Australian Government

National Health and Medical Research Council

Survey on the replacement, reduction and refinement of the use of animals for scientific purposes in Australia

Survey Findings Report

August 2018

MELBOURNE CANBERRA SYDNEY BRISBANE
www.orima.com

ORIMA RESEARCH

Table of Contents

I. Overview 3
II. Survey background and methodology 5
Background 5
Research methodology 6
III. Knowledge of the 3Rs 16
Awareness 16
Understanding 18
IV. Attitudes towards the 3Rs 21
V. 3Rs in practice 27
VI. Enablers and barriers to implementation of the 3Rs 40
VII. Access to information about the 3Rs 53
VIII. Training on the 3Rs 56
IX. Promotion of the 3Rs 60

Appendices

Appendix A: Questionnaire for investigators
Appendix B: Questionnaire for AEC members
Appendix C: Questionnaire for institutional representatives
Appendix D: Overall frequency results
Appendix E: Verbatim comments

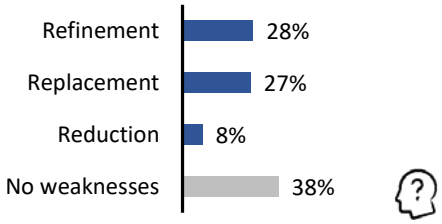
This project has been undertaken in accordance with the International Standard AS ISO 20252, and complies with the Australian Privacy Principles contained in the Privacy Act 1988.

I. Overview

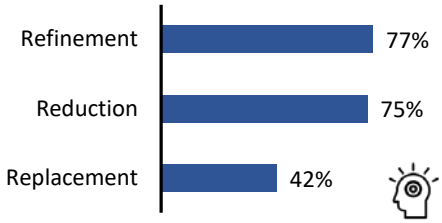
INVESTIGATORS

71%
of respondents agreed that 3Rs methods are **recognised throughout the Australian scientific community**

Weakest **knowledge areas** with regards to the 3Rs



Frequency with which the 3Rs play a role in the **design, conduct & review of work**



Top 3 enabling factors for **replacement**		Top 3 enabling factors for **reduction**		Top 3 enabling factors for **refinement**	
34%	Greater availability of human tissues	**41%**	Statistical evidence that fewer animals would provide the required research results	**40%**	Help to identify refinement methods
31%	Increased funding to develop replacement options	**30%**	Increased sharing of data or collaboration between research groups	**32%**	Increased sharing of information between research groups
31%	Technical advances in tissue engineering	**23%**	Increased sharing of data or collaboration between institutions	**23%**	Increased sharing of information between institutions

27%
of respondents felt that the main obstacle to implementing the 3Rs was the **lack of appropriate scientific or technological innovation**

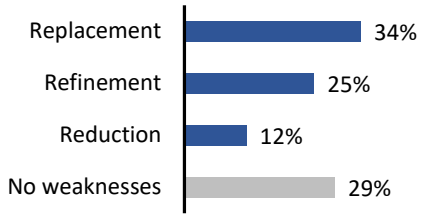
Top 3 **information sources** for investigators, in relation to the 3Rs

53%		Scientific publications
51%		Animal Welfare Officer or equivalent
48%		Animal ethics committee members

AEC MEMBERS

77%
of respondents agreed that 3Rs methods are **recognised throughout the Australian scientific community**

Weakest **knowledge areas** with regards to the 3Rs



AEC MEMBERS (continued)

Top 3 enabling factors for **replacement**		Top 3 enabling factors for **reduction**		Top 3 enabling factors for **refinement**	
57%	Increased funding to develop replacement options	**47%**	Increased sharing of data or collaboration between research groups	**54%**	Help to identify refinement methods
47%	Help to identify replacement techniques	**46%**	Statistical evidence that fewer animals would provide the required research results	**52%**	Greater willingness among investigators to change their methods
41%	Technical advances in tissue engineering	**42%**	Increased sharing of data or collaboration between institutions	**50%**	Increased sharing of information between research groups

25%
of respondents felt that the main obstacle to implementing the 3Rs was the **lack of appropriate scientific or technological innovation**

Top 3 **information sources** for AEC members, in relation to the 3Rs

70%		Animal Welfare Officer or equivalent
68%		Animal ethics committee members
60%		Scientific publications

INSTITUTIONAL REPRESENTATIVES

Top 3 enabling factors for **replacement**		Top 3 enabling factors for **reduction**		Top 3 enabling factors for **refinement**	
48%	Increased funding to develop replacement options	**30%**	Statistical evidence that fewer animals would provide the required research results	**39%**	Help to identify refinement methods
43%	Help to identify replacement techniques	**28%**	Increased sharing of data or collaboration between institutions	**32%**	Greater willingness among investigators to change their methods
25%	More predictive computer models	**26%**	Increased sharing of data or collaboration between research groups	**28%**	Increased sharing of information between research groups/ institutions

18%
of respondents felt that the main obstacles to implementing the 3Rs were the **lack of appropriate scientific or technological innovation**, as well as **the availability of sufficient funding**

54%
of respondents reported that their institution currently supports and facilitates the implementation of the 3Rs by providing **training for investigators** (followed by developing **institutional policies** – 51%)

II. Survey background and methodology

Background

In Australia, the state and territory governments have regulatory responsibility for animal welfare, and the National Health and Medical Research Council (NHMRC) has a statutory responsibility to issue guidelines, and advise the community, on public health research, medical research, and ethical issues relating to health.

The NHMRC developed the *Australian code for the care and use of animals for scientific purposes, 2013* (the Code) to promote ethical, humane and responsible care and use of animals used for scientific purposes. The Code has been adopted into all Australian state and territory law. The governing principles in the Code include the necessity for the application of the **3Rs** at all stages of animal care and use:

- **replacement** of animals with other methods;
- **reduction** in the number of animals used; and
- **refinement** of methods to alleviate or minimise the adverse impact on animals, and enhance animal wellbeing.

These principles underpin the requirements of the entire Code, including the responsibilities of institutions, animal ethics committees (AECs), and investigators.

The development and adoption of the 3Rs in Australia has been criticised in many forums. However, there is limited documented evidence about the use of the 3Rs in Australia, and factors that enable or hinder their development and adoption. In August 2017, the NHMRC commissioned ORIMA Research to conduct a survey on its behalf in relation to the replacement, reduction and refinement of the use of animals for scientific purposes. The objectives of the survey were to obtain current information in relation to:

- what is being done to replace, reduce and refine the use of animals for scientific purposes;
- tools that are being used to identify 3Rs options for a specific project or circumstance;
- factors that support, facilitate or motivate the development and adoption of the 3Rs; and
- barriers to the development and adoption of the 3Rs.

Views were sought from three key groups:

- investigators who have been involved with the use of animals sometime during the last three years;
- current AEC members; and
- institutional representatives who are responsible for overall institutional governance with respect to the care and use of animals.

This research forms part of a broader '3Rs Project' overseen by the NHMRC's Animal Welfare Committee. This project has been designed to develop an information paper presenting evidence about the development and adoption of the 3Rs in Australia, to promote informed discussion and guide recommendations for improvement if required.

This report presents the findings of the survey, with comparisons between the three participant groups (investigators, AEC members, and institutional representatives), as well as against results from comparable international surveys (see below), where possible.

Comparable international surveys

Results from three comparable international surveys are referenced throughout this report:

- A UK survey (referred to as "UK") commissioned by the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) in 2008, which obtained information on how scientists who use animals understand and implement the 3Rs. Views were sought from scientists and animal care staff in the UK.
- A Denmark survey (referred to as "Denmark") commissioned by the Danish 3R Center in 2015, which obtained information on stakeholders' knowledge and experience of the 3Rs. Views were sought from researchers in Denmark.
- A European survey (referred to as "Europe") conducted by the Basel Declaration Society in 2016, which obtained information on how the 3R principles are integrated in European research laboratories. Most respondents were scientists, although responses were also received from research assistants/ students, technicians, and research directors.

Research methodology

Pilot survey

The survey was administered using an online self-completion methodology. As part of the questionnaire finalisation process, a pilot was conducted between Monday 9 October 2017 and Monday 23 October 2017, to assess the suitability of survey design and content, and to test the online system.

Pilot participants were volunteers recruited by the NHMRC project team and the NHMRC's Animal Welfare Committee. A total of n=18 respondents participated in the pilot survey, from a pilot contact list of N=21, representing a response rate of 86%. This sample of n=18 respondents included representation from each of the three key participant groups:

- n=7 investigators;
- n=9 AEC members; and
- n=2 institutional representatives.

A formal Pilot Testing Report was provided to the NHMRC on Friday 27 October 2017, which detailed suggestions for improvement in relation to:

- improving the clarity of some survey questions, and reviewing the suitability of particular questions to relevant participant groups;
- expanding response options, or allowing for multiple responses; and
- reducing questionnaire length.

Overall, the pilot was determined to be successful due to a range of factors including:

- the high level of participation;
- no respondents dropped out of the survey between the first and last page; and
- aside from a few respondents commenting on the length of the questionnaire, there was no substantial feedback provided in relation to any particular aspect or question of the survey, and no critical survey issues were uncovered from the pilot test.

Following the pilot survey, the questionnaire was revised to incorporate pilot feedback, and was finalised in consultation with the NHMRC project team in preparation for the main fieldwork phase.

Main survey

Ethics approval for the main survey was granted by the Department of Health Human Research Ethics Committee on Monday 5 February 2018, and the main survey was then conducted between Monday 5 March 2018 and Monday 28 May 2018.

Due to privacy constraints on the release of contact lists to ORIMA Research, the NHMRC project team was responsible for managing the distribution of survey invitations. Where required, the NHMRC team distributed survey invitations to third parties (including state and territory government departments, and relevant staff of Research Administration Offices) to facilitate onward distribution to further members of the target groups. Participation in the survey was completely voluntary, and responses to the survey were anonymous.

A total of n=733 responses were received, comprising:

- n=452 investigators;
- n=166 AEC members; and
- n=115 institutional representatives.

This represents an overall response rate of approximately 17% (based on an estimated overall population of N=4,380).

Profile of respondents

Figures 1 to 12 below present the demographic and experience profile of respondents to the main survey.

Demographics – All participant groups

Figure 1: In which state/ territory are you based?

(Base: All participant groups)

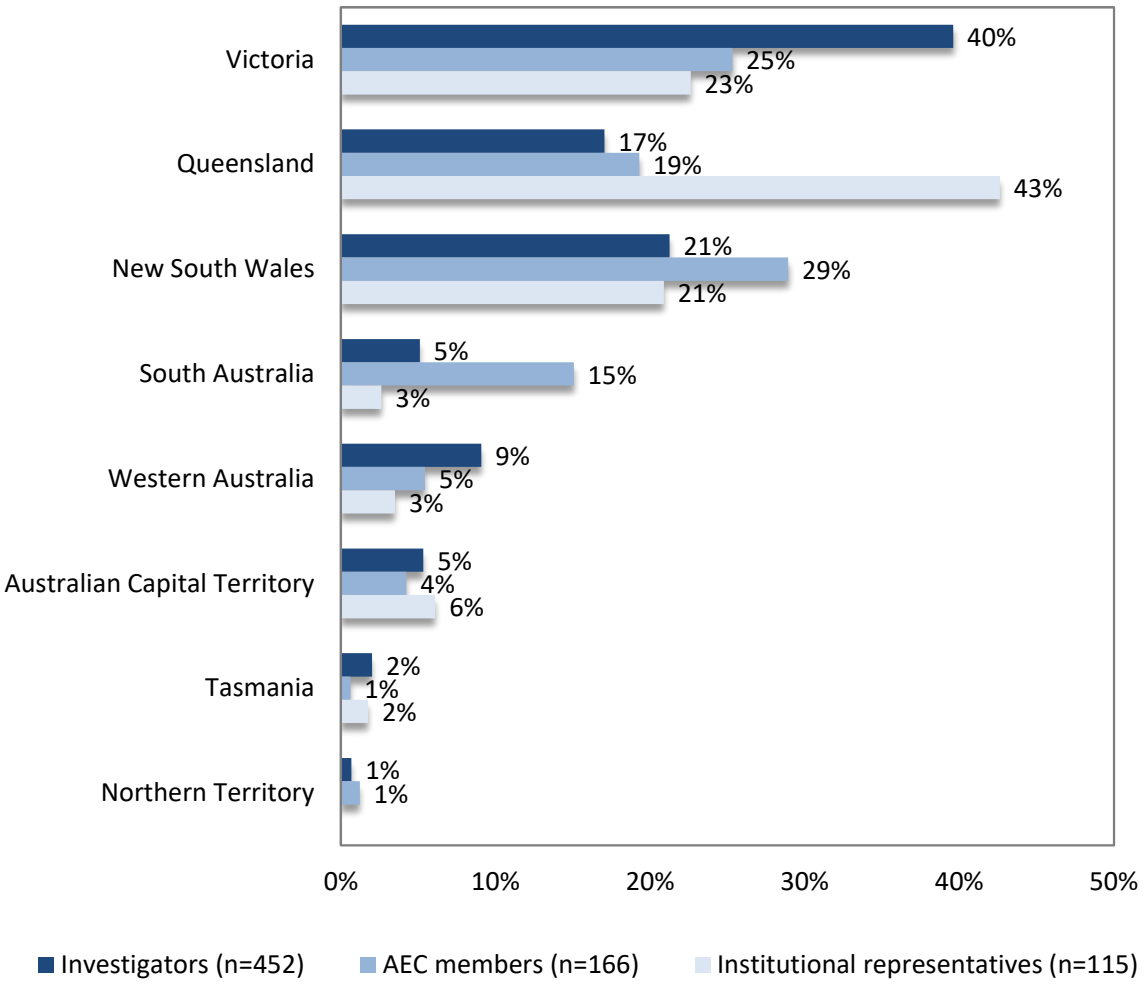


Figure 2: Which sector are you primarily affiliated with? [Investigators] / What type of institution is your AEC primarily associated with? [AEC members] / What is your institution type? [Institutional representatives]

(Base: All participant groups)

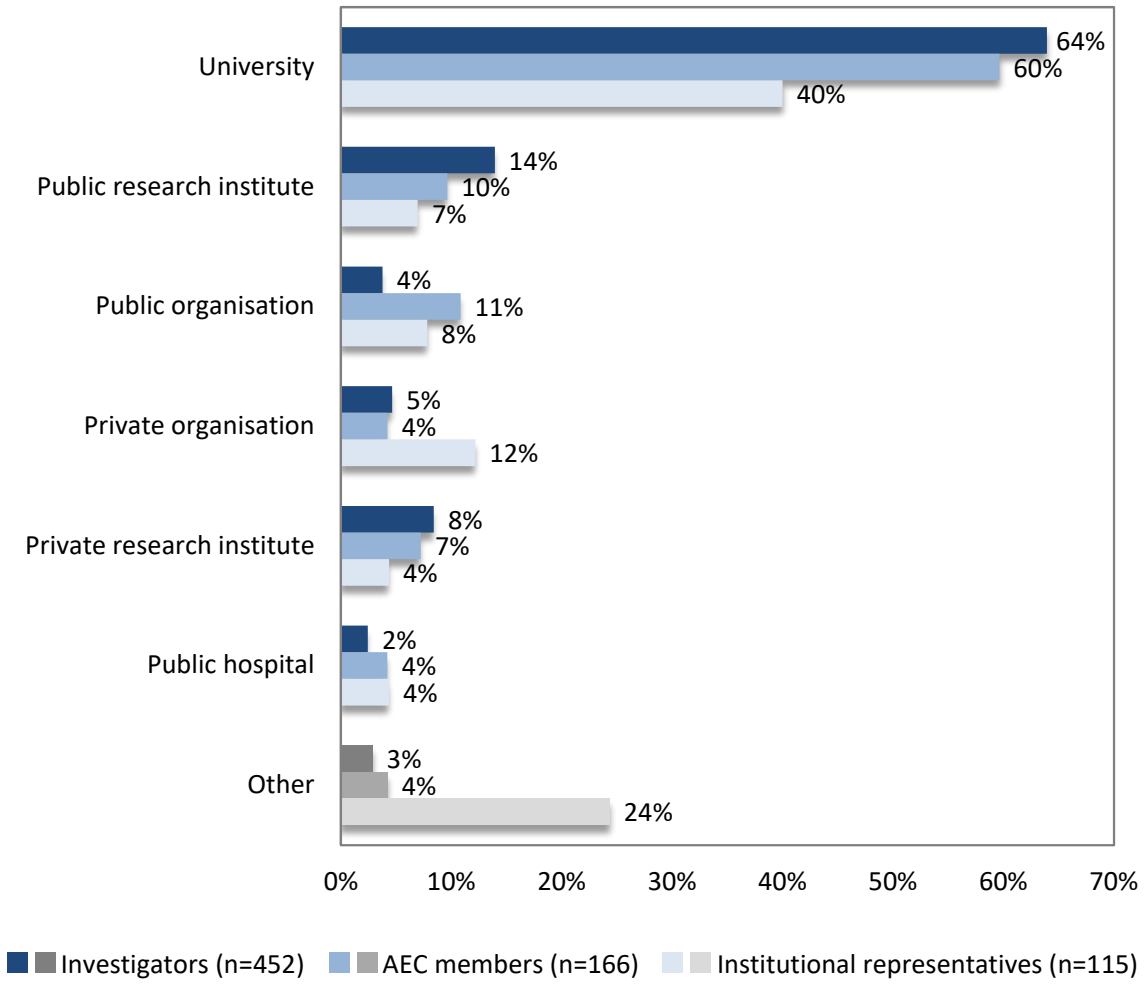


Figure 3: What type of activity are you currently involved in where animals are used? [Investigators] / What type of activity does your AEC review? [AEC members] / What type of activity involving the use of animals is conducted at your institution? [Institutional representatives]

(Base: All participant groups; multiple responses accepted)

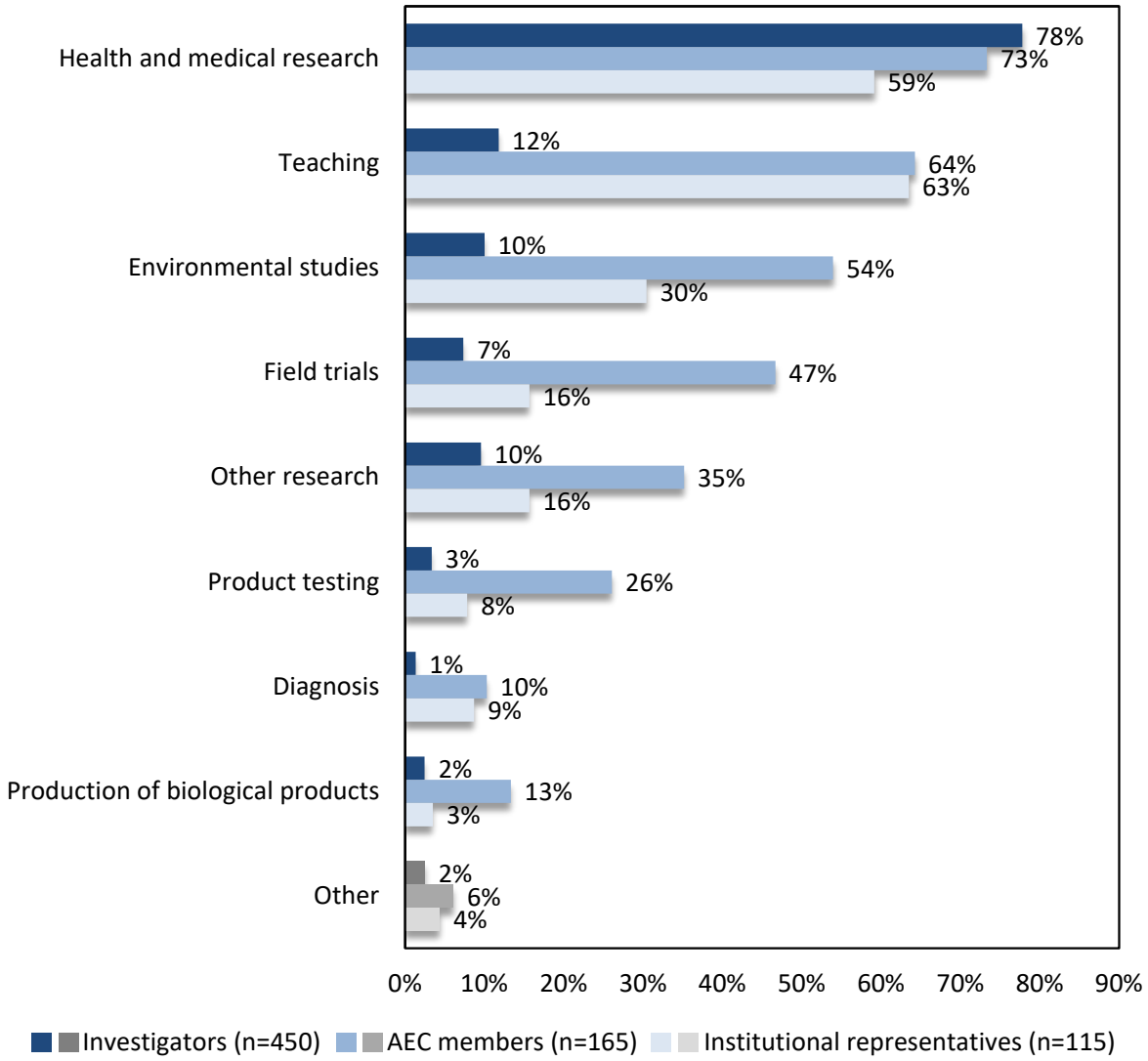
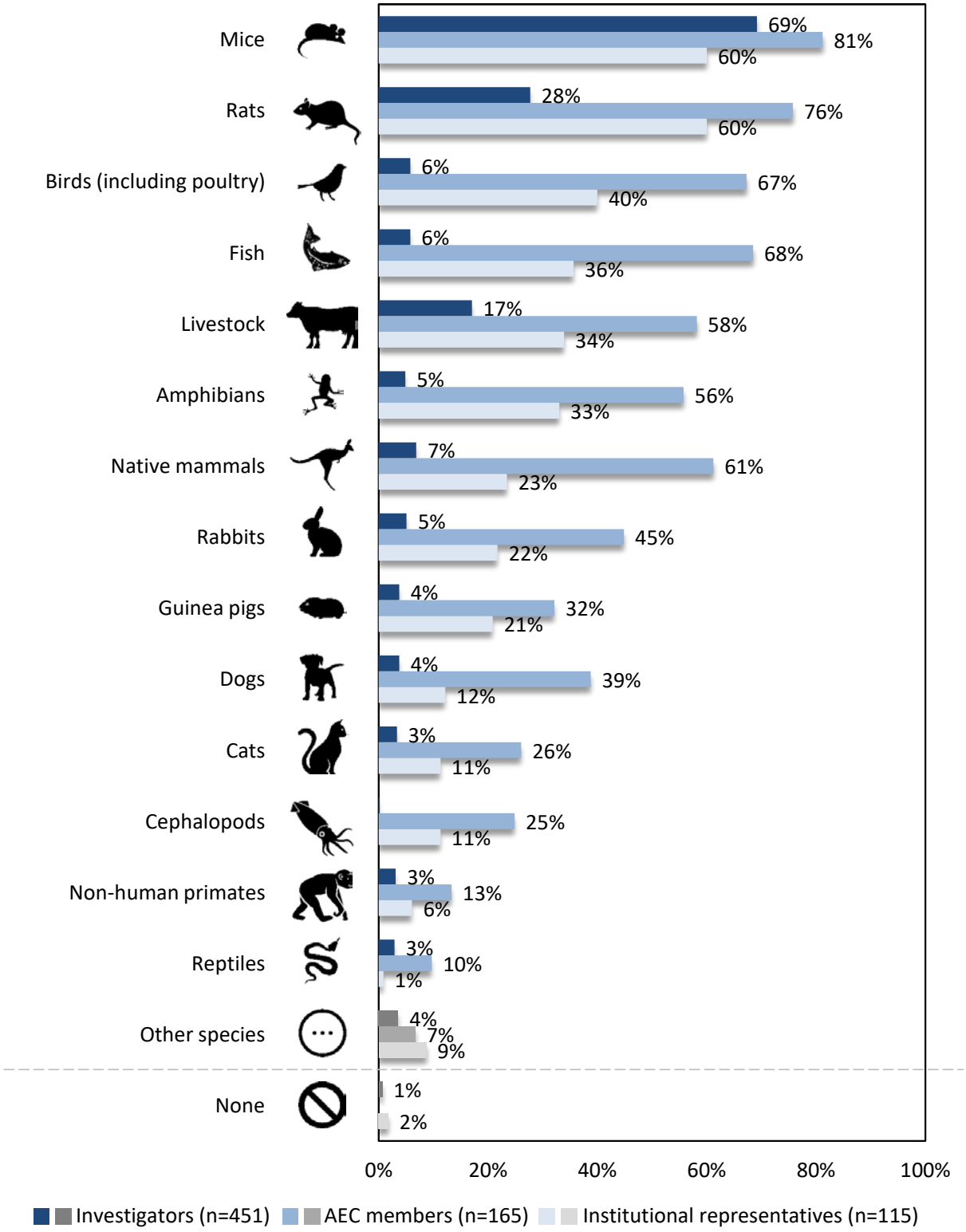


Figure 4: What types of animals are used in your work? [Investigators] / What types of animals are subject to review by your AEC? [AEC members] / What types of animals are used at your institution? [Institutional representatives]

(Base: All participant groups; multiple responses accepted)



Demographics – Institutional representatives only

Figure 5: Which of the following best describes your position at your institution?

