011
    - 2014 (2)
    - 2015

- Customers less likely to lapse (4 of 7)
    - 1995
    - 2011
    - 2012
    - 2014
- Customer health profile (1 of 5)
    - 2016
- Target market determination (5 of 9)
    - 2000
    - 2014 (3)
    - 2015
- Cross selling (5 of 10)
    - 2000
    - 2004
    - 2006
    - 2008
    - 2015
- Up selling (4 of 9)
    - 2005
    - 2006
    - 2014
    - 2015
- Other (2 of 4)
    - "Attracting new reinsurance business" – 2014
    - "UL vs. Term prospecting" – 2005

For the underwriting PA programs:

- Deciding on underwriting requirements (5 of 9)
    - 2014
    - 2015 (2)
    - 2016 (2)
- Underwriting risk class (3 of 12)
    - 2014
    - 2015
    - 2016
- Stretch criteria for selecting underwriting class (1 of 5)
    - 2014

No companies provided implementation dates for the other underwriting PA programs.

For the post-issue management PA programs:

- Targeted conversion (4 of 5)
  - 2006
  - 2012
  - 2015
  - 2016
- Post level-premium term conversion (1 of 2)
  - 2016
- Pre-lapse in force management (2 of 7)
  - 2016 (2)

No companies provided implementation dates for the other post-issue management PA programs.

Table A.5 summarizes the responses, grouped by implementation years and type of program.

Table A.5 – Summary of Implementation Dates by Type of Program

Program	2016	2015	2014	2013	2010-12	2005-09	2000-04	Before 2000	Total
Marketing	1	4	8	1	4	8	3	2	31
Underwriting	3	3	3	0	0	0	0	0	9
In-Force Management	4	1	0	0	1	1	0	0	7

The Subcommittee is uncertain whether some of the PA tools being described actually fit the Survey's definition of PA, given the condition of the industry's information architecture in earlier years.

While most of the PA programs were implemented within the last few years, 19 of the 47 programs were implemented before 2013.

However, none of the underwriting PA programs and only two of the in-force management programs were implemented before 2013.

The Subcommittee observed that marketing programs using PA, whether known by that name or not, have been in use longer than for the other two types of programs.

In particular, the earliest applications reflected in the above table under marketing were for customers more likely to buy and customer less likely to lapse. Both were implemented in 1995.

The use of PA in underwriting and in-force management is a more recent development.

3a. Was this program initially implemented as a pilot program?

3b. Is this program still running as a pilot program?

For the marketing PA programs:

- Agent selection (4 of 5 responded) – 1 of 4 indicated they implemented their program initially as a pilot program and it is not still running as a pilot. Note that one more responded to this question than had responded to agent selection on question 2.
- Customer more likely to buy (7 of 12) – 5 implemented as a pilot program and no pilots are still running
- Customers less likely to lapse (4 of 7) – 3 implemented as a pilot program and no pilots are still running
- Customer health profile (1 of 5) – This was not implemented as a pilot program
- Target market determination (5 of 9) – 4 implemented as a pilot program and 3 are still running as a pilot
- Cross selling (5 of 10) – 4 implemented as a pilot program and no pilots are still running
- Up selling (4 of 9) – 3 implemented as a pilot program and 1 is still running as a pilot
- Other (2 of 4)
    - Attracting new reinsurance business – Implemented as a pilot program and not still running as a pilot
    - UL vs. Term prospecting – Implemented as a pilot program and not still running as a pilot

For the underwriting PA programs:

- Deciding on underwriting requirements (5 of 9) – 4 implemented as a pilot program and 2 are still running as a pilot
- Underwriting risk class (3 of 12) – 1 implemented as a pilot program and is still running as a pilot
- Stretch criteria for selecting underwriting class (1 of 5) – Implemented as a pilot program and not still running as a pilot
- No companies provided implementation information for the other underwriting PA programs

For the post-issue management PA programs:

- Targeted conversion (4 of 5) – 3 implemented as a pilot program and 2 are still running as a pilot
- Post level-premium term conversion (1 of 2) – 1 implemented as a pilot program and is still running as a pilot
- Pre-lapse in force management (2 of 7) – 2 implemented as a pilot program and both are still running as a pilot
- No companies provided implementation information for the other post-issue management PA programs

Table A.6 summarizes the responses to questions 3a. and 3b. by type of program.

Table A.6 – Summary of Use of Pilot Programs by Type of Program

Type of PA	Was this program initially implemented as a pilot program?		Is this program still running as a pilot program?	
	Yes	No	Yes	No
Marketing	22	10	4	28
Underwriting	6	3	3	6
Post-issue Management	6	1	5	2

While 22 of 32 marketing programs overall were Implemented as pilot programs, four of them continue to be run as pilots. This likely reflects the fact that many of the marketing programs were initially implemented more than a few years ago.

Six of nine underwriting programs overall were Implemented as pilots, and three of them continue to be run as pilots.

Six of seven post-issue management programs were introduced as pilots, and five continue to be run as pilot programs.

More underwriting and post-issue management programs remain as pilots, likely because these are still recently implemented programs.

4a. Is this program offered on some or all of your company's term products?

4b. Is this program offered on some or all of your company's permanent products?

The response rate for questions 4a. and 4b. was about the same by program as for questions 2 and 3a. and 3b.

Table A.7 summarizes the responses for this question by type of program.

Table A.7 – Summary of Offering on Term and Permanent Products by Type of Program

Type of PA	Is this program offered on some or all of your company's term products?			Is this program offered on some or all of your company's permanent products?		
	None	Some	All	None	Some	All
Marketing	2	12	17	1	17	13
Underwriting	2	3	4	0	6	3
Post-issue Management	0	5	2	6	0	1

Twenty-nine of 31 marketing programs were implemented on some or all of the respective companies' term products, and 30 programs were implemented on some or all of their permanent products. Note, there were no significant differences among the various types of marketing programs between term and permanent products.

Seven of nine underwriting programs were implemented on some or all of their term products and all nine were implemented on some or all of their permanent products. Note that the two extra underwriting programs implemented on permanent products were deciding on underwriting requirements.

All seven post-issue management programs were implemented on some or all of their term products, but only one program was implemented on permanent products. The main reason for this result for permanent products is that five of the seven programs were on targeted conversion or post-level premium term conservation management programs, neither of which would apply to permanent products.

4c. Considering all of the products on which your company offers this program, please provide the overall maximum issue age that your company will allow with this program.

4d. Considering all of the products on which your company offers this program, please provide the overall maximum face amount that your company will allow with this program.

Responses were received on 23 of the 61 total marketing programs that had been implemented. The maximum issue ages ranged from 50 to 85. There was a wide range of maximum face amounts provided; the most common was $1 million (10 responses).

Responses were received on nine of the 30 total underwriting programs that had been implemented. The maximum issue ages ranged from 54 to 85. There was a wide range of maximum face amounts provided; the most common was $1 million (4 responses).

