The social distribution of veterinary care

Jones P.H.[1,2], Buchan I.E.[3], Dawson S.[2], Gaskell R.M.[2], Radford A.D.[2], Setzkorn C.[1,2], Tierney A.[2] and Noble P-J.[2]

[1] National Consortium for Zoonosis Research; [2] University of Liverpool; [3] Northwest Institute for Bio-Health Informatics, University of Manchester

Introduction

The Small Animal Veterinary Surveillance Network (SAVSNET), is a small animal disease surveillance scheme initiated by the University of Liverpool in 2008 with consortium funding from commercial companions and Defra. Data are collected from both commercial diagnostic laboratories and from 'sick-animal' consultations at private veterinary practices. Consultation data consists of general signalment data together with the results of a short questionnaire presented to the clinician at the end of each consultation and focused on a single syndrome. The questionnaire can be changed on a regular basis to enable different syndromes to be investigated. All results including signalment data and the free-text entered during the consultation, are electronically sent to the University of Liverpool. Consultation data is collected on the basis of an 'opt-out' system for owners. All data collection is ethically approved by the University of Liverpool and the aims of the project are supported by the Royal College of Veterinary Surgeons. The project has recently completed an initial pilot phase that involved collecting data from twenty practices in England and Wales. Data were collected for a maximum of six months and resulted in each practice contributing between 679 and 5,243 (median = 1,516) records from cat and dog consultations.

Materials and Methods

Signalment data and owners' postcodes were retrieved from the database. For animals that were presented to a veterinary practice on more than one occasion, only the information from the most recent visit was used. Many species of animals were presented to practices but the results reported herein are restricted to dogs and cats. The postcodes were used to calculate straight-line distances from an animal's postcode to the veterinary practice and to link each animal to databases containing Index of Multiple Deprivation (IMD) scores (for England and Wales) based on the 2001 UK census data. Deprivation scores for England and Wales were categorised based on quintile cut-off scores with category 1 being least deprived and category 5, the most deprived. Mixed-effects, logistic regression models, including practice ID as a random effect, were developed for dependent variables and used to calculate odds ratios.

Contact: Dr. Philip H. Jones, National Consortium for Zoonosis Research, University of Liverpool, Leahurst Campus, Neston, South Wirral, CH64 7TE.
E-mail: p.h.jones@liverpool.ac.uk

IMD	Species	Insurance Proportion (95% CI)	Insurance OR (95% CI)	Microchipping Proportion (95% CI)	Microchipping OR (95% CI)	Neutering (males) Proportion (95% CI)	Neutering (males) OR (95% CI)	Neutering (females) Proportion (95% CI)	Neutering (females) OR (95% CI)
1 (least deprived)	cat	0.19 (0.17, 0.21)	1.00	0.35 (0.33, 0.37)	1.00	0.91 (0.89, 0.93)	1.00	0.85 (0.82, 0.87)	1.00
	dog	0.33 (0.32, 0.35)	2.18 (1.88, 2.48)*	0.53 (0.52, 0.55)	2.30 (2.03, 2.57)*	0.59 (0.57, 0.61)	0.14 (0.11, 0.18)*	0.67 (0.65, 0.70)	0.36 (0.29, 0.44)*
2	cat	0.16 (0.14, 0.17)	1.00	0.31 (0.29, 0.33)	1.00	0.87 (0.86, 0.89)	1.00	0.85 (0.83, 0.87)	1.00
	dog	0.29 (0.28, 0.30)	2.44 (2.14, 2.74)*	0.38 (0.47, 0.49)	2.25 (2.02, 2.47)*	0.57 (0.55, 0.58)	0.18 (0.15, 0.22)*	0.66 (0.65, 0.68)	0.33 (0.28, 0.40)*
3	cat	0.14 (0.12, 0.15)	1.00	0.30 (0.28, 0.31)	1.00	0.86 (0.84, 0.88)	1.00	0.84 (0.82, 0.87)	1.00
	dog	0.25 (0.24, 0.26)	2.56 (2.20, 2.92)*	0.46 (0.45, 0.47)	2.23 (1.99, 2.47)*	0.56 (0.54, 0.58)	0.22 (0.18, 0.26)*	0.63 (0.61, 0.65)	0.33 (0.27, 0.39)*
4	cat	0.16 (0.15, 0.18)	1.00	0.29 (0.27, 0.31)	1.00	0.85 (0.83, 0.87)	1.00	0.80 (0.77, 0.83)	1.00
	dog	0.25 (0.24, 0.26)	2.06 (1.75, 2.36)*	0.44 (0.42, 0.45)	2.14 (1.88, 2.40)*	0.54 (0.52, 0.56)	0.22 (0.17, 0.26)*	0.58 (0.56, 0.60)	0.36 (0.29, 0.43)*
5 (most deprived)	cat	0.15 (0.13, 0.16)	1.00	0.25 (0.24, 0.27)	1.00	0.77 (0.75, 0.80)	1.00	0.73 (0.70, 0.76)	1.00
	dog	0.26 (0.25, 0.27)	2.54 (2.18, 2.90)*	0.43 (0.41, 0.44)	2.45 (2.17, 2.73)*	0.46 (0.44, 0.47)	0.25 (0.21, 0.29)*	0.53 (0.51, 0.55)	0.44 (0.37, 0.52)*