(Base: Institutional representatives (n=109))

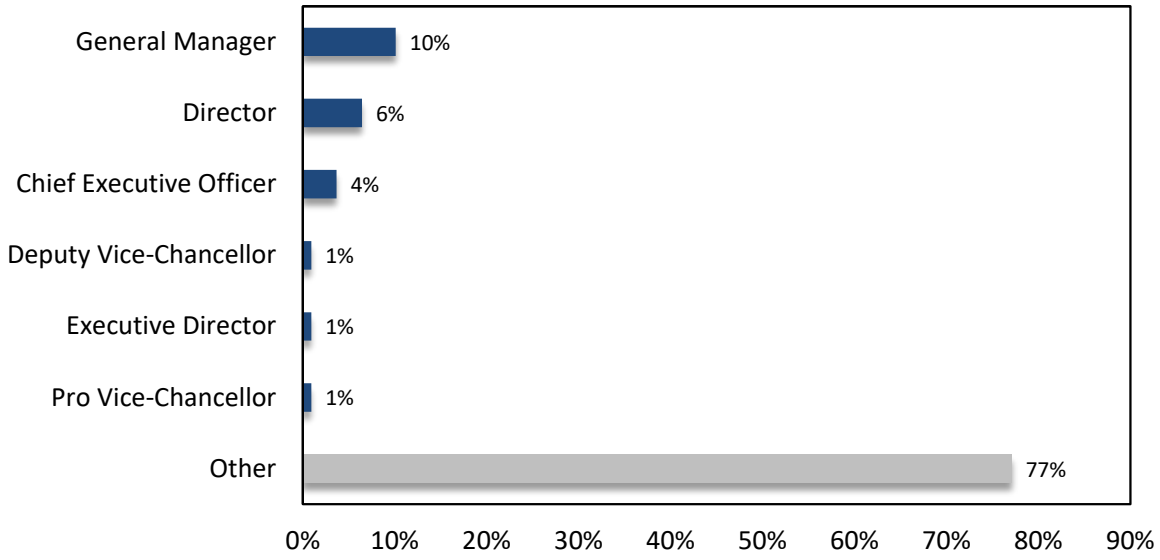
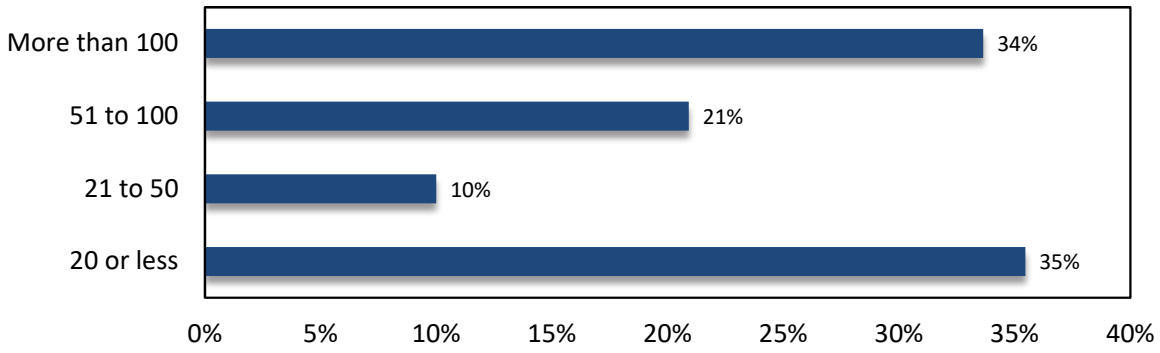


Figure 6: Approximately how many investigators are involved in the use of animals for scientific purposes at your institution?

(Base: Institutional representatives (n=110))



Experience – Investigators only

Figure 7: How many years have you been working with animal-based studies?

(Base: Investigators (n=445))

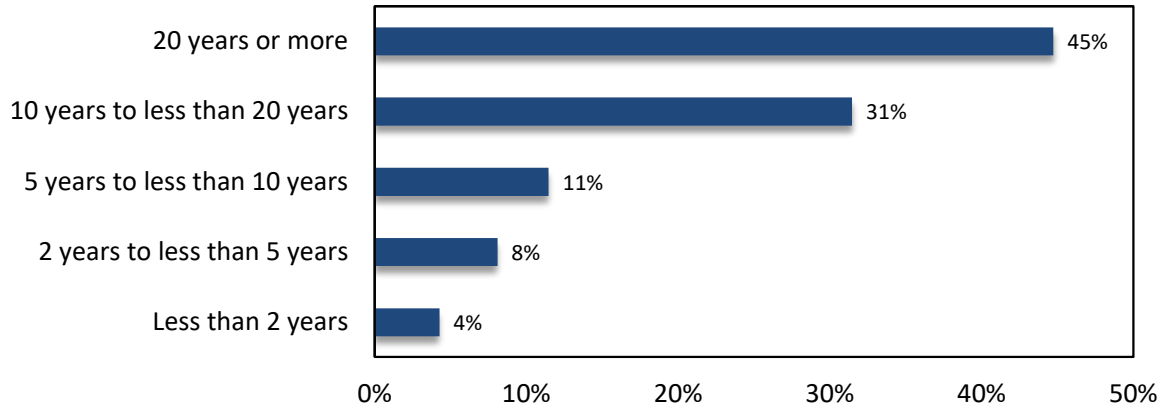


Figure 8: What is your current primary role in animal-based studies?

(Base: Investigators (n=445))

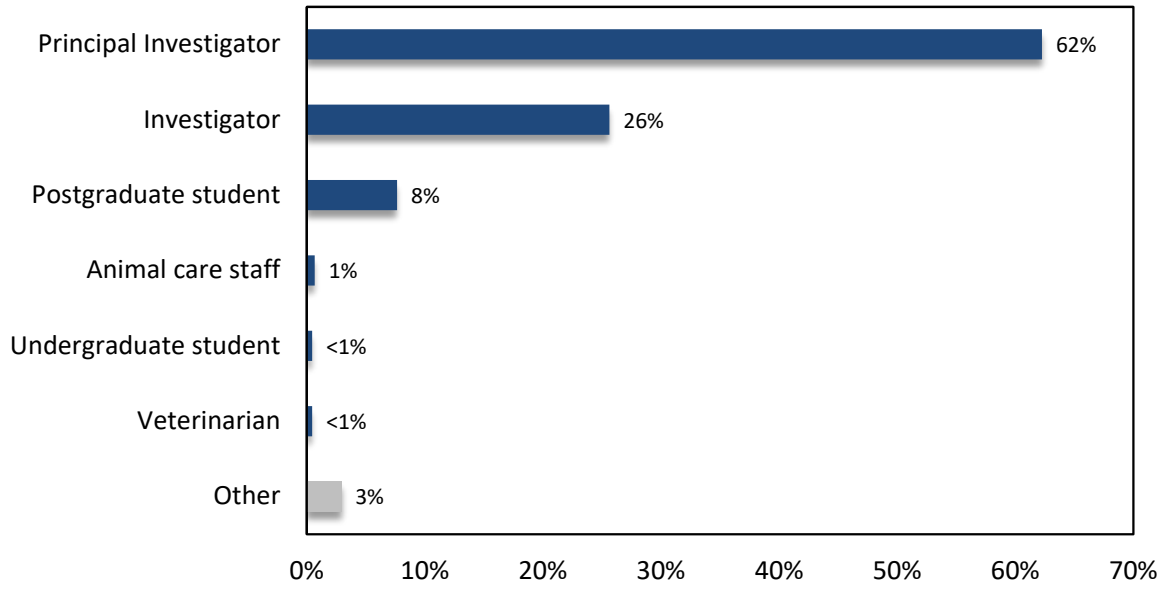
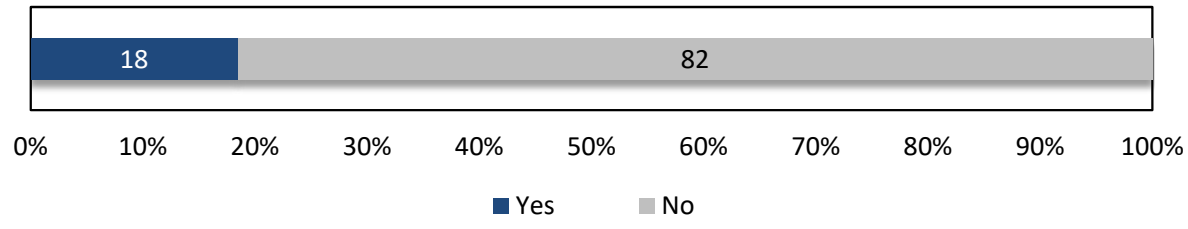


Figure 9: Do you have experience as a member or Chair of an AEC?

(Base: Investigators (n=439))



Experience – AEC members only

Figure 10: How much experience do you have working as a member or chair of an AEC?

(Base: AEC members (n=162))

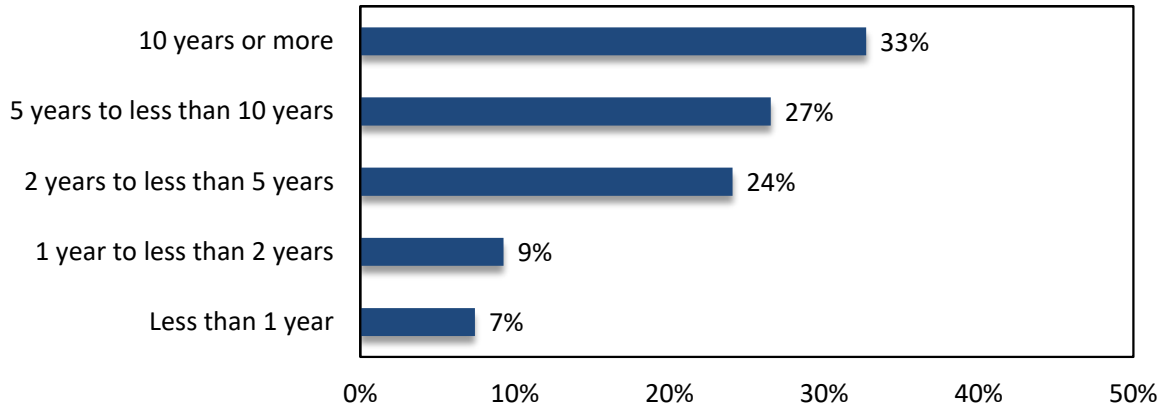


Figure 11: What is your current role on the AEC as per Clauses 2.2.2-2.2.6 of the Code?

(Base: AEC members (n=164)

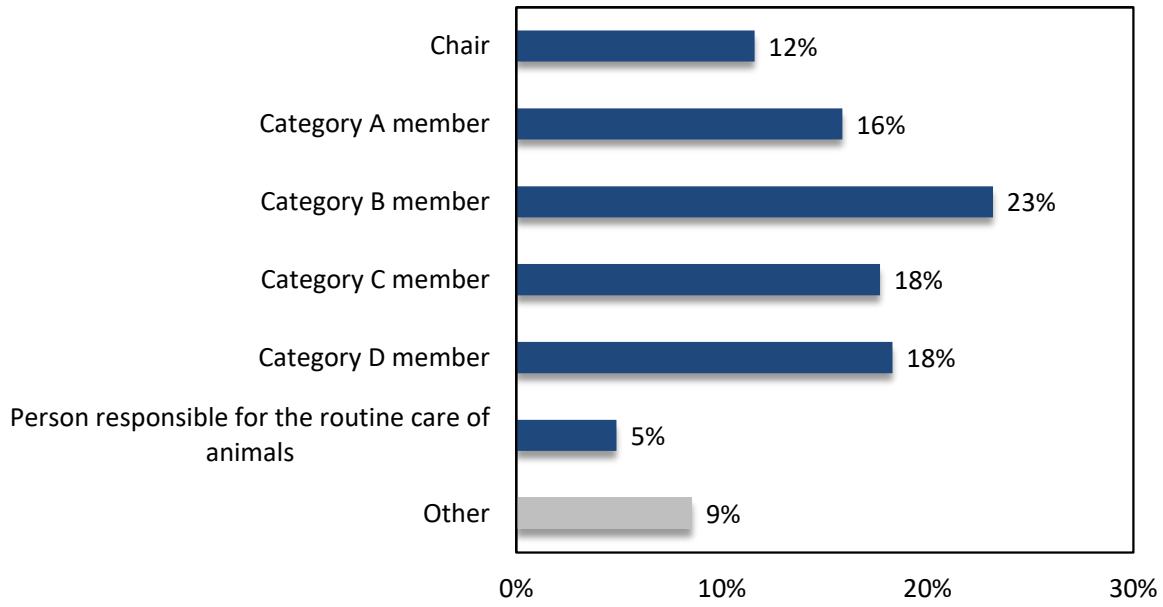
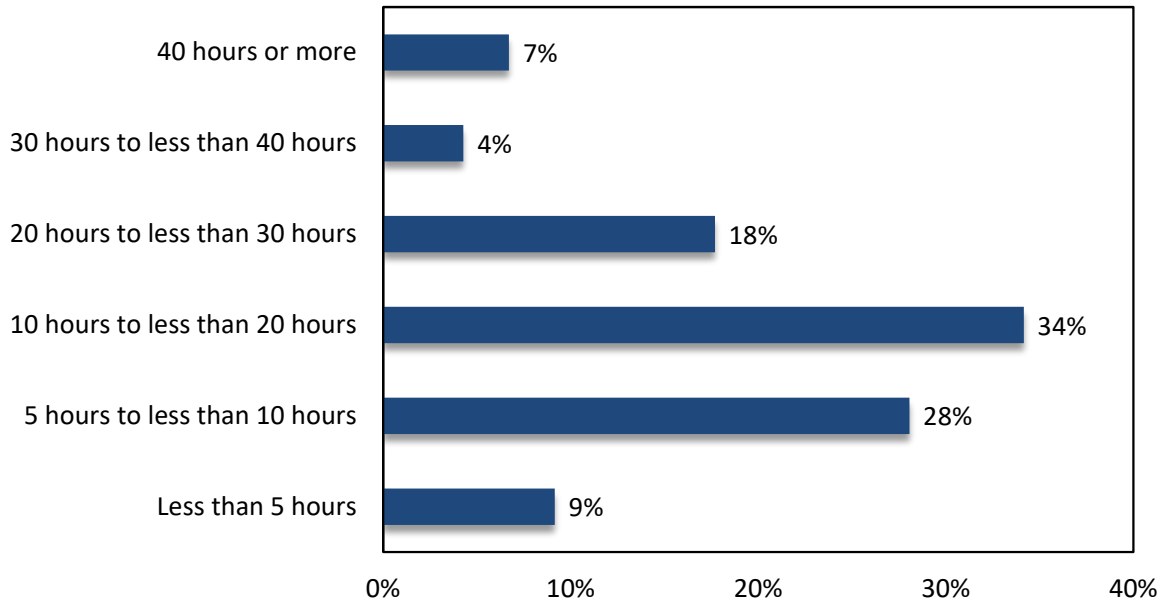


Figure 12: Approximately how many hours per month do you spend on AEC-related business?
(Base: AEC members (n=164)



Statistical precision

As this survey was a census of those involved with the use of animals for scientific purposes in Australia (i.e. all those in scope for the survey were invited to participate), the survey results are not subject to sampling error.

However, the survey is subject to potential non-sampling error. Unlike sampling error, non-sampling error is generally not mathematically measurable. Non-sampling error can arise from many aspects of survey design and conduct, including non-response bias. Non-response bias arises if the people who respond to the survey differ systematically to non-respondents in terms of characteristics of relevance to the survey. ORIMA Research uses several strategies to address sources of non-sampling error, including careful questionnaire construction and data processing quality control.

Presentation of results

Percentages in this report are based on the total number of valid responses made to the particular question being reported on. In most cases, results reflect those respondents who expressed a view and for whom the questions were applicable. Percentage results throughout the report may not add up to 100% (particularly where displayed in chart form) due to rounding, or where respondents were able to select more than one response.

III. Knowledge of the 3Rs

This chapter covers investigators' and AEC members':

- level of awareness of the concept of the 3Rs; and
- depth of understanding of each of the 3Rs.

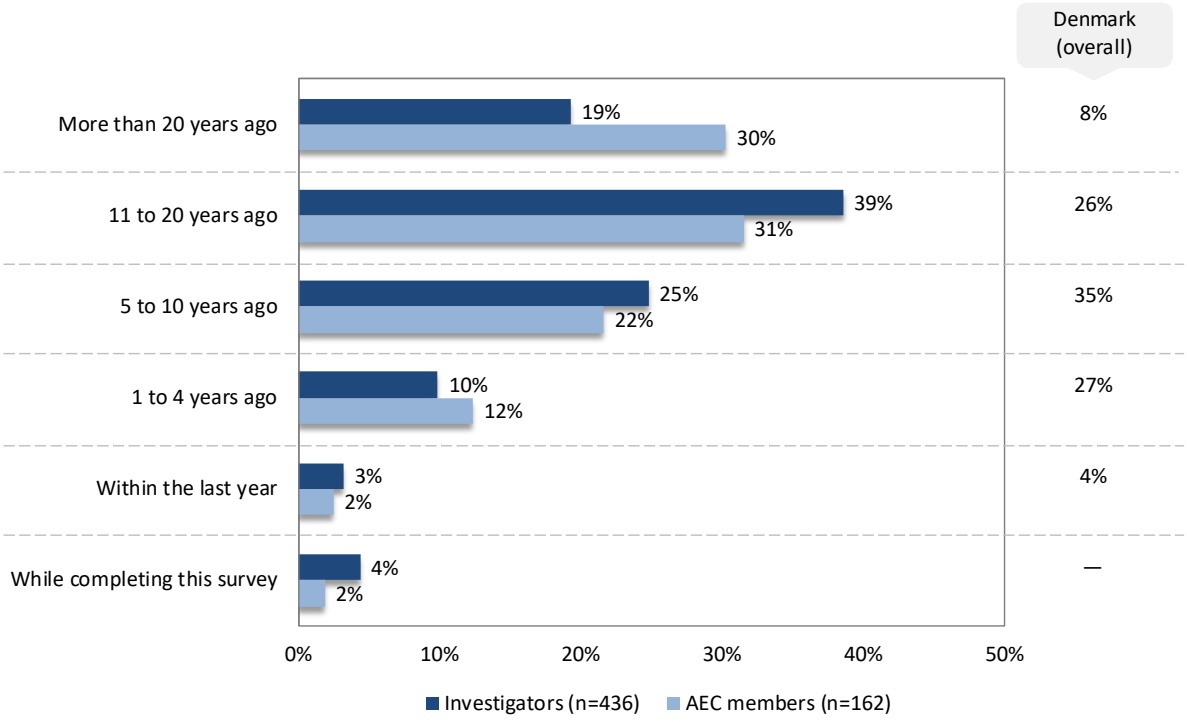
Awareness

Investigators and AEC members

Around three-in-five respondents demonstrated a long-standing awareness of the 3Rs, having first heard about the 3Rs more than 10 years ago (62% of AEC members and 58% of investigators – see Figure 13). AEC members were more likely to have first heard of the 3Rs more than 20 years ago (30%, compared to 19% of investigators). A small proportion of investigators and AEC members had not heard about 3Rs until the time of the survey (4% and 2% respectively).

Figure 13: When did you first hear about the 3Rs?[1]

(Base: Investigators and AEC members)



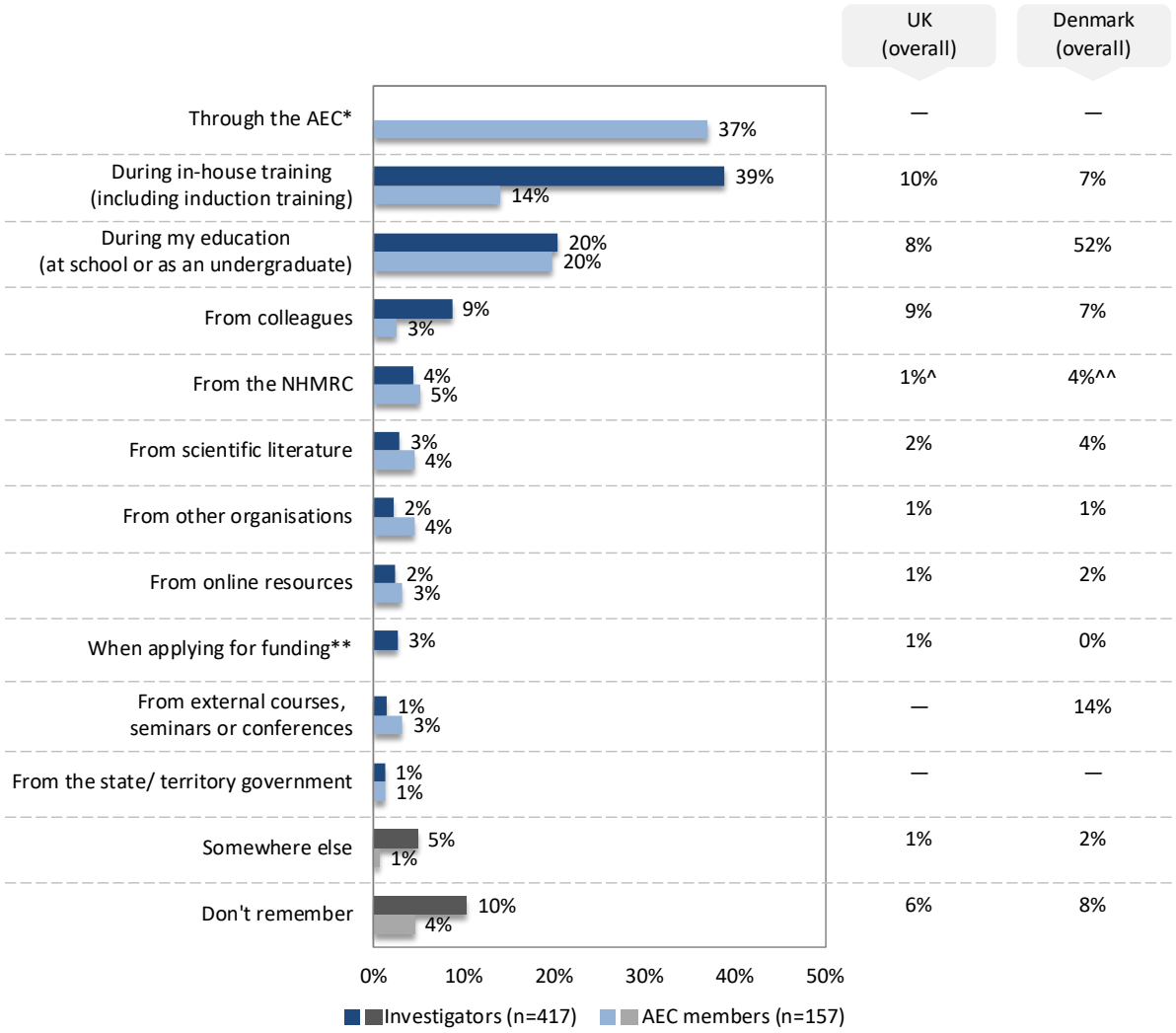
[1] Please note that comparisons against the Denmark results should be treated with caution, due to differences in response options. Throughout this report, dashes in the international results indicate that there was no equivalent response option. Please also note that the Denmark survey did not seek the views of AEC members.

Investigators and AEC members differed in terms of how they had first been introduced to the concept of the 3Rs.

- Investigators were most likely to report that they were introduced to the concept of the 3Rs via in-house training (including induction training – 39% – see Figure 14), followed by education (at school or as an undergraduate – 20%), and colleagues (9%).
- The majority of AEC members first heard about the concept of the 3Rs through the AEC (37%). Similar to investigators, other common sources included education (20%), and in-house training (14%, although substantially lower compared to 39% for investigators).

Figure 14: Where did you first hear about the concept of the 3Rs?[2]

(Base: Investigators and AEC members who first heard about the 3Rs prior to this survey)



* *This response option only appeared for AEC members.*

** *This response option only appeared for investigators.*

^ *In the UK survey, the equivalent response option was "From the NC3Rs".*

^^ *In the Denmark survey, the equivalent response option was "From the Danish 3R Center".*

[2] Please note that comparisons between the two groups (investigators and AEC members), as well as comparisons against the UK and Denmark results, should be treated with caution, due to differences in response options. Please note that the UK results do not add up to 100%, as the majority respondents selected "Home Office training modules", which is a response option unique to the UK survey. Please also note that the UK and Denmark surveys did not seek the views of AEC members.