Responses were received on five of the 21 total post-issue management programs that had been implemented. Only three companies provided the five responses to this question, so we are unable to show the results.

5. Within the products for which this predictive analytics is used, what percentage, by policy count, of your business has been impacted?

Table A.8 summarizes the responses by type of PA program.

Table A.8 – Percentage of Business Impacted by PA Program

Type of PA	% by Policy Count					
	0-10%	11-25%	26-50%	51-75%	76-90%	91-100%
Marketing	20	7	1	2	0	0
Underwriting	4	2	1	2	0	0
Post-issue Management	4	3	0	0	0	0

Given the newness of PA programs, it is likely still too early to determine the ultimate percentage of business impacted. Also, the Survey did not specify whether to answer this question based on new business or inforce. Therefore, the results below should be viewed cautiously. For example, the 51-75% for marketing and underwriting PA programs only makes sense as a percentage of eligible new business; it is possible some companies provided answers for these programs based on new business while others answered it based on inforce.

Of the 46 responses on all programs, 28 had an impact of 0 – 10%, 12 had an impact of 11 – 25%, 2 had an impact of 26 – 50%, and 4 had an impact of 51 – 75%. No programs had an impact of over 75%.

Among the several marketing programs, 27 of 30 had an impact of 0 – 25%. Two programs had an impact of 51 – 75%.

Within the underwriting programs, 6 of 9 had an impact of 0 – 25%. Two programs had an impact of 51 – 75%.

For post-issue management programs, all seven programs had an impact of 0 – 25%. This may be lower because it is based on inforce policy count rather than new business policy count.

Post-issue management programs, which were more recently introduced (question 2) and most of which still continue as pilot programs (question 3), appear to have had less of an impact on business, being still very much under development.

The Subcommittee considered discussing the “success” of various programs, but it does not have each company’s definition for success, policy count may or may not be the most appropriate metric to measure success, and some programs are still in pilot stage, or have been used for too short a period of time to accurately determine the long-term impact on business.

6a. Who was involved in the design/development of the predictive analytics model? In the second column, please indicate the area(s) leading this effort. Check all that apply.

Table A.9 shows the people involved in the design/development of the PA model.

Table A.9 – People Involved in Design/Development of PA Model

Who	Marketing		Underwriting		Post-Issue Mgmt.	
	Involved	Leading	Involved	Leading	Involved	Leading
Internal actuary	17	3	5	1	4	0
Internal data scientist/statistician	14	13	2	2	5	3
Internal IT	10	0	3	0	1	0
Internal marketing	17	17	4	0	5	5
Internal underwriter	10	2	5	4	1	0
External actuarial consultant	0	0	1	0	0	0
External data scientist/statistician	4	3	0	0	1	0
External underwriting consultant	0	0	0	0	0	0
External consultant (other)	3	1	2	0	0	0
Reinsurer	2	2	2	0	0	0
Vendor (e.g., lab, credit bureau, etc.)	7	0	2	1	3	0
Other	7	4	0	0	3	0

The most common individuals involved in the development of a PA model varied a little by the three broad types of PA.

For Marketing programs, the top three were:

- Internal actuary (17)
- Internal marketing (17)
- Internal data scientist/statistician (14)

It was far more likely to have the effort led by an Internal marketing person (17).

No company indicated that they used either an External actuary or underwriting consultant for these marketing initiatives. While External actuarial and underwriting consultants do not appear to be used, other outside parties are involved in the development of these programs, namely:

- Vendors (7)
- External data scientist/statistician (4)
- External consultants (other) (3)
- Reinsurers (1)

For the Marketing and Post-Issue Management programs, there were ten instances where companies input details for "other" roles that were involved. These fell into three job categories:

- Customer Service (6)
- Chief Medical Officer (3)
- Sales (1)

If these job categories had been included in the Survey, other companies may also have selected them.

For Underwriting programs, the top three were:

- Internal actuary (5)
- Internal underwriter (5)
- Internal marketing (4)

The Internal underwriter (4) was most prominent in leading the effort.

For Post-Issue Management programs, the top three were:

- Internal marketing (5)
- Internal data scientist/statistician (5)
- Internal actuary (4)

The Internal marketing person (5) led the design/development efforts most often.

There were three instances where a company indicated that an Other role was involved. These responses were all from the same company, and stated that "Customer Service" was involved.

6b. Who was involved in the implementation of the predictive analytics model? In the second column, please indicate the area(s) leading this effort. Check all that apply.

Table A.10 shows the people involved in the implementation of the PA model.

Table A.10 – People Involved in Implementation of PA Model

Who	Marketing		Underwriting		Post-Issue Mgmt.	
	Involved	Leading	Involved	Leading	Involved	Leading
Internal actuary	8	2	6	0	1	0
Internal data scientist/statistician	16	7	2	0	5	3
Internal IT	16	1	6	0	4	0
Internal marketing	22	18	5	0	6	5
Internal underwriter	6	4	5	4	1	0
External actuarial consultant	0	0	1	1	0	0
External data scientist/statistician	5	4	1	1	1	0
External underwriting consultant	0	0	0	0	0	0
External consultant (other)	3	2	2	0	0	0
Reinsurer	3	3	3	0	0	0
Vendor (e.g., lab, credit bureau, etc.)	6	1	2	0	1	0
Other	14	7	1	0	4	3

The most common individuals involved in the implementation of a PA model varied by the three broad types of PA, but they were always internal people. Not surprisingly, the people involved in implementing these PA models were generally consistent with those involved with the design/development of the models.

For Marketing programs, the top three were:

- Internal marketing (22)
- Internal IT (16)
- Internal data scientist/statistician (16)

Similar to the design and development of marketing PA models, it was most common to have the implementation effort led by an Internal marketing person (18). While an actuary is typically involved in designing/developing PA marketing programs, they are less likely to be involved in implementation.

There were fourteen instances where companies input details for "other" roles that were involved, including:

- "Chief medical director" (3)
- "Customer service center" (3)
- "Data management team" (3)
- "Distribution" (3)
- "Our clubs, as employers of agents" (1)
- "Sales force development" (1)

If these job categories had been included in the Survey, it is likely other companies may also have selected them.

For Underwriting programs, the top four were:

- Internal actuary (6)
- Internal IT (6)
- Internal marketing (5)
- Internal underwriter (5)

The Internal underwriter (4) was most prominent in leading the effort.

"Legal/Compliance" was the only Other role indicated as involved in the implementation of an underwriting PA model.

For Post-Issue Management programs, the top three were:

- Internal marketing (6)
- Internal data scientist/statistician (5)
- Internal IT (4)

The Internal marketing person (5) led the implementation efforts most often.

There were four instances where companies indicated that at least one Other role not listed as options in the Survey was involved in the implementation of the post-issue management PA models. One company indicated that, for each of the three distinct post-issue PA models they had implemented, two additional roles participated: "Customer service" and "Distribution." Another company stated their "Data management team" was involved in the implementation.

6c. Who is responsible for taking the output from the model and making decisions based upon it?

