

ANIMAL USE IN SWISS RESEARCH:

A LOOK AT SEVERITY

GLOSSARY

What are severity degrees?

In animal experiments in Switzerland four degrees of severity are distinguished, measuring the level of constraint.

SD0 No constraint

SD1 Slight constraint

SD2 Moderate constraint

SD3 Severe constraint

For more information [> CLICK HERE](#)

What is an animal use?

We use the term “animal use” as opposed to “number of animals used” because a single animal might be used for multiple uses. Each “animal use” corresponds to one data point with a given severity degree.

WHY STUDY ANIMAL USE IN RELATION TO SEVERITY?

Understanding how animals are used in Swiss research is crucial for improving animal welfare.

By analysing the distribution of animal uses and their severity classification, we can help identify trends and factors that influence the levels of constraint animals face in experiments.

Understanding where and why high severity uses occur is the basis for better and more targeted 3Rs measures that pave the way for more humane research practices.

WHAT THIS REPORT PRESENTS:

- The changes in constraint on animals over the 27 years of publicly available data.
- The breakdowns of these changes across species and research areas.
- The constraint characterizing individual studies in recent years (i.e., the severity degrees of uses within individual studies).

FINDINGS:

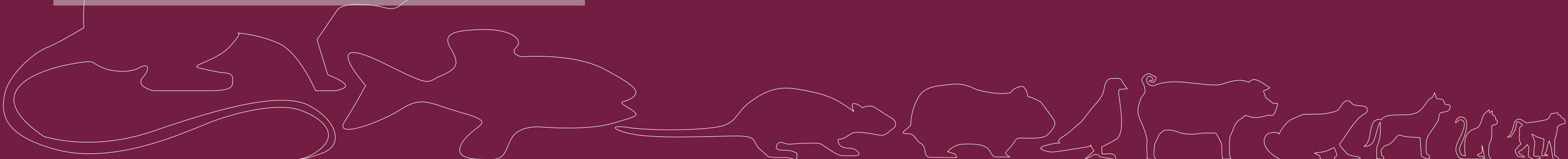
In the past 27 years, the number of animal uses in Switzerland was around 630 000 per year with no consistent pattern of increase or decrease.

Over the past 10 years, the number of animal uses with higher levels of burden (severity degrees 2 and 3) has shown a small and consistent increase.

The increase in the number of animals experiencing higher levels of burden in the past 10 years can be tracked to the increased use of mice in research. Growing research on severe human diseases that rely on mouse models is a key factor in this increase.

In several other species in contrast, both the number of animal uses and their overall burden have decreased over the last 27 years. In primates, monkeys, cats and dogs, uses in the most severe classification (severe degree of burden) in Switzerland have drastically decreased and have been rare in recent years.

It is frequent for the animal uses occurring under a single license to be of different burdens and 56% of all studies span more than one severity degree (none, slight, moderate and severe).



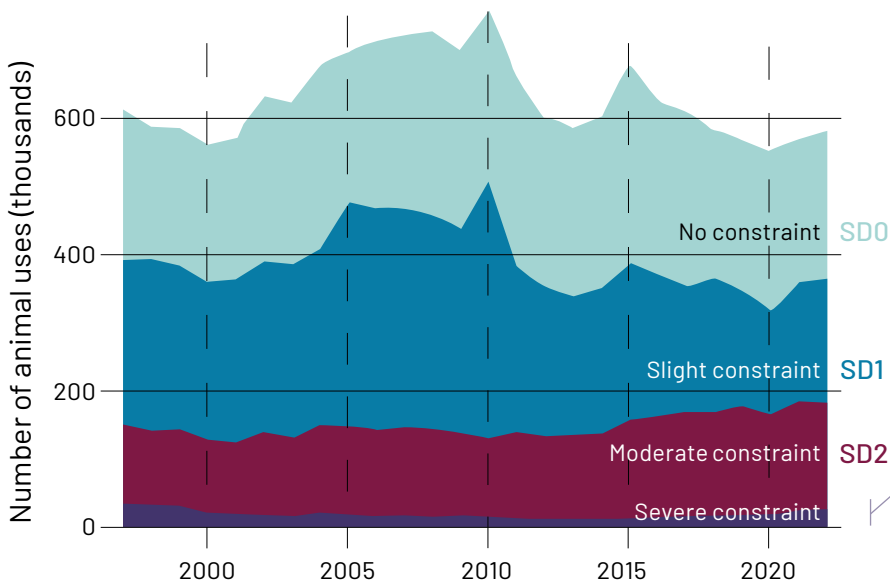
HIGH SEVERITY OF ANIMAL USE IN RESEARCH OVER THE PAST 27 YEARS

TOTAL NUMBER OF ANIMAL USES BY SEVERITY

The total number of animal uses has been around 630K per year with no consistent upward or downward pattern.

