Longevity of UK Dog Breeds

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Background

Canine longevity studies to date have relied on data from diverse sources such as veterinary referral populations, insurance databases and owner surveys (1,2,3,4). Although useful, several potential biases (referral, exclusion, recall) limit generalisation of results to the wider population. Mortality data from primary veterinary practice electronic records offer opportunities for large scale study of the longevity of UK dogs attending small animal practices as well as documenting the reasons for and mechanism of death.

M&M

The **VetCompass Animal Surveillance** database (5) of electronic patient records from 92 UK small animal practices covered varying periods between 2007-2011. This database was searched for records identifying dogs that either died or were euthanased. These records held animal demographics including breed, sex, neuter status, age and insured status. The summary diagnoses and clinical notes were evaluated for the veterinary-recorded reason for death and also the mechanism of death (died naturally or euthanasia). Ethical approval was granted by the RVC Ethics and Welfare Committee.

Analysis: Following cleaning in Microsoft Excel, data were imported to Stata 11 for analysis. All-breed longevity was plotted. The median (interquartile range, IQR) longevity values for common breeds were compared. Common reasons cited for mortality were described. A quantile regression model evaluated risk factors associated with longevity: sex, neuter status, purebred size, insured status, purebred/crossbred status. The level of significance was set at $P<0.05$.

Aims & Objectives

This study aimed to describe the longevity of common UK dog breeds in order to scientifically inform the canine pedigree health debate. Other objectives included description of common veterinary reasons for canine mortality and to evaluate risk factors associated with dog longevity.

Results

1. All-breed dog longevity

From a cohort of 111,293 dogs on the VetCompass database, 4,728 deaths were identified. All-breed canine longevity was bi-modal, peaking in the first year of life and again at 13 years (Figure 1). Overall, 3,858 (**86.70%**) of 4,450 dogs with a mode of death recorded were euthanased. The remainder died without veterinary assistance.
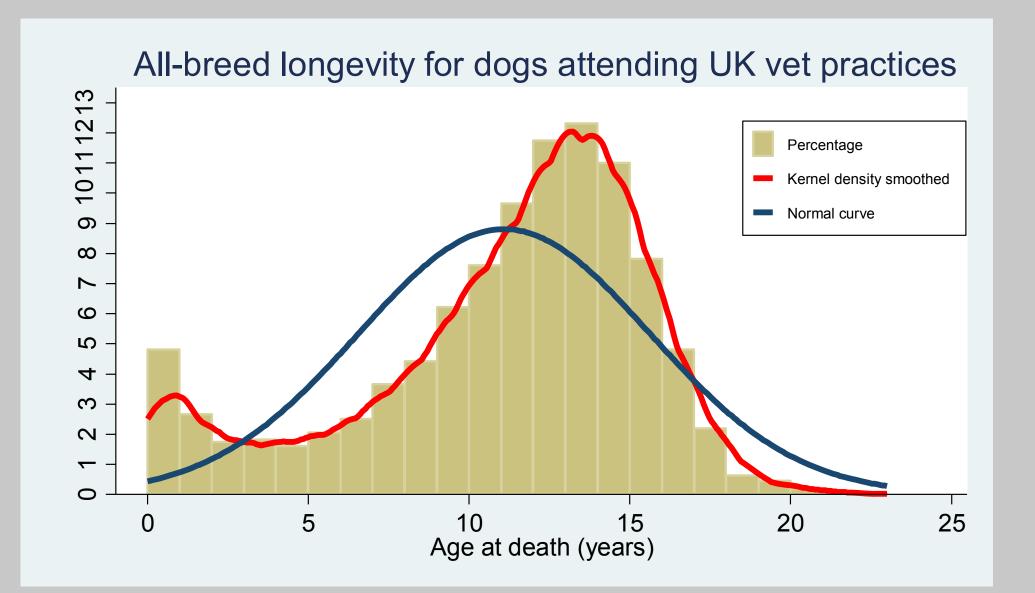

