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# **CHARACTERISTICS OF PETS WHO VISIT VETERINARIANS**

A report to the Victorian Bureau of Animal Welfare,  
2009

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## Executive Summary

In this study we surveyed a sample of Victorian veterinarians and their clients in order to describe the characteristics of the owners and pets, describe their ownership practices, with particular reference to how they manage the reproductive behaviour of their pets, and to identify veterinary attitudes to strategies that might be used to reduce the number of unwanted cats and dogs in our community. A large number of veterinary clinics were invited to participate in the study resulting in 51 participant practices. Client surveys were distributed via these practices, resulting in 588 completed owner surveys. The main findings are as follows:

### Client Surveys

- The client sample was broadly comparable with the Victorian population, although somewhat wealthier, better educated, more likely to speak English and live with fewer children than the average Victorian.
- Cat owners were somewhat under-represented in this sample. Dogs comprised 72.8% of animals brought to clinics, whereas cats comprised only 22.8%.
- A higher than expected percentage (37.9% compared to 22%) of the sample fed cats that they did not own (cat semi owners), indicating not only that responsible cat owners engage in this behaviour, but that they may do so at a greater level than the general population. This suggests that targeting education regarding the effects of feeding semi-owned cats to clients of veterinary clinics may be an effective strategy.
- Cultural background was associated with the number of cats owned. European, Eastern European and Eurasian participants owned a greater number of cats than participants from other cultural backgrounds.
- Very few litters were presented at the participating clinics. Most of the progeny of these owned animals were rehomed directly by their owner in some way. Very few were taken to shelters. This suggests that the progeny of veterinary clients are not contributing significantly to shelter admissions.

- Most dog and cat owners had carefully considered the acquisition of their pet. However, there was a proportionately greater level of impulsive acquisition amongst Individuals who had acquired other species. Impulsive acquisition was not associated with acquiring a pet from a pet shop, nor was it associated with shorter periods of ownership for dogs and cats.
- The majority of cats and dogs were acquired when aged less than three months of age.
- Dogs tended to be sourced from pet shops and breeders while cats were sourced from friends, neighbours and shelters or passively acquired i.e. the cat adopted them.
- Almost one quarter (22.9%) of the pets in this sample were acquired at no cost. These animals were primarily cats, with most being acquired from the stray population, from friends, relatives and neighbours. In fact, 47.7% of cats were obtained at no cost. The most expensive animals were acquired from breeders and were most likely to be dogs.
- Dogs presented at the practices tended to be younger than cats. Generally, cats tended to be owned for longer than dogs. Cats acquired at no cost were likely to be owned for as long as those that had been acquired at considerable cost. By contrast, expensive dogs tended to be owned for shorter periods of time than those acquired a little or no cost. In fact, dogs acquired at little or no cost were over-represented amongst dogs owned for the longest periods of time.
- Not surprisingly, older animals were presented for treatment at the veterinary surgery more often than young animals, regardless of their acquisition cost.
- Cats were taken to the veterinarian less frequently and for treatment of more serious or acute conditions than dogs. This may indicate that cats are generally healthier than dogs or possibly, that cats are only taken to the veterinarian for more significant health issues.
- While equal proportions of dog and cat owners sought desexing for their pet, the other veterinary services utilised differed significantly. Cat owners were less likely to seek pre-purchase advice, socialisation, advice on diet, weighing, referral to a specialist, heartworm treatment, external parasite treatment and advice prior to relinquishment than dog owners.
- The majority of participants either did not know when female cats became sexually mature or perceived that they matured after six months of age. Almost two-fifths of the sample did not know when male cats became sexually mature. Participants were better informed about the age of maturity for dogs. Almost a quarter (22.3%) was uncertain when bitches became sexually mature and 32.6% were uncertain when male dogs became sexually mature. The median age given for the sexual maturity of male and female dogs was 6 months.
- A greater proportion of cats were desexed at acquisition compared to dogs, but this is probably because more cats were acquired from welfare shelters, which are required to desex animals prior to sale.
- Overall, the level of desexing was high, with a greater percentage of cats (94%) being desexed than dogs (89.7%). The majority (63.8%) of people with a sexually entire pet intended to



desex their animal at some point to prevent unwanted pregnancies or obtain behavioural benefits.

- Over 60% of the dogs and cats in this sample were desexed after acquisition, with a mean age of desexing of 9.57 months. No differences were observed between dogs and cats in this regard. Therefore, many owned animals are desexed after sexual maturity with an accompanying possibility of unplanned litters, even amongst animals whose owners frequent veterinarians. There may be some potential to reduce the numbers of unwanted cats and dogs by increasing desexing pre-acquisition or ensuring that desexing occurs pre-puberty.
- Nearly three-quarters (70.2%) of the owners of sexually entire animals had been advised by their veterinarian to desex their animal, with most advised to do so at about six months of age. A small percentage (4.3%) was advised by their veterinarian to desex their pet after six months of age.
- Owners of sexually entire animals relied primarily on physical management/containment and desexing before sexual maturation to prevent unwanted pregnancies. Approximately 10% of these owners believed that they could prevent unwanted pregnancies with their management strategies. People who owned male animals perceived desexing as less appropriate for their animals.
- Participants perceived that they would dispose of unplanned progeny by giving away/rehoming a third of them and selling about a quarter of them.
- Thirty-three animals had produced at least one litter each with the cats producing an average of six kittens and dogs 10.25 puppies each. Whilst the vast majority of the puppies produced were sold, most kittens were given away. Notably, few of these progeny produced were presented to shelters and therefore appear not to contribute significantly to shelter statistics. It is interesting to note that 6.6% of the puppies produced died, while none of the kittens did. This suggests that pet cats may be reproductively healthier than pet dogs.
- Client response to the proposed strategies:
  - The majority supported mandatory desexing (MD) of dogs and cats by six months of age, although there was slightly more support for desexing cats than dogs.
  - There was considerably less support for desexing by three months of age (EAD), particularly from dog owners. Less than half of the cat and dog owners supported EAD with cat owners significantly more supportive of EAD for dogs than dog owners.
  - While approximately one-quarter of the client sample supported MD as a method of reducing the number of unwanted companion animals in our society, approximately one-sixth of the sample felt that such legislation was unnecessary as they desexed their animals voluntarily anyway; others believed that such decisions should be made by the owner in consultation with their veterinarian. While many participants supported MD

in principle, they voiced concerns regarding the age at which desexing might be legislated.

- Compliance/ avoidance of penalties were the major reasons cited to register their pets. There was little acknowledgement that registration fees fund animal management activities. Owner attitudes to council and the lack of value received from registering an animal formed the majority of reasons for not registering a pet. This may be the reason that a significantly greater percentage of cats (21%) were unregistered than dogs (8%). As dissatisfaction with registration negatively impacts compliance, market the services provided may counteract these perceptions.
- The primary reason cited by owners to microchip their animal was to help find a lost animal. Some owners perceived that the pre-requisite of microchipping before registration would lessen/remove the need for registration at all; while others perceived that the expense of implantation was a barrier to microchipping. Owners did not see the need to microchip an animal that was never unsupervised, allowed outdoors or identified in some other way. Also, some owners believed that microchipping might compromise the animal's well-being in some way and this formed another barrier to compliance. A significantly greater proportion of dogs were microchipped compared to cats.
- While the majority (85.3%) of dogs were never allowed outside the owner's property unsupervised, approximately 15% were allowed to wander at large. This is somewhat surprising, as it is illegal to allow a dog to wander at large in Victoria. By contrast 62.8% of cats are allowed outside unsupervised for at least some period of time, with 18.6% unsupervised at least half of the time. Male cats were allowed outside unsupervised to a greater degree than female cats. It is uncertain why this difference exists. Perhaps male cats are more problematic to contain or possibly that the owners of female cats may be more aware of the consequences of allowing a cat to roam.

### **Veterinarian surveys**

- The majority (72.5%) of practices were located in metropolitan Melbourne, with 21.6% rural and 5.9% regional practices represented.
- Veterinarians have an accurate perception of their clients' income and educational status, with a good correlation between owner and veterinarian reports.
- Veterinary clients were perceived as primarily (70.25%) of Anglo Australian or New Zealander heritage, with another one-sixth of European descent and approximately one-tenth of Asian heritage. There appeared to be no significant differences between practice location and the cultural heritage of their clientele.
- Cats and dogs formed the vast majority of animals seen at the practices sampled, livestock formed a significantly greater percentage of rural and regional practices, wildlife and fish

comprised a greater proportion of rural practices and reptiles and birds contributed more to urban practices.

- The vast majority of animals (79.6% of cats and 86.2% of dogs) treated by practices were thought to be fully owned, with approximately one-tenth of both species thought to be casually owned and about 5% of cats thought to be semi-owned or ownerless. There were significantly fewer casually owned, semi-owned, ownerless and feral dogs than cats. Rural and regional practices saw significantly more unowned, feral cats and semi-owned dogs compared to urban practices. With an estimated one-tenth of 'less responsibly' owned animals, veterinary clinics may provide a venue to educate some of these hard to reach owners.
- Lower client income levels were associated with a higher percentage of feral cats being presented at clinics which suggests that providing low cost/no cost desexing in low income areas might be effective in reducing feral cat numbers.
- A greater number of puppy litters were presented at clinics than kitten litters. Most puppy litters presented were planned, whilst the majority of kitten litters were not.
- Veterinarians expected to provide significantly different services to dog and cat owners. While they expected that dog owners would access the full range of services, they expected cat owners to use fewer services. Practice location also affected service provision with rural/regional practices expecting to provide fewer services to cat and dog owners than urban practices. Client income level determined the type of treatment that veterinarians expected to provide, particularly for cats. Income level may also affect compliancy with microchipping and desexing, particularly for cats where perceived affordability may be important.
- The vast majority of veterinarians in all locations advised their clients to desex their animals, with no difference in the mean recommended desexing age for dogs and cats.
- Veterinarians did not perceive that any one of the three strategies proposed would achieve the optimal result of increasing the numbers of owned animals whilst reducing the numbers of unowned, semi-owned or feral animals.
  - They believed that the introduction of mandatory desexing prior to six months would reduce the population of casually owned cats without affecting the numbers of fully owned cats and dogs. A minority believed that this strategy would reduce the numbers of feral animals significantly. Approximately an equal proportion of veterinarians perceived that this strategy would either reduce or not change the numbers of semi-owned and ownerless cats.
  - The introduction of compulsory EAD was felt to be a less effective as it was perceived as likely to reduce the number of fully owned cats and dogs.
  - Veterinarians perceived that desexing before six months would reduce the numbers of semi-owned, ownerless and feral cats more effectively than desexing at three months

of age. These perceptions may form a barrier to veterinarians supporting MD before three months of age.

- Veterinarians believed that encouraging the voluntary desexing of cats and dogs before three months of age might produce the largest increases in fully and casually owned cats and dogs. However, they believed that this would be accompanied by an increase in the numbers of semi owned, ownerless and feral animals.
- Veterinarians perceived that EAD has health consequences in dogs, such as incontinence, and that bitches should have a season before desexing. These reservations were not expressed for cats. They did not identify any barriers to performing EAD based on a need for extra equipment or training. They felt that EAD was appropriate for unowned shelter animals, but not for owned puppies and kittens.

## Introduction

Over the last decade veterinary epidemiologists (Baldock, Alexander, & More, 2003) and marketing companies (BIS Shrapnel Global Marketing Intelligence and Forecasting, 2006) have reported that pet ownership, and particularly cat ownership, has diminished in Australia. Therefore, it could logically be expected that admissions to pounds and shelters would have also reduced, as has, in fact, been reported in New Zealand (Rinzin et al., 2008). However, similar reductions in the rates of admission and euthanasia have not reported by shelter and pound operators in Australia.

The majority of animals entering Australian shelters are sexually entire and many animals, particularly cats, are admitted at a very young age. Based on the assumptions that this reflects an over-supply of pet species and that high admission levels result in unacceptably high levels of euthanasia, Australian welfarists are urging state governments to legislate the Mandatory Desexing (MD) of companion animals (Marston, Bennett, & Toukhsati, 2006). The success of this approach is dependent on ensuring that the animals which are contributing to shelter admissions and euthanasia are desexed in accordance with the proposed legislation, which in turn requires that these animals have a guardian who will comply with this legislative requirement.

This issue is less straightforward than it initially appears for two main reasons.

The introduction of legislation that requires a medical procedure to be performed is contentious; particularly if clinicians have reservations about the health outcomes associated with the prescribed procedure, which would undermine their duty of care to their patients. Veterinarians have expressed reservations about MD including associated health issues (Cooley et al., 2002), a reduction in genetic diversity (Marston, 2007), a further reduction in cat ownership and possibly a compromised ability to earn a reasonable income (McGreevy, Fougere, Collins, Bartimote, & Thomson, 2002). As the support of veterinarians is essential to any strategy requiring surgical desexing it is important to understand any clinical, ethical or business reservations that they may have.

Desexing strategies entail the surgical removal of an animal's ability to reproduce, with Early Age (or paediatric) Desexing (EAD) performed in the first three months of life. This process requires the cooperation of veterinarians but currently, MD and EAD are opposed by many veterinarians. In the past few years a fundamental difference in opinion has been expressed between welfare organizations and many veterinarians regarding the feasibility and effectiveness of MD for companion animals. Available veterinary statistics (Baldock et al., 2003), which are consistent with Victorian council registration records (McMurray, 2004), indicate both that the majority of pet cats are desexed and that

the population of owned cats is decreasing, perhaps even below sustainable levels. (Baldock et al., 2003). Given that most cats seen by veterinarians are already desexed (Baldock et al., 2003), many veterinarians question whether desexing strategies targeting pet owners would achieve a reduction in shelter admissions and are concerned that it would further reduce the population of owned cats.

One factor that may be relevant to the owned cat population is the age at which people desex their animals. While evidence suggests that 'responsible' cat owners tend to desex their animal, a recent study (Marston et al., 2006) suggests that some may not desex their animal before sexual maturity. It is not known whether this delay results in unplanned pregnancies, nor is it known if the progeny of these pregnancies, if they do occur, form a significant percentage of the cats and kittens presented to shelters and pounds. If kittens from owned cats do not enter shelters in any great numbers but primarily become pet cats, then MD may further reduce the already declining owned cat population, without influencing shelter statistics.

A second complication is that there is dispute over where cats and dogs admitted to shelters come from. A far greater number of cats than dogs are admitted to shelters in a given time frame, with up to a four-fold difference reported in New Zealand (Rinzin et al., 2008). Several Victorian studies indicate that two-thirds, or more, of cats admitted to shelters annually are killed, a large proportion of these were healthy and rehomeable kittens (Marston et al., 2006; Webb, 2006). By contrast, very few puppies are euthanased, with available data indicating that most dogs are euthanased because they are unsuitable for rehoming (Marston et al., 2004). This suggests that there are some significant differences between unwanted cats and dogs. In one case it appears that there are simply too many cats, in the other it appears that undesirable canine behaviour and owner-related issues are the key problems.

The 'Cat Issue' is further complicated by the existence of a population of a semi-owned cat population. Cat semi-owners feed cats that they do not own, but rarely, if ever, access veterinary services for them (Toukhsati et al., 2006). Due to better nutrition, semi-owned cats are likely to be in better reproductive condition than other strays, but as they tend to be entire it is possible that they contribute significantly to the numbers of unwanted cats in our society. The relatively high incidence of cat semi-owners (22%) in Victoria (Toukhsati et al., 2006), makes it difficult to predict the impact of MD. As most of the cats which enter shelters as strays display some evidence of having been socialised to humans (Marston et al., 2006), it is likely that many of them are semi-owned cats. Increasing the proportion of cat semi-owners who desex the animals they feed therefore could reduce shelter admissions. It is unknown, but probably unlikely, whether such a behavioural change can be achieved by legislation, given the difficulty in accessing these individuals for enforcement purposes.

Logically therefore, MD is unlikely to have any impact on this population, unless the owned cat and semi-owned cat populations interact on a large scale and currently this is unknown.

Any strategy devised to reduce the level of shelter euthanasia is likely to be costly to implement. Therefore, such strategies must be strategically focused upon the factors most likely to produce change. While there is some information available from shelters about the types of animals admitted and some from the general community regarding attitudes to cats and the presence of semi-owned cats there is very little information available regarding how 'responsible' owners control the reproductive behaviour of their pets, the types of cats presented to veterinarians, nor is there any data available regarding the movement of cats between the fully-owned, semi-owned and stray populations. If many pet cats are being desexed after sexual maturity then how many of them have kittens before being desexed? How many of these pregnancies are planned? What happens to the kittens produced? Do they contribute to the semi-owned cat population or are they adopted into responsible homes and desexed? Many cat owners acquire their cats passively (Toukhsati et al., 2006), but where are they sourced from? Are they bred by neighbours, friends or family? Or are they the progeny of semi-owned or feral cats? These data would provide information on the movement of cats between the various sub-populations i.e. fully-owned, semi-owned and stray animals. Also we know little about the types of animals currently presented to veterinarians and what responsible, caring owners think and feel about desexing their pets. Unfortunately, there is little research available to answer these questions.

To reduce the numbers of animals admitted to, and euthanased by, shelters, it is essential that a consistent, well-informed, evidence-based approach be implemented. The aim in this study is to characterise the dogs and cats that visit veterinarians, particularly with regard to factors related to how owners manage their animal's reproductive behaviour. This will be achieved by surveying veterinarians and their clients and building upon existing data (Marston et al., 2006; Toukhsati et al., 2006). Due to the paucity of pre-existing data, a two-tiered approach was adopted, with both veterinarians and their clients surveyed.

## **Method**

A list of private practice veterinary surgeries was compiled from the Victorian phone book. Specialist practices such as dentists, mobile veterinarians, veterinary behaviourists, emergency centres etc were excluded from the contact list as they and their clientele were not felt to represent the type of practices most often frequented by ordinary pet owners. This resulted in a contact list of 321 veterinary practices.

Two questionnaires were created using information obtained from a review of the scientific literature, and refined in consultation with the project steering committee, which was comprised of representatives from shelter organisations, government, the veterinary profession, a microchip database management company and researchers. One questionnaire was directed to practitioners and the other to their clients.

The study was publicised through the Victorian branch of the Australian Veterinary Association's (AVA) e-zine, via the journal of the Veterinary Nurses Council of Australia, and received personal endorsement from the president of the AVA. An information pack, consisting of an introductory letter inviting the practitioner to enrol their practice in the study, samples of the two questionnaires and a small advertising poster, was posted to each veterinary practice on the database. One week after the packs were posted, all practices were contacted by telephone to determine if they wished to participate. Client surveys were then distributed to consenting practices, along with post-paid envelopes addressed to the researcher. Practitioners also received a post-paid envelope to return their own survey. A total of 588 completed owner surveys and 51 completed veterinarian surveys were returned. Distribution of the information packs began in July 2008 and continued progressively through the practice list until the end of 2008. Completed surveys were collected until the end of January 2009. The following is a brief description of the two surveys. The final questionnaires are included as Appendix A in this report.

#### **Owner Survey:**

Pet owners were asked to provide descriptive information about their pets, such as age, gender and whether their pets were registered, microchipped and desexed. They were also asked to identify why they were attending the veterinary surgery and how often they access veterinary care. Their attitudes and behaviour regarding the management of their pets' reproductive capacity were probed as were their attitudes to mandatory and early-age desexing.

