



Validation of data from The Danish Veterinary Cancer Registry

L. B. Broenden, N. Toft, A. T. Kristensen

Faculty of Life Sciences, University of Copenhagen, Denmark

Introduction

Cancer is a very common cause of death among dogs and cats. Mortality studies show that 14.5-30% of dogs and 26% of cats die as a result of cancer.

The aim of creating a veterinary cancer registry is to obtain an incidence estimate of canine and feline neoplasia in Denmark. Furthermore to estimate prevalence of different tumour types in different breeds, genders, or geographical locations.

The Danish Dog Registry provide detailed demographics on the country's 600.000 dogs and several widely used cat registries exist, providing information on the reference populations.

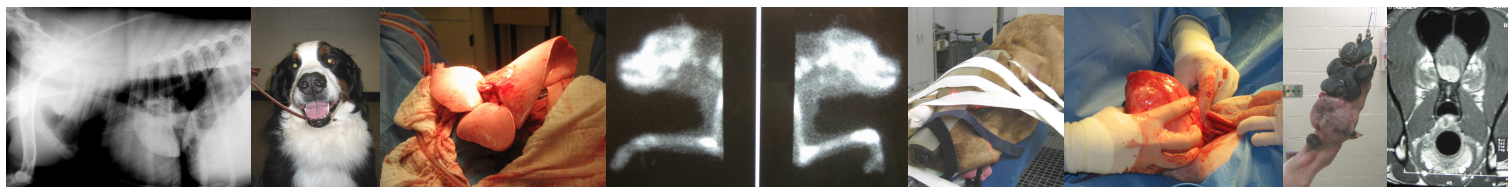
Objective of validation study

A validation study is performed to locate biases and problems in connection with the submission of data. Analysis of data entries and distribution with regard to dates of submission and diagnosis is performed to detect fluctuations and breed ratio and proportion of malignant and benign neoplasia is compared between 6 clinics.

This is done to locate problems that warrant further evaluation and changes in a future version of data collection model in order to ensure that the registry constitutes a representative sample for evaluation of population neoplasia.

Data overview

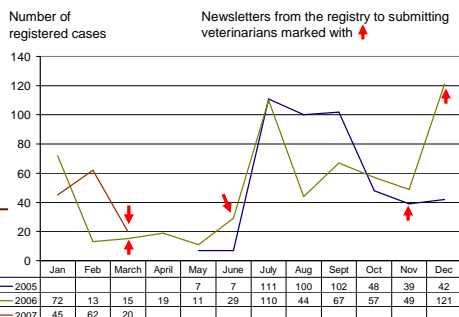
From 15th of May 2005 until 5th of March 2007 1190 cases of neoplasia from dogs and cats have been submitted to the Danish Veterinary Cancer Registry. Twenty-one clinics report via a web interface to a central database. The interface consists of a questionnaire, which the practitioners fill in with data on the animal, the disease and postal code. Drop-down menus exist for a number of data-steps to prevent erroneous data submission. One case represents one neoplastic lesion or disease. The database currently holds information on 1050 cases from dogs and 140 from cats.



Validation - Data entries

Date of submission

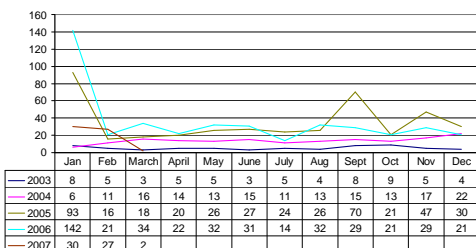
There is a marked rise in registrations during the summer months. This is most likely due to lower case-burden for practitioners in this period. Publication of newsletters do not seem to impact the number of submissions dramatically.



Date of diagnosis

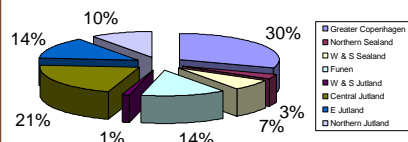
The pattern of date of diagnosis does not correspond with that of submission dates. This time lap may cause a bias as some submissions will be historical at the time of submission and details may be lost.

The high number of diagnoses in January can be caused by the fact that owners spend more time and will notice behavioural changes in their companion animals during the holidays. Due to indolent (non-painful) nature of these diseases, owners may choose to wait to consult a veterinarian until after the holidays.



