# SURVEY

## 3R PRINCIPLES IN BIOLOGICAL AND BIOMEDICAL RESEARCH LABORATORIES

Like the Helsinki Declaration, which forever altered the ethical landscape of human clinical research, the aim of the **Basel Declaration** is to bring the scientific community together to further advance the implementation of ethical principles such as the **3Rs** whenever animals are being used and to call for more trust, transparency and communication on the sensitive topic of **animals in research.** The Basel Declaration Society, founded on October 5th 2011, strives to promote the Basel Declaration.

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## INDEX

# SUMMARY


**EVALUATION OF THE 3R SURVEY OF THE BASEL DECLARATION SOCIETY**

In 2012, the 'European Citizen Initiative' (ECI) 'Stop vivisection' was handed in with more than 1.2 million certified signatures asking people to support a change to abolish animal experiments. This was a reaction to the EU-directive 2010/63 that in summary concluded that the concept of the 3Rs provides the guideline to ethical responsibility in biomedical animal research. as well as being thestarting point for the conveyance of the national legislation.

The purpose of this survey is to investigate how the 3R principles are integrated in European research laboratories. Furthermore, there is also the question of the possibility of relinquishing animal testing without hindering the progress of Biomedical research.

This electronic survey was conducted with the program 'lime survey' and was anonymously availableto all researchers from Europe from mid August until the end of October 2016. In the end, 755 researchers from 26 countries took part in this survey.


# RECOMMENDATIONS

First of all, we recommend to inform researchers more thoroughly about the advantage of centralized breeding platforms and to take away their fear of not having enough influence over the breeding animals and their individual needs not being matched.

Furthermore, there is a need for more practical information about cryopreservation and its advantages in reducing the number of breeding animals and lower costing.

It is also interesting to know that there would be high demand of a possibility to exchange organs and/or surplus animals and we recommend this to be evaluated and if possible expanded.

Even though the 3Rs are not an unheard term this survey clearly indicated that there is still a need to expand its implementation. Our aim is that every institute and research facility will educate their next generation of researchers about the 3Rs.

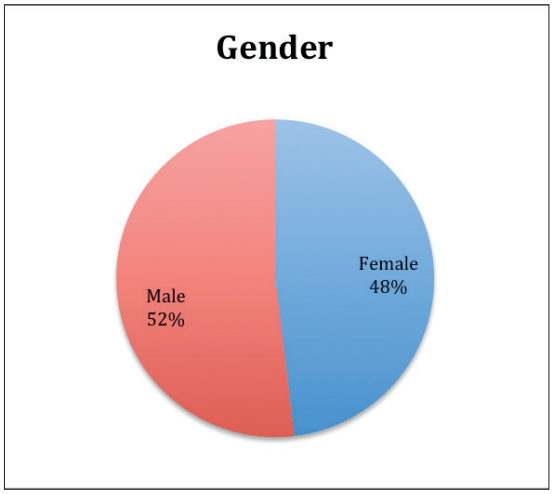
In addition, we recommend to further communications among countries, at the level of researchers but also between regulatory authorities, concerning ideas on optimal score sheets. The survey shows that a lot of researchers still rely on score sheets from colleagues, the Internet and in some cases even that they don't use them at all.

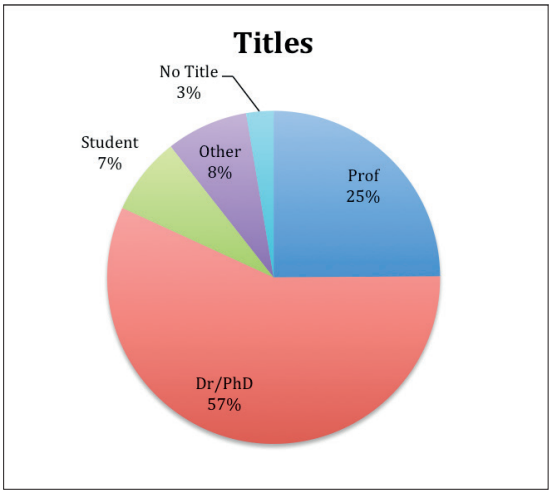
Another point that should be more encouraged is the use of pilot studies. They can help to reduce animals in experiments, and should therefore be used more frequently.

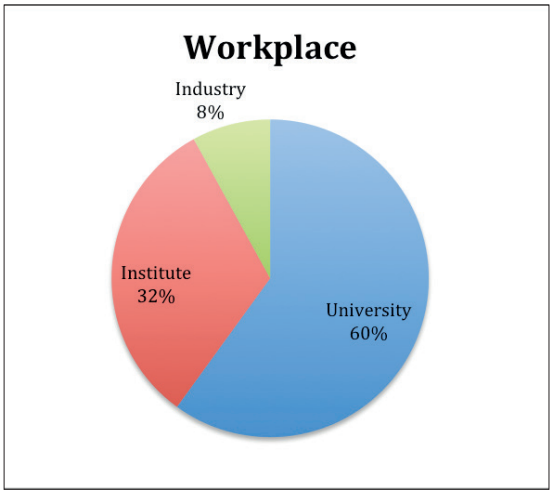
Lastly, we recommend to strengthen the position of the animal welfare officer further and to encourage researchers to accept the assistance and advice that an animal welfare officer can offer.

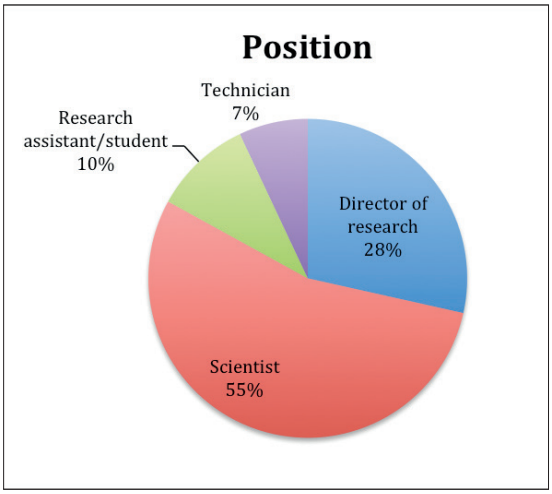
# 1. INTRODUCTION

## GENERAL INFORMATION

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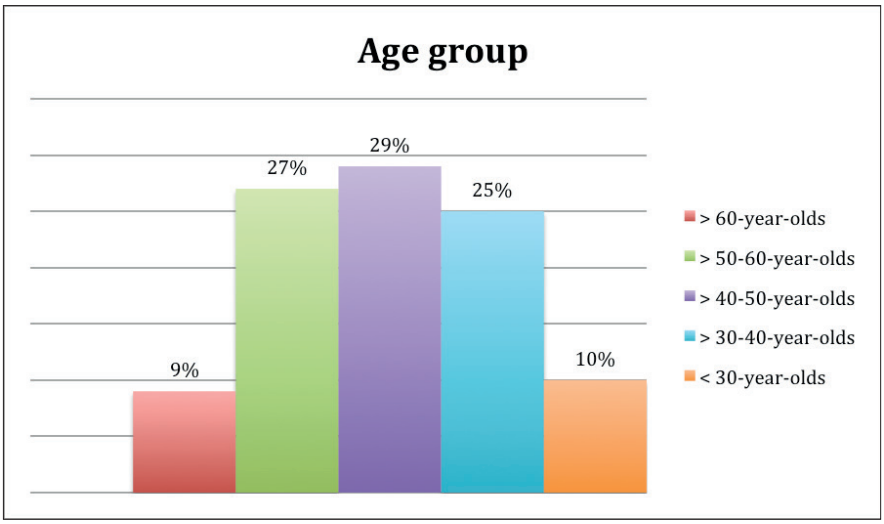
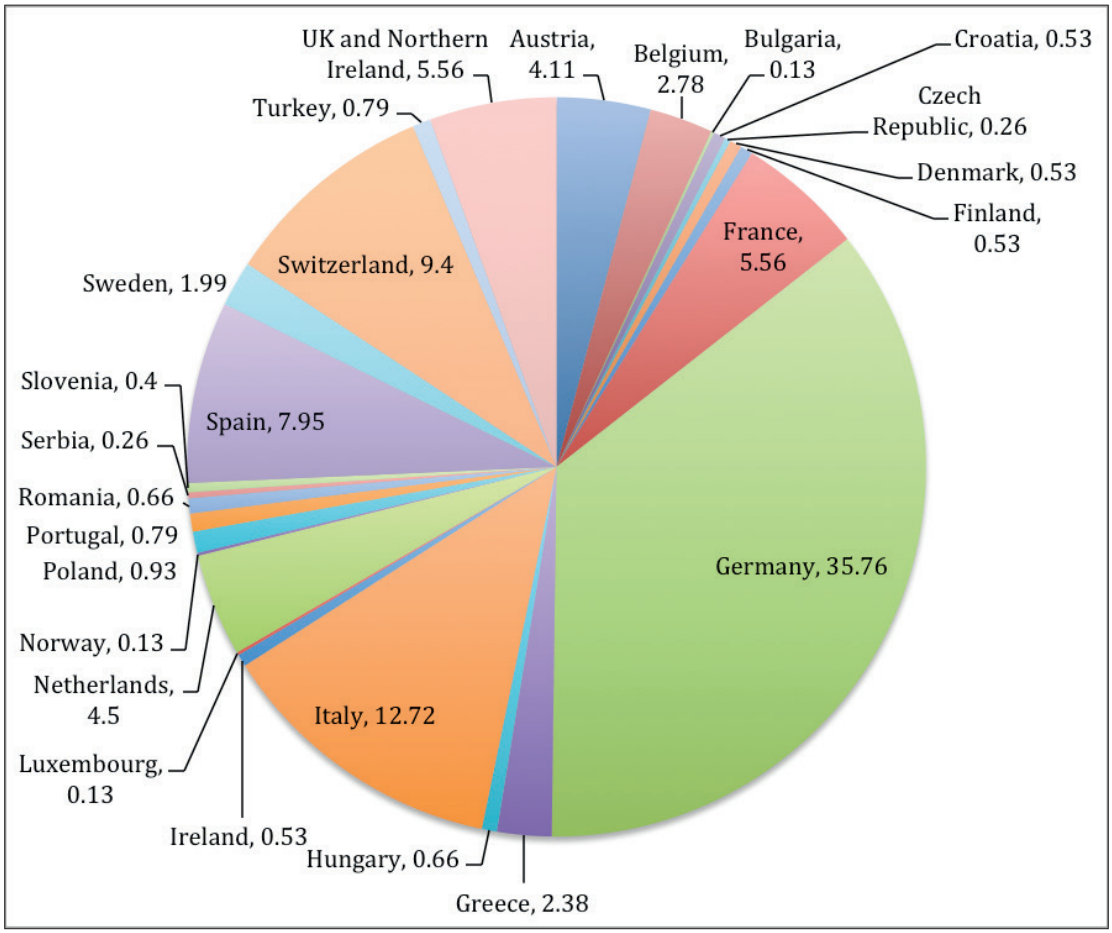


