

Animal research in the UK: the numbers in perspective

In today's world our understanding of how the human body works is continually improving. This understanding comes from more biomedical research than ever before, in turn leading to new and innovative ways to treat diseases. Animal studies continue to be a key part of this research. And as our understanding of genetics has improved we are also using increasing numbers of animals to study the genetic basis of diseases, as explained in this briefing.

The benefits of animal research

Research involving animals is essential for scientific progress. It helps us to understand the body in health and disease, and is also used to develop and test medical treatments. Medicines for serious conditions such as diabetes and asthma mean that patients can now live with the disease, where once prognosis was poor. Other important uses include testing chemicals for safety, and wildlife research.

The law

In the UK animal research which may cause pain, suffering, distress or lasting harm is regulated under the Animals (Scientific Procedures) Act 1986. This Act requires every research project involving an animal to be thoroughly assessed by the Home Office before a licence is granted.

The application process for a licence is therefore very detailed, and involves considerable scrutiny of the scientific benefits and harms to animals. Each application is subject to this 'cost-benefit assessment' which weighs up the potential harms to the animals against the intended benefits of the research. Proposed research projects are usually 'peer reviewed' which means that they are examined by independent researchers with expertise in the field.

The legislation in the UK was never intended to limit the overall numbers of animals used. Rather, it strikes a balance between the legitimate needs of science and medical progress, and genuine concerns about animal welfare. Therefore an increase in numbers can reflect an increase in the overall amount of research done, and ultimately benefits to patients.

Alternative methods

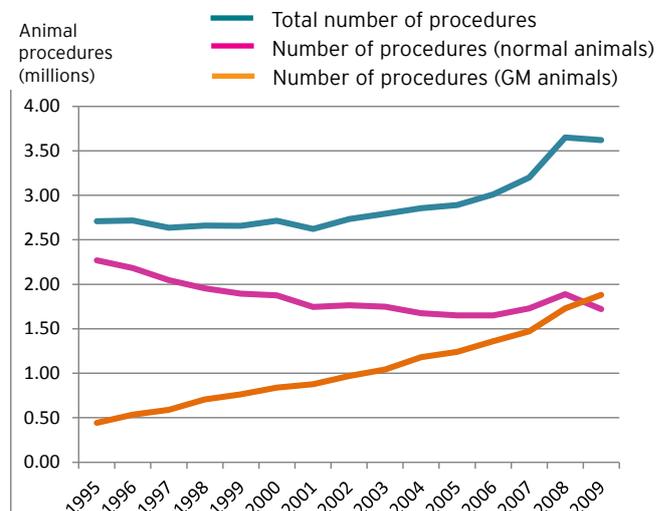
By law, animal research only takes place when there is no other way of answering a specific scientific question. Most areas of biomedical research already use non-animal methods, such as cell cultures, computer simulations or human volunteers. However, sometimes non-animal methods cannot adequately replace the complex systems of a living organism.

Trends in research animal numbers

The graph below shows the numbers of scientific procedures using animals in Great Britain between 1995 and 2009. Over this period the number of procedures involving normal animals has generally been decreasing, with an increase in the use of genetically modified (GM) animals. For the first time in 2009 the number of procedures involving genetically altered animals was greater than the number of procedures involving normal animals.

Overall, the total number of procedures continues to follow an increasing trend; however it should be noted that the figures for 2009 showed a slight decrease on those of 2008.

To fully understand what the total numbers mean, it is important to look at how the annual statistics are formulated. The law states that species and types of procedures must be counted and published every year. However, changes in government policy (such as the introduction of the 1986 ASPA Act, and potentially the new European Directive) could mean different species or procedures are included. In other words, what is measured over time can change, so long-term trends which involve periods of legislative change can be misleading.



Animal research in the UK: the numbers in perspective

Why are the numbers rising?

Medical benefit

The information gained from studying animals has allowed scientists to make enormous contributions to many areas of biomedical research. Animal research has contributed to many medical advances such as vaccines, antibiotics and anaesthetics.

Genetically modified (GM) animals

Genetic modifications can produce better and more predictive animal models for human disease, and increase the ways in which animals contribute to our knowledge of the genetic basis of disease. The main factor in the increase of procedures involving animals is the use of GM animals (although the increase is linear and not exponential as sometimes claimed by antivivisection groups).

The graph shows that in 2009 the number of procedures involving GM animals exceeded the number of procedures using normal animals for the first time. The valuable insights provided by GM animals in biomedical research are such that their numbers are likely to continue rising.

There are various initiatives in place to ensure that the maximum knowledge is gained from these animals, whilst minimising animal use by avoiding duplication. Examples include the European Mouse Mutant Archive, providing open access to mutant mouse lines, and the International Mouse Phenotyping Consortium (IMPC) which aims to explain and share the functions of genes in mice. Such projects mean that scientists, wherever they are, will have comparable models, procedures and data.

