



Welcome and thank you for your interest in viewing this webinar recording presented to you by representatives of the of the IAA's Big Data Working Group and Health Committee.

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International Actuarial Association
Association Actuarielle Internationale



Data Science Survey Results

Expectations and Insights from Actuaries

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13 January 2020

Agenda



Agenda

1. Introduction
2. Demographics, experience, and data science familiarity
3. The use of data science in organizations
4. Data science knowledge acquisition and use
5. Conclusion & Summary

1. Introduction

Introduction

- The Big Data Working Group (BDWG) of the International Actuarial Association (IAA) conceived in mid-2019 the idea of a fact-finding survey of actuaries world-wide to determine their familiarity and use of data science.
- the objectives were to better understand attitudes towards the data science field,
- find out the extent of use of data science and to identify the barriers to entry and
- the rewards associated with integrating advanced analytics into more actuarial work.





Survey Process

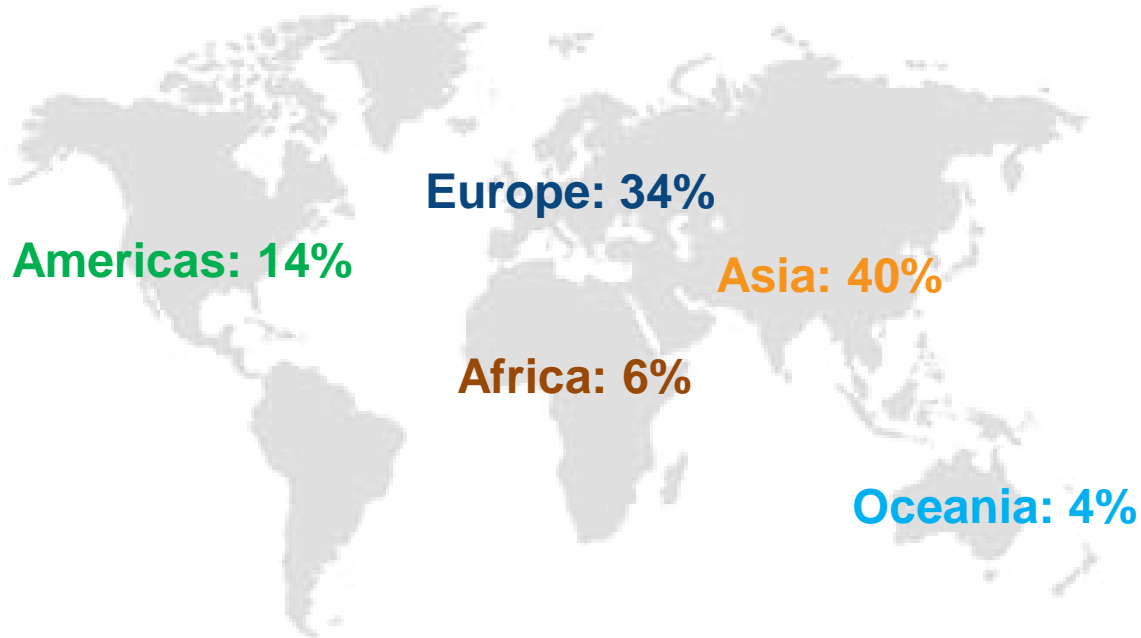
- The survey was conducted via the IAA's Weekly News Brief (March 11, 2020) and was shared with anyone connected with the IAA that had consented to receiving such e-mails from the IAA.
- This list included all members of the IAA Committees, Working Groups, and Sections. In addition, some participants promulgated the survey within relevant groups outside the IAA to get greater coverage.
- The survey reached about 1,000 people, out of which 123 responded, a response rate of approximately 12%.
- The analysis of the survey results, as given in the following sections, demonstrates that actuaries and insurance companies are increasingly interested in data science and how such is being incorporated into their work and activities.

2. Data Science Experience & Demographics



Survey Demographics

- The survey was completed by **123** people from all over the globe.
- **Over 80%** of the respondents were Fully Qualified Actuaries





Poll Question

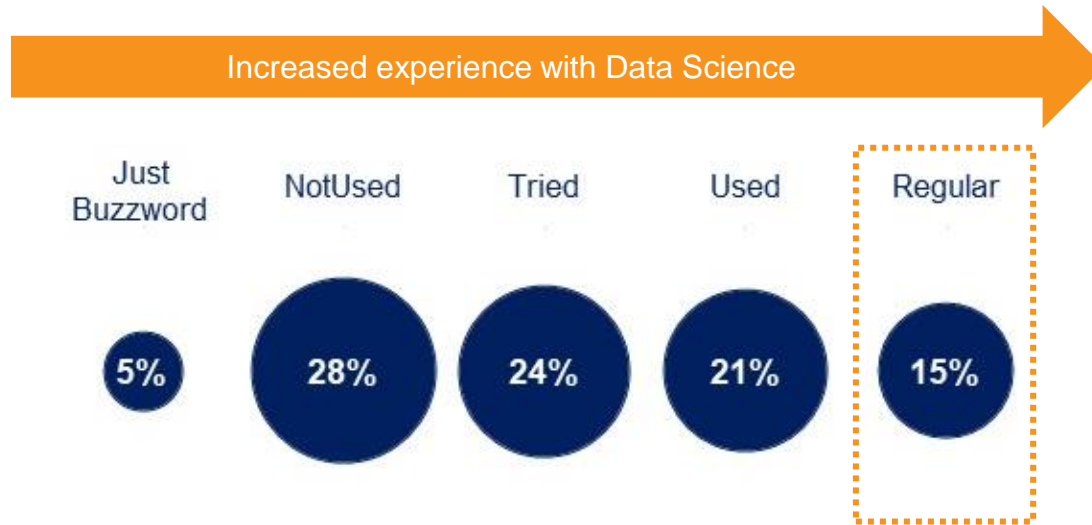
What is your level of Data Science Experience?

- A. Just Buzzword
- B. Not Used
- C. Used
- D. Regular



Experience with Data Science & Demographics

% of Respondents by Level of Data Science Experience





Experience with Data Science & Age

% of Respondents by Age & Level of Data Science Experience





Experience with Data Science & Position

% of Respondents by Position & Level of Data Science Experience



Increased experience with Data Science



Experience with Data Science & Practice Area

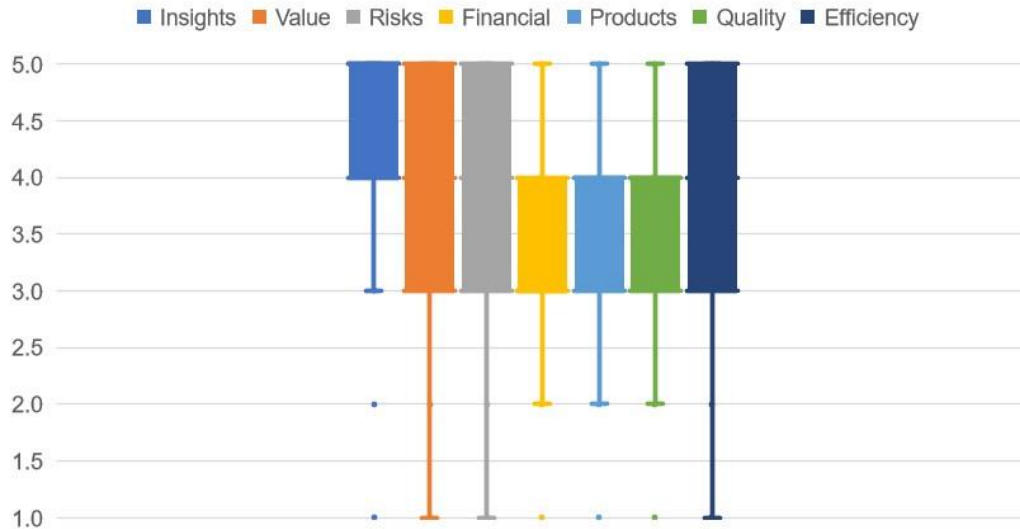
- Most respondents practiced in multiple areas
- Each respondent on average works in in three areas of practice
- The majority of responses were in traditional actuarial roles, such as pricing, risk management, reserving, and product development.