## GENERAL INFORMATION READINGS IN PERCENT

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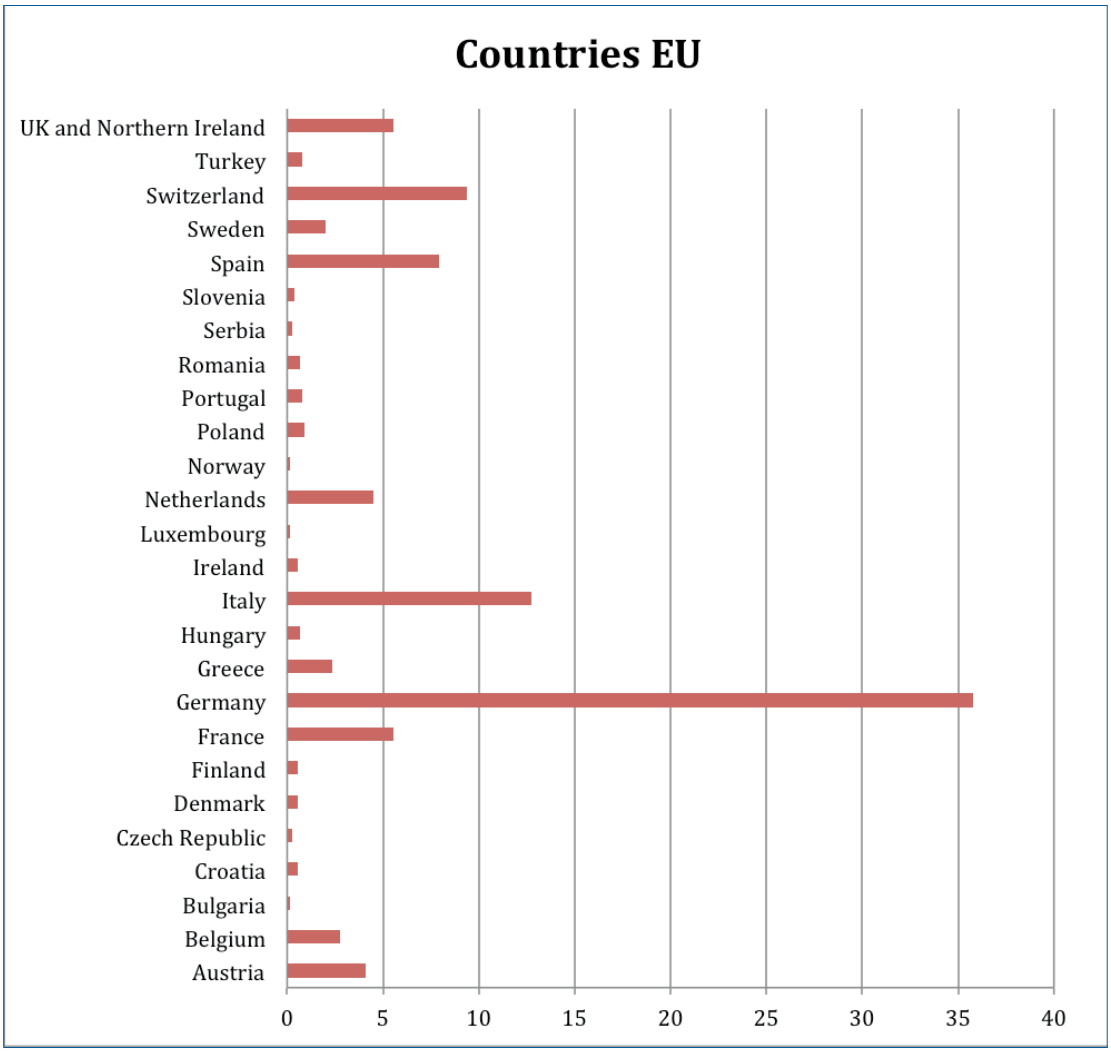
Countries EU
UK and Northern Ireland
Turkey
Switzerland
Sweden
Spain
Slovenia
Serbia
Romania
Portugal
Poland
Norway
Netherlands
Luxembourg
Ireland
Italy
Hungary
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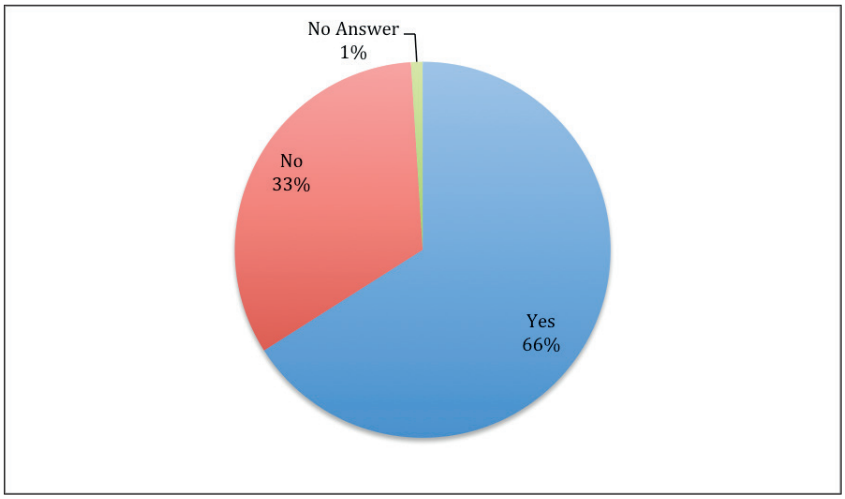
n = 755

## 2. ANIMAL BREEDING AND HUSBANDRY

### 2.1 IS THE BREEDING OF LABORATORY ANIMALS CENTRALLY ORGANIZED AT YOUR INSTITUTION?

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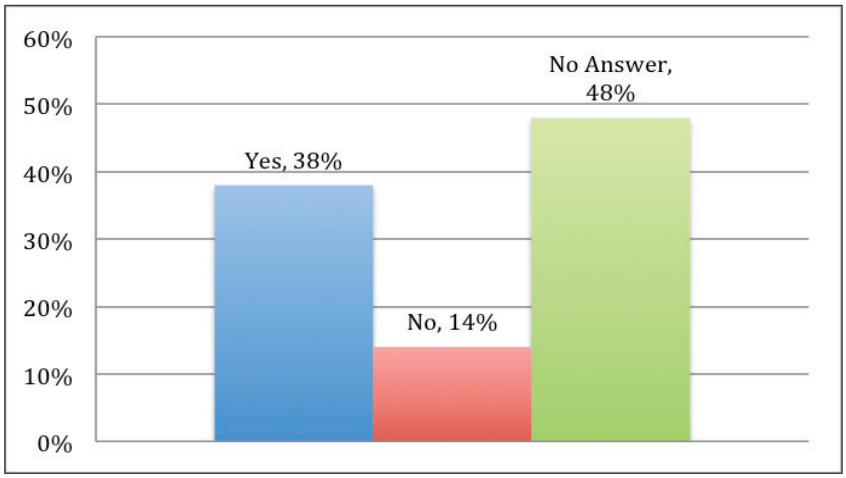
### IF NOT, WOULD YOU WELCOME A CENTRALIZED BREEDING PLATFORM?




n = 755

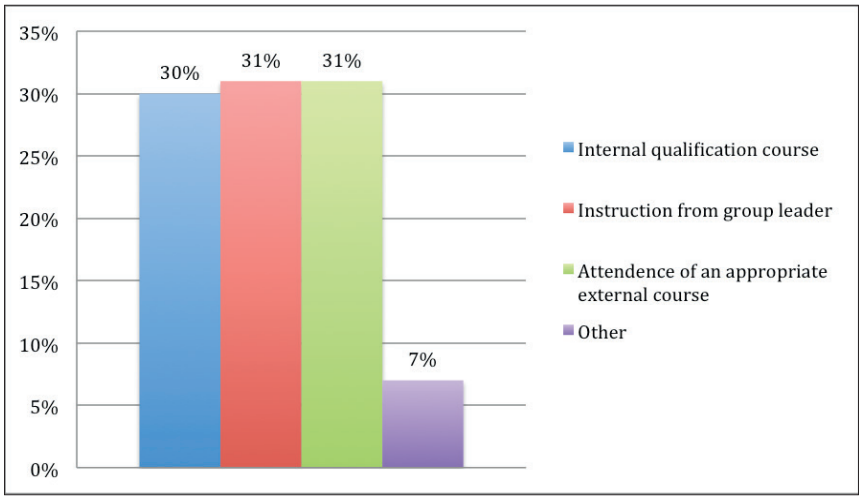
Two thirds of the respondents answered that the breeding platforms of laboratory animals are centrally organized at their institutions. This is a remarkable result.

249 researchers did not have access to centralized breeding platforms and 155 researchers from that poll would welcome one – only 88 did not.

From multiple discussions with researchers we know that centralized breeding platforms are often critically looked upon because researchers often fear that they do not have enough influence over the breeding animals and the individual needs would not be matched.

Advantages of centralized breeding platforms are uniform standards of care and improved time and cost management.

## 2.2 IN CASE YOUR INSTITUTION BREEDS ITS OWN TRANSGENIC LINES: HOW ARE THE PEOPLE RESPONSIBLE FOR BREEDING TRAINED IN THE SUBJECTS OF BREEDING MANAGEMENT, BREEDING METHODS AND GENETICS? CHOOSE ALL THAT APPLY.

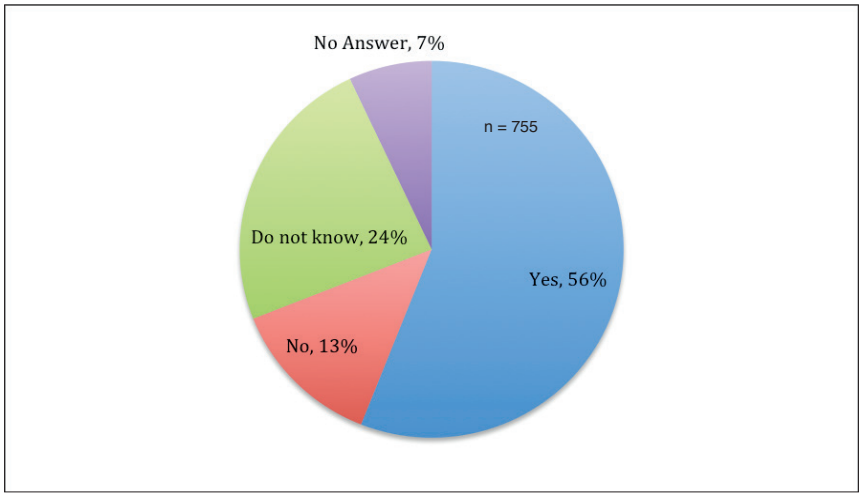



n = 982

This graph indicates that the majority of the institutions and their experts pass their knowledge on to their protégés.