Over the last decade, the number of uses with moderate and severe burdens (SD2 and SD3) has increased slowly but consistently.

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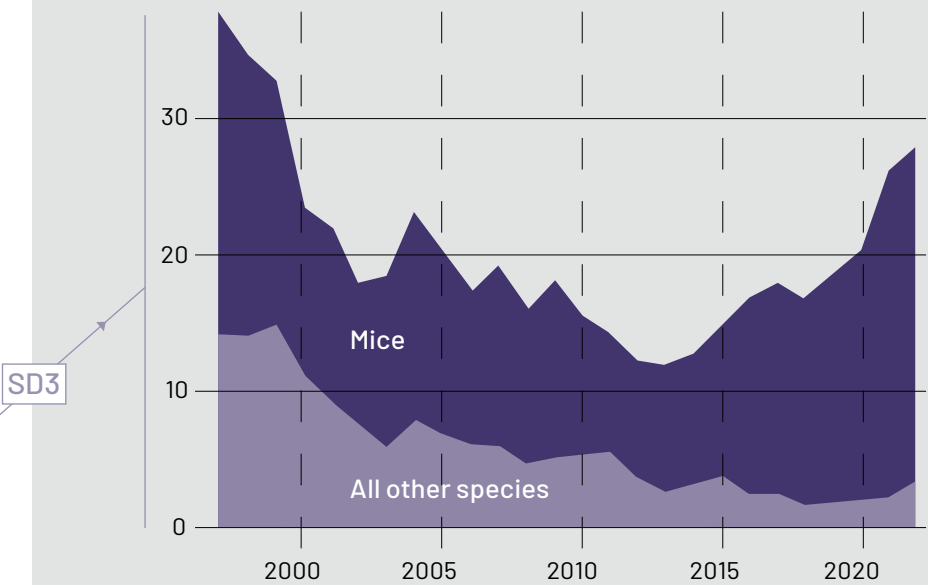
ANIMAL USES WITH HIGHEST BURDEN (SD3) BY SPECIES

Over the past 27 years, there were on average 19'800 animal uses per year in the highest constraint category (severity degree SD3).

After a nearly threefold decrease from 1997 to 2013, the number of uses in SD3 reversed trend in 2012 and has increased since.

The increase reflects a steady increase of uses of mice in SD3. In contrast, SD3 uses in other species have declined.

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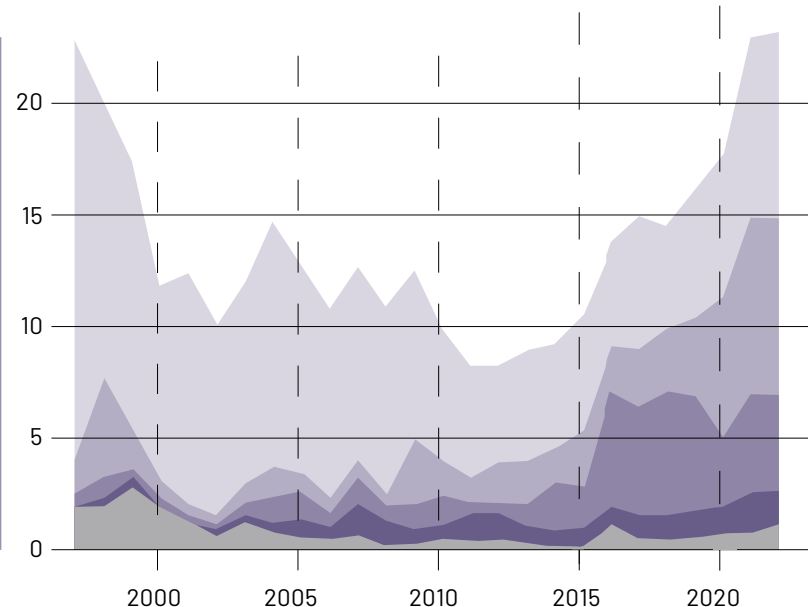


MICE USED IN SD3 BY DISEASE STUDIED

The fields of oncology and neurology are two key contributors to the overall increase in SD3 uses of mice over the last ten years.

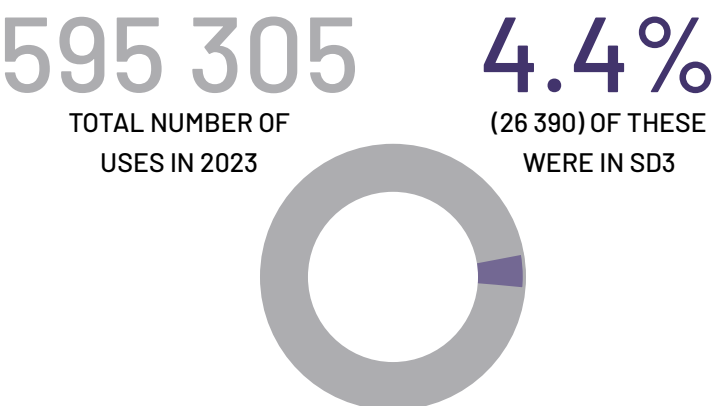
Finer classifications of purposes and diseases are needed to identify specific drivers, in particular in the category that groups all other human diseases.