Understanding

Investigators and AEC members

When asked about their knowledge or expertise gaps in relation to the 3Rs, almost two-in-five investigators (38% – see Figure 15) indicated that they had no weaknesses, compared to a lower proportion of under one-in-three AEC members (29%).

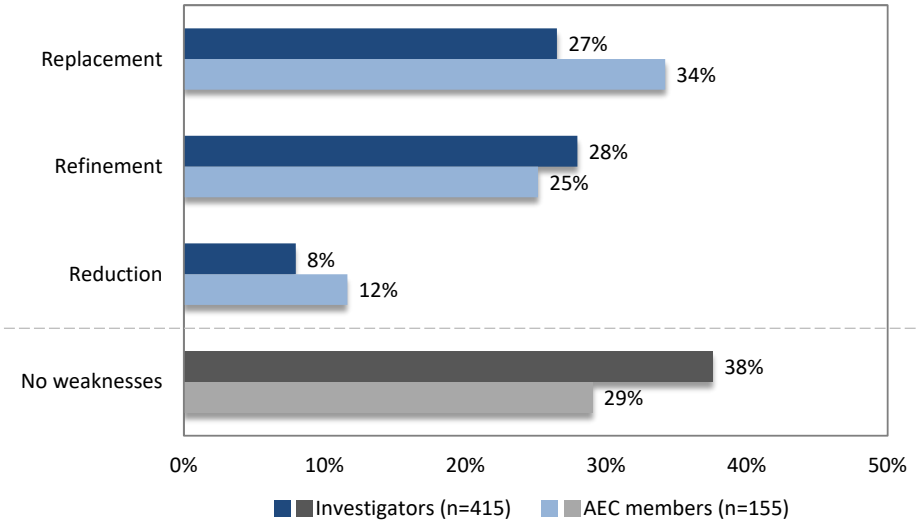
Of those respondents who identified a knowledge or expertise gap, **refinement** was the most common area of weakness amongst investigators (28%, closely followed by replacement at 27%), while **replacement** was the most common weakness area for AEC members (34%). Neither group reported a substantial gap in their knowledge or expertise of **reduction**.

Furthermore:

- Investigators involved in teaching were most likely to identify refinement as a knowledge/ expertise gap (40%), while those involved in product testing were least likely (13%).
- Investigators in the Principal Investigator role, and AEC members involved with the review of applications about the use of animals for *diagnosis*, were the cohorts most likely to indicate that they had no knowledge/ expertise gaps (46% and 50% respectively).

Figure 15: With regards to the 3Rs, in which area do you consider your knowledge/ expertise to be the weakest?

(Base: Investigators and AEC members who first heard about the 3Rs prior to this survey)



To further assess investigators' and AEC members' understanding of the 3Rs, respondents were presented with a set of definitions for replacement, reduction, and refinement. These definitions included correct statements, as well as some common misconceptions. Respondents were then asked to identify the definitions which aligned with their understanding of each of the 3Rs.

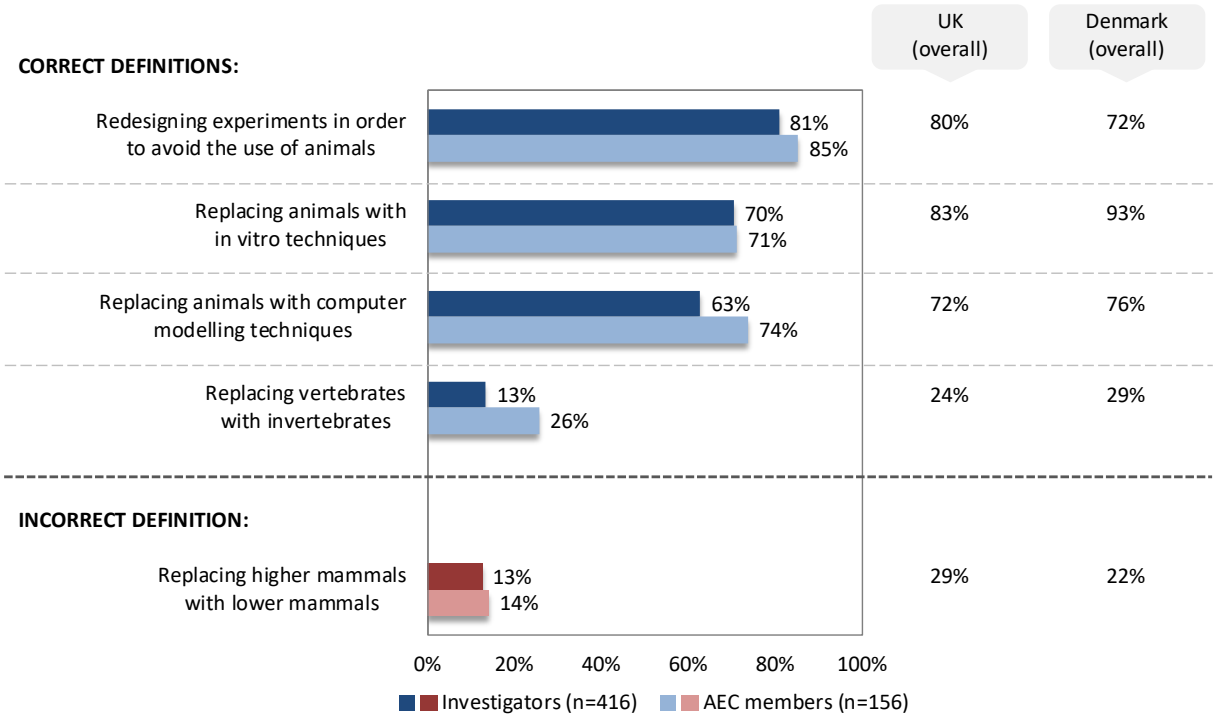
At an overall level, knowledge appeared to be strongest in relation to replacement. This is inconsistent with the self-reported knowledge/ expertise gap presented in Figure 15, although this may be driven by the lower levels of understanding of replacement in relation to replacing vertebrates with invertebrates (see Figure 16).

Misconceptions were most common for the concept of refinement (with between 39% and 49% of respondents selecting incorrect definitions) – this is more consistent with the self-reported knowledge/ expertise gap presented in Figure 15.

Overall, AEC members tended to demonstrate a relatively stronger understanding of the 3Rs compared to investigators, particularly in relation to refinement (see Figure 18).

Figure 16: Which of the following definitions fits your understanding of REPLACEMENT?[3]

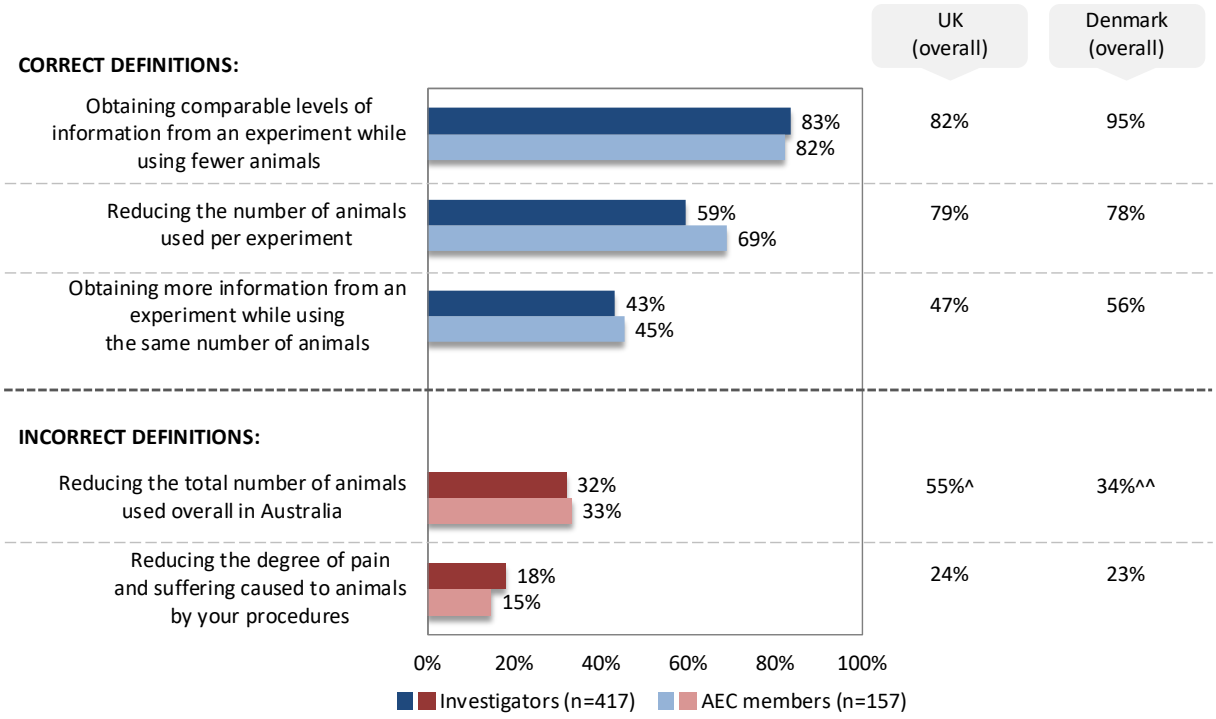
(Base: Investigators and AEC members who first heard about the 3Rs prior to this survey; multiple responses accepted)



[3] Please note that the UK and Denmark surveys did not seek the views of AEC members. This also applies to Figure 17 and Figure 18 overleaf.

Figure 17: Which of the following definitions fits your understanding of REDUCTION?

(Base: Investigators and AEC members who first heard about the 3Rs prior to this survey; multiple responses accepted)

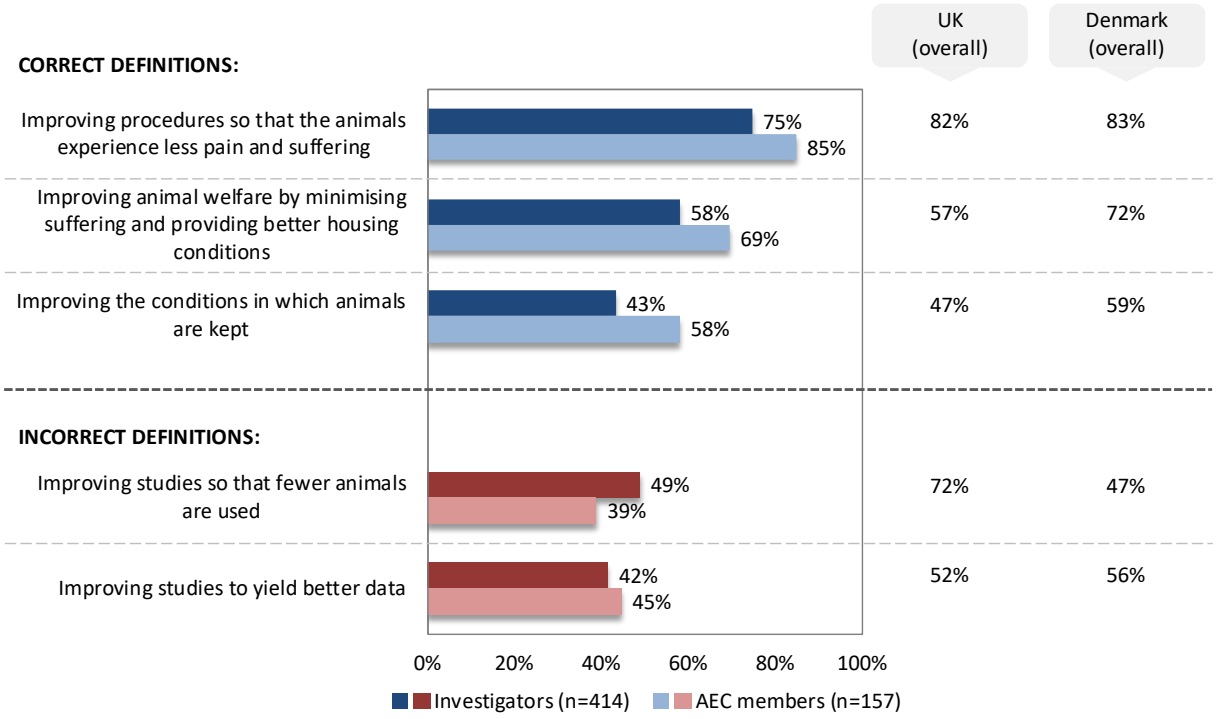


^ *In the UK survey, the equivalent definition referred to animals used overall in the UK.*

^^ *In the Denmark survey, the equivalent definition referred to animals used overall in Denmark.*

Figure 18: Which of the following definitions fits your understanding of REFINEMENT?

(Base: Investigators and AEC members who first heard about the 3Rs prior to this survey; multiple responses accepted)



IV. Attitudes towards the 3Rs

This chapter covers the opinions of investigators and AEC members in relation to different aspects of the use of animals for scientific purposes, and the 3Rs.

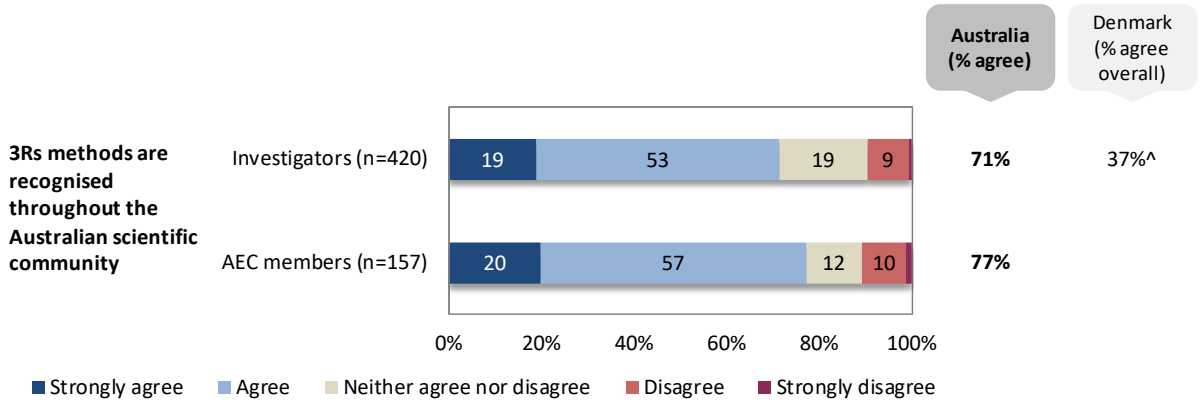
Investigators and AEC members

Over seven-in-ten respondents (71% of investigators and 77% of AEC members) agreed that 3Rs methods are recognised throughout the Australian scientific community, with investigators more likely than AECs to adopt a mixed view (19%, compared to 12% of AEC members – see Figure 19).

- Agreement levels were *highest* for investigators involved in the production of biological products (82%), and AEC members involved with the review of applications about the use of animals for diagnosis (93%).
- Agreement levels were *lowest* for investigators involved in product testing (60%), and AEC members involved with the review of research other than health and medical research (69%).

Figure 19: Please indicate the extent to which you agree or disagree with the following statement about the use of animals for scientific purposes.[4]

(Base: Investigators and AEC members)



^ *In the Denmark survey, the statement was "Alternative methods are recognized throughout the research community".*

Compared to AEC members, investigators tended to demonstrate stronger views in relation to the necessity and importance of the use of animals for scientific purposes. Four-in-five investigators agreed that complete replacement of the use of animals in research will never be achieved (80%, compared to 66% for AEC members – see Figure 20).

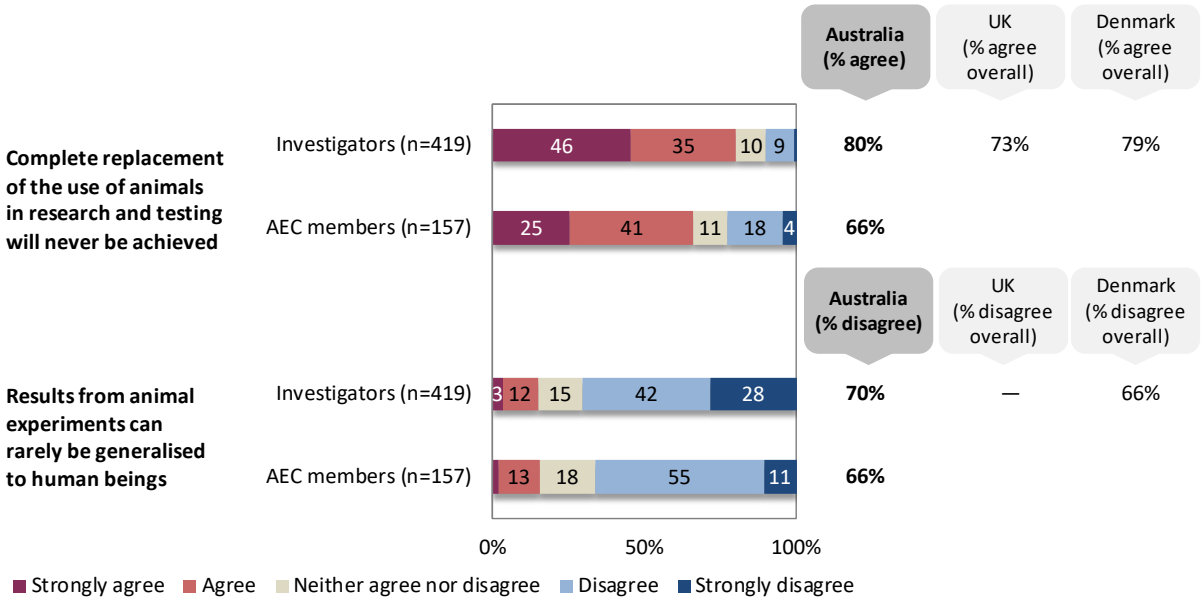
- Principal Investigators (85%), and investigators involved in teaching and product testing (both 87%) were *most* likely to agree with this statement; while postgraduate students (56%), and investigators involved in environmental studies (69%) were *least* likely to agree.
- Amongst AEC members, agreement was *highest* for Chairs (82%), and *lowest* for Category D members (i.e. persons not employed by or otherwise associated with the institution, and who have never been involved in the use of animals in scientific or teaching activities – 52%).

[4] Please note that comparisons against the Denmark results should be treated with caution, due to the difference in statement wording. Please also note that the Denmark survey did not seek the views of AEC members.

Seven-in-ten investigators (70%) disagreed that results from animal experiments can rarely be generalised to human beings, compared to two-thirds of AEC members (66% – see Figure 20). While this difference in overall disagreement is not significant, investigators were substantially more likely to strongly disagree with this statement (28%, compared to 11% for AEC members).

Figure 20: Please indicate the extent to which you agree or disagree with the following statements about the use of animals for scientific purposes.[5]

(Base: Investigators and AEC members)



As shown in Figure 21, compared to investigators, AEC members were more likely to agree that:

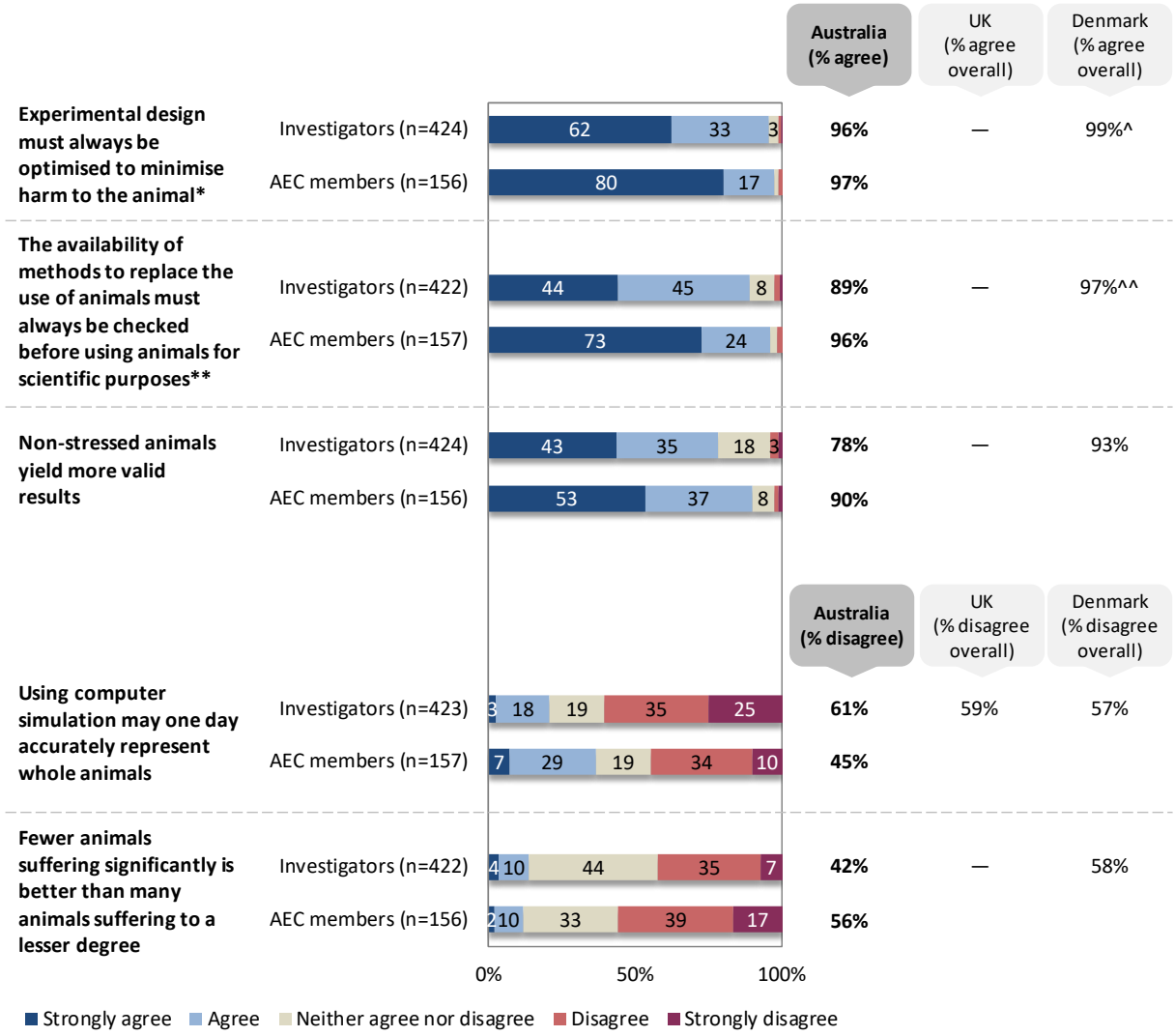
- the availability of methods to replace the use of animals must always be checked before using animals for scientific purposes (96%, compared to 89% for investigators); and
- non-stressed animals yield more valid results (90%, compared to 78% for investigators).

While investigators were more likely to disagree that using computer simulation may one day accurately represent whole animals (61%, compared to 45% for AEC members), they were less likely to disagree that fewer animals suffering significantly is better than many animals suffering to a lesser degree (42%, compared to 56% for AEC members). These results support the earlier observation that relative to AEC members, investigators appeared more likely to view the use of animals as important and necessary for scientific purposes.

[5] Please note that comparisons against the UK results should be treated with caution, due to differences in response options (the inclusion of a 'Don't know' option), as well as the inclusion of non-responses in the calculation base. Please also note that the UK and Denmark surveys did not seek the views of AEC members.

Figure 21: Please indicate the extent to which you agree or disagree with the following statements about the use of animals for scientific purposes.[6]

(Base: Investigators and AEC members)



** This statement appeared for AEC members. The equivalent statement which appeared for investigators was "You must always optimise the experimental design to minimise harm to the animal".*

*** This statement appeared for AEC members. The equivalent statement which appeared for investigators was "You must always check if there are methods to replace the use of animals before using animals for scientific purposes".*

^ In the Denmark survey, the statement was "You must always optimize the experimental design, to minimize harm to the animal".

^^ In the Denmark survey, the statement was "You must always check if there are alternative methods before using experimental animals".