3. Data Science in Organisations

Benefits of Data Science

- Insights, value, risks and efficiency are the top benefits that could be achieved from data science initiatives.

**Ditribution of Rankings for most Important Benefits of Analytics
(0 to 5=highest for each category)**





Poll Question

What are the main barriers to using Predictive Analytics?

- A. Shortage of staff with the appropriate skillset
- B. Lack of system infrastructure that supports analytics
- C. Insufficient data exists to perform analytics on
- D. Data is segregated



Barriers to Data Science Adoption

- Shortage of skilled staff as the most significant barrier (with 74 responses), followed by lack of appropriate infrastructure and insufficient data to perform analytics work (about 55 responses each).

Barriers to Use of Predictive Analytics

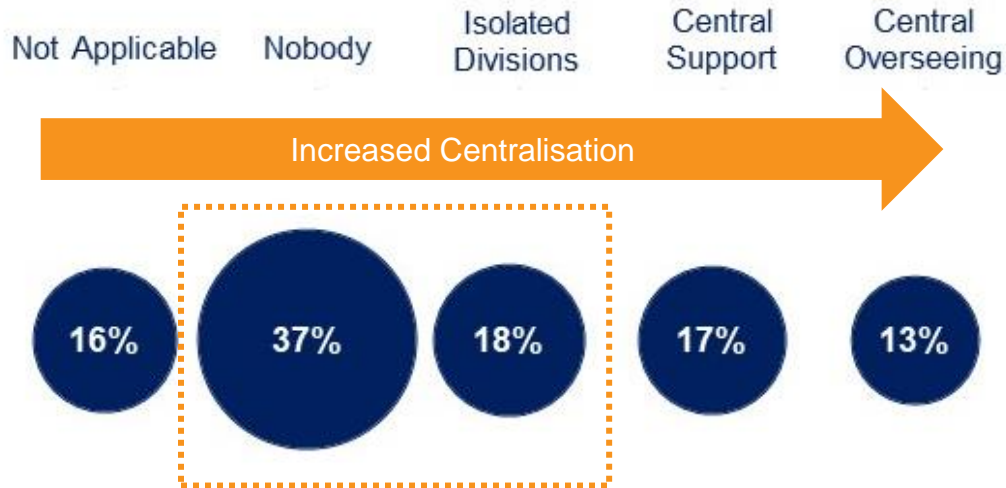
(multiple responses permitted)



Responsibility for Analytical Areas

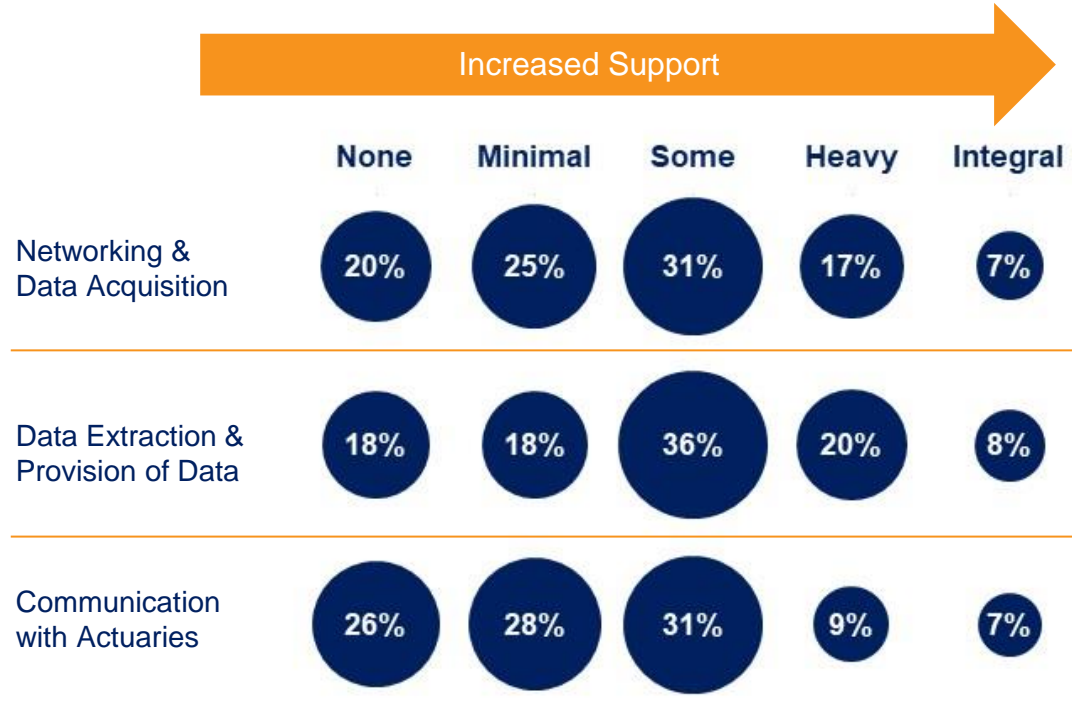
- Most respondents indicated that the responsibility for analytical work did not reside with any one team or business unit but was spread across the organisation in an unstructured manner.