#### **Veterinarian Survey:**

Veterinarians were asked to estimate the relative proportions of owned, semi-owned and feral cats and dogs seen in their clinics using descriptions provided. They were also asked about their beliefs concerning the fate of the puppies and kittens produced by the animals presented at their clinics and their opinions regarding the likely impact of various desexing strategies on cats and dogs. Practitioners were also asked to indicate how they feel about MD and EAD, expressing any clinical, ethical or business concerns that they may have regarding these issues.



At the completion of the data collection period, all records were compiled in an electronic spreadsheet and transferred to a statistical package (SPSS for Windows, version 17) for analysis with significance levels set at  $\alpha = 0.05$ .

## Results

Owner and veterinarian surveys were analysed separately.

### Owner Surveys

#### *Demographics*

Data relating to the gender, age and household composition of the owner sample is summarised in the following table.

**Table 1. Owner Demographics**

	Frequency	Percent
<b>Gender of respondent</b>		
Female	485	82.5
Male	92	15.6
Unspecified	10	1.7
Married couple	1	0.2
Total	588	100.00
<b>Age</b>		
18-25	38	6.5
26-55	372	63.3
56-65	112	19.0
66-75	45	7.7
Unspecified	21	3.6
Total	588	100.00
<b>Household demographics</b>		
Single Person Household	207	35.2
Multi-Adult Household	190	32.3
Dual Parent Family	104	17.7
Single Parent Family	68	11.4
Unspecified	19	3.2
Total	588	100.0

As can be seen the majority of respondents were female, with women over-represented in this sample compared to the Victorian population, where 50.9% are female (Australian Bureau of Statistics, 2006). The oldest age group was under-represented compared to Victorian Census data, where 13.7% of the population was aged 65 years and over (Australian Bureau of Statistics, 2006). Almost one-third of the sample lived alone, which is somewhat higher than the 23.3% identified in Victorian Census data (Australian Bureau of Statistics, 2006). There was no significant difference between the proportion of men and women who lived alone ( $\chi^2=6.19$ ,  $df=6$ ,  $p=0.40$ ) with a significantly greater

proportion (62.9%) of people aged 66-75 living alone ( $\chi^2=81.77$ ,  $df=9$ ,  $p<0.000$ ). This is much higher than expected based on the 2001 Census data, where the highest rate of ‘living alone’ (47.7%) was seen amongst females aged over 75 years (Australian Bureau of Statistics, 2001). Almost half (46.6%) of the sample lived in a single adult household (209 women and 29 men). There was an under representation of children in participant households (28.9% in the sample compared to 64.2% (Australian Bureau of Statistics, 2006)). Data relating to the number of children in each household is presented below.

**Table 2. Number of Children per Household**

	Frequency	Percent
0	397	67.5
1	88	15.0
2	59	10.0
3	23	3.9
4	2	0.3
Unspecified	19	3.2
Total	588	100.0

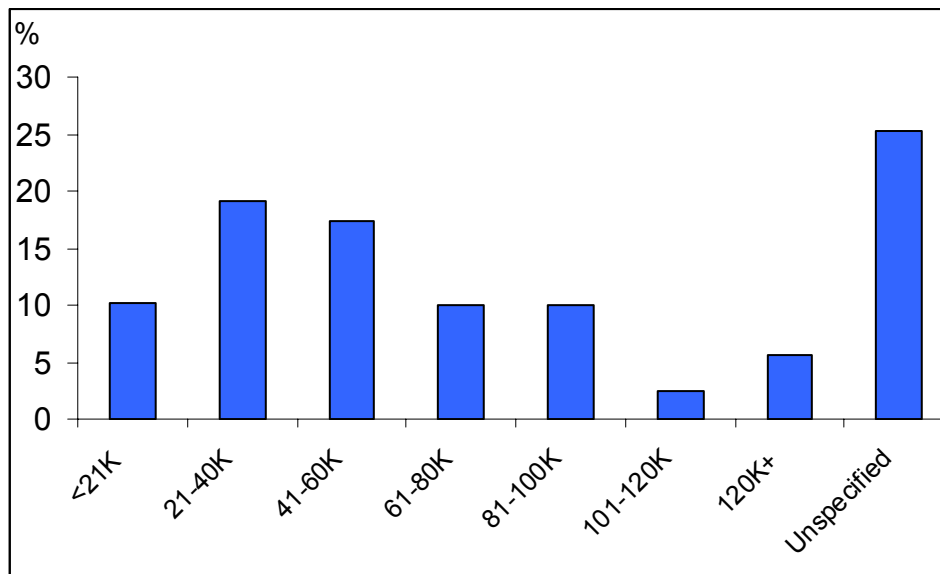
As can be seen from the preceding table, more than two-thirds of the sample households did not include any children. By contrast, nearly two-thirds of the Victorian population live in a household with at least one child (Australian Bureau of Statistics, 2006). As could be expected, a significantly higher proportion of respondents who answered this question (171 out of the 567) with children in the household were aged 26-55 years ( $\chi^2=79.76$ ,  $df=15$ ,  $p<.000$ ). Data relating to the educational level of owners are tabulated below.

**Table 3. Educational Level**

	Frequency	Percent
Completed Primary School	5	0.9
Completed Part Secondary School	57	9.7
Completed Secondary School	195	33.2
Completed Undergrad degree	171	29.1
Completed Post-Grad Degree	132	22.4
Unspecified	28	4.8
Total	588	100.0

The table above shows that the vast majority of the sample had completed secondary education, with over half the sample having attained a tertiary qualification. The level of education reported by this sample is greater than that expected from Victorian Census data; 8.4% of the Victorian population have not completed primary education and 45.3% have not completed secondary school (Australian Bureau of Statistics, 2006).

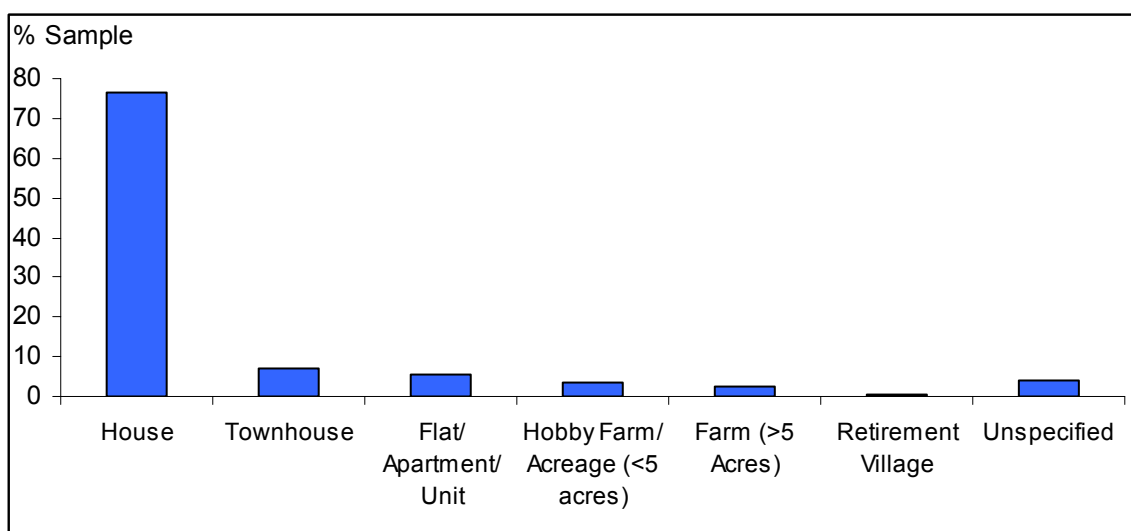
Data relating to the income level of the sample is presented below. It should be noted that 149 respondents (or 25.3% of the sample) declined to answer this question.



**Figure 1. Owner Income Levels (as a percentage sample)**

The mean annual household income of the sample was \$99,740, but income levels varied widely from a minimum of \$8,000 to a maximum = \$1.5M. Excluding extreme values resulted in a mean income level of \$65,990, which is substantially higher than the \$53,144 average Victorian household income (Australian Bureau of Statistics, 2006). Analysis of the 427 cases that supplied their income, revealed that income varied significantly with the age of respondent ( $\chi^2=66.37$ ,  $df=18$ ,  $p<.000$ ): older people formed a greater proportion of those reporting the lowest incomes (41.4% of those with an income below \$20,000 were aged 66 years and over) while 61.3% of 18-25 year olds sample received an income between \$21,000- \$40,000.

Data relating to the participants' residence is presented below.



**Figure 2. Type of Residence.**

As can be seen the vast majority (76.7%) of the sample lived in a house. This is almost identical to the 76.4% of Victorians identified as inhabiting houses in the 2006 Census (Australian Bureau of Statistics, 2006). There were no relationships observed between age, gender, education or income level of respondents and type of residence occupied. Respondents were asked to describe their cultural heritage. In order to simplify the data, responses that occurred only once were subsumed into an ‘Other’ category. These included Russian, Anglo-Canadian, Maori, Aboriginal and Asian. The grouped data are tabulated below. The majority of the participants described themselves as Anglo-Australian, or of European heritage.

**Table 4. Cultural Heritage of Sample**

	Frequency	Percent
Anglo-Australian	482	82.0
European	52	8.8
Eastern European	6	1.0
New Zealand	6	1.0
Other	6	1.0
Eurasian	4	0.7
South African	3	0.5
Indian	2	0.3
Unspecified	27	4.6
Total	588	100.0

Respondents were asked what languages they spoke at home. Of the 565 (96.1%) people who responded to this question, the vast majority (94.0%) spoke only English, 10 people (1.8%) spoke a second language plus English and only two respondents did not speak English at home. The number of dogs and cats owned by respondents is tabulated below.

**Table 5. Number of Cats and Dogs Owned by Participants**

	Frequency	Percent
<b>No. Cats owned</b>		
0	316	53.7
1	140	23.8
2	91	15.5
3	16	2.7
4	3	0.5
5	4	0.7
6	3	0.5
7	1	0.2
Unspecified	14	2.4
Total	588	100.0
<b>No. Dogs owned</b>		
0	125	21.3
1	261	44.4
2	171	29.1
3	22	3.7
4	7	1.2
6	2	0.3
Total	588	100.0

A total of 258 people owned 427 cats (1.65 cats per cat owning participant) and 463 people owned 709 dogs (or 1.53 dogs per dog owning participant) in this sample. Over half of the respondents did not own a cat and approximately one-fifth of participants did not own a dog. When cultural heritage was considered, it was found that there was an over-representation of European, Eastern European and Eurasian respondents who owned three or more cats ( $\chi^2=113.54$ ,  $df=64$ ,  $p<.000$ ).

Respondents were asked if they had ever fed a cat that they believed was unowned. Almost two-fifths of the sample (37.9% or 223 people) responded that they had done so. A significantly greater proportion of cat owners had fed cats that they did not own ( $\chi^2=24.22$ ,  $df=6$ ,  $p<.000$ ) as compared to owners of other species. A significantly greater proportion of women fed cats that they did not own ( $\chi^2=12.41$ ,  $df=3$ ,  $p<.006$ ) compared to men and a significantly greater proportion of female cat owners were semi-cat owners ( $\chi^2=19322$ ,  $df=3$ ,  $p<.000$ ). There was no relationship observed between this behaviour and age, income or educational level.

### ***Characteristics of the Animals Presented at Veterinary Clinics***

Participants were asked to describe the animal they were presenting at the clinic at the time of their recruitment. These data are displayed below.

**Table 6. Number of Dogs and Cats Presented**

	Frequency	Percent
Dog	428	72.8
Cat	134	22.8
Other	21	3.6
Unspecified	5	.9
Total	588	100.0

As can be seen, dogs formed the majority of animals presented at the clinic. The ‘Other’ category consists of cats and dogs (17) presented together, two rabbits, one rat and one bird. The vast majority (577 or 98.1%) of the animals presented at the clinic were owned by the person presenting them. Three participants brought unowned animals to the clinic; one an animal on behalf of a family member, another a ‘lost’ animal and another an animal to be cared for ‘because no one owned it’. Nine participants did not answer this question. Data relating to the sex of the 134 cats and 428 dogs are presented below.

**Table 7. Sex of the Cats and Dogs Presented**

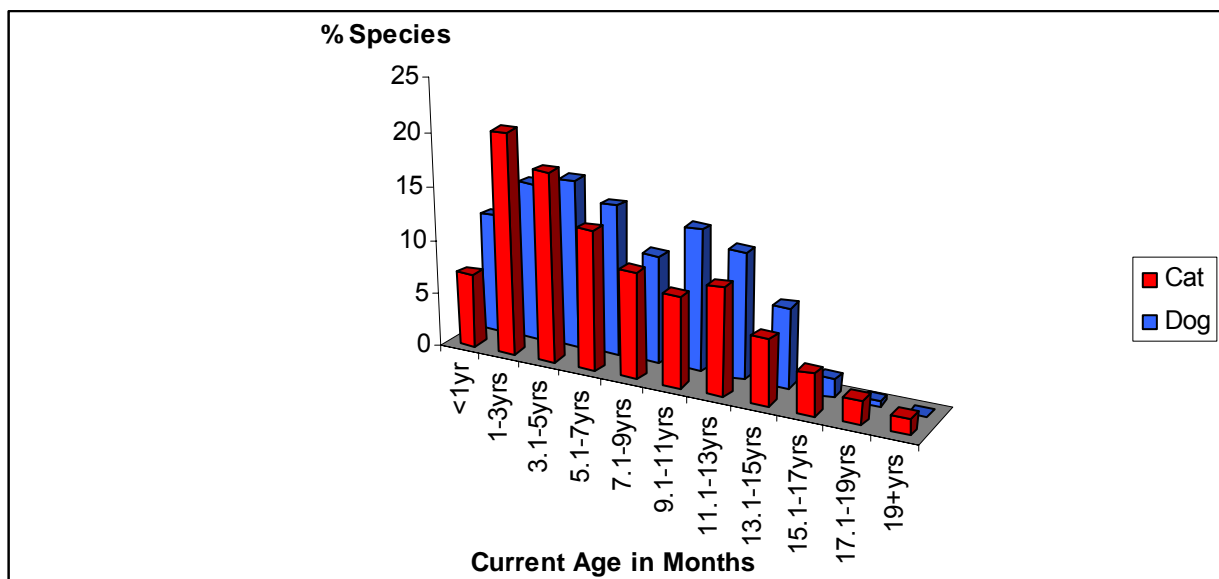
Sex of animal	Cat		Dog		Total	
	n	%	n	%	n	%
Female	65	48.5	208	48.6	273	48.6
Male	65	48.5	208	48.6	273	48.6
Unspecified	4	3.0	12	2.8	16	2.8
Total	134	100.0	428	100.0	562	100.0

An equal number of male and female cats and dogs were presented with the vast majority (95.6%) of them not presented as part of a litter. In fact, there were very few litters presented to veterinarians. There were no statistical differences observed between cats and dogs regarding the number of litters presented with only 4.5% of cats presented as a litter of kittens and 4.2% of dogs presented as a litter of puppies.

### Age of Animals Presented at Clinic

The mean age of the animals at the time of survey was 6.83 years or 82.16 months (S.E. = 2.38). The mean age of cats was 7.05 years (SE = 5.34, range 3months to 21 years), which was slightly older than the mean age of dogs (6.78 years, SE =2.64, range 2.5 months to 19 years).

A breakdown of the current age of the dogs and cats sampled is depicted graphically below.



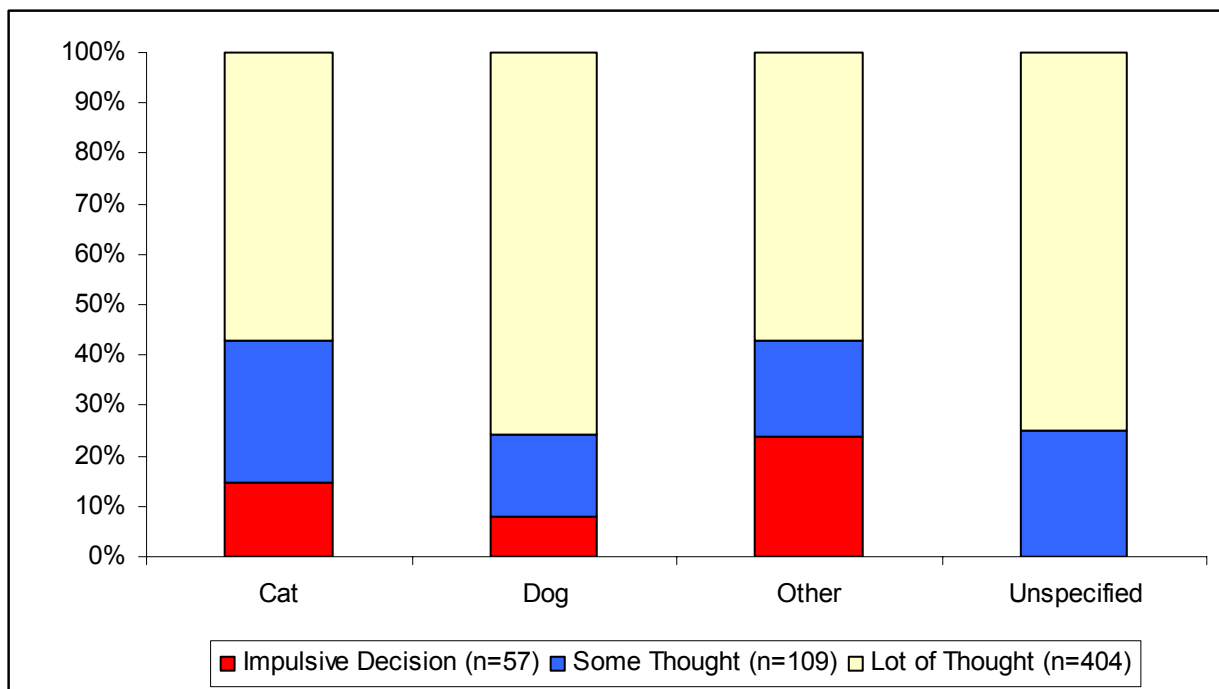
**Figure 3. Current Age of Dogs and Cats Sampled**

As can be seen from the above chart, over half the cats and dogs sampled were aged less than seven years of age at time of survey. A significant proportion of the very young animals were dogs, while a

greater proportion of the oldest animals were cats ( $\chi^2=18.73$ ,  $df=10$ ,  $p< .05$ ). There was no observable relationship between gender of the animal and age.

### Acquisition of Animals

Participants were asked to rate how much they had thought about getting their pet prior to acquisition. Almost three-quarters of the sample (68.7%) reported having taken a lot of thought, 18.5% had taken some thought and 9.7% had made an impulsive acquisition (3.1% of the sample did not answer this question). Data relating to the amount of thought given to the acquisition of different species is depicted graphically below.



**Figure 4. Amount of Thought about Acquisition by Species**

As can be seen, a significantly greater proportion of participants ( $\chi^2=21.85$ ,  $df=6$ ,  $p= .001$ ) thought a lot more about acquiring a dog than did those who acquired a cat. The highest proportion of impulsive acquisitions occurred amongst individuals who acquired species other than cats and dogs e.g. rabbits and rats. Participants were asked where they had acquired their animal. The results are presented below.