Thanks to good breeding-planning, the numbers of animals used in research may be sharply reduced.

## 2.3 IS CRYOPRESERVATION OF SPERM AND EMBRYOS BEING CONSIDERED FOR THE REDUCTION OF BREEDING ANIMALS AND LOWERING COSTS?

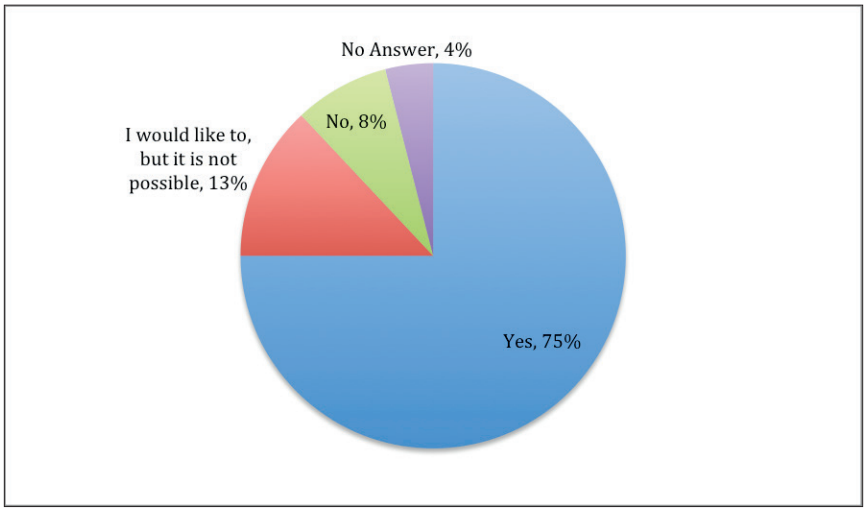



n = 755

Cryopreservation is a method in which organs, cells, cellular tissue and other biological materials are frozen to prevent decay. The cryopreservation of sperm and embryos supports the attempt to lower the cost of animals in animal research.

56% perceived cryopreservation to be a promising study and use/want to use this technique. But 37% of the questioned researchers do not use it/will not use it or do not know if it has advantages. This indicates a need for more practical information about cryopreservation.

## 2.4 DO YOU TRY TO IMPROVE THE ANIMALS' HOUSING CONDITIONS SO THAT THEY EXCEED THE MINIMUM LEGAL REQUIREMENTS?



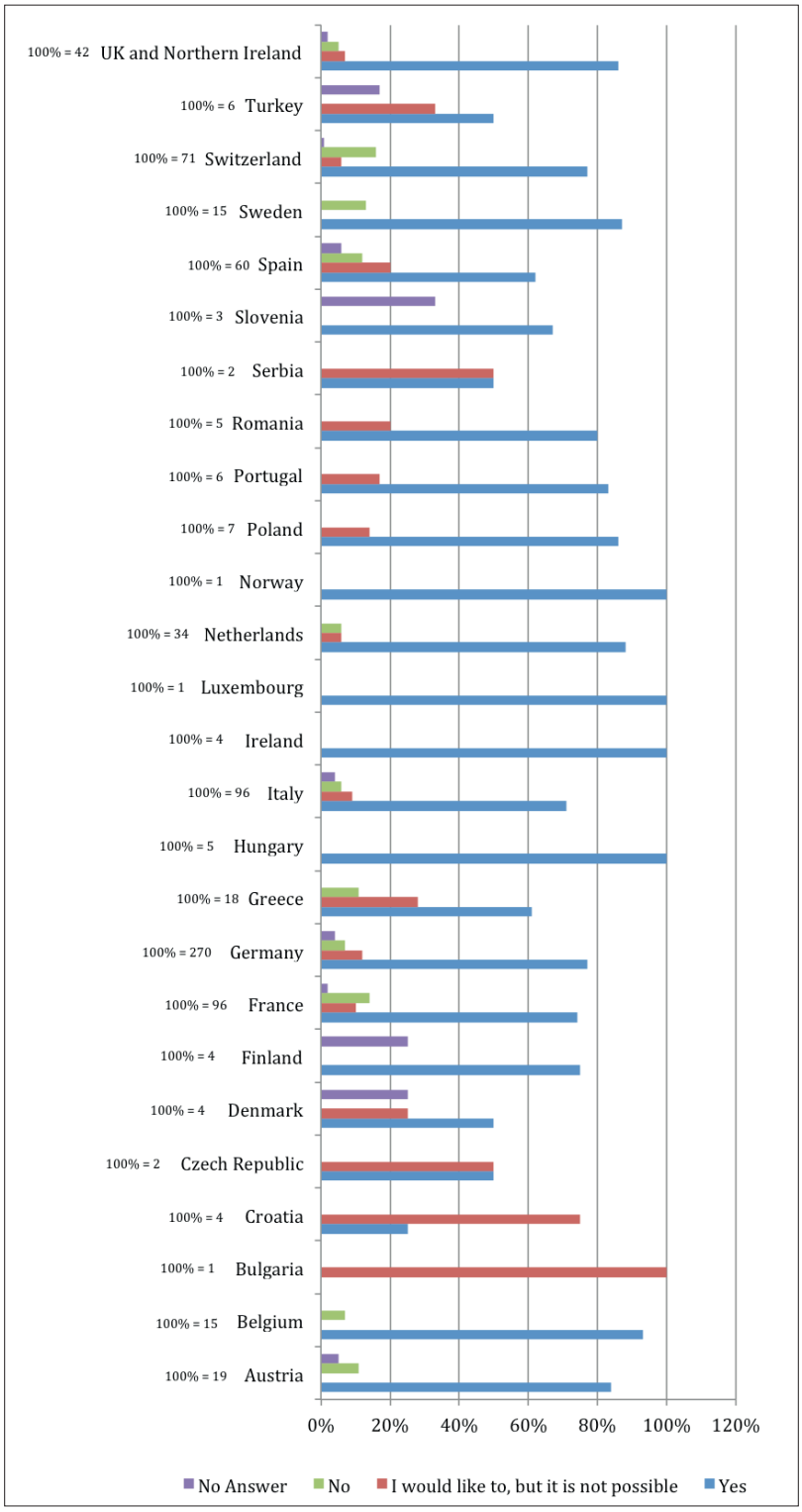

n = 755

A substantial majority of researchers (75%) are trying to exceed the minimum legal requirements to improve the condition of their animals. Another 13% wish to do so, but are probably not able to do so because of reasons of logistics.

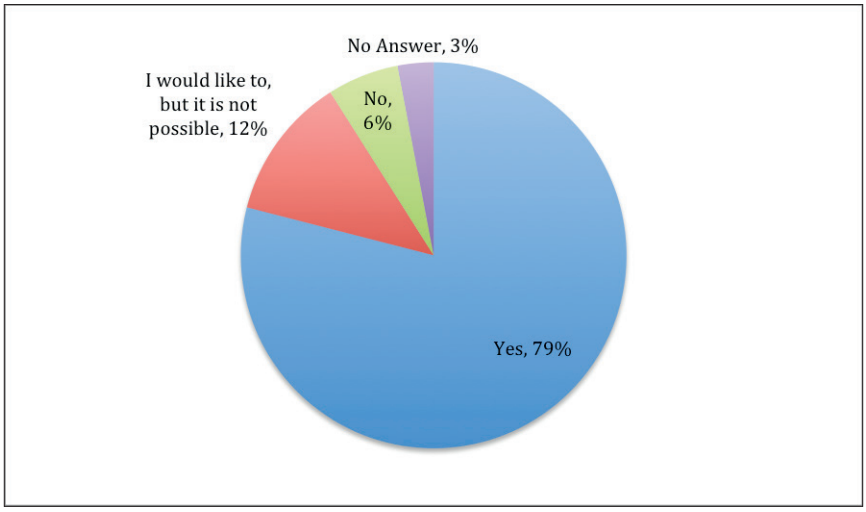
The most common actions to improve animal husbandry are summarized under the term 'Enrichment' – to improve the cages with more nesting material, play and hiding places. Another possibility is to offer the animals more space than the minimum legal requirement and to check the cages more often.

As one can see, the evaluation indicates a serious effort to improve animal welfare across European resesarch laboratories.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 2.4



