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Breed, gender and age pattern of diagnosis for veterinary care in insured dogs in Japan during fiscal year 2010

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ABSTRACT

We calculated the annual prevalence of diseases of 18 diagnostic categories in the insured dog population in Japan, using data from 299,555 dogs insured between April 2010 and March 2011. The prevalence was highest for dermatological disorders (22.6% for females and 23.3% for males), followed by otic diseases (16.4% for females and 17.2% for males) and digestive system disorders (15.7% for females and 16.4% for males). The prevalence of cardiovascular, urinary, neoplasia and endocrine disorders, increased with age; infectious diseases and injuries showed a high prevalence at young ages, and the prevalence of musculoskeletal and respiratory disorders showed a bimodal peak at young and old ages. A large variation in prevalence was observed between breeds for dermatological, otic, digestive, ophthalmological and cardiovascular disorders.

1. Introduction

In companion animals, knowing the pattern of disease occurrence is important to maintain their health and to prevent or reduce the impact of disease. Estimating the risk or prevalence of disease by breed, gender and age in a population provides owners of companion animals, veterinarians, breeders and researchers with useful information for these purposes. For example, if a breed, gender or age is identified as being a risk factor for a certain disease, owners and veterinarians can use such information to take measures to reduce the risk of occurrence or severity of that disease. Comparing risk factors for diseases between breeds, genders, and ages might lead to the discovery of their cause. However, in most countries, there is no database of companion animal disease, and little information is available about the risk factors involved.

In recent years, epidemiological analysis of dog diseases has been conducted using data from referral hospitals (Fleming et al., 2011), from veterinary primary-care practices and veterinary practices (O'Neill et al., 2014b; Edney, 1997), and from insurance companies (Bonnett et al., 1997; Egenvall et al., 2000a, 2000b, 2000c).

The data from referral hospitals are accurate in regard to diagnosis but there is no information about the total population at risk and there is a possible selection bias when only cases are referred to them. The data from primary-care practices and veterinary practices are more representative of the national dog population than data from referral hospitals. However, they have a selection bias if a large

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proportion of dogs is not registered with them or when the practices participating in the study are not representative of the overall veterinary practice structure. Diagnostic information on insured dogs may be inaccurate, but background data relating to breed, gender and age of both diseased and healthy animals is sound with less selection bias (Egenvall et al., 1998, 2009). Epidemiological analysis by breed, gender, age, and habitat has been conducted using data of insured dogs on mortality (Bonnett et al., 1997; Egenvall et al., 2000b); mammary tumors (Egenvall et al., 2005), atopic dermatitis (Nodtvedt et al., 2006a, 2006b, 2007), lymphoma (Edwards et al., 2003) and bone tumors (Egenvall et al., 2007).

Much literature supports the predisposition of dogs to disease by breed, gender and age, but quantitative information on relative or increased risk of disease by these parameters is lacking (Asher et al., 2009; Summers et al., 2010; Gough and Thomas, 2010). Some kennel clubs provide information on disease predisposition of different dog breeds (American Kennel Club, 2013; The Kennel Club, 2004), but information is mostly based on a limited number of pedigree dogs, and consequently is not representative of the general population.

In Japan, no large scale and comprehensive epidemiological study has been conducted on dog diseases except for the ones conducted by the Ministry of Agriculture, Forestry and Fisheries in 2001 (MAFF, 2002) and a local study group of veterinary clinicians (TJRK, 2008). These studies used data obtained from veterinary clinics and hospitals. Because no information was available to them about the background population, it was not possible to calculate the disease risk or prevalence.

Dogs are the most popular companion animals in Japan. Of the total dog population, which is estimated to be 11.5 million (JPFA, 2013), 381,657 dogs (3.3%) were insured by a pet insurance company, Anicom at the end of 2012. This represents more than half of the total dogs insured in Japan. The purpose of this study is to estimate and compare the annual prevalence of the different diseases of dogs by breed, gender and age using data of insured dogs.

2. Materials and methods

2.1. Insurance procedures

Healthy dogs younger than 11 years old are eligible to enter the Anicom insurance program, which provides insurance for veterinary care. The insurance policy term is one year from the enrolment and the owner can choose to renew the policy at the end of each policy year until the dog dies. The Anicom pet insurance program covers veterinary care costs. If a dog receives veterinary care, the owner gets between 50% and 70% of the cost reimbursed, depending on the type of insurance contract. A maximum amount of reimbursement is set for veterinary care without hospitalization, veterinary care with hospitalization and veterinary care with surgical operation, but there is no deductible cost. The insurance claims are settled by the attending veterinarians, who submit the claims to the insurance company either electronically or on paper. Basic data about the dog, such as the date of birth, breed, and gender are submitted at the time of enrolment into the insurance program. The date of visit to the veterinarian, amount paid for the treatment and reason for the claim are submitted with the claim.

Table 1
Number of dogs in the study by gender and age in years.

Age	Male	Female	Total
0	30,910	28,206	59,116
1	24,591	22,121	46,712
2	14,865	13,835	28,700
3	17,727	16,337	34,064
4	16,477	14,665	31,142
5	14,877	13,201	28,078
6	13,231	11,126	24,357
7	9,531	7,717	17,248
8	5,689	4,905	10,594
9	3,756	3,295	7,051
10	2,715	2,513	5,228
11	1,691	1,672	3,363
12+	1,998	1,904	3,902
Total	158,058	141,497	299,555

Table 2
Number of dogs of the 17 major breeds in the insured dog population subjected to comparison between breeds.

Breed	Number of dogs
Miniature Dachshund	50,323
Chihuahua	46,414
Toy Poodle	45,382
Shiba	14,647
Yorkshire Terrier	10,622
Pomeranian	9,365
Pembroke Welsh Corgi	9,031
Papillon	8,965
Shih Tzu	8,239
Miniature Schnauzer	8,123
French Bulldog	6,804
Labrador Retriever	6,422
Cavalier King Charles Spaniel	5,743
Golden Retriever	5,377
Maltese	5,056
Pug	4,245
Crossbreds (mongrels)[a]	15,416
Others[b]	39,381
Total	299,555

[a] Crossbreds (mongrels) are dogs of mixed breed where either, one or both parents are not purebred, or, the parents are purebred but of different breeds.
[b] Others include pure breeds whose sample size (n) = < 4,000.

2.2. Data management

Data on all dogs of ages 0–18 years that entered an insurance program or renewed the insurance policy during fiscal year 2010 (1 April 2010–31 March 2011) were entered into a database for this study. These dogs were observed for one year from the date of entrance into, or renewal of, the insurance program. The variables included in the database were breed, gender and age at entrance into or renewal of the insurance program. Data on claims for veterinary care, including the reasons for claims were entered into the database. If an owner cancelled the insurance program during the observation period data was excluded from the study. A total of 299,555 dogs were observed for one year and subjected to the analysis in this study. Their distributions by gender, age, and breed are shown in Tables 1 and 2.