**Table 8. Source of Acquisition**

Source	Cat		Dog		Other		Unspecified		Total	
	N	%	n	%	n	%	n	%	n	%
From a Breeder	29	21.60	167	39.00	3	14.30	1	20.00	200	34.00
Shelter/Welfare Organisation	33	24.60	64	15.00	6	28.60	1	20.00	104	17.70
Pet shop	12	9.00	81	18.90	4	19.00	0	0.00	97	16.50
Neighbour/Family/Friend	29	21.60	46	10.70	3	14.30	2	40.00	80	13.60
Other (incl. failed guide dog, newspaper adverts, 'free to good home' signs)	8	6.00	28	6.50	1	4.80	0	0.00	37	6.30
Animal Adopted you	10	7.50	18	4.20	4	19.00	0	0.00	32	5.40
Veterinarian	8	6.00	9	2.10	0	0.00	0	0.00	17	2.90
Breed Rescue Group	1	0.70	3	0.70	0	0.00	0	0.00	4	0.70
Unspecified Source	4	3.00	12	2.80	0	0	1	20	17	2.90
Total	134	100.00	428	100.00	21	100.00	5	100.00	588	100.00

As can be seen from the preceding table, over one-third of the animals were obtained from a breeder and an approximately equal number of animals were sourced from pet shops and welfare shelters. Almost two-thirds (62%) of the 200 people who acquired their pet from a breeder were supplied with pedigree papers. There were significant differences in where cats and dogs were acquired ( $\chi^2=59.33$ ,  $df=24$ ,  $p<.000$ ); dogs were more likely to be sourced from a breeder or pet shop, while cats were over-represented amongst animals sourced from neighbours, family and friends, welfare organisations and those that adopted their owner. A non-significant tendency was identified for people with low incomes (below \$20,000) to acquire their pet from a shelter/welfare organisation, while those with mid-range incomes (\$41,000-\$60,000) tended to acquire pets from their veterinarian and those with incomes between \$60,000 - \$80,000 tended to acquire pets from pet shops and breeders ( $\chi^2=62.63$ ,  $df=48$ ,  $p<.076$ ). No relationship existed between household demographics, gender of respondent or type of residence occupied and the source of pet. Participants were asked how they had found out about their pet. Their responses are tabulated below.

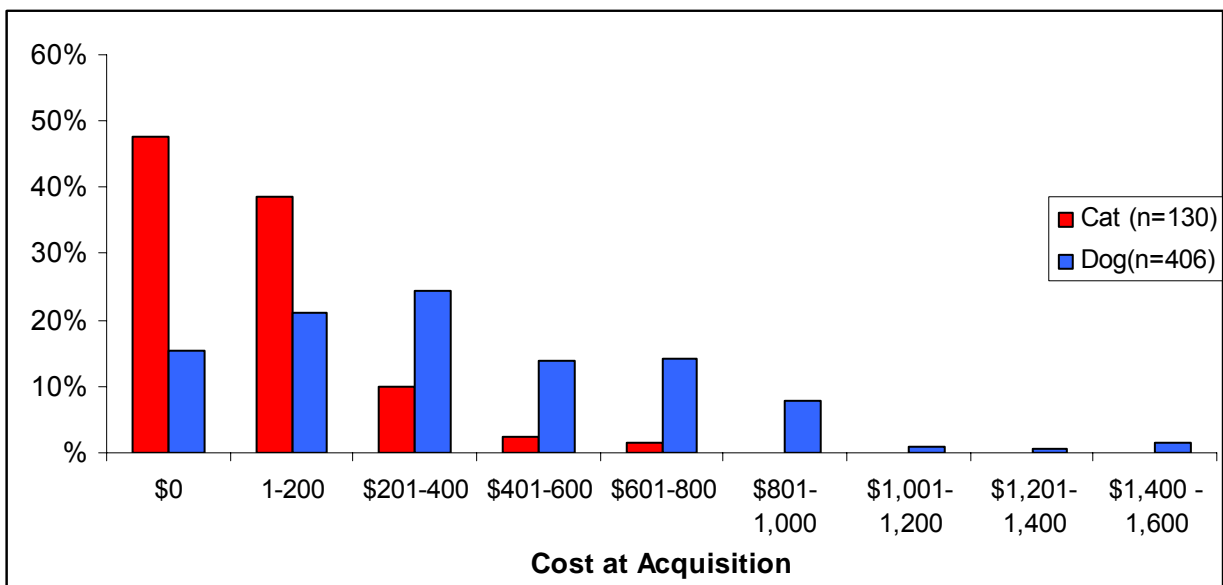


**Table 9. How did Owners find out about their Animal?**

Method Used	n	Percent
Heard about it via a neighbour/friend/family member	115	19.6
Through Breed club or contacted breeder	108	18.4
Saw it at the vet clinic or pet shop	90	15.3
Visited a shelter/pound to find it	77	13.1
Saw an advert in newspaper or local shops	70	11.9
Searched for it on the internet	28	4.8
Turned up on doorstep/ Found it	28	4.8
Other	12	2.0
Gifted	4	.7
Bred Animal myself	3	.5
Via Information provided by Vet	3	.5
Unspecified	50	8.5
Total	588	100.0

One-third of participants (36.7% or 216 participants) exerted active intentionality in acquiring their pet, either by undertaking research or by following up on information from their veterinarian. Almost one-fifth of the sample found out about their pet by word of mouth from neighbours, friends and family. The 'Other category' included seven cases where the source of information about the animal is unclear, three cases of taking over ownership from a casual acquaintance and two people who adopted reclassified guide dogs.

Participants were asked how much they paid for their pet, 550 participants provided this information. The mean cost was \$322.40 per animal, with a minimum of zero and a maximum of \$2,000. Notably, 22.9% of the animals were acquired at no cost. Not surprisingly, a significant relationship existed between cost and source of the animal ( $\chi^2=526.74$ ,  $df=72$ ,  $p< .000$ ). Those acquired by passive adoption (the animal adopted them or from friends and relatives) were obtained at very little cost, if any, whereas animals acquired from a breeder were more expensive. In fact, all animals costing more than \$1,000 were acquired from a breeder. Animals acquired from a veterinary clinic cost less than \$400 and those from pet-shops cost less than \$1,000. A graphical representation of the cost of acquisition broken down by species is presented below.

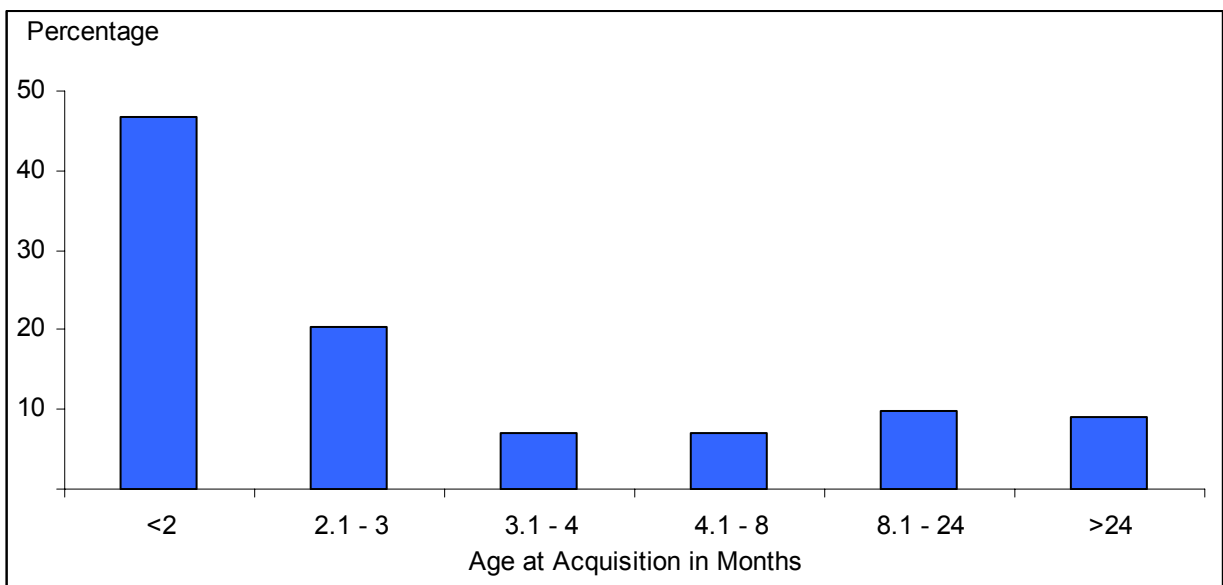


**Figure 5. Cost of Acquisition for Dogs and Cats**

As can be seen from the preceding figure, the cost of acquisition differed significantly for dogs and cats ( $\chi^2=105.23$ ,  $df=8$ ,  $p<.000$ ). Virtually (96.2%) all of the cats were acquired for less than \$400, with almost half (47.7%) acquired at no cost. By contrast, only 15.5% of dogs were acquired at no charge.

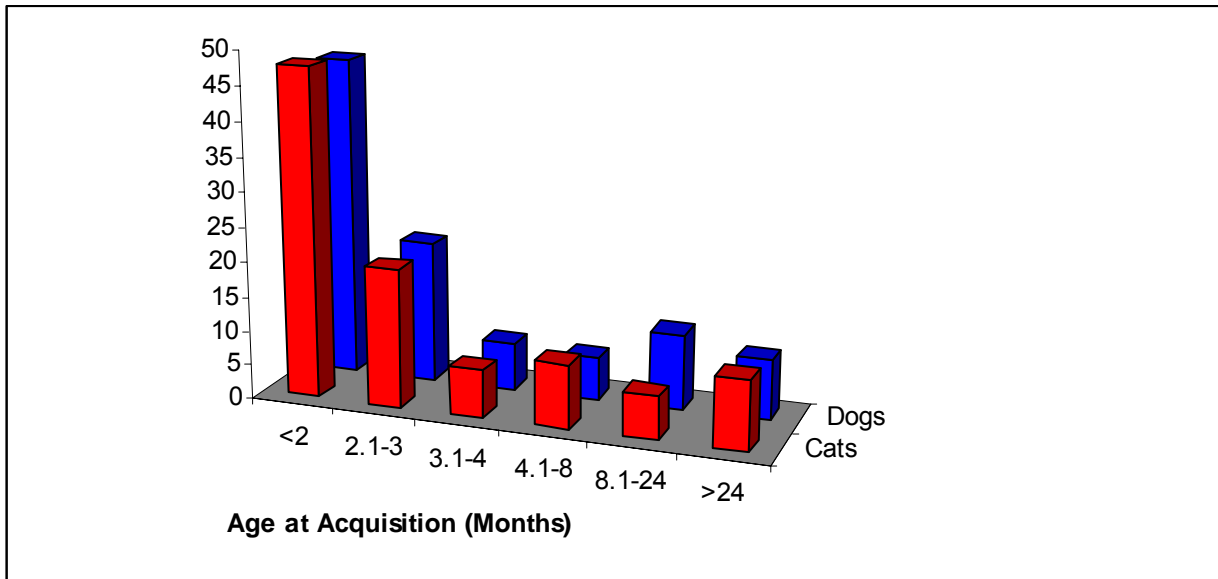
### Age at Acquisition

Respondents were asked how old their animal was when they acquired it. The mean age at acquisition (n=574) was 9.03 months (median=3 and mode =2). These data are presented graphically below.



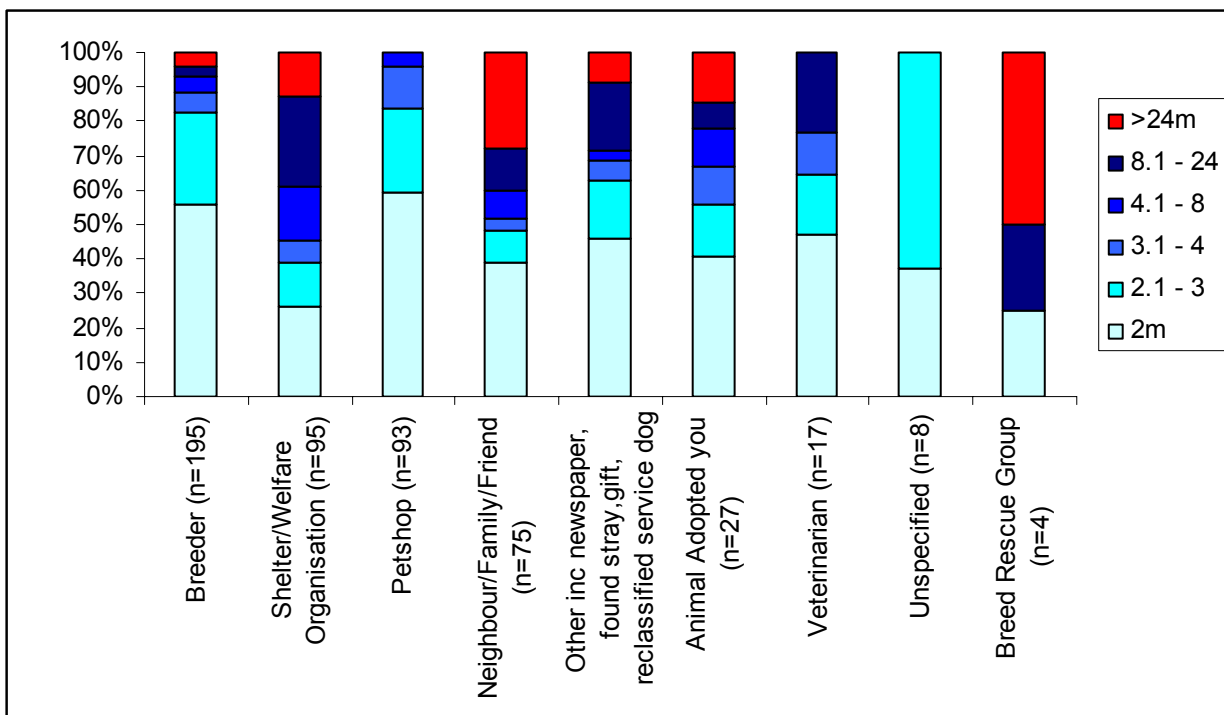
**Figure 6. Age at Acquisition (in Months)**

As can be seen almost two-thirds (65.6%) of animals were acquired aged less than three months. A comparison of the age of acquisition of the dogs and cats presented at veterinary clinics during this study is presented graphically below.



**Figure 7. Age at Acquisition by Species**

Dogs and cats were generally acquired when aged three months or less, No significant difference was observable between the species. A graphical representation of the age group by source of acquisition is presented below.

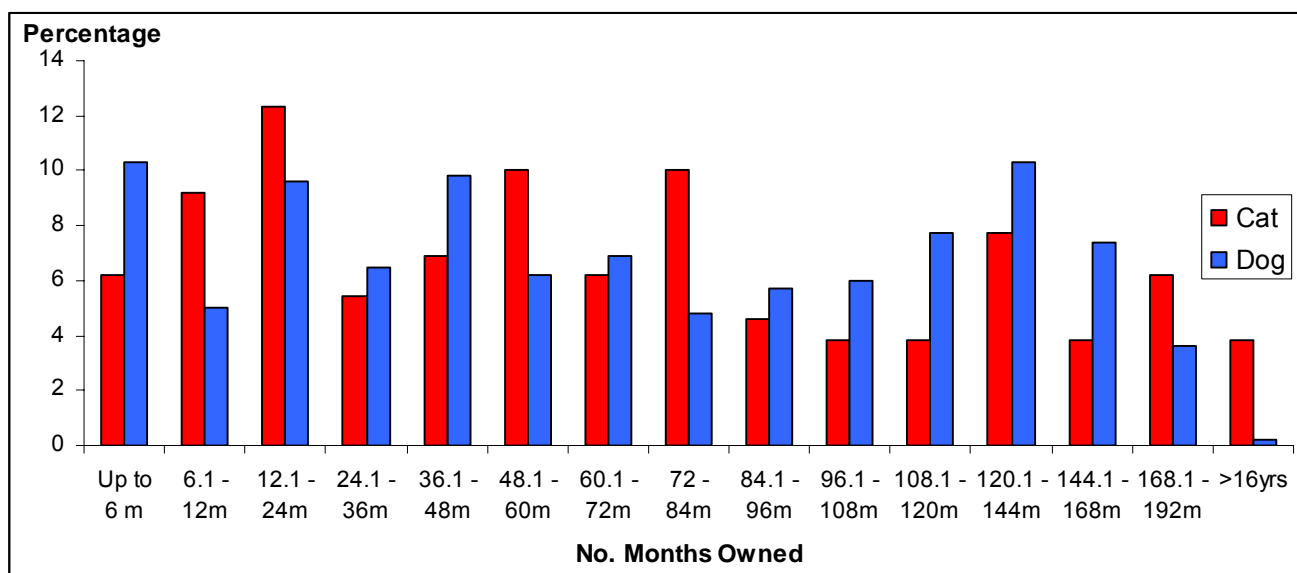


**Figure 8. Age of Acquisition by Source**

Significant differences exist between the age of the animals sourced from different agencies ( $\chi^2=169.59$ ,  $df=40$ ,  $p<.000$ ). Animals sourced from pet shops and unspecified sources tended to be younger than other sources, while those from breed rescue and acquaintances included a greater proportion of older animals.

## Length of Ownership

The length of time that each animal had been owned was calculated by subtracting the age of acquisition from the animal's current age. The mean length of ownership was 6.11 years (or 73.34 months with  $SE = 2.32$ ). Data relating to the length of ownership for dogs and cats is depicted graphically below.



**Figure 9. Length of Ownership (in months) of Dogs and Cats.**

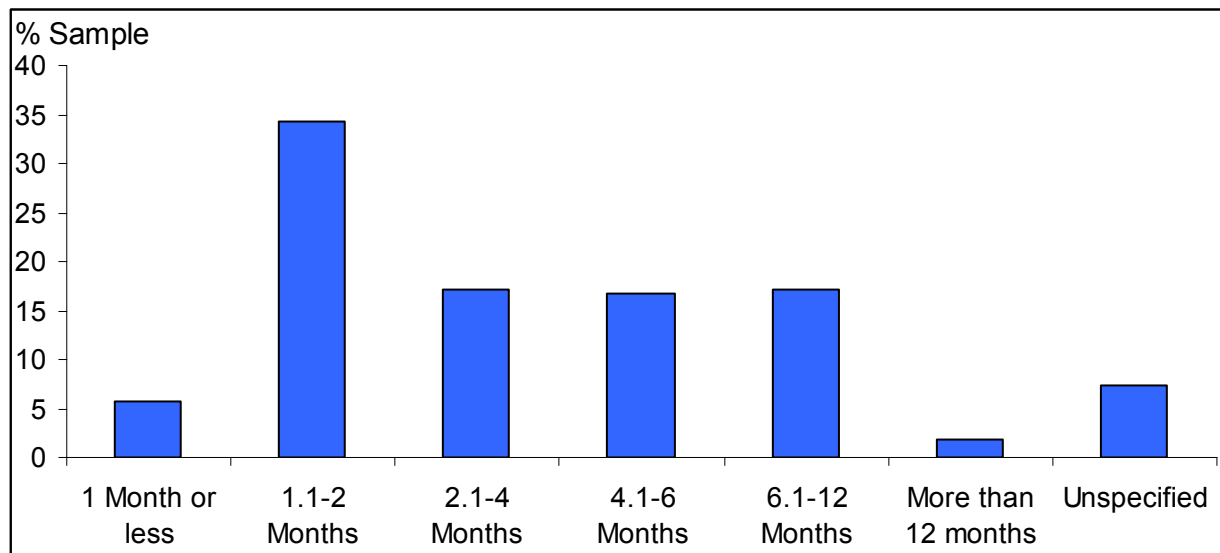
As can be seen, significant differences ( $\chi^2=32.25$ ,  $df=14$ ,  $p<.05$ ) exist between the species regarding length of ownership. Cats were over-represented amongst those animals owned for the longest periods and dogs were over-represented amongst those owned for the shortest period. No statistically significant difference was identified between length of ownership and source of acquisition. A significant relationship was observed between the length of ownership and time since last veterinary visit ( $\chi^2=136.77$ ,  $df=70$ ,  $p<.000$ ), with animals owned for the longest times over-represented amongst those presented most recently at a vet clinic. A significant positive relationship was found between the length of ownership and number of visits to the veterinarian per year for dogs ( $\chi^2=156.32$ ,  $df=126$ ,  $p=.035$ ) but not for cats.