## 2.5 IF THERE WAS AN EXCHANGE POSSIBILITY FOR ORGANS AND/OR SURPLUS ANIMALS, WOULD YOU PARTICIPATE?



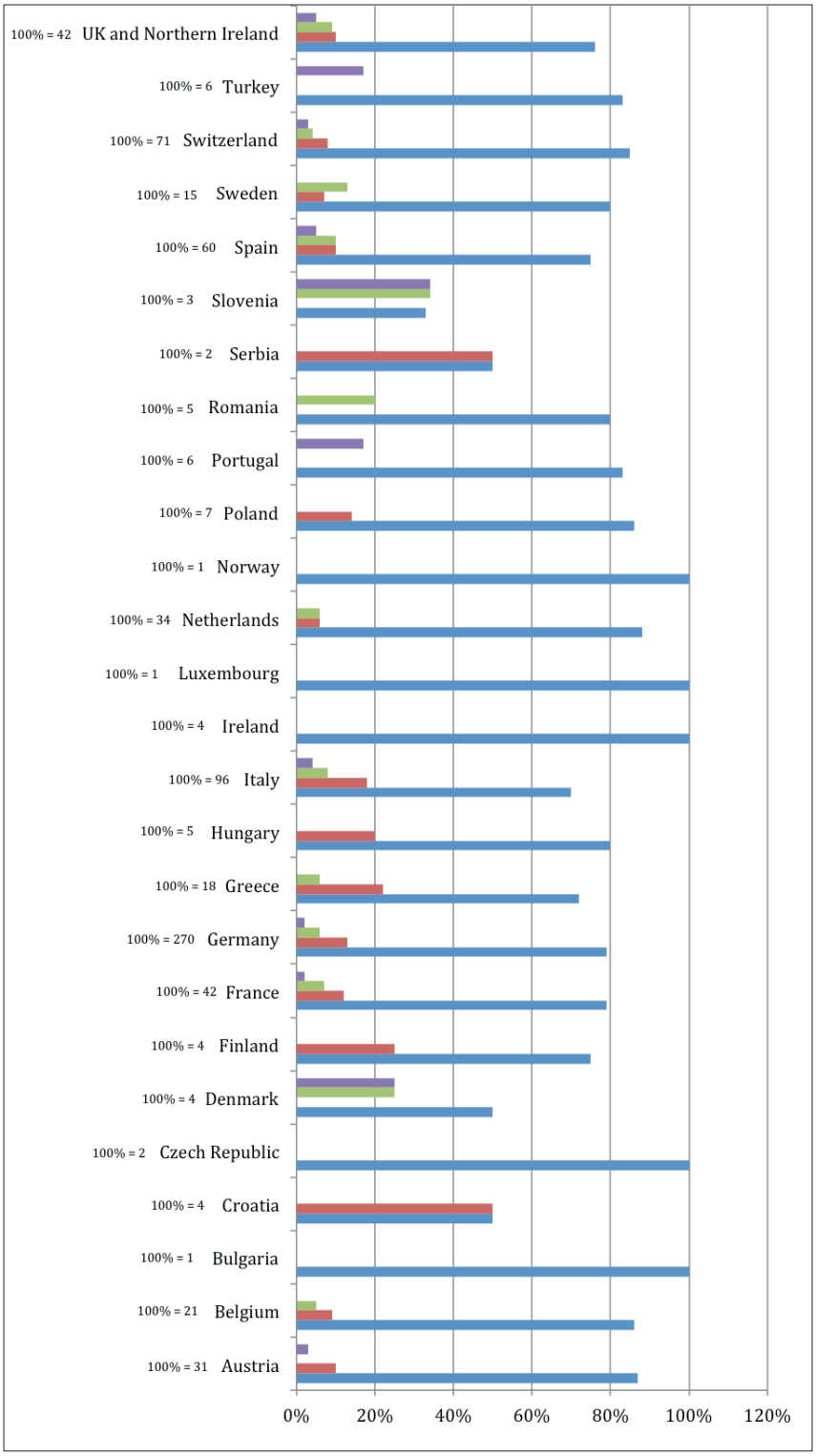

n = 755

Within the scope of breeding rodents there are always so-called ‚surplus animals' that cannot be used for the intended purpose of the breeding. These could go to other researchers for different research projects. The same goes for organ material that is not used by the assigned researcher. Potentially it could be used by someone else.

The substantial majority of respondents in almost every country would like to profit from this possibility. How much 'organ exchange' already exists and is used is not covered in this survey.

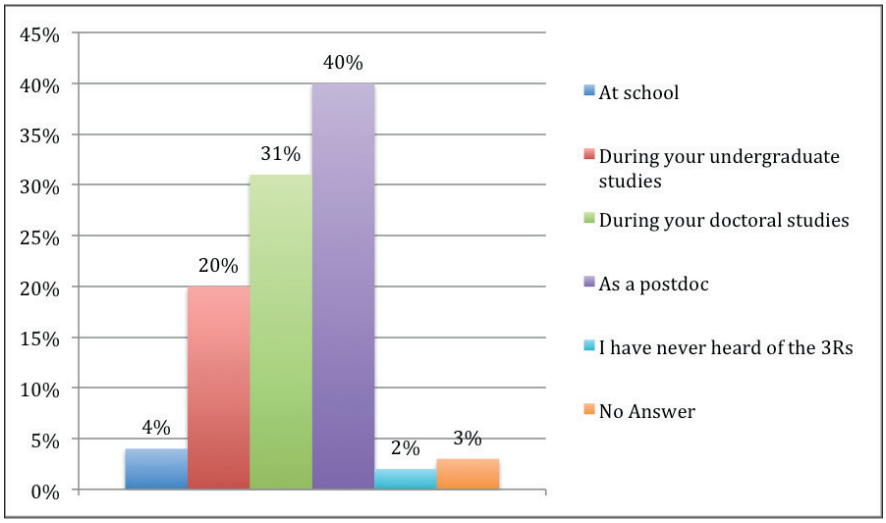
It is however recommended that this possibility of exchange be evaluated and, if possible, expanded.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 2.5



# 3. EDUCATION AND TRAINING

## 3.1 WHEN DID YOU FIRST LEARN ABOUT THE 3R PRINCIPLES?

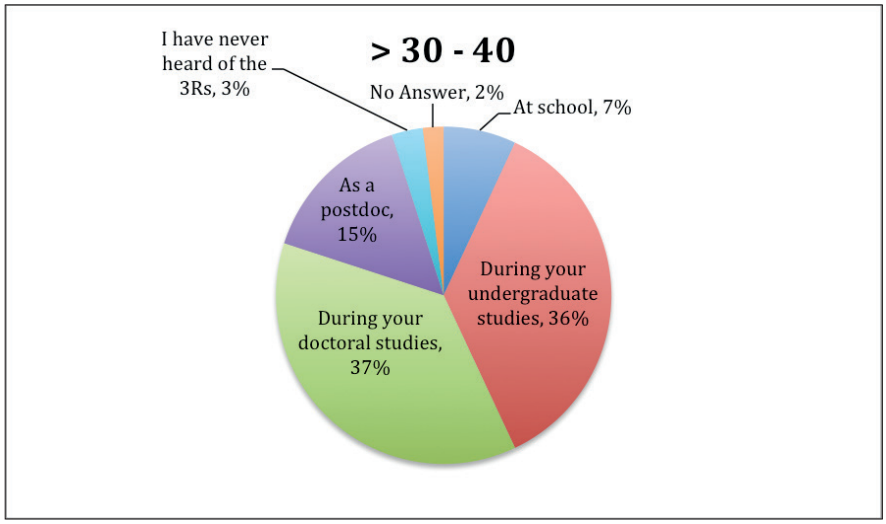


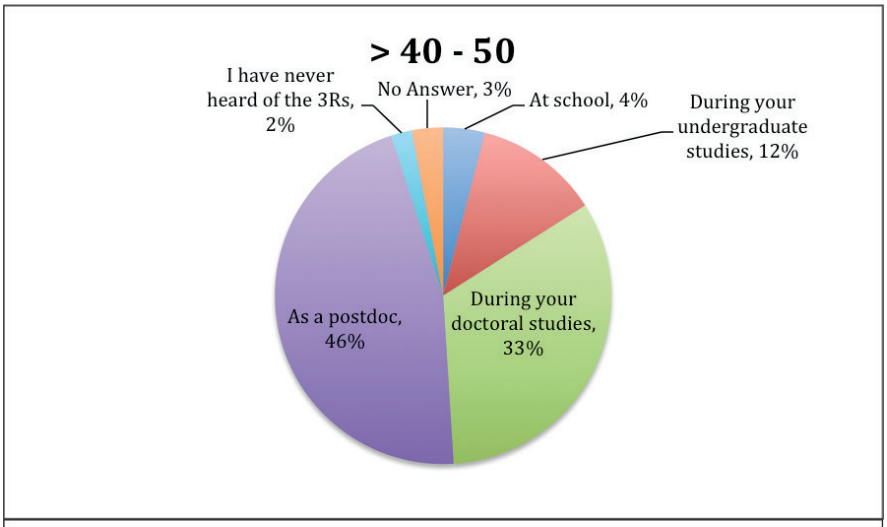

n = 755

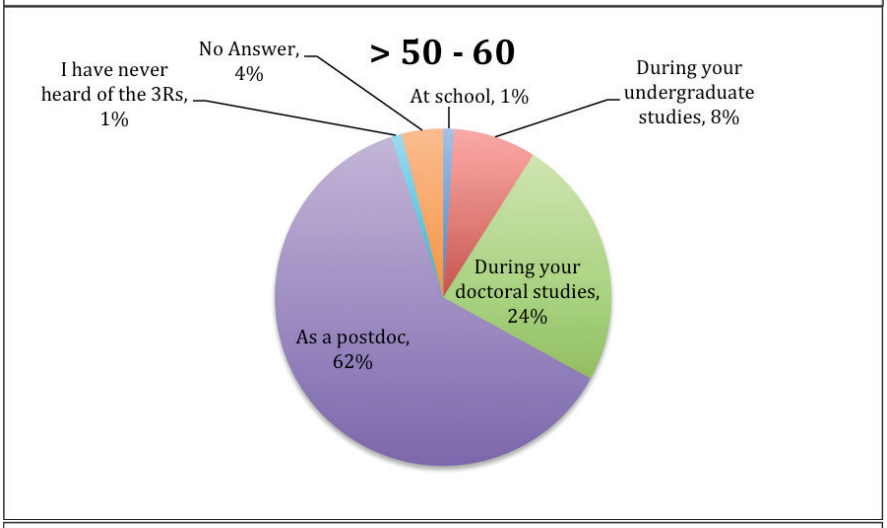
The survey shows that 71% of the researchers first learned about the 3Rs during their PhD or postdoc.

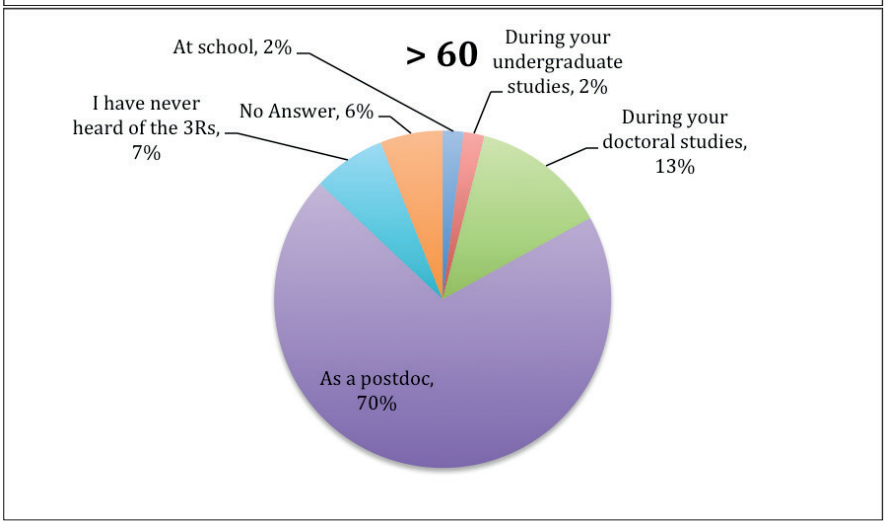
Younger respondents learned earlier about the 3Rs. The bar graphs show that only 2% of respondents had never heard of the 3Rs. The pie-charts below indicate that most of these were in the age group 60+.

These two findings indicate that the 3R principles are currently integrated in the curriculum of animal researchers at the entry level.