Figure 1: All-breed longevity for 4728 dogs with records of death from 92 UK veterinary practices

2. Risk factors associated with dog longevity

Variable	Coefficient	Std. Err.	P-Value	Median 95% CI
Neuter status	1.33	0.17	<0.0001	1.00 to 1.66
Insured status	-1.76	0.19	<0.0001	-2.13 to -1.39
Purebred status	-1.22	0.20	<0.0001	-1.61 to -0.84
Intercept	12.73	0.20	<0.0001	12.33 to 13.13

Figure 2: Final multivariable quantile linear regression model showing risk factors associated with longevity in dogs attending UK veterinary practices

Multivariable modelling indicated that neutering was associated with increased longevity while being a purebred or holding pet insurance was associated with reduced longevity (Figure 2). Within the variable 'purebred breed size', large size was associated with a shorter lifespan than small or medium size on univariable analysis but this factor was excluded from the final multivariable model because of collinearity with purebred status.

3.Breed-specific longevity

Breed	Number	Median longevity (years)	Interquartile range
Border Collie	165	13.38	11.49-14.99
English Springer Spaniel	107	13.35	10.35-14.80
Crossbred	965	13.27	10.63-15.22
West Highland White Terrier	126	13.23	10.98-14.82
Shih-tzu	77	13.03	9.19-15.43
Jack Russell Terrier	266	12.99	9.17-15.66
Yorkshire Terrier	197	12.99	9.99-15.07
Bichon Frise	55	12.99	9.99-15.22
Labrador Retriever	381	12.52	10.71-13.99
Golden Retriever	117	12.48	10.99-13.98
Cocker Spaniel	137	11.65	8.29-13.78
German Shepherd Dog	285	10.95	9.00-12.89
Greyhound	85	10.82	8.00-11.99
Staffordshire Bull Terrier	261	10.65	4.01-13.67
Boxer	87	10.03	7.54-11.62
Cavalier King Charles Spaniel	121	9.99	8.14-12.39
Rottweiler	98	8.33	5.46-10.33

Table 1: Median and interquartile range longevity values for dog breeds with more than 50 animals represented

Although purebred dogs overall showed significantly shorter longevity than crossbreds (Figure 2), not every individual breed had reduced longevity. Indeed, of the common breeds analysed, the median longevities for the Border collie and the English Springer Spaniel were higher than for crossbreds, although these values were not statistically significantly different (Table 1). However, the general trend was for purebreds to have shorter longevity than crossbreds, in agreement with the results from multivariable modelling. This highlights the importance of interpretation of results at both the individual breed level as well as the overall purebred/crossbred level to avoid errors of ecological fallacy.

3. Veterinary-recorded reasons for dog death

Reason for animal death	Frequency	Per cent
Neoplasia	775	16.39
Musculoskeletal system problem	594	12.56
No diagnosis recorded	506	10.70
Neurological Cranial incl. Seizures	396	8.38
Gastrointestinal problem	313	6.62
Heart problem	260	5.50
Respiratory problem	180	3.81
Collapse	159	3.36
Aggression (primary)	152	3.21
Kidney problem	149	3.15
Non-specific signs	119	2.52
Neurological Spinal	116	2.45
Incontinence	101	2.14
Road Traffic Accident (RTA)	89	1.88
Abdominal problem	69	1.46
Trauma	56	1.18
Cachexia	54	1.14
Anorexia	51	1.08
Dermatological problem	50	1.06
Other	539	11.38
Total	4728	99.97

Table 2: Veterinary-recorded reasons for animal death by any mechanism from 4728 deaths recorded.

The most frequent veterinary-recorded reasons for canine death were neoplasia and musculoskeletal disorders.

Discussion

This study described all-breed and breed-specific longevity for dogs attending UK veterinary practices. Neuter status, purebred status and insured status were all associated with longevity. The most frequent reasons for dog deaths were neoplasia and musculoskeletal problems. This information will assist breeders, policy makers and welfare organisations in decision-making to improve the welfare of pedigree dogs.

References
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