An analysis was performed on the relationship between length of ownership and cost of acquisition. There was no relationship between these variables for cats. The data for dogs (not presented) revealed

a significant relationship between cost and length of ownership ( $\chi^2=160.48$ ,  $df=112$ ,  $p=.002$ ). Dogs acquired a little or no cost, were over-represented amongst those owned for the longest periods of time. In fact, all dogs owned for more than 16 years were acquired for free. In contrast very few of the most expensive dogs had been owned for more than four years. No relationship was identified between the amount of thought given to the acquisition of the animal and the length of time that it had been owned.

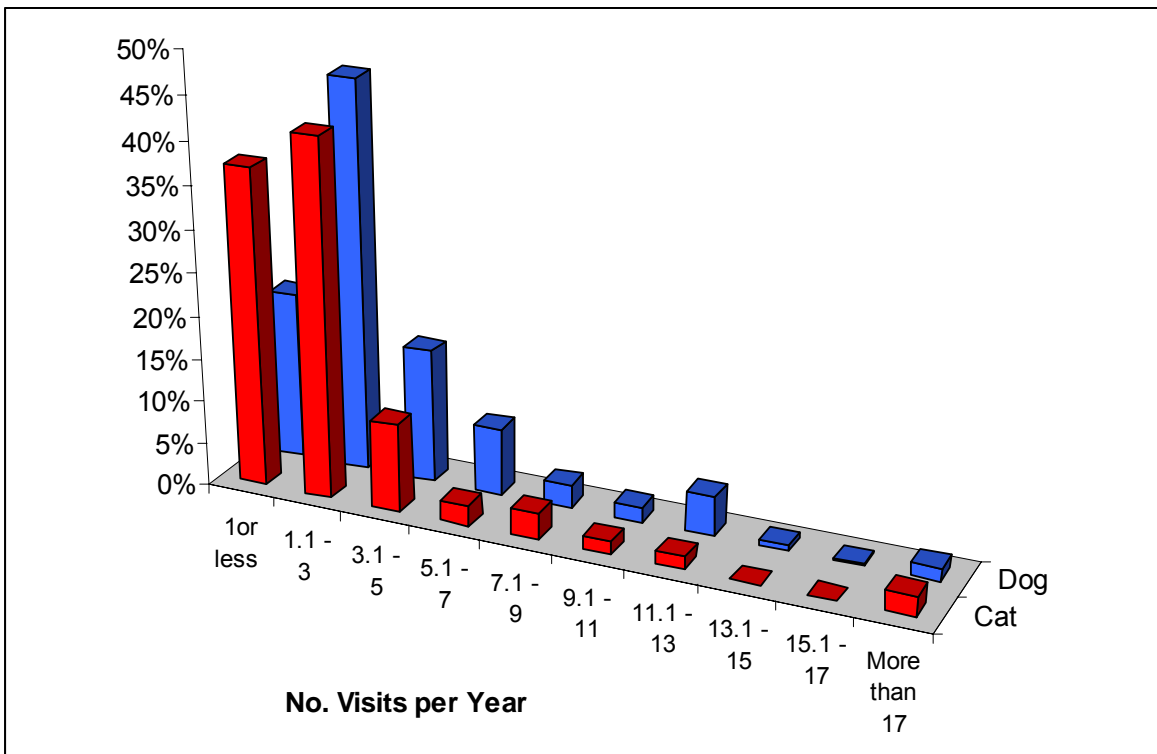
### **Factors Associated with Visit to the Veterinary Clinic**

The vast majority (95.9%) of the sample were visiting their regular veterinarian. The majority (87.2%) were consulting the veterinarian, 2.6% were obtaining a service from a clinic nurse and 9.1% were collecting medication, pet supplies or food or were having their pet groomed or weighed. Data relating to the number of months since their last visit to the veterinarian are presented graphically below.



**Figure 10. Number of Months since Last Visit**

Approximately two-fifths of the sample had visited the vet in the past two months and only 1.9% had not visited the vet in over a year. An analysis of the 520 dog and cat owners, who identified how long it had been since their last visit, revealed a significant difference ( $\chi^2=17.07$ ,  $df=5$ ,  $p<.004$ ) between cat and dog owners (mean = 6.08 and mean = 4.43 months respectively), with cat owners having a longer period since their last visit. Analysis of the number of visits per year ( $n=563$ ) resulted in a mean number of 3.7, with a significant difference between dog and cat owners ( $n = 537$ ,  $\chi^2=23.35$ ,  $df=9$ ,  $p<.005$ ). These data are presented graphically below.



**Figure 11. No. of Visits per year by Type of Animal**

Significant ( $\chi^2=23.35$ ,  $df=9$ ,  $p= .005$ ) differences between cats and dogs were apparent in the pattern of visits. Over one-third (37%), of cats in the sample visited the veterinarian once a year or less, and a further two-fifths (41.6%) visited the veterinarian up to three times per year. By contrast, dogs visited the vet more frequently. Only 20% of dogs visited the veterinarian once a year or less and a further 45.5% visit up to three times per year. Participants with a cat or dog were asked to identify why they were visiting the veterinarian's surgery. These data are presented below.

**Table 10. Reasons Dogs and Cats were Presented at the Clinic**

Reason	% Dogs	% Cats	Total %
Annual Vaccination & Health Check	24.77	29.10	25.80
Treatment of Chronic Condition	10.28	8.21	9.79
Collect Food/ Medication/Supplies	5.61	8.96	6.41
Diagnostics	5.84	5.97	5.87
Follow up visit	7.24	0.00	5.52
Injury	3.27	11.19	5.16
Gastro-intestinal Problem	4.21	4.48	4.27
Skin Problems	5.37	1.49	4.45
Unspecified	3.50	2.99	3.38
Puppy/Kitten Vaccination	3.50	2.24	3.20
Respiratory Problem	2.57	3.73	2.85
Minor Medical Condition	2.80	1.49	2.49
Musculo-skeletal Problem	3.04	0.00	2.31
Grooming	2.34	1.49	2.14
Eye Problem	1.40	3.73	1.96
Ear Problem	1.87	1.49	1.78
Dental	1.40	1.49	1.42
Allergy Treatment	1.64	0.75	1.42
Urinary Problem	0.93	2.99	1.42
Monitoring Weight	1.40	0.75	1.25
Anal Glands	1.17	0.00	0.89
Cancer Treatment	1.17	0.00	0.89
Desexing	0.47	2.24	0.89
Other	0.93	0.75	0.89
Renal problems	0.00	2.99	0.71
Prophylactic care	0.47	1.49	0.71
Surgery	0.93	0.00	0.71
Puppy school	0.70	0.00	0.53
Behaviour problems	0.47	0.00	0.36
Follow up for abnormal reaction to treatment	0.47	0.00	0.36
Cardio Vascular Problems	0.23	0.00	0.18
Total	100.00	100.00	100.00

As can be seen from the preceding table, there were significant differences apparent between the reasons that dogs and cats were presented to the clinic ( $\chi^2=266.42$ ,  $df=30$ ,  $p< .000$ ). A greater proportion of cat owners sought treatment for injuries, desexing, and treatment for eye, urinary and renal problems compared to dog owners. A greater percentage of dog owners sought treatment for cancer, minor medical conditions, skin, allergies, musculo-skeletal and anal gland problems. Desexing comprised less than 1% of the visits. Interestingly, no participants reported taking a cat for a follow-up visit.

### Reasons Clients Visited a Veterinary Clinic

Veterinary clients were asked why they have, or would ever, visit a veterinary clinic for the animal that they brought to the clinic. These results are tabulated below.

**Table 11. Reasons that Cats and Dogs Owners Visit Veterinarians (shown in % with n indicated in brackets).**

Reasons	Type of Animal bought to surgery				Total		$\chi^2$	p
	Cat		Dog		No	Yes		
	No	Yes	No	Yes	No	Yes		
Pre-purchase advice	81.3 (109)	18.7 (25)	70.8 (303)	29.2 (125)	73.3 (412)	26.7 (150)	5.8	0.016 *
Socialisation	75.4 (101)	24.6 (33)	52.3 (224)	47.7 (204)	57.8 (325)	42.2 (237)	22.21	<.000 ***
Puppy/ kitten Vaccination	11.9 (16)	88.1 (118)	14.3 (61)	85.7 (367)	13.7 (77)	83.6 (485)	0.461	0.497
Internal Parasite treatment or prevention	19.4 (26)	80.6 (108)	12.9 (55)	87.1 (373)	14.4 (81)	85.6 (481)	3.55	0.059
Advice on diet	40.3 (54)	59.7 (80)	35.5 (152)	64.5 (276)	36.7 (206)	63.3 (356)	15.396	<.000 ***
Treatment of minor health problems	19.4 (26)	80.6 (108)	15.7 (67)	84.3 (361)	16.5 (93)	83.5 (469)	1.04	0.308
Weighing	61.2 (82)	38.8 (52)	41.8 (179)	58.2 (249)	46.4 (261)	53.6 (301)	15.4	<.000 ***
Advice on diet	40.3 (54)	59.7 (80)	35.5 (152)	64.5 (276)	36.7 (206)	63.3 (356)	1.01	0.32
Treatment of minor health problems	19.4 (26)	80.6 (108)	15.7 (67)	84.3 (361)	16.5 (93)	83.5 (469)	1.04	0.31
Desexing	16.4 (22)	83.6 (112)	16.4 (70)	83.6 (358)	16.4 (92)	83.6 (470)	0	0.986
Contraception	83.6 (112)	16.4 (22)	76.2 (326)	23.8 (102)	77.9 (438)	22.1 (124)	3.26	0.071
Breeding advice	82.8 (111)	17.2 (23)	75 (321)	25 (107)	76.9 (432)	23.1 (130)	3.52	0.06
Minor Injuries	19.4 (26)	80.6 (108)	15.7 (67)	84.3 (361)	16.5 (93)	83.5 (469)	1.04	0.31
Emergency Medical care	9.7 (13)	90.3 (121)	8.9 (38)	91.1 (390)	9.1 (51)	90.9 (511)	0.08	0.77
Referral to specialist	29.1 (39)	70.9 (95)	20.3 (87)	79.7 (341)	22.4 (126)	77.6 (436)	4.52	0.03 *
Euthanasia	24.6 (33)	75.4 (101)	18.5 (79)	81.5 (349)	19.9 (112)	80.1 (450)	2.43	0.12
Microchip	18.7 (25)	81.3 (109)	16.4 (70)	83.6 (358)	16.9 (95)	83.1 (467)	0.39	0.53
Health Check	12.7 (17)	87.3 (117)	8.9 (38)	91.1 (390)	9.8 (55)	90.2 (507)	1.68	0.195
Heartworm	37.3 (50)	62.7 (84)	13.8 (59)	86.2 (369)	19.4 (109)	80.6 (453)	36.14	<.000 **
External parasite treatment	26.9 (36)	73.1 (98)	15.7 (67)	84.3 (361)	18.3 (103)	81.7 (459)	8.57	0.003 **
Adult vaccinations	6.7 (9)	93.3 (125)	6.1 (26)	93.9 (402)	6.2 (35)	93.8 (527)	0.07	0.79
Blood Tests	14.9 (20)	85.1 (114)	14.7 (63)	85.3 (365)	14.8 (83)	85.2 (479)	0.003	0.95
Routine surgery	16.4 (22)	83.6 (112)	14.5 (62)	85.5 (366)	14.9 (84)	85.1 (478)	0.3	0.58
Behavioural Advice	42.5 (57)	57.5 (77)	42.3 (181)	57.7 (247)	42.3 (238)	57.7 (324)	0.003	0.96
Stitch Removal	17.9 (24)	82.1 (110)	15.2 (65)	84.8 (363)	15.8 (89)	84.2 (473)	0.57	0.45
Geriatric Care	32.1 (43)	67.9 (91)	23.8 (102)	76.2 (326)	25.8 (145)	74.2 (417)	3.63	0.06
Emergency Trauma Care	19.4 (26)	80.6 (108)	18.2 (78)	81.8 (350)	18.5 (104)	81.5 (458)	0.09	0.76
Advice prior to relinquishment	62.7 (84)	37.3 (50)	47.9 (205)	52.1 (223)	51.4 (289)	48.6 (273)	8.94	0.003 **

a - df = 1 and N = 562 for all  $\chi^2$  analyses, \* = p< .05, \*\* = p<.01, \*\*\*= p< .001



As is apparent from the table above, differences exist regarding the type of care accessed from veterinary clinics by cat and dog owners. Cat owners were significantly less likely to seek pre-purchase advice, socialisation, advice on diet, weighing, referral to a specialist, heartworm treatment, external parasite treatment and advice prior to relinquishment. Dog owners had a non-significant tendency to seek treatment for internal parasites, contraception, breeding advice and geriatric care more frequently for their pets than cat owners. Interestingly, the proportion of dog and cat owners reporting that they would seek desexing for their pet is identical (83.6%).

## ***Factors Related to Dog and Cat Reproduction & Desexing***

### **Perceived Age of Sexual Maturity for Cats and Dogs**

Participants were asked at what age they believed male and female cats become able to reproduce. While only 4.4% (n=26) participants stated that they did not know when female cats are mature enough to breed, over a quarter of the sample (26.4%) chose not to answer this question. The median age identified for sexual maturity for both female (n=407, with a minimum age of 1 month and maximum age of 24 months) and male cats was 6 months (n=362 with a minimum of one month and a maximum of 24 months). Of concern was the fact that 46.9% of participants, who responded to this question, believed that female cats become sexually mature when more than six months of age with cat owners no better informed than other individuals. With regard to male cats, one-third of the sample did not answer the question and 5.4% explicitly stated that they did not know the age of sexual maturity. Nearly three-quarters (72.7%) of people who answered this question, believe that tom cats are sexually mature by six months of age, with almost half of them (47.5%) believing that six months is the age of sexual maturity.

Almost a quarter (22.3%) of the sample did not state an age at which they believed female dogs to become sexually mature, with 3.1% explicitly stating that that they did not know. The median age supplied for the sexual maturity of both female (n=439 with a minimum of one month and a maximum of 24 months) and male (n=396 with a minimum of one month and a maximum of 36 months) dogs was 6 months. Almost a third (28.7%) of the sample did not identify when a male dog becomes able to reproduce. A further 3.9% explicitly indicated that they did know the answer to this question. Participants who had brought a cat or dog to the clinic were asked a number of questions specifically relating to issues associated with reproduction.

### **Desexed Status of Animals**

Participants were asked if their animal was desexed at the time of acquisition. These results are presented below.

**Table 12. Frequency and Percentage of Cats and Dogs Desexed at Time of Acquisition**

Species	Desexed at acquisition						Total	
	No		Yes		Unknown			
	n	%	n	%	n	%	n	%
Cat	85	63.4	41	30.60	8	6.00	134	100
Dog	317	74.1	94	22.00	17	4.00	428	100
Total	402	71.5	135	24.00	25	4.40	562	100

Analysis of these data revealed that there is a non-significant trend for a greater proportion of cats to be desexed at acquisition compared to dogs ( $\chi^2=5.70$ ,  $df=2$ ,  $p=.058$ ). Dogs and cats acquired from welfare organisations were significantly more likely to be desexed than animals from any other source ( $\chi^2=240.18$ ,  $df=16$ ,  $p<.000$ ), with 78.4% of these animals being desexed. For those animals not desexed at acquisition, owners of dogs and cats were asked at what age their animal was desexed. Three hundred and fifteen participants answered this question. The mean age of desexing was 9.57 months (SE = 0.71) with a minimum age of 1.5 months and a maximum age of 10 years. There was no difference in the age that dogs and cats were typically desexed. In order to enable comparisons to be made with a recent study (Masters & McGreevy, 2008), the data were broken into specific age categories for dogs. Unfortunately only 250 dog owners responded to this question. These data are presented below.

**Table 13. Percentage of Dogs by Age Desexed**

Age desexed in Months	n	% of dogs in sample
< 5	170	39.7
6-11	32	7.5
12-24	36	8.4
25-48	7	1.6
49-60	2	.5
61-96	2	.5
108-120	1	.2
Sub-total	250	58.4
Missing	178	41.6
Total	428	100.0

As can be seen from the preceding table over two-fifths of the dogs in this sample were desexed at less than six months of age. This is twice the prevalence reported by Masters and McGreevy's study (2008), with nearly three-fifths of their sample being desexed between six and 11 months. Participants were asked if their animal was desexed at the time of survey. These data are presented below.

**Table 14. Frequency and percentage of Cats and Dogs Desexed at Time of Survey**

Species	No		Yes		Unknown		Total	
	n	%	n	%	n	%	n	%
Cat	5	3.7	126	94.0	3	2.2	134	100
Dog	42	9.8	384	89.7	2	0.5	428	100
Total	47	8.4	510	90.7	5	0.9	562	100

As can be seen from the preceding table, significantly more cats were desexed at time of survey than dogs ( $\chi^2=8.32$ ,  $df=2$ ,  $p= .016$ ). Although the sexual status of an equal number of male and female dogs was reported, a greater number of male dogs (24) were sexually entire compared to female dogs (16). Significantly more entire dogs were aged less than one year of age compared to desexed animals ( $\chi^2=102.05$ ,  $df=18$ ,  $p= .000$ ). The number of entire cats was too low to identify any relationship between desexed status, sex and age. Comparison of the preceding two tables indicates that over 60% of the dogs and cats in this sample were desexed after acquisition. There was no difference between cultural groups regarding whether their pets were desexed or not.

### **Factors Associated with Sexually Entire Cats and Dogs**

Participants with sexually entire cats and dogs ( $n=47$ ) were asked if they intended to breed their animal. Numbers of these participants were too low to enable tests of significance to be meaningful calculated so descriptive statistics only are reported. None of the cat owners indicated that they intended to breed their cat and only 12, or 28.6%, of the owners of sexually entire dogs indicated their intention to breed their dog (another 2.4% were uncertain whether they would breed their dog or not). Reasons for breeding a cat or dog included: breeding for good temperament as pets ( $n=3$ ), breeding for show or to improve the breed ( $n=3$ ), being a responsible breeder ( $n=2$ ), wanting to have pups ( $n=2$ ), producing small numbers of working dogs every two years ( $n=1$ ), financial reasons and as a hobby ( $n=1$ ).

Owners of sexually entire animals were asked if they intended to desex them and the reasons why. The majority (63.8% or 30) of the 47 participants with a sexually entire animal did intend to desex, 31.9% (or 15 participants) did not, one was uncertain and another did not respond to this question. Reasons given for intending to desex are tabulated below.