CLICK HERE FOR MORE INFORMATION

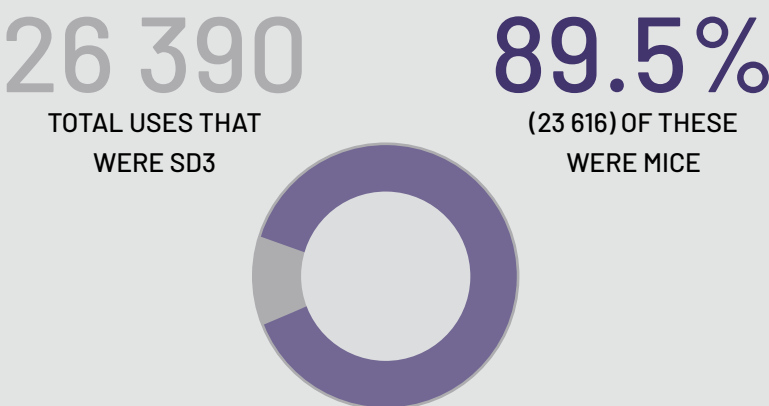


BREAKDOWN IN 2023

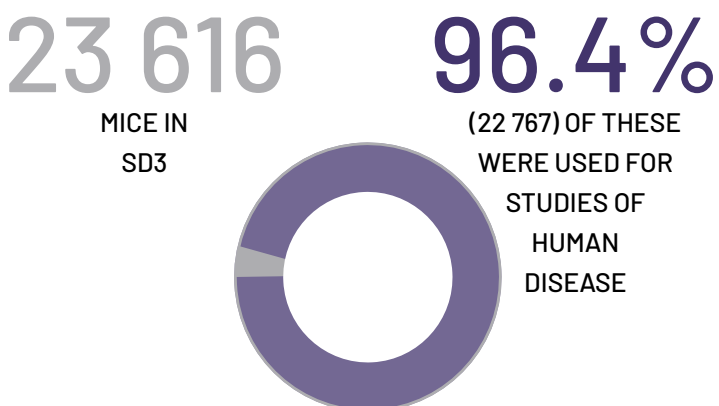
PROPORTION BY SD



SD3 BY SPECIES



SD3 IN MICE BY PURPOSE

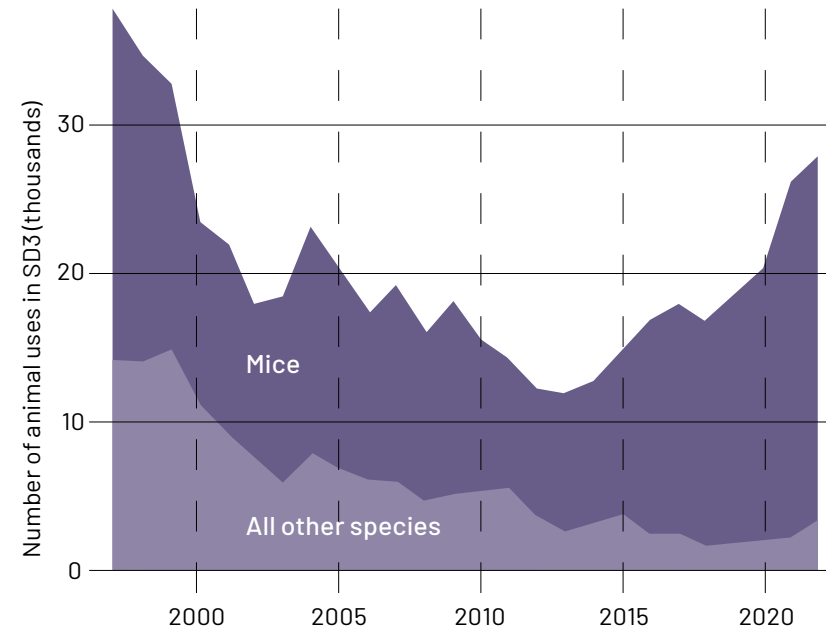


CONTRASTING COUNT AND SEVERITY TRENDS ACROSS SPECIES

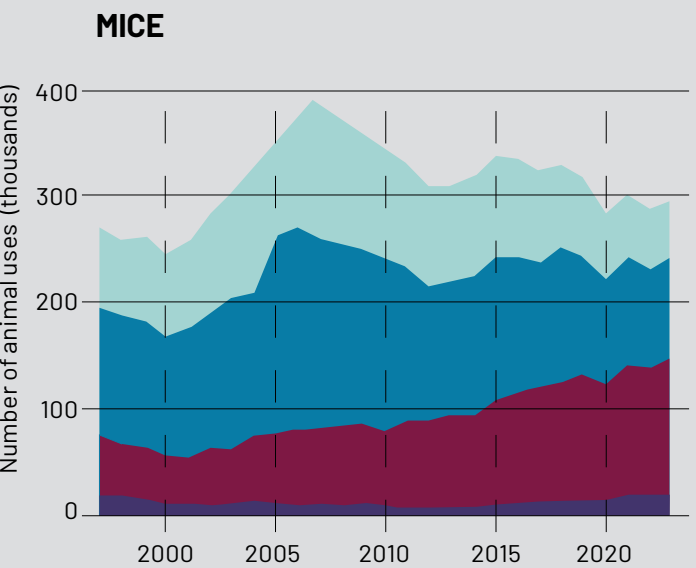
The breakdown of animal uses in the SD3 category by species reveals contrasting patterns for mice and for all other species.

Uses of mice in SD3 have increased over the last 10 years, more than offsetting the decrease in all other species combined. The number of mice uses has also increased steadily in the second highest burden category (SD2) for over two decades. Note that in recent years, this increase in SD3 is amplified in the data by the adoption in 2018 of new guidelines which lowered the threshold of burden for SD3 classification.

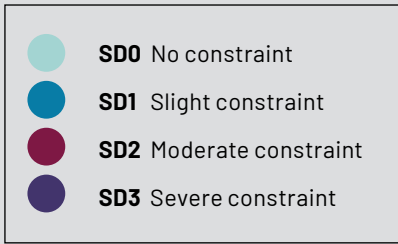
In contrast to mice, the total numbers of SD3 uses in primates, cats and dogs, rats, and other rodents have drastically decreased alongside a reduction in severity. The most burdening experiments (SD3) almost entirely disappeared. A similar pattern is visible in SD2 and other lower categories meaning the decrease in use counts and burden is a general pattern in these key species.



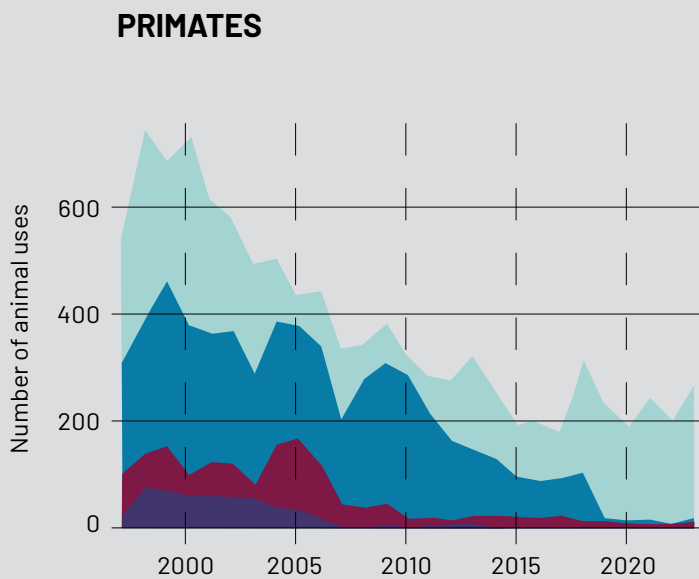
Persistent trend towards higher severity uses in mice despite fluctuations in total number of uses.



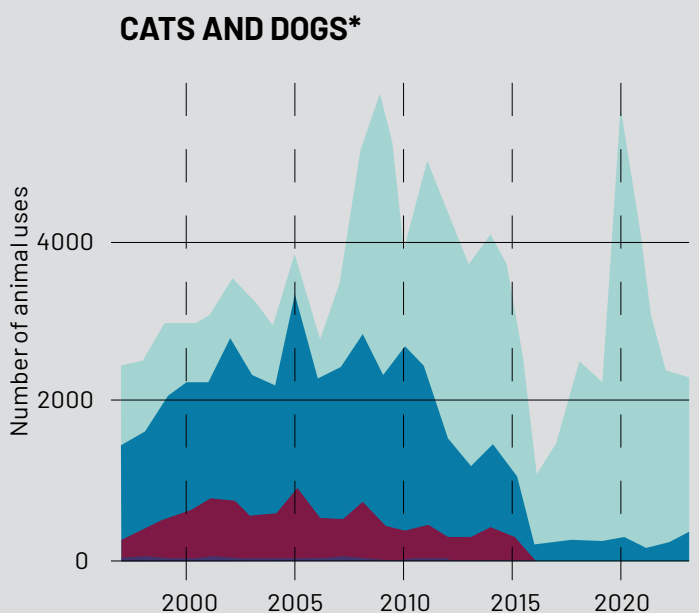
+33 %
IN USES IN SD1, SD2 OR SD3
BETWEEN 2000 AND 2020



Drastic reduction in number of uses and constraint for primates, cats, dogs, rats and other rodents.



