



Home Office

Annual Statistics of Scientific Procedures on Living Animals Great Britain 2024

HC 1386





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Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024

Presented to Parliament pursuant to section 21A(1) of the Animals (Scientific Procedures) Act 1986.

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Annual Statistics of Scientific Procedures on Living Animals, Great Britain, 2024

This report details information on the regulated scientific procedures involving living animals carried out in the calendar year, including the number of procedures, species and genetic status of animals, and purpose and severity of procedures.

This report is available as a PDF and on GOV.UK in HTML format.

Please see the accompanying [user guide](#) for information on data collection, methodology, data quality, uses of the statistics, glossary and links to related statistics.

Protected animals: Any living vertebrate, other than man, and any living cephalopod. The Animals (Scientific Procedures) Act 1986 also counts embryos after two-thirds of gestation, and fish and amphibian larvae after they become capable of free feeding as protected animals, however these are not included in this publication.

Regulated procedures: Any procedure applied to a protected animal for an experimental or other scientific purpose, or for an educational purpose, that may have the effect of causing an animal pain, suffering, distress or lasting harm equivalent to, or higher than, that caused by the introduction of a needle in accordance with good veterinary practice.

‘Number of procedures’ is not ‘number of animals’: The number of procedures carried out in a year does not equal the number of animals that have been used in procedures that year. This is because some animals may be used more than once, ‘re-used’, in certain circumstances. These instances are counted as separate, additional procedures. As a result, the number of procedures is usually slightly higher than the number of animals used.

Key results

- 2.64 million scientific procedures involving living animals were carried out in Great Britain in 2024, a decrease from 2.67 million last year and the lowest number since 2001
- experimental procedures have decreased by 2% and procedures for creation and breeding have decreased by 0.4% since 2023
- experimental procedures made up 54% of all procedures in 2024
- the majority (95%) of procedures (both for experimental and breeding purposes) used mice, fish, birds or rats; these species have been the most used for more than a decade
- procedures on specially protected species (cats, dogs, horses and non-human primates) accounted for use in 1% of experimental procedures in 2024

Experimental procedures

These procedures involve using animals in scientific studies for purposes such as basic research and the development of treatments, safety testing of pharmaceuticals and other substances, specific surgical training and education, environmental research and species protection.

- 1.43 million procedures carried out for experimental purposes (54% of all procedures in 2024)
- 57% of procedures used mice
- 16% of procedures used fish
- 10% of procedures used rats
- 8% of procedures used birds
- 1% of procedures used specially protected species (cats, dogs, horses and non-human primates)
- 7% of procedures used other species
- around half (52%) of experimental procedures were for basic research; the top 3 research areas were the nervous system, the immune system and cancer (oncology)
- 97% of all experimental procedures were assessed as non-recovery, sub-threshold, mild, or moderate in severity; the remaining 3% were assessed as severe

Creation and breeding of genetically altered (GA) animals

This refers to the breeding of animals whose genes have mutated or have been modified. These animals are used to produce GA offspring for use in experimental procedures but are not themselves used in experimental procedures.

- 1.21 million procedures carried out for the creation and breeding of GA animals (46% of all procedures in 2024)
- 87% were for the creation and breeding of mice
- 13% were for the creation and breeding of fish
- 0.43% were for the creation and breeding of rats and birds
- the majority (88%) of procedures in this category were for maintenance of already established GA lines, with 12% of procedures for the creation of new lines
- 99% of all procedures for creation and breeding were assessed as non-recovery, sub-threshold, mild or moderate in severity; 1% were assessed as severe

Introduction

Purpose of this release

This publication meets the requirements of section 21(A) of the 1986 Act to publish, and lay before Parliament, annual statistics on the use of protected animals in regulated procedures in Great Britain.

Coverage of this release

These statistics cover England, Scotland, and Wales. For Northern Ireland, the Department of Health separately collects and publishes [information on NI regulated procedures](#) under devolved arrangements.

‘Number of procedures’ is not ‘number of animals’

The statistics in this release and the accompanying data tables relate to the number of procedures, not the number of animals used, unless specified (Tables 1.3, 2.1, 2.2 and 2.3 relate to the number of animals).

Severity of procedures

These statistics describe the nature and purpose of procedures, including their actual severity. The experience of the animal at the time of death or killing is a factor in determining the actual severity and therefore the killing or death of animals is not reported separately. Further information regarding actual severity can be found here: [Advisory notes on actual severity reporting](#).

Accompanying data tables and user guide

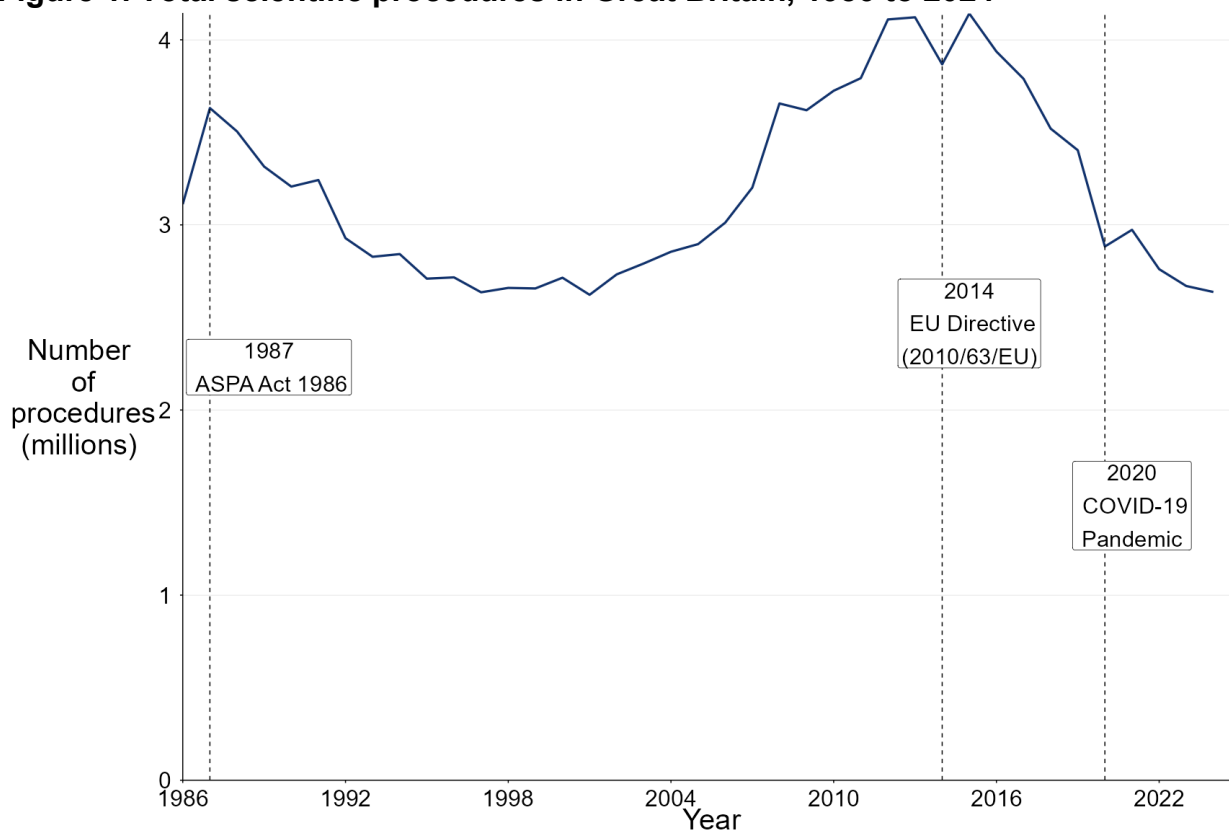
The accompanying data tables for this report can be found on the [statistics of scientific procedures webpage](#). Since the 2018 publication, the principal data tables have been expanded to include data from 2014 to allow users to view and extract the data as they wish. Since the 2021 publication, Tables 1.1 and 1.2 have been expanded to include country data from 2014. Since the 2023 publication, Table 12 has been added to include the historic data from 1986 to 2013. See the accompanying [user guide](#) for further information.

Glossary

A full glossary of terms is available within the [user guide](#).

Total procedures

Figure 1. Total scientific procedures in Great Britain, 1986 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 1.1 and Table 12.

In 2024, there was a decrease in procedures to 2.64 million, the lowest figure since 2001.

As shown in Figure 1, the number of procedures carried out decreased from 1987 until 2001, to a low of 2.62 million. This was mainly due to a reduction in the use of rodents, rabbits and birds (although there was an increase in procedures involving fish). After 2001, procedures increased, reaching a peak of 4.14 million in 2015 and then began decreasing again to 2.88 million in 2020. This may be partly explained by national lockdowns in response to the COVID-19 pandemic, which may have affected the activity of the establishments. In 2021, there was an increase to 2.97 million, falling to 2.76 million in 2022, 2.67 million in 2023 and continuing down to 2.64 million in 2024.

The number of procedures in England and Scotland fell by 0.1% and 6% respectively in the last year. The number of procedures undertaken in establishments in Wales decreased by 19% compared with 2023. A similar trend to Great Britain is seen in the number of procedures for England and Scotland. England's number of procedures peaks at 3.51 million in 2015 and is lowest at 2.24 million in 2024. Scotland's peak was 573,000 in 2015 and the low was 370,000 procedures in 2024. Wales also peaked in 2015 at 55,000 procedures, the number of procedures decreased to a low of 26,000 in 2024.

The number of procedures carried out on living animals is determined by several factors, including the focus of scientific and medical endeavours, the economic climate, and global trends in new technologies or fields of research.