**Table 15. Reasons to Desex Sexually Entire Animals**

Reason	Frequency	Percent
Population Control	11	23.4
Prevention of Tumours /Cancer in Later Life	8	17.0
Behavioural Reasons	6	12.8
Recommended by Vet/Breeder	2	4.3
No Intention of Breeding	2	4.3
Dog has fault and I will not breed her	1	2.1
Unspecified	17	36.2
Total	47	100.0

As can be seen, the most common reason to intend to desex is to ensure that unwanted pregnancies and offspring were not produced. Behavioural reasons included preventing roaming and ‘stabilising the male temperament’. Although not cited as their primary reason to desex their pet, another four participants expressed the belief that their animal would be more settled, or would be less of a nuisance, after desexing. The median age that participants (n=27) intended to desex their animals was 6 months although 9 intended to desex later than that. Visually, there appeared to be a slight tendency in the data for owners to intend to desex cats at a younger age than dogs, but this would have to be confirmed statistically with a larger sample. Fourteen of the participants who did not intend to desex their animal identified the reason that they would not do so. These included showing (4), breeding (4), not necessary or able to manage a sexually entire dog (3), animal is too old (2) and cannot catch stray cat mother to desex her (1).

Thirty-eight of the 47 participants with sexually entire animals identified how they would prevent unwanted pregnancies occurring. These methods focused primarily on physical management or containment (26 dog owners and three cat owners), five participants would desex before sexual maturation to prevent an unwanted pregnancy, two participants felt that as they had male dogs they did not have to do anything to prevent an unwanted pregnancy, one participant felt that their dog was too old and another felt that their dog was too lazy. Participants with sexually entire animals were asked what they would do with any litters produced. Fourteen (29.8%) of these participants did not complete this question. Twelve (25.5%) would ‘find homes for them’, 10 (21.3%) would sell them, five (10.6%), felt that they would prevent any litters by their management strategy, three (6.4%) would give the puppies or kittens away, two would take them to a shelter and one would euthanase them.

Thirty-six (76.6%) of the 47 participants with sexually entire animals recalled being advised about desexing by their veterinarian, 10 did not and one participant did not respond. Thirty-three (70.2%) stated that their vet had advised them to desex their animal and 9 participants (19.1%) stated that their vet had advised them not to desex their animal. Just over one third (36.2%) of this group was advised to desex their animals at six months of age, with 15% advised to desex their animal when aged between

three to six months, 6.4% were advised to desex as soon as possible and 4.3% were advised to desex after six months. Another third (36.2%) did not respond to this question.

## Litters Presented

People who presented cat and dogs at the clinic were asked if the animal had had any litters of offspring. Thirty-four had produced at least one litter. These data are presented below, broken down by species.

**Table 16. Number of Litters produced by Cats and Dogs.**

No. of Litters produced	Cat		Dog	
	n	%	n	%
0	114	85.1	394	92.1
1	8	6	11	2.8
2	2	1.5	5	1.2
3	0	0	1	0.2
More than 3	2	1.5	4	0.9
Unspecified	8	6	13	3.3
Total	134	100	428	100

No statistical differences were identified in the number of litters produced by cats and dogs. Thirty three animals were identified as having had a litter; 22 of these were female and 11 were male. Only one cat was unowned and all dogs were owned. Although 32 owned dogs and cats had had at least one litter, data relating to the number of progeny was only supplied for 27 animals. Eleven cats had a total of 66 kittens and 16 dogs had a total of 164 puppies, totalling 230 progeny. The fate of the progeny is presented in the following table.

**Table 17. Fate of Progeny by Species**

Outcome	Species	
	Cat	Dog
Sold Privately	13	123
Sold to Petshops	0	3
Died of natural causes	0	25
Taken to vet	2	0
Retained by Breeder	8	9
Given Away	24	4
Euthanased	1	0
Unspecified	18	0
Total	66	164

As can be seen from the table above, although not statistically significant there was a tendency for puppies to be sold privately ( $\chi^2=17$ ,  $df=10$ ,  $p=.074$ ) or to die of natural causes, and for cats to be given away or for the fate to be unspecified.

## Owners' Responses to Desexing Strategies

Clients were asked whether they would support or oppose various strategies proposed to reduce the number of unwanted cats and dogs in the community. Participants were asked to respond to each question using a 5-point Likert scale which ranged from 'strongly oppose' to 'strongly support'. One dog owner deliberately marked an area between two of the options on the Likert scale to indicate that they 'Slightly Opposed' some of these strategies, for consistency these responses were recoded conservatively to 'Don't Knows'. Strategies included the mandatory desexing of dogs and cats before six and three months of age. The results are tabulated below.

**Table 18. Support for Strategies to Reduce Unwanted Cats and Dogs (shown in % with n indicated in brackets)**

Strategy	Degree of Support/Opposition to Strategy					Total
	Strongly Oppose	Oppose	Don't know	Support	Strongly Support	
<b>Support for desexing dogs before 6 months</b>						
Cat Owners	3.9 (5)	6.2 (8)	8.5 (11)	26.4 (34)	55.0 (71)	100 (129)
Dog Owners	5.43 (23)	9.9 (42)	11.8 (50)	28.8 (122)	43.0 (186)	100 (423)
<b>Support for desexing cats before 6 months</b>						
Cat Owners	6.0 (8)	5.3 (7)	4.5 (6)	20.3 (27)	63.9 (85)	100 (133)
Dog Owners	2.9 (12)	5.3 (22)	9.0 (37)	20.3 (84)	62.5 (258)	100 (413)
<b>Support for desexing dogs before 3 months</b>						
Cat Owners	11.8 (15)	16.5 (21)	31.5 (40)	12.6 (16)	27.6 (35)	100 (127)
Dog Owners	18.5 (76)	28.5 (117)	23.8 (98)	14.4 (59)	14.8 (61)	100 (411)
<b>Support for desexing cats before 3 months</b>						
Cat Owners	11.6 (15)	15.5 (20)	25.6 (33)	14.7 (19)	32.6 (42)	100 (129)
Dog Owners	12.5 (49)	22.1 (87)	22.6 (89)	16.3 (64)	26.5 (104)	100 (383)

As can be seen from the preceding table, three quarters of dog (55% +26.4%) and cat (43% + 28.8%) owners supported desexing dogs by six months of age, over 80% of both dog (63.9% + 20.3%) and cat (62.5% + 20.3%) owners supported desexing cats by six months. Support for EAD of both species was far lower with 47% of dog owners opposing EAD for dogs. Notably, dog and cat owners did not differ from each other regarding these strategies in any statistically significant manner with one exception. Cat owners were significantly more supportive of EAD for dogs than dog owners ( $\chi^2=19.17$ ,  $df=4$ ,  $p=.001$ ). Although not statistically significant dog owners were less supportive of EAD for cats than cat owners were.

When asked if they would comply with mandatory desexing, if it was introduced with exemptions for owners who wished to breed their animals, the vast majority (84.4%) of participants said that they would comply. Only 3.1% would not, 6.3% would comply if their veterinarian advised them to, 4.3% did not

know and 2% did not answer this question. Data relating to why participants would or would not comply are tabulated below.

**Table 19. Reasons to Comply (or not) with MD**

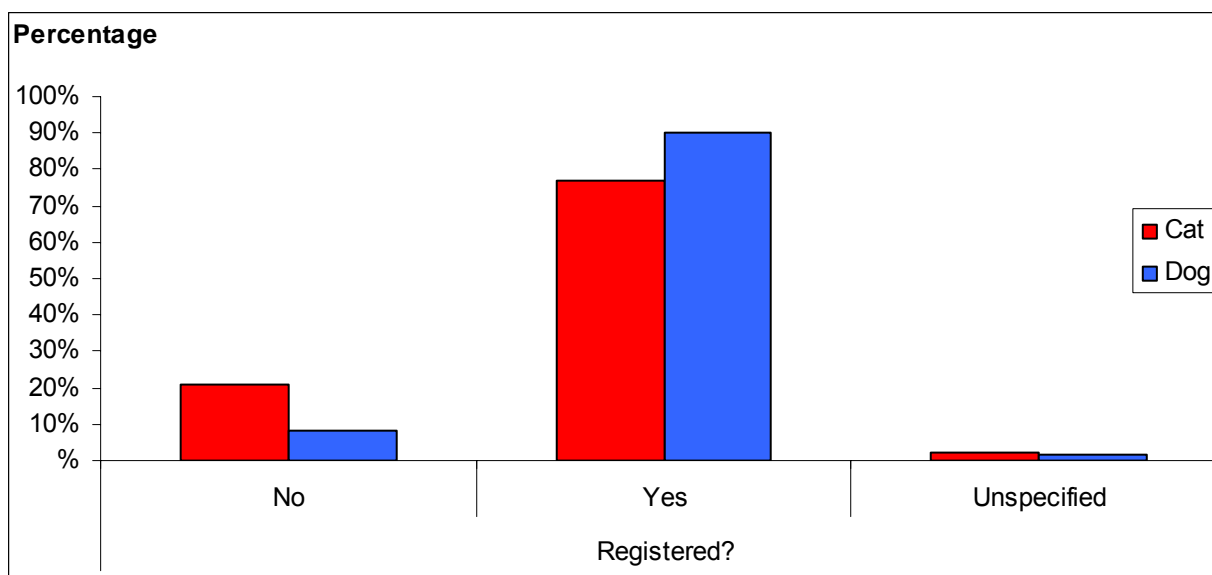
Reason	Frequency	Percent
Reduce number of unwanted animals	143	24.3
I don't want to breed and already desex voluntarily	83	14.1
Right thing to do, part of responsible ownership	46	7.8
Health/Behavioural benefits for animals	35	6.0
Avoid fine, legal requirement	25	4.3
Should be owner decision not legislation	25	4.3
Support but have age concerns	18	3.1
Breeder concerns re exemptions	17	2.9
Support but have cost concerns	4	.7
Fear pets will become extinct	3	.5
Dog and cat issues are different	2	.3
Missing	187	31.8
Total	588	100.0

By far the strongest reason given for owners to comply with MD is to reduce the number of unwanted companion animals; other individuals supported MD but had various concerns. These included: the age at which desexing would be legislated, the cost involved and the presence of breeder exemptions. The strongest reason for not supporting such legislation was given by approximately one-sixth of the sample, who reported that they already desexed their pets voluntarily and perceived no need for such legislation; others believed that the decision to desex should be made by the owner, upon advice from their veterinarian and others expressed concern that pet ownership would become difficult as the numbers of pets would reduce.

## ***Compliance Behaviour***

### **Registration**

Participants were asked whether their animal was registered with their local council, as required by law in Victoria. The data provided by the 562 cat and dog owners are presented graphically below.



**Figure 12. Percentage of Registered Dogs and Cats.**

A significant difference was identified in the proportion of each species registered ( $\chi^2=17.02$ ,  $df=2$ ,  $p<.000$ ) with a greater proportion of dogs registered when compared to cats. Approximately 21% of cats in this sample were not registered with their local council, compared with 8% of dogs.

### Reasons for Registering or not registering a Cat or Dog

Participants who had registered their cat or dog were asked to provide their primary reason for doing so. Although asked for their primary reason many participants gave multiple responses. These totalled 790 responses and have been tabulated below.

**Table 20. Reasons to register by Species.**

Reasons to Register an Animal	Cat		Dog		Total	
	n	%	n	%	n	%
Comply with legal requirement	77	20.53	298	79.47	375	100.0
To find a lost animal	46	17.83	212	82.17	258	100.0
Avoid a Fine	16	15.84	85	84.16	101	100.0
Fund Animal Management	7	12.50	49	87.50	56	100.0

As can be seen, the most common reasons to register an animal, particularly a dog, were to comply with legal requirements (including avoiding a fine), locating a lost animal and funding animal management. Other reasons were given infrequently. Five participants volunteered other reasons such as responsible ownership (2). One participant identified each of the following reasons: provides identification, wanting the best for their pet and for 'Pet health insurance and microchipping' as their reason to register. The 63 (or 11.2% of the total sample) cat and dog owners that explicitly stated that they had not registered their pet were asked their primary reason for not doing so. Sixty of these responded. The results are presented below.



**Table 21. Reason not to Register a Cat or Dog.**

Reason not register	n	Percent
Owner ignorance, laziness or forgetfulness,	16	26.7
Animal does not go outside property	11	18.3
Animal either too young or too old	8	13.3
Don't see the need or point	6	10.0
Negative perception of council/registration	6	10.0
Need to microchip first	5	8.3
No value/Waste of money	3	5.0
Animal microchipped so no point	2	3.3
Other	3	5.0
Total	60	100.0

Owner ignorance or laziness was the major reason given for not registering. Some owners did not see the point in registering as they did not allow their animal outside or the animal or because the animal was microchipped. In fact, owner attitudes and perceptions contributed to the reason many participants had not registered their animal. These included; negative perceptions of council; a perception that registration has little value or relevance; and a belief that registration fees are not used for animals but serve as a council revenue raiser.

### **Value for Registration Fee**

Participants who registered their dog or cat were asked if they received value for money for their registration dollar. The results are tabulated by species below.

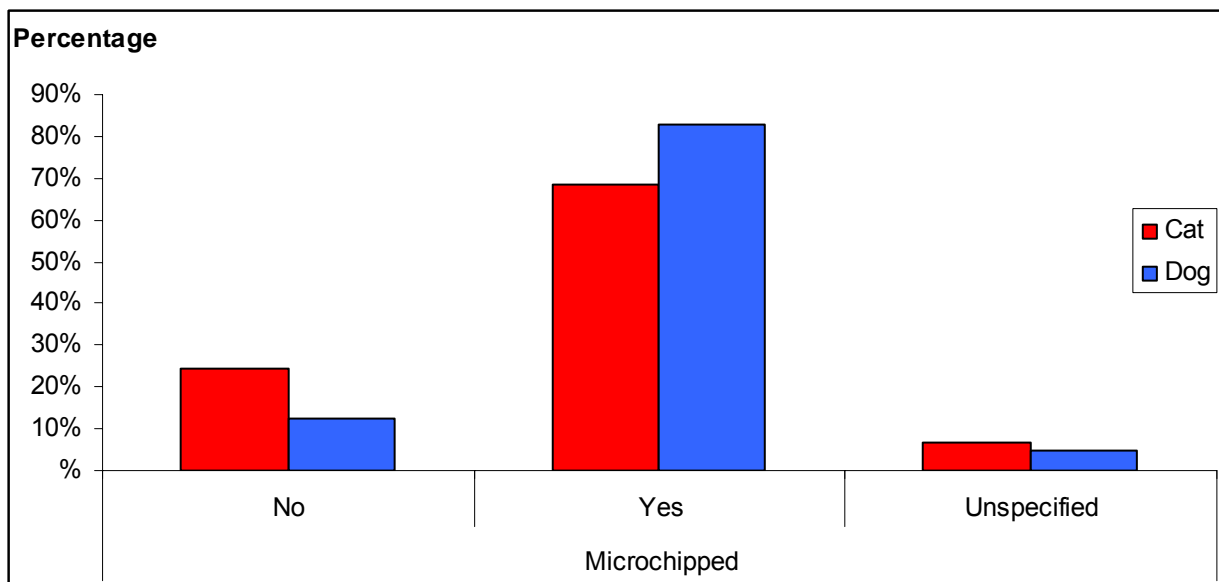
**Table 22. Owner Perception of Receiving Value for Registration by Species**

Species	Receive value for registration				Total
	No	Yes	Unspecified	Don't Know	
Cat	40.3%	33.6%	26.1%	.0%	100.0%
Dog	41.6%	39.3%	18.2%	.9%	100.0%
Total	41.3%	37.9%	20.1%	.7%	100.0%

As can be seen, less than 40% of dog and cat owners perceived that they received value for registering their animal. There were no significant differences between cat and dog owners in their perceptions but, notably, over a quarter of cat owners did not answer this question.

### **Microchipping**

Participants were asked if their animal was microchipped. Results for dog and cat owners (n = 562) are presented graphically below.



**Figure 13. Percentage of Microchipped Dogs and Cats**

As can be seen the majority of both dogs and cats were microchipped, although a significantly greater proportion of dogs were microchipped ( $\chi^2=13.44$ ,  $df=2$ ,  $p= .001$ ).

### Reasons to Microchip or not to Microchip

Participants were asked to identify their primary reason for microchipping their cat or dog. Although participants were asked only to provide one answer, many provided multiple answers and so the total is greater than the number of participants. The results are presented below.

**Table 23. Reasons to Microchip by Species**

Reason	Species		Dog		Total	
	n	%	n	%	n	%
To find lost animals	77	20.48	299	79.52	376	100.00
Microchipped when acquired	18	20.00	75	83.33	90	103.33
To comply with legal requirement	16	18.39	71	81.61	87	100.00
Recommended by veterinarian	10	11.63	76	88.37	86	100.00
Unspecified	13	100.00			13	100.00

As can be seen, the most popular reason for people to microchip their cat or dog was to help them find a lost animal. In fact, 57.4% of all the cats (134) and 69.8% of all the dogs (428) were microchipped for this reason. Seven participants volunteered other reasons for microchipping their animal. These reasons included preventing the animal being stolen (2). One participant cited each of the following reasons: responsible ownership, wanting the best for their pet, cheaper registration, taking the animal overseas and for 'Pet health insurance and microchipping' as their reason to register. Eighty-six participants had not microchipped their pets (14.6% of the sample) and 79 of these identified their main reason for not doing so. These are tabulated below.

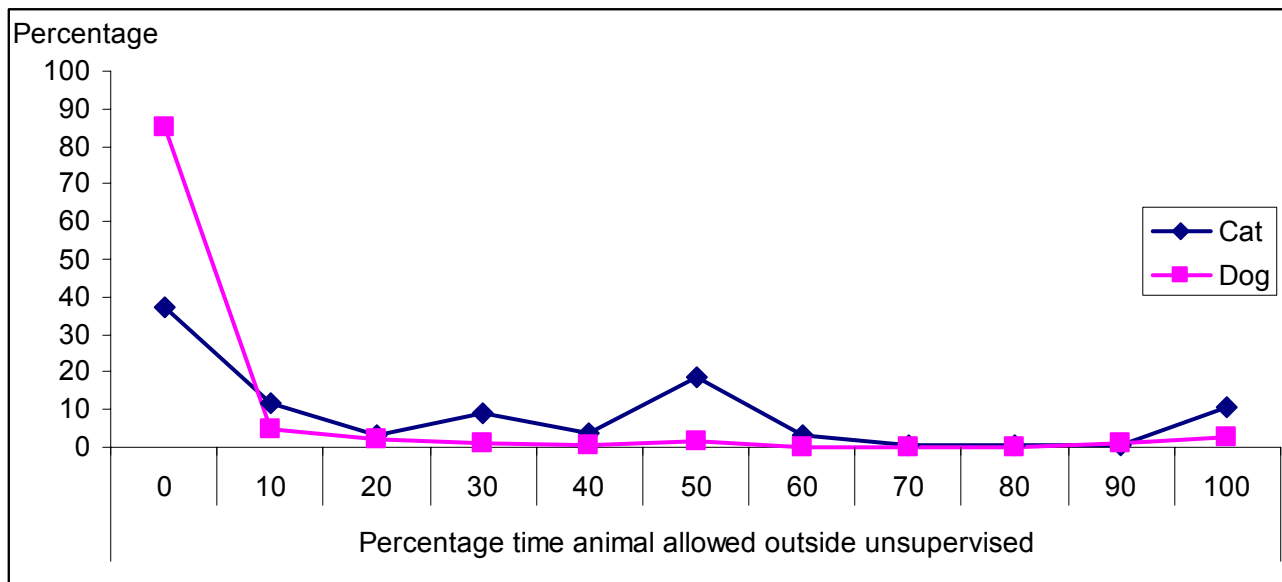
**Table 24. Reasons for not Microchipping a Cat or Dog**

Reason	n	%
Inside Animal or Always supervised	32	40.5
Too old/Too young	13	16.5
Intend to Microchip soon	7	8.9
Don't see the point or agree with microchipping	8	10.1
Expense	5	6.3
Health Concerns / Seems cruel or uncomfortable	5	6.3
Haven't thought about it	4	5.1
Wears other ID	2	2.5
Other Reasons	3	3.8
Total	79	100.0

Many of these participants did not see the need for microchipping, either because the animal was not allowed to wander, or because it had other forms of identification. About a quarter of the reasons given for not microchipping a cat or dog related to the animal's condition, either because of its age or physical concerns. Other reasons cited by a single client included: the cat being a stray, being worried about having contact with the council and believing that microchipping was not a legal requirement.