-96 %
IN USES IN SD1, SD2 OR SD3
BETWEEN 2000 AND 2020

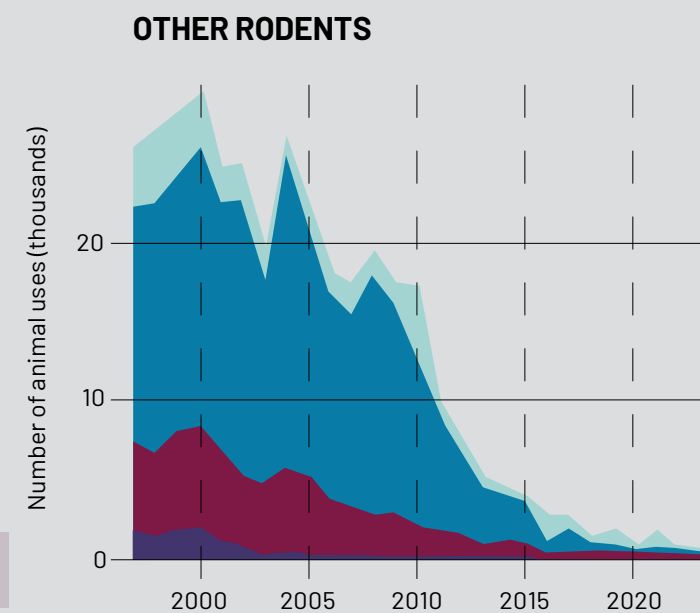


- 85 %
IN USES IN SD1, SD2 OR SD3
BETWEEN 2000 AND 2020

A report on the puposes of uses of cats and dogs is forthcoming.