Table 1 Proportions and odds ratios of insuring, microchipping and neutering in dogs compared with cats (* $p < 0.01$; ** $p < 0.001$; † $p > 0.05$)

Results

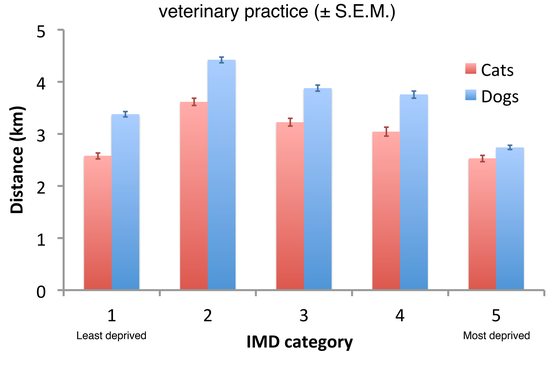
The study included data from 25,347 dogs and 10,718 cats. The distance travelled to the veterinary practice was associated with IMD and species (figure 1). The distance travelled was lower for cats in all levels of IMD although the effect was reduced in IMD category 5 (most deprived).

The odds of pets being neutered, insured or microchipped differed significantly between dogs and cats (table 1). In general, dogs were over twice as likely to be insured or microchipped than cats but were significantly less likely to be neutered. These affects were seen across all IMD categories.

IMD also affected the odds of pets being neutered, insured or microchipped (table 2). Dogs and cats belonging to owners in least deprived areas were more likely to be neutered, insured and microchipped.

The odds of pets being neutered was also related to the sex of the animal (table 3). In dogs, bitches were more likely to be neutered than males dogs. This effect was seen across all IMD categories. In cats, however, queens were generally less likely to be neutered than toms. This effect was significant in IMD categories 1, 4 and 5 but was not significant in categories 2 and 3.

Figure 1 Geometric mean distance (km) travelled to veterinary practice (± S.E.M.)



Conclusions

These data demonstrate that the behaviour and opinions of pet owners across the UK are influenced by the species of the animal and the deprivation scores of owner's address. The data collected to date represent a relatively small pilot study. As the project expands, the volume of data will increase and more detailed analyses will be feasible. These findings could inform educational programmes, promotions and advertising campaigns to promote preventive measures (such as neutering and micro-chipping) and will, therefore, lead to improved health and welfare of pets in the UK.

Variable	Gender & species	IMD	Odds ratio (95% confidence interval)
Neutering	Male dogs	5 (most)	1.00 –
		1 (least)	1.59 (1.39, 1.79)**
	Female dogs	5 (most)	1.00 –
		1 (least)	1.74 (1.51, 1.98)**
	Male cats	5 (most)	1.00 –
		1 (least)	2.81 (2.07, 3.56)**
	Female cats	5 (most)	1.00 –
		1 (least)	2.13 (1.63, 2.63)**
Insurance	Dogs	5 (most)	1.00 –
		1 (least)	1.54 (1.37, 1.71)**
	Cats	5 (most)	1.00 –
		1 (least)	1.80 (1.47, 2.13)**
Microchipping	Dogs	5 (most)	1.00 –
		1 (least)	1.57 (1.42, 1.72)**
	Cats	5 (most)	1.00 –
		1 (least)	1.67 (1.43, 1.92)**

Table 2 Effect of IMD on neutering, insurance and microchipping in dogs and cats (**$p < 0.001$)

IMD	Gender	Dogs Odds ratio (95% confidence interval)	Cats Odds ratio (95% confidence interval)
1 (least deprived)	Male	1.0 –	1.0 –
	Female	1.49 (1.29, 1.69)**	0.58 (0.42, 0.75)**
2	Male	1.0 –	1.0 –
	Female	1.54 (1.38, 1.70)**	0.84 (0.65, 1.03)†
3	Male	1.0 –	1.0 –
	Female	1.37 (1.22, 1.51)**	0.91 (0.70, 1.12)†
4	Male	1.0 –	1.0 –
	Female	1.20 (1.05, 1.35)*	0.72 (0.54, 0.90)*
5 (most deprived)	Male	1.0 –	1.0 –
	Female	1.36 (1.22, 1.51)**	0.77 (0.62, 0.93)*

Table 3 Odds ratios of neutering in dogs and cats in IMD categories (* $p < 0.01$; ** $p < 0.001$; † $p > 0.05$)

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