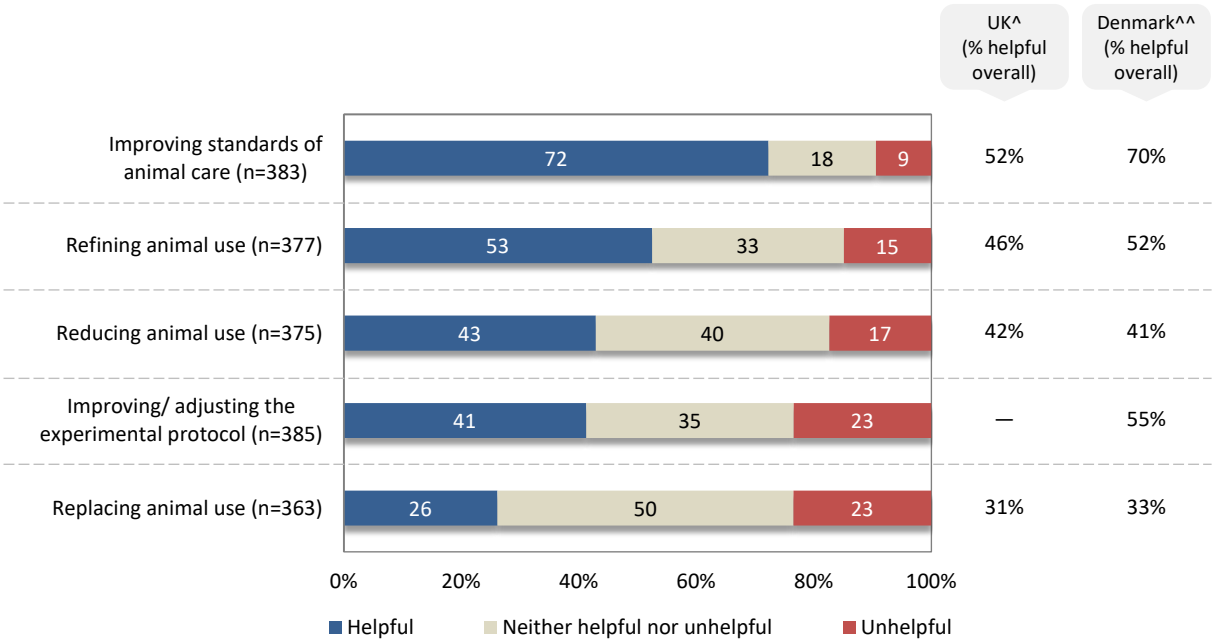
[6] Please note that comparisons against the UK results should be treated with caution, due to differences in response options (the inclusion of a 'Don't know' option), as well as the inclusion of non-responses in the calculation base. Please also note that the UK and Denmark surveys did not seek the views of AEC members.

Investigators only

When asked to assess the helpfulness of their AEC in supporting the implementation of the 3Rs, investigators reported that their AEC was most helpful with regards to improving standards of animal care (72%), followed by refining animal use (53% – see Figure 22). Less than half of respondents found their AEC helpful with regards to reducing animal use (43%), improving/ adjusting the experimental protocol (41%), and replacing animal use (26%).

Figure 22: How helpful is your AEC with regards to each of the following:[7]

(Base: Investigators)



^ In the UK survey, respondents were asked to rate the helpfulness of the Ethical Review Process (ERP) at their establishment.
^^ In the Denmark survey, respondents were asked to rate the helpfulness of their local ethical committee.

Investigators were also asked for their opinions regarding the use of animals for scientific purposes generally, and in their own work. On a positive note, the majority of investigators (76%) felt that implementing the 3Rs will not be detrimental to the quality of their results (see Figure 23).

Furthermore, a majority of investigators **disagreed** that:

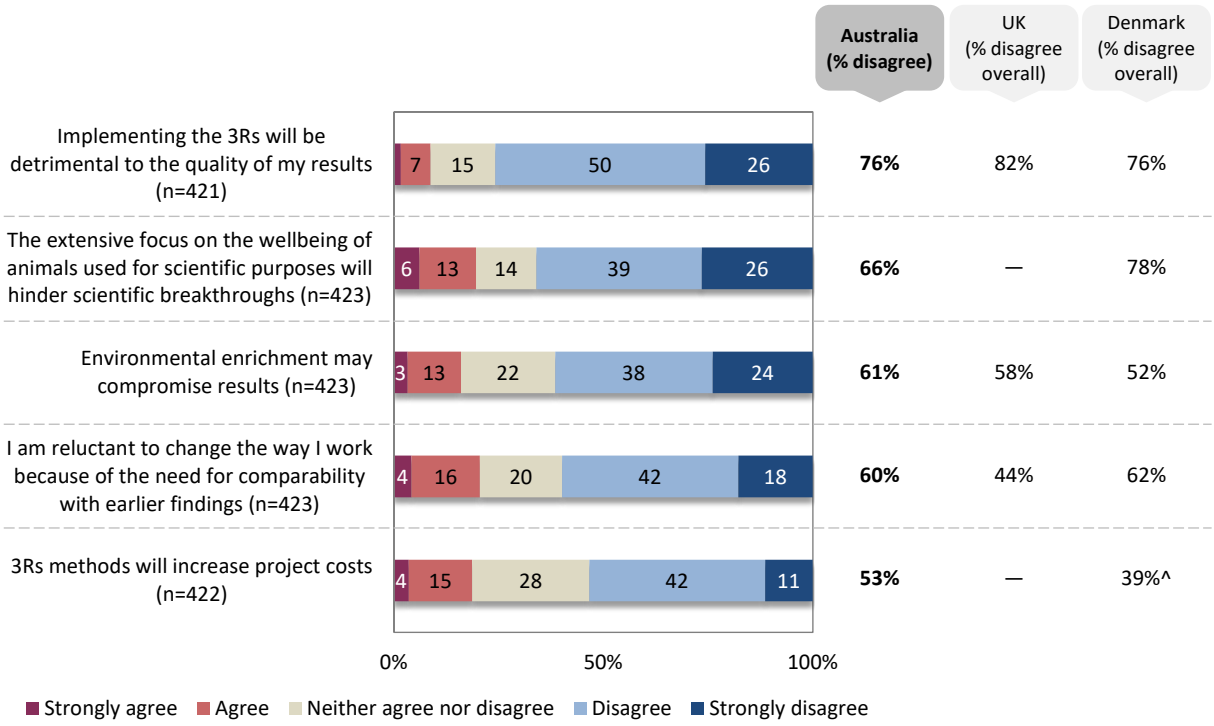
- the extensive focus on the wellbeing of animals used for scientific purposes will hinder scientific breakthroughs (66%);
- environmental enrichment may compromise results (61%);
- they are reluctant to change the way they work because of the need for comparability with earlier findings (60%); and
- 3Rs methods will increase project costs (53%).

[7] Please note that comparisons against the UK results should be treated with caution, due to the inclusion of 'Don't know' responses, as well as non-responses, in the calculation base.

Investigators involved in product testing were significantly more likely to agree that 3Rs methods will increase project costs (33%, compared to 19% overall), and that environmental enrichment may compromise results (27%, compared to 16% overall).

Figure 23: Please indicate the extent to which you agree or disagree with the following statements about the use of animals for scientific purposes.[8]

(Base: Investigators)



^ *In the Denmark survey, the statement was "Alternative methods will increase research costs".*

[8] Please note that comparisons against the UK results should be treated with caution, due to the inclusion of 'Don't know' responses, as well as non-responses, in the calculation base.

AEC members only

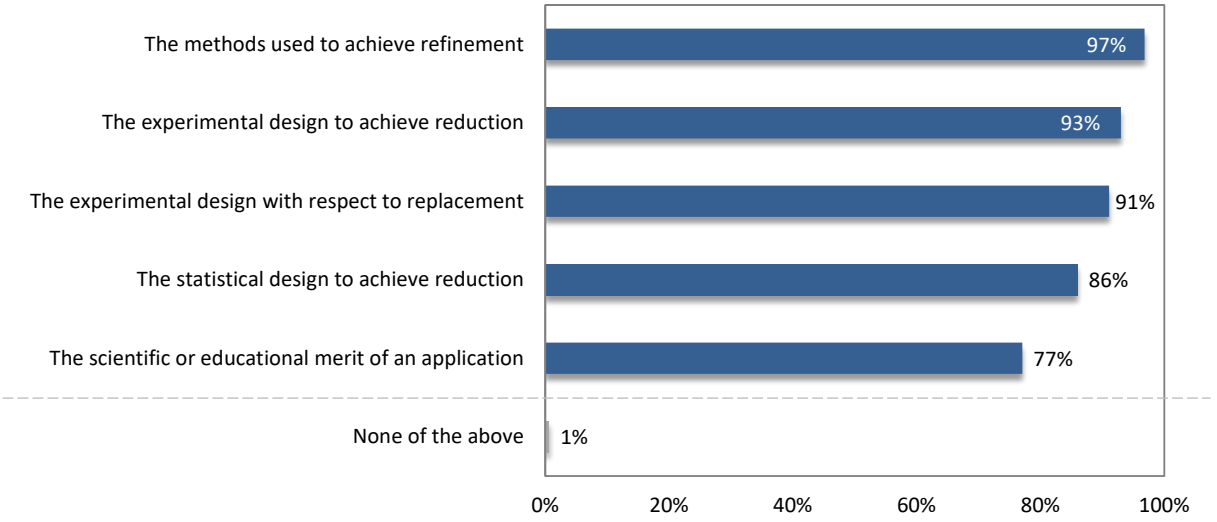
AEC members were asked to comment on what they believe the AEC should be able to question, in relation to peer reviewed applications. As shown in Figure 24, over nine-in-ten AEC members felt that if an application has been peer reviewed, the AEC should be able to question:

- the methods used to achieve refinement (97%);
- the experimental design to achieve reduction (93%); and
- the experimental design with respect to replacement (91%).

AEC members were slightly less likely to indicate that the AEC should be able to question the statistical design to achieve reduction, and the scientific educational merit of an application (although the proportions were still high at 86% and 77% respectively).

Figure 24: If an application has been peer reviewed, which of the following do you think the AEC should be able to question?

(Base: AEC members (n=157); multiple responses accepted)



V. 3Rs in practice

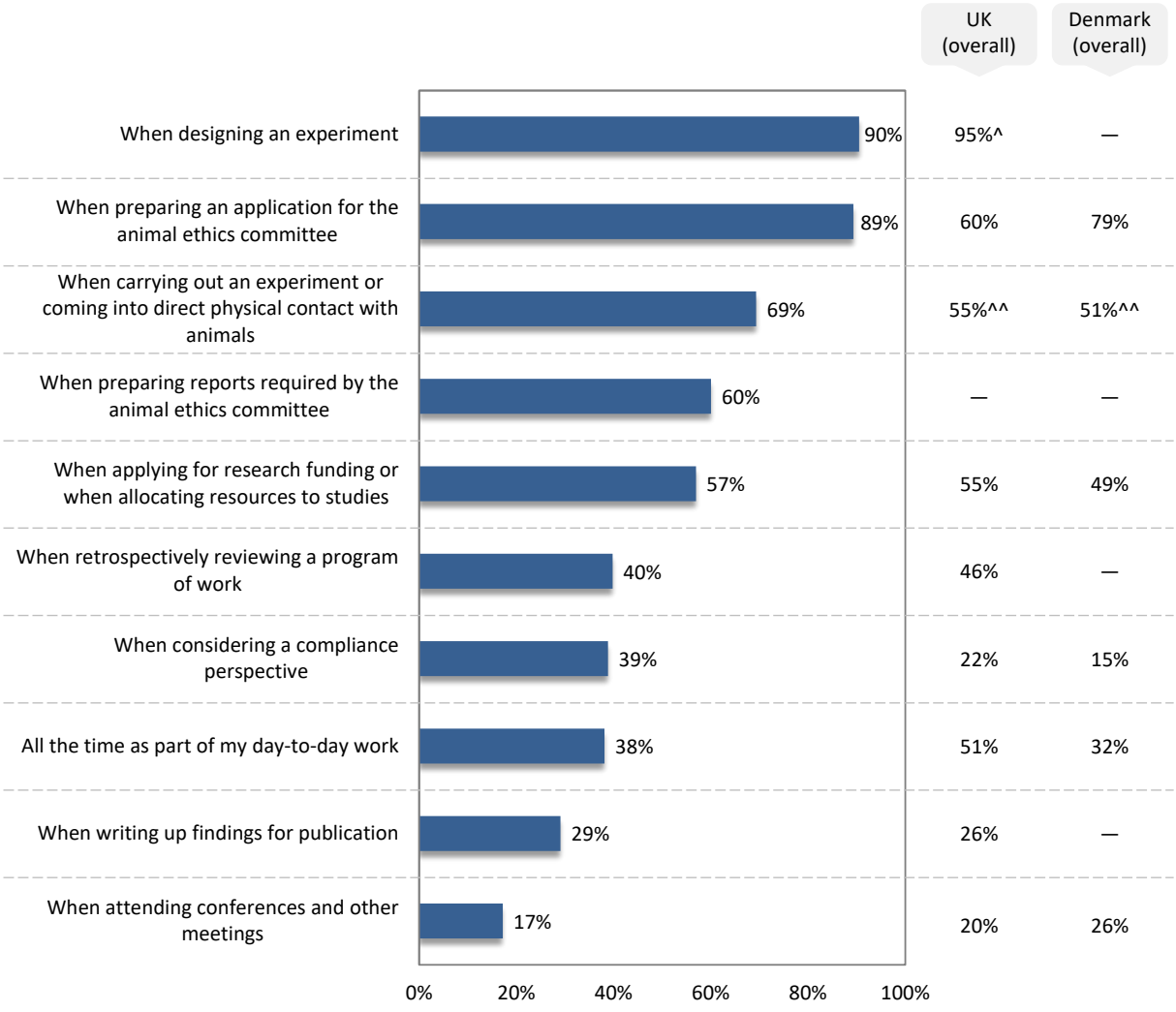
This chapter covers the views of investigators, AEC members, and institutional representatives in relation to the use of the 3Rs in their workplace or role.

Investigators

Around nine-in-ten investigators reported that they consider the 3Rs when designing an experiment (90%), and preparing an application for the animal ethics committee (89% – see Figure 25). Investigators were least likely to consider the 3Rs when writing up findings for publication (29%), and when attending conferences and other meetings (17%).

Figure 25: When do you consider the 3Rs in your work?[9]

(Base: Investigators (n=420); multiple responses accepted)



^ *In the UK survey, the response option was "When designing and carrying out an experiment".*

^^ *In the UK and Denmark surveys, the response option was "When coming into direct physical contact with animals".*

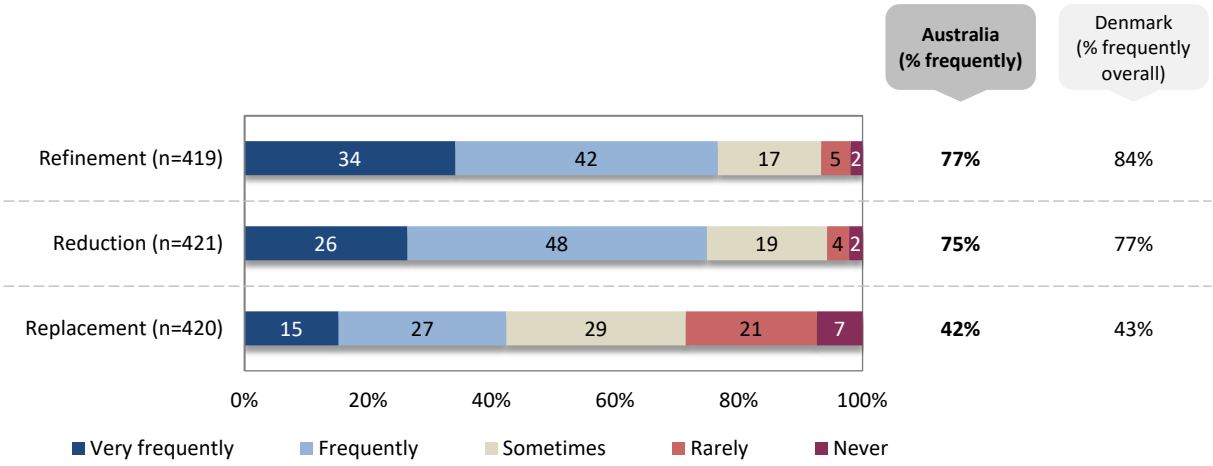
[9] Please note that comparisons against the UK and Denmark results should be treated with caution, due to differences in response options.

When asked how often each of the 3Rs play a role when investigators plan, conduct and review their work involving animals, around three-in-four respondents indicated that refinement (77%) and reduction (75%) frequently play a role, while less than half (42%) reported that replacement frequently plays a role (see Figure 26).

- Investigators involved in the production of biological products were *most* likely to indicate that the 3Rs frequently play a role when they plan, conduct and review their work involving animals (100% for refinement, 91% reduction, and 64% for replacement).
- Investigators involved in environmental studies were *least* likely to indicate that the 3Rs frequently play a role (67% for refinement, 55% for reduction, and 37% for replacement).

Figure 26: How often does each of the 3Rs play a role when you plan, conduct and review your work involving animals?

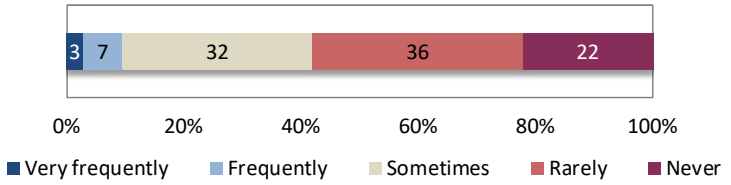
(Base: Investigators)



Of those investigators who indicated that replacement plays a role when they plan, conduct and review their work involving animals, just 10% reported that consideration of replacement has *frequently* or *very frequently* led to adoption of a non-animal alternative in a study, or a component of a study (see Figure 27). Around one-in-three stated that consideration of replacement has *sometimes* (32%) or *rarely* (36%) led to adoption of a non-animal alternative, while just under one quarter (22%) said non-animal alternatives have *never* been adopted.

Figure 27: How often has consideration of replacement led to adoption of a non-animal alternative in a study, or a component of a study?

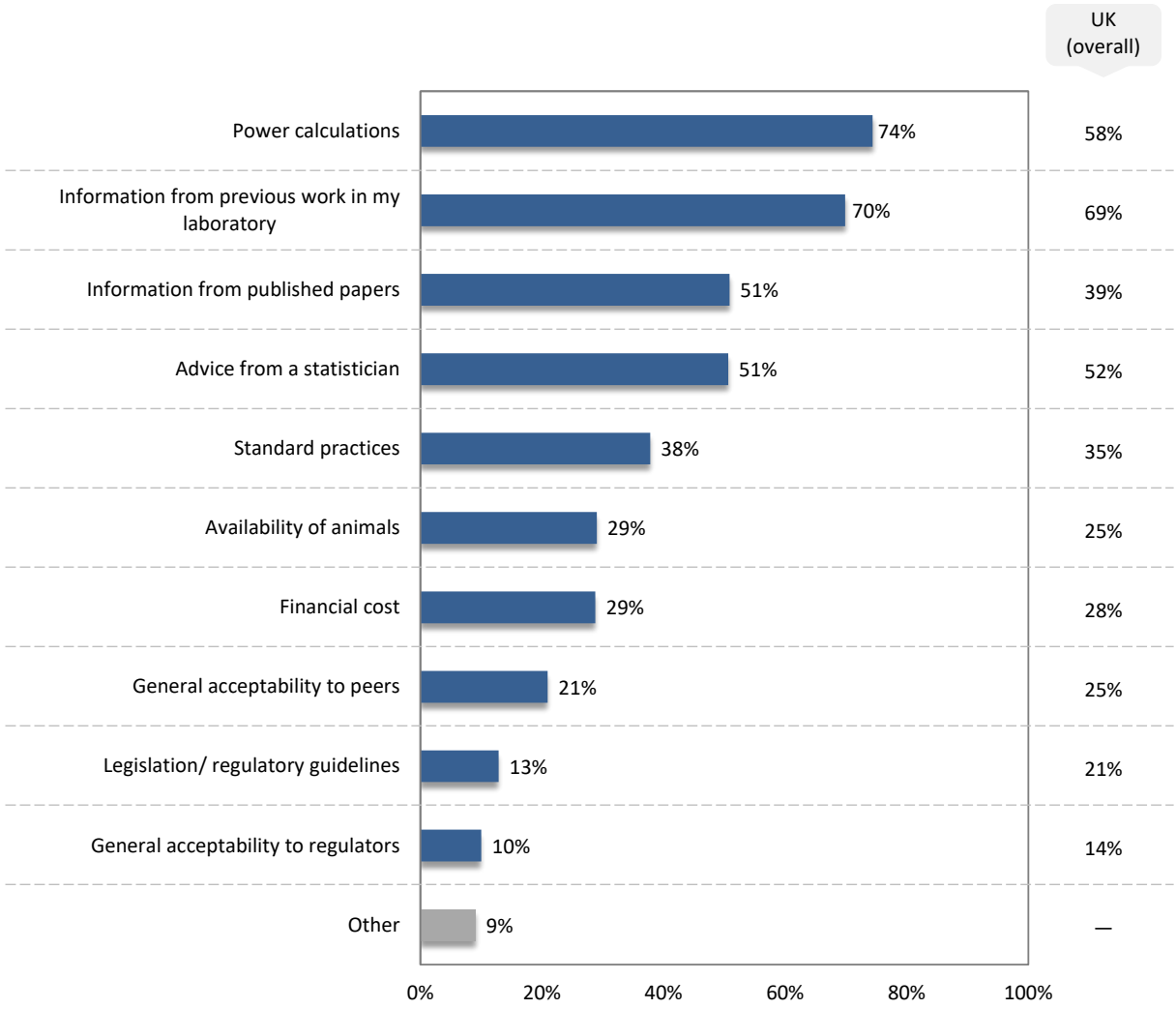
(Base: Investigators (n=388))



As shown in Figure 28, around seven-in-ten investigators reported that they generally decide on the number of animals to use in their experiments based on power calculations (74%), and information from previous work in their laboratory (70%). Investigators were least likely to base their decision on legislation/ regulatory guidelines (13%), and general acceptability to regulators (10%).

Figure 28: How do you generally decide on the number of animals to use in your experiments?[10]

(Base: Investigators (n=421); multiple responses accepted)



[10] Please note that comparisons against the UK results should be treated with caution, due to differences in response options.

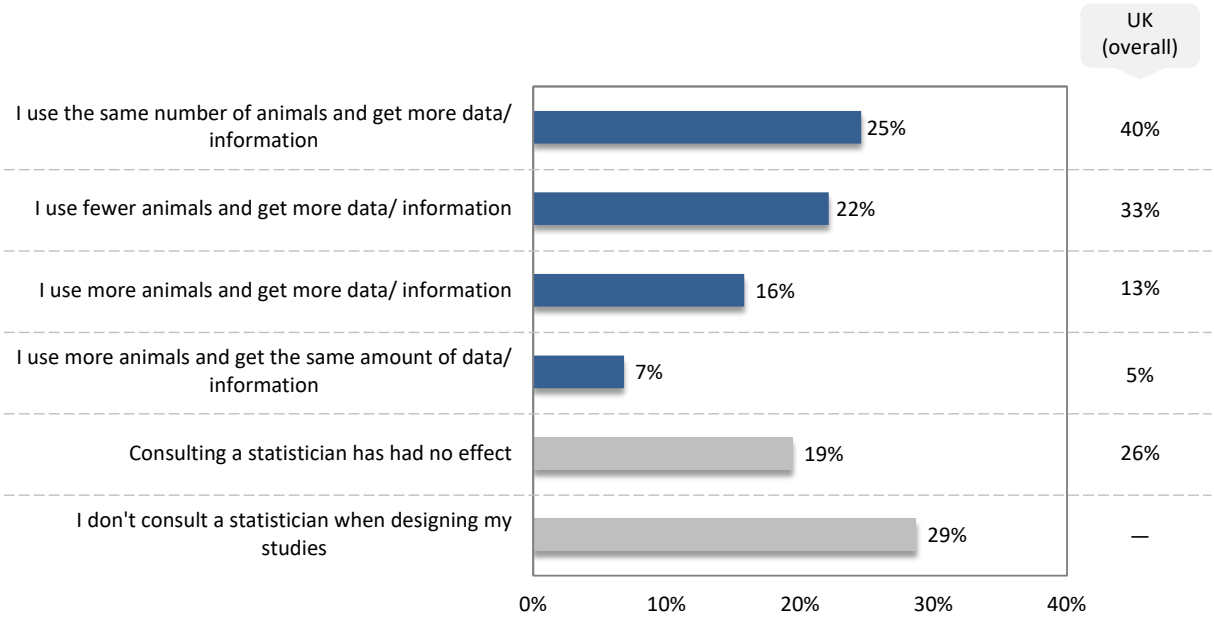
Around seven-in-ten investigators indicated that they consult a statistician when designing their studies (71% – see Figure 29). However, 19% felt that consulting a statistician has had no effect on the design of their studies.

- Investigators involved in field trials were most likely to consult statisticians (91%), while postgraduate students (57%) and investigators involved in environmental studies (68%) were least likely.

Over one-in-five investigators found that consulting a statistician had changed the design of their studies to use the same number of animals and get more data/ information (25%), and use fewer animals and get more data/ information (22%).