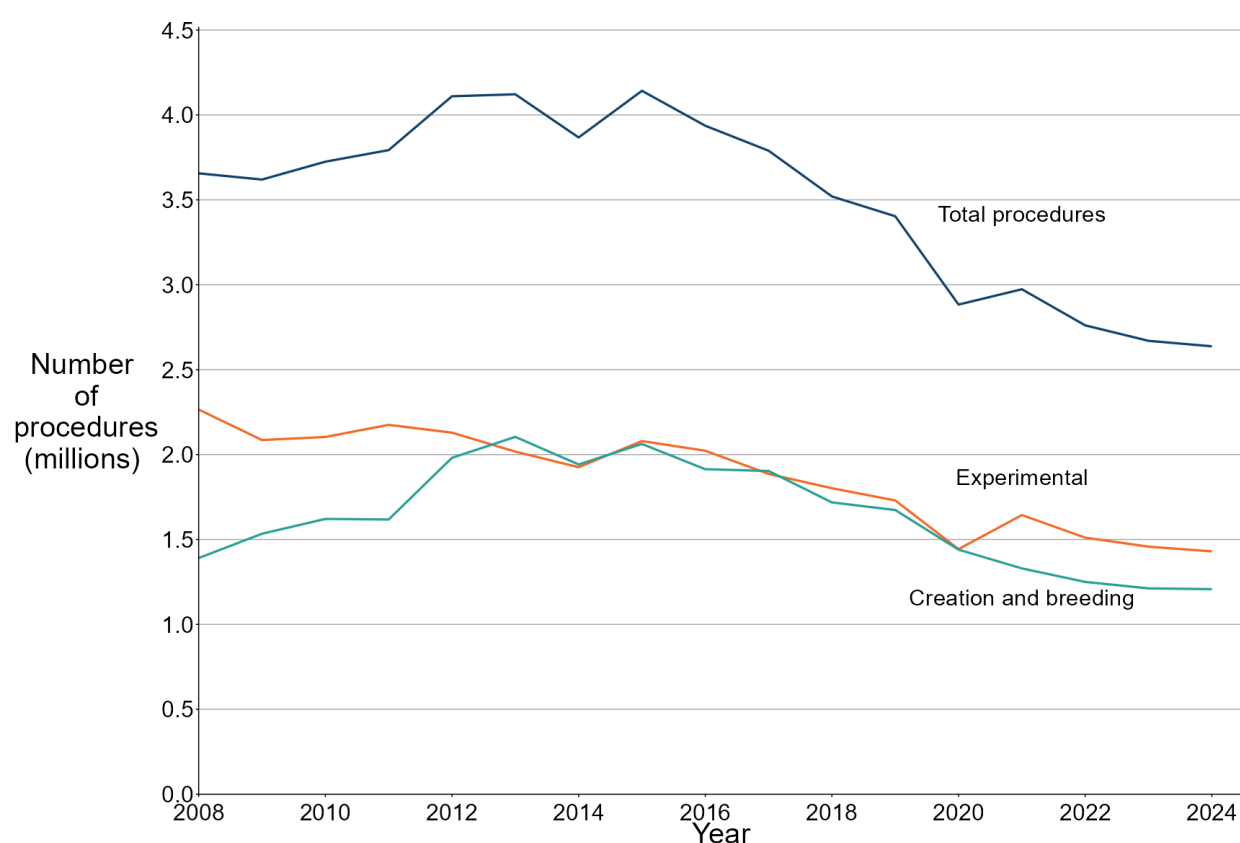
In 1986, the Animals (Scientific Procedures) Act (ASPA) was introduced, which required all 'scientific procedures' to be recorded. This new, broader term largely explains the initial increase in figures directly after 1986.

At the beginning of 2013, EU Directive 2010/63/EU came into effect, which, as a result, changed how the data were collected under UK law from 2014 onwards. All figures for procedures (1986 onwards) are comparable, as the definition of a procedure is unchanged. As a result of the change in methodology, the 2014 data are subject to data quality issues (see the [user guide](#) for further information).

Experimental procedures involve using animals in scientific studies for purposes such as basic research and the development of treatments, safety testing of pharmaceuticals and other substances, education, specific surgical training and education, environmental research and species protection.

Procedures for creation and breeding involve the breeding of animals whose genes have mutated or have been modified. These animals are used to produce genetically altered (GA) offspring for use in experimental procedures but are not themselves used in experimental procedures.

Figure 2. Total scientific procedures by type, 2007 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 1.2 and [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2017](#): time series tables, Table 1

As shown in Figure 2, the total number of procedures broadly increased prior to 2013, mainly due to the increase in procedures for the creation and breeding of GA animals. This increase in the earlier part of the decade can mainly be attributed to the availability of new technology, which led to new research opportunities. However, after 2013, the number of procedures for the creation and breeding of GA animals has been falling, with a small decrease of 0.4% compared with last year.

In contrast, the number of experimental procedures remained relatively stable during the earlier part of the last decade but has decreased since 2015. There was a decrease of 2% in experimental procedures in 2024 compared with 2023.

Experimental procedures

The severity of a procedure is determined by the degree of pain, suffering, distress or lasting harm expected to be experienced by an individual animal during the course of a procedure. In 2024, 97% of the 1.43 million experimental procedures were assessed as non-recovery, sub-threshold, mild or moderate in severity, while the remaining 3% were assessed as severe.

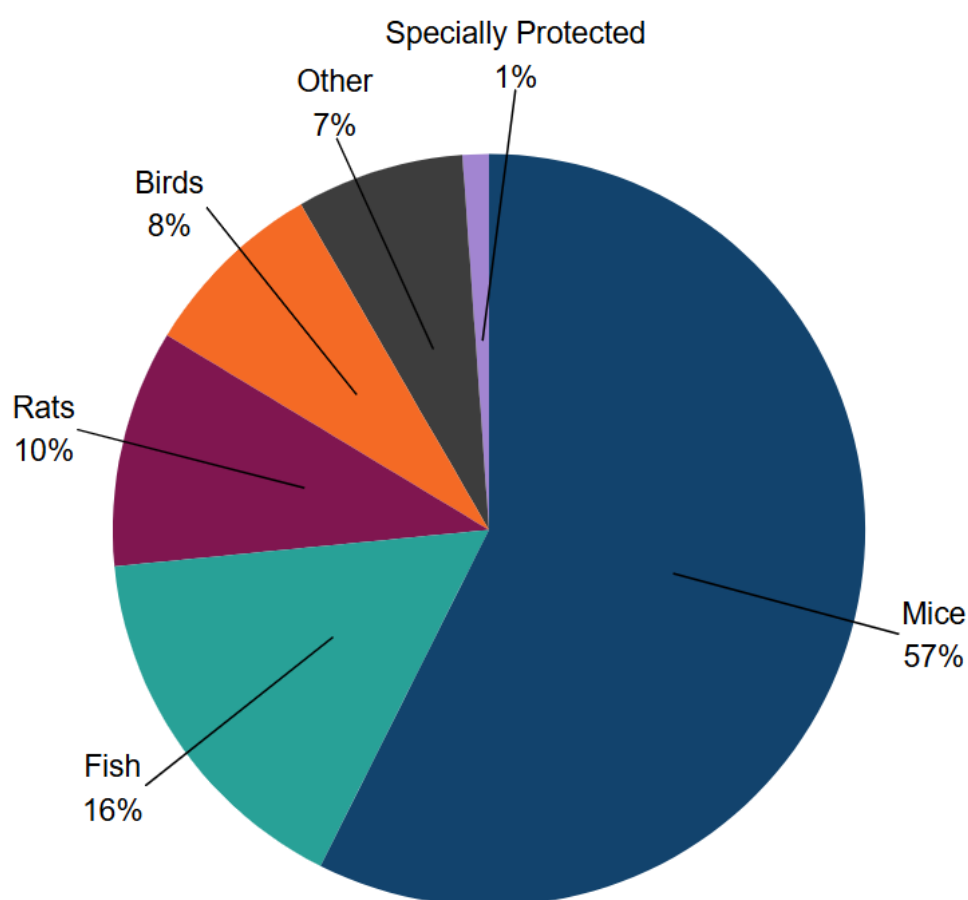
This section covers only experimental procedures, which are procedures that involve using animals in scientific studies for purposes such as basic biological research, medical studies and development of treatments, training and education, environmental research, preservation of species, and safety testing of pharmaceuticals and other substances. An experimental procedure may benefit people, animals or the environment for any of the purposes stated above. The animals used in experimental procedures may be genetically altered.

Species

The proportions of species used for experimental procedures, as shown in Figure 3, have remained similar from 2014 onwards. From 2023 to 2024, the proportion of mice has fallen from 59% to 57%, and rats has remained at 10%. The proportion of fish species has increased from 15% to 16%. The proportion of birds and other has remained at 8% and 7% respectively from 2023.

For most species, small year-on-year variations can be attributed to expected variation in procedure counts across project lifecycles.

Figure 3. Experimental procedures by species, 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 1.2

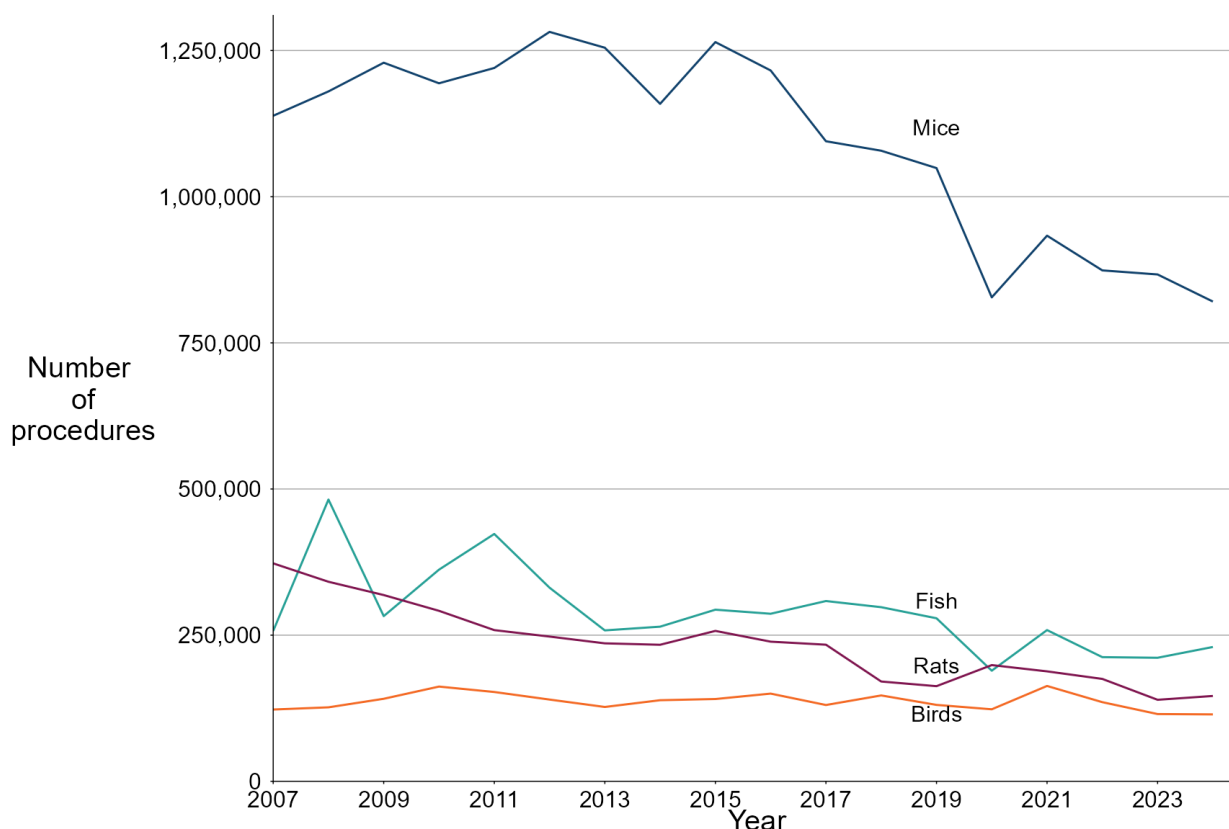
Notes: Specially protected species are cats, dogs, horses and non-human primates.