Table A.11 shows the roles of people responsible for using the PA model output.

Table A.11 – People Who Use the PA Model Output

Who	Marketing	Underwriting	Post-Issue Mgmt.
Internal actuary	7	0	3
Internal data scientist/statistician	11	2	3
Internal IT	2	0	0
Internal marketing	16	0	6
Internal underwriter	7	7	0
External actuarial consultant	0	0	0
External data scientist/statistician	1	0	0
External underwriting consultant	0	0	0
External consultant (other)	1	1	0
Reinsurer	3	0	0
Vendor (e.g., lab, credit bureau, etc.)	0	1	0
Other	14	0	1

Once the PA models have been implemented, the people using the output to make decisions are generally internal resources.

For Marketing programs, the top decision makers were:

- Internal marketing (16)
- Internal data scientist/statistician (11)
- Internal actuary (7)
- Internal underwriter (7)
- Other – “Distribution service center” (7)

The Other roles companies indicated as using the marketing PA model output were:

- “Distribution service center” (7)
- “Medical directors” (3)
- “Agents” (2)
- “Agency Distribution” (1)
- “Club sales management” (1)

If these job categories had been included in the Survey, other companies may also have selected them.

For Underwriting programs, is was not surprising to see that Internal underwriters (7) are the main user of the PA model.

For Post-Issue Management programs, the top 3 users of the PA model were:

- Internal marketing (6)
- Internal actuary (3)
- Internal data scientist/statistician (3)

7. Since your company implemented this program, have there been improvements in the following.

Table A.12 shows the areas where there has been improvement due to the introduction of a PA model.

Table A.12 – Have Improvements been seen due to the PA Model?

Improvement Type	Marketing		Underwriting		Post-Issue Mgmt.	
	Yes	No/Not Sure	Yes	No/Not Sure	Yes	No/Not Sure
Acquisition costs	5	19	3	2	0	5
Mortality	0	23	1	4	0	6
Persistency	6	15	0	5	1	5
Sales	20	7	2	4	1	4
Time to issue	4	21	3	3	0	5
Other	1	5	0	0	0	0

The areas that companies indicated improvement in from implementing a PA program are mostly in the Marketing program category. This may be because the development and implementation of PA programs appears to have gotten the earliest traction in the Marketing category, as discussed in question 2.

The top three areas of improvement seen in the Marketing category were:

- Sales (20)
- Persistency (6)
- Acquisition costs (5)

Except for Sales, most of the responses indicated that it was still too early to know if the PA program had produced benefits.

For Underwriting, about half of the responses indicated the PA programs helped to improve Acquisition costs, Sales and Time to issue; all but one of the responses also indicated that it was too early to tell on the programs for Mortality and Persistency. There is one Underwriting PA program where improvement was seen on Mortality; this was the only program across all types of PA programs where an impact on Mortality was identified.

As companies develop future PA programs, they may want to consider defining success criteria and metrics.

8. What data sources did your company use to develop the predictive model?

Table A.13 shows the sources companies used in developing their PA model.

Table A.13 – Sources of Information

Data Source	Marketing	Underwriting	Post-Issue Mgmt.
Vendor data	17	3	4
Financial data	16	4	4
Lifestyle data	13	4	3
Internal experience study	12	4	2
Application	12	3	3
Internal data from other lines of business (e.g., P & C)	10	0	5
Actual physical measurements	9	3	0
External consulting data	8	2	1
MIB checking service	5	5	0
MVR	5	5	0
Prescription history	5	4	0
Personal history report	5	3	0
Criminal history	4	4	0
Credit report or bankruptcy	4	3	1
Reinsurer data	4	0	0
MIB Insurance Activity Index	3	6	0
Special questionnaire (e.g. older age, aviation)	3	0	0
Other internal data	2	0	1
Online questionnaire	1	0	0
Social media	1	0	0
Health-related technology (e.g. wearable, smart phone)	0	0	0
Other	0	0	2

<u>PA Marketing Models</u>

Six sources used for developing PA models received ten or more responses:

- Vendor data (17)
- Financial data (16)
- Lifestyle data (13)
- Application (12)
- Internal experience study (12)
- Internal data from other lines of business, e.g., P&C (10)

Two sources also received a large number of responses:

- Actual physical measurements (9)
- External consulting data (8)

PA Underwriting Models

The top three responses for sources used in developing a predictive model for Underwriting programs were:

- MIB Insurance Activity Index (6)
- MIB checking service (5)
- MVR (5)

Five sources also received four responses:

- Financial data
- Lifestyle data
- Internal experience study
- Prescription history
- Criminal history

PA Post-Issue Management Models

The top three responses for sources used in developing a predictive model for Post-Issue Management programs were:

- Internal data from other lines of business (5)
- Financial data (4)
- Vendor data (4)

Answers for the respondents indicating Other were:

- "Actuarial data (embedded values)" (2)

9. How often does your company plan to review the model?

Table A.14 shows the frequency which companies expect to review their PA model.

Table A.14 – Model Review Frequency

Type of PA	At least once per year	Every 1-3 years	Longer than 3 years	As needed	Undecided
Marketing	19	5	2	1	0
Underwriting	3	2	2	1	0
Post-issue management	4	1	1	0	0

Twenty-six of the 40 responses indicated an expectation that the models would be reviewed at least annually. It is interesting to note that 19 of the 27 marketing models and four of the six Post-issue management models were expected to be reviewed annually, while the length of time to review the Underwriting models was quite varied. One potential reason is that the experience mortality resulting from use of the PA model in the Underwriting process takes more than just one year to develop credibility. Note also that there was a definitive plan for model review for all PA models (i.e., no Undecideds).

10. Does your company have current plans to expand the use of the model (e.g. by age, product, distribution channel, etc.)?

Table A.15 shows planned expansion use for the PA models.

Table A.15 – Model Use Expansion

Type of PA	Yes	No
Marketing	20	6
Underwriting	6	2
Post-issue management	4	2

Respondents indicated that 30 of 40 PA models were expected to have expanded use in the future.

11. Are your company's reinsurers participating in this program?

Table A.16 shows reinsurance participation in the PA programs.

Table A.16 – Reinsurance Participation

Type of PA	All	Some	None
Marketing	1	12	11
Underwriting	3	2	3
Post-issue management	1	3	1

Of the 37 responses, 22 PA programs were either fully or partially reinsured; however, only five of the programs were fully reinsured. By type of PA program, Post-issue management had the highest proportion of reinsurer participation (4 out of 5), while Underwriting programs had the second highest participation rate, with 5 out of 8 programs having some or all of the companies' reinsurers participating. The Marketing program responses were more evenly split between some or all reinsurance (13) and no reinsurance (11). Note that only one Marketing PA program was fully reinsured.

12. In developing the predictive analytics program, your company likely encountered some obstacles. Please rank the top three.

Table A.17 shows Obstacles that were in ranked in the top three by companies as they developed their PA programs.

