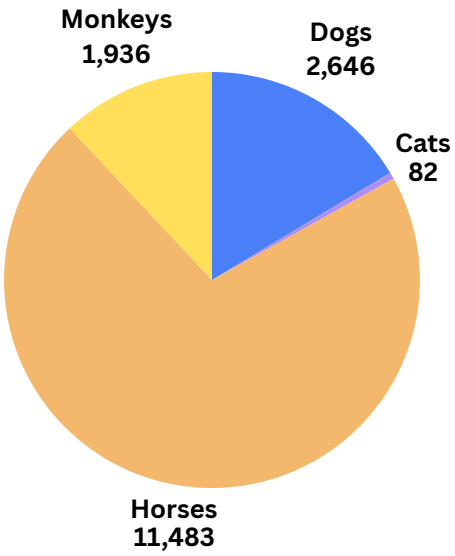
Animal Testing: MYTH vs FACT

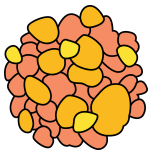
2024 Statistics on Specially Protected Animals



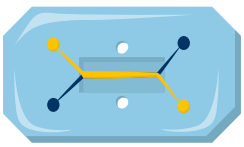
- **2.64 million** scientific procedures involving animals took place in 2024
- **16,147 animal tests** were carried out on specially protected animals, including **cats, dogs, horses, and monkeys** (non-human primates), see pie chart.
- **99% of the cynomolgus monkeys** used in these tests were **brought from Africa or Asia**, meaning they had to go through long journeys that would have caused them extra stress.
- **250 tests** were the **Forced Swim Test**, an old test first created in the 1970s. In this test, mice are placed in a container of water that they cannot escape from. Scientists have evidence that this test is **not a useful way to study depression** and **does not reliably predict** whether new antidepressant medicines will be safe and effective for people.
- **2,698 scientific procedures** involving guinea pigs in 2024
- **48,224 tests** were reported to cause **"severe" suffering** to animals. This was only a 3.8% decrease compared with 2023.

MYTH : There are no alternatives to animal testing

FACT : There are several alternative technologies that are effective at saving humans and do not involve animals (examples below)

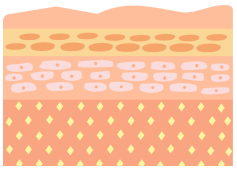


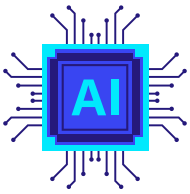
Organoids (Mini-Organs): Scientists can grow tiny versions of human organs, called **organoids**, from human stem cells. These mini-organs can behave like parts of the brain, liver, heart, lungs or intestines. These “mini-organs” can be developed from a patient’s own cells, allowing scientists to identify the cause of a patient’s disease directly. These "mini-organs" are transforming the way scientists study disease and develop new medicines. In the University of Glasgow, scientists have developed a 3D bone marrow model to study blood cancer (leukaemia) treatments.



Organs-on-Chips: An **organ-on-a-chip** is a small device, about the size of a USB stick, that contains living human cells. Tiny channels inside the chip allow nutrients and fluids to flow through it, just like blood flows through our bodies. Scientists can build chips that behave like the liver, lungs, heart, kidneys or brain. These chips help researchers see how medicines affect human organs. One study found that a Liver-Chip **correctly identified 87% of medicines** that caused liver damage in people. Many of these medicines had appeared safe in animal tests but caused liver damage in humans. Animal tests have been reported to identify only around 40-60% of these medicines. Think of what scientists are missing by continuing animal tests. Scientists can even connect multiple organs-on-chips to create a human-on-a-chip!

3D Human Tissues: Scientists can grow 3D human tissues in the laboratory using human cells. These tissues look and behave like real human skin, eyes and other organs. Today, 3D human skin and eye models are already used around the world to test the safety of chemicals, replacing animal tests. For example, **XCellR8**, a UK laboratory, uses **human cell and tissue models** (completely animal-free) to test the safety of chemicals and cosmetic ingredients. Their tests meet internationally recognised standards and are accepted worldwide.