Mice, fish, rats and birds in experimental procedures

The majority of experimental procedures used mice, fish, rats or birds; together, these species were used in 92% of experimental procedures in 2024.

The Other category contains all other protected animals, including amphibians, cattle and reptiles. Figures relating to individual species within this category are available in the data tables.

Figure 4. Experimental procedures using mice, fish, birds and rats, 2007 to 2024



Source: [Home Office, Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024 data tables: Table 1.2 and Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2017: time series tables, Table 2.2](#)

As shown in Figure 4, there were decreases in the number of procedures using mice. However, fish (9%) and rats (2%) both increased compared with 2023.

Around two-thirds (66%) of experimental procedures involving mice in 2024 were for basic research. The specific research areas that performed the greatest numbers of procedures using mice were immune system and nervous system research.

Of the experimental procedures involving fish in 2024, 58% were for basic research. The specific basic research areas that performed the greatest numbers of procedures using fish were nervous system and developmental research.

In 2024, around two-thirds (68%) of experimental procedures involving rats were for regulatory testing (for example, tests evaluating the safety and efficacy of substances such as pharmaceuticals).

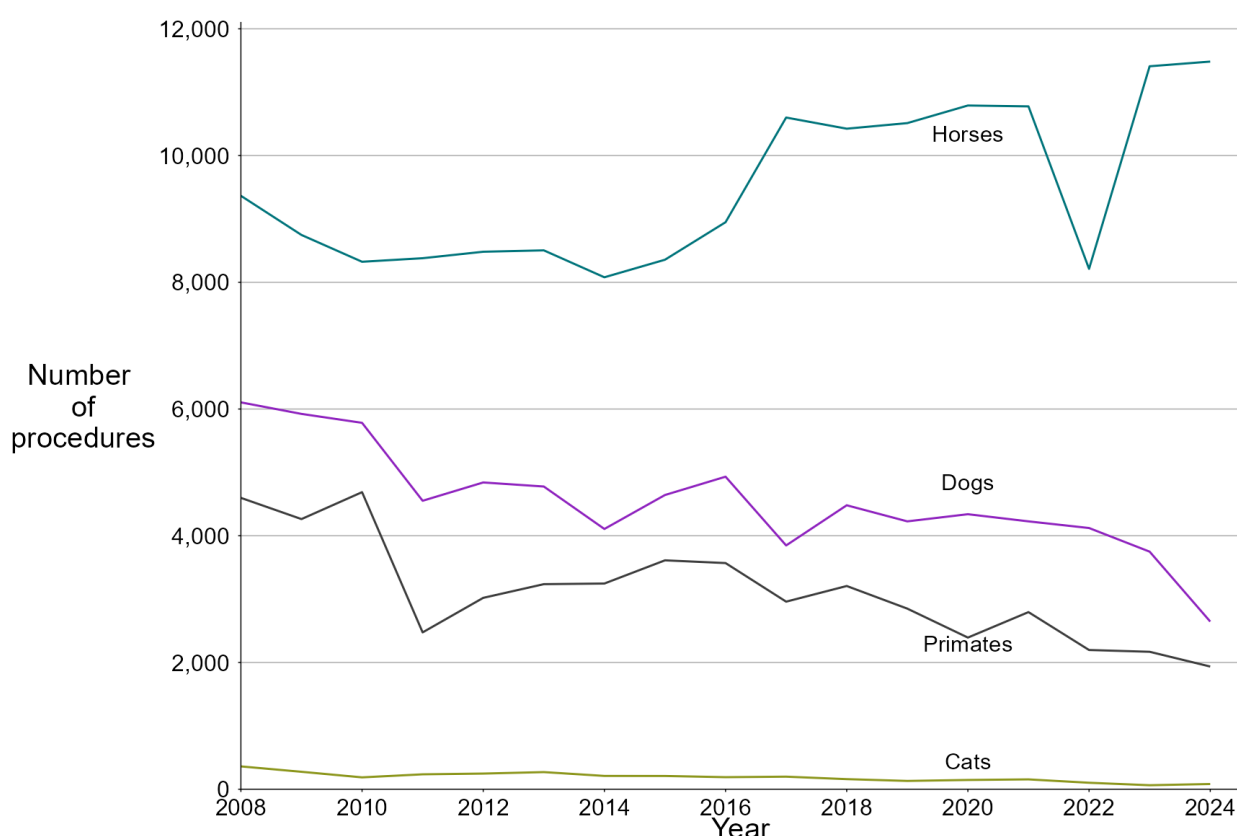
The majority (85%) of experimental procedures involving birds in 2024 were for applied research. The applied research area of animal diseases and disorders had the highest number of procedures using birds.

Specially protected species in experimental procedures

Specially protected species refers to cats, dogs, horses and non-human primates. These species were used in 1% of experimental procedures (about 16,000) in 2024; this compares with 1% of experimental procedures (about 17,000) in 2023.

Cats, dogs, horses and primates are subject to additional protection under Section 5C of the 1986 Act. Licence holders using specially protected species must demonstrate that no other species are suitable for the purposes of the licence and must adhere to additional licence conditions.

Figure 5. Experimental procedures involving specially protected species, 2008 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#) data tables: Table 1.2 and [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2017](#): time series tables, Table 2.2.

The total number of procedures involving specially protected species has decreased to around 16,000 in 2024.

The number of procedures involving horses had decreased from 2010 to 2014, with an increase in procedures between 2015 to 2017. From 2017 to 2021, the numbers remained relatively steady, followed by a notable decrease in 2022. The figures increased again in 2023 and 2024 (by 0.6%). Though the number of procedures increased, the numbers of horses and other equids being used in scientific procedures in 2024 has decreased. There were 60 horses used for the first time in procedures in 2024, compared with 64 in 2023 and 74 in 2022 (see table 1.3). In 2024, the majority (77%) of experimental procedures that used horses were for

regulatory purposes. The main regulated procedure carried out on horses was for the routine production of blood-based products, which are used for a variety of laboratory uses.

The number of experimental procedures that used cats has increased by 30% from 2023. There were 82 experimental procedures that used cats in 2024 compared with 63 in 2023, 58 of which were for basic research and 24 were used for regulatory research (veterinary medicines).

The species of primates that were used in experimental procedures in 2024 were cynomolgus monkeys (1,770 procedures), marmosets and tamarins (90 procedures) and rhesus monkeys (76 procedures). The total number of procedures (1,936 procedures) has decreased by 11% from last year. This is the lowest level in over 20 years.

In 2024, the use of dogs in experimental procedures decreased by 29%. There were 2,646 procedures that used dogs in 2024, mainly for regulatory purposes. This is lower than the previous lowest year of 2023 (3,749).

In 2024, most experimental procedures that used primates and dogs were for regulatory purposes (87% and 71% respectively). These were mainly for testing the safety of products and devices for human medicine and veterinary medicine.

Note: the figures in this section do not follow the rounding conventions as stated in the [user guide](#).

Use of endangered species

Information was collected on whether any endangered species were used. Endangered species reported are those listed in [Annex A of Council Regulation \(EC\) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein](#) which were not bred in captivity.

One endangered species was used in 2024, the Rock Dove (*Columba livia*), which were used for basic research.

Place of birth of primates

Self-sustaining colony

Marmosets, tamarins, and other new-world primates: A self-sustaining colony is a colony that contains no wild-caught animals, is kept in a way that ensures animals are used to humans and is sustained using animals from within or from other self-sustaining colonies.

Macaques and other old-world primates: A self-sustaining colony is a colony that no longer sources animals from the wild (it may contain some existing wild-caught animals) and is sustained using only captive-bred animals.

Generation

F0 – wild-caught

F1 – progeny of wild-caught females

F2 – progeny of captive-bred females

Of the 1,478 primates used for the first time in experimental procedures in 2024, all marmosets, tamarins and rhesus monkeys were born in the UK at a licensed establishment, whereas 99% of all cynomolgus monkeys were born in either Africa or Asia. All primates used for the first time in experimental procedures in 2024 were from self-sustaining colonies.

The place of birth of primates used in experimental procedures for the first time are in Table 2.2 of the [data tables](#). The place of birth of all other species used in experimental procedures for the first time in each year since 2014 are in Table 2.1 of the [data tables](#).

Of the 1,478 primates used for the first time in experimental procedures in 2024, 398 (27%) were F1 generation and 1080 (73%) were F2 generation or greater. There were no F0 generation primates in 2024.