Table A.17 – Top 3 Obstacles during PA Program Development

Obstacle	Marketing	Underwriting	Post-Issue Mgmt.	Total
Data sources	14	1	5	20
Agent buy-in	9	4	0	13
Internal user buy-in	9	1	3	13
Implementation	11	0	1	12
Designing/building the model	8	2	1	11
Model validation	5	4	1	10
Sufficient resources to complete the work	7	1	0	8
Justifying cost/benefit analysis	3	1	3	7
Senior management buy-in	2	2	1	5
Reinsurer buy-in	1	3	0	4
Finding/developing predictive analytics expertise	3	1	0	4
Regulatory/compliance issues	0	1	1	2
Available technology	0	1	0	1
Finding appropriate outside help	0	0	0	0
Public relations	0	0	0	0
Other	0	0	0	0

There were 110 obstacles reported from 14 companies, ranked 1, 2 or 3 for 38 PA programs. Finding appropriate outside help and Public relations were not considered to be obstacles for any respondent.

Of the 110 responses, the top obstacles to developing the PA programs were:

- Date sources (20)
- Agent buy-in (13)
- Internal user buy-in (13)
- Implementation (12)
- Designing/building the model (11)
- Model validation (10)

Of the 72 responses associated with Marketing PA programs, the top obstacles to developing the programs were:

- Data sources (14)
- Implementation (11)
- Agent buy-in (9)
- Internal user buy-in (9)

Of the 22 responses on Underwriting PA programs, the top obstacles were:

- Agent buy-in (4)
- Model validation (4)
- Reinsurer buy-in (3)

The reinsurer buy-in obstacle responses supports the findings for question 11 (Table A.14), where only 3 out of the 8 respondents stated that all of the reinsurers were participating in the PA model associated with an Underwriting program.

Of the 16 Post-issue management responses, the top obstacles were:

- Data sources (5)
- Justifying cost/benefit analysis (3)
- Internal user buy-in (3)

Data sources were ranked as top obstacles for both marketing and post-issue management PA program development. Buy-in, whether agent, internal or reinsurer, was also an important obstacle to overcome for all PA programs.

Marketing

Table A.18 shows the top 3 Obstacles companies incurred in the development of Marketing PA programs.

Table A.18 – Top 3 Obstacles during PA Development: Marketing

Obstacle	Rank			Total
	1st	2nd	3rd	
Data sources	8	0	6	14
Implementation	3	3	5	11
Internal user buy-in	6	2	1	9
Agent buy-in	1	8	0	9
Designing/building the model	1	2	5	8
Sufficient resources to complete the work	0	5	2	7
Model validation	4	0	1	5
Justifying cost/benefit analysis	1	0	2	3
Finding/developing predictive analytics expertise	0	3	0	3
Senior management buy-in	0	1	1	2
Reinsurer buy-in	0	0	1	1
Other	0	0	0	0

The obstacles rated as most important for companies in the development of marketing PA programs were:

- Data Sources (8)
- Internal user buy-in (6)
- Model validation (4)

Model validation (4) was selected more often than Implementation (3) as a number one issue, but when looking at responses for the top three obstacles combined Implementation had more (11 vs 5) responses.

Underwriting

Table A.19 shows the top three obstacles companies incurred while developing Underwriting PA programs.

Table A.19 – Top 3 Obstacles during PA Development: Underwriting

Data Source	Rank			Total
	1st	2nd	3rd	
Model validation	3	0	1	4
Agent buy-in	1	2	1	4
Reinsurer buy-in	0	0	3	3
Designing/building the model	1	1	0	2
Senior management buy-in	1	0	1	2
Data sources	1	0	0	1
Finding/developing predictive analytics expertise	1	0	0	1
Available technology	0	1	0	1
Internal user buy-in	0	1	0	1
Justifying cost/benefit analysis	0	1	0	1
Regulatory/compliance issues	0	1	0	1
Sufficient resources to complete the work	0	0	1	1

For the underwriting PA programs, Model validation (3) was selected most often as the number one obstacle incurred. It was the only underwriting obstacle considered most important with more than one vote.

Even though reinsurer buy-in is one of the top obstacles selected for underwriting PA programs, all three responding companies ranked this as third, indicating that other sources were more of an obstacle.

Post-Issue Management

Table A.20 shows the top three obstacles companies incurred while developing Post-Issue Management PA programs.

Table A.20 – Top 3 Obstacles during PA Development: Post-Issue Management

Data Source	Rank			Total
	1st	2nd	3rd	
Data sources	1	1	3	5
Justifying cost/benefit analysis	3	0	0	3
Internal user buy-in	0	3	0	3
Senior management buy-in	0	0	1	1
Designing/building the model	0	0	1	1
Model validation	1	0	0	1
Implementation	0	1	0	1
Regulatory/compliance issues	1	0	0	1

For post-issue management PA programs, Justifying cost/benefit analysis (3) was selected most often as the number one obstacle. It was the only post-issue management obstacle considered most important with more than one vote.

While Data Sources had only one vote as being the most important obstacle, it had the most overall votes for post-issue management PA program obstacles (5).

Section B – Accelerated Underwriting

The purpose of this section of the Survey was to determine what each respondent's company was doing, at the time of the survey, with respect to accelerated and enhanced underwriting. As described in the introduction, the Subcommittee received limited responses (three companies) on enhanced underwriting and the three did not respond to all of the questions. Therefore, results on enhanced underwriting are not provided.

This section will therefore be devoted to the accelerated underwriting results. For purposes of this Survey, accelerated underwriting was defined as the use of tools such as a predictive model to waive requirements such as fluids and a paramedical exam on a fully underwritten product for qualifying applicants without charging a higher premium.

Question 1 is shown in its entirety in Appendix 2.

Twenty-six companies responded to this section of the Survey. Answers to question 1 on the use of accelerated underwriting programs are shown in Table B.1.

Table B.1 – Use of Accelerated Underwriting Programs

Implemented	Working on and plan to implement			Working on but not sure if will implement	Not currently working on but…			Total
	Within 1 year	In 1-2 years	Longer than 2 years		Considering it	Considered it and/or worked on it and decided not to do it	Not considering it	
10	6	4	0	2	1	0	3	**26**

Ten companies indicated that they had Implemented accelerated underwriting programs and another ten indicated that they Plan to implement a program within the next two years.

There were two comments regarding this question:

- "Currently we are looking into our option for Accelerated Underwriting and how they could be used in our current and future portfolio of products."
- "We are in the process of implementing accelerated underwriting and plan to launch a limited pilot in Q3 2016. The program which is intended to cover all products and states, will be rolled out in a phased manner in 2016 and 2017. Selected product designs and riders are excluded from the accelerated underwriting program."

The Survey asked respondents follow-up questions regarding companies that had Implemented an accelerated underwriting program. Nine companies responded to the follow-up questions.