Distribution of responsibility for analytics function



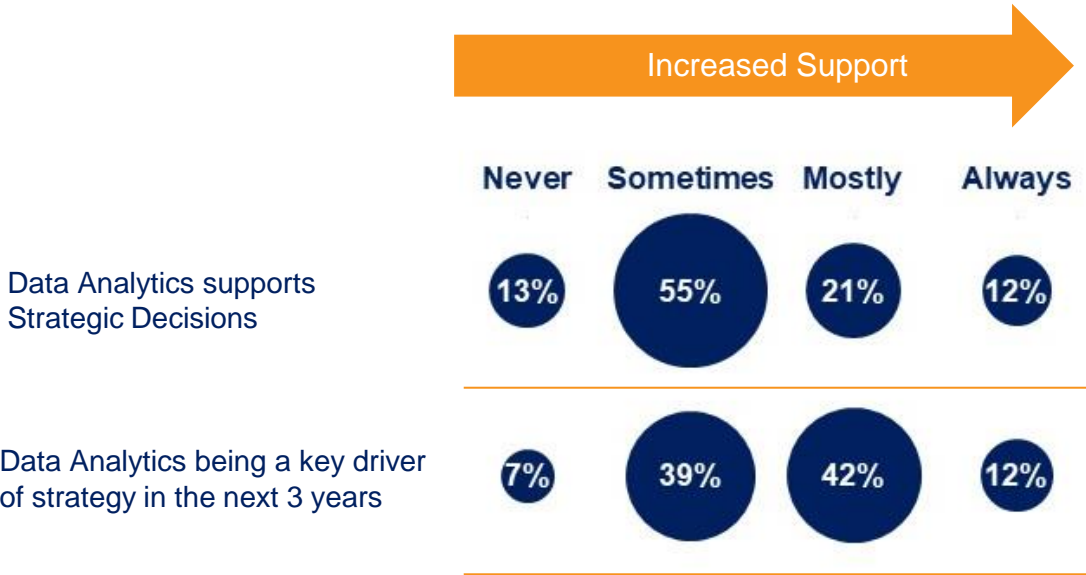


IT Support by Activity





Data Analytics & Decision Making

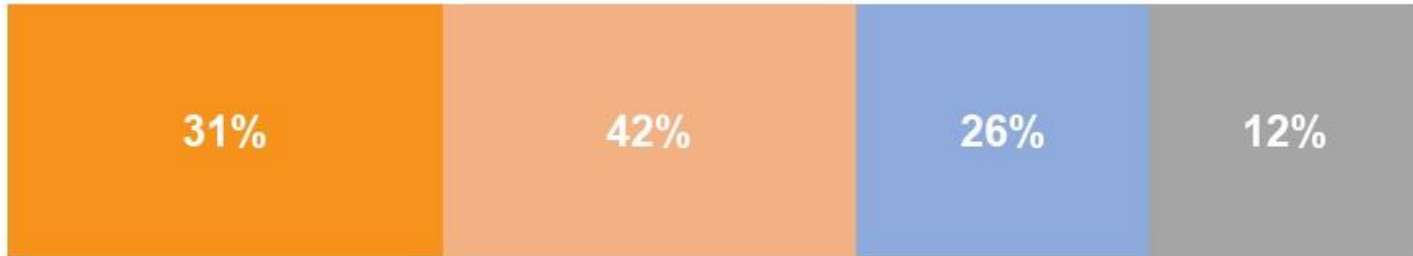




Main stakeholder driving the Data Analytics Agenda

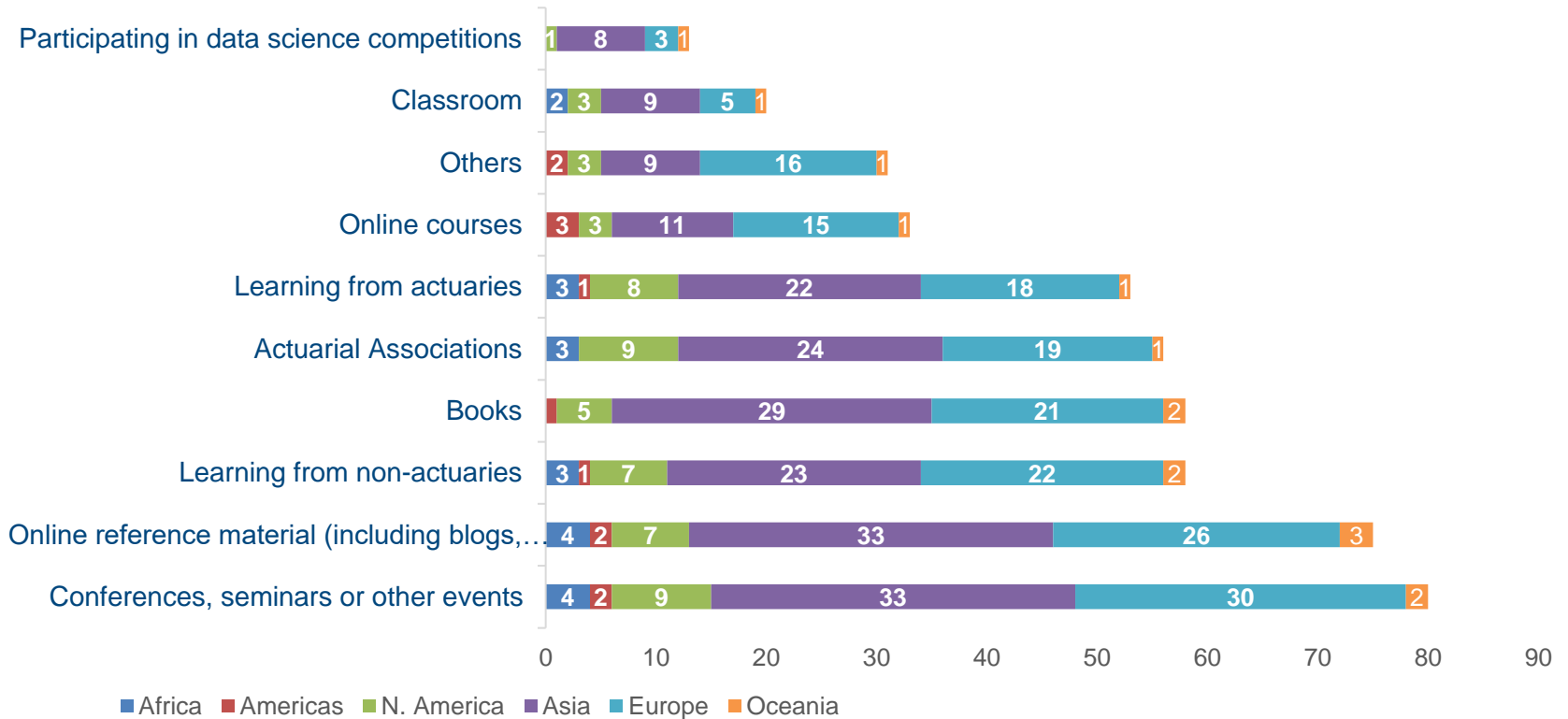
Who is Most Likely to Adopt / Push Predictive Analytics in the Organisation?