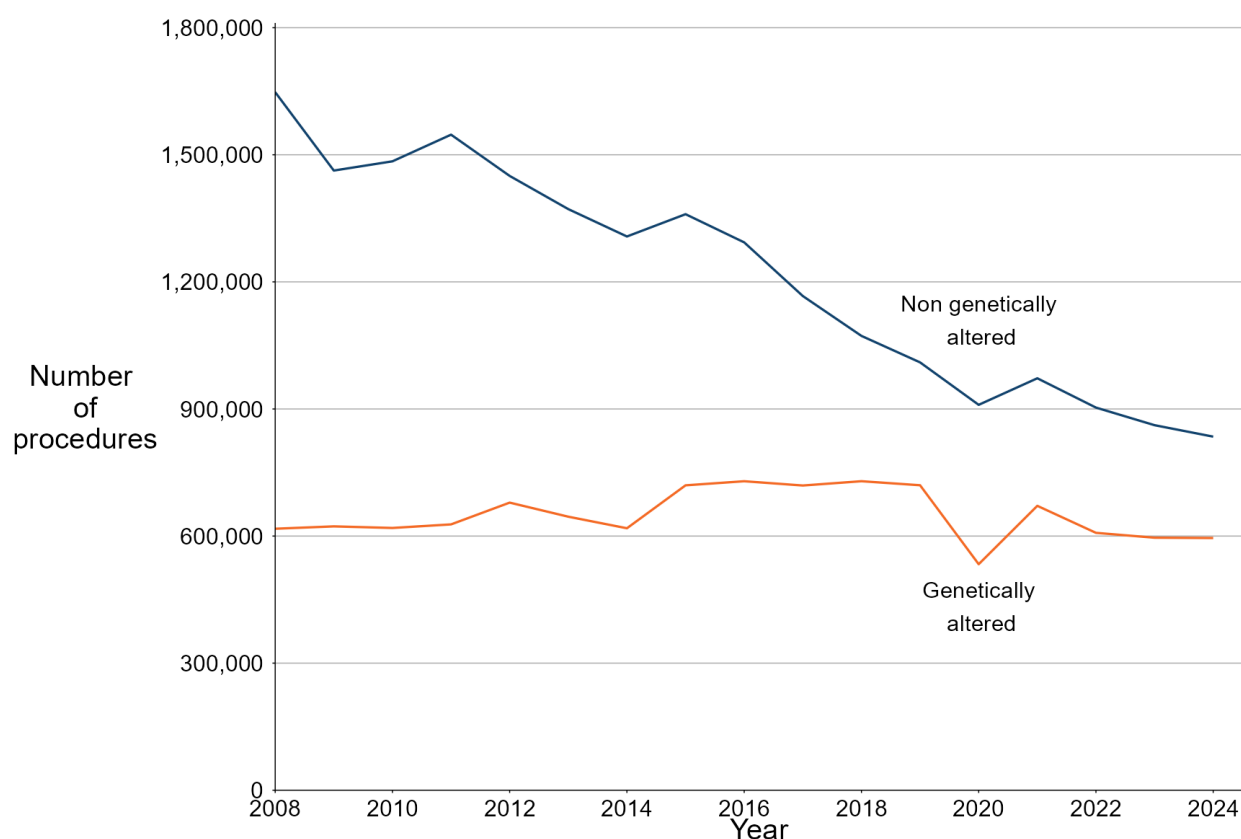
This publication uses definitions consistent with previous releases. In 2022, '[Ad hoc data on non-human primates used in experimental procedures for the first time](#)' was published to provide assurance on the data used for non-human primates. These ad hoc statistics were produced following the Animal in Science Committee's report on non-human primates bred for use in scientific purposes, which proposed alternative definitions for colony status and generation. These alternative definitions would classify some colonies as non-self-sustaining due to containing old-world primates originally sourced in the wild, even if new animals are no longer sourced from the wild and had not been for many years. The definitions for self-sustaining colonies and generation status will be changed to reflect this guidance. This will be implemented for the 2026 data collection, which will be published in 2027. For more information see [Non-human primates bred for use in scientific purposes](#).

Note: the figures on the place of birth of primates do not follow the rounding conventions as stated in the [user guide](#) to provide additional detail.

Genetic Status

Of the 1.43 million experimental procedures completed in 2024, 58% used animals that were not genetically altered.

Figure 6. Experimental procedures by genetic status, 2008 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 4 and [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2017](#): time series tables, Table 3.2

As shown in Figure 6, and in line with the overall decrease in experimental procedures in 2024, the number of experimental procedures involving non-GA animals has decreased by 3% in the last year and decreased by 36% over the last decade.

The use of GA animals was relatively stable from 2015 until 2019, before a 26% decrease in 2020, which may be related to national lockdowns in response to the COVID-19 pandemic. There was an increase in 2021, though still below the number in the years 2015 to 2019, followed by a decrease since.

Further information regarding the genetic status of GA animals used in experimental procedures in 2024 is in Table 4 of the [data tables](#).

Purpose

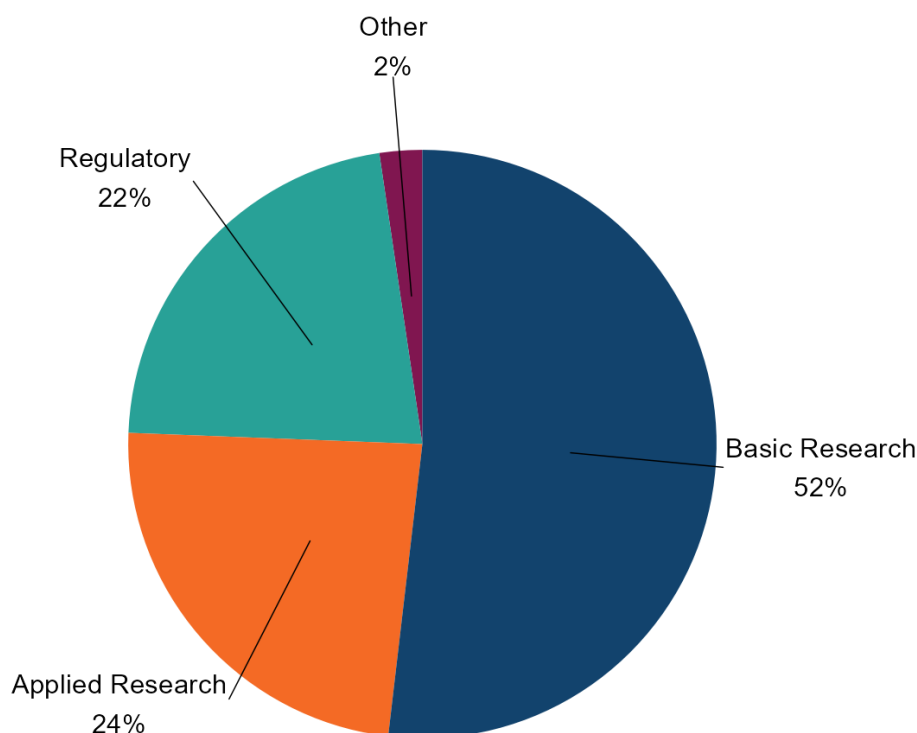
Basic research: aims to expand our knowledge of the structure, functioning and behaviour of living organisms and the environment.

Applied research: attempts to address diseases through prevention and development of treatments. Within the data tables, this is shown as 'Translational/Applied research'.

Regulatory testing: procedures carried out to satisfy legal requirements, including ensuring substances are produced to legal specification, evaluating the safety or effectiveness of pharmaceuticals and other substances.

As shown in Figure 7, around half (52%) of the experimental procedures carried out in 2024 were for basic research, a further 24% for applied research and 22% conducted for regulatory testing purposes. Other (2%) includes experimental procedures carried out for higher education or training, preservation of species and for the protection of the natural environment.

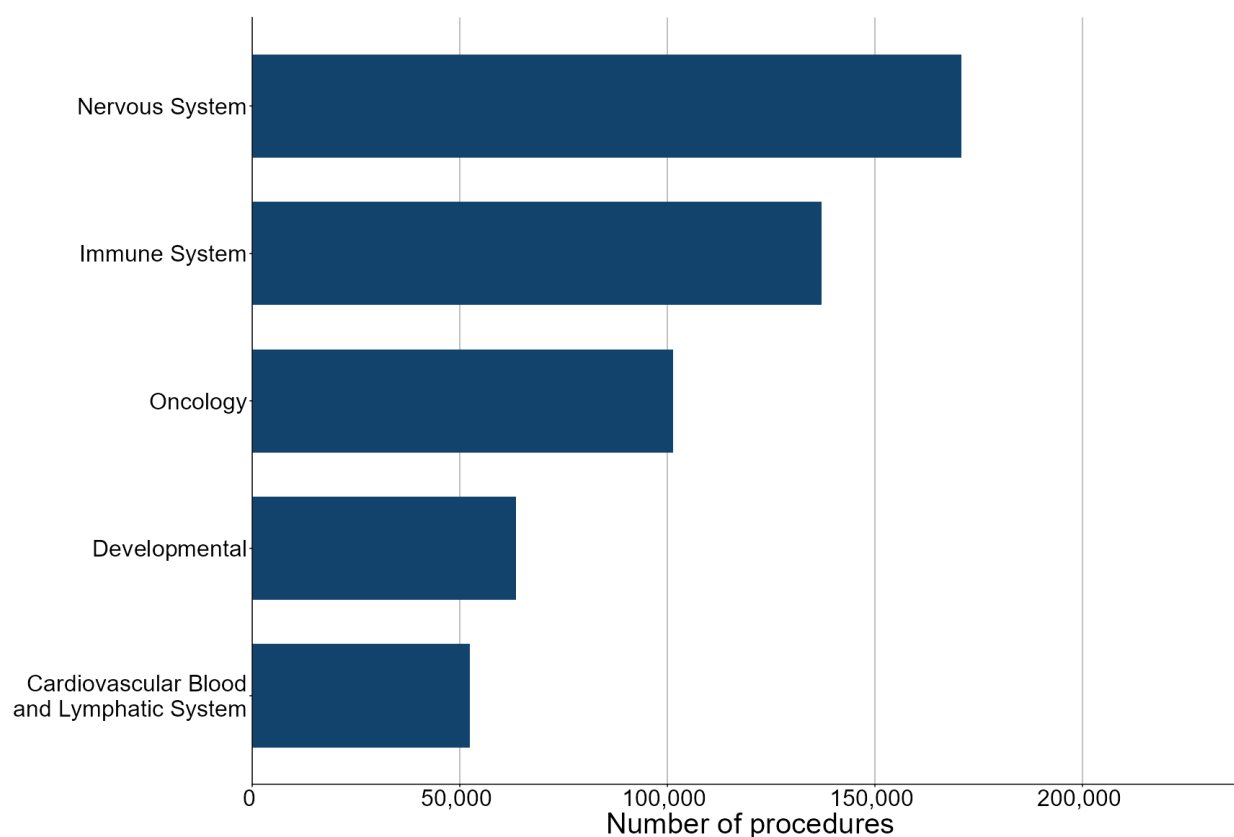
Figure 7. Experimental procedures by purpose, 2024



Basic research

In 2024, around 740,000 experimental procedures were carried out for basic research purposes. The most common research areas, as shown in Figure 8, were the nervous system (23%), immune system (18%) and oncology (14%).