2. What year did your company begin to implement this program, even on a limited basis or as a pilot program?

The nine responses were:

- 2010
- 2011
- 2014
- 2015 (3)
- 2016 (2)
- 2017

Seven of the nine companies implemented their program within the last few years, as would be expected. The company that indicated an implementation date in 2017 was likely responding when their program would be fully implemented, that it was implemented earlier on a limited basis. The Subcommittee had intended for this answer to represent when it was first implemented, even if just on a limited or pilot basis.

3a. Was this program initially implemented as a pilot program?

- Yes – 5
- No – 4

Results were mixed on whether or not a pilot program was initially implemented.

3b. Is this program still running as a pilot program?

- Yes – 1
- No – 8

Only one company is still running their accelerated program as a pilot.

4a. Is this program offered on some or all of your company's term products?

The nine responses on term products were:

- None – 2
- Some – 4
- All – 3

Responses were mixed.

4b. Is this program offered on some or all of your company's permanent products?

The nine responses on permanent products were:

- None – 0
- Some – 7
- All – 2

All respondents indicated using the accelerated underwriting program on some or all of their permanent products.

4c. Considering all of the products on which your company offers this program, please provide the overall maximum issue age that your company will allow with this program.

The eight responses on maximum issue age were:

- 35
- 50
- 54
- 60 (3)
- 65
- 85

The maximum issue age on accelerated underwriting programs ranged from 35 to 85 and the most common maximum issue age was 60.

4d. Considering all of the products on which you offer this program, please provide the overall maximum face amount that your company will allow with this program.

The eight responses on maximum face amount were:

- $100,000
- $249,999
- $250,000
- $1,000,000 (4)
- $3,000,000

The maximum face amounts on accelerated underwriting programs ranged from $100,000 to $3,000,000 and the most common maximum face amount was $1,000,000. The Subcommittee was not aware of any companies with a maximum face amount on accelerated underwriting programs beyond $1,000,000 so it followed up with this company and they confirmed the $3,000,000 maximum face amount was correct.

5. Does your company randomly check some applicants to test your assumptions/model?

- Yes – 4
- No – 5

Responses were mixed on whether companies randomly checked some applicants to test their assumptions and/or model.

6. Who was involved in the design/development of the program? In the second column, please indicate the area(s) leading this effort. Check all that apply.

Table B.2 shows the people involved in the development of an accelerated underwriting program.

Table B.2 – People Involved in Development of Accelerated Underwriting Programs

Who	Involved	Leading
Internal actuary	7	3
Internal underwriter	8	4
Internal marketing	4	1
Internal IT	3	0
Internal data scientist/statistician	3	1
External data scientist/statistician	0	0
External actuarial consultant	0	0
External underwriting consultant	0	0
Other external consultant	1	0
Reinsurer	2	0
Vendor (e.g., lab, credit bureau, etc.)	3	0
Other	2	1
Total # of Respondents	**8**	

The top three Involved in the development of an accelerated underwriting program were:

- Internal underwriter (all 8)
- Internal actuary (7)
- Internal marketing (4)

The next most prominent participants in the development were Internal data scientist/statistician, Internal IT and Vendor, all at three companies.

There were also several people whom the Subcommittee asked about, but no company indicated that they were Involved. These include:

- External data scientist/statistician
- External actuarial consultant
- External underwriting consultant

While External consultants do not appear to be used (other than one company that indicated they used another type of External consultant), other outside parties were involved in the development of accelerated underwriting programs, namely Vendors (3) and Reinsurers (2).

Those leading the effort were typically:

- Internal underwriter (4)
- Internal actuary (3)

Answers for the respondents indicating Other were:

- "Distribution"
- "Research Dept"

7. Does your company use predictive analytics in your decision-making?

- Yes – 4
- No – 4

Results were evenly split between companies using or not using PA in the decision-making process. While this result makes sense, it should also be pointed out that there are different definitions of PA and if the Subcommittee provided a precise definition, the results may have changed in either direction.

8. What type of data does your company use in its decision-making on ____? Check all that apply. In the second column, please indicate the five items your company considers to be the most important for this decision.

Table B.3 shows the data sources that are used in the decision-making process for accelerated underwriting programs.

Table B.3 – Data Sources Used for Accelerated Underwriting Decision-Making

Data Sources used for Decision Making	Use	Most Important (Choose 5)
Prescription history	7	6
MVR	7	5
MIB checking service	7	4
Application	6	5
Lifestyle data	5	1
MIB Insurance Activity Index (IAI)	5	1
Financial data	4	2
Credit report/Bankruptcy	4	1
Criminal history	4	0
Personal history report/Background check/e-inspection report	3	3
Other internal data	3	1
Actual physical measurements	2	1
Internal data from other lines of business (e.g., Property and Casualty)	2	0
Online questionnaire	1	0
Health-related technology (e.g., wearable technology, smart phone apps)	0	0
Social media	0	0
Other	1	1

The top Data Sources used for accelerated underwriting decision-making were:

- MIB checking service (7)
- MVR (7)
- Prescription history (7)
- Application (6)
- Lifestyle data (5)
- MIB Insurance Activity Index (5)

Eight companies responded to this question and no data source was reported being used by all companies. However, it is likely that some companies did not indicate using the Application because they did not interpret it as being a Data Source.

It is interesting that Lifestyle data was one of the top Data Sources for accelerated underwriting decision-making.

Other data Sources used by half of the responding companies were:

- Financial data (4)
- Credit report/Bankruptcy (4)
- Criminal history (4)

Companies indicated that the most important Data Sources were:

- Prescription histories (6)
- Application (5)
- MVR (5)
- MIB checking service (4)

Data Sources that the Subcommittee asked about, but that were not used by any companies were:

- Social media
- Health-related technology

The answer for the respondent indicating Other was:

- "Telephone interview & APS for cause"

9. What type of data does your company use in its decision-making on risk class? In the second column, please indicate the five items your company considers to be the most important for this decision. Check all that apply.

This question is similar to question 8, but is asking for the Data Sources used in decision-making on the risk class. Table B.4 shows the results.

Table B.4 – Data Sources Used for Risk Class Decision-Making

Data Sources used for Decision-Making	Use	Most Important (Choose 5)
Prescription history	7	7
MVR	7	6
Application	6	5
MIB checking service	6	5
Financial data	5	1
Personal history report/Background check	4	4
Criminal history	4	1
MIB Insurance Activity Index (IAI)	4	1
Credit report/Bankruptcy /e-Inspection	3	1
Other internal data	3	1
Lifestyle data	3	0
Actual physical measurements	2	2
Online questionnaire	2	1
Other	1	1
Internal data from other lines of business (e.g., Property and Casualty)	1	0
Health-related technology (e.g., wearable technology, smart phone apps)	0	0
Not applicable	0	0
Social media	0	0

The top Data Sources used in risk class decision-making were:

- MVR (7)
- Prescription history (7)
- Application (6)
- MIB checking service (6)
- Financial data (5)

Again, no Data Source was used by all companies. It was surprising that the Application was not indicated as being used by all companies and that Financial data was indicated as being used to determine the risk class by more than half of the applicants.

