

Animal Research: the facts

People around the world enjoy a better quality of life thanks to advances made possible through medical research. Although work continues to replace the use of animals in experiments, they are currently a vital part of this research. The understanding and treatments made possible through animal research is of benefit to humans, animals and the environment.

Why use animals in research?

When applying for licenses or funding to conduct animal research, scientists must demonstrate that there is no way of obtaining this information other than through the use of animals. It is illegal to use an animal for research if there is a viable alternative available. Here are some reasons why animals are used in research:

1. To advance understanding

Although animals differ from humans, their biological systems are often very similar and their use in research helps to advance our understanding of how the body works. The focus of much of this research today is on discovering what genes do and how they work. Some animals also have unique biological properties that we want to understand.

2. To test new medical treatments for humans and animals

Practical applications arise from our growing understanding of how biological systems work. New medicines and other techniques to prevent and treat disease often need to be tested in complex whole-body systems.

3. As models to study disease

Over 90% of human genes have equivalents in mice, and basic systems in our body are similar to those in other animals. Using animals to model disease, for example by altering their genes or observing how cancers spread, allows scientists to understand how diseases develop in humans and animals, and identify potential methods of treatment.

4. To meet legislative requirements

As part of international regulations the safety of new medicines has to be assessed in at least two different mammalian species i.e. a rodent (usually rat or mouse) and a non-rodent (usually the dog) before they can be trialled in humans.

What has animal research achieved?

All modern medicines have been tested in animals and the benefits to human health are clearly evident: many cancers are now treatable and once-deadly diseases such as polio and measles are almost non-existent in this country. Animal research is also conducted for veterinary purposes, from research to develop treatments for foot and mouth disease to dietary research to benefit domestic cats.

Many things that now seem obvious about human and animal biology were only discovered through animal research. But many areas remain unclear, such as how cancers spread or the function of many genes in health and disease. Understanding these could bring great benefits to humans and animals alike.

Like much scientific research, animal research does not always lead to immediately tangible benefits, which can lead people to question its necessity. However, until there are viable alternatives to all use of animals in research, well regulated animal research is vital now in order to create life-saving treatments in the future.

Made possible by animal research

- Insulin-based treatments for diabetes affecting humans and animals were discovered through research using dogs.
- The observation that steroids promote lung development in premature lambs and rabbits 30 years ago, led to treatments which have vastly improved survival rates of premature babies today.
- Western Lowland Gorillas, which have seen 25% of their global population wiped out by the Ebola virus, are now immunised using the human vaccine, which was developed using non-human primates.
- Mouse and sheep models of cystic fibrosis are leading to substantial improvements in gene therapies for the disease.
- Mouse models of the life-threatening heart condition in Marfan syndrome led to the identification of a potential new treatment, now in clinical trials.
- Immunisation against human papillomavirus (HPV) was developed following research in rabbits, dogs and cattle showing it was possible to stop the development of cervical cancer.

Animal Research

How is the use of animals in research regulated in the UK?

The UK's regulatory framework for the use of animals in research is founded on the Animals (Scientific Procedures) Act 1986 (ASPA) and is among the most stringent in the world. Responsibility for ensuring animal research in the UK is carried out in accordance with this law rests with the Secretary of State for the Home Office, who is supported by:

- The Home Office Animals in Science Regulation Unit (ASRU) - operates a system of animal research licensing (people, projects and places), enforced by inspection.
- Animal Procedures Committee - provides independent advice.
- Local Ethical Review Committees - undertake a review of research proposals at institutional level.
- Funding bodies - peer review research to ensure it is scientifically justified.

Around 20-30% of research funded by the BBSRC, MRC and Wellcome Trust uses animals