■ Executive Office ■ Senior Management ■ Managers ■ Staff



4. Data science knowledge acquisition and use

Data Science Knowledge – Acquisition Methods





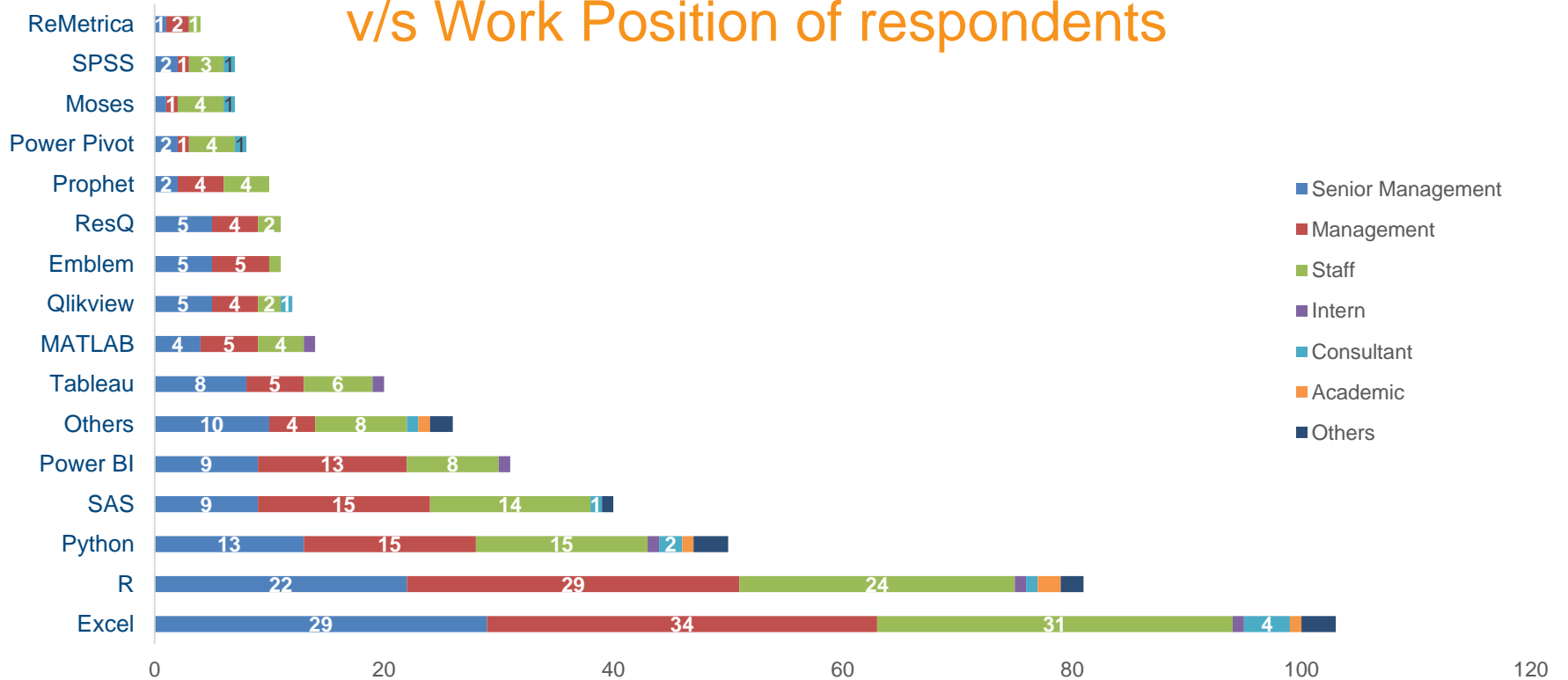
Poll Question

What software tools do you use for data analytics?