Other Data Sources used by half of the responding companies were:

- Personal history report/Background check (4)
- MIB Insurance Activity Index (4)
- Criminal history (4)

It was not surprising that the most important Data Sources matched the Data Sources most-widely used:

- Prescription history (7)
- MVR (6)
- Application (5)
- MIB checking service (5)
- Personal history report/Background check (4)

Data Sources that the Survey asked about that were not used were the same as those used in accelerated underwriting decision-making:

- Social media
- Health-related technology

The answer for the respondent indicating Other was:

- "Telephone interview & APS for cause"

10a. Since your company implemented the program, has the time to issue the policy: increased, decreased, remained approximately the same, not sure?

The eight responses were:

- Increased – 0
- Decreased – 7
- Remained approximately the same – 1
- Not sure – 0

Seven of the eight respondents indicated that the time to issue a policy under the accelerated underwriting program has decreased, while the other respondent indicated that the time to issue had not changed.

10b. When your company implemented the program, did it expect the mortality to: increase, decrease, remain approximately the same, not sure?

The eight responses were:

- Increase – 2
- Decrease – 2
- Remain approximately the same – 3
- Not sure – 1

Answers to this question varied considerably. Of the eight respondents, two expected mortality to increase while two expected it to decrease and three thought it would remain about the same. One company was not sure.

The Subcommittee also received one comment on this question:

- "We expect mortality to decrease in certain face amount/age bands."

10c. Since your company implemented the ___ program, has the mortality: increased, decreased, remained approximately the same, not sure?

The eight responses were:

- Increased – 0
- Decreased – 1
- Remained approximately the same – 1
- Not sure – 6

This question asked how mortality had actually changed. Of the eight respondents, six indicated that they did not know. Of the two that responded, one indicated that mortality had decreased and the other observed that it was about the same as prior to implementing the accelerated underwriting program. The two observations of experience matched what those companies were expecting.

11. Excluding program development costs, have your company's underwriting costs: increased, decreased, remained approximately the same, not sure?

The eight responses were:

- Increased – 0
- Decreased – 5
- Remained approximately the same – 1
- Not sure – 2

12. Of the eight respondents, five indicated that underwriting costs had decreased, one indicated they were about the same, and two were not sure.

After implementation, indicate where your company has seen a change in business. Check the appropriate column for each item (each row).

Table B.5 shows where companies saw changes in their business as a result of the implementation of the accelerated underwriting program and the direction of the change, where known.

Table B.5 – Changes as a Result of Implementation of Accelerated Underwriting Program

Item	Increased	Decreased	Remained about the same	Not sure	Not applicable
Sales of product sold	3	0	2	1	2
Average age	0	1	2	3	1
Average face amount	1	1	3	1	1
Declination rate	0	0	5	1	1
Placement ratio	3	0	2	1	1
Profitability	2	0	1	3	1
Other	0	0	0	0	2
	Better class	**Worse class**	**About the same**	**Not sure**	**Not applicable**
Average underwriting class	1	0	5	2	0

Eight companies responded to this question. Changes where at least two companies indicated a noticeable change were:

- Sales of product sold – 3 indicated an Increase
- Placement ratio – 3 indicated an Increase
- Profitability – 2 indicated an Increase
- Average face amount – 1 indicated an Increase and 1 indicated a Decrease

The only item asked about where no company indicated a change (higher or lower) was in the Declination rate.

One company provided a comment on this question:

- "Still in early pilot phase"

13. Does your company have plans to expand use of this program (e.g., by age, product, etc.)?

- Yes – 7
- No – 1

Seven of the eight responding companies indicated that they plan to expand their accelerated underwriting program.

14. Are your company's reinsurers participating in this program?

The eight responses were:

- All of them – 0
- Some of them – 4
- None of them – 4

Of the eight respondents, half indicated that some of their reinsurers participated in this program and the other half indicated that none of their reinsurers participated.

*15. In developing its program, your company likely encountered some challenges. Please rank the **top three** challenges your company faced, with **1 being the most difficult**.*

Table B.6 shows the challenges encountered by the responding companies.

Table B.6 – Challenges Encountered in Developing an Accelerated Underwriting Program

Challenge	Rank			Total
	1st	2nd	3rd	
Data sources	2	2	0	4
Justifying cost/benefit analysis	1	2	1	4
Implementation	2	0	1	3
Designing/building the program	1	1	0	2
Regulatory/compliance issues	1	0	0	1
Sufficient resources to complete the work	1	0	0	1
Agent buy-in	0	1	0	1
Internal user buy-in	0	1	0	1
Available technology	0	0	1	1
Finding appropriate outside help	0	0	1	1
Reinsurer buy-in	0	0	1	1
Senior management buy-in	0	0	1	1
Public relations	0	0	0	0
Other	0	0	1	1

Seven companies provided their three top challenges and one company only provided its top challenge.

The biggest challenges were:

- Data sources (4)
- Justifying cost/benefit analysis (4)
- Implementation (3)
- Designing/building the program (2)

The data sources category was chosen by two companies as the biggest challenge and by two companies as the second biggest challenge. Justifying cost/benefit analysis was chosen by one company as the biggest challenge, by two companies as the second biggest challenge and by one company as the third biggest challenge.

No companies chose Public relations as a challenge.

The answer for the respondent indicating Other was:

- “Impact on manual processing without system support”

16a. Including all of your company's products with an Accelerated Underwriting program combined, what percentage of the applicants qualified to be issued without fluids?

Five companies responded to this question. The percentage of all products with an accelerated underwriting program where applicants qualified to be issued without fluids were:

- 30%
- 45%
- 50%
- 70%
- 100%

Results ranged from 30% to 100%. It was surprising that one company indicated that 100% of the applicants would qualify for the accelerated underwriting program; it is possible this company misinterpreted our instructions.

16b. Compared to your company's anticipated percentage, the actual percentage was…?

This question relates to the actual percentages asked about in question 16a. Based on this, eight companies responded with anticipated percentages of:

- Higher – 0
- Lower – 1
- About the same – 4
- Don't know – 3

Note that only five companies provided actual percentages in question 16a. Four of the respondents to this question indicated that their anticipated percentage to qualify to be issued without fluids was about the same as the actual percentage, one indicated it was lower than what actually happened, and three indicated they did not know how it compared. Of those that responded to 16a, four of the five indicated that the actual percentage was what they anticipated. The other company was not sure. Of those not providing a percentage in 16a, two did not know if it matched the anticipated percentage and one indicated that it was lower.