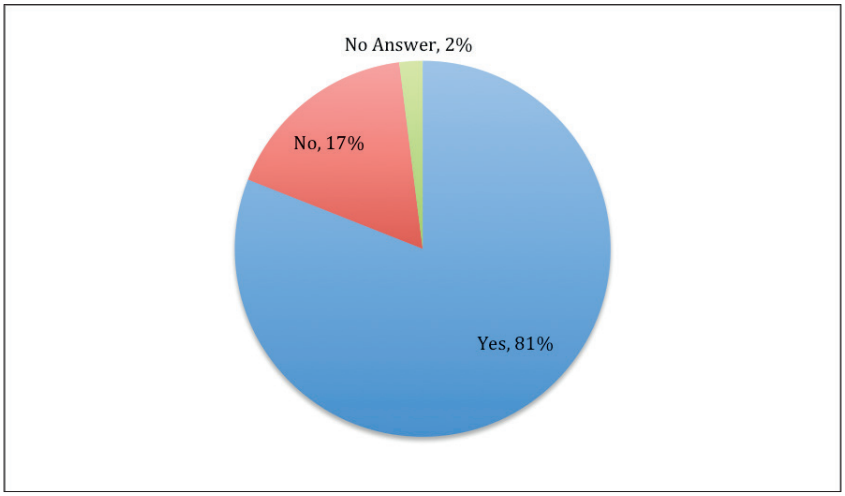



> 40 - 50
I have never heard of the 3Rs, 2%
No Answer, 3%
At school, 4%
During your undergraduate studies, 12%
During your doctoral studies, 33%
As a postdoc, 46%


> 50 - 60
No Answer, 4%
I have never heard of the 3Rs, 1%
At school, 1%
During your undergraduate studies, 8%
During your doctoral studies, 24%
As a postdoc, 62%


> 60
At school, 2%
During your undergraduate studies, 2%
I have never heard of the 3Rs, 7%
No Answer, 6%
During your doctoral studies, 13%
As a postdoc, 70%

## 3.2 ARE THE 3R PRINCIPLES FORMALLY TAUGHT TO NEW STUDRENTS AND EMPLOYEES AT YOUR INSTITUTION?



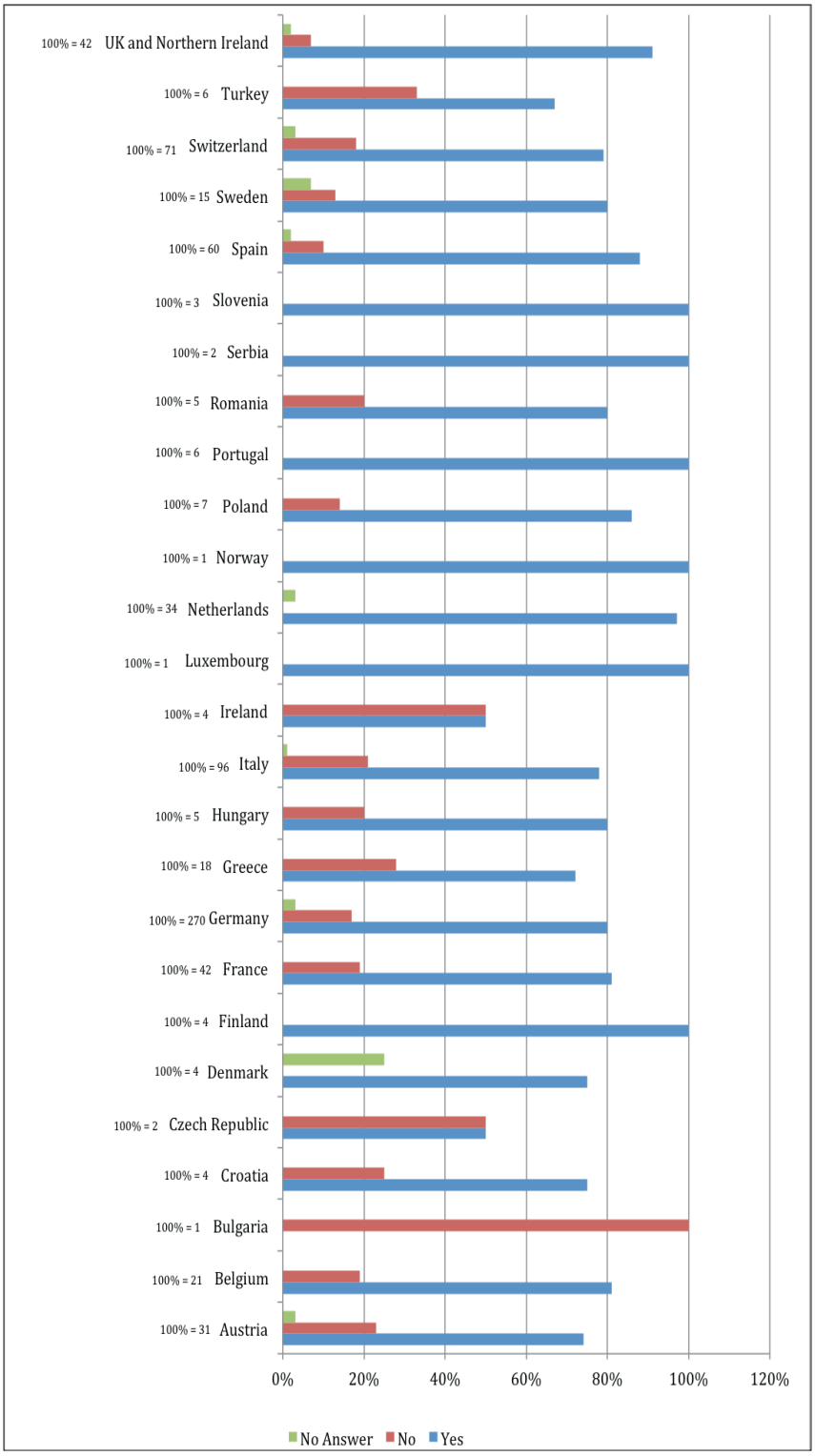

n = 755

Although the results have to be interpreted cautiously because Germany represents such a large number of responders, fully 81% of the respondents confirmed that the 3R principles are taught to new employees.

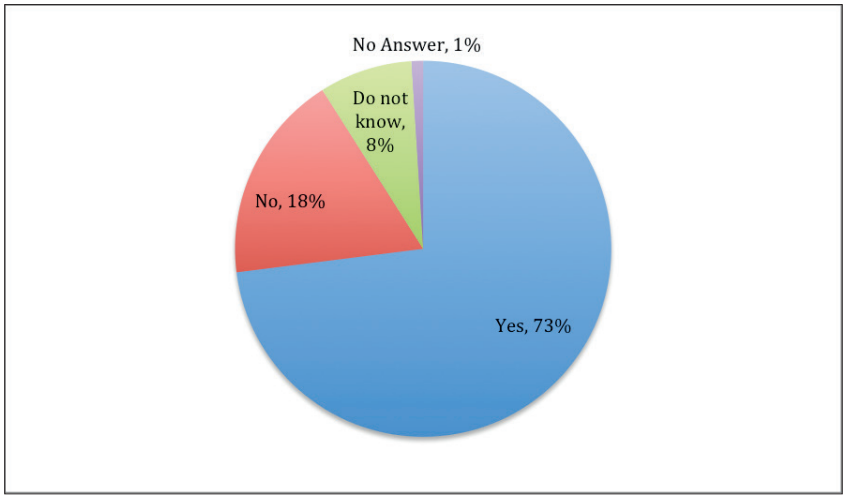
One concern is that 17% answered this question with a ‚No'. The bar graphs below show the breakdown by country.

Our aim is that from the outset every institute and research facility will educate their next generation of researchers about the 3Rs.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 3.2



### 3.3 DOES YOUR INSTITUTION OFFER REFRESHER COURSES (INTERNAL/EXTERNAL) ABOUT ANIMAL WELFARE AND EXPERIMENTATION TO ITS EMPLOYEES?

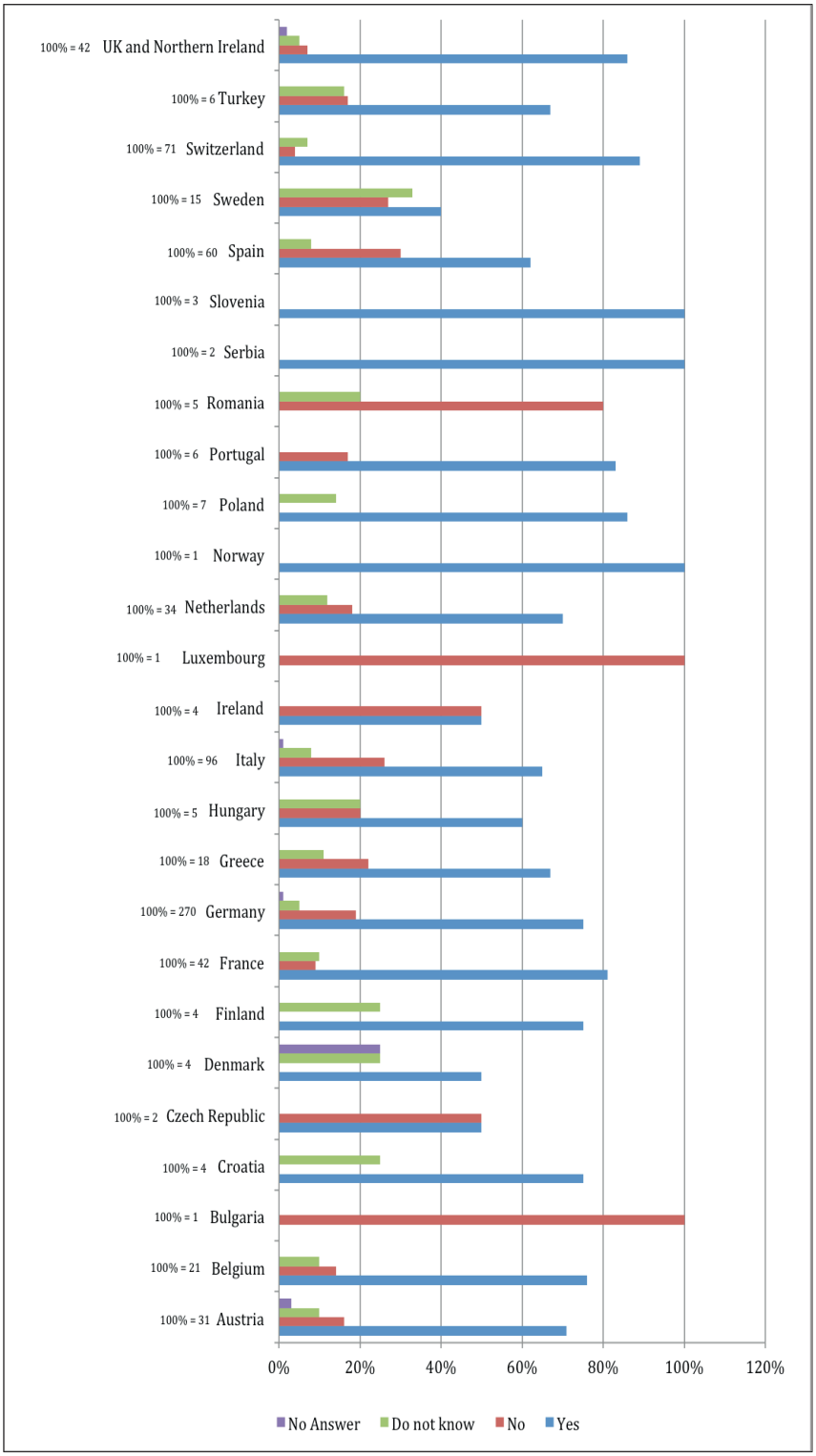



n = 755

Almost three quarters of respondents indicated that their research facility offers internal or external refresher courses. Just less than one fifth responded that such offers are not available to them.