Figure 29: How, if at all, has consulting a statistician changed the design of your studies?[11]

(Base: Investigators (n=411); multiple responses accepted)



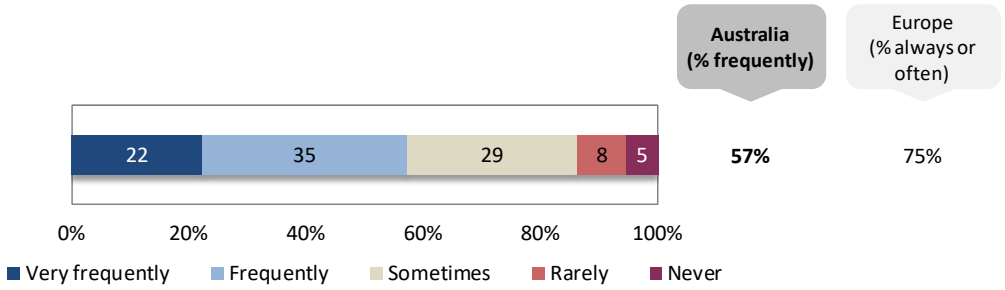
As shown in Figure 30, when asked about pilot studies, almost three-in-five investigators (57%) reported that they *frequently* or *very frequently* carry out pilot studies with a small number of animals in order to test a hypothesis, a model or a method before the larger scale study is planned and performed. A small proportion (5%) reported that they *never* carry out pilot studies.

- Investigators involved in health and medical research (65%) and the production of biological products (64%) were most likely to indicate that they *frequently* carry out pilot studies.
- Investigators involved in environmental studies were most likely to indicate that they *never* carry out pilot studies (27%).

[11] Please note that comparisons against the UK results should be treated with caution, due to differences in response options.

Figure 30: How frequently do you carry out pilot studies with a small number of animals in order to test a hypothesis, a model or a method before the larger scale study is planned and performed?[12]

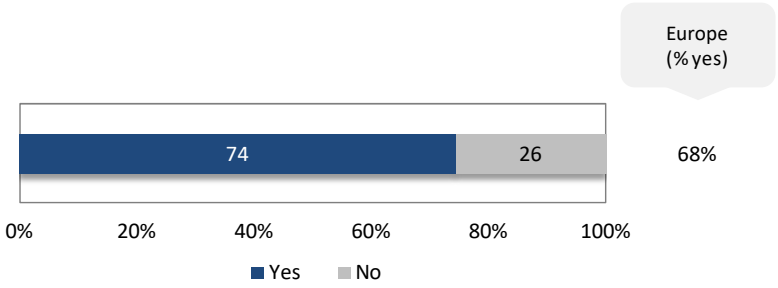
(Base: Investigators (n=411))



Of those investigators who had carried out pilot studies, around three-in-four (74%) indicated that they had cancelled parts of a planned study, or an entire planned study, based on the results of a pilot study (see Figure 31).

Figure 31: Have you ever cancelled parts of a planned study, or an entire planned study, based on the results of a pilot study?[13]

(Base: Investigators (n=386))



When asked about original 3Rs techniques developed in the last five years, just under three-in-five respondents (58%) stated that they had not developed any. For those who had, the most common technique developed was the refinement of the use of animals (29%), followed by reduction (23%), and replacement (12%). Details of the techniques developed can be found in Appendix E.

AEC members

When asked how they are generally assured of the scientific or educational merit of the applications that they review, the majority of AEC members indicated that they generally receive assurance via the expertise of other members of the AEC (80% – see Figure 32).

The Code requires investigators to be competent in procedures they perform, or be under the supervision of a person who is competent in performing the procedure. As shown in Figure 33, over three-in-five AEC members reported that they generally receive assurance of the competency of investigators in applications that they review, based on:

[12] Please note that comparisons against the Europe results should be treated with caution, due to differences in response options, and the inclusion of non-responses in the calculation base.
[13] Please note that comparisons against the Europe results should be treated with caution, due to the inclusion of non-responses in the calculation base.

- advice from another party, such as an Animal Welfare Officer (65%); and
- the sufficiency of information provided in the application (61%).

Figure 32: How are you generally assured of the scientific or educational merit of the application that you review?

(Base: AEC members (n=157); multiple responses accepted)

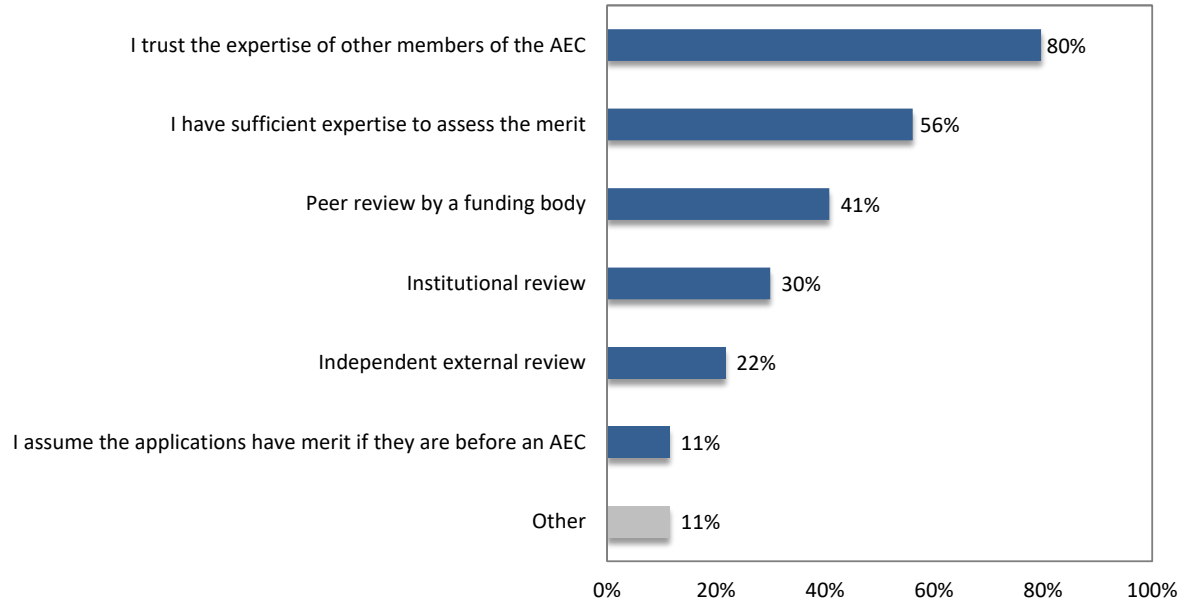
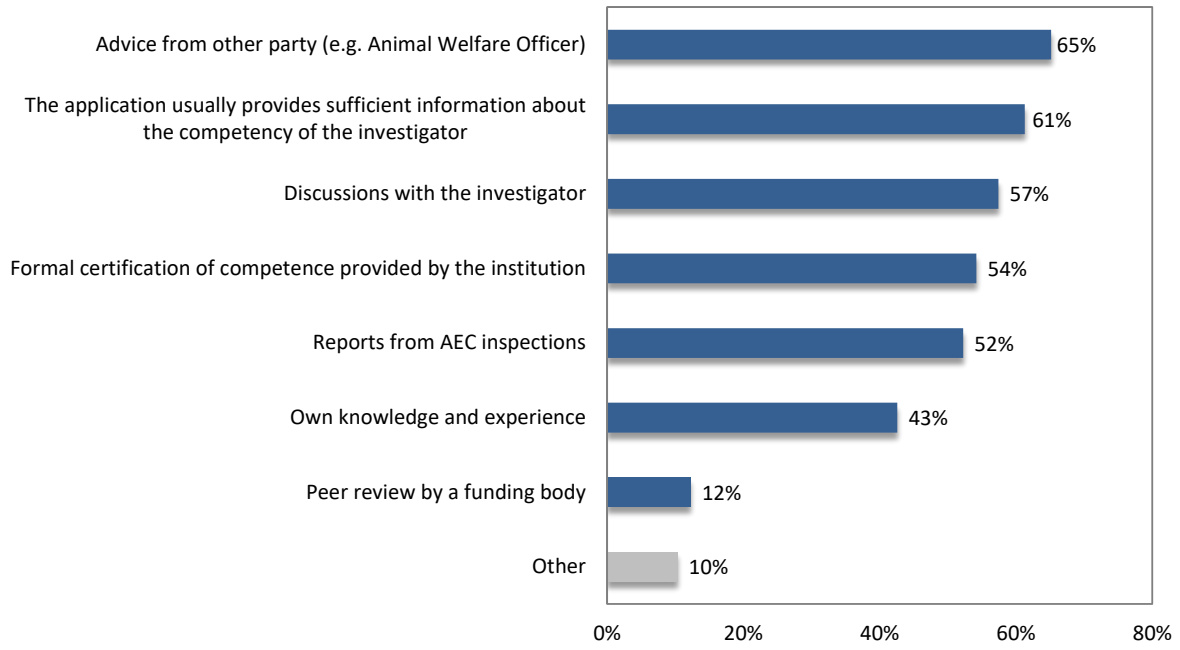


Figure 33: How are you generally assured of the competency of investigators in applications that you review?

(Base: AEC members (n=155); multiple responses accepted)



Reliance on the expertise of AEC members was a recurring theme – when asked what their AEC relies on for assurance about the statistical design of a study, the majority of AEC members (90%) indicated that their AEC relies on the expertise amongst AEC members (see Figure 34). The expertise of the investigator was also highly relied upon (69%).

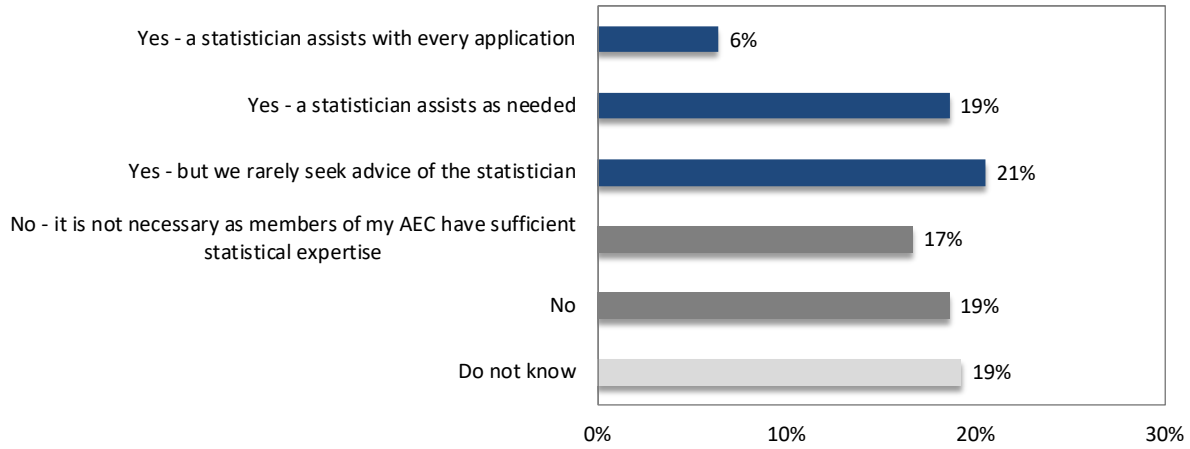
Figure 34: What do you think your AEC relies on for assurance about the statistical design of a study?

(Base: AEC members (n=157); multiple responses accepted)

When asked if their AEC has access to a statistician to advise on optimal animal numbers, almost half of AEC members (46%) indicated yes, around one-third (35%) indicated no, and the remaining AEC members (19%) were unsure (see Figure 35).

Figure 35: Does your AEC have access to a statistician to advise on optimal animal numbers?

(Base: AEC members (n=156))



As shown in Figure 36, over four-in-five AEC members also trusted the advice from other AEC members (89%), and the Animal Welfare Officer or equivalent (85%), about the application of the 3Rs.

- Category D members (i.e. persons not employed by or otherwise associated with the institution, and who have never been involved in the use of animals in scientific or teaching activities) were *most* likely to trust advice from other AEC members (100%) and the Animal Welfare Officer (93%).
- AEC members involved with the review of applications about the use of animals for product testing were *least* likely to trust advice from other AEC members and the Animal Welfare Officer (although still high at 80% and 73% respectively).

When asked about their own confidence and practices, over seven-in-ten AEC members agreed that:

- they are confident in their knowledge of the 3Rs in relation to the applications they consider (81%); and
- they do their own investigation of the 3Rs when considering an application (72%).

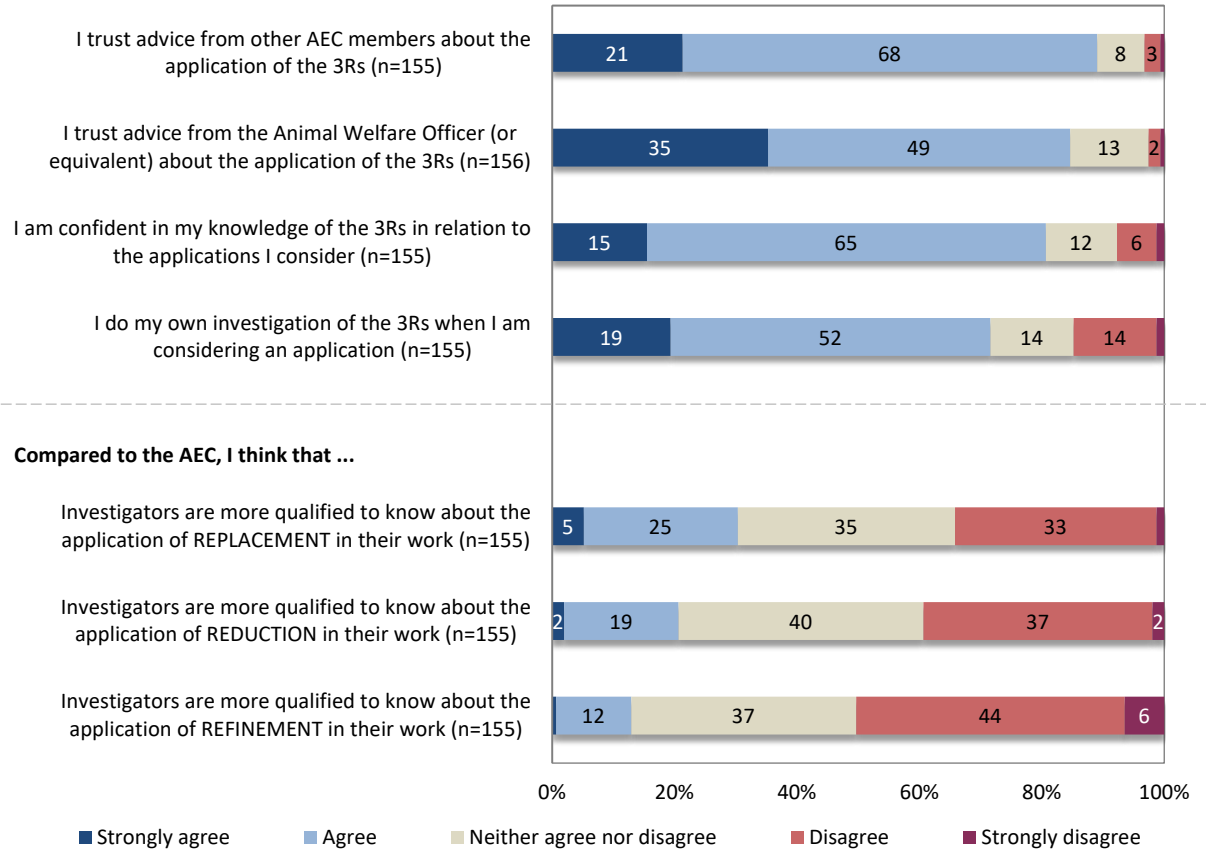
Agreement levels were highest amongst:

- AEC members involved with the review of applications about the use of animals for diagnosis (93% confident in their knowledge of the 3Rs; 87% conduct their own investigation of the 3Rs); and
- Category B members – persons with substantial and recent experience in the use of animals for scientific purposes relevant to the institution and the business of the AEC (91% confident in their knowledge of the 3Rs; 80% conduct their own investigation of the 3Rs).

Furthermore, less than one-in-three AEC members felt that investigators are more qualified to know about the application of replacement (30%), reduction (21%), and refinement (13%) in their work, compared to the AEC – see Figure 36.

Figure 36: Please indicate the extent to which you agree or disagree with the following statements about the application of the 3Rs.

(Base: AEC members)



When asked about how frequently various topics are discussed during the consideration of an application, many topics were consistently raised. As shown in Figure 37, during the consideration of an application, over nine-in-ten AEC members indicated that their AEC frequently discusses:

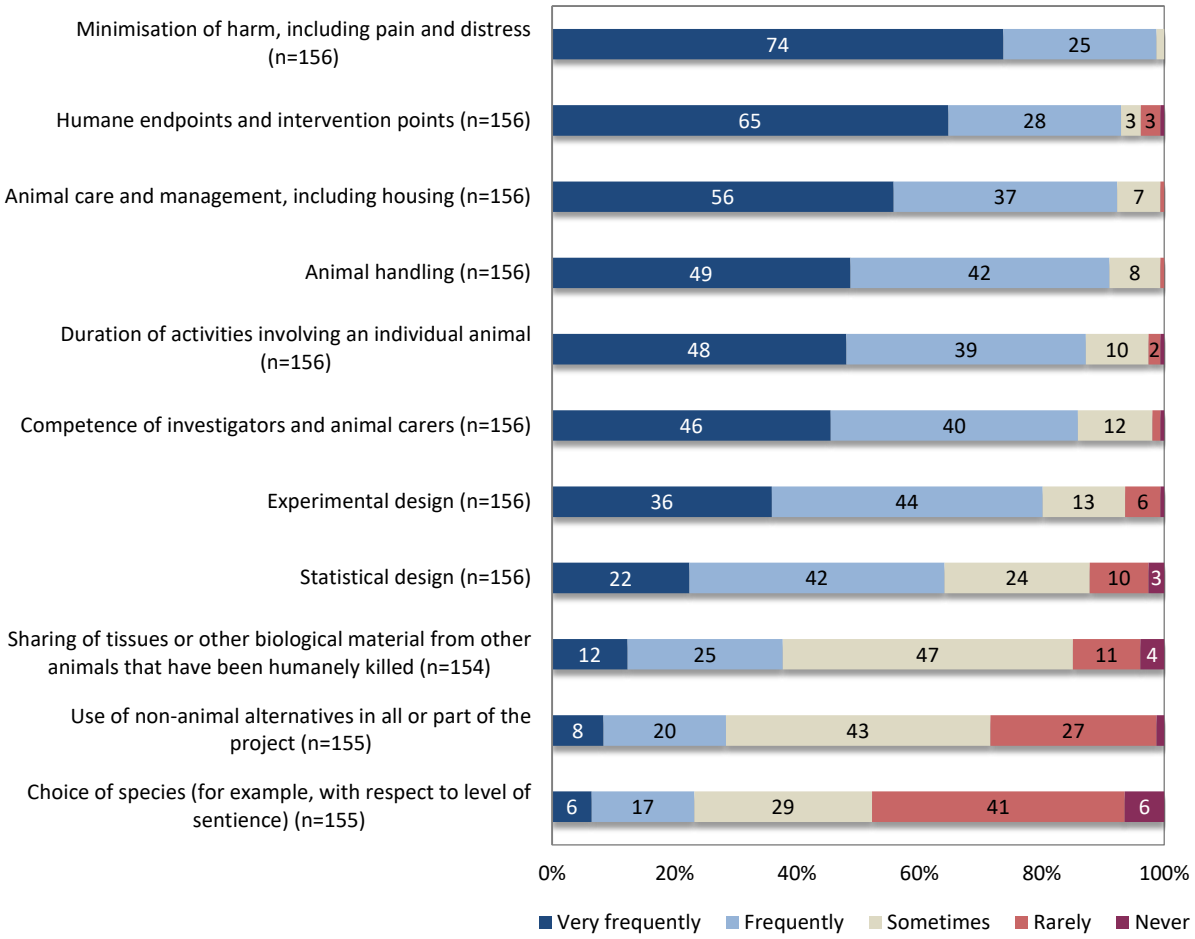
- minimisation of harm, including pain and distress (99%);
- humane endpoints and intervention points (93%);
- animal care and management, including housing (92%); and
- animal handling (91%).

Less frequent discussion topics included:

- sharing of tissues or other biological material from other animals that have been humanely killed (38%);
- use of non-animal alternatives in all or part of the project (28%); and
- choice of species (23%).

Figure 37: How frequently do you think your AEC discusses each of the following during consideration of an application?

(Base: AEC members)



In relation to their approval process, one-in-five AEC members (19%) reported that their AEC *frequently* or *very frequently* approves applications without modification. Around two-in-five indicated that their AEC *sometimes* (41%) or *rarely* (39%) approves applications without modification, while just 1% indicated that their AEC *never* approves applications without modification.

- AEC members involved with the review of applications about the use of animals for diagnosis were least likely to indicate that their AEC frequently approves applications without modification (7%).

As shown in Figure 38, the most common factors resulting in the modification of an application were:

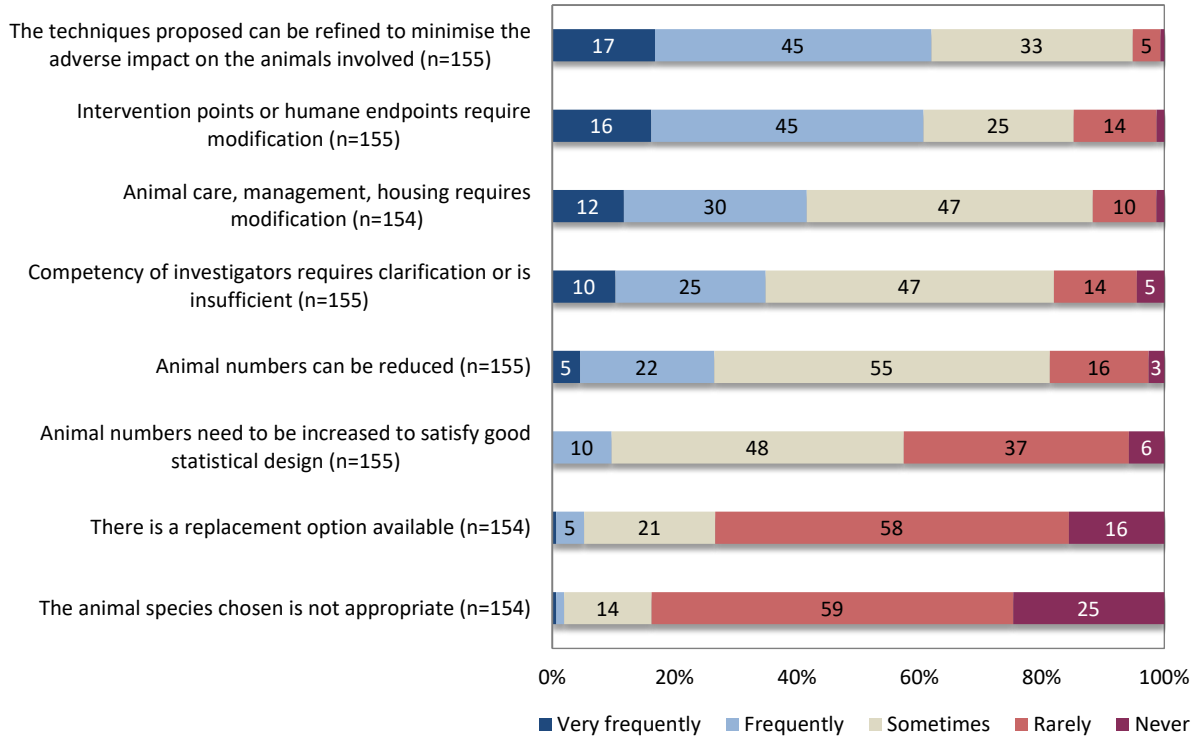
- the techniques proposed could be refined to minimise the adverse impact on the animals involved (62%); and
- intervention points or humane endpoints required modification (61%).

The least common factors included:

- the need for animal numbers to be increased to satisfy good statistical design (10%);
- the availability of a replacement option (5%); and
- the inappropriateness of the chosen animal species (2%).

Figure 38: How often do you think the following factors result in your AEC requiring a modification of an application?

(Base: AEC members)



When asked about approval of pilot studies, half of AEC members (50%) reported that their AEC had not approved parts of a planned study, or an entire planned study, based on the results of a pilot study.

Information was also sought from AECs about the design of the AEC application form, and the extent to which the form meets their information needs about the application of the 3Rs in a proposed project.

- The majority indicated that the design of the form ensures that they receive *adequate* information about the application of the 3Rs (77%).
- Around one-in-five indicated that the design of the form means that they receive *limited or inconsistent* information about the application of the 3Rs (19%); and
- The remaining 3% indicated that the design of the form means that *they do not get the information they need* to assess the application of the 3Rs.