### Time Cats and Dogs are Allowed to Wander Unsupervised

Participants were asked to indicate the percentage of time their cat or dog was allowed to wander freely outside their property without supervision. These data are presented in the following figure.



**Figure 14. Time Allowed Outside of Owner's Property Unsupervised.**

As can be seen from the figure above, a significant difference ( $\chi^2=145.08$ ,  $df=10$ ,  $p< .000$ ) exists between cats and dogs regarding the amount of time that they are allowed outside their owners' property without supervision. The vast majority of dogs (85.3%) are not allowed out unsupervised, whilst 62.8%

of cats are allowed outside the property unsupervised for some time and 18.6% are allowed out unsupervised at least half the time. The majority (62.8%) of cats were allowed a mixture of indoor/outdoor activity. When these data were analysed by gender and desexed status a significant difference was identified for cats between the sexes ( $\chi^2=47.6$ ,  $df=20$ ,  $p<.000$ ). Male cats were allowed outside unsupervised for a greater percentage of time than female cats. Surprisingly, no difference was observed in the amount of time cats were allowed outside unsupervised and their desexed status. However, this is likely an artefact of the data as there were only five (out of 129) cat owners who owned a sexually entire cat.

## **Other Comments**

Owners were given the opportunity to make any comment that they wished at the end of the survey. These are categorised and tabulated below.

**Table 25. Owner Comments**

<b>Comment</b>	<b>Frequency</b>	<b>Percent</b>
Need more studies like this to make a difference	30	5.1
Cannot legislate responsible ownership	22	3.7
Support desexing	22	3.7
Prevent sale of animals in pet shops	21	3.6
Education is the key to change	16	2.7
Cost of desexing and vet bills prohibitive.	14	2.4
Pets bring benefits for family and society	14	2.4
Councils need to do more	11	1.9
Feed strays because they need help	9	1.5
License owners	9	1.5
All breeders need to be licensed	8	1.4
Support desexing but not EAD	6	1.0
Support cat confinement	4	.7
Concern over loss of mixed breed animals and health of purebreeds	2	.3
Increase penalties	2	.3
Compulsion is a bad thing	1	.2
Desex animal at time of sale	1	.2
Unspecified	396	67.3
<b>Total</b>	<b>588</b>	<b>100.0</b>

Less than half of the clients sampled availed themselves of the opportunity to comment. The most common comments expressed support for the research and support for MD (although not necessarily EAD). Other participants believed that stronger requirements should be placed on breeders, owners and councils. Others emphasised that legislation may not be the best way to create change but that education may be more effective at increasing responsible ownership.

## Veterinarian Surveys

A total of 51 veterinary practice surveys were returned, equalling a participation rate of 15.9% (321 practices were contacted regarding participation).

### ***Characteristics of Participating Practices***

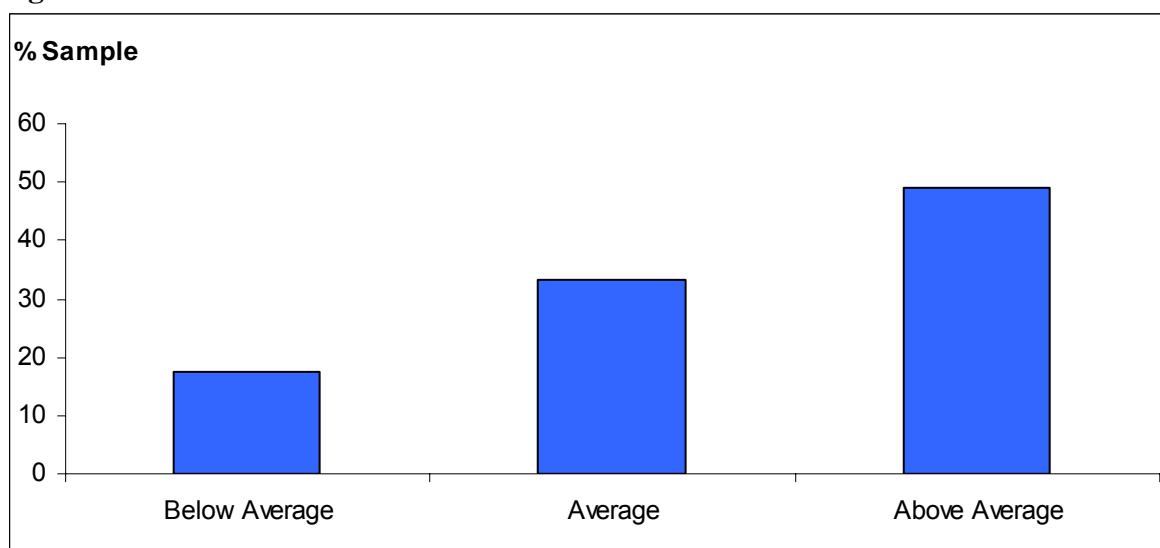
The location of the practices was determined using the postcode supplied. Practices were identified as urban (37 practices or 72.5%), regional (3 practices, 5.9%) or rural (11 practices, 21.6%).

### ***Perceived Client Demographics***

#### **Income Level**

Participating practices were asked to indicate the perceived income level of their client base on a 170mm line. The line was 'anchored' in three places: at zero mm to indicate an extremely low income, at 85mm to indicate an average income and at 170mm to indicate an extremely high income. To simplify analysis, income level was categorized into below average (<75mm), average (75-95mm) and above average (>95mm). These data are depicted graphically below.

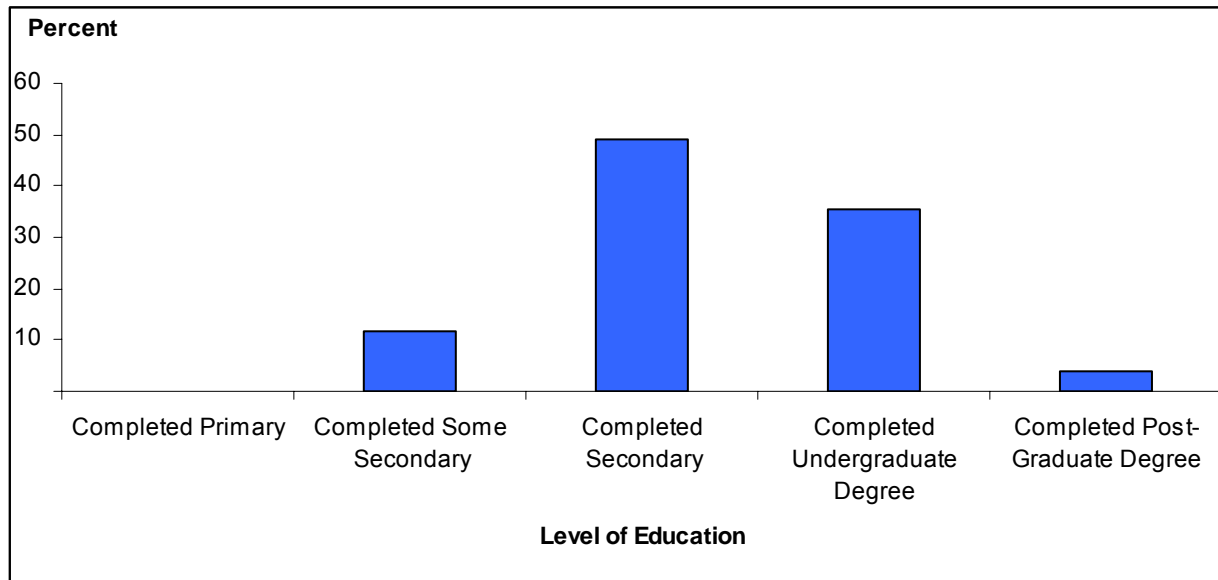
**Figure 15. Perceived Income level of Practice Clientele.**



As can be seen, 49% of practices indicated that their client base had an above average income level, with a further 17.6% below average.

## Educational Level

Participating practices indicated the average educational level of their client base on a 175 mm line which was ‘anchored’ in five equidistant places. These indicated: completed primary school, some secondary school, completed secondary education, completed undergraduate degree and completed postgraduate degree. These data are presented graphically below.



**Figure 16. Perceived Average Level of Education of Client Base**

As can be seen, almost half (49%) of the clients seen by participating practices were perceived to have completed their secondary education, with a further 39.2% having completed some tertiary education.

## Cultural Heritage

Veterinarians were asked to estimate the percentage of their clientele that belong to various cultural groups. The results are tabulated below.

**Table 26. Perceived Cultural Heritage**

Cultural Heritage	N	Mean	Std. Error of Mean
Anglo Australian/ New Zealand	51	70.27	2.02
European	51	14.82	1.35
Asian	51	9.04	1.03
Middle Eastern	51	2.88	1.01
Indigenous Australian/ New Zealand	51	1.51	0.30
American	51	1.37	0.23
African	51	0.38	0.12
Polynesian	51	0.60	0.22
Other	51	0.06	0.04

As can be seen nearly three-quarters of the clients of the participating practices were perceived to be of Anglo Australian/New Zealand heritage, with a further sixth perceived as European, primarily English, Italian and Greek. People of Asian heritage clients formed approximately one-tenth of the clientele. No significant differences were found between urban, regional and rural practices regarding the cultural heritage of the clientele except for a non-significant trend ( $\chi^2=21.73$ ,  $df=14$ ,  $p< .084$ ) for Indigenous Australian/ New Zealand clients to be seen at rural practices and for African clients to be seen at regional and rural practices ( $\chi^2=19.32$ ,  $df=12$ ,  $p< .081$ ).

## **Characteristics of the Animals Seen at Participating Practices**

### **Species**

Veterinary participants were asked to estimate the percentage of the various species seen at their practices. These results are tabulated below.

**Table 27. Contribution of Species to Practice**

Species	Mean % Practice	S.E.	Range
Dogs	56.49	1.80	0 - 80
Cats	36.27	1.80	15 - 100
Pocket Pets	2.74	0.35	0 - 10
Livestock	1.97	1.24	0 - 50
Birds	1.36	0.24	0 - 10
Wildlife	0.71	0.15	0 - 5
Reptiles	0.28	0.12	0 - 5
Fish	0.04	0.03	0 - 1
Other	0.04	0.04	0 - 2
Amphibians	0.00	0.00	0

As can be seen, cats and dogs formed, on average, more than 90% of the animals presented at the practices sampled. Other animals contributed significantly less. When the contribution of the species were analysed by the location of the practice, certain patterns were observed. Livestock ( $\chi^2=28.29$ ,  $df=12$ ,  $p= .005$ ) contributed significantly more to rural and regional practices than urban ones, wildlife ( $\chi^2=35.45$ ,  $df=16$ ,  $p= .003$ ) and fish ( $\chi^2=7.39$ ,  $df=2$ ,  $p= .03$ ) contributed significantly more to rural practices, while reptiles ( $\chi^2=33.89$ ,  $df=12$ ,  $p= .001$ ) and birds ( $\chi^2=29.40$ ,  $df=16$ ,  $p= .02$ ) contributed more to urban practices.

### **Subpopulations of Dogs and Cats**

Participants were provided with the following definitions of various types of ownership.

**Table 28. Definitions of Ownership**

Category	Description
Fully owned animals	Are fed, housed, receive regular veterinary care and are registered and/or identified. The person responsible for their care would claim ownership if asked.
Casually owned animals	Are fed and housed but may not be registered, identified or receive regular veterinary care. The person responsible for their care would probably claim ownership if asked.
Semi owned animals	Are fed and sometimes cared for by specific people who would recognise the cat but deny ownership if asked.
Ownerless Animals	Exist in close proximity to humans but are not dependent upon specific humans who intentionally feed them.
Feral animals	Are not dependent at all on humans for food or shelter

Participants were asked to estimate the percentage of animals in each category seen by their practice. These data are presented below.

**Table 29. Percentage of Dogs and Cats seen by Ownership Category**

		Mean %	Std. Deviation	Minimum	Maximum
Cats	Fully Owned	79.60	18.66	30	100
	Casually Owned	13.87	13.72	0	61
	Semi-owned	3.90	5.15	0	20
	Ownerless	1.51	3.04	0	15
	Feral	1.09	2.27	0	10
Dogs	Fully Owned	86.24	20.45	0	100
	Casually Owned	9.29	10.04	0	50
	Semi-owned	0.37	1.44	0	10
	Ownerless	0.29	1.03	0	5
	Feral	0.04	0.20	0	1

As can be seen from the table above, while the majority of animals seen were perceived to be fully owned, practitioners estimated that about one-tenth of both species were casually owned and that about 5% of cats were either semi-owned or ownerless. Paired sample t-tests were used to determine if the percentage of types of ownership differed between cats and dogs. It was found that there were significantly more casually owned ( $t(50)=4.23$ ,  $p>.000$ (two-tailed)), more semi-owned ( $t(50)=4.87$ ,  $p>.000$ (two-tailed)), more ownerless ( $t(50)=3.22$ ,  $p=.002$  (two-tailed)) and more feral ( $t(50)=-3.23$ ,  $p=.002$  (two-tailed)) cats than dogs and correspondingly fewer fully owned cats than dogs seen ( $t(50)=-2.11$ ,  $p=.04$  (two-tailed)).



Analysis of the types of animals seen by the practice location identified that a significantly greater proportion of rural and regional practices see unowned ( $\chi^2=27.99$ ,  $df=16$ ,  $p= .032$ ) and feral ( $\chi^2=25.15$ ,  $df=14$ ,  $p= .033$ ) cats and semi-owned dogs ( $\chi^2=18.56$ ,  $df=6$ ,  $p= .005$ ) compared to urban practices.

Analysis of the type of animals seen by perceived client income level (using below average, average and above average categories) revealed that practices with below average income level clients saw a significantly greater frequency of feral cats ( $\chi^2=28.10$ ,  $df=14$ ,  $p= .014$ ) compared with practices seeing clients with higher incomes. No relationship was apparent between education level and the types of cat and dogs seen.

## Factors Associated with Litters

Veterinary participants were asked to estimate how many litters of puppies and kittens they would see annually and respond using one of six categories. This information is displayed below.

**Table 30. Number of Puppy and Kitten Litters Seen Annually.**

No. of Litters	Kittens		Puppies	
	n	%	n	%
0	4	7.8	3	5.9
1-5	28	54.9	18	35.3
6-10	8	15.7	11	21.6
11-20	6	11.8	11	21.6
21-50	3	5.9	5	9.8
51-100	1	2.0	1	2.0
100+	1	2.0	2	3.9
Total	51	100.0	51	100.0

As can be seen from the table displayed above, a greater proportion of practices saw higher numbers of puppy litters than kitten litters each year. Notably, practices that saw higher number of puppy litters also saw higher number of kitten litters ( $r(49) = .60$ ,  $p < .000$ ). No relationship was apparent between the location of the practice and the number of puppy or kitten litters seen.

## Source of Litters

Participants were then asked to estimate the percentage of the litters that were planned purebred, planned mixed breed, accidental purebred, accidental mixed breed and unowned. These data are presented in the following table.

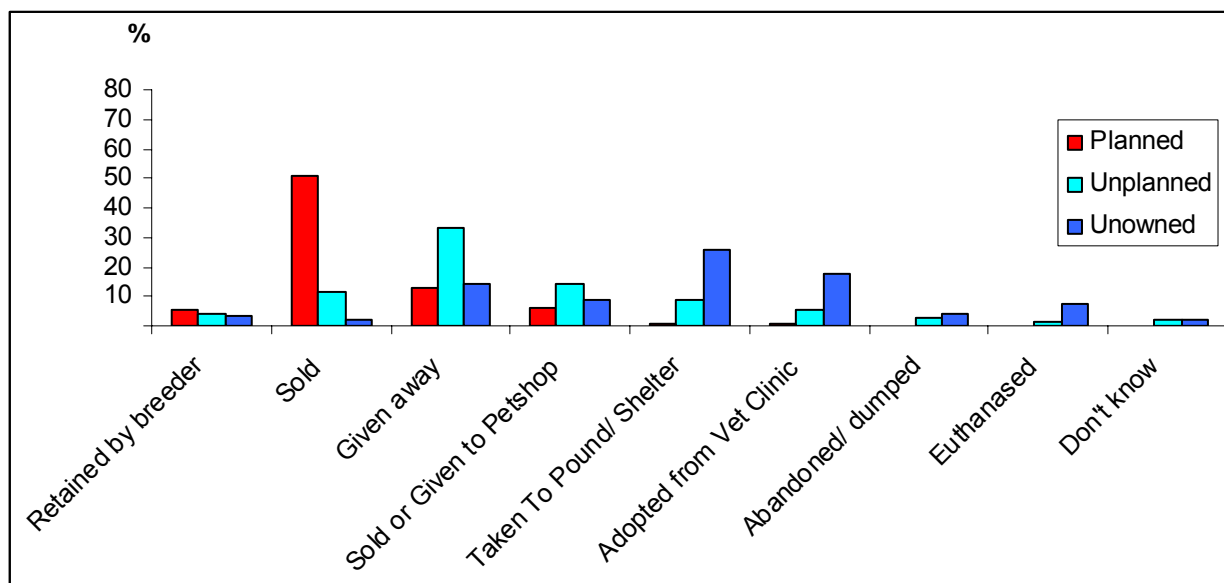
**Table 31. Source of Litters Seen.**

Type of Litter	n	Mean Percentage	Std. Error	Minimum Percentage	Maximum Percentage
<b>Cats</b>					
Planned Purebred	51	21.10	4.432	0	99
Planned Mixed Breed	50	10.66	2.963	0	95
Accidental Purebred	51	3.42	1.399	0	50
Accidental Mixed Breed	51	22.14	3.717	0	100
Unowned/Found	50	33.69	5.229	0	100
<b>Dogs</b>					
Planned Purebred	50	47.72	4.903	0	100
Planned Mixed Breed	50	22.98	3.198	0	90
Accidental Purebred	49	2.69	1.056	0	40
Accidental Mixed Breed	49	19.88	3.556	0	100
Unowned/Found	49	4.90	2.513	0	92

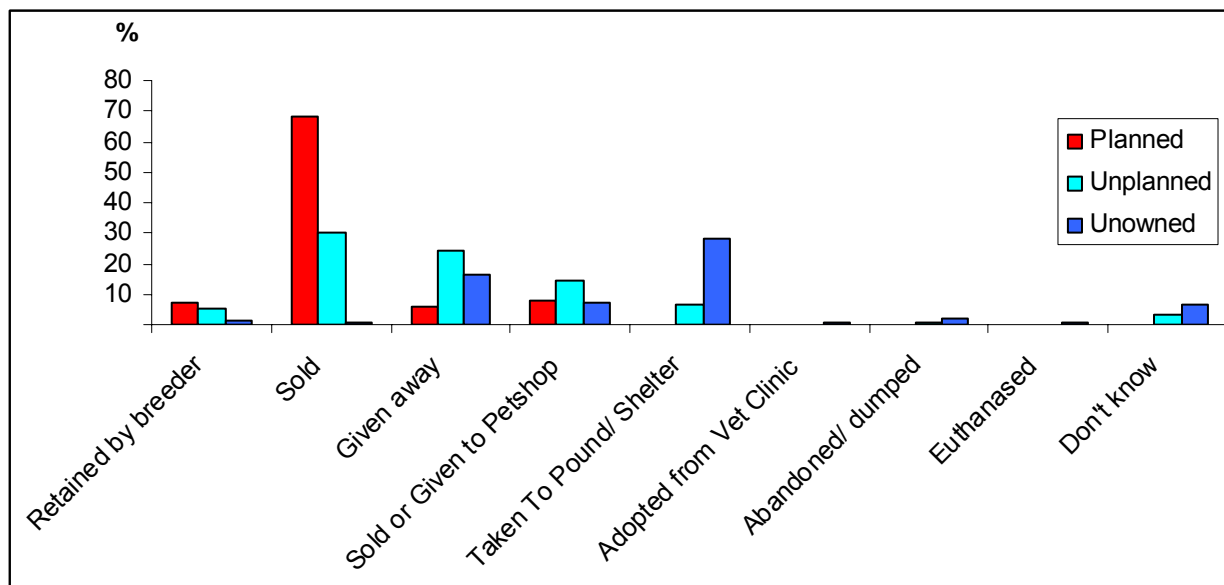
As can be seen, veterinarians in the sample perceived that over 70% of puppy litters resulted from planned matings, whilst less than half that percentage of kitten litters were believed to be the result of planned matings. Veterinarians believed that twice the percentage of kittens resulted from unowned or found animals compared to puppies. Practices varied considerably in the number and type of litters seen. Four practices saw no kitten litters at all, while one practice saw over a hundred kitten litters, of which 99% were planned purebred kittens. The same practice also saw over 100 litters of puppies, of which 98% were planned purebred dogs, while three practices saw no puppy litters at all.