-86 %
IN USES IN SD1, SD2 OR SD3
BETWEEN 2000 AND 2020



-97 %
IN USES IN SD1, SD2 OR SD3
BETWEEN 2000 AND 2020

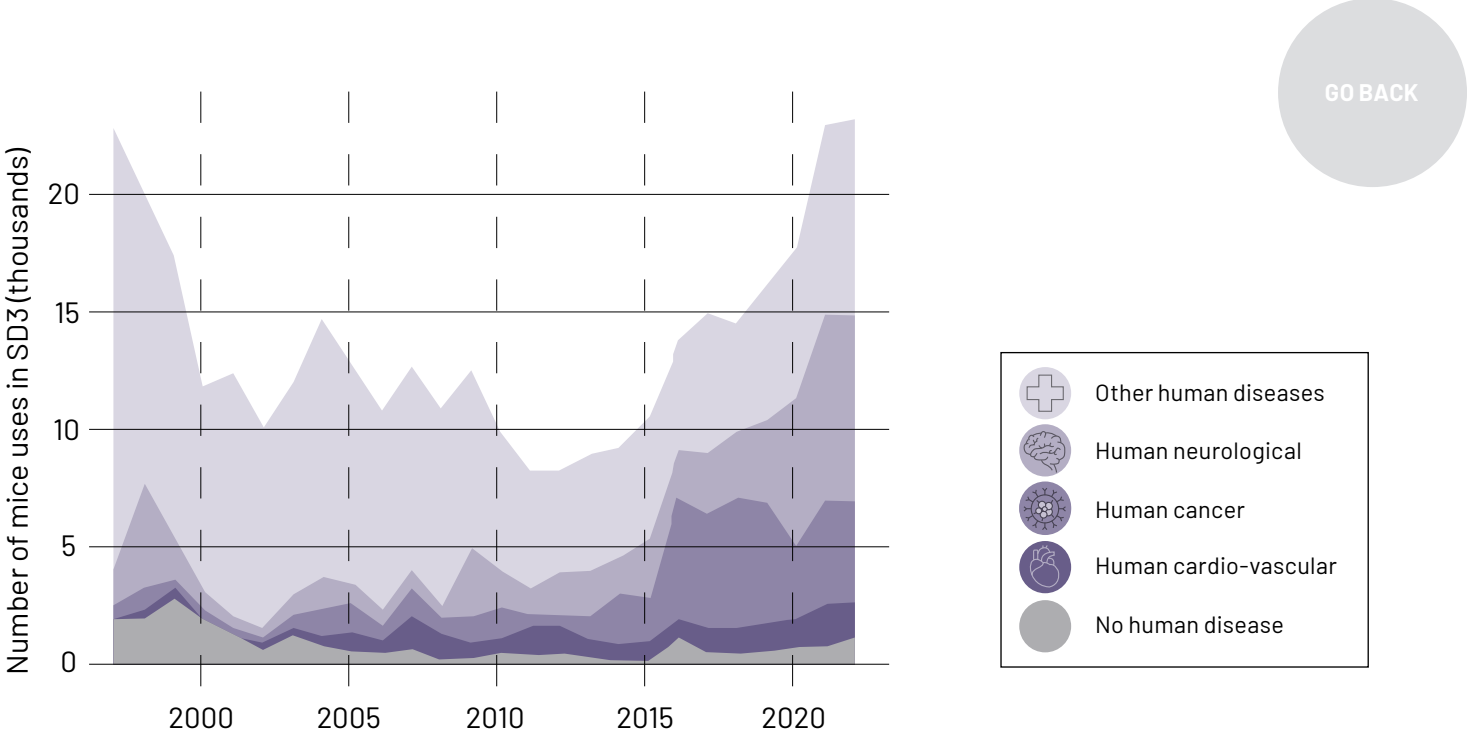
STUDIES OF HUMAN DISEASE IN MICE DRIVE INCREASED SEVERITY

The fields of oncology and neurology are two key contributors to the overall increase in SD3 uses of mice over the last ten years.

These fields also contribute to the increase in SD2 uses in mice. Cancer research is where the number of uses in SD2 has increased the fastest over the last 27 years.