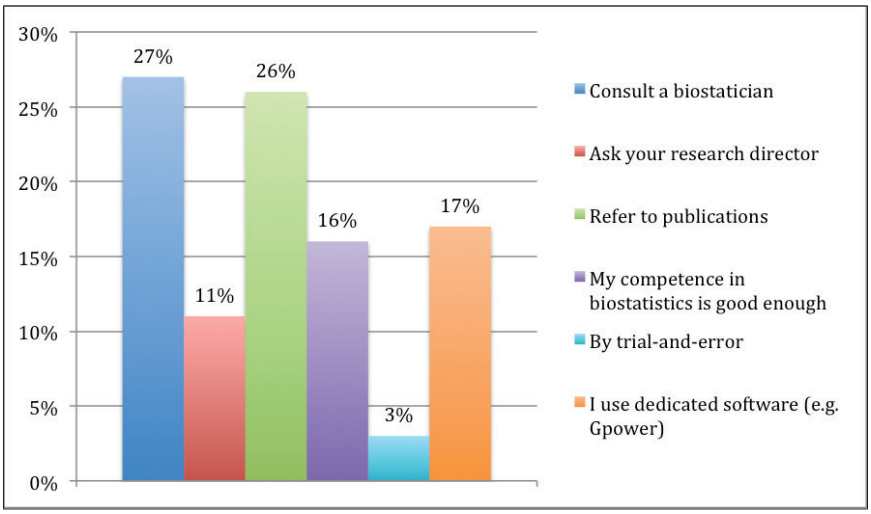
The evaluation of the different countries clearly shows that there are differences - even within single countries.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 3.3



# 4. PLANNING EXPERIMENTS

## 4.1 IN YOUR EXPERIMENTS HOW DO YOU DETERMINE THE SAMPLE GROUP SIZES AND NUMBER FOR YOUR EXPERIMENTS? CHOOSE ALL THAT APPLY.

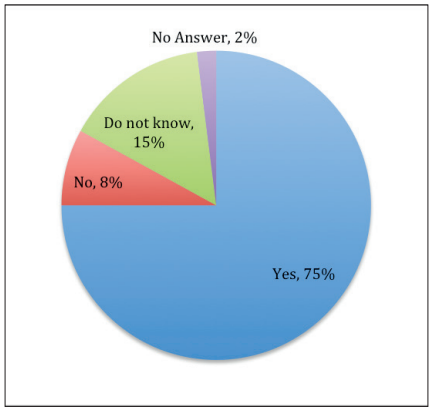



n = 1295

In almost every case respondents determine the sample group sizes and numbers for their experiments using biostatic methods. Moreover, the Research Director is often asked to lend his know-how about biostatics. Only 5% reported that they use trial-and-error.

Almost 20% of respondents believe their knowledge about biostatics is good enough to prepare their animal experiments optimally - evidence that these researchers are educated in biostatic methods.

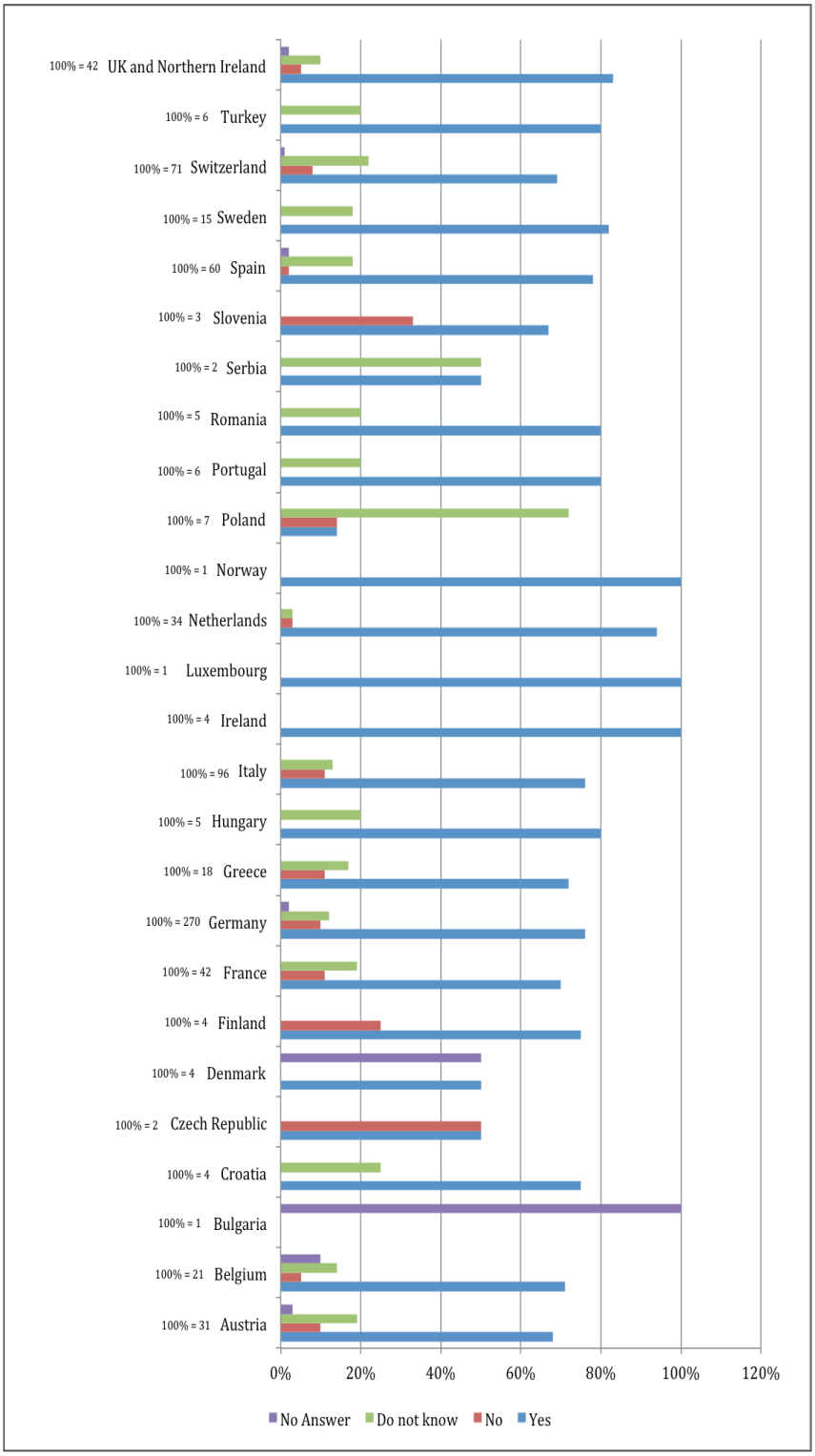
## 4.2 ARE PROTOCOLS FOR ANALGESIA/ANESTHESIA REGULARLY CHECKED AND UPDATED TO TAKE INTO ACCOUNT NEW DEVELOPMENTS DESCRIBED IN PUBLICATIONS AND GUIDELINES?



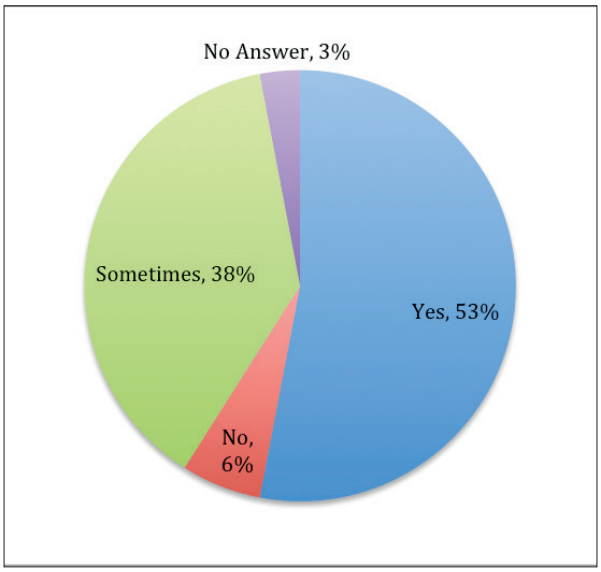

n = 704

The terms ‘analgesia’ and ‘anesthesia’ describe a temporary medical induced state to relief or prevent pain e.g. to operate on animals. As in human medicine, there are also several protocols for animal medicine. These protocols get adapted to each animal concerning the species, age, the constitution, and extent of the expected pain and stress levels in order to ensure the fulfillment of requirements of each surgical intervention (e.g. guarantee of an unconscious, immobilized state during a certain amount of time).
The majority (75%) of respondents indicated that they do regular check-ups and updates with the help of guidelines and publications.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 4.2



## 4.3 DO YOU BELIEVE THAT CLINICAL SCORE SHEETS ARE A USEFUL TOOL FOR MONITORING ANIMAL HEALTH?



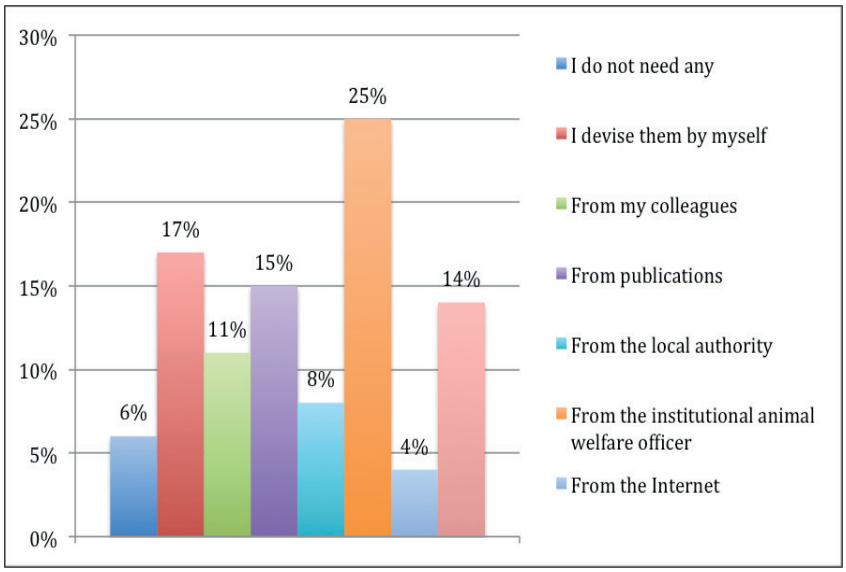

n = 704

A score sheet is an aid to document symptoms and effects to provide a rigorous point-based assessment of the condition an amimal through the course of an experiment. The scoring provides clear indicators of when it is time to intervene. Some of these interventions are e.g. administration of analgesics, or to interrupt a substance application, or an end-point for euthanasia to prevent suffering. The score sheet also provides a more objective retrospective assessment of the severity grade of the experiment.