**Fate of Litters Seen**

Veterinary participants were asked what they believed happened to the puppies and kittens from planned, unplanned and unowned litters. These data are presented graphically in the two figures below.



**Figure 17. Perceived Fate of Kitten Litters.**

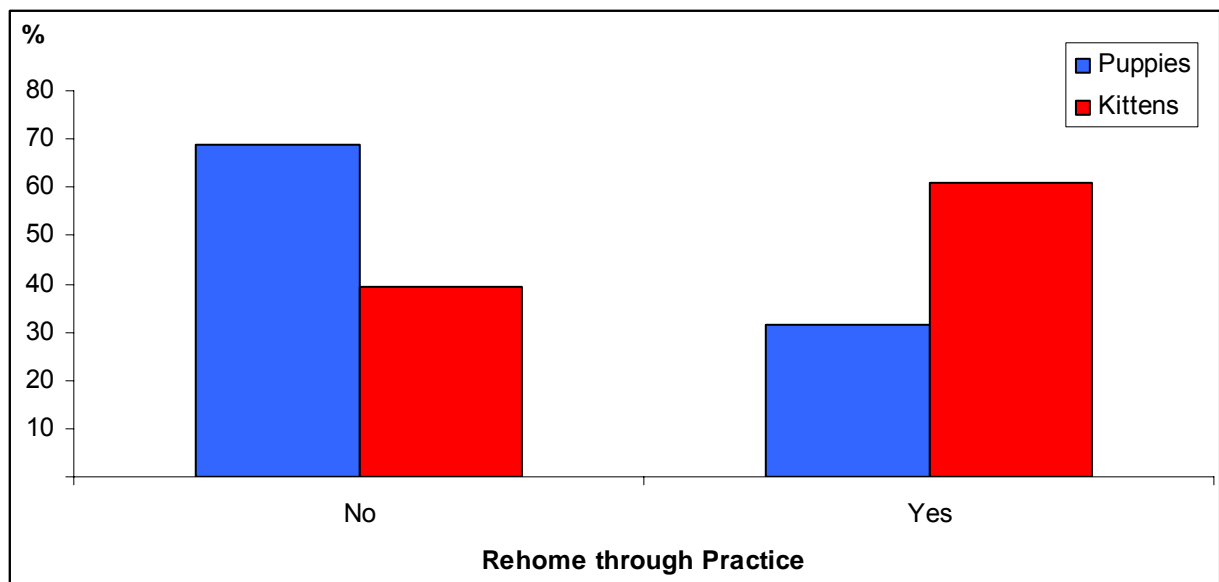


**Figure 18. Perceived Fate of Puppy Litters.**

As can be seen from the two figures above, the perceived outcomes for kittens and puppies from all sources is similar, although a greater percentage of planned and unplanned puppy were believed to be sold compared to kittens and a greater percentage of kittens were adopted from veterinary clinics. When the data were analysed by location, several differences became apparent for kittens although there were no regional differences identified for puppies. A greater percentage of planned kitten litters from rural areas were believed to have been given to or sold to pets shops ( $\chi^2=731.58$ ,  $df=18$ ,  $p= .025$ ); a greater percentage of unplanned urban litters were believed to have been sold ( $\chi^2=58.22$ ,  $df=20$ ,  $p= .000$ ); or taken to the pound/shelter ( $\chi^2=29.28$ ,  $df=18$ ,  $p= .045$ ). Rural and regional practices believed that a greater percentage of unplanned kittens were euthanased ( $\chi^2=18.11$ ,  $df=6$ ,  $p= .006$ ); a greater percentage of unowned kittens were taken to the shelter/pound ( $\chi^2=39.12$ ,  $df=26$ ,  $p= .047$ ); or euthanased ( $\chi^2=36.85$ ,  $df=14$ ,  $p= .001$ ). A greater proportion of rural and regional practices were uncertain of the fate of the unowned kittens seen by them ( $\chi^2=26.30$ ,  $df=4$ ,  $p < .000$ ).

### **Rehoming of Kittens and Puppies**

Participants were asked if their practices regularly rehomed puppies and kittens. The data are presented below.



**Figure 19. Percentage of Practices that Rehomed Puppies and Kittens.**

As can be seen, almost twice as many practices rehomed kittens (60.8%) compared with puppies (31.4%). Breakdowns of the sources of these animals are presented in the two tables below.

**Table 32. Source of Kittens Rehomed by Practices**

Source	No. Practices	Min % rehomed	Max % Rehomed
Abandoned at practice	27	10	98
Strays	26	10	98
Client kittens	20	5	95
Pounds and shelters	5	30	0
Registered breeders	4	10	50
Other	3	2	99
Pet shops	1	5	0

**Table 33. Source of Puppies Rehomed by Practices**

Source	No. Practices	Min % rehomed	Max % Rehomed
Client puppies	10	2	100
Strays	9	2	80
Abandoned at practice	6	2	100
Registered breeders	6	10	60
Pounds and shelters	2	5	10
Other	1	2	0
Pet shops	1	5	0

As can be seen there are some obvious differences between the sources of the puppies and kittens rehomed by practices. Whilst the main source of kittens was abandonments and strays, the main source of puppies were client animals. Registered breeders provided a relatively greater proportion of rehomed puppies than kittens. None of the rehomed kittens or puppies were bred by practice staff.

## Type of Care Sought for Cats and Dogs

Participants were asked to estimate the percentage of their dog and cat owning clients that would utilise certain services. These data are tabulated below accompanied by paired sample t-tests to compare the types of treatment that veterinarians expect dog and cat owners to seek from them.

**Table 34. Comparison of the Treatment Veterinarians Expect Dog and Cat Owners to Seek**

Treatment	Mean % Cat Owners	Mean % Dog Owners	N	t	df	Sig. (2- tailed)	
Pre-purchase Advice	9.60	15.46	50	-5.32	49	.000	***
Puppy/Kitten Socialisation	9.18	37.30	50	-6.68	49	.000	***
Puppy/Kitten vaccinations	76.42	82.98	50	-2.07	49	.043	*
Internal Parasite Prevention or Treatment	65.34	74.14	50	-3.23	49	.002	**
Weighing	13.34	21.78	50	-4.07	49	.000	***
Advice on Diet	36.12	45.60	50	-4.09	49	.000	***
Treatment for Minor Health Problems	65.38	72.28	50	-2.73	49	.009	**
Desexing	83.12	81.34	50	0.71	49	.481	
Chemical Contraception	4.62	6.13	50	-5.15	49	.000	***
Breeding & Pregnancy Advice	8.80	15.20	50	-4.06	49	.000	***
Care for Minor Injuries	51.80	57.62	50	-1.92	49	.061	
Emergency Medical Care	75.66	77.96	50	-0.94	49	.350	
Referral to Specialist	32.20	38.46	50	-3.91	49	.000	***
Euthanasia	71.76	72.82	50	-0.49	49	.625	
Microchip Implantation	54.72	67.26	50	-3.76	49	.000	***
Routine Health Check	50.14	59.46	50	-3.45	49	.001	*
Heartworm Treatment	8.58	63.60	50	-15.06	49	.000	***
External Parasite Prevention or Treatment	53.40	66.30	50	-4.28	49	.000	***
Adult Vaccinations	65.12	74.84	50	-3.55	49	.001	**
General Diagnostics	61.30	68.20	50	-2.62	49	.012	*
Treatment for Chronic Conditions	59.10	66.10	50	-2.82	49	.007	**
Routine Surgery	68.70	73.60	50	-1.96	49	.056	
Behavioural Advice	32.46	42.54	50	-4.02	49	.000	***
Stitch Removal	86.26	88.66	50	-2.16	49	.035	*
Geriatric Care	47.04	58.30	50	-4.15	49	.000	***
Emergency Trauma Care	74.12	78.48	50	-1.98	49	.054	
Relinquishment Advice	29.83	35.94	49	-3.61	48	.001	**
Body Disposal	47.92	54.71	49	-2.48	48	.017	*

Note: \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$

As can be seen from the table above, many significant differences existed in the type of care that veterinarians expected to provide to dog and cat owners. Veterinarians expected significantly more dog

owners to use their services for everything bar desexing, care for minor injuries, emergency medical care, euthanasia, routine surgery and emergency trauma care.

Significant differences were also observed between the location of the practice and the proportion of dog and cat owning clients expected to utilise particular services. For example, a greater proportion of urban owners were expected to vaccinate their kittens ( $\chi^2=46.79$ ,  $df=24$ ,  $p= .004$ ) and puppies ( $\chi^2=47.87$ ,  $df=28$ ,  $p= .011$ ), require internal parasite treatment for cats ( $\chi^2=42.95$ ,  $df=28$ ,  $p= .035$ ) and dogs ( $\chi^2=63.70$ ,  $df=32$ ,  $p= .001$ ), and request euthanasia ( $\chi^2=77.71$ ,  $df=30$ ,  $p< .000$ ) and geriatric care ( $\chi^2=48.48$ ,  $df=30$ ,  $p= .018$ ) for cats and heartworm treatment for dogs ( $\chi^2=40.44$ ,  $df=26$ ,  $p= .035$ ) compared to the clientele of regional or rural practices.

Significant correlations were found between the income level of the client base and the treatment that veterinarians expected their clients to access. For cats and dogs, income level was significantly and positively correlated with socialisation (kitten ( $r(49) = .30$ ,  $p = .035$ ) and puppy ( $r(49) = .30$ ,  $p = .031$ )), weighing (cats ( $r(49) = .36$ ,  $p = .010$ ) and dogs ( $r(49) = .28$ ,  $p = .049$ )), health checks (cats ( $r(49) = .47$ ,  $p = .001$ ) and dogs ( $r(49) = .34$ ,  $p = .016$ )), heart worm treatment (dogs ( $r(49) = .38$ ,  $p = .006$ )), external parasite treatment (cats ( $r(49) = .56$ ,  $p < .000$ ) and dogs ( $r(49) = .38$ ,  $p = .007$ )), behavioural advice (cats ( $r(49) = .37$ ,  $p = .008$ ) and dogs ( $r(49) = .33$ ,  $p = .019$ )), geriatric care (cats ( $r(49) = .52$ ,  $p < .000$ ) and dogs ( $r(49) = .39$ ,  $p = .005$ )) and microchipping (cats ( $r(49) = .28$ ,  $p = .007$ ) and dogs ( $r(49) = .28$ ,  $p = .053$ )).

However, perceived client income levels had a greater effect on the services that veterinarians expected to supply for cat owners compared to dog owners, with high income levels significantly and positively correlated with veterinarians expecting to provide kitten vaccinations ( $r(49) = .42$ ,  $p = .003$ ), internal parasite care ( $r(49) = .36$ ,  $p = .010$ ), diet advice ( $r(49) = .45$ ,  $p = .001$ ), treatment for minor health problems ( $r(49) = .36$ ,  $p = .012$ ), treatment of minor injuries ( $r(49) = .29$ ,  $p = .040$ ), adult vaccinations ( $r(49) = .47$ ,  $p = .001$ ), general diagnostics ( $r(49) = .36$ ,  $p = .011$ ) and treatment for chronic conditions ( $r(49) = .37$ ,  $p = .009$ ) for cat owners. Similar relationships were not identified for dogs.

## ***Factors Relating to Desexing***

### **Provision of Desexing Advice**

Participants were asked to estimate what percentage of their cat and dog owning clientele they advised to desex their animals. Practices reported that they advised a mean of 96.2% of dog owners (SE = 2.07 with a range of 0 to 100%) and 99.7% of cat owners (SE = 0.22 with a range of 90-100%) to desex their animals. No significant differences were identified between practices in urban, regional and rural

locations in this regard. Assuming healthy body weight, participants were asked at what age (in weeks) they advised clients to desex their cats and dogs. Many participants responded with a range of weeks. In these cases, the median value of the range given was used in the following analyses. These data are tabulated below.

**Table 35. Recommended Desexing Age (in Weeks)**

Age in Weeks	n	Range	Mean	Std. Error
Dogs	50	10.00-26.00	21.13	.50
Cats	51	10.00-26.00	20.37	.48

As can be seen, there was little difference between the mean recommended age for desexing dogs and cats. A significant correlation was observed between the recommended desexing age for dogs and cats ( $r(48) = .88, p < .000$ ), with practices that recommended later age desexing for dogs also recommending later age desexing for cats.

### Veterinarian Response to Proposed Desexing Strategies

Veterinary participants were asked what effect they thought three possible strategies to reduce the numbers of unwanted cats and dogs might have upon the various sub-populations of dogs and cats. They were asked to respond using a 5-point scale ranging from greatly reduce numbers to greatly increase numbers. The first of these strategies was the introduction of mandatory desexing prior to six months of age. The results are tabulated below.

**Table 36. Effect of Compulsory Desexing Prior to Six Months of Age**

Species	Population	Greatly Reduce Numbers	Slightly Reduce Numbers	No Change	Slightly Increase Numbers	Greatly Increase Numbers	Unanswered	Total
<b>Cats</b>	Fully Owned	11.76	27.45	52.94	1.96	5.88	0.00	100
	Casually Owned	13.73	43.14	35.29	7.84	0.00	0.00	100
	Semi-Owned	21.57	25.49	45.10	1.96	0.00	5.88	100
	Ownerless	25.49	13.73	49.02	1.96	1.96	7.84	100
	Feral	23.53	5.88	60.78	1.96	1.96	5.88	100
<b>Dogs</b>	Fully Owned	7.84	23.53	56.86	3.92	3.92	3.92	100
	Casually Owned	7.84	33.33	43.14	7.84	0.00	7.84	100
	Semi-Owned	21.57	13.73	49.02	1.96	0.00	13.73	100
	Ownerless	23.53	9.80	50.98	3.92	0.00	11.76	100
	Feral	23.53	5.88	54.90	3.92	0.00	11.76	100

As can be seen, the majority of veterinarians believe that the introduction of mandatory desexing prior to six months would not change the numbers of fully owned cats and dogs, but would reduce the population of casually owned cats. Almost half of the veterinarians believed that this strategy would not alter the numbers of semi-owned and ownerless cats, although a similar number believed that it would

reduce the numbers of semi-owned cats to some degree. Whilst the majority of veterinarians believe that this strategy will result in no change to feral cat and dog numbers, approximately one quarter of the sample believed that it would reduce the numbers of feral animals significantly. Participants were asked to identify what effect compulsory desexing before the age of three months (EAD) would have on the same population groups. These data are presented below,

**Table 37. Effect of Compulsory Desexing Prior to Three Months of Age**

Species	Population	Greatly Reduce Numbers	Slightly Reduce Numbers	No Change	Slightly Increase Numbers	Greatly Increase Numbers	Unanswered	Total
<b>Cats</b>	Fully Owned	13.7	27.5	54.9	2.0	2.0	0	100.0
	Casually Owned	15.7	37.3	41.2	3.9	2.0	0	100.0
	Semi-Owned	13.7	19.6	56.9	3.9	.0	5.9	100.0
	Ownerless	21.6	13.7	53.0	0	3.9	7.8	100.0
	Feral	19.6	7.8	62.7	.0	3.9	5.9	100.0
<b>Dogs</b>	Fully Owned	11.8	23.5	58.8	2.0	2.0	2.0	100.0
	Casually Owned	9.8	31.4	49.0	5.9	.0	3.9	100.0
	Semi-Owned	11.8	11.8	62.7	2.0	.0	11.8	100.0
	Ownerless	19.6	7.8	58.8	2.0	.0	11.8	100.0
	Feral	19.6	5.9	60.8	2.0	0	11.8	100.0

As can be seen from the preceding table, the majority of veterinarians believe that this strategy will not change the numbers of most population groups, with the exception of casually owned cats and dogs. More than 20% of veterinarians believe that this strategy will cause some decrease in the numbers of all population groups of cats and dogs, including fully owned animals.

Participants were then asked what effect incentives to encouraging the voluntary desexing of cats and dogs before three months of age might have. The results are presented below.

**Table 38. Effect of Incentives to Increase Voluntary Desexing Prior to Three Months of Age**

	Population	Greatly Reduce Numbers	Slightly Reduce Numbers	No Change	Slightly Increase Numbers	Greatly Increase Numbers	Unanswered	Total
<b>Cats</b>	Fully Owned	5.9	27.5	54.9	3.9	7.8	.0	100.0
	Casually Owned	15.7	31.4	41.2	5.9	5.9	0	100.0
	Semi-Owned	15.7	23.5	45.1	3.9	5.9	5.9	100.0
	Ownerless	17.6	15.7	51.0	0	7.8	7.8	100.0
	Feral	17.6	15.7	54.9	.0	5.9	5.9	100.0
<b>Dogs</b>	Fully Owned	3.9	25.5	54.9	3.9	7.8	3.9	100.0
	Casually Owned	7.8	33.3	43.1	3.9	5.9	5.9	100.0
	Semi-Owned	7.8	13.7	54.9	5.9	3.9	13.7	100.0
	Ownerless	9.8	9.8	58.8	3.9	3.9	13.7	100.0
	Feral	11.8	9.8	58.8	3.9	2.0	13.7	100.0

As can be seen, of the three strategies investigated this strategy was believed to produce the largest increase in fully and casually owned cats and dogs, although it was also felt that it would result in increases in semi owned, ownerless and feral animals. If participants had indicated that incentives could



work, they were asked to identify suitable incentives. Twenty-one participants made suggestions regarding appropriate incentives. These are presented below.