While disease studies in neurology and the category “other diseases” show a consistent decrease in the total number of animal uses over the past 15 years, a simultaneous increase in the proportion of higher severity degrees results in an increase in animal uses in the two highest severity degrees.

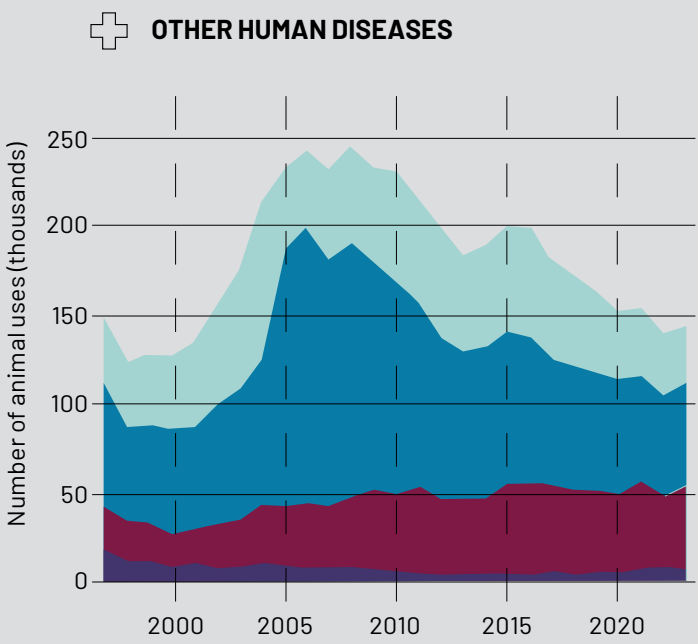
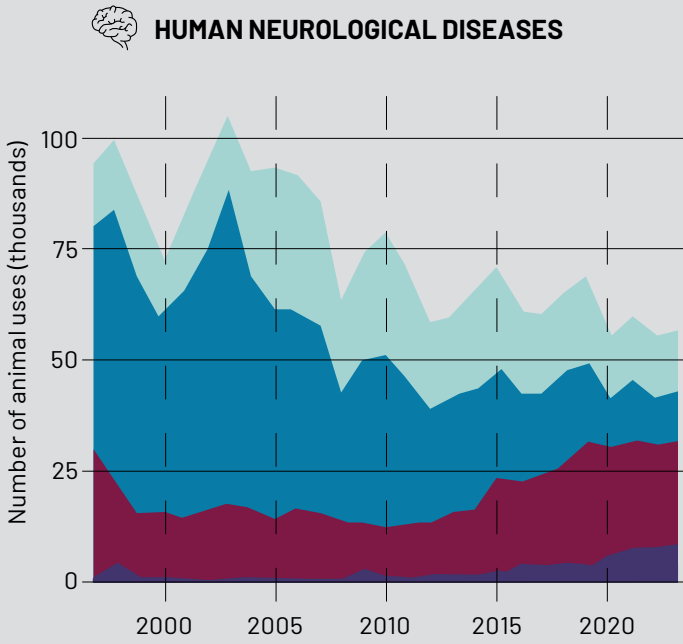
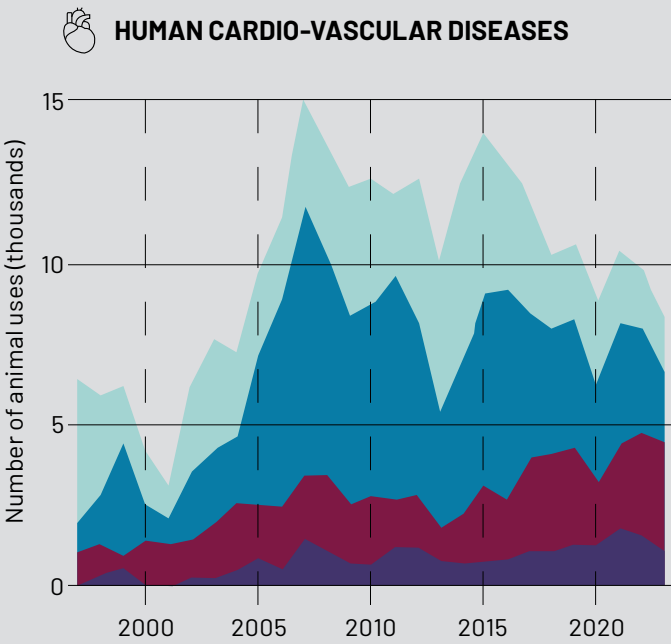
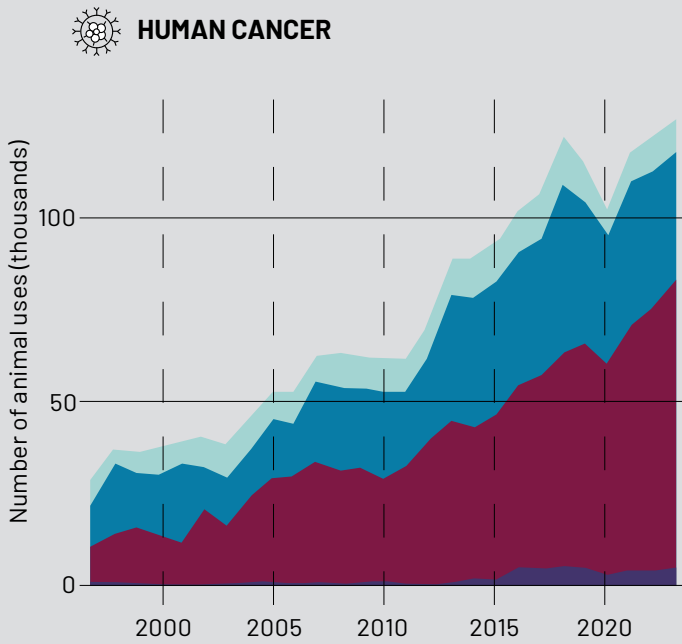
Finer classifications of purposes and diseases are needed to identify specific drivers, in particular in the category “other diseases” in which all other human diseases are grouped.