- A. Excel
- B. R / Python
- C. SAS
- D. Power BI

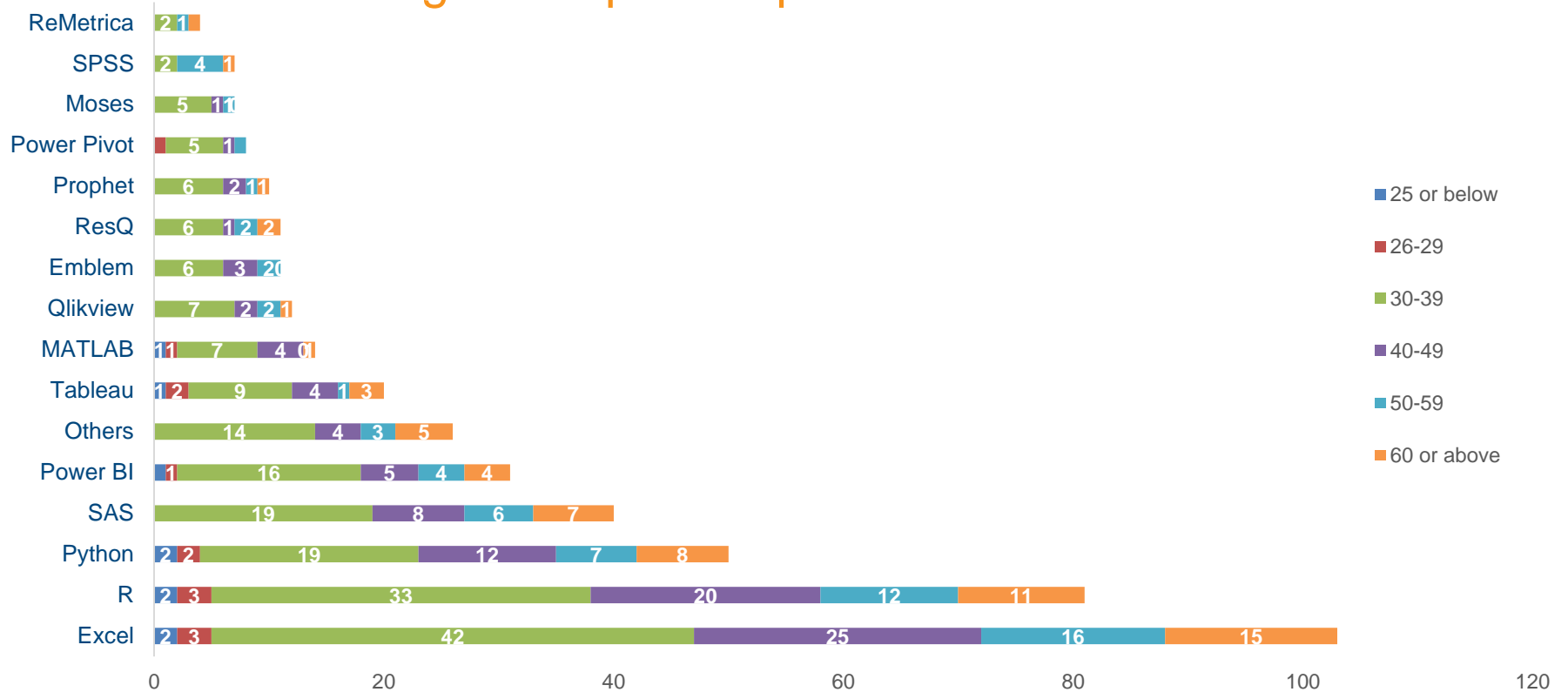


Data science and software tools for analytics v/s Work Position of respondents



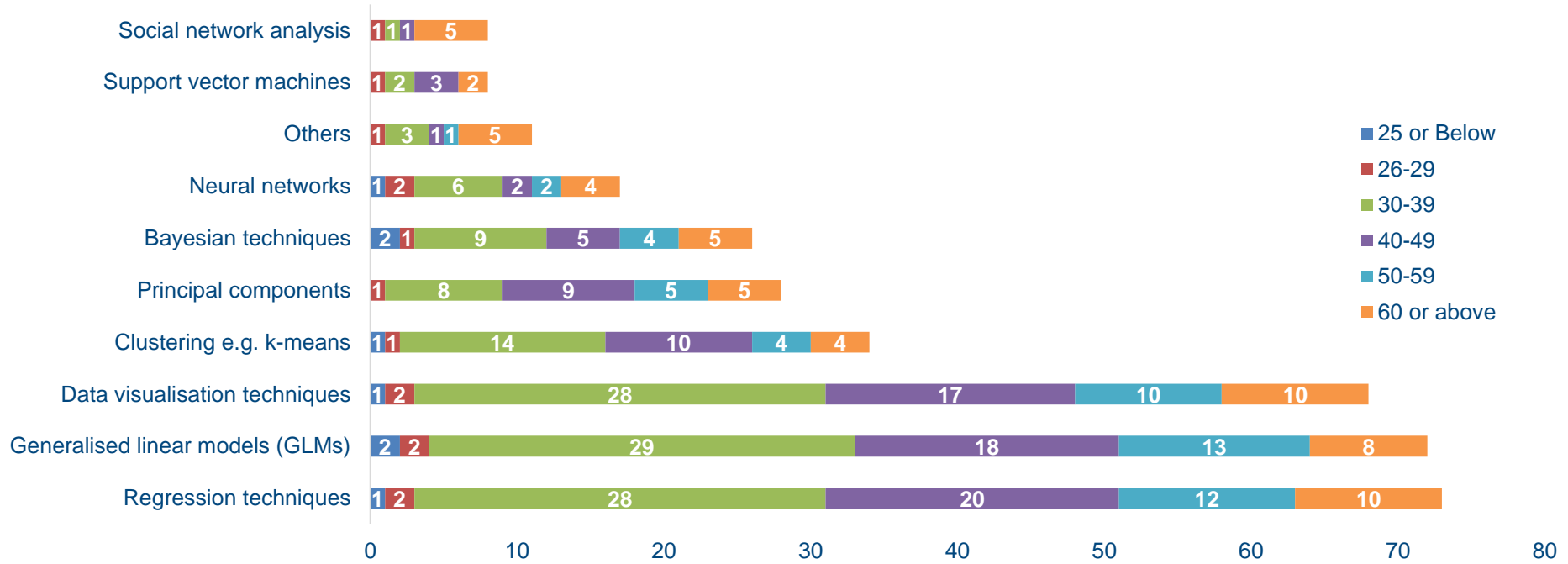


Data science and software tools for analytics v/s Age Group of respondents



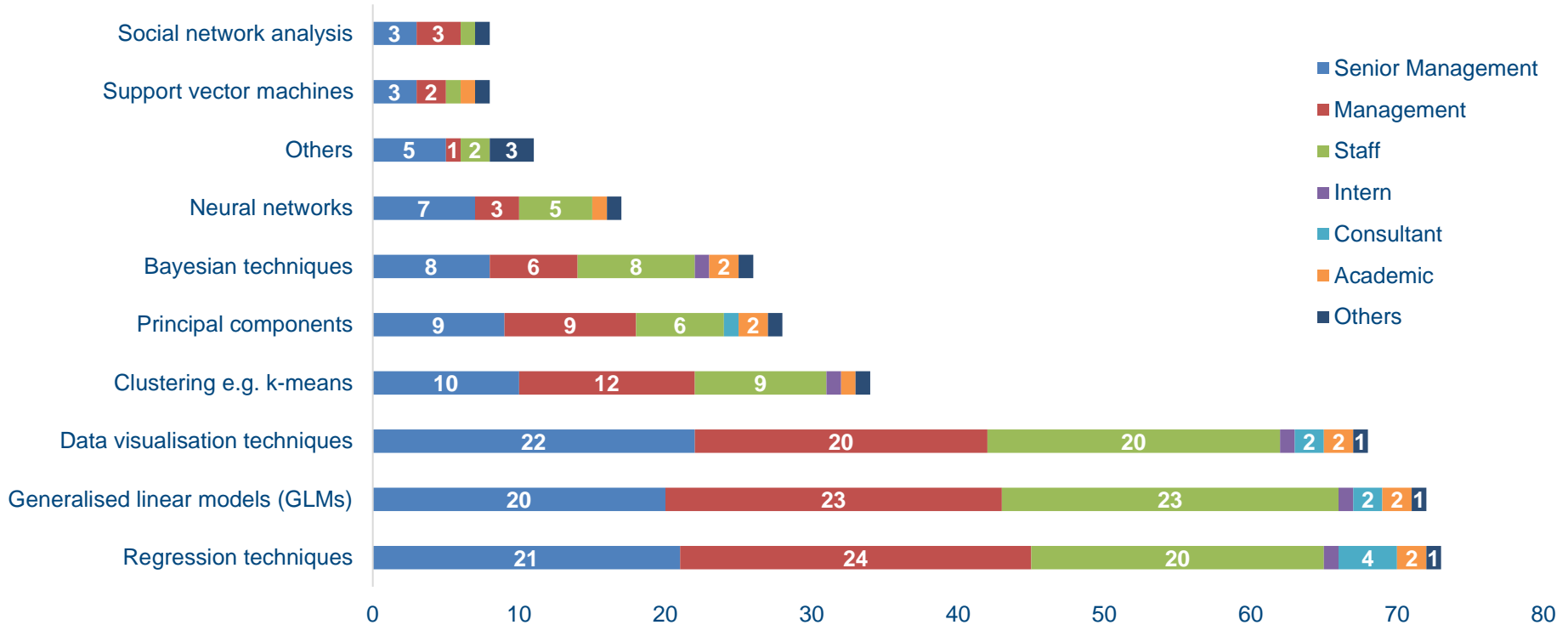


Data science or actuarial techniques used v/s Age Group of respondents





Data science & actuarial techniques used v/s Work Position of respondents





Participants Views and comments

Below is a summary of some of the (unedited) comments:

- *I think **data science is very important** for the actuarial work.*
- *There is a **lot of value in moving the traditional actuarial reports to using a more granular big datasets**, and I believe this skill set can change the way we as actuaries work with data. But there is also a cost benefit analysis that needs to be considered.*
- *Having worked both as a qualified actuary and data scientist in a cryptocurrency startup, I see limited use of data science in the actuarial field (particularly life insurance), due to the inadequacy of data, prohibitions from regulators, siloed IT department, lack of skills from actuaries, and limited profit potential of advanced data science techniques.*
- ***Be careful about the use of artificial intelligence. It includes psychology, ethics, and many other fields – and actuaries are rarely trained in these disciplines.***
- *Data science is not only about tooling, it's about communication, connecting, customer needs awareness, goal setting, understanding, social skills, etc.*

5. Conclusion & Summary



Summary

- ❖ The BDWG recognizes the need for and opportunities of data science technologies and their application to actuarial work.
- ❖ it is important to include relevant topics in actuarial educational programs to best prepare the actuary of the future. With this mindset, the BDWG conducted this survey, the first of its kind, with the objective of assessing:
 - Attitudes of actuaries world-wide to data science, big data, and data analytics;
 - Familiarity with emerging technologies; and
 - Usefulness of advanced analytic tools in actuarial work.
- ❖ The respondents also shared their opinions about the benefits, barriers, and adoption of analytic techniques. While additional relations and correlations between the answers may have gleamed further insight, we judged that the additional information would not materially add to the findings.