Increases in investment

The numbers of animals used in research procedures are rising in virtually all modern economies across the world. The UK is particularly successful in biomedical research; as a country we attract considerable investment in this area, even in difficult economic times (see graph below).

To put the figures into perspective, although the number of animal procedures increased by one million (over one third) in

GM mouse technology has been used recently to:

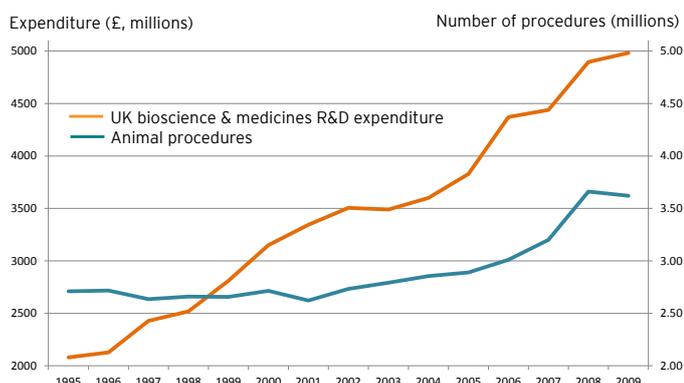
- reveal that protein suppression can stop leukaemia growth;
- identify a key enzyme responsible for destroying lung tissue in TB patients;
- discover that mutations in a single gene can lead to autism;
- treat diabetes using antibodies to stop the immune system attacking insulin producing cells;
- identify and monitor brain cells to examine why the brain produces fewer neurons with age.

the 12 years to 2009, UK expenditure on biomedical research more than doubled in real terms over the same period. This shows the commitment of the scientific community to the development and use of replacement and reduction techniques such as computer modelling and imaging techniques and the use of alternative resources such as human cell lines.

Why do primate numbers fluctuate?

The number of procedures using non-human primates is a tiny fraction of the total number of animal procedures. In 2009, 2,815 non-human primates (NHPs) were involved in 4,263 procedures – only 0.12% of all animal procedures. This low number means that relatively small changes in the numbers have a big impact on percentages. From year to year, a variation of +/-15% is typical.

In the medium-term, we anticipate that the use of NHPs may increase. This is partly because of their use to study neurodegenerative disorders (which are increasing due to our ageing population), and also because they are needed to test the new generation of biological medicines.



Cosmetics

Cosmetic tests performed on animals have been banned in the UK since 1998.



High resolution images of research animals are available from our online photolibrary at http://www.understanding-animalresearch.org.uk/resources/images_library

Animal research in the UK: the numbers in perspective

The new Directive

In November 2010 a new European Directive concerning the use of animals in research was published. The European member states are now in a period of transposition; all must incorporate the Directive into national legislation by November 2012.

The new Directive refers to statistics and recording number of animals in a number of instances. As one of the aims of the Directive was to harmonise practices across Europe it is likely that in the future there will be a change in the way the UK collects and reports the numbers.

The new Directive should be seen as an opportunity to ensure the numbers collected are the most appropriate and meaningful for the purpose for which they're intended: to give an overall picture of the amount and types of animal research in the UK.

Other uses of animals

We destroy over 7 million rodents a year as vermin, many of which die an unpleasant or distressing death, sometimes simply through starvation.

We eat over 1 billion (meat) animals a year in the UK, most of them significantly larger than the rodents typically used in medical research. If fish are included, this figure rises to 2.5 billion. Welfare standards for food production generally fall short of those found in animal research centres.

For example, breeding of GM animals with normal phenotypes (ie normal characteristics and traits) and for use in further breeding programmes generally involves minimal stress and is usually considered to fall into the 'mild' category for procedures. The UK currently includes these animals in the annual statistics, but the Directive doesn't stipulate their inclusion. Given the high numbers of animals used for breeding, this will substantially reduce their numbers.

Conversely the Directive covers animals bred and then euthanised humanely so that their organs can be used for research. These animals are not currently counted in the annual statistics; therefore this inclusion will appreciably raise the numbers reported, without an actual increase in the number of animals used in research in this country. The final balance between these changes cannot yet be predicted.

The Directive also stipulates that the statistics should be submitted to the Commission by 10 November 2015 and every year thereafter. This date was set to give member states time to harmonise their method of collection across the European countries.

When the Animals (Scientific Procedures) Act was introduced in 1986 it led to a one-off rise in the animal numbers, simply because the experiments were classified and therefore counted in a different way. The new Directive being introduced into the UK will almost certainly cause a similar change, but not immediately.