Figure 8. Most common areas of focus in basic research in experimental procedures, 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 5

Notes: Research is classified as multisystemic when numerous body organs and systems are targeted.

The distribution of purposes for basic research has remained mostly similar since 2014. Studies into the functioning and disease of the nervous system, the immune system, oncology, developmental and cardiovascular blood and lymphatic system, have been reported within the top 5 most common areas for basic research in each year since 2014.

For data on all purposes for basic research by species, see Table 5 of the [data tables](#).

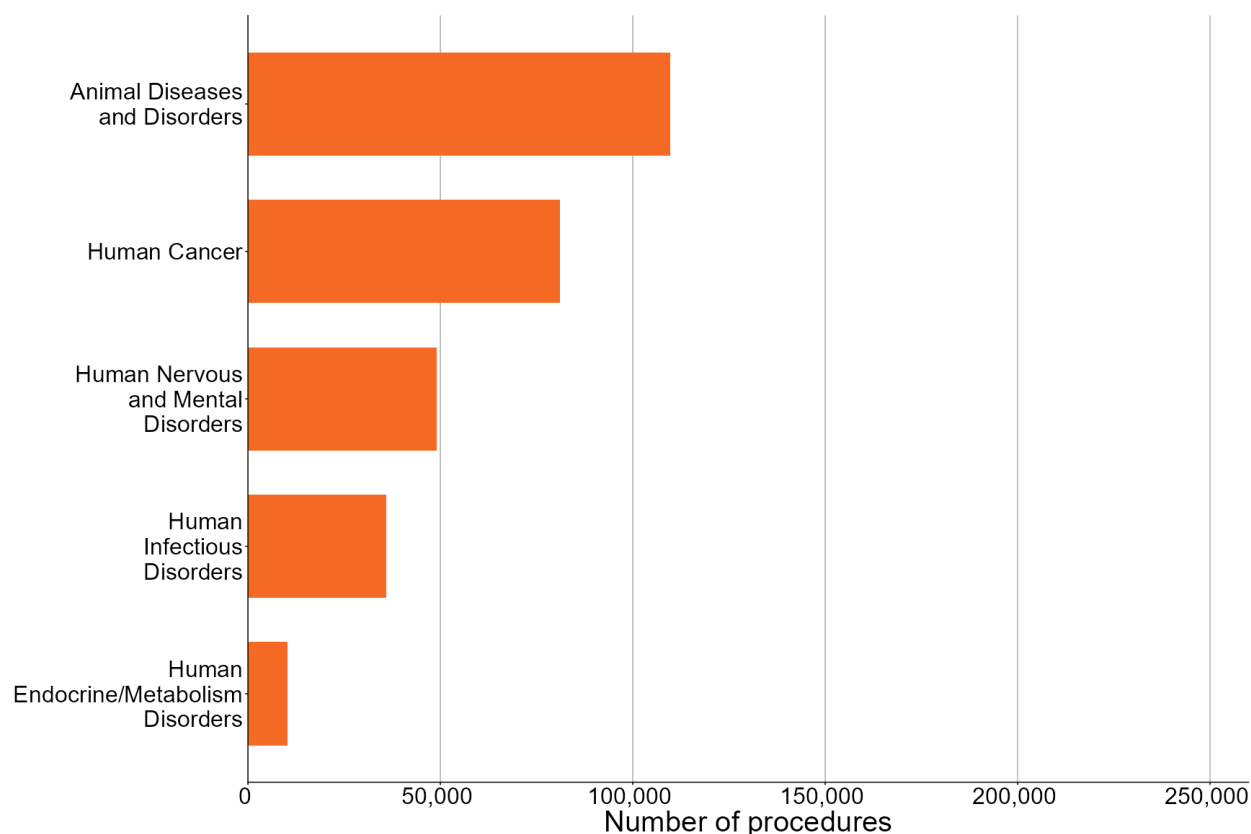
Applied research

There were around 340,000 experimental procedures for applied research (24% of all experimental procedures) in 2024. Applied research attempts to address diseases through prevention and development of treatments, as shown in Figure 9. The most common areas of research were animal diseases and disorders (32%), human cancer (24%) and human nervous and mental disorders (14%).

The majority of procedures for animal diseases and disorders (88%) were conducted on fowl. Almost all (99%) experimental procedures for applied research focusing on

human cancer used mice; the remaining 1% of procedures involved rats, pigs and zebra fish.

Figure 9. Most common areas focused upon in experimental procedures for applied research, 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 6

Since 2014, human cancer, infectious disorders, and nervous and mental disorders have consistently been within the top 5 most common areas of applied research in each year.

For data on all purposes for applied research by species, see Table 6 of the [data tables](#).

Regulatory

There were around 315,000 procedures carried out for regulatory purposes in 2024 (22% of all experimental procedures). Regulatory procedures are carried out to satisfy the legal requirements necessary to enable materials, products and devices to be licensed for use. Regulatory procedures are usually carried out during the final stages of research and development and focus on safety and efficacy. The most common procedure in 2024 was toxicity and other safety testing (50%).

Of the approximate 315,000 regulatory procedures in 2024, the most common legislative requirements were legislation on medicinal products for human use (47%) and medicinal products for veterinary use and their residues (27%). No procedures were carried out for cosmetics testing.

The majority (87%) of regulatory procedures were under legislation satisfying EU requirements, including UK requirements derived from EU legislation. 1% were to satisfy UK requirements only.

Routine production: covers studies carried out for manufacturing processes requiring regulatory approval.

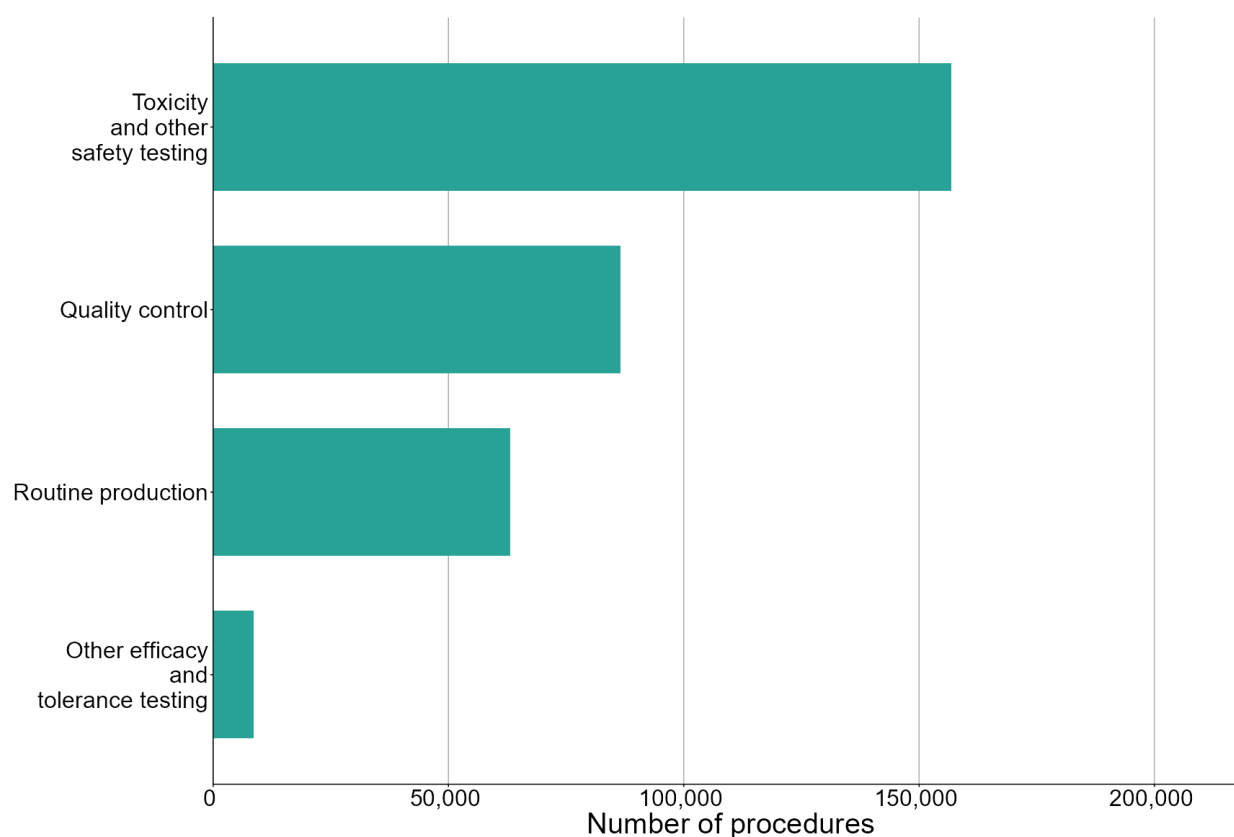
Toxicity and other safety testing: studies for safety evaluation of products and devices for human medicine, dentistry, veterinary medicine and other chemicals.

Quality control: the testing of quality control parameters of a product, and any controls carried out during the manufacturing process for registration purposes, to satisfy any other national or international requirements or to satisfy the in-house policy of the manufacturer.

Other efficacy and tolerance testing: efficacy testing of biocides and pesticides is covered under this category as well as the tolerance testing of additives in animal nutrition.

Figure 10 shows the proportion of each purpose of regulatory procedures carried out in 2024. With **toxicity and other safety testing**, **quality control** and **routine production** accounting for 50%, 27% and 20% respectively.

Figure 10. Experimental procedures for regulatory purposes by sub-purpose, 2024



Source: [Home Office, Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 7.1

The most common species used for regulatory purposes were mice (35%; about 111,000). Of which, 76% were for quality control. The second most common species for regulatory purposes were rats (32%; about 100,000), of which 97% were for toxicity and other safety testing, including pharmacology.

Toxicity and safety testing – cosmetic

Animal testing for consumer safety of cosmetics and their ingredients has been banned in the UK since 1998. Under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) legislation, regulated procedures on animals to test chemicals that may be used as ingredients in cosmetics have been required as a last resort for worker and environmental safety. These procedures are recorded under the purpose of 'Toxicity and other safety testing', which also includes safety evaluation of products and devices for human medicine, dentistry, veterinary medicine and other chemicals.