The aim of the score sheet is therefore to estimate possible suffering of the laboratory animal, and to determine before to what extent testing is justified to reach the goal of the experiment. Furthermore, the score sheet is an effective means of ensuring that the laboratory animal is observed across a range of measures and indicates necessary actions.

Over half of the respondents reported that the score sheet was a helpful aid to oversee the state of a laboratory animal. But, almost as many thought that the score sheet is only sometimes useful. Only a tiny minority (6%) of respondents felt that score sheets are not useful. Clearly the score sheet is not ‚one-size-fits-all', (see 4.4) but an important aid that should be designed and refined for the specifc experiment and species.

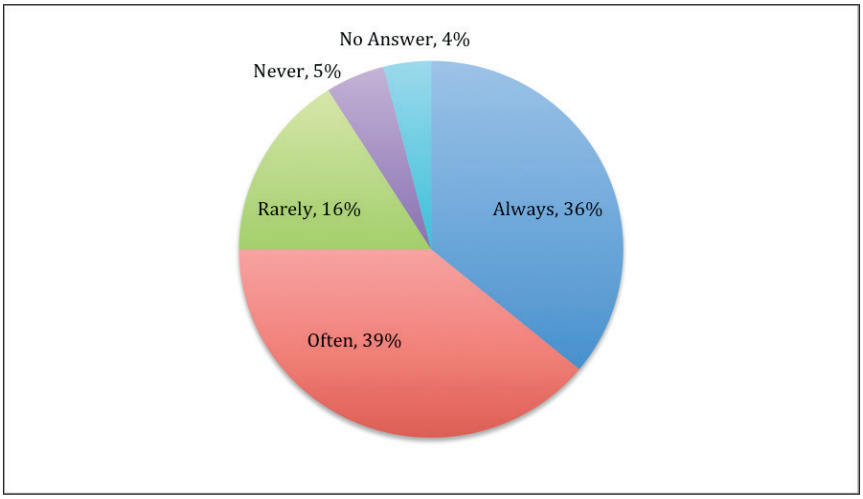
### 4.4 WHERE DO YOU OBTAIN YOUR CLINICAL SCORE SHEETS? CHOOSE ALL THAT APPLY.




n = 1260

The survey shows that there is no standard source of score sheets, and that researchers rely on many sources, probably whichever happens to be available, for assembling their score sheets. This may be an area where further communication among countries, at the level of researchers but also between regulatory authorities may be useful to exchange ideas on optimal score sheets in various areas of biomedical research. Of course, researchers will still need to adapt any available score sheets to take into account peculiarities of their experimental paradigm and species.

### 4.5 DO YOU CARRY OUT PILOT EXPERIMENTS WITH JUST A FEW ANIMALS IN ORDER TO TEST A HYPOTHESIS, A MODEL OR A METHOD BEFORE THE LARGE-SCALE STUDY IS PLANNED AND PERFORMED?

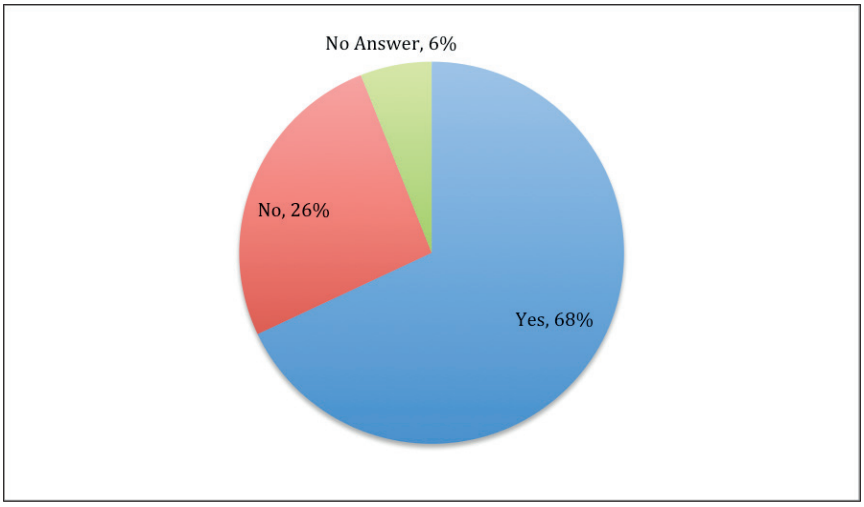



n = 704

Pilot studies are conducted to test the feasibility of the planned studies with as little animals as possible. Pilot studies can help refine experiments and reduce the use of laboratory animals.

More than 70% confirm that they always or often conduct pilot studies – only 5% do not.

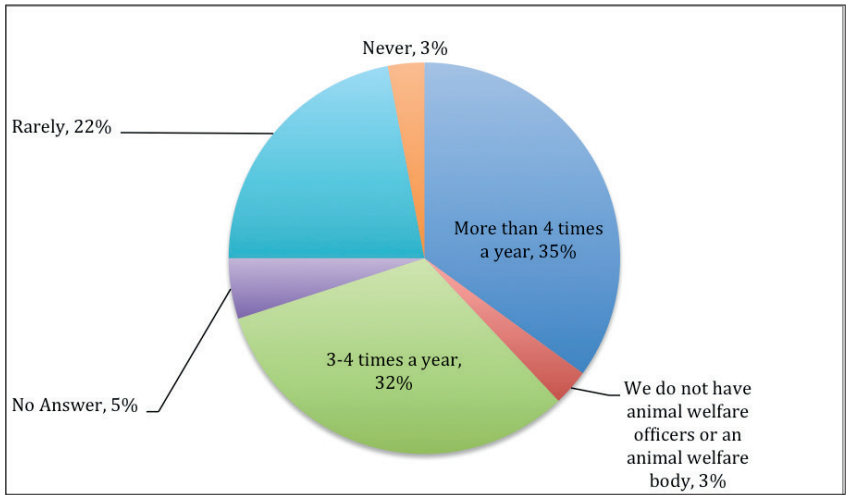
### 4.6 DID YOU EVER CANCEL PARTS OR AN ENTIRE PLANNED LARGE-SCALE STUDY BASED ON THE RESULTS OF A PILOT STUDY?




n = 704

Where indicated the use of pilot studies should be encouraged by regulatory authorities, given the documented reduction in animals used in experiments. Pilot studies take into account the dynamic and unpredictable nature of scientific discoveries, and on the evidence of the survey, even though the results are necessarily provisional, pilot experiments nevertheless play an important part in reducing animal use, as well as aiding the creative process of scientific discovery.

## 4.7 HOW OFTEN DO YOU CONSULT THE ANIMAL WELFARE OFFICERS OR THE ANIMAL WELFARE BODY AT YOUR INSTITUTION FOR QUESTIONS REGARDING APPLICATIONS FOR ANIMAL EXPERIMENTATION LICENSES OR ANIMAL TESTING?



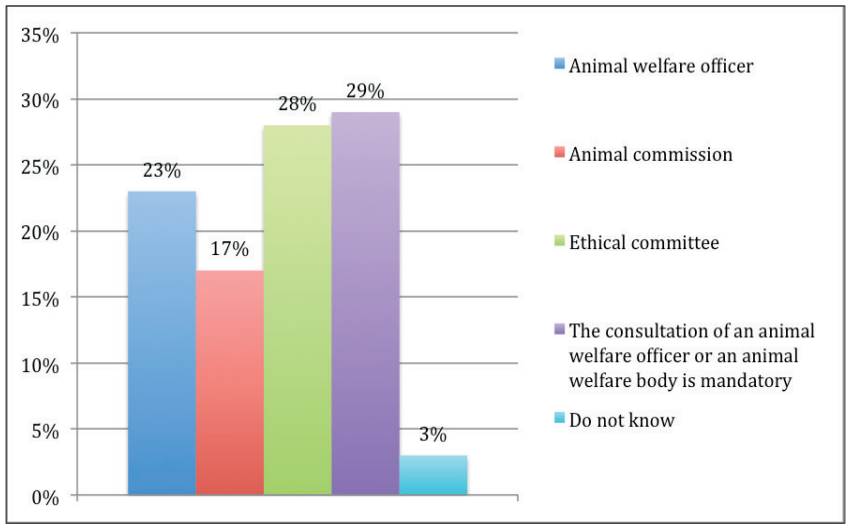

n = 704

Only a tiny minority (3%) of the respondents indicated that there is no animal welfare officer at their institution.

Most of the researchers ask and take advice from their animal welfare officer on a regular basis. This shows that the position of an animal welfare officer is accepted by the researchers and is an important source to be consulted.

Therefore, it is important to strengthen the position of the animal welfare officer further and to encourage researchers to accept the assistance and advice an animal welfare officer can offer.