Institutional representatives

When asked how their institution currently supports and facilitates the implementation of the 3Rs, over half of institutional representatives reported that their institution does so through providing training for investigators (54%), and developing institutional policies (51% – see Figure 39).

Furthermore, Figure 40 illustrates that over four-in-five institutional representatives reported that their institution provides assistance to both investigators (86%) and AEC members (82%) to access 3Rs information.

Figure 39: How does your institution currently support and facilitate the implementation of the 3Rs?

(Base: Institutional representatives (n=98); multiple responses accepted)

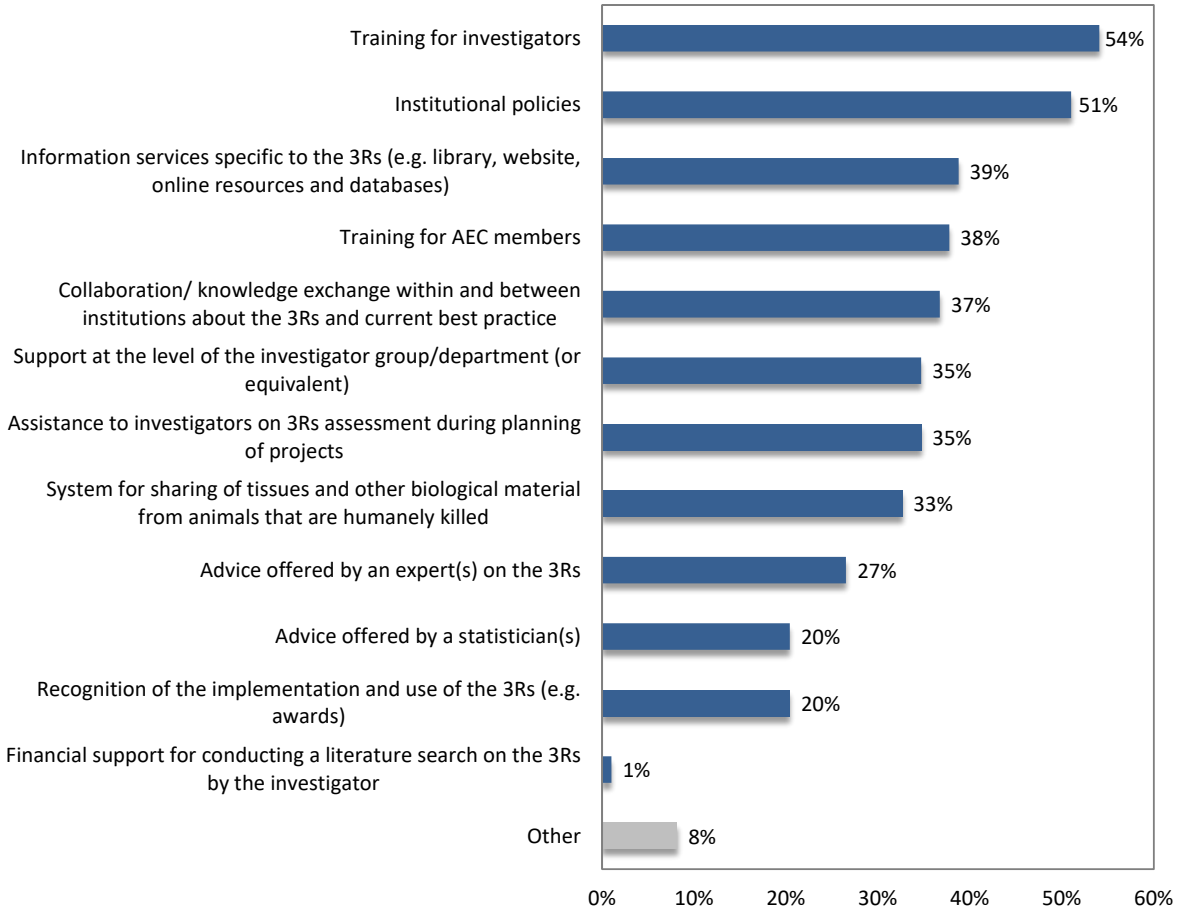
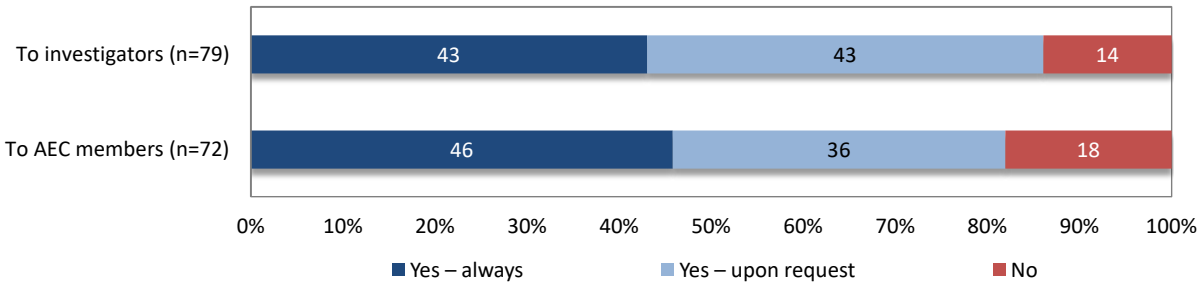


Figure 40: Does your institution provide assistance to the following groups to access information specifically about the 3Rs?

(Base: Institutional representatives)



VI. Enablers and barriers to implementation of the 3Rs

This chapter covers the views of investigators, AEC members, and institutional representatives in relation to factors that promote or hinder the implementation of the 3Rs.

All participant groups

As shown in Figure 41, when asked what would best enable investigators to achieve their scientific/ educational objectives in the future without using animals, the most common factors identified by both AEC members and institutional representatives were:

- increased funding to develop replacement options (57% for AEC members; 48% for institutional representatives); and
- help to identify replacement techniques (47% for AEC members; 43% for institutional representatives).

Many investigators felt that nothing would enable them to achieve their objectives without using animals, as their work demands that they look at the whole animal system (37%). The most commonly nominated enablers among investigators were the greater availability of human tissues (34%), increased funding to develop replacement options (31%), and technical advances in tissue engineering (31%).

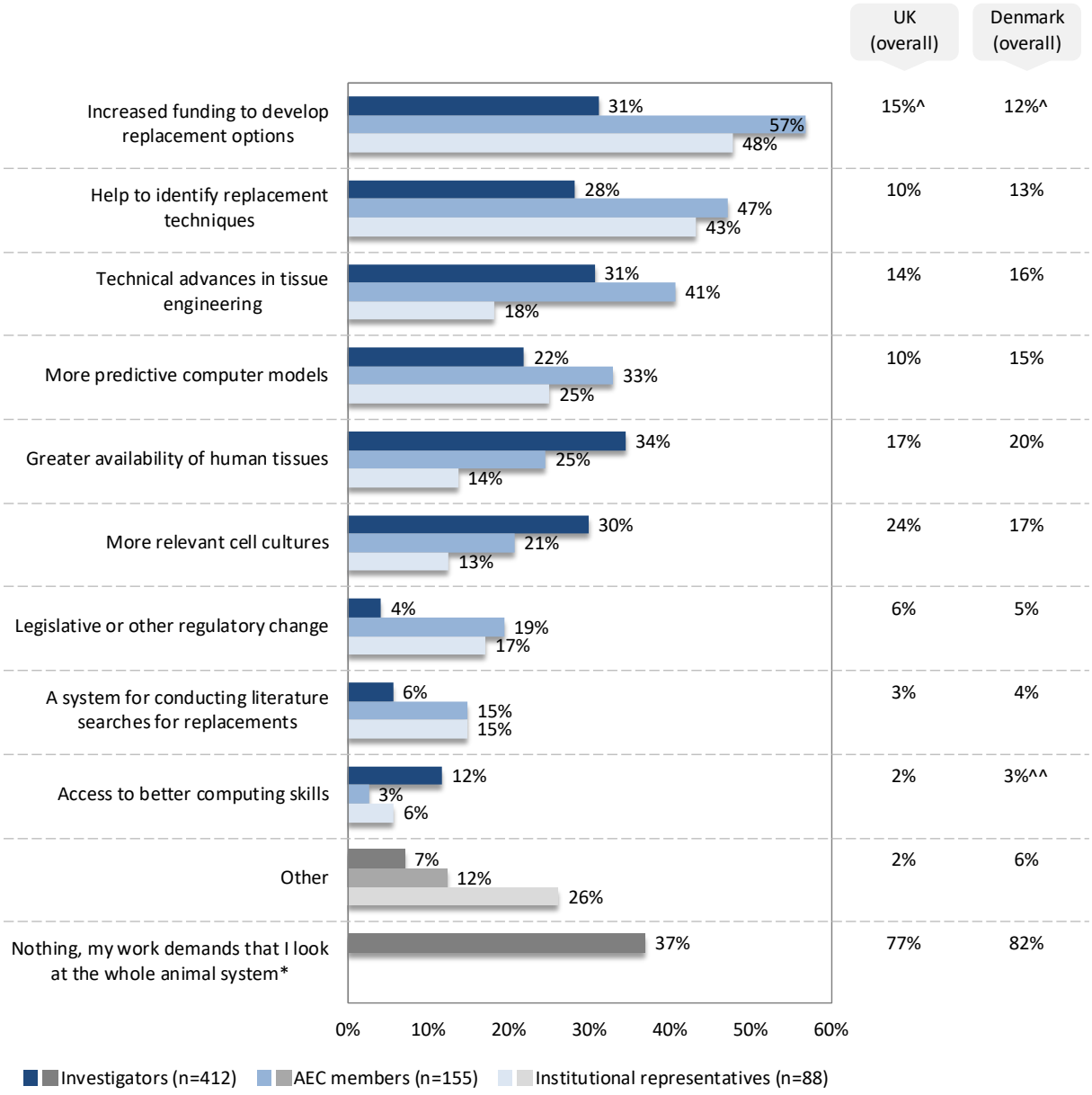
In terms of factors that would enable investigators to use fewer animals, the three most common factors identified by all participant groups were, as shown in Figure 42:

- statistical evidence that fewer animals would provide the required research results (41% for investigators; 46% for AEC members; 30% for institutional representatives);
- increased sharing of data or collaboration between research groups (30% for investigators; 47% for AEC members; 26% for institutional representatives); and
- increased sharing of data or collaboration between institutions (23% for investigators; 42% for AEC members; 28% for institutional representatives).

Compared to AEC members, investigators and institutional representatives were more likely to indicate that nothing would enable investigators to use fewer animals, as they already adequately minimise the number of animals they use (21% for investigators and 20% for institutional representatives, compared to just 4% for AEC members).

Figure 41: Which of the following would best enable investigators to achieve their scientific/ educational objectives in the future without using animals?[14]

(Base: All participant groups; up to three responses accepted)



** This response option only appeared for investigators.*

^ In the UK and Denmark surveys, the response option was "Increased funding to develop alternatives".

^^ In the Denmark survey, the response option was "Improve computing skills".

[14] Please note that comparisons between the three participant groups should be treated with caution, due to differences in response options. Please also note that the UK and Denmark surveys did not seek the views of AEC members or institutional representatives.

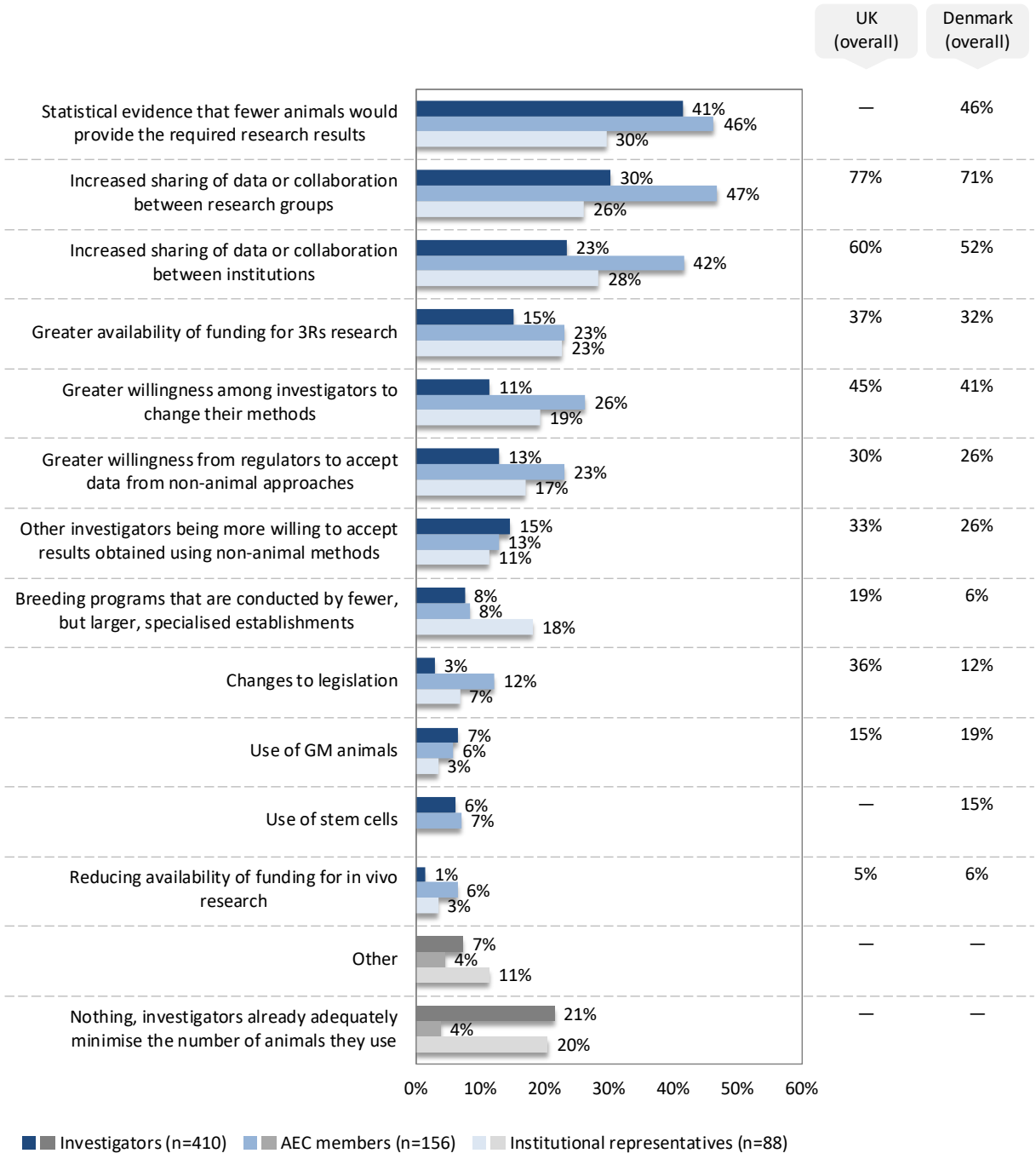
Table 1: Top enabling factor which would best enable investigators to achieve their scientific/ educational objectives in the future without using animals – Results by type of activity, per participant group*

	Investigators	AEC members	Institutional representatives
Health and medical research	Greater availability of human tissues (42%)	Increased funding to develop replacement options (57%)	Increased funding to develop replacement options (64%)
Other research	Increased funding to develop replacement options (23%); More predictive computer models (23%); Access to better computing skills (23%)	Increased funding to develop replacement options (57%)	Help to identify replacement techniques (71%)
Field trials	Increased funding to develop replacement options (38%)	Increased funding to develop replacement options (64%)	Increased funding to develop replacement options (63%)
Environmental studies	Increased funding to develop replacement options (22%)	Increased funding to develop replacement options (61%)	Help to identify replacement techniques (63%)
Teaching	Increased funding to develop replacement options (32%)	Increased funding to develop replacement options (57%)	Increased funding to develop replacement options (53%)
Diagnosis	—	Help to identify replacement techniques (60%)	—
Product testing	Help to identify replacement techniques (33%)	Increased funding to develop replacement options (59%)	—
Production of biological products	Help to identify replacement techniques (45%)	Increased funding to develop replacement options (67%)	—

** A dash indicates that the sample size for this cohort has fallen below the reportable threshold of n=10.*

Figure 42: Which of the following would best enable investigators to use fewer animals?[15]

(Base: All participant groups; up to three responses accepted)



[15] Please note that comparisons against the UK and Denmark results should be treated with caution, due to differences in response options. Please also note that the UK and Denmark surveys did not seek the views of AEC members or institutional representatives.

Table 2: Top enabling factor which would best enable investigators to use fewer animals – Results by type of activity, per participant group* (continued on next page)

	Investigators	AEC members	Institutional representatives
Health and medical research	Statistical evidence that fewer animals would provide the required research results (41%)	Statistical evidence that fewer animals would provide the required research results (43%); Increased sharing of data or collaboration between research groups (43%)	Statistical evidence that fewer animals would provide the required research results (44%)
Other research	Statistical evidence that fewer animals would provide the required research results (45%)	Statistical evidence that fewer animals would provide the required research results (48%); Increased sharing of data or collaboration between institutions (48%)	Increased sharing of data or collaboration between institutions (41%); Greater willingness among investigators to change their methods (41%)
Field trials	Statistical evidence that fewer animals would provide the required research results (50%)	Statistical evidence that fewer animals would provide the required research results (54%)	Statistical evidence that fewer animals would provide the required research results (44%)
Environmental studies	Statistical evidence that fewer animals would provide the required research results (34%)	Increased sharing of data or collaboration between research groups (46%)	Statistical evidence that fewer animals would provide the required research results (43%)
Teaching	Statistical evidence that fewer animals would provide the required research results (42%)	Statistical evidence that fewer animals would provide the required research results (47%)	Increased sharing of data or collaboration between institutions (26%)
Diagnosis	—	Statistical evidence that fewer animals would provide the required research results (80%)	—

	Investigators	AEC members	Institutional representatives
Product testing	Statistical evidence that fewer animals would provide the required research results (47%); Greater willingness from regulators to accept data from non-animal approaches (47%)	Statistical evidence that fewer animals would provide the required research results (61%)	—
Production of biological products	Increased sharing of data or collaboration between research groups (36%); Increased sharing of data or collaboration between institutions (36%); Greater willingness from regulators to accept data from non-animal approaches (36%)	Statistical evidence that fewer animals would provide the required research results (57%)	—

** A dash indicates that the sample size for this cohort has fallen below the reportable threshold of n=10.*

When asked what would best enable investigators to use methods that better minimise adverse effects on the animals they use, the top factor identified by all participant groups was help to identify refinement methods (40% for investigators; 54% for AEC members; 39% for institutional representatives – see Figure 43).

In addition, around half of AEC members identified greater willingness among investigators to change their methods (52%), and increased sharing of information between research groups (50%), as key enabling factors.

Again, the views of both investigators and institutional representatives were at odds with those of AEC members in relation to the belief that nothing further could be done. Compared to AEC members, investigators and institutional representatives were more likely to indicate that nothing would enable investigators to use methods that better minimise adverse effects on the animals they use, as they already adequately do so (26% for investigators and 22% for institutional representatives, compared to just 3% for AEC members).

Figure 43: Which of the following would best enable investigators to use methods that better minimise adverse effects on the animals they use?

(Base: All participant groups; up to three responses accepted)

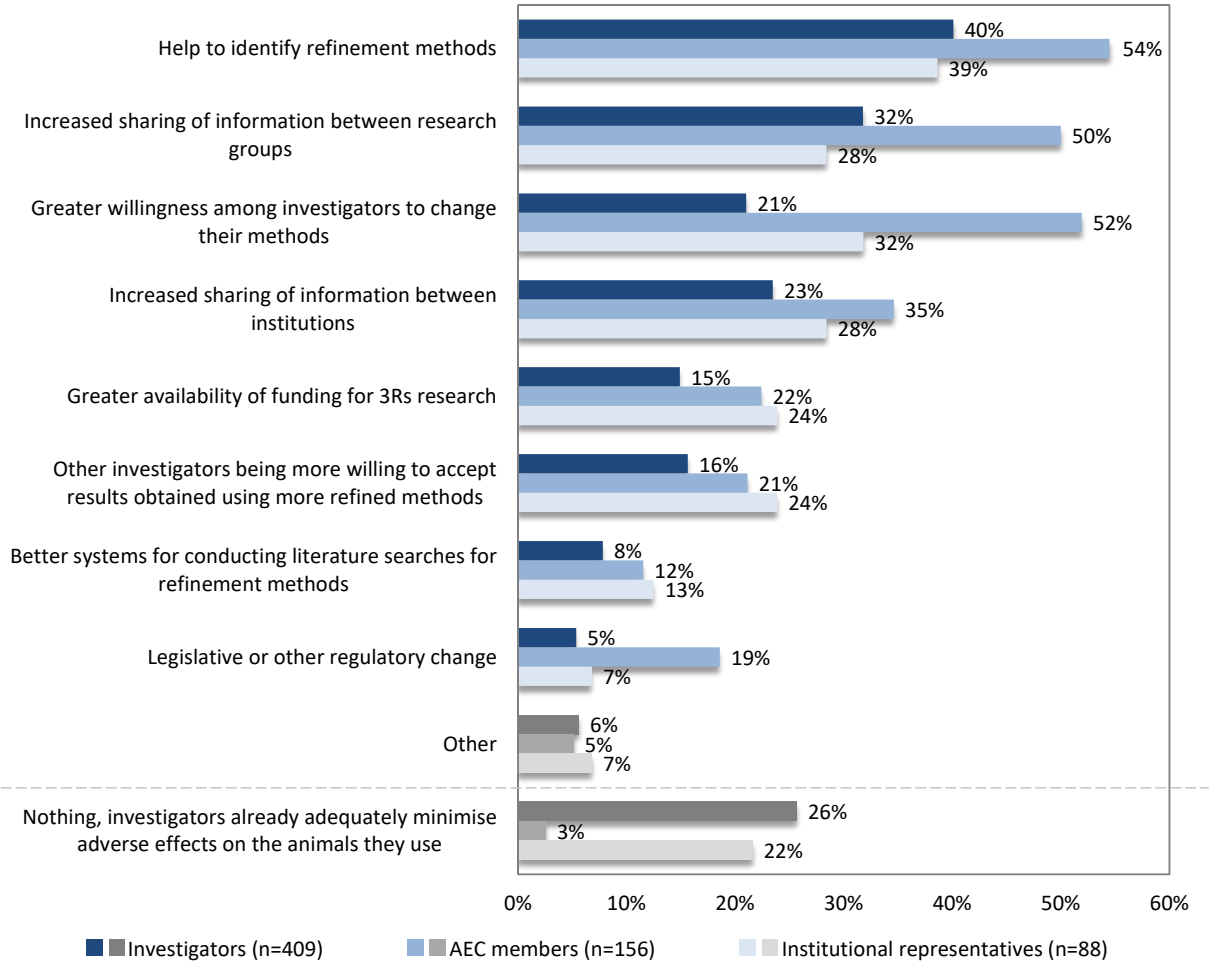


Table 3: Top enabling factor which would best enable investigators to use methods that better minimise adverse effects on the animals they use – Results by type of activity, per participant group* (continued on next page)

	Investigators	AEC members	Institutional representatives
Health and medical research	Help to identify refinement methods (42%)	Help to identify refinement methods (57%)	Help to identify refinement methods (52%)
Other research	Help to identify refinement methods (43%)	Help to identify refinement methods (63%)	Increased sharing of information between institutions (41%)
Field trials	Help to identify refinement methods (31%); Greater willingness among investigators to change their methods (31%)	Help to identify refinement methods (58%)	Greater willingness among investigators to change their methods (50%)
Environmental studies	Increased sharing of information between research groups (41%)	Help to identify refinement methods (59%)	Help to identify refinement methods (41%); Greater willingness among investigators to change their methods (41%)
Teaching	Help to identify refinement methods (47%)	Greater willingness among investigators to change their methods (57%)	Help to identify refinement methods (44%)
Diagnosis	—	Greater willingness among investigators to change their methods (73%)	—
Product testing	Help to identify refinement methods (33%); Increased sharing of information between research groups and institutions (33%)	Help to identify refinement methods (59%)	—

	Investigators	AEC members	Institutional representatives
Production of biological products	Increased sharing of information between research groups (45%); Greater willingness among investigators to change their methods (45%)	Help to identify refinement methods (67%)	—

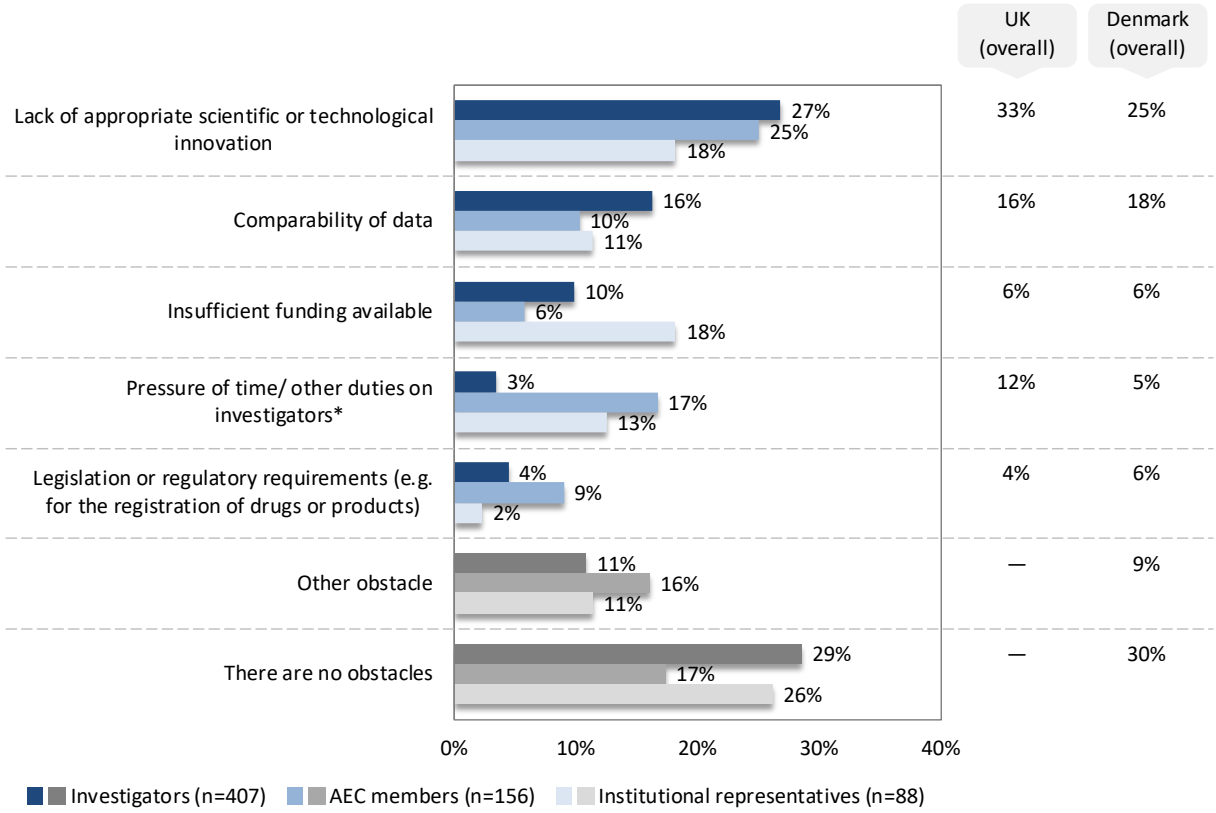
** A dash indicates that the sample size for this cohort has fallen below the reportable threshold of n=10.*

In terms of obstacles to implementing the 3Rs, the lack of appropriate scientific or technological innovation was a primary obstacle for all participant groups (27% for investigators; 25% for AEC members; 18% for institutional representatives – see Figure 44). Other key obstacles included:

- comparability of data (for investigators – 16%);
- pressure of time/ duties on investigators (for AEC members – 17%); and
- insufficient funding available (for institutional representatives – 18%).