Summary

- ❖ Members of the IAA BDWG are aware that some actuarial professional organizations, particularly those in North America and Europe, are actively working in the area of advanced analytics. Their activities include, but are not limited to, changes in education (including basic and continuing education) as well as the introduction of new educational paths. Many of these actuarial organizations are addressing issues related to advanced analytics through committees, task forces, and working groups.
- ❖ Given that the BDWG did not have access to the global community of actuaries, the 123 responses to the survey likely do not represent the views of the global profession. Nevertheless, there is value in understanding the patterns and trends seen in responses to this survey.
- ❖ We hope to further advance our understanding of the future role of data science in the actuarial practice, and conduct future similar studies, probably on a bi- or tri-annual basis, and hopefully in cooperation with other groups as noted above.
- ❖ In such follow-up studies it may be worthwhile to follow the penetration of data science tools and practices in various business and regulatory areas (e.g., banking, finance, consulting, and insurance) of different sizes (small, medium, large, multi-national), as well as to describe successful projects



Acknowledgments

This report was prepared by the Big Data Working Group (BDWG) of the International Actuarial Association (IAA).

The IAA is the worldwide association of professional actuarial associations, with several special interest sections and working groups for individual actuaries. The IAA exists to encourage the development of a global profession, acknowledged as technically competent and professionally reliable, which will contribute to the public interest being served.

The role of the BDWG is to identify what technical work actuaries are already doing or could do with big data, create a forum for them to share knowledge and expertise, encourage communication and sharing of information on big data related topics, identify big data experts with whom the IAA can work to develop this practice area, and encourage and facilitate the IAA's involvement in big data forums where the IAA and its members can both learn from and add value to other participants.

This is a report on the “Actuaries in Data Science Survey 2020” that was conducted by the BDWG. The report was primarily an effort of a subgroup of the BDWG including Yair Babad, Mahidhara Davangere, Yashica Nagpaul, and Ryutaro Yamada. It was reviewed and approved by the BDWG for distribution within the IAA.

The intent of this report is to present the views of those responding to the survey. Thus, the views expressed in this report are not necessarily the views of the IAA nor those of the entire BDWG. We would like to express our gratitude to all those who responded to the survey.



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Results from the Survey:

