The "Generation Pup" longitudinal study: Owner- and dog-related predictors of complete survey data: age 6- to 12-months

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Take-home message: **Missing data resulted more frequently from owners not submitting survey data than from active withdrawal from the longitudinal study. Eight factors were associated with the provision of complete survey datasets for dogs aged 6-12m. These factors were: owner age, employment status, owned or rented house, highest level of education within the household, previous dog ownership, age of dog at acquisition, number of adults in the household and presence of children. Identifying predictors of missing data is important in order to limit the impact of non-response bias in future analyses where predictors are associated with exposure and outcome.**

Background - The Generation Pup project:

- The Generation Pup study is an ongoing project designed to identify associations between early-life environment, genotype and health and behaviour outcomes at different life stages of registered dogs. Modifiable risk factors can then be targeted to improve the health and welfare of dogs in the future. Owners living in the United Kingdom or Republic of Ireland can register pure- and mixed-breed puppies up to 16 weeks of age (or 21 weeks if entering the country through quarantine) with the study.
- Recruitment will continue until 10,000 dogs are registered.
- The profile of the first 3,726 dogs and their owners registered (May 2016-Jan 2020) on the Generation Pup study has previously been described [1].
- Data collection: All owners are asked to complete surveys and many elect to providing additional data (canine biological samples, health cards completed by veterinary professionals and consent to access veterinary clinical notes).
- Surveys: After registration, owners are asked to complete surveys at set time points throughout the life of their dogs, including at ages 6m, 7m, 9m and 12m. Some owners omit, or partially complete, surveys. All owners have the option of withdrawing from the study at any time.
- Missing data that occurs 'not at random' has the potential to bias analyses if predictors of missing data are related to both the exposure and outcome of interest.

Identifying factors associated with non-response can inform recruitment strategies and efforts to maximise owner engagement and retention. Future analyses can assess factors associated with non-response for association with exposures and outcomes under investigation, and adjust for/discuss results in light of potential bias [2].

Methodology

Owner-submission of survey data when dogs were aged 6m, 7m, 9m, 12m (four consecutive early surveys within the project) were analysed.

The number of survey sections that were submitted (1-16 sections available for completion/survey) was used to calculate the percentage of survey completion.

Cases = Complete survey dataset: (100% of 6-12m surveys completed)
Controls = Empty: (none of 6-12m survey sections completed)/ Partial survey dataset: (1-99% of 6-12m survey sections completed)

Potential predictors were assessed for association with complete vs partial/empty survey datasets for 2,304 dogs who, in the absence of loss to follow up/non-response, could have had 6m, 7m, 9m and 12m survey data submitted by their owners.

Multivariable logistic regression model (SPSS v25).

Provision of survey data (6-12m)	n	%
Complete survey dataset (6-12m)	723	31.4
Partial survey dataset (6-12m), dog withdrawn from study before age 12m	23	1.0
Partial survey dataset (6-12m), dog NOT withdrawn from study before age 12m	913	39.6
Empty survey dataset (6-12m), dog withdrawn from study before age 12m	117	5.1
Empty survey dataset (6-12m), dog NOT withdrawn from study before age 12m	528	22.9
Total	2,304	100

Predictors for a complete 6m-12m survey dataset

31.4% of registered dogs had a complete survey dataset between 6m and 12m.

Variables associated with **increased odds** of providing a complete dataset:
- Highest level of household education post-A level, compared to A level or less, OR=1.54 (95%CI 1.21-1.97)
- Increasing age of respondent, compared to age < 35 yrs,
  - age 35-54 yrs, OR=2.30 (95%CI 1.78-3.02)
  - age ≥ 55 yrs, OR=3.70 (95%CI 2.73-5.02)
- Owned house (vs. rented), OR=2.09 (95%CI 1.53-2.84)
- Previous dog ownership as an adult, OR=1.52 (95%CI 1.20-1.92)
- Increasing age (days) of puppy at acquisition, OR=1.01 (95%CI 1.00-1.02)

Variables associated with **decreased odds** of providing a complete dataset:
- Respondent is employed (vs. self-employed, retired, homemaker, student), OR=0.71 (95%CI 0.57-0.90)
- Children present in the household, OR=0.49 (95%CI 0.38-0.64)
- Increasing number of adults in the house, continuous variable, OR=0.79 (0.70-0.89)

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References:

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