The government does not issue licences for animal testing of chemicals that are used exclusively as cosmetics ingredients carried out under chemicals (REACH) regulations for the purpose of worker and environmental safety, following the government's ban in May 2023.

In 2024, no procedures were conducted on chemicals that are exclusively intended to be used as ingredients in cosmetic products.

Techniques of special interest

Information was collected on whether any procedures were related to techniques of interest to the Home Office (areas related to significant public interest or related to changes in policies). The areas of interest include testing of household products, alcohol, tobacco, ascites methods of monoclonal antibody production, the forced swim test and testing of chemicals exclusively used in cosmetics (see above).

In 2024, there were no experimental procedures reported under the policy for the testing of ingredients primarily for household products.

There were no experimental procedures that involved the testing of products containing alcohol or tobacco. Alcohol or tobacco may still be used in experimental procedures, such as to develop models for conducting further research.

Ascites methods of monoclonal antibody production are of interest because a non-animal alternative exists. No ascites methods of monoclonal antibody production were used in 2024.

The 2024 statistics include the forced swim test as a technique of special interest for the first time. For the purposes of these statistics the forced swim test has been defined as 'any procedure in which an animal is placed into a container of water, out of its depth, with no means of escape' as per the definition established in section 3.1 of the [Animals in Scientific Committee Forced Swim Test report](#). The test results in causing short-term distress to the animal, but does not cause lasting harm.

There were 250 procedures reported as the forced swim test in 2024, all on mice. All procedures were performed for the purpose of basic research in the areas of the nervous, endocrine and sensory systems, and were either mild or moderate severity. This included 215 procedures performed using force swimming with no means of escape, and 35 procedures using the Morris water maze test of memory (where a platform may be removed so could be considered forced swimming, as there is no means of escape).

Note: these figures do not follow the rounding conventions as stated in the [user guide](#).

Rodenticide trials

Rodenticides are a category of pest control chemicals intended to kill rodents. Rodenticide trials are field trials of such chemicals and are occasionally undertaken by commercial companies that produce them to assess how safe and effective they are when used.

Of the 2,746 returns, 2 reported that rodenticide trials occurred in 2024. The Home Office asks data suppliers to only indicate whether field trials of rodenticide substances occurred, as these trials can be conducted in semi-field situations where the number of animals is not accurately known since colonies are not intensively managed.

Severity

The severity (pain, distress or suffering) experienced by animals in procedures has been recorded since 2014. There are 5 severity assessments:

Sub-threshold: when a procedure was authorised under a project licence but did not actually cause suffering above the threshold of regulation; that is, it was less than the level of pain, suffering, distress or lasting harm that is caused by inserting a hypodermic needle according to good veterinary practice.

Non-recovery (under general anaesthesia): when the entire procedure was carried out under general anaesthesia from which the animal shall not recover consciousness. It includes unintended death of animals on recovery protocols while under anaesthesia, provided that no regulated procedure had been carried out prior to the induction of anaesthesia.

Mild: any pain or suffering experienced by an animal was, at worst, only slight or transitory and minor so that the animal returns to its normal state within a short period of time.

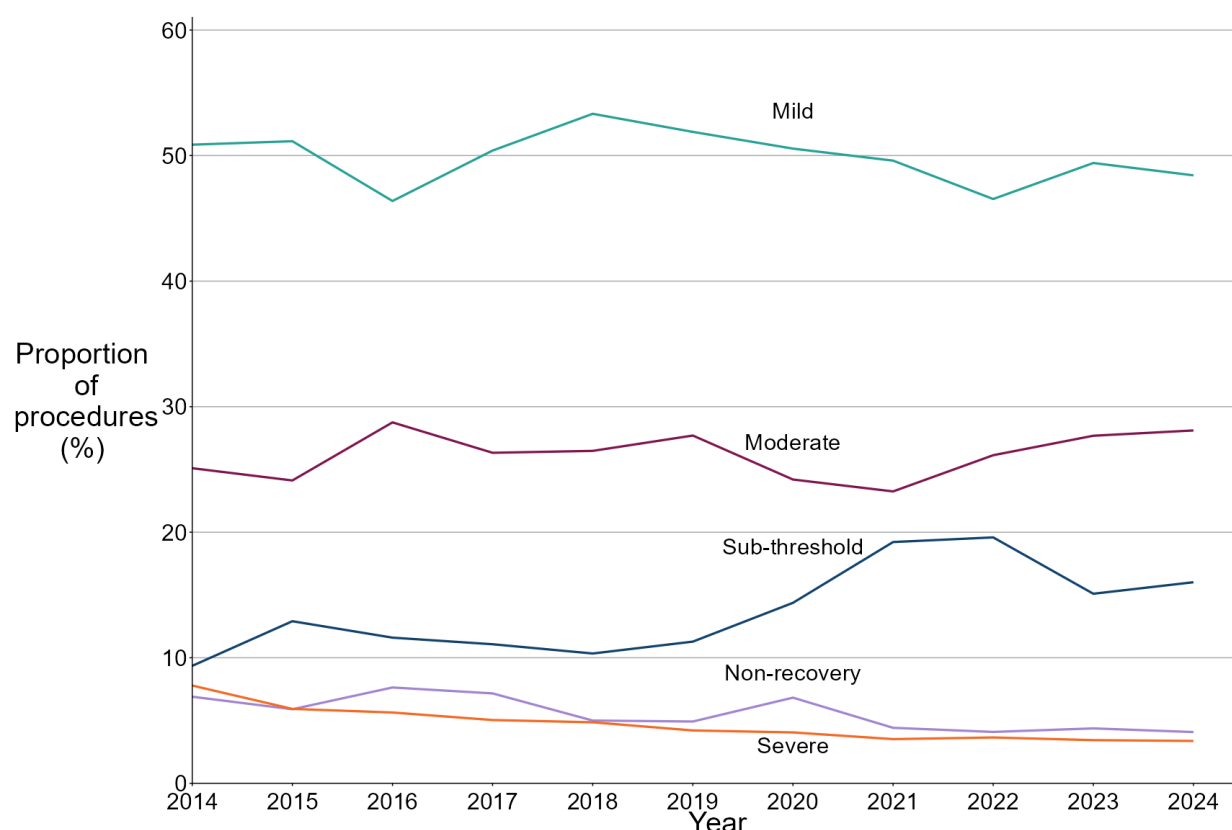
Moderate: the procedure caused a significant and easily detectable disturbance to an animal's normal state, but this was not life threatening. Most surgical procedures carried out under general anaesthesia and with good post-operative analgesia (pain relief) would be classed as moderate.

Severe: the procedure caused a major departure from the animal's usual state of health and well-being. This would usually include long-term disease processes where assistance with normal activities such as feeding and drinking were required, or where significant deficits in behaviours/activities persist. It includes animals found dead unless an informed decision can be made that the animal did not suffer severely prior to death.

Sub-threshold: when a procedure was authorised under a project licence but did not actually cause suffering above the threshold of regulation; that is, it was less than the level of pain, suffering, distress or lasting harm that is caused by inserting a hypodermic needle according to good veterinary practice.

Severity assessments measure harms to an animal during a procedure and generally reflect the peak or cumulative severity of the entire procedure. They do not include harms caused to animals as a result of non-procedural events such as transport and housing.

Figure 11. Experimental procedures by severity, 2014 to 2024



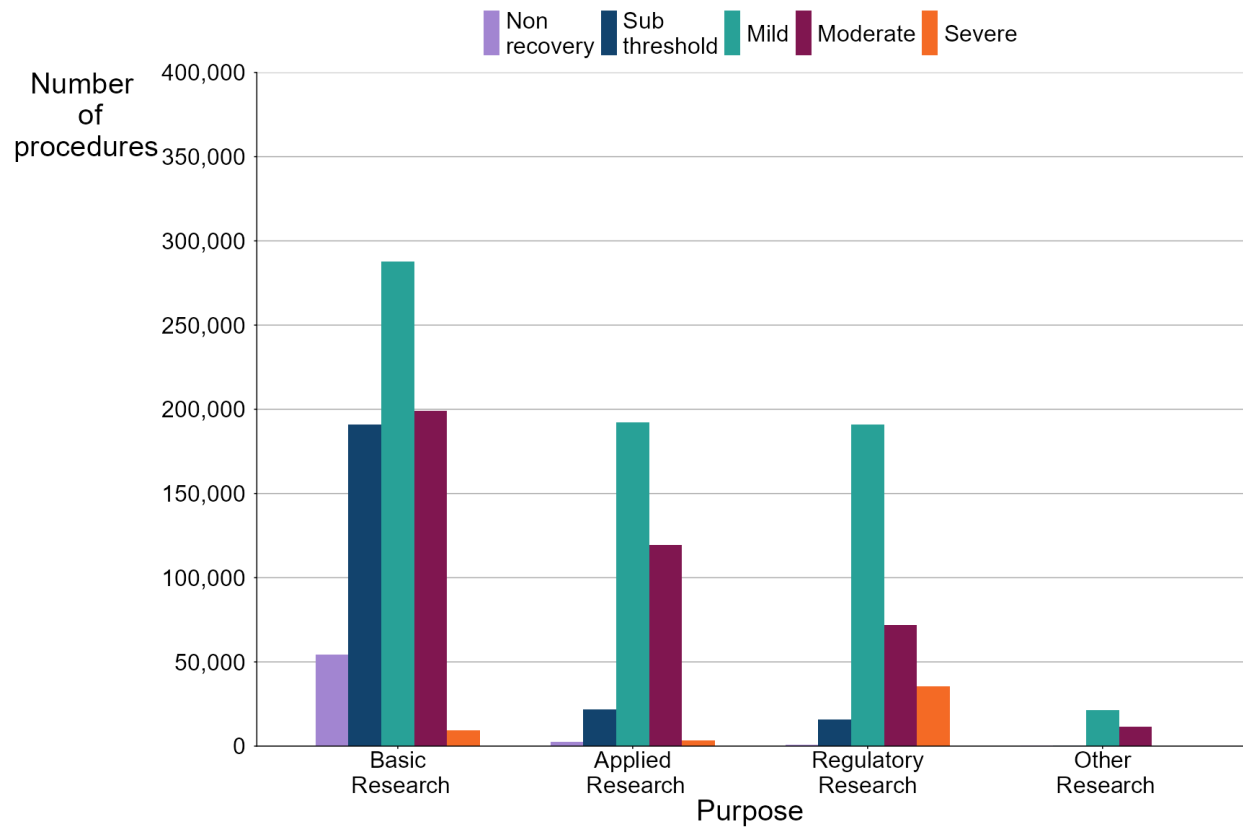
Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 3.1

The proportions of severity assessments for procedures reported were relatively similar from 2014 to 2019, as shown in Figure 11. From 2019 to 2021, the proportion of procedures with a moderate severity decreased to 23%, before increasing in 2022 and reaching 28% in 2024. The proportion of sub-threshold procedures increased from 15% to 16% between 2023 and 2024. Almost half (48%) of the experimental procedures in 2024 were mild, a decrease from 49% in 2023. The proportion of non-recovery assessments for procedures has remained at a similar level (4.1% for 2024 compared with 4.2% for 2023). The proportion of severe remained at 3.4% compared with last year.