The Evolving Role of the Healthcare Actuary

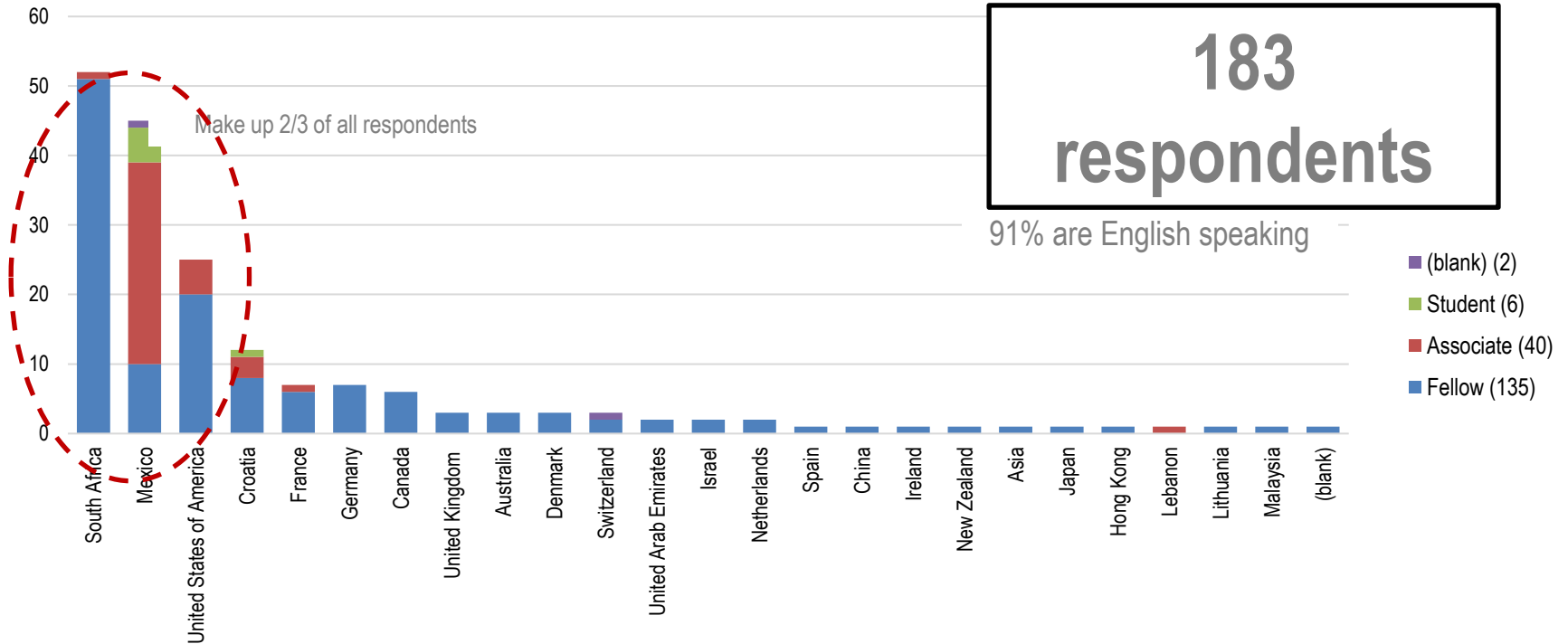
Roseanne Harris

Vice Chair, Health Committee

13 January 2020

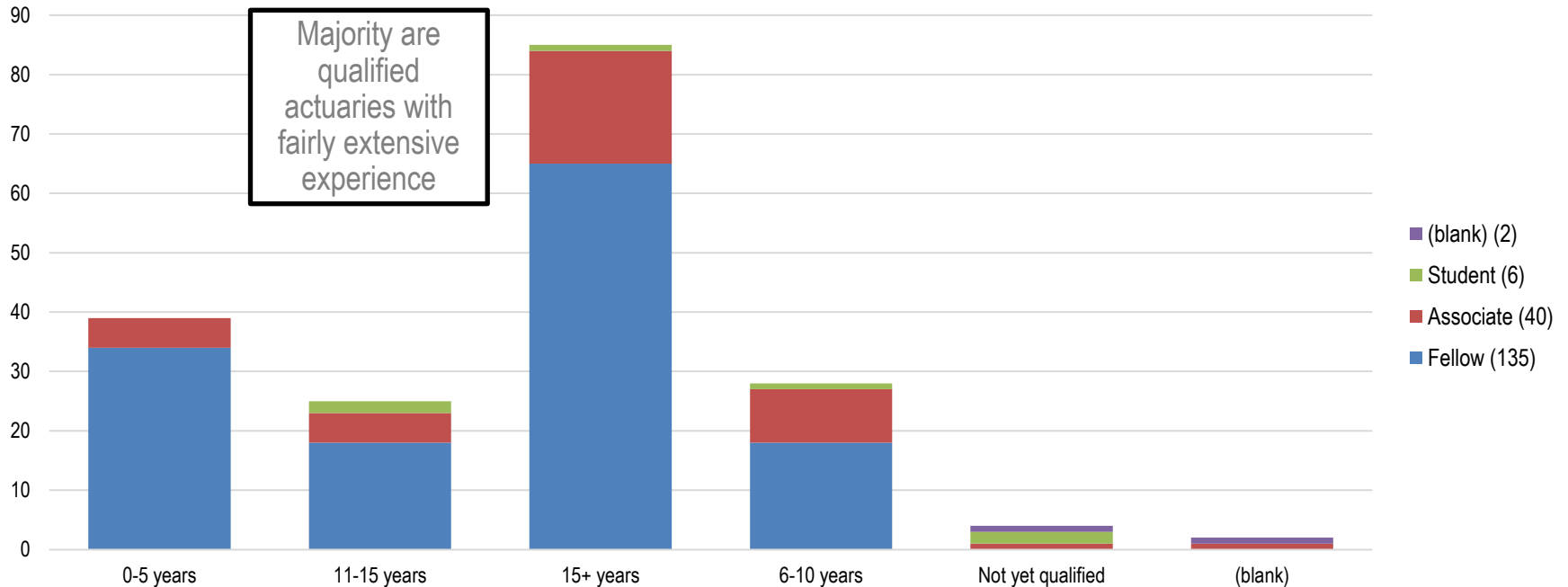
Participation

Participants by country and membership type



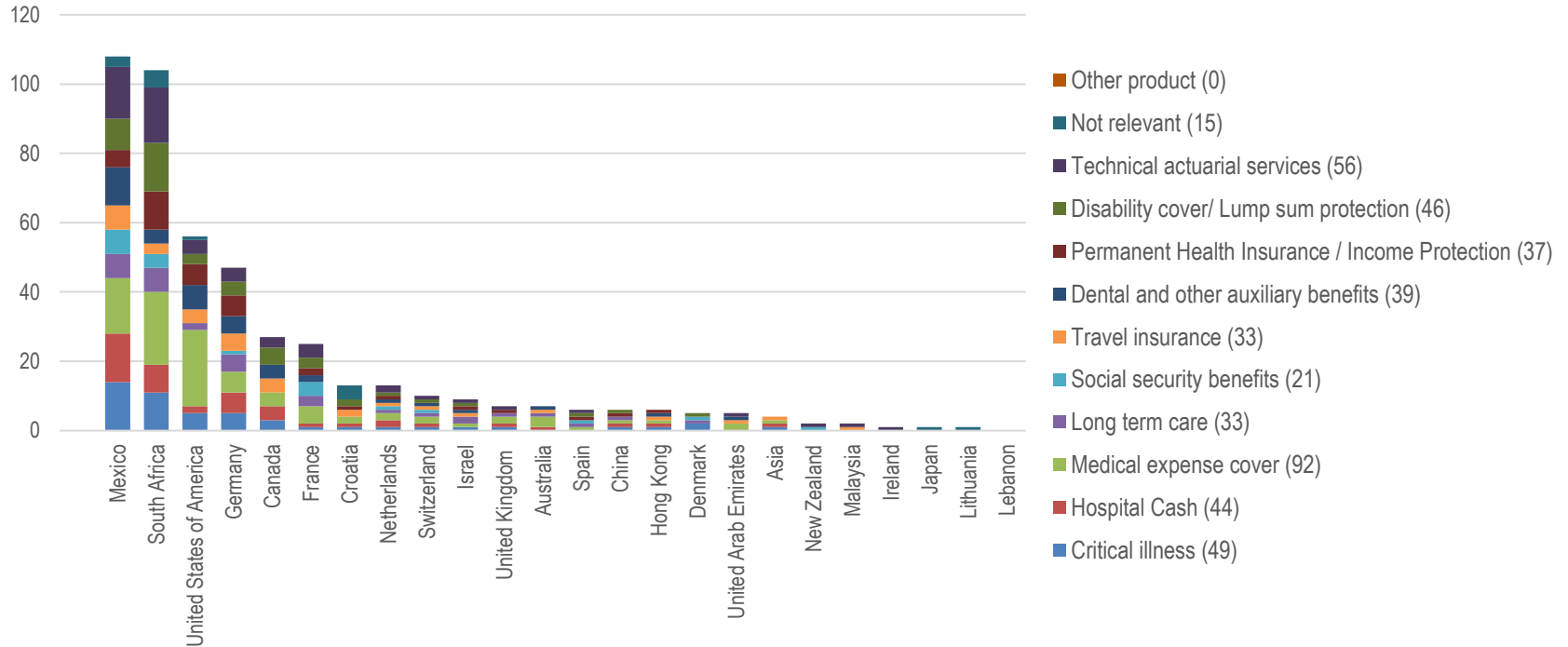
Participation

Participants by membership type and experience



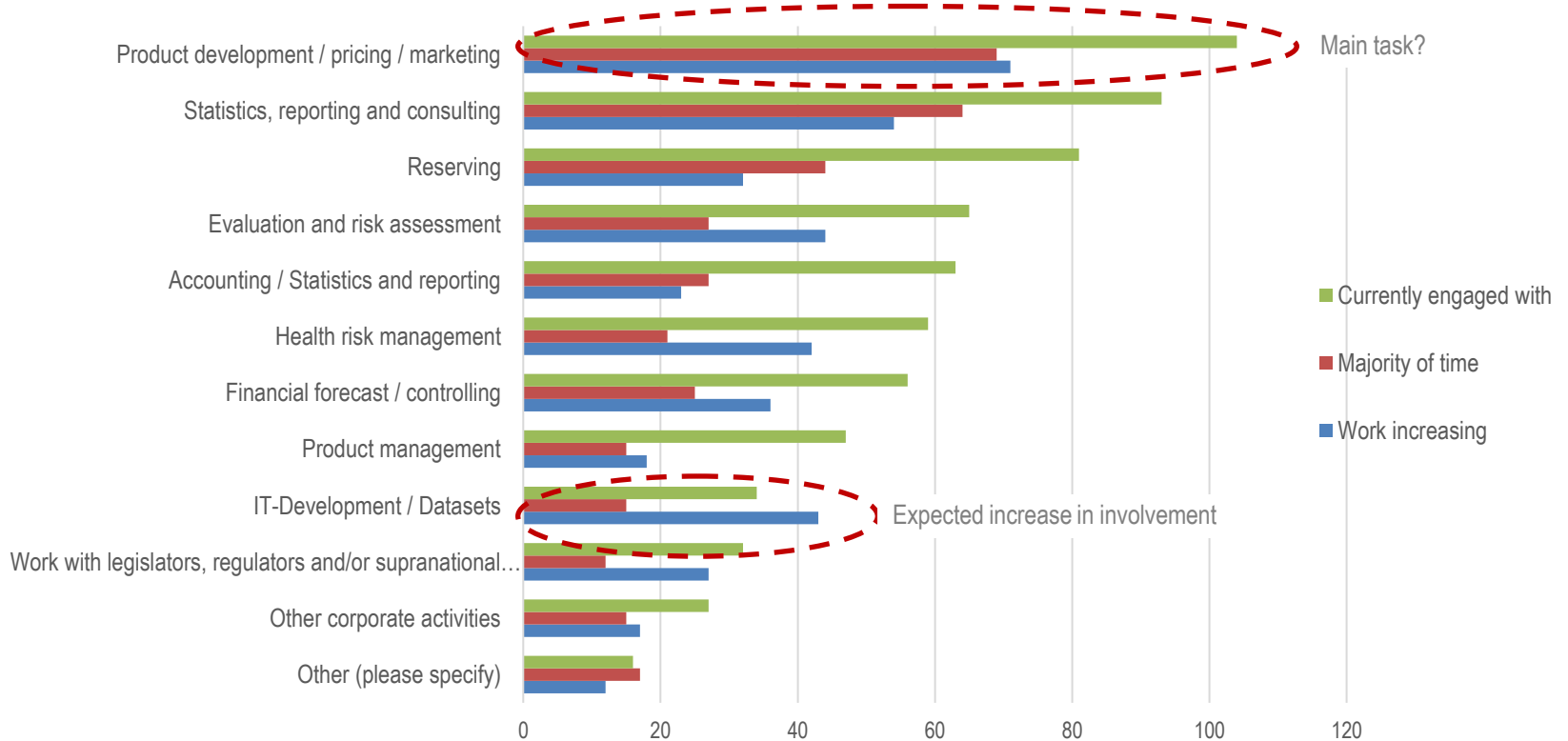
Health Products

Health products by country



Tasks

Tasks relevant to health actuaries





Tasks

Top three tasks where work is
INCREASING the *most* :

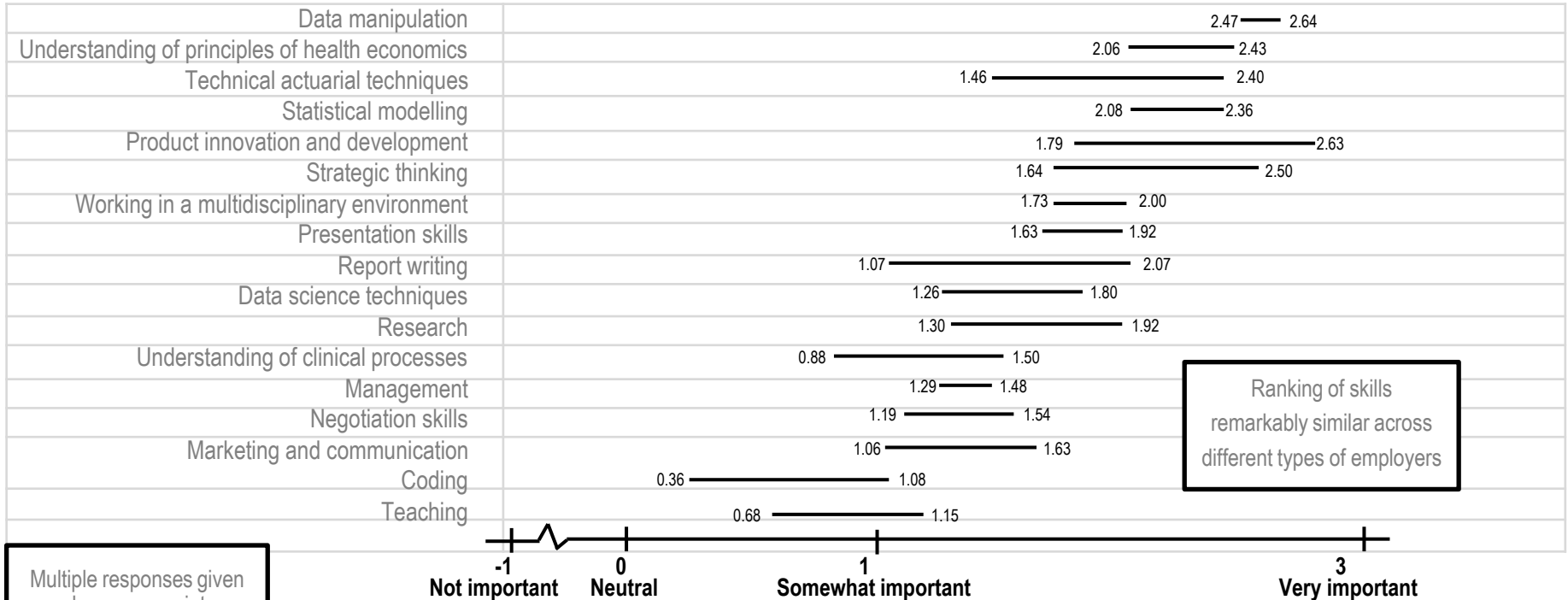
1. Product development/ pricing/ marketing
2. Statistics, reporting and consulting
3. Evaluation and risk assessment

Bottom three tasks where work is
INCREASING the *least* :

1. Accounting/ statistics and reporting
2. Product management
3. Other corporate activities

Skills considered most relevant

Range of average score per skill



Ranking of skills remarkably similar across different types of employers

Multiple responses given where appropriate

Skills considered most relevant

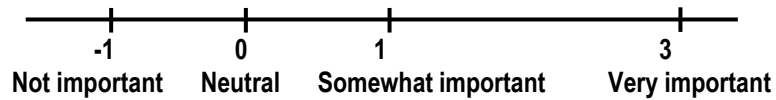
	ALL EMPLOYERS	INSURANCE	CONSULTING	REINSURANCE	OTHER
TOP 3	<p>Data manipulation</p> <p>Understanding of principles of health economics</p> <p>Technical actuarial techniques</p>	<p>Data manipulation</p> <p>Technical actuarial techniques</p> <p>Product innovation and