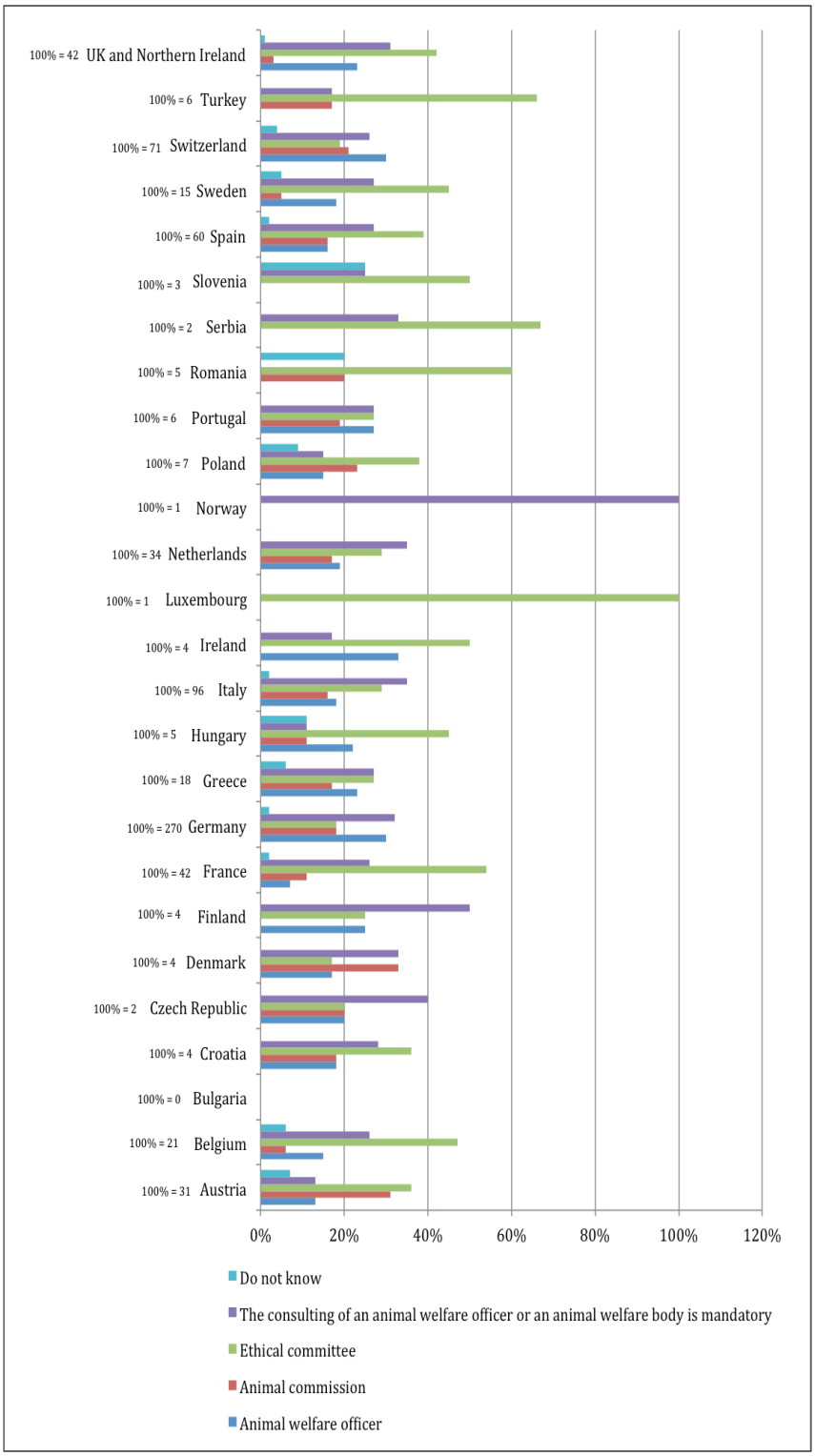
## 4.8 DO APPLICATIONS FOR ANIMAL EXPERIMENTATION LICENSES UNDERGO REVIEWS BY AN ANIMAL WELFARE OFFICER OR ANIMAL BODY OR ETHICAL COMMITTEE?



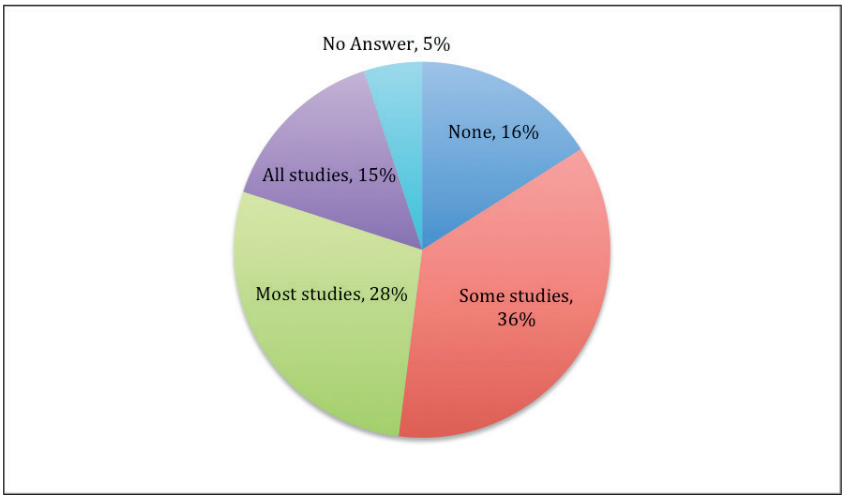

n = 1331

Although only 29% of respondents indicated that the consultation with animal welfare experts was mandatory, the survey showed that nearly 95% of all applications for animal experimentation licenses go through a one or more step-assessment involving animal welfare experts before being approved.

## EVERY COUNTRY WITH ITS POLLS FOR QUESTION 4.8



## 4.9 WHAT FRACTION OF YOUR STUDIES MAKE USE OF IN VITRO/IN SILICO METHODS BEFORE OR IN COMBINATION WITH STUDIES ON ANIMALS?

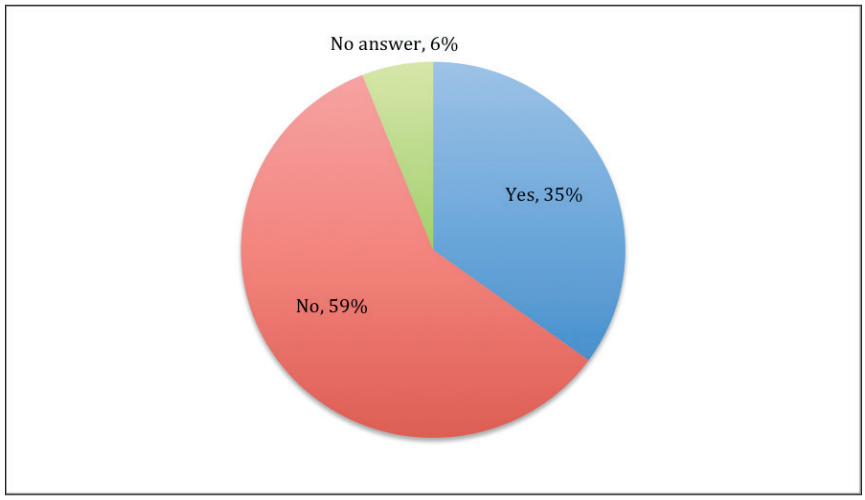



n = 704

A majority of respondents reported using in vitro/in silico methods before, or in combination with, their in vivo studies.

Over three quarters of respondents active in the area of animal experimentation already use alternative methods - almost half of them using alternative methods in all or most of their studies. This reflects the wide acceptance of alternative methods, which are helping to reduce overall numbers of animals used, for example by maximizing the scientific insights gained through the use of complementary methods. This highlights the idea that alternative methods have wide acceptance in the scientific community, and should be considered as complementary to animal-based research, rather than as replacement.

## 4.10 HAVE YOU EVER NOT DONE PLANNED ANIMAL EXPERIMENT THANKS TO ALTERNATIVES RELYING ON IN VITRO/IN SILICO METHODS?

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At least 35% of respondents reported that they were able to forgo animal experiments thanks to alternatives methods. For 60% this was never the case.

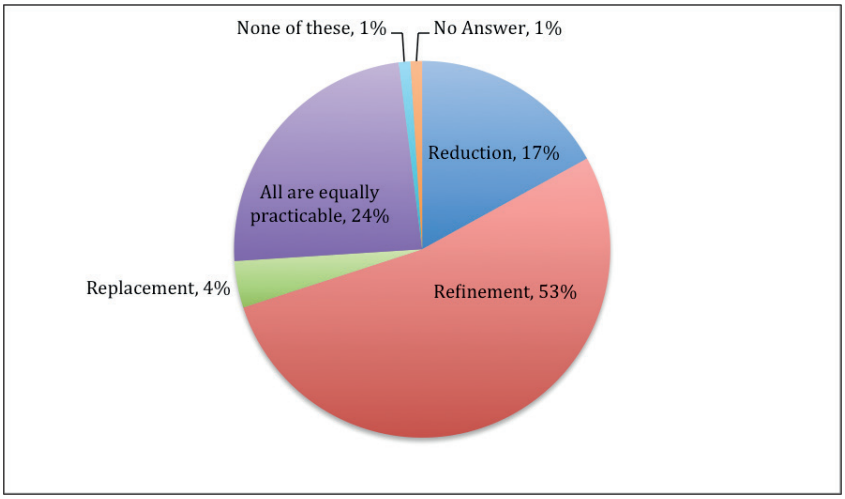
Researchers do animal experiments because our knowledge of the complex bioogy is very incomplete and this knowledge cannot be gained alternative methods, such as in vitro cell cultures, or by computer simulations.

Cell cultures, one of the methods that animal welfare supporters often propose as a suitable alternative method, apply to a restricted set of problems and are inadequate ufonrd erstanding physiological processes in the whole animal. Similarly ‚computer-simulation (alternative method ‚in silicio') can only be used if the biological process is already well-understood, and this can only come from studying living organisms.

As the responses to the question 4.9 showed, use of alternative methods is well-estabished and that in vitro methods and computer simulations are applied before or in combination with in vivo studies.

# 5. FURTHER QUESTIONS

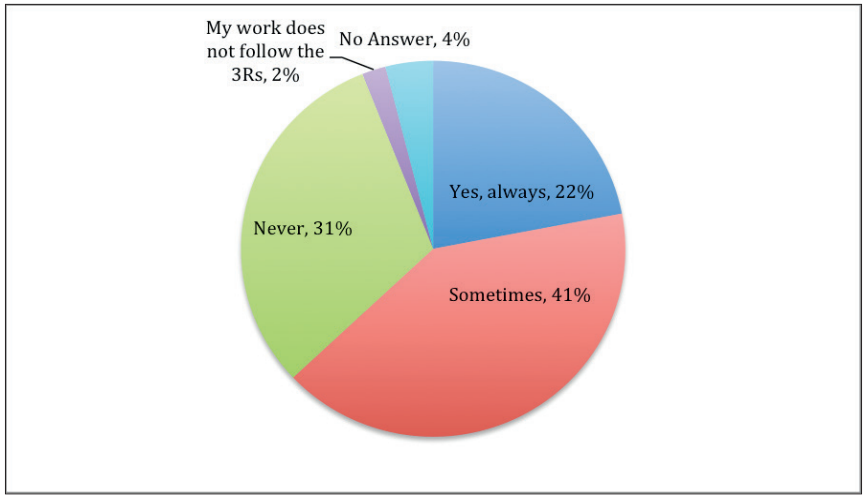
## 5.1 WHICH OF THE 3R RULES DO YOU THINK IS THE MOST PRACTICABLE TO IMPLEMENT IN YOUR OPINION?




n = 691

"Refinement" and "Reduction" are widely accepted principles in terms of practicability in the scientific community across Europe. "Replacement" is only considered practicable by a small minority of researchers, consistent with the idea that for the foreseeable future animal experimentation is considered to be irreplaceable for biomedical research. Given the wide acceptance of "Refinement" and "Reduction", further progress in the welfare of experimental animals will be possible and this should be taken into account in future policy decisions.

## 5.2 DO YOU MENTION IN YOUR PUBLICATIONS ONE OR ALL OF THE 3R PRINCIPLES THAT YOU ARE IMPLEMENTING IN YOUR ANIMAL STUDIES?

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Almost two-thirds of respondents have mentioned the 3R principles in relevant scientific publications, further documenting the wide acceptance of these principles across Europe.


BASEL DECLARATION