- the total number of mild procedures decreased to around 692,000 in 2024 from 712,000 in 2023
- the total number of moderate procedures decreased to around 402,000 in 2024 from 410,000 in 2023
- the total number of sub-threshold procedures increased to around 229,000 in 2024 from 225,000 in 2023
- the total number of non-recovery procedures decreased to around 58,000 in 2024 from 61,000 in 2023
- the total number of severe procedures decreased to around 48,000 in 2024 to 50,000 in 2023

The severity assessment of experimental procedures varies according to the purpose. However, as shown in Figure 12, the most common severity assessment was mild for each purpose of experimental procedure.

Figure 12. Experimental procedures by severity and purpose, 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 3.1

Neuromuscular blocking agents and anaesthesia

Neuromuscular blocking agents (NMBA) are used for muscle relaxation during some types of experimental procedure, such as nerve stimulation under anaesthesia. NMBAs may be used only when given the authority to do so and with an appropriate level of anaesthesia and/or analgesia as determined in the project license.

No use of NMBA was recorded in the 2,746 returns.

Creation and breeding of genetically altered animals

This section covers only procedures performed for the purpose of creation and breeding of GA animals, which is the breeding of animals whose genes have mutated or have been modified and have not been subsequently used in other procedures.

Species

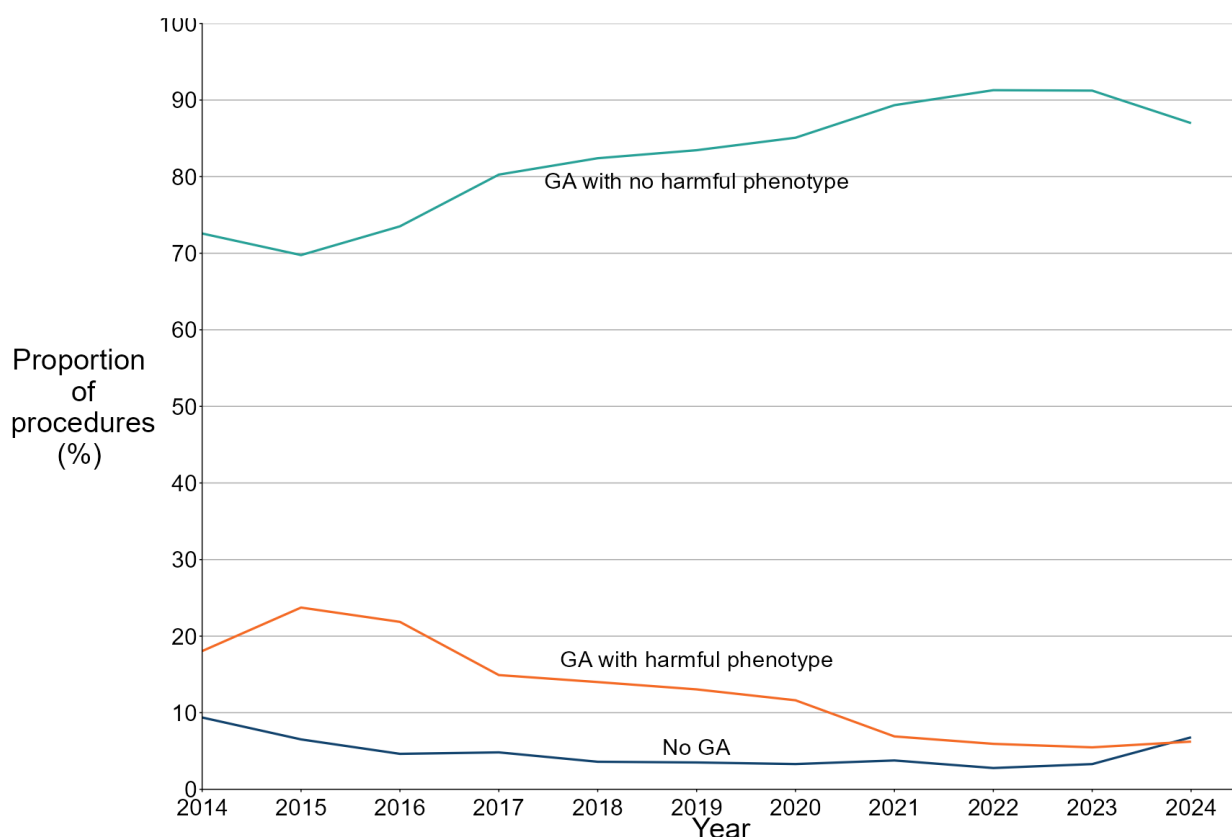
Almost all the procedures for the creation and breeding of GA animals involved mice (87%), fish (13%) or rats (0.4%). The remaining 0.2% of creation and breeding procedures used domestic fowl, amphibians, and opossums (recorded as 'Other mammals').

These percentages may not add up to 100 due to rounding.

Genetic status

Of the 1.21 million procedures for creation and breeding that used GA animals in 2024, 1.05 million (87%) used GA animals with no harmful phenotype (the animals did not appear or behave any differently from non-GA animals).

Figure 13. Creation and breeding of GA animals by genetic alteration type, 2014 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 8

As shown in Figure 13, there has been an increase in the proportion of animals used for creation and breeding that are genetically altered without a harmful phenotype

(increasing from 73% in 2014 to 87% in 2024), although there has been a decrease from 2023 to 2024.

There were some animals that were bred with the intention of producing GA animals, but resulted in non-GA animals being born. In addition, some animals used for the creation of a new genetic line will also have been genetically normal animals (for example, those used for superovulation). In 2024, 7% of procedures for creation and breeding involved non-GA animals.

Purpose

Of the total 1.21 million procedures for the creation and breeding of GA animals, 88% were for the maintenance of already established GA lines, with the remainder for the creation of new lines.

Of the approximate 150,000 procedures for the creation of new GA lines, the majority (89%) were to create new GA lines to be used in basic research. The most common areas within basic research were multisystemic research (about 34,000 breeding procedures), the immune system (about 26,000 breeding procedures) and oncology (about 18,000 breeding procedures).

For data on all purposes for applied research by species, see Tables 8 to 10 of the [data tables](#).

Creation: includes the natural breeding of different strains to produce a new strain, and procedures that use standard techniques such as vasectomy for the generation of novel transgenic or mutant lines of GA animals. The birth of a GA animal counts as creation when the line is new and before it is 'established' (that is, stable and characterised).

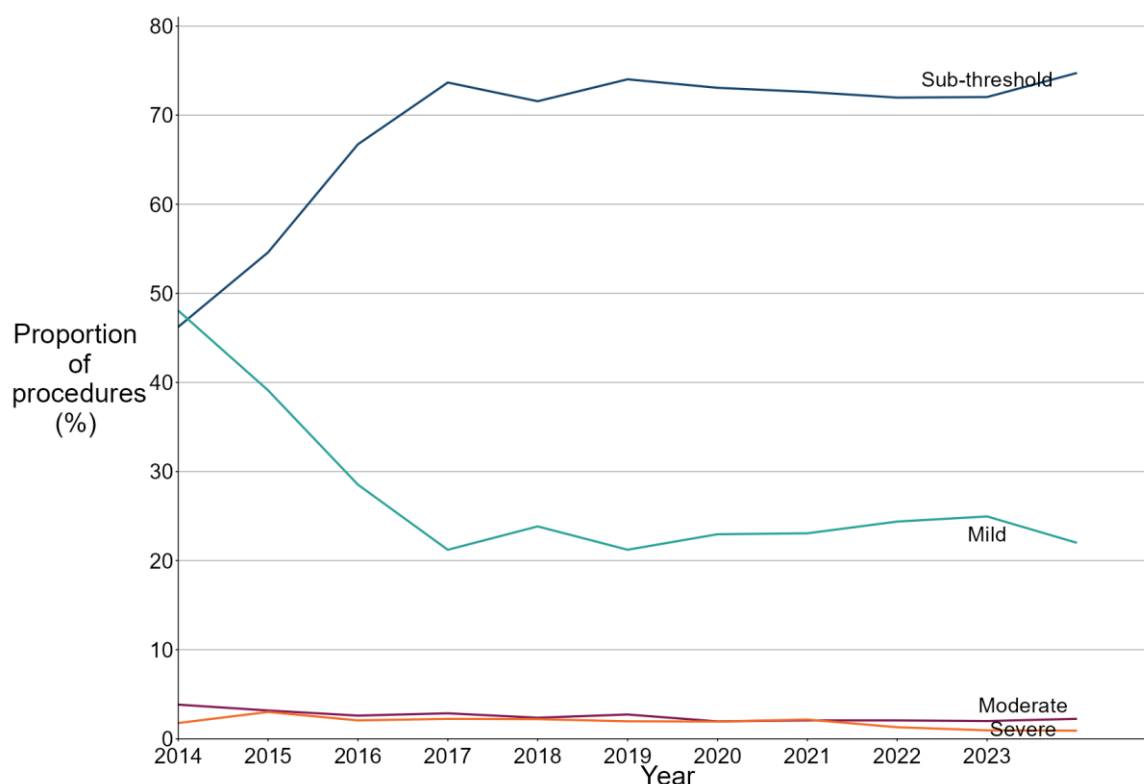
Breeding: the production of GA animals of an established line that has been bred for at least 2 generations. Breeding procedures also include other techniques applied to the animal after birth, such as genotyping, but not any techniques applied as part of an experiment or study.