Respondents were asked for other comments regarding this section. The Subcommittee received one comment:

- “Neither enhancement or accelerated have been implemented / enhanced in 2017-18 / accelerated is within a year”

Respondents were asked for other general comments regarding the Survey that would better help the Subcommittee to understand their answers. The Subcommittee received a number of comments. They were:

- “I assumed that by 'predictive analytics' you meant to imply a regression model type approach. Personally, I think this is something of a false distinction - for instance, all companies have for years and years had 'predictive models' in place for lapsation. And similar for good cross-sell candidates, etc. But I have answered the questions in the spirit in which I believe they were asked.”
- “Tough to complete in its entirety as analytic efforts cross multiple teams areas”
- “We have looked at many products/vendors/data sources; are considering a variety of uses, trying to prioritize and leverage our efforts.”
- “The initial pilot will focus on Term policies only, and will be expanded further to include Permanent policies at a later stage. Approximately 30% of eligible applications that are electronically submitted between issue ages 18 and 60 for face amounts of $100k to $1M with tele-underwriting. During the early phases we are largely relying on information that is traditionally used for underwriting. We will be expanding this to additional data sources. Overall mortality for business issued using accelerated underwriting is expected to be higher than business that is tested. The program is currently focused on the ‘Preferred’ business alone. Post the initial pilot phase, we will look for additional ways to expand the proportion of policies that can be covered under the accelerated underwriting program. Part of this will be achieved through expanding the program to cover some of the lower underwriting categories.”
- “We're looking at how we can leverage predictive analytics across most aspects of our business. Because we're in the very early stages there aren't any implementations plans at this time. “
- “Clientele consists of older age and higher amounts.”

Section B - Enhanced Underwriting

The same Survey questions were asked for Enhanced Underwriting that were asked for Accelerated Underwriting. Only four companies answered that they had implemented enhanced underwriting programs, and only three of those answered the remaining questions.

Three other companies responded that they planned to implement such a program within a year, and three other companies planned to implement enhanced underwriting within 1-2 years. Five companies stated that they were not considering it.

No additional information could be published in this report.

Appendix A – Participating Companies

AAA Life Insurance Company
Accordia Life
Allstate
American Family Life Insurance Company
AXA US
Farmers New World LIC
FBL Financial Group, Inc.
Federal Life Insurance
Gen Re
Guardian
Ivari
John Hancock
Kansas City Life Insurance Company
Liberty Mutual
Lincoln Heritage Life Insurance Company
MetLife
Midland National and North American
National Life Group
New York Life
Pacific Guardian Life
Pacific Life
Principal
Protective Life
Prudential
RMA
SCOR
Securian/Minnesota Life
State Farm Life
Sun Life
Swiss Re
The Wawanesa Life Insurance Company
Thrivent Financial
USAA Life
Zurich American Life Insurance Company

Appendix B – Predictive Analytics and Accelerated Underwriting Survey

Section A – Predictive Analytics

The purpose of this section of the Survey is to determine what your company is doing with respect to predictive analytics. For purposes of this Survey, predictive analytics means the use of a data-driven model or statistical algorithm to help predict likely outcomes based on that data and that can be used to enhance or improve a business decision or process.

1. Please complete the table below with your best answer for each type of predictive analytics (each row). After the table, there is a place for comments to explain any issues if necessary.

Type of Predictive Analytics	Implemented	Working on and plan to implement…			Working on but not sure if will imple-ment	Not currently working on but…		
		Within 1 year	In 1-2 years	Longer than 2 years		Considering it	Considered it and/or worked on it and decided not to proceed	Not considering it
Marketing								
Agent selection/hiring								
Customer more likely to buy								
Customer less likely to lapse								
Customer health profile								
Target market determination								
Cross selling								
Up selling								
Other (please specify):								
Underwriting								
Deciding on underwriting requirements								
Underwriting risk class (i.e., preferred, standard, substandard)								

Stretch criteria for selecting underwriting class								
Table shave								
Business decisions								
Other (please specify):								
Post-issue Management								
Targeted conversion								
For term, post-level premium term, conservation management								
In force management – pre-lapse								
In force management – post-lapse								
In force management – other customer interaction (please specify):								
Agent monitoring/ management								
Other (please specify):								

Comments on question 1:

If your company has not implemented any type of predictive analytics program, please skip to Section B.

2. What year did your company begin to implement this program, even on a limited basis or as a pilot program?

3a. Was this program initially implemented as a pilot program? Yes ___, No ___

3b. Is this program still running as a pilot program? Yes ___, No ___

Questions 4 and 5 should be skipped for Agent Selection and Agent Monitoring/Management

4a. Is this program offered on some or all of your company's term products? None ___, Some ___, All ___

4b. Is this program offered on some or all of your company's permanent products? None ___, Some ___, All ___

4c. Considering all of the products on which your company offers this program, please provide the overall maximum issue age that your company will allow with this program.

4d. Considering all of the products on which your company offers this program, please provide the overall maximum face amount that your company will allow with this program.

Comments on question 4:

5. Within the products for which this predictive analytics is used, what percentage, by policy count, of your business has been impacted?

0-10% ___, 11-25% ___, 26-50% ___, 51-75% ___, 76-90% ___, 91-100% ___

Comments on question 5:

6a. Who was involved in the <u>design/development</u> of the predictive analytics model? In the second column, please indicate the area(s) leading this effort. Check all that apply.

	Involved?	**Leading?**
Internal actuary		
Internal underwriter		
Internal marketing		
Internal IT		
Internal data scientist/statistician		
External data scientist/statistician		
External actuarial consultant		
External underwriting consultant		
Other external consultant		

Reinsurer		
Vendor (e.g., lab, credit bureau, etc.)		
Other (please specify):		

6b. Who was involved in the implementation of the predictive analytics model? In the second column, please indicate the area(s) leading this effort. Check all that apply.

	Involved?	**Leading?**
Internal actuary		
Internal underwriter		
Internal marketing		
Internal IT		
Internal data scientist/statistician		
External data scientist/statistician		
External actuarial consultant		
External underwriting consultant		
Other external consultant		
Reinsurer		
Vendor (e.g., lab, credit bureau, etc.)		
Other (please specify):		

6c. Who is responsible for taking the output from the model and making a decision based upon it? Check all that apply.

Internal actuary

Internal underwriter

Internal marketing

Internal IT

Internal data scientist/statistician

External data scientist/statistician

External actuarial consultant

External underwriting consultant

Other external consultant

Reinsurer

Vendor (e.g., lab, credit bureau, etc.)

Other (please specify):

Comments on question 6:

7. Since your company implemented this program, have there been improvement in the following?

	Some Improvement	**No Improvement**	**Not Sure**
Sales			
Acquisition costs per case			
Time to issue			
Persistency			
Mortality			
Other (please specify):			

Comments on question 7:

8. What data sources did your company use to develop the predictive analytics model? Check all that apply.

Application

Actual physical measurements

Internal experience studies

Internal data from other lines of business (e.g., Property and Casualty)

Other internal data (please specify)

Financial data

Lifestyle data

Social media

Special questionnaire (e.g., older age, aviation, etc.)