GO BACK

Studies on cancer and cardio-vascular diseases increased the use of mice in total and in higher severity degrees (SD2 and SD3).

In neurology and other diseases, the number of animal uses consistently decreased over the past 15 years but with an increasing proportion of higher severity degrees (SD2 and SD3).



- SD0 No constraint
- SD1 Slight constraint
- SD2 Moderate constraint
- SD3 Severe constraint

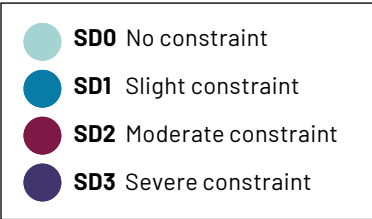
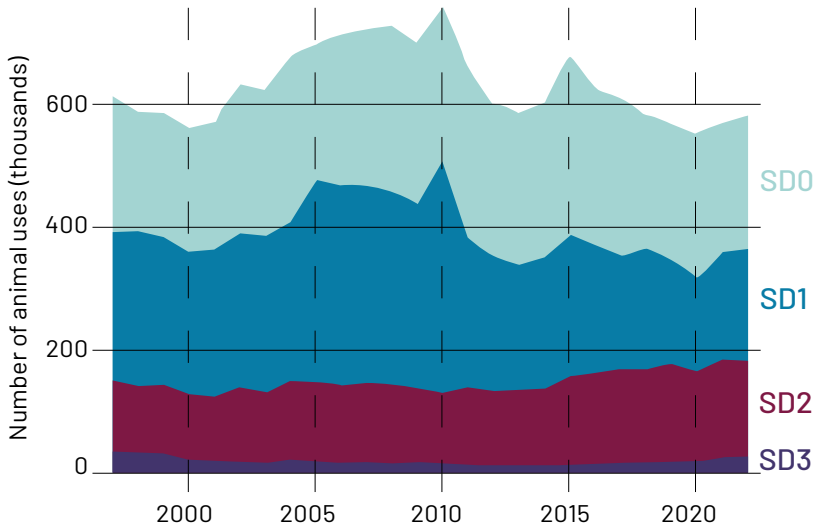
Mixed trends are observed in licenses related to animal diseases or with no link to a disease. The graphs for all disease are provided in the supplemental information available [CLICK HERE](#).