Artificial Intelligence (AI) and Computer Models: Scientists can use **AI** to help discover new medicines. AI can analyse **millions of pieces of information** much faster than humans, helping scientists predict whether a new medicine is likely to work or cause harmful side effects before it is tested in people. For example, in 2018, scientists developed an AI system called **RASAR**. After learning from information on more than **10,000 chemicals**, it correctly predicted harmful effects, such as **skin and eye irritation**, **89% of the time**. Traditional animal tests predicted these harmful effects only about 69% of the time. This shows how AI can help scientists make fast and accurate predictions and end harmful animal testing.

MYTH : We have to choose between saving people from disease or protecting animals from testing

FACT : Scientists can develop medicines using technologies that do not use animals, that are effective and save human lives

This question is commonly used by animal testers, “would you sacrifice your dog to save your mother from disease?”. It is very important to know that this argument is not real. Scientists do not have to choose between saving humans and protecting animals.

Did you know that around 95% of medicines that appear safe and effective in animals fail when they reach humans? That is an extremely high failure rate, some diseases have an even higher failure rate, and that means thousands of animals are tortured for each medicine tested. Take cancer for example, they have an average failure rate of 96% - mice have been given cancer and cured of it for decades, human patients are still waiting for a cure. 99% of Alzheimer’s drugs fail in humans. Over 1,000 medicines to treat stroke were tested successfully in mice, none have cured stroke in humans.

Decades of animal torture and suffering, and no cure for humans - it is time to adopt non-animal technologies that are relevant to human biology that can save humans and stop animal testing.

MYTH : We need animals to find a cure for cancer

FACT : Scientists are already using human-based technologies (that do not involve animals) to revolutionise cancer treatment.

For many years, scientists have used mice to study cancer. However, around **96% of cancer medicines** that appear successful in animals **fail in human clinical trials**.

Today, scientists can grow **mini-tumours**, called **tumour organoids**, using cancer cells donated by patients. These tiny models behave much like a patient's own tumour, allowing researchers to study the disease directly and test which medicines are most likely to work for that individual. This is helping move medicine towards **personalised cancer treatment**.

Scientists are also developing **tumour-on-a-chip** technology. These small devices contain living human cancer cells and recreate the environment around a tumour, including blood vessels and immune cells. This allows researchers to watch how cancers grow, spread and respond to new medicines using **human biology rather than animal biology**.

Around the world, many biotechnology companies are now developing organoids for diseases including **cancer, Parkinson's disease, Alzheimer's disease, cystic fibrosis, liver disease, kidney disease and rare genetic conditions**. These technologies are helping scientists study **human diseases directly**, making research more relevant to patients.

World's First Drug Approval in Cancer Medicine

An exciting breakthrough came when the U.S. Food and Drug Administration (FDA) accepted the first-ever application to begin testing a new cancer medicine in people using human vascularised organoids (mini human tissues with their own tiny blood vessels), without relying on animal studies to show that the medicine worked. The medicine has now progressed to human clinical trials. This is an important milestone because it is the first time the FDA has accepted a cancer drug application supported solely by non-animal methods instead of animal testing. It shows that human-based technologies are replacing animal experiments in the development of new medicines.

> ***"An obvious truth that is either being ignored or going unaddressed in cancer research is that mouse models do not mimic human disease well and are essentially worthless for drug development."***
>
> **— Azra Raza, Professor of Medicine and Director of the MDS Centre, Columbia University, New York, 2014**

MYTH : Scientists only need a few animals to develop a new medicine

FACT : Developing a new medicine can require hundreds or even thousands of animals

Developing a new medicine usually involves hundreds or even thousands of animals, not just one or two. Scientists may use mice, rats, rabbits, dogs, monkeys, fish and other species during different stages of research. Each study often requires many animals and experiments, that are painful and invasive, are repeated. Because so many animals are used, an estimated 200 million animals are involved in testing around the world every year.