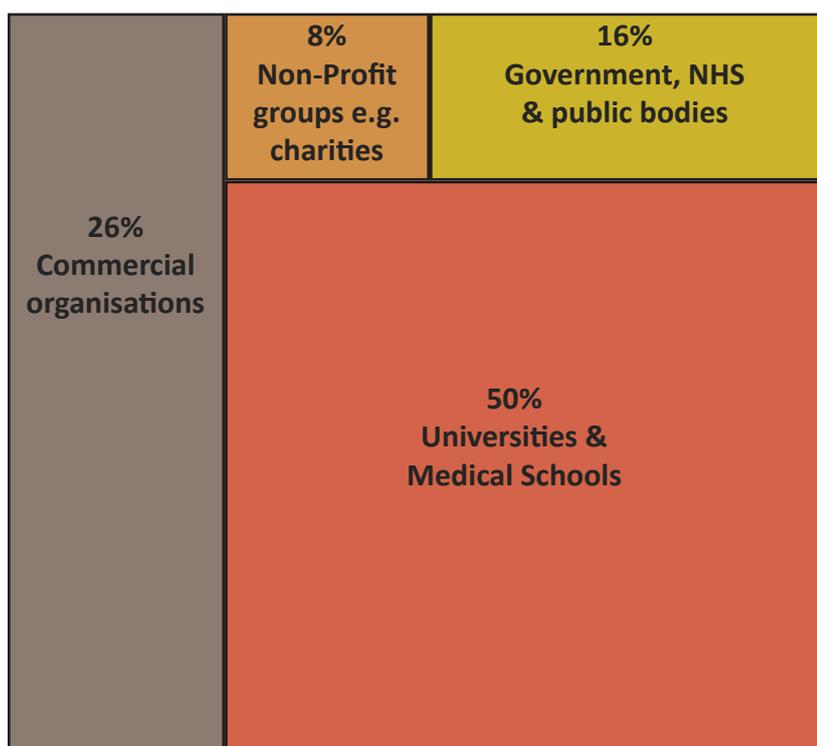
The UK is currently renewing ASPA to ensure it is consistent with the recent European Directive (2010/63/EU) on the Protection of Animals used for Scientific Purposes. This process must be completed by January 2013.

The Directive aims to harmonise animal research practices across Europe and represents a significant advance for many Member States, which should lead to improvements for millions of animals. For example, the Directive requires licensing of animal research, sets consistent animal welfare standards, and specifies that initiatives to refine, replace and reduce the use of animals (the '3Rs') are considered in each EU State.

Because UK regulations are already robust, concerns have been raised that if these were to be amended in line with the minimum requirements of the Directive, the UK's animal welfare standards would be lowered. However, Member States can retain aspects of their current national laws that go beyond the basic requirements of the new EU legislation. The Home Office have consulted the sector on this, and the updated legislation proposes to maintain UK standards.

The draft of the updated UK legislation will be laid before Parliament in October 2012. The proposed changes will be considered by a House of Commons Select Committee and debated in the House of Lords in November 2012.

Who undertakes animal research?¹



Public views on animal research in the UK

Opinions on animal research among the UK general public have been researched by Ipsos MORI since 1999. In 2011 the findings² showed:

- 87% of those surveyed accepted the need for animal research, which was carried out for medical research purposes, caused no unnecessary suffering to animals, and which had no alternative.
- Public confidence in regulation was strong, with the majority of respondents considering UK rules on animal research to be tough (65%) and well enforced (56%).
- 30% of survey participants objected to any use of animals in research because of animal welfare concerns.

¹ Home Office, *Statistics of Scientific Procedures on Living Animals in Great Britain*, 2011. <http://bit.ly/PmPGeq>

² Ipsos MORI for Department of Business, Industry & Skills, *Views on Animal Experimentation*, 2011. <http://bit.ly/PU8HTR>

in the UK

How many and what types of animals are used?

Within the UK, 3.71 million animals were used in 3.79 million scientific experiments in 2011. This represented a 2% rise in the number of experiments using animals compared to 2010.

11% of experiments were conducted to test the safety of medicines, a requirement of national and European legislation. This is slightly higher than in 2010 due to an increase in fish used in toxicity testing.

There has been a significant reduction in annual scientific procedures since 1976. This trend levelled out in the second half of the 1990s, and more recently there has been an increase, with the total number of procedures higher in 2011 than 2000 (an increase of 1.08 million or 40%).

This was mostly accounted for by breeding to produce Genetically Modified (to study gene function) and Harmfully Mutant (likely to develop a disease) animals. Under UK legislation breeding a genetically modified (GM) animal - even if it is not used in any other regulated procedures, is counted as an animal procedure. In 2011, the breeding of GM animals made up 43% of all experiments (1.62 million procedures).

Excluding such breeding, the total number of procedures was only slightly higher than in 2000 (159,900 or 8%). In the same period, UK expenditure on biomedical research has more than doubled.