Online questionnaire

Health-related technology (e.g., wearable technology, smart phone apps)

Credit report/Bankruptcy

Personal history report/Background check/e-Inspection report

MIB checking service

MIB Insurance Activity Index (IAI)

MVR

Prescription history

Criminal history

External consultant data

Reinsurer data

Vendor data

Other (please specify):

Comments on question 8:

9. How often does your company plan to review the model?

At least once per year ___

Every 1-3 years ___

Longer than 3 years ___

As needed ___

Don't have plans yet ___

Don't know ___

Other (please specify):

Comments on question 9:

10. Does your company have current plans to expand the use of the model (e.g., by age, product, distribution channel, etc.)? Yes ___, No ___

11. Are your company's reinsurers participating in this program? All of them ___, Some of them ___, None of them ___

12. In developing its predictive analytics program, your company likely encountered some obstacles. Please rank the **top three** obstacles your company faced, with **1 being the most difficult**.

    Data sources ___

    Justifying cost/benefit analysis ___

    Senior management buy-in ___

    Internal user buy-in ___

    Agent buy-in ___

    Reinsurer buy-in ___

    Finding/developing predictive analytics expertise ___

    Finding appropriate outside help ___

    Sufficient resources to complete the work ___

    Designing/building the model ___

Model validation ___

Available technology ___

Implementation ___

Public relations ___

Regulatory/compliance issues ___

Other (please specify):

Any other comments on this section:

Section B – Accelerated/Enhanced Underwriting

The purpose of this section of the Survey is to determine what your company is doing with respect to accelerated underwriting and enhanced underwriting. For purposes of this Survey, accelerated underwriting means the use of tools such as a predictive model to waive requirements such as fluids and a paramedical exam on a fully underwritten product for qualifying applicants without charging a higher premium. Enhanced underwriting refers to the use of supplemental information (e.g., criminal history, credit rating, prescription histories) and a predictive model to refine the underwriting process for a simplified issue product. For enhanced underwriting, do not include guaranteed issue, group, final expense, or pre-need products.

1. Please complete the table below with where your company is with respect to accelerated underwriting and enhanced underwriting. After the table, there is a place for comments to explain any issues if necessary.

Type of Underwriting Program	Implemented	Working on and plan to implement…			Working on but not sure if will imple-ment	Not currently working on but…		
		Within 1 year	In 1-2 years	Longer than 2 years		Considering it	Considered it and/or worked on it and decided not to do it	Not considering it
Accelerated underwriting								
Enhanced underwriting								

Comments on question 1:

If your company <u>has not</u> implemented an accelerated underwriting program, please provide any additional comments you have on the Survey. If your company <u>has</u> implemented a program, please answer the questions below.

2. What year did your company begin to implement this program, even on a limited basis or as a pilot program?

3a. Was this program initially implemented as a pilot program? Yes ___, No ___

3b. Is this program still running as a pilot program? Yes ___, No ___

4a. Is this program offered on some or all of your company's term products? None ___, Some ___, All ___

4b. Is this program offered on some or all of your company's permanent products? None ___, Some ___, All ___

4c. Considering all of the products on which your company offers this program, please provide the overall maximum issue age that your company will allow with this program.

4d. Considering all of the products on which you offer this program, please provide the overall maximum face amount that your company will allow with this program.

Comments on question 4:

5. Does your company randomly check some applicants to test your assumptions/model? Yes ___, No ___

6. Who was involved in the design/development of the program? In the second column, please indicate the area(s) leading this effort. Check all that apply.

	Involved?	**Leading?**
Internal actuary		
Internal underwriter		
Internal marketing		
Internal IT		
Internal data scientist/statistician		
External data scientist/statistician		
External actuarial consultant		
External underwriting consultant		
Other external consultant		
Reinsurer		
Vendor (e.g., lab, credit bureau, etc.)		
Other (please specify):		

Comments on question 6:

7. Does your company use predictive analytics in your decision-making? Yes ___, No ___

8. What type of data does your company use in its decision-making on _____? Check all that apply. In the second column, please indicate the five items your company considers to be the most important for this decision.

	Use	**Most Important (Choose 5)**
Application		
Actual physical measurements		
Internal data from other lines of business (e.g., Property and Casualty)		
Other internal data		
Financial data		
Lifestyle data		
Social media		
Online questionnaire		
Health-related technology (e.g., wearable technology, smart phone apps)		
Credit report/Bankruptcy		
Personal history report/Background check/e-inspection report		
MIB checking service		
MIB Insurance Activity Index (IAI)		
MVR		
Prescription history		
Criminal history		
Other (please specify):		

Comments on question 8:

9. What type of data does your company use in its decision-making on risk class? In the second column, please indicate the five items your company considers to be the most important for this decision. Check all that apply.

	Use	**Most Important (Choose 5)**
Application		
Actual physical measurements		
Internal data from other lines of business (e.g., Property and Casualty)		
Other internal data		
Financial data		
Lifestyle data		
Social media		
Online questionnaire		
Health-related technology (e.g., wearable technology, smart phone apps)		
Credit report/Bankruptcy		
e-Inspection report		
Personal history report/Background check		
MIB checking service		
MIB Insurance Activity Index (IAI)		
MVR		
Prescription history		
Criminal history		
Other (please specify):		
Not applicable		

Comments on Question 9:

10a. Since your company implemented the program, has the time to issue the policy: increased ___, decreased ___ , remained approximately the same ___, not sure ___ ?

10b. When your company implemented the program, did it expect the mortality to: increase ___, decrease ___ , remain approximately the same ___, not sure ___ ?

10c. Since your company implemented the ____ program, has the mortality: increased ___, decreased ___ , remained approximately the same ___, not sure ___ ?

11. Excluding program development costs, have your company's underwriting costs: increased ___, decreased ___ , remained approximately the same ___, not sure ___ ?

Comments on questions 10 or 11:

12. After implementation, indicate where your company has seen a change in business. Check the appropriate column for each item (each row).

Item	Increased	Decreased	Remained about the same	Not sure	Not applicable
Sales of product sold under this program					
Average age					
Average face amount					
Declination rate					
Placement ratio					
Profitability					
Other (please specify):					
	Better class	**Worse class**	**About the same**	**Not sure**	**Not applicable**
Average underwriting class					

Comments on question 12:

13. Does your company have plans to expand use of this program (e.g., by age, product, etc.)? Yes ___, No ___

14. Are your company's reinsurers participating in this program? All of them ___, Some of them ___, None of them ___

15. In developing its program, your company likely encountered some challenges. Please rank the **top three** challenges your company faced, with **1 being the most difficult**.

    Data sources ___

    Justifying cost/benefit analysis ___

    Senior management buy-in ___

    Internal user buy-in ___

    Agent buy-in ___

    Reinsurer buy-in ___

    Finding appropriate outside help ___

    Sufficient resources to complete the work ___

    Designing/building the program ___

    Available technology ___

    Implementation ___

    Public relations ___

    Regulatory/compliance issues ___

    Other (please specify):

16a. Including all of your company's products with an Accelerated Underwriting program combined, what percentage of the applicants qualified to be issued without fluids?

16b. Compared to your company's anticipated percentage, the actual percentage was…

higher ___

lower ___

about the same ___

don't know___

Any other comments on this section:

Any other comments on the Survey that will better help us understand your answers:

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