INDIVIDUAL STUDIES OFTEN SPAN ACROSS SEVERITY DEGREES

To improve our understanding of the drivers of severity in animal uses in research, it is useful to consider how these uses occur within individual licences. Whether SD3 uses occur in a few small studies with only SD3 uses or across a larger number of studies that include many uses in other categories determines the best strategies for implementation of 3Rs.

The 630K annual uses are in fact distributed among around 2 000 licenses which often involve animal uses of various constraint. The combination different severity degrees is consistent with how dose-response studies to test safety of a compound are conducted, or with studies comparing a genetically altered animal to a wild type.

According to the published data for expired licenses for the last few years (2021-2024), 56% of all studies span more than one severity degree. 23% of all studies had at least one SD3 use. Among studies with SD3, most studies (70%) had less than 20% of the animals subject to SD3.

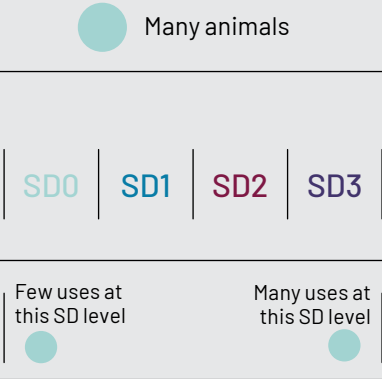


MAPPING SEVERITY DEGREES WITHIN INDIVIDUAL STUDIES

In this figure, **each study** is represented by **one bubble** with an area proportional to the number of animal uses in the study.

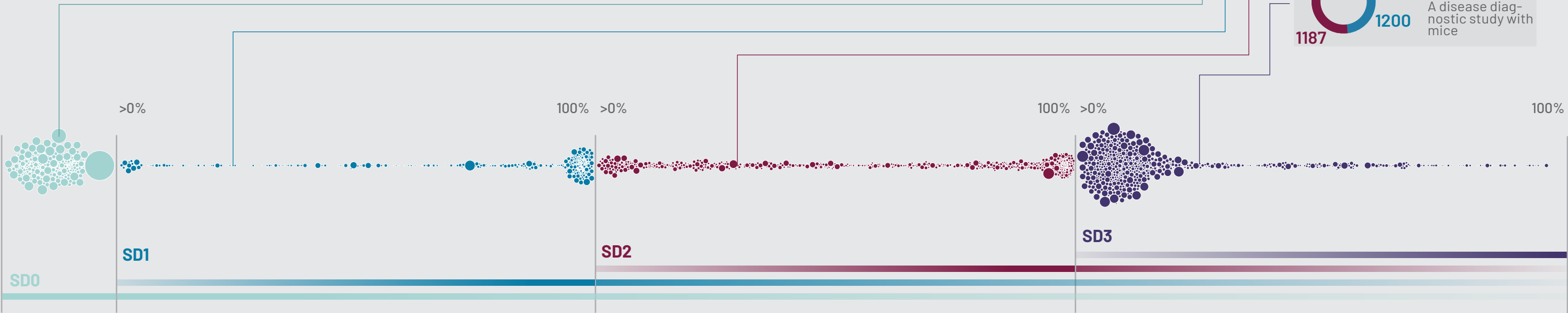
Each study is positioned using two indicators of severity:

1. A study is first placed in a segment according to the maximum severity degree found in the study. Severity of SD0 is to the left in light green and SD3 to the right in purple. SD1 and SD2 are in blue and red in the middle. The color of the study also indicates its maximum severity.
2. Within each segment of maximum severity, a study is placed according to the proportion of uses in that maximum severity degree out of the total number of animal uses in the study.



Information about each individual license is available in the interactive version of this infographic > [CLICK HERE](#).

Note that a smoothing is applied to the position of the studies/bubbles to improve readability.



Data and methods:

The Federal Food Safety and Veterinary Office (FSVO) publishes and maintains two public datasets on animal uses.

1) The dynamic statistics dataset provides yearly aggregate animal use counts by severity and across species and diseases (among other factors) for the period 1997 to 2023. This dataset was used in all time plots in the current report and is consistent with the FSVO annual statistics reports.

2) The expired license dataset provides animal counts by severity for individual licenses at the time of their completion and ranges from 2014 to 2023. This individual license data was used in the bubble visualization of license severity and summary statistics on SD proportions within licenses.

The numbers reported here are uses and not individual animals, which may be used multiple times in some instances.

As indicated above, the change in guidelines for classification of severity degrees implemented in 2018 means that some of the SD3 increases visible in the last 3 or 4 years of the data do not reflect an actual increase in the severity of uses.

The datasets can be downloaded here:

<https://www.tv-statistik.ch/fr/statistique-simples/index.php>

Supplemental material and the interactive map can be found here:

<https://swiss3rcc.org/our-reports/severity-degree-report>

For more information on the processing of the data and figures, contact:

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