MYTH : Animal testing would have stopped by now if it wasn't working

FACT : Animal testing continues because it has always been traditionally used, but it is not effective and it does not predict whether a medicine will save human lives

Most funding for medical research is traditionally directed towards animal experiments. Testing of a new medicine, can take 10-15 years and cost $1-3 billion US dollars. Think about how many people are employed to test for a new medicine which has such a staggeringly high failure rate. That is thousands of animals who are tortured, and failed medicines which never save a human being.

Scientists estimate that replacing animal tests with accurate human-based (non-animal) technologies, such as **organs-on-chips**, could save **more than $24 billion dollars overall** by making medicine development fast and efficient - saving human and animal lives.

MYTH : Scientists could just end testing on large animals such as dogs, cats, monkeys and only test on rats or mice

FACT : Current government guidelines for testing new medicines require data from two animal species before it is given to humans. The first species is either a rat or a mouse, the second species is a large mammal, usually either a dog or a monkey

As you have read in this factsheet, mice are not very good at predicting human diseases!

MYTH : Animals are so similar to humans, so they must be good at testing for human diseases

FACT : Animals and humans share similarities, but they are not biologically the same. Even small differences in our bodies can change how diseases develop and how medicines work

A medicine that is safe for one species may be harmful to another. For example, chocolate is safe for people but poisonous to dogs, while some medicines used safely in animals can be dangerous for humans. Chimpanzees share about 99% of their DNA with humans but do not suffer the same diseases as us, such as AIDS, hepatitus B or common malaria. This shows that even very closely related species can have important biological differences and respond differently to diseases and medicines.

Can biological differences between animals and humans be dangerous?

Yes. Because animals and humans are different species, they can respond very differently to the same medicine. This means animal tests can sometimes produce false results. Sometimes a medicine appears safe in animals but causes serious harm in people. For example:

- **Thalidomide was tested in more than 10 animal species, including monkeys, but caused severe birth defects in around 30,000 babies.**
- **Vioxx appeared safe in animal studies but was later linked to an estimated 140,000 heart attacks and strokes in patients.**
- **TGN1412 was found to be safe in monkeys, yet six healthy volunteers became critically ill after receiving a tiny dose during a clinical trial.**

Animal tests can also make a medicine appear dangerous, even when it could help people. This may lead researchers to abandon treatments that might have saved lives. Examples include:

- **Penicillin, which is toxic to guinea pigs.**
- **Paracetamol, which is toxic to dogs and cats.**
- **Aspirin, which causes toxic effects in some animals.**

MYTH : The law says every new medicine must be tested on animals

FACT : In the United Kingdom, there is no law that says every new medicine must be tested on animals

Traditionally, medical organisations in the UK has always **expected** animal testing, not **needed** animal testing - that is an important difference. In the United States, the **FDA Modernization Act 2.0** (a law passed in 2022) removed the expectation of animal testing to develop new medicines before it is given to humans. The law now allows scientists to use non-animal alternatives, such as organs-on-chips, organoids and computer models.

MYTH : Animals can be tested for veterinary medications

FACT : Even within the same species, medicines do not affect everyone in the same way

Not all dogs respond to medicines in the same way. Greyhounds have differences in their liver that mean they break down some medicines more slowly than other dogs. This shows that even animals of the same species can respond differently to the same medicine. Humans are even more biologically different from animals, which is one reason scientists are studying human biology directly.

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Follow us on social media @MedicineWithoutCruelty, visit www.medicinewithoutcruelty.com, and sign up for our Stop & Use Non-Animal Methods (SUN) courses.

Would your school like to hear from a young campaigner? Isabelle Keane (11) is an inspiring young advocate for ending animal testing and Patron of Camp Beagle. If you or your school would like to arrange a talk or online Q&A with Isabelle, please ask your teacher or parent to contact @KirstyKeane (Isabelle's mom) on Instagram.