Figure 44: What is the main obstacle to <u>implementing</u> the 3Rs in your own work/ in the work that your AEC reviews/ at your institution?[16]

(Base: All participant groups)



* *This response option appeared for AEC members and institutional representatives. The equivalent response option which appeared for investigators was "Lack of time due to other duties".*

[16] Please note that comparisons against the UK results should be treated with caution, due to differences in response options, as well as the inclusion of non-responses in the calculation base. Please also note that the UK and Denmark surveys did not seek the views of AEC members or institutional representatives.

Table 4: Top obstacle to implementing the 3Rs – Results by type of activity, per participant group*

	Investigators	AEC members	Institutional representatives
Health and medical research	Lack of appropriate scientific or technological innovation (30%)	Lack of appropriate scientific or technological innovation (26%)	Insufficient funding available (24%)
Other research	Lack of appropriate scientific or technological innovation (15%)	Lack of appropriate scientific or technological innovation (19%)	Insufficient funding available (24%)
Field trials	Legislation or regulatory requirements (25%)	Lack of appropriate scientific or technological innovation (29%)	Insufficient funding available (25%)
Environmental studies	Lack of appropriate scientific or technological innovation (15%)	Lack of appropriate scientific or technological innovation (33%)	Insufficient funding available (23%)
Teaching	Lack of appropriate scientific or technological innovation (22%)	Lack of appropriate scientific or technological innovation (28%)	Insufficient funding available (19%)
Diagnosis	—	Lack of appropriate scientific or technological innovation (47%)	—
Product testing	Legislation or regulatory requirements (33%)	Lack of appropriate scientific or technological innovation (24%)	—
Production of biological products	Legislation or regulatory requirements (36%)	Lack of appropriate scientific or technological innovation (19%); Legislation or regulatory requirements (19%)	—

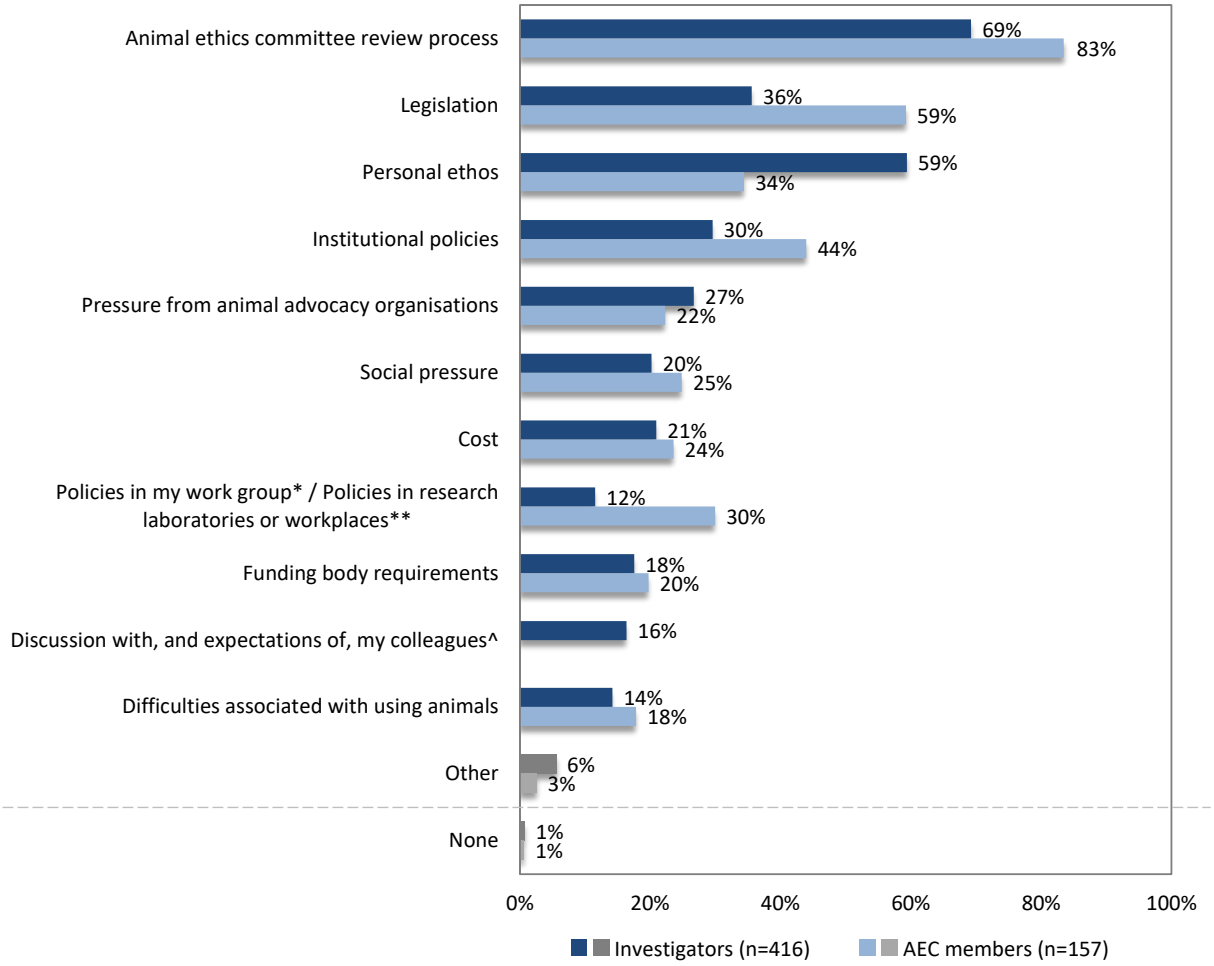
** A dash indicates that the sample size for this cohort has fallen below the reportable threshold of n=10.*

Investigators and AEC members only

As shown in Figure 45, the animal ethics committee review process was identified as a top driving factor for investigators to use 3R methods (69% for investigators; 83% for AEC members). Personal ethos was another key driving factor for investigators (59%), while AEC members felt that legislation was a key driving factor for the use of the 3Rs (59%).

Figure 45: What do you think are the driving factors for using 3R methods?

(Base: Investigators and AEC members; up to four responses accepted)



* *This response option appeared for investigators.*

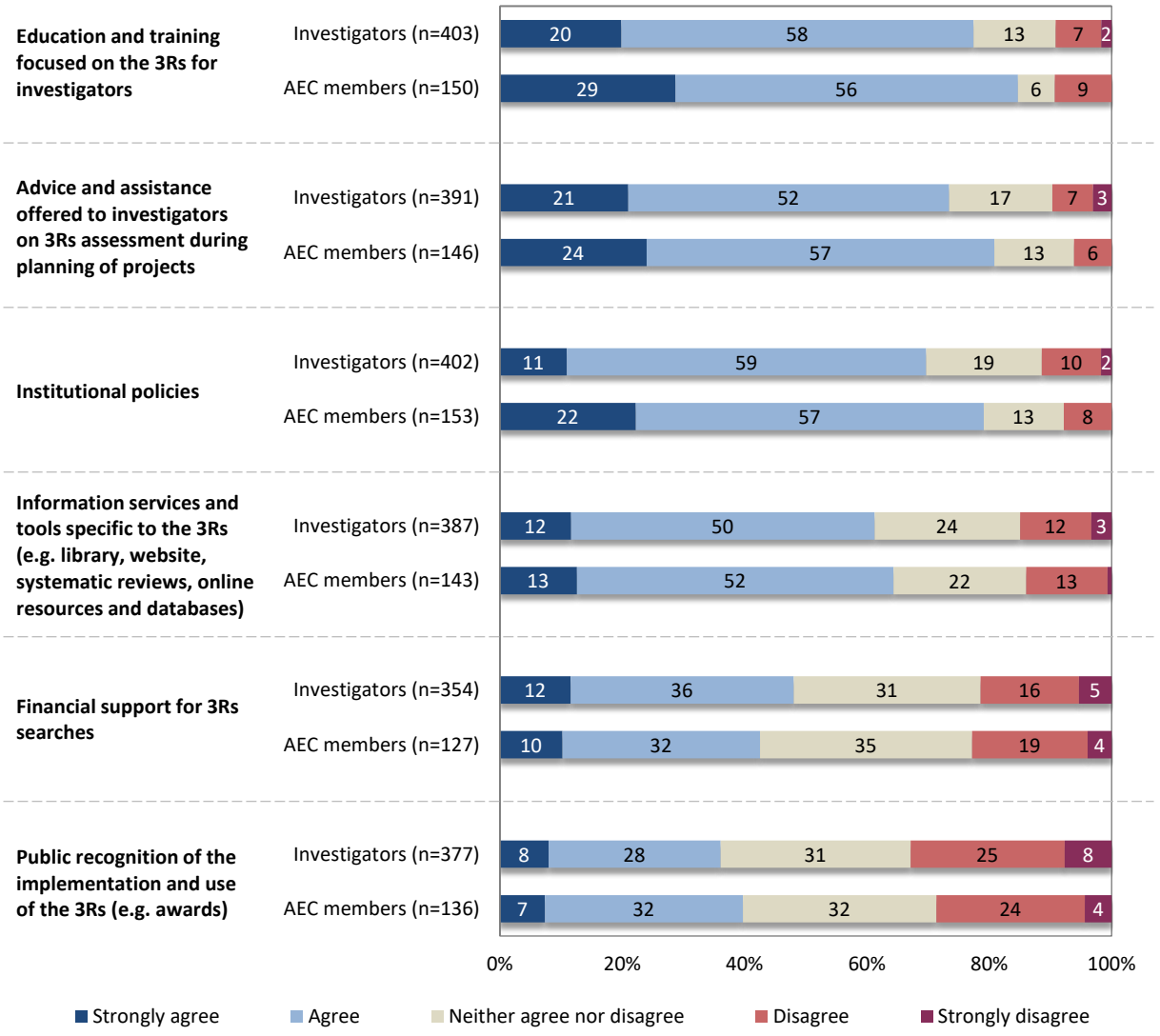
** *This response option appeared for AEC members.*

^ *This response option only appeared for investigators*.

Both investigators and AEC members felt that education and training focused on the 3Rs for investigators would most effectively support and facilitate the implementation of the 3Rs (77% of investigators and 81% of AEC members agreed – see Figure 46). The strategy or initiative perceived to be the least effective was the public recognition of the implementation and use of the 3Rs (36% for investigators; 35% for AEC members).

Figure 46: Please indicate the extent to which you agree or disagree that the following strategies or initiatives effectively support and facilitate the implementation of the 3Rs.

(Base: Investigators and AEC members)



VII. Access to information about the 3Rs

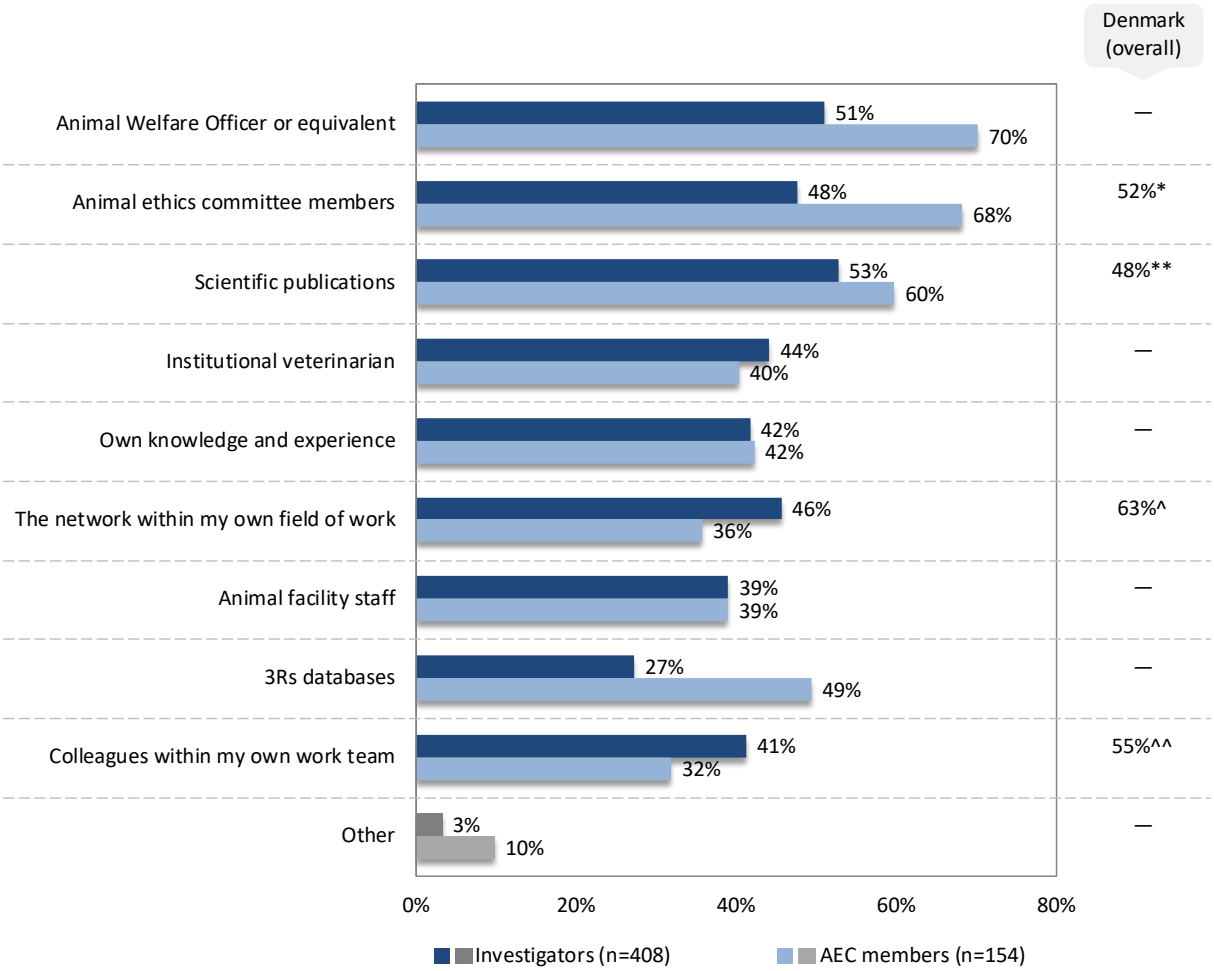
This chapter covers the views of investigators and AEC members in relation to information access.

Investigators and AEC members

As shown in Figure 47, the most common sources of 3Rs information for both investigators and AEC members were an Animal Welfare Officer or equivalent (51% for investigators; 70% for AEC members), animal ethics committee members (48% for investigators; 68% for AEC members), and scientific publications (53% for investigators; 60% for AEC members).

Figure 47: If you were to seek information about the 3Rs, which of the following sources would you typically turn to?[17]

(Base: Investigators and AEC members; multiple responses accepted)



* *The response option in the Denmark survey was "The Ethical Committee".*

** *The response option in the Denmark survey was "Scientific articles".*

^ *The response option in the Denmark survey was "My network".*

^^ *The response option in the Denmark survey was "Colleagues".*

[17] Please note that comparisons against the Denmark results should be treated with caution, due to differences in response options. Please also note that the Denmark survey did not seek the views of AEC members.

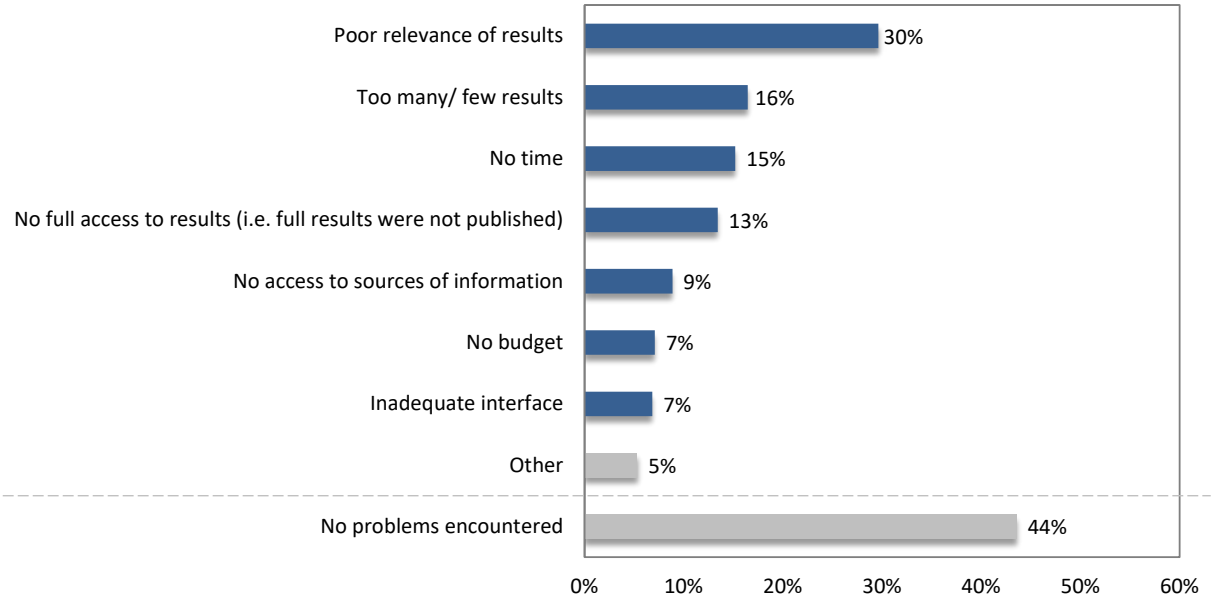
Investigators only

The majority of investigators reported that they had not encountered any problems when searching for information about the 3Rs in the literature/ databases (44% – see Figure 48). Among those who had, the most common problem encountered was the poor relevance of results (30%).

- Investigators involved in environmental studies were *least* likely to indicate that they experienced problems when searching for 3Rs information (50%).
- Investigators involved in the production of biological products were *most* likely to indicate that they experienced problems (64%).

Figure 48: Which of the following problems, if any, have you encountered when searching for information about the 3Rs in the literature/ databases?

(Base: Investigators (n=395); multiple responses accepted)



Over half of investigators (53%) reported that they spend less than 2 hours searching for information about the 3Rs, per application to the animal ethics committee. Around one-quarter of investigators (24%) spent 2 to 4 hours searching for information, and just over one-in-ten (13%) spent 4 to 6 hours searching for information. Just 4% of investigators spent 10 hours or more searching for 3Rs information, per application.

In terms of the best ways to make 3Rs information available, website was the top preference for investigators (71%), followed by services by animal facility (50%), and education (34%). Library was the least preferred option for investigators (5%).

AEC members only

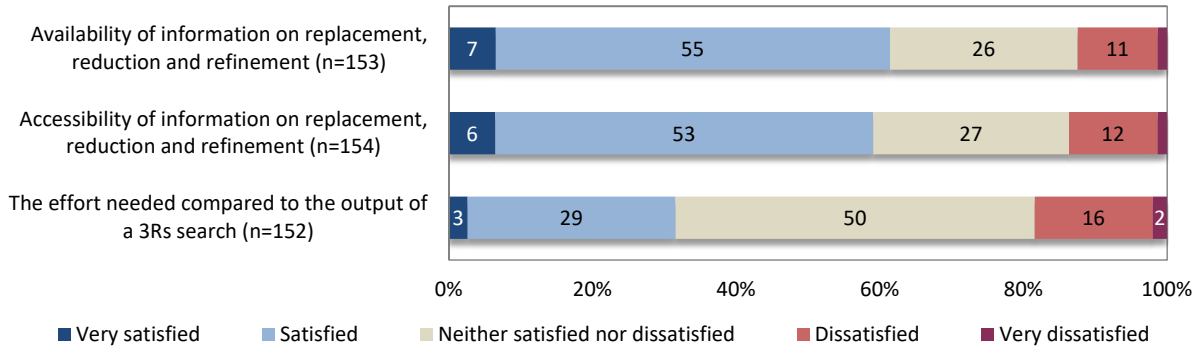
As shown in Figure 49, around three-in-five AEC members were satisfied with the availability of information on the 3Rs (61%), and the accessibility of this information (59%).

- AEC members involved with the review of applications about the use of animals for diagnosis were *most* satisfied with the availability (73%) and accessibility (67%) of 3Rs information.
- AEC members involved with the review of applications about the use of animals for the production of biological products were *least* satisfied with the availability and accessibility of 3Rs information (both 43%).

Just one-in-three AEC members (32%) were satisfied with the effort needed compared to the output of a 3Rs search, while half of AEC members (50%) adopted a mixed view. Satisfaction levels were *highest* for Category B members (persons with substantial and recent experience in the use of animals for scientific purposes relevant to the institution and the business of the AEC – 41%), and *lowest* for Chairs (just 6%).

Figure 49: Please indicate your level of satisfaction with the following:

(Base: AEC members)



VIII. Training on the 3Rs

This chapter covers the views of:

- investigators and AEC members in relation to their training on the 3Rs; and
- institutional representatives in relation to training on the 3Rs that is provided or supported by their institution.