Animal research is vital to UK science

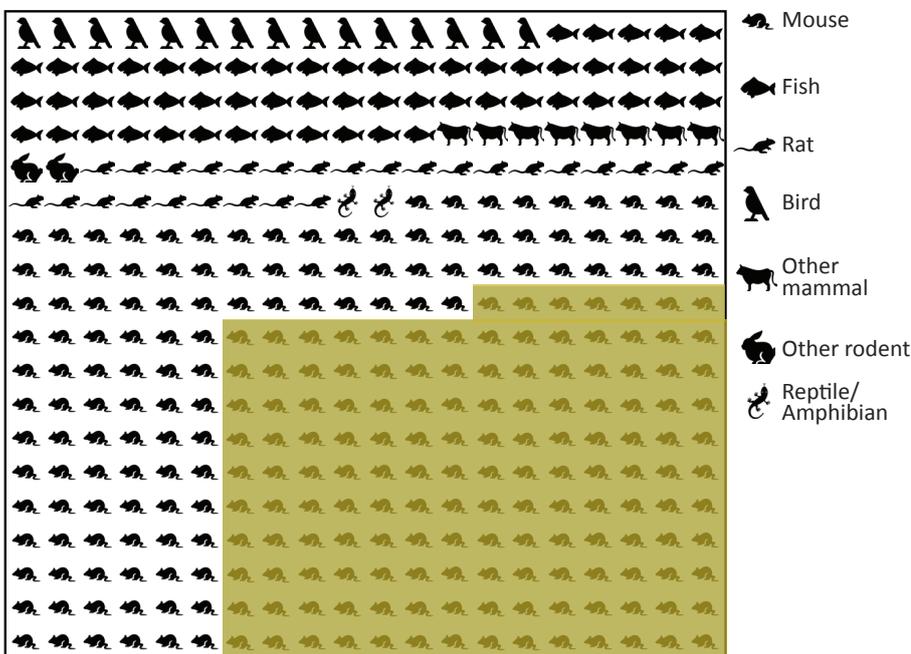
The UK is uniquely positioned to attract the whole research and development chain for new medicines. It is vital for the UK to maintain expertise across the spectrum of biomedical research, from scientific discovery to clinical application, leading to improved health population both here and abroad.

In 2007, pharmaceutical and medical technology sectors generated around £10 billion in added value and employed over 120,000 people in the UK. In March 2011, the Department of Business, Industry and Skills (BIS) set out an aim for the UK to become a world leader in the biosciences sector in the *Plan for Growth*². Earlier this year, the Prime Minister also launched a *Challenge on Dementia*³, in which research plays a key part.

Animal research is integral to the UK's ability to achieve these goals. It is important that the opportunities opened up by transposition to improve animal research legislation are approached proportionately.

Enabling excellent preclinical science to flourish in the UK means promoting the consistency of research practices across the EU, whilst ensuring our regulatory system protects animal welfare will bring public support. Both aspects are key to achieving the maximum economic and societal benefits from biomedical research.

Animals used in 3.79 million UK procedures during 2011¹



Each icon represents 10,000 procedures. The shaded area represents breeding procedures to produce GM or HM mice. 93.5% of experiments used rodents or fish. Cats, dogs and non-human primates were used in 0.19% of experiments.

¹ Home Office, *Statistics of Scientific Procedures on Living Animals in Great Britain*, 2011. <http://bit.ly/PmPGeq>

² The *Plan for Growth*: <http://bit.ly/Qy17yH>

³ The *Challenge on Dementia*: <http://bit.ly/RLlfkS>

Alternatives to animals

Are there currently alternatives to using animals in research?

Aspects of biology can be studied using human cells in a dish (*in vitro*), or computer modelling (*in silico*) and the scientific community is committed to the development and use of replacement and reduction techniques. However, while they are becoming increasingly informative, currently these methods are not sufficiently advanced to replicate the complex workings of a whole organism and are often complementary rather than alternative methods to the use of animals in research.

To be licensed to use animals, researchers are required to implement the “3Rs” and the UK’s National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs¹) works with academic and commercial scientists to develop ways to advance the 3Rs. The centre’s programmes lead the Government’s work to reduce the use of animals in research and since 2004 the Centre has awarded over £25 million for research to develop approaches with reduced reliance on animals and / or improved animal welfare. One example is work to replace the use of mice in experiments to develop treatments for kidney disease, by developing a cell line which performs some of the kidney’s functions. This will potentially reduce the number of mice used in such research by 15,000 per annum.

The NC3Rs also works with some bioscience funders to embed the 3Rs in their policies and practice. This focuses on two main activities: reviewing grant proposals (when they request to use horses and related animals, non-human primates, dogs and cats) and supporting contemporary good practice through the development of guidelines. Together these activities help to ensure that standards of animal welfare are genuinely high and exceed the legal minimum, that local issues relating to practice are addressed and that overseas work is conducted to standards equivalent to those in the UK.

¹ <http://www.nc3rs.org.uk>

² <http://bit.ly/OrldzC>

What are the 3Rs?

- Reduce the number of animals used in experiments
- Replace animals in experiments wherever possible by developing alternatives or using species less likely to experience pain
- Refine the ways in which animals are used to reduce any suffering caused to the animals

Cosmetics testing

Cosmetics testing, which will soon be subject to an EU ban, has been illegal in the UK since 1998.

In 2011 the UK government also pledged to end testing of household products on animals.²

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