Severity

Animals in this type of procedure were not used in regulated experimental procedures. As such, the severity experienced by GA animals created and bred are assessed as follows:

- the observable characteristics (phenotype) of the animals, such as development of congenital disease (diseases present at birth) or tumours
- in the case of animals that have no harmful phenotype but which have been biopsied (taking a sample of tissue) specifically for genotyping to determine the genetic makeup of an animal, the biopsy procedures will generally be assessed as mild
- the animals assessed as severe in this category are largely animals within breeding colonies that were found dead and where the death of the animal was either a result of its phenotype or, more commonly, unexplained (all animals found dead are reported as severe unless an informed decision can be made that the animal did not suffer severely prior to death)
- a small number of the animals used to create new lines of GA animals will have been subjected to surgical procedures (classed as moderate) or the injection of drugs (classed as mild)

Figure 14. Creation and breeding of GA animals by severity, 2014 to 2024



Source: Home Office, [Annual Statistics of Scientific Procedures on Living Animals, Great Britain 2024](#): data tables, Table 8

Note: non-recovery values are close to 0% and therefore are not visible in Figure 14.

The severity assessments for creation and breeding in 2024 have remained stable since 2017, where sub-threshold procedures make up the majority (75%) and only 1% of creation and breeding procedures were assessed as severe. Mild procedures accounted for 22%, followed by moderate (2%) and non-recovery (0.1%).

As shown in Figure 14, up until 2017, there was an increase in the proportion of sub-threshold and a decrease in the proportion of mild procedures. This does not reflect a true change in the severity of creation/breeding procedures from 2014 to 2017. Home Office inspectors believe that many creation/breeding procedures initially reported as 'mild' should have been reported as 'sub-threshold'. Therefore, the changing severity assessment profile reflects data suppliers' improved familiarity and understanding of severity assessments. Since 2017, the proportions of sub-threshold and mild have remained relatively stable, although 2024 did see an increase in sub-threshold (from 72% of all procedures to 75%) and mild decreased (from 25% of all procedures to 22%).

Establishment and project licences

All projects and establishments seeking to conduct regulated procedures on living animals must be licensed under [Animals \(Scientific Procedures\) Act 1986 \(ASPA\)](#).

As of 31st December 2024, ASRU licensed and regulated 134 establishments.

These establishments include universities, pharmaceutical companies and contract research laboratories. As of 31st December 2024, there were 2,315 active project licences.

Information regarding establishment type is not collected as part of the return of procedures data used in this publication. Establishment type was previously reported as the result of a separate data collection exercise. The reported establishment type was not an indicator of the type of procedures carried out, and often establishments could be categorised as more than one type.

Revisions

It is standard practice across all Home Office statistical releases to incorporate revisions to previous years' data in the latest release. Corrections and revisions follow the [Home Office's Statement of Compliance](#) with the Code of Practice.

The following table shows the net changes for any revisions or corrections since the previous publication:

What has changed	Number of procedures affected
2023	
Reduction in total procedures	11,819
Reduction in Experimental procedures	10,781
Reduction in Creation/breeding of GA animals	1,038
	12,608
Reduction in Mouse (<i>Mus musculus</i>)	374
Reduction in Zebrafish (<i>Danio rerio</i>)	24
Reduction in Rat (<i>Rattus norvegicus</i>)	11
Reduction in Sheep (<i>Ovis aries</i>)	6
Reduction in Cattle (<i>Bos taurus</i>)	
	1,204
Increase in Other fish (other Pisces)	
	95
Change in country from Scotland to England for Pig (<i>Sus scrofa domesticus</i>)	220
Change in country from Scotland to England for <i>Xenopus</i> (<i>laevis</i> and <i>tropicalis</i>)	
2022	
Reduction in total procedures	3,864
Reduction in Experimental procedures	4,976
Increase in Creation/breeding of GA animals	1,112
	3,813
Reduction in Mouse (<i>Mus musculus</i>)	142
Reduction in Other carnivore (other Carnivora)	67
Reduction in Cattle (<i>Bos taurus</i>)	16
	142
Increase in Rat (<i>Rattus norvegicus</i>)	
Increase in Other mammal (other Mammalia)	95
	34
Change in country from Scotland to England for Pig (<i>Sus scrofa domesticus</i>)	

What has changed	Number of procedures affected
Change in country from Scotland to England for <i>Xenopus</i> (<i>laevis</i> and <i>tropicalis</i>)	
2021	
Reduction in total procedures	3,703
Reduction in Experimental procedures	4,322
Increase in Creation/breeding of GA animals	619
	2,979
Reduction in Mouse (<i>Mus musculus</i>)	724
Reduction in Rat (<i>Rattus norvegicus</i>)	
	74
Change in country from Scotland to England for Pig (<i>Sus scrofa domesticus</i>)	
	1,465
Zebrafish (<i>Danio rerio</i>) change in severity from Non-recovery to Sub-threshold	
2020	
Mouse (<i>Mus musculus</i>) change in severity from severe to mild	10

There are several reasons why counts of procedures may change between years, including amendments following a retrospective assessment or other intervention by an inspector, or self-reported corrections by project licence holders. It is an offence for a project licence holder to provide information they know to be false or misleading. Some changes summarised above will be a combination of small increases and/or decreases across multiple projects.

Further information on the data source used for this publication, and the revisions and corrections policy, are available in the [user guide](#).

The majority of the reduction in Mouse procedures across 2023 to 2021 was from one licence holder where an error was made in the original submission, identified by a Home Office inspector and rectified for this publication. Some minor revisions were made by other licence holders, which have also contributed to this reduction.

The 2023 increase in Other fish was identified by a licence holder to have been missed from their original submission.

The change in country for Pig and *Xenopus* procedures across 2023 and 2021 is due to a licence holder transferring from an establishment in Scotland to England.

The 2021 change in Zebrafish severity was identified during an establishment's internal review.

Further information

The data for 2024 used in this release were extracted on 9th September 2025.

Frequency of release: Annual

Forthcoming release: [Home Office statistics release calendar](#)

Home Office responsible statistician: Sebastian Mansley

This report contains statistics on regulated scientific procedures performed using living animals under the [Animals \(Scientific Procedures\) Act 1986 \(ASPA\)](#).

Accompanying user guide

See the accompanying [user guide](#) for information including:

- background information on the data collection
- uses of the statistics, and links to related statistics
- details on methodology and data quality issues

Data quality

The UK Statistics Authority has designated these statistics as Accredited Official Statistics, in accordance with the Statistics and Registration Service Act 2007, signifying compliance with the [Code of Practice for Statistics](#).

Accredited Official Statistics status

Accredited Official Statistics means our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

The designation of these statistics as Accredited Official Statistics was confirmed in 2023, following a compliance check by the [Office for Statistics Regulation](#). The statistics last underwent a full assessment of compliance against the Code of Practice in 2012. More information is available in the [user guide](#).

Changes in legislation and definitions

Prior to 1986, figures were recorded for the number of ‘experiments’ on living animals, under the Cruelty to Animals Act 1876. In 1986, the Animals (Scientific Procedures) Act (ASPA) was introduced, and required all ‘scientific procedures’ to be recorded. This new, broader term largely explains the increase in figures directly after 1986 (see Figure 1).

At the beginning of 2013, an EU Directive (2010/63/EU) came into effect, and as a result changed how data were collected under UK law from 2014 onwards. All figures for procedures (1986 onwards) are comparable as the definition of a procedure is unchanged. As a result of the change in methodology, the 2014 data are subject to data quality issues (see the [user guide](#) for further information).

Additional statistics for animal use in Great Britain

The annual statistics release covers regulated procedures on living animals under ASPA. This comprises procedures carried out using animals for experimental purposes, and procedures counted under creation/breeding of genetically altered (GA) animals (that is, the use of GA animals to create offspring for use in experimental procedures). The use of non-GA animals for breeding, to produce non-GA offspring for use in experimental procedures, is covered under the 1986 Act but is not included in the annual statistics. The annual statistics also do not include the use of other animals 'used' specifically in the support of the production and use of animals in experimental procedures or, for example, sentinel animals for the monitoring of disease within the facilities. These data on [breeding and genotyping of animals for 2017](#) was published by the Home Office in November 2018 on GOV.UK.

Other information on animal use

The Animals in Science Regulation Unit (ASRU) releases an annual report describing their role and performance in regulating work under ASPA.

ASRU also publishes non-technical summaries of projects granted under ASPA. Publication of non-technical summaries is a legal requirement under ASPA. They are a statement, in non-technical language, of the proposed programme of work and state the objectives, predicted harm, benefits of the programme and the number and types of animals to be used in the programme. They also demonstrate that the proposed programme of work will be carried out in compliance with the principles of replacement, reduction and refinement. The non-technical summaries of projects granted by ASRU include those that should be retrospectively assessed.

ASRU's publications are available on [GOV.UK](#).

Figures for Northern Ireland are reported annually in the [Statistics of Scientific Procedures on Living Animals, Northern Ireland](#).

Cross-government ownership of animals in scientific procedures policy

The annual statistics on regulated procedures on living animals are released by the Home Office; however, policies and legislation that influence the number and type of procedures are the responsibility of different government departments. The table below outlines organisations and their areas of responsibility.

Department	Areas of responsibility
Home Office	Policy and regulation of the use of animals in science under ASPA, including licensing and compliance
Department for Science, Innovation and Technology	Policy on the development and validation of alternatives that cause less harm or do not use animals (under ASPA Section 20B); government funding for alternatives (through UK Research and Innovation (UKRI) and the National Centre for the 3Rs (NC3Rs)); basic research; applied research; strategic support to the life sciences sector to promote research
Department for Environment, Food & Rural Affairs	Protection of the natural environment; chemical regulation (REACH); precision breeding; animal welfare (excluding ASPA) and sentience, health and preservation of species; veterinary medicine
Department for Health and Social Care	Medicines and healthcare products policy and regulation; Higher Education or training (primarily training for surgeons)
Department for Business and Trade	Consumer product safety, including regulation of cosmetics
Food Standards Agency	Food safety regulation

Feedback and enquiries

Home Office statisticians welcome feedback on the annual statistics release. If you have any feedback or enquiries about this publication, please contact the Statistical Transformation Team, the Home Office Unit that produced the statistics.

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