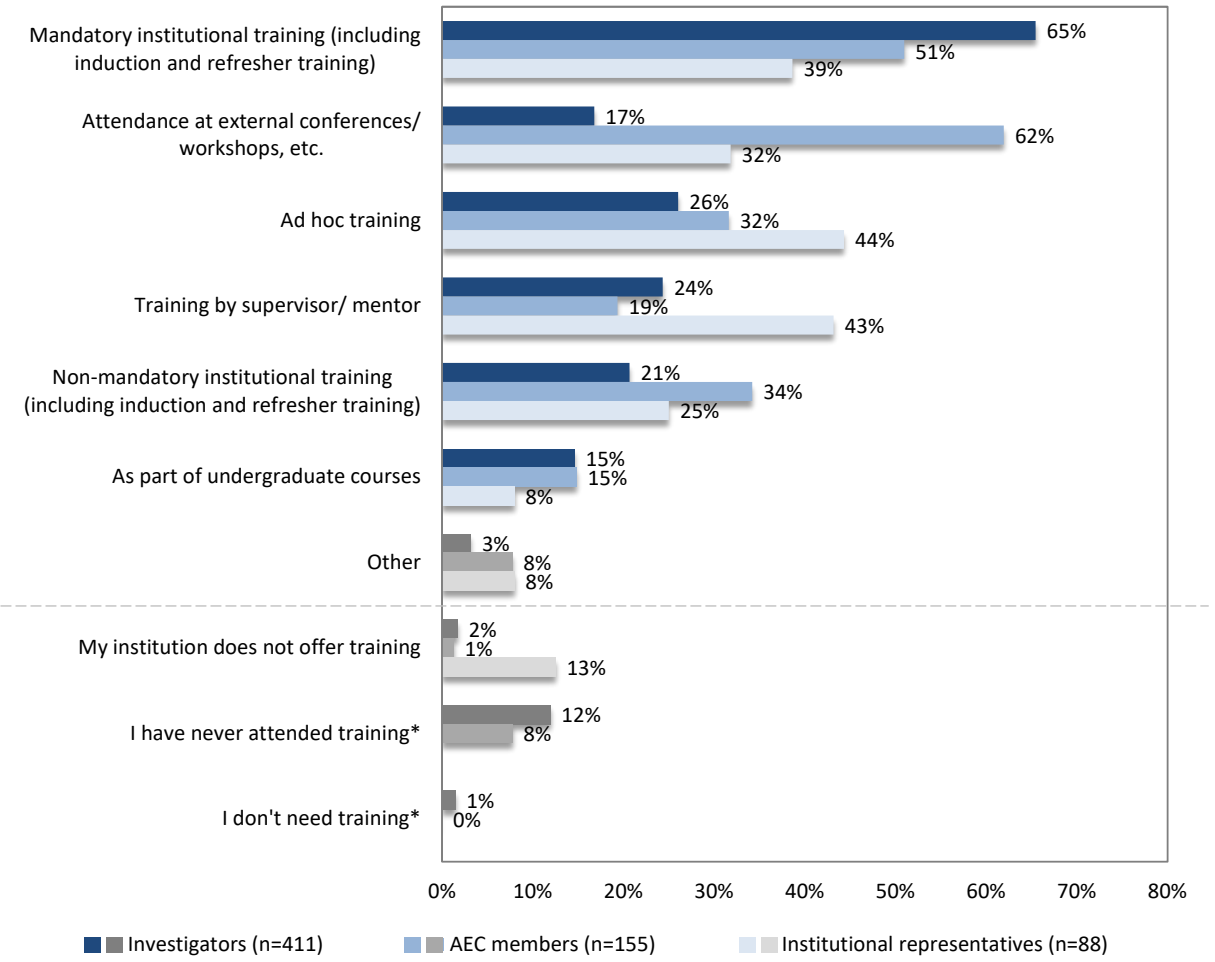
All participant groups

As shown in Figure 50, investigators most commonly received training on the 3Rs via mandatory institutional training, including induction and refresher training (65%), while the majority of AEC members received training via attendance at external conferences, workshops, or similar (62%).

Over two-in-five institutional representatives reported that their institution offers ad hoc training (44%), and training by a supervisor/ mentor (43%).

Figure 50: How have you received training on the 3Rs/ What training does your institution offer on the 3Rs?

(Base: All participant groups; multiple responses accepted)



** These response options only appeared for investigators and AEC members.*

Investigators and AEC members only

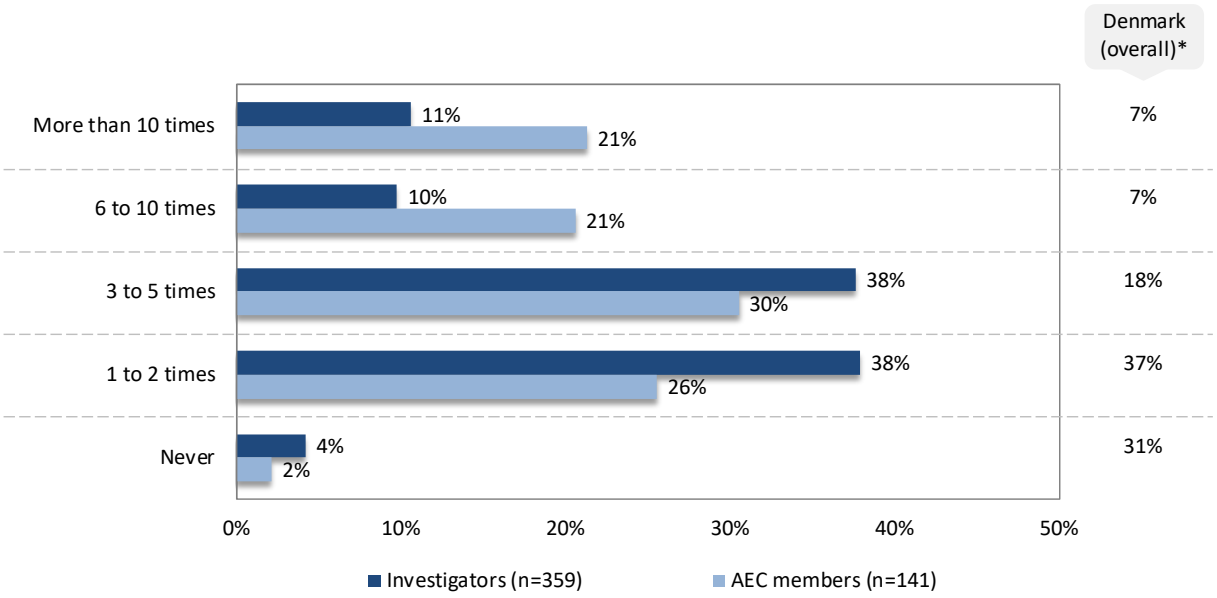
Relative to investigators, AEC members tended to participate in 3Rs training more frequently, with one-in-five having participated in such training more than 10 times (21%, compared to 11% of investigators – see Figure 51).

- Investigators involved in the production of biological products were most likely to have participated in training *more than 10 times* (27%), while those involved in *teaching* were most likely to have *never* participated in training (7%).
- AEC members involved with the review of applications about the use of animals for health and medical research were most likely to have participated in training *more than 10 times* (25%), while those involved with the review of applications about the use of animals for diagnosis were most likely to have *never* participated in training (23%).

Of those who had participated in training where the 3Rs were discussed, AEC members were also more likely to have participated in training more recently – 40% having undertaken training within the last year, compared to 28% of investigators (see Figure 52).

Figure 51: How many times have you participated in training where the 3Rs were discussed?[18]

(Base: Investigators and AEC members)

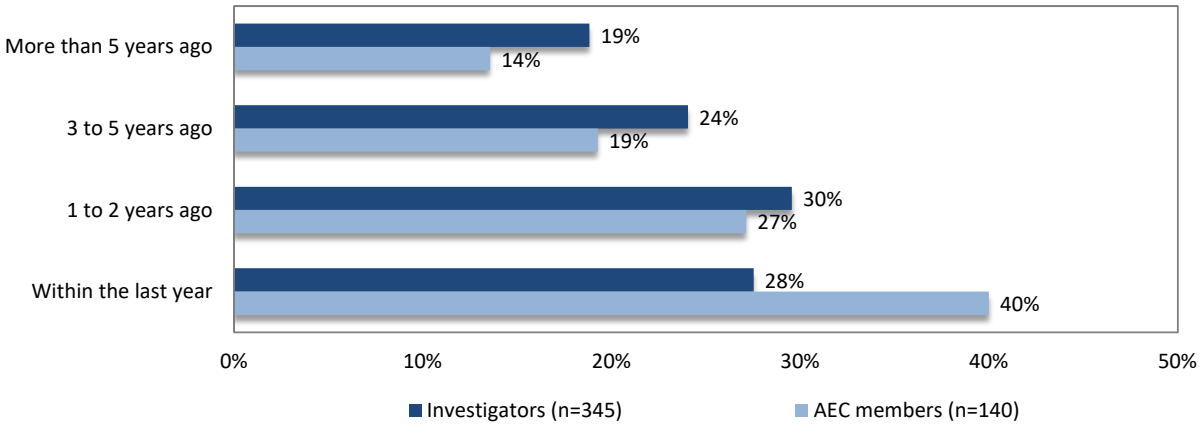


** In the Denmark survey, the question text was "How many times have you participated in a seminar, conference and/or workshop about the 3Rs?"*

[18] Please note that the Denmark survey did not seek the views of AEC members.

Figure 52: How recent was the last training session in which you participated where the 3Rs were discussed?

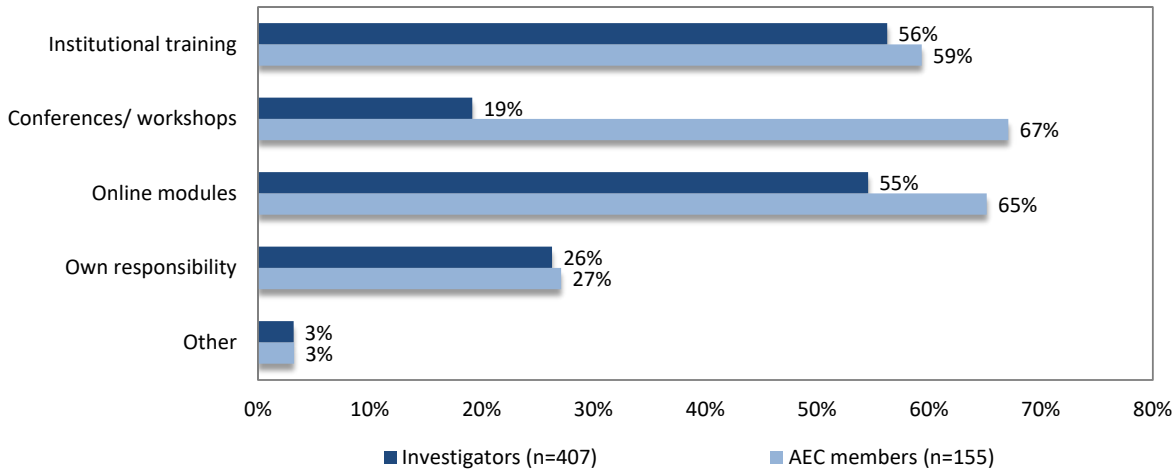
(Base: Investigators and AEC members who have participated in training where the 3Rs were discussed)



When asked how they would like to participate in training on the 3Rs, the top preference for AEC members was via conferences or workshops (67% – substantially higher than 19% for investigators – see Figure 53). For investigators, the top preference was institutional training (56%). Online modules were another popular preference for both groups (65% for AEC members; 55% for investigators).

Figure 53: How would you like to participate in training on the 3Rs?

(Base: Investigators and AEC members; multiple responses accepted)

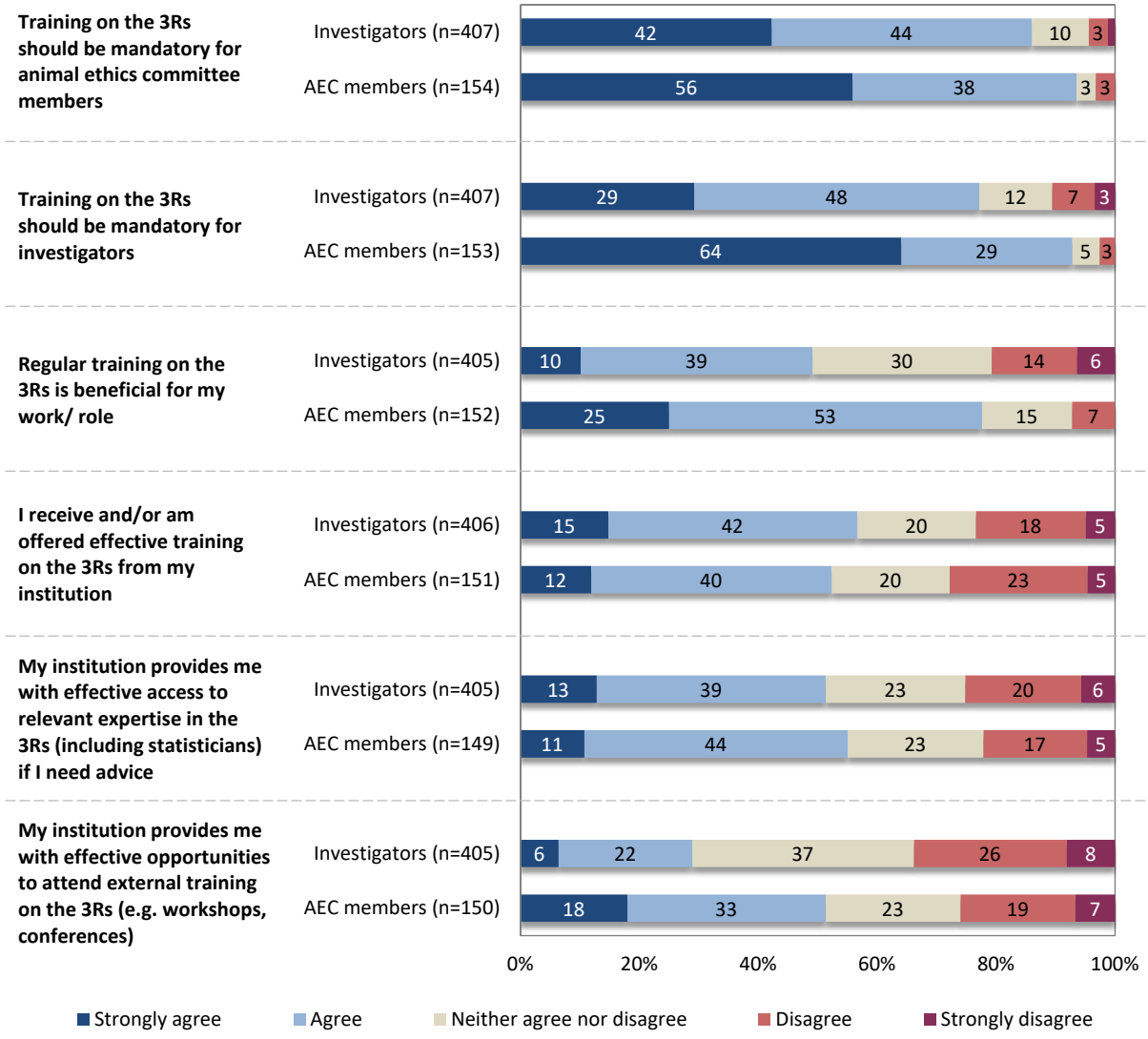


As shown in Figure 54, AEC members were more likely to agree that regular 3Rs training is beneficial for their work/ role (78%, compared to 49% of investigators). AEC members were also more likely to agree that their institution provides them with effective opportunities to attend external 3Rs training (51%, compared to 29% of investigators).

Over nine-in-ten AEC members agreed that training on the 3Rs should be mandatory for both AEC members (94%) and investigators (93%). A relatively lower proportion of investigators felt that training should be mandatory, although still high at 86% in terms of mandatory training for AEC members, and 77% in terms of mandatory training for investigators.

Figure 54: Please indicate the extent to which you agree or disagree with the following statements about training on the 3Rs.

(Base: Investigators and AEC members)

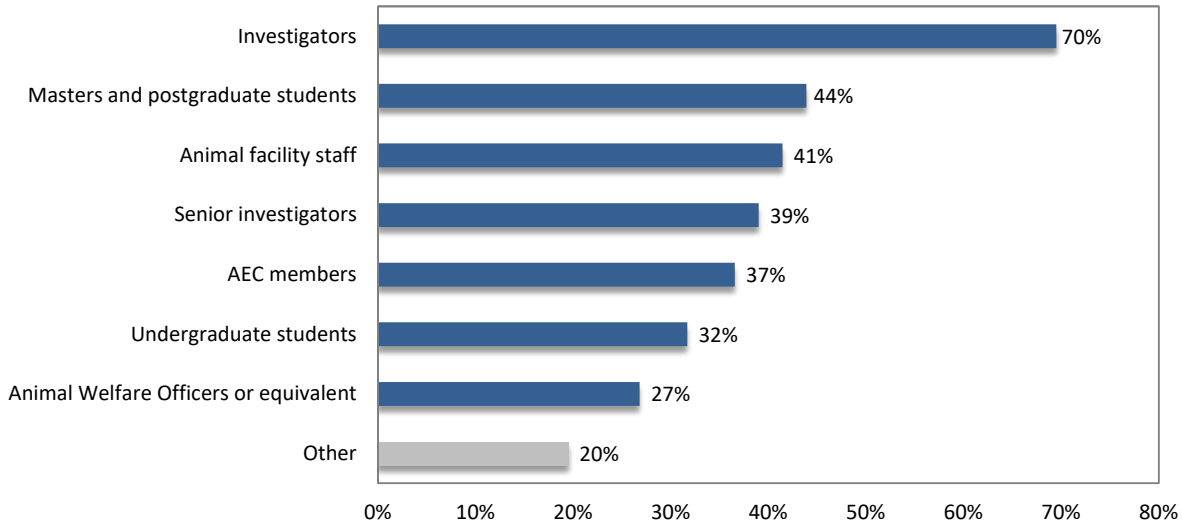


Institutional representatives only

The majority of institutional representatives indicated that investigators were the key cohort targeted to attend 3Rs training (70% – see Figure 55).

Figure 55: Who is targeted to attend 3Rs training?

(Base: Institutional representatives (n=82); multiple responses accepted)



IX. Promotion of the 3Rs

This chapter covers the experiences of:

- investigators in relation to how they communicate new information about the 3Rs to their peers; and
- institutional representatives in relation to how their institution promotes and communicates about the 3Rs.

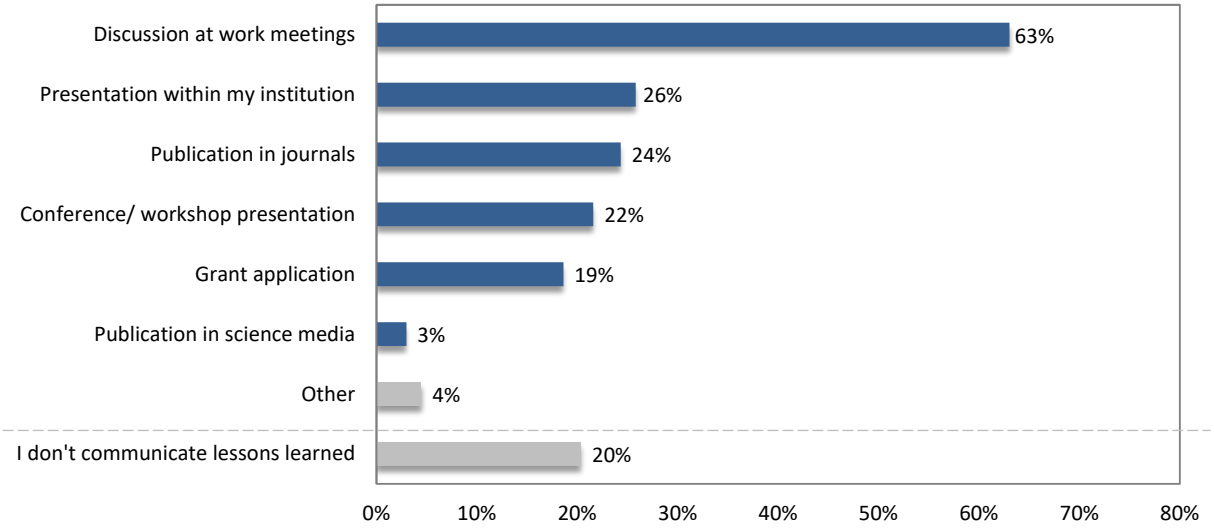
Investigators

The majority of investigators (58%) indicated that, in their publications, they *never* mentioned one or more of the 3Rs that they use. Around one-third of investigators (34%) *sometimes* mentioned the 3Rs in their publications, while less than one-in-ten (8%) *always* did.

As shown in Figure 56, the most common method through which investigators communicated lessons learned about the 3Rs was discussion at work meetings (63%). One-in-five investigators (20%) reported that they did not communicate lessons learned at all.

Figure 56: How do you communicate lessons learned about the 3Rs in the workplace and in the scientific community?

(Base: Investigators (n=403); multiple responses accepted)

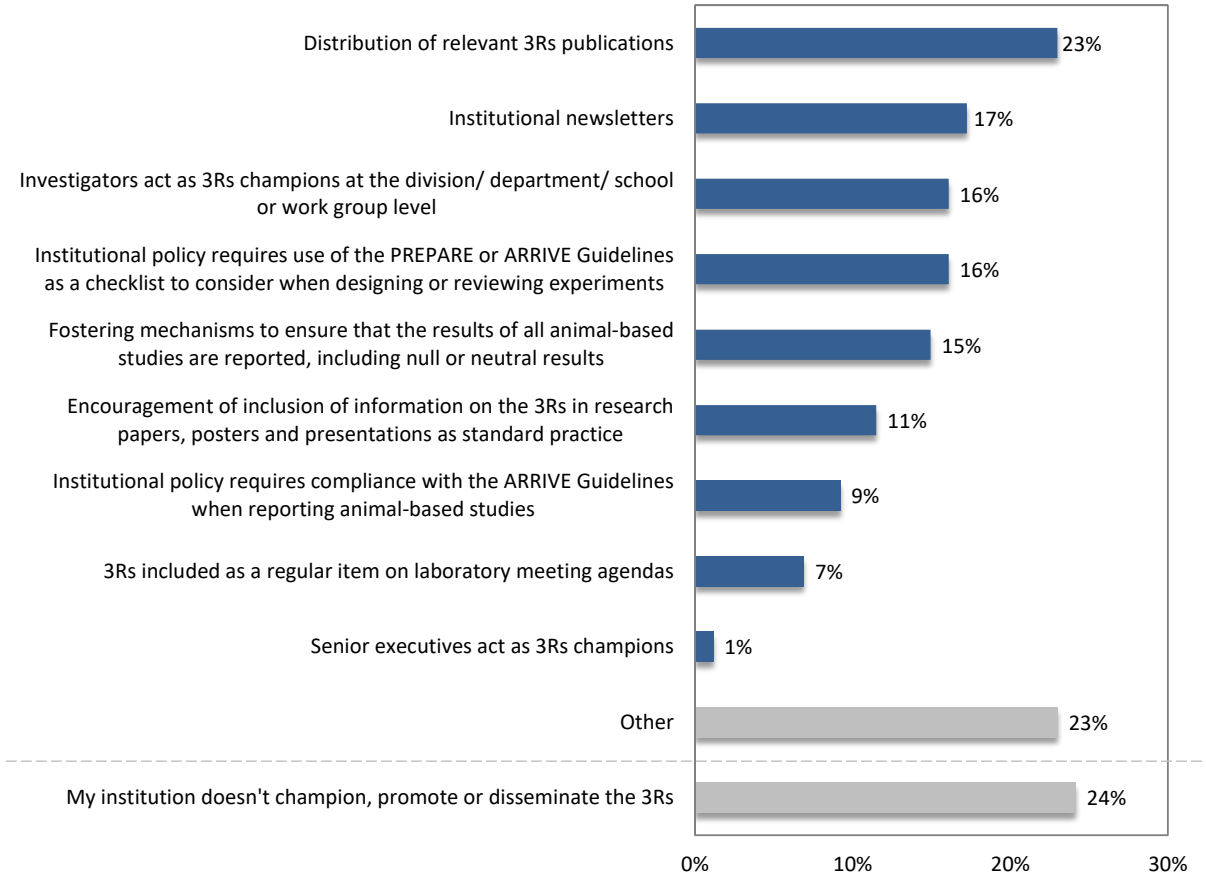


Institutional representatives

As shown in Figure 57, the most common method through which institutions promoted the 3Rs was the distribution of relevant 3Rs publications (23%). Around one-quarter of respondents (24%) reported that their institution does not champion, promote or disseminate the 3Rs.

Figure 57: How does your institution promote the 3Rs?

(Base: Institutional representatives (n=87); multiple responses accepted)



When asked how their institution rewards the development, adoption and implementation of the 3Rs, the majority of institutional representatives (70%) reported that their institution does not do so. A small proportion of institutional representatives indicated that their institution rewards the development, adoption and implementation of the 3Rs through annual 3Rs prizes (14%), and the sharing of narratives and success stories (11%).

When asked how their institution publicly communicates the use of the 3Rs by the institution, around one-quarter of institutional representatives (26%) indicated that their institution does so through an annual report or similar document. Less common communication methods included:

- encouraging publication of open access articles on the use of the 3Rs (6%);
- media communication (6%); and
- encouraging use of keywords related to the 3Rs (1%).

Over half of institutional representatives (56%) reported that their institution does not publicly communicate the use of the 3Rs by the institution.