# UK Pet Dog Population Project

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Dogs Trust
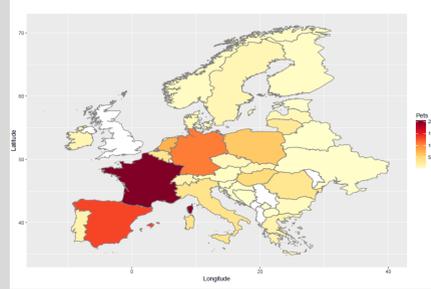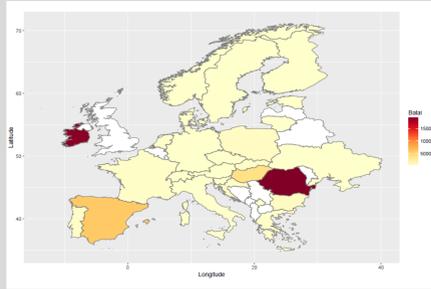
Background

The UK has limited knowledge regarding our pet dog population. Based on public surveys, previous estimates of population size have varied between 8.5 - 11.6 million [1, 2, 3]. However, public surveys are costly initiatives, and as such, participant numbers remain constrained. This has led to significant knowledge gaps and potentially unreliable pet dog population estimates.

In 2011, Dr. Asher and colleagues approached this challenge from a fresh perspective [4]. They enriched public survey data with existing datasets. This provided a more robust population estimate of 9.4 million pet dogs. However, due to limited project collaborators (Kennel Club, veterinary practices, and Sainsbury's pet insurance), the researchers could only confidently suggest that the true figure fell somewhere between 3.6 million and 21.5 million (range = 17.9 million). This suggests that the commonly referenced PFMA estimate of 8.5 million [1], may be a *substantial* underestimate.

Aims

Dogs Trust Research Team are obtaining the cooperation of several external project participants, in order to build the most comprehensive dataset to date, which will allow for the definitive estimation of the UK pet dog population. More specifically, we aim to:

- Establish a population baseline which will provide significant analytical benefits to welfare, epidemiological and business corporations alike, as it will allow for the development of network analyses and targeted strategies, while providing a greater understanding of the dog population, including spatial density and distribution, demographics and regional trends.

- Identify interventions that successfully impact upon the availability of puppies from irresponsible breeders and limit/block the illegal trade of puppies into the UK, thus minimising welfare implications and disease transmission.

Methods

Step 1 Engage with external stakeholders. Consistency of variables is vital as we anticipate the presence of duplicate records across multiple data sources. Consequently, all project participants are asked to provide data listed in Table 1 (Options A - C, when Option A is preferred).

Step 5 Predictive modelling will then be applied to assess the effect that interventions (including a ban on third party sales) will have upon: (1) the availability of puppies from irresponsible breeders, and (2) the illegal trade of puppies into the UK.

Step 2 Download data from project participants. Clean datasets via R programming to ensure standard formatting. Merge all datasets to build one comprehensive dataset, incorporating common elements such as partial postcodes and/or microchip numbers.

Welfare Centres • Microchip databases • Pet insurance co. • Local councils • Government authorities → ← Veterinary practise • Rehoming Centre • Pet retailers (online and offline) • Kennel Club
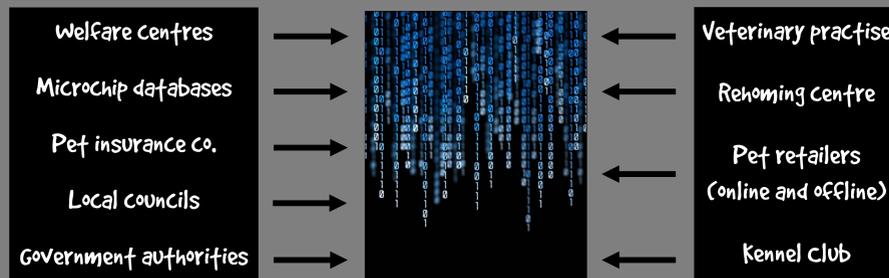
Step 3 Use common elements across different sources to identify duplication of individuals. This allows us to: (1) quantify proportional coverage between datasets; and (2) remove repeat individuals to ensure that the final population estimate is not artificially inflated.

Microchip dataset • Pet insurance dataset • Rehoming dataset • Govt. & local authority dataset • Etc.

% coverage between datasets
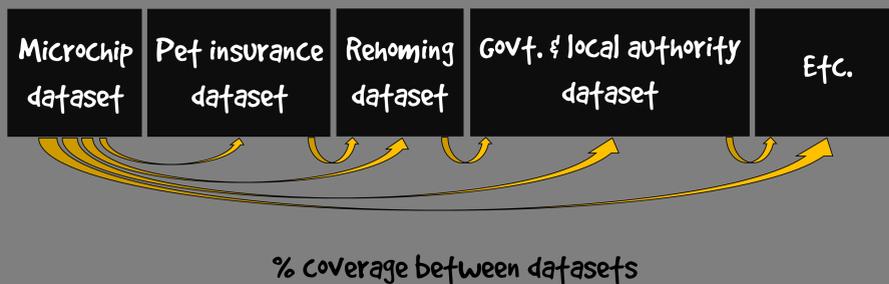
Step 4 Knowledge of proportional coverage will enable us to apply a hierarchical Bayesian approach to multi-state mark-recapture. This will allow us to establish a population baseline, and map spatial density, distribution, demographics and regional trends within the UK.

VARIABLE	OPTION A	OPTION B	OPTION C
Postcode	First four characters	First three characters	First two characters
Microchip no.	Full	Last six digits	Y/N
Name of dog	Full	First three letters	First letter
Sex of dog	Male/Female		
Breed of dog	Breed name	Crossbreed (Y/N)	
Age of dog	Date of birth (DD/MM/YYYY)	Date of birth (MM/YYYY)	Date of birth (YYYY) OR Age category
Death of dog	Date of death (DD/MM/YYYY) OR Age of dog at point of death (Months and Years)	Date of death (MM/YYYY) OR Age of dog at point of death (Years)	

Table 1: Data request sent to all external project participants.

References: [1] Pet Food Manufacturing Association (PFMA) (2017). Pet Population 2017 (http://www.pfma.org.uk/pet-population-2016). [2] Murray, J. K. *et al.* (2015). Assessing changes in the UK pet cat and dog populations: numbers and household ownership. Veterinary Record, 177(259). [3] Murray, J. K. *et al.* (2010). Number and ownership profiles of cats and dogs in the UK. Veterinary Record, 166(6): 163 - 168. [4] Asher, L. *et al.* (2011). Estimation of the number and demographics of companion dogs in the UK. Veterinary Research, 7(74).