Geographical distribution

Contributions to the registry is made from all over the country (except for the island of Bornholm). This pattern reflect the location of the contributing clinics, but is very similar to the distribution of the population of humans and thereby also companion animals in Denmark



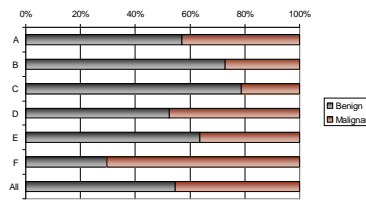
Validation - Data distribution

Benign versus malignant behaviour between the clinics

Behaviour of neoplasias for different clinics A through F, all clinics have more than 100 registered cases.

Chi-square test shows significant difference between the distribution of known benign and malignant neoplasias in the different clinics (p value <0,0001).

This is also the case if the proportion of known and unknown behaviour of neoplasia is compared between the clinics (p value <0,0001)(not illustrated).

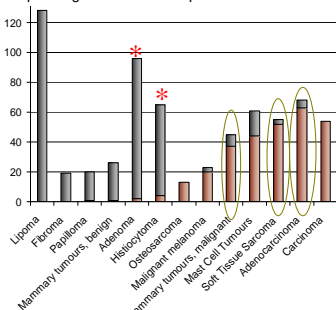
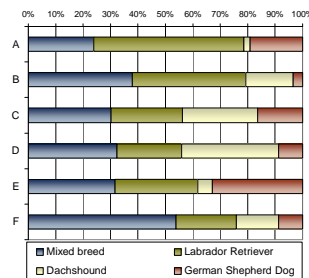


Top 4 breeds distribution in the clinics

The ratio of the different breeds submitted by the clinics A through F varies significantly (Chi square test p value <0,0001).

Numbers might yet be too small to thoroughly evaluate this distribution for the single clinics.

An investigation of differences in breed distribution in the entire country might also clarify the origin of these differences, as some breeds may be bred or kept to a greater extent in specific areas.



Diagnoses and behavior of diseases

Certain tumour types are malignant by definition and it should therefore be impossible to combine one of these (see circled bars) with a benign behaviour and vice versa for some diagnoses that are essentially benign and cannot take a malignant form (see bars marked with stars).

This must therefore be considered to be due to mistakes, and further work will be needed in these cases to locate whether the error is situated in the submission of diagnosis or behaviour of the lesion.

Conclusion

The pattern of data submission showed a marked increase in submissions during the summer period. Dates of diagnoses were distributed in a more uniform pattern throughout the year, with an increase in January. This could create a bias as submission of older data may be less detailed.

The ratio of benign and malignant neoplasias varied between the 6 clinics investigated, as did the ratio between the numbers of known and unknown behaviour. The ratio of the top 4 breeds reported was significantly different for the 6 clinics with more than 100 submissions.

Despite the measures undertaken to prevent typing errors, diagnoses with a malignant disease course were occasionally classified as benign and vice versa. Further work will be needed in these cases to locate whether the error occurred in the submission of diagnosis or behaviour of the lesion.

Steps are continuously taken to ensure the quality of submitted data in future updates of the submission form and data base.

Furthermore the number of clinics contributing to the registry is increasing, ensuring that data will be increasingly representative of the population.

Continuous evaluation of the quality of submissions is imperative to ensure the quality of submitted data.



Contact information

Louise Bjoern Broenden
DVM, PhD student
Dept. of Small Animal Clinical Sciences
Faculty of Life Sciences
University of Copenhagen, Denmark
Telephone +45 35 28 29 14, E-mail lobb@life.uu.dk

References

Amesen, K., Gamlem, H., Glatte, E., Grandalen, J., Moe, L., Nordstoga, K., 2000. Hundekrefteregisteret i Norge 1990-1998. Norsk Veterinær Tidsskrift 112, 137-147.
Bonnert, B.N., Egenvall, A., Olson, P., Hedhammar, A., 1997. Mortality in insured Swedish dogs: rates and causes of death in various breeds. Vet Rec 141, 49-44.
Eichelberg, H. and Seine, R., 1996. Lebenserwartung und Todesursachen bei Hunden I. Zur Situation bei Mischlingen und verschiedenen Rassehunden (Life expectancy and cause of death in dogs. I. The situation in mixed breeds and various dog breeds). Berl Munch Tierarztl Wochenschr 109, 292-303.
Proschowsky, H.F., Rugbjerg, H., Ersboll, A.K., 2003. Mortality of purebred and mixed-breed dogs in Denmark. Prev Vet Med 58, 63-74.