development</p>	<p>Data manipulation</p> <p>Understanding of principles of health economics</p> <p>Statistical modelling</p>	<p>Product innovation and development</p> <p>Data manipulation</p> <p>Statistical modelling</p>	<p>Data manipulation</p> <p>Strategic thinking</p> <p>Understanding of principles of health economics</p>
BOTTOM 3	<p>Marketing and communication</p> <p>Coding</p> <p>Teaching</p>	<p>Marketing and communication</p> <p>Coding</p> <p>Teaching</p>	<p>Marketing and communication</p> <p>Coding</p> <p>Teaching</p>	<p>Teaching</p> <p>Understanding of clinical processes</p> <p>Coding</p>	<p>Data science techniques</p> <p>Teaching</p> <p>Coding</p>
<p>Overall it seems that a collaborative, interdisciplinary approach to healthcare challenges is acknowledged</p>					



Support for Healthcare Actuaries

Average score for support requirements by employer type

	Specific health subject in syllabus	Guidance	Seminars and conferences	Webinars	Regulatory guidelines
Insurance	1.94	1.77	1.57	1.29	2.00
Consulting	1.98	1.49	1.67	1.70	1.69
Reinsurance	1.80	1.20	1.75	1.63	0.67
Other	1.71	1.23	1.21	1.23	1.57
All	1.88	1.25	-0.57	0.20	1.35



Should you have any questions or comments,
they can be sent directly to the IAA by email to
technical.activities@actuaries.org
and we will forward them on for a response.

Thank you for your interest!



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