**Table 39. Suggested Incentives to Encourage Voluntary Desexing**

Type of incentive	n	% of Total Sample
Reduced Registration/ Council incentives	10	19.6
Discount Vouchers	5	9.8
Disagree with Desexing before 3 Months	3	5.9
Make Desexing free	2	3.9
Free microchip, heartworm or insurance	1	2.0
Total	21	41.2

As can be seen, most suggestions involved financial incentives; either reducing council registration or reducing the cost of desexing (or making it free). Several participants took the opportunity to express their disagreement with desexing prior to three months of age.

## Veterinarian Perceptions Regarding EAD

Veterinary participants were asked to describe their agreement with various statements about EAD using a 1 – 5 scale where 1 equalled ‘Strongly Disagree, 3 equalled neither agreement nor disagreement and 5 equalled ‘Strongly Agree’ i.e. higher scores indicate stronger agreement. The mean scores for cats and dogs are presented in the following table, accompanied by the results of paired t-tests to identify where differences in perception occur between the species.

**Table 40. Veterinarians Perception Regarding EAD (mean values)**

	Mean score for Cats	Mean Score for Dogs	t	df	Sig. (2- tailed)
Is more difficult to perform on female animals than later age desexing	3.02	3.14	-1.231	49	.224
Is more difficult to perform on male animal than later age desexing	2.98	2.80	1.498	49	.141
Is more difficult to perform	2.51	2.28	1.908	49	.062
Need training to perform	1.96	2.00	-.829	49	.411
Need to buy equipment to perform	1.80	1.84	1.043	49	.302
Is appropriate for shelter animals	4.69	3.96	1.429	49	.159
Do not advise for young females	3.51	3.60	-1.181	49	.243
Do not advise for young male animals	3.47	3.56	-1.231	49	.224
Have clinical concerns regarding EAD	3.29	3.38	-.771	49	.444
Associated with health risks for some animals	3.24	3.30	-.697	49	.489
Has health benefits for juvenile animals	2.39	2.56	-1.414	49	.164
Has health benefits for adult animals	2.32	2.51	-1.429	48	.159
Increases prevalence of obesity	2.37	2.46	1.124	49	.267
Reduces roaming	2.98	2.92	.893	49	.376
Increases incontinence	2.14	2.90	-5.261	49	.000 *
Reduces spraying	2.92	.00			
Reduces aggression	2.80	3.02	-1.871	49	.067
Is appropriate for kittens and puppies	2.80	2.78	.363	49	.718
Advise clients that animal should have a season before desexing	2.80	1.30	-2.333	49	.024 *
Advise clients that animal should have a litter before desexing	1.20	1.24	-1.429	49	.159

*Note: low scores i.e. 1 indicate strong disagreement and scores close to 5 indicate strong agreement. Score of 3 indicate neither agreement nor disagreement.*

As can be seen from the preceding table veterinary perceptions regarding EAD were similar for cats and dogs with two exceptions: veterinarians agreed significantly more strongly that EAD increased incontinence in dogs and that dogs should have a season before desexing. They also tended to agree that desexing reduces aggression in dogs and that performing EAD on kittens is more difficult than puppies. Generally veterinarians did not feel that they needed more training or equipment to perform EAD, or that dogs and cats should have a litter before desexing. They tended to perceive that EAD was appropriate for shelter animals, particularly cats, but not for owned puppies and kittens. A correlation analysis of the perceived effect of EAD upon the various categories of dogs and cats is presented below.

**Table 41. Correlation Matrix of the Perceived Effects of Mandatory EAD**

		Reduction of Fully Owned Cats	Reduction of Casually Owned Cats	Reduction of Semi-Owned Cats	Reduction of Ownerless Cats	Reduction of Feral Cats	Reduction of Fully Owned Dogs	Reduction of Casually Owned Dogs	Reduction of Semi-Owned Dogs	Reduction of Ownerless Dogs	Reduction of Feral Dogs
Reduction of Fully Owned Cats	Spearman's rho	1.000	.613**	.220	.192	.020	.857**	.596**	.213	-.003	.007
	Sig. (2-tailed)	.	.000	.134	.196	.895	.000	.000	.160	.985	.966
	N	51	51	48	47	48	50	49	45	45	45
Reduction of Casually Owned Cats	Spearman's rho	.613**	1.000	.612**	.461**	.315*	.464**	.852**	.578**	.391**	.346*
	Sig. (2-tailed)	.000	.	.000	.001	.029	.001	.000	.000	.008	.020
	N	51	51	48	47	48	50	49	45	45	45
Reduction of Semi-Owned Cats	Spearman's rho	.220	.612**	1.000	.723**	.529**	.141	.520**	.847**	.604**	.548**
	Sig. (2-tailed)	.134	.000	.	.000	.000	.346	.000	.000	.000	.000
	N	48	48	48	47	48	47	47	45	45	45
Reduction of Ownerless Cats	Spearman's rho	.192	.461**	.723**	1.000	.834**	.023	.383**	.626**	.779**	.722**
	Sig. (2-tailed)	.196	.001	.000	.	.000	.882	.009	.000	.000	.000
	N	47	47	47	47	47	46	46	45	45	45
Reduction of Feral Cats	Spearman's rho	.020	.315*	.529**	.834**	1.000	.014	.161	.439**	.704**	.757**
	Sig. (2-tailed)	.895	.029	.000	.000	.	.926	.278	.003	.000	.000
	N	48	48	48	47	48	47	47	45	45	45
Reduction of Fully Owned Dogs	Spearman's rho	.857**	.464**	.141	.023	.014	1.000	.514**	.161	-.041	-.038
	Sig. (2-tailed)	.000	.001	.346	.882	.926	.	.000	.290	.791	.804
	N	50	50	47	46	47	50	49	45	45	45

		Reduction of Fully Owned Cats	Reduction of Casually Owned Cats	Reduction of Semi-Owned Cats	Reduction of Ownerless Cats	Reduction of Feral Cats	Reduction of Fully Owned Dogs	Reduction of Casually Owned Dogs	Reduction of Semi-Owned Dogs	Reduction of Ownerless Dogs	Reduction of Feral Dogs
Reduction of Casually Owned Dogs	Spearman's rho	.596**	.852**	.520**	.383**	.161	.514**	1.000	.616**	.381**	.320*
	Sig. (2-tailed)	.000	.000	.000	.009	.278	.000	.	.000	.010	.032
	N	49	49	47	46	47	49	49	45	45	45
Reduction of Semi-Owned Dogs	Spearman's rho	.213	.578**	.847**	.626**	.439**	.161	.616**	1.000	.691**	.624**
	Sig. (2-tailed)	.160	.000	.000	.000	.003	.290	.000	.	.000	.000
	N	45	45	45	45	45	45	45	45	45	45
Reduction of Ownerless Dogs	Spearman's rho	-.003	.391**	.604**	.779**	.704**	-.041	.381**	.691**	1.000	.941**
	Sig. (2-tailed)	.985	.008	.000	.000	.000	.791	.010	.000	.	.000
	N	45	45	45	45	45	45	45	45	45	45
Reduction of Feral Dogs	Spearman's rho	.007	.346*	.548**	.722**	.757**	-.038	.320*	.624**	.941**	1.000
	Sig. (2-tailed)	.966	.020	.000	.000	.000	.804	.032	.000	.000	.
	N	45	45	45	45	45	45	45	45	45	45

\* Correlation significant at .05 level (two-tailed)

\*\* Correlation significant at .01 level (two-tailed)

As can be seen from the preceding table, significant correlations existed between various factors associated with EAD and the beliefs of veterinarians. Veterinarians who believed that EAD would reduce the numbers of fully owned dogs also believed that EAD would reduce the numbers of casually owned dogs, those who believed that EAD would reduce the numbers of fully owned cats also believed that it would reduce the numbers of casually owned cats as well as fully owned and casually owned dogs. Veterinarians who believed that EAD would reduce the number of casually owned cats also believed that it would reduce the numbers of fully owned, semi-owned, ownerless and feral cats but reduce the numbers of all categories of dogs. Veterinarians who believed that EAD would reduce the numbers of semi-owned cats also believed that it would reduce the numbers of ownerless and feral cats but also reduce the numbers of all categories of dogs except fully owned ones.

### ***Veterinarian Comments***

Veterinary participants were provided with an opportunity to comment at the end of their survey. More than half the sample (54.9%) availed themselves of the opportunity to comment. The results are categorised and tabulated below.

**Table 42. Veterinarian Comments**

Comments	Frequency	Percent
Clinical concerns over EAD including increased fatalities	9	17.65
MD does not target problem owners	7	13.73
Overpopulation associated with low income and education levels	3	5.88
EAD would be more expensive to perform	2	3.92
Clients should be guided by veterinarians regarding desexing	2	3.92
Compulsory microchip before gifting/sale	1	1.96
EAD appropriate for shelters	1	1.96
Concern that MD may lead to only purebred cats and problems	1	1.96
MD not necessary	1	1.96
Need more evidence in this area	1	1.96
Unspecified	23	45.10
Total	51	100.00

As can be seen the greatest number of comments concerned EAD and possible health issues arising from it. These issues were felt by some to make EAD inappropriate for owned animals. Other participants felt that MD would not actually target the appropriate population and that strategies aimed at providing low cost desexing or education would be more effective.

## **Discussion**

The principle aim in this project was to characterise the pets in our community by surveying veterinarians and their clients, particularly with regard to factors related to how their owners manage the reproductive

behaviour of their animals. To achieve this, surveys were distributed to 51 veterinary practices and 588 practice clientele.

## **Owner Demographics**

Females were over-represented in this sample, compared to the Victorian population (82.5% versus 50.9% (Australian Bureau of Statistics, 2006)). However, this is consistent with previous research involving a self-selected group of pet owners (Adamelli, Marinelli, Normando, & Bono, 2005; Ley, Bennett, & Coleman, 2008). However, the percentage of owners living in a single adult household was far higher than identified in a recent study of people who adopted cats from a shelter (Marston & Bennett, 2009) and nearly one-third (29.3%) of the sample lived alone. While this is broadly comparable to the Victorian census, there were significantly more (62.9%) older people i.e. those aged 66-75, living alone compared to other age groups in this study population. This level of 'living alone' was somewhat greater than the 47.7% females aged over 75 years, who were identified in the census as having the highest rate of 'living alone' (Australian Bureau of Statistics, 2001). It may be that people living alone have a greater tendency to own pets perhaps because they gain social support from their pets that they are lacking from other sources and perhaps they are also more likely than other pet owners to frequent a veterinary clinic; however a larger scale study would be needed to confirm this conjecture.

Although broadly comparable to the Victorian population, this sample was not representative with regard to the number of households containing children. Over two-thirds of this sample lived in a household without children. This is less than half the number of households expected to contain children based on census data (28.9% in this sample compared with the national figure of 64.2% (Australian Bureau of Statistics, 2006)). A similar finding was made in a recent Australian study of dog owners, where participants were similarly self-selected (Masters et al., 2008). This suggests that pet owners may differ in some systematic way from the Victorian population on household demographics and may support the contention that pets can act as child substitutes. Alternatively, it may be that pet owners who have children were simply less likely to complete our survey, perhaps because juggling both children and their pets in a veterinary waiting room is a challenging undertaking. The time taken to complete the survey may have systematically biased the sample in favour of other individuals who are willing and able to dedicate time for such activities.

The vast majority (76.7%) of the sample lived in houses, which is almost identical to the 76.4% of Victorians identified in the 2006 Census who inhabit houses (Australian Bureau of Statistics, 2006). Overall the types of residences inhabited were similar to those identified by Masters and McGreevy (Masters et al., 2008), with the exception that a smaller proportion of people lived in residences with more land attached than a normal garden.

Cultural heritage affected ownership patterns, with people of European, Eastern European and Eurasian heritage being most likely to own three or more cats. The vast majority of the client sample described themselves as Anglo-Australian, or of European heritage and 94.2% spoke only English at home. This is a far higher than would be expected from the Victorian Census (Australian Bureau of Statistics, 2006), where only 74.4% spoke English at home. This may indicate that the English speaking community is more likely to own animals and/or visit a veterinarian than other groups, although it is also possible that non-English-speaking Australians were less inclined to complete the survey.

In agreement with a previous study (Toukhsati, Coleman, & Bennett, 2005), gender differences existed between individuals who fed an unowned cat and those who did not. Significantly more women were cat semi-owners and significantly more female cat owners were cat semi-owners compared to men., The level of reported cat semi-ownership was surprisingly high (37.9% as compared to the 22% identified by Toukhsati et al. using a random phone sample of the Victorian population). This would suggest that responsible cat owners may form a reasonable proportion of cat semi-owners and that veterinary clinics may form a strategic venue to educate and inform such individuals about cat semi-ownership. Unlike the Toukhsati et al study, no observable relationship was discovered between cat-semi-ownership, age, income or educational level.

In summary, the sample was generally representative of the Victorian population although it was somewhat wealthier, somewhat better educated, more likely to speak English and tended to either live alone or with fewer children than the average Victorian.

### **Animal Characteristics**

Dogs formed the majority (72.8% or 428 animals) of animals brought to participating clinics, with cats forming 22.8% (134). The balance of animals was a mixture of 17 cases of dogs and cats presented together, two rabbits, one rat and one bird. It is difficult to determine whether the proportion of cats and dogs presented in this study is representative of the wider community. Two available sources suggest that the prevalence of dogs in this study is somewhat high and correspondingly that cats are somewhat under-represented. The Australian Companion Animal Council ((BIS Shrapnel Global Marketing Intelligence and Forecasting, 2006) has reported that there are 1.5 dogs owned for every cat owned in Victoria, which translates to a ratio of 60:40. In close agreement with these figures is a recent Sydney based study which identified that 59.4% of pet owning households owned dogs (Toribio et al., 2008). It may be that the self-selected nature of this sample has resulted in this bias. Perhaps dog owners who visit veterinarians were more willing to participate in the study than cat owners, or conversely perhaps dog owners are more likely to visit a veterinarian. Consistent with this second possibility is information gathered regarding

client reasons for attending veterinary clinics and the types of services utilised for dogs or cats. These are discussed further below.

Owned animals formed the vast majority of the animals presented to the clinics, with very few litters presented. This suggests that it is unlikely that the progeny of veterinary clients are contributing significantly to shelter statistics.

The mean age (7.05 years) of the cats presented was somewhat older than that of the dogs presented (6.78 years) and is almost identical with that identified in another Australian study that utilised a random sample of homes (Toribio et al., 2008). These figures are older than reported in a Sydney study where the mean age of cats presented at veterinary clinics was 6.5 years and that of dogs 5.0 years (McGreevy, Fougere, & Thomson, 2003) and substantially greater, than the mean age of 3-5 years reported for pet cats in 1994 (Leslie, Meek, Kawash, & McKeown, 1994). It is possible that this increase in longevity results from improvements in veterinary care and nutrition that have occurred in the past 15 years. The high level of desexing in this sample may also be relevant to this issue, as castration has long been known to improve the longevity of male cats (Hamilton, 1965) and the percentage of desexed cats has been increasing over the last decade (Headey, 2006). An alternative explanation, however, is that older animals are more likely to be represented in a sample sourced via veterinary clinics, since they probably visit more often than younger conspecifics. It is well documented in human studies that older individuals access health care more frequently than younger ones.

There was a significant difference in the age of the dogs and cats presented at the clinics. Younger animals tended to be dogs and older animals tended to be cats. This contrasts with a previous study which identified an over-representation of young cats amongst those receiving veterinary care (Toribio et al., 2008). This was ascribed to the need for young animals to be presented for vaccinations and desexing. The same study also reported finding a greater proportion of females amongst the older cats (Toribio et al., 2008). However, there was no age bias nor any relationship identified between age and gender in this study. This may be due to an artefact of the sampling methodology. This sample was self-selected, whereas the Toribio et al. study utilised a random telephone sample.

### **Factors Relevant to Acquisition**

Whilst 68.7% of the sample had thought a lot before acquiring their pet, 9.7% had made an impulse acquisition. Dog owners thought more about the decision than cat owners and the greatest proportion of impulsive acquisitions occurred amongst people who owned pets other than cats and dogs e.g. rabbits and rats. Although two-thirds of the sample reported thinking a lot before acquiring their pet, a minority (36.7%) displayed active intentionality when acquiring their pet, either undertaking research or by following up on information from their veterinarian. Almost one-fifth of the sample found out about their



pet by word of mouth from neighbours, friends and family. It appears that pet acquisition may often be a relatively informal process.

More than one-third of the animals in this sample were obtained from a breeder, with approximately equal percentages sourced from welfare shelters and pet shops (17.7:16.5). Dogs were significantly more likely than cats to be sourced from a breeder or pet shop, while cats were over-represented amongst those animals sourced from neighbours, family and friends, welfare organisations and passive adoptions i.e. where the animal adopted its owner. The relative proportions of dogs obtained from the various sources in this study are comparable with those identified previously in a study of dog enthusiasts (Masters et al., 2008). However, the percentage of cats and dogs sourced from shelters in this sample were somewhat higher than reported in a slightly older study (cats 26.4% compared to 22% and dogs 15% compared to 11% (Anon, 2005)). Perhaps this indicates that shelters are somewhat better accepted as an acquisition source for pets.

The mean cost of an animal was \$322.40, with 22.9% of the animals being acquired at no cost. Animals acquired at little, or no, cost tended to be cats that were acquired passively or from friends and relatives. In fact, 47.7% of cats were obtained at no cost. The most expensive animals were acquired from breeders and all of the animals that cost more than \$800, were dogs.

Approximately two-thirds (65.6%) of animals in this sample were acquired when aged less than three months, with no statistical difference between dogs and cats. This is similar to the findings of the Pet Acquisition Study, where 59% and 66% of the total number of cats and dogs respectively, were acquired at less than three months of age (Anon, 2005). In contrast with a study of dog enthusiasts (Masters et al., 2008), where the majority of dogs were acquired aged older than one year of age (39% aged less than 12 months), less than 20% of dogs were acquired aged older than eight months of age in this study. It is likely that dog enthusiasts are not representative of the general dog-owning public, as they may specifically acquire older dogs with proven abilities, to increase their chance of success in their chosen dog sport. Animals sourced from pet shops and unspecified sources tended to be younger than other sources, while those from breed rescue and acquaintances included a greater proportion of older animals.

The mean period of ownership was 6.11 years. However, there were significant differences between the species in this regard. Cats were over-represented amongst animals owned for the longest time and dogs over-represented amongst those owned for the shortest time. Possibly this is indicative of the generally longer lifespan of the cats in this sample, although this study contained a higher percentage of dogs that had been owned for 10 or more years than identified in a study of dog enthusiasts (Masters et al., 2008). Perhaps participating in dog sports motivates people to keep younger dogs or perhaps participation in

such sports reduces the longevity of the animals involved. Further research would be required to clarify this issue.

There was no relationship between length of ownership and the amount of thought given to the acquisition of the animal or the source of acquisition. Dogs and cats from all sources were retained in a similar manner. This is important because it tends to refute claims that all animals acquired from pet shops are acquired impulsively and that this translates into reduced retention

([www.leadtheway.org.au/aboutthebill.html](http://www.leadtheway.org.au/aboutthebill.html) retrieved 30/06/2009). In fact, in this study animals sourced from pet shops, acquired passively or from friends were retained in the same way as those acquired from other sources, as were animals acquired impulsively. It is possible however, that by recruiting people who were taking their animal for veterinary treatment, we may have recruited only the most committed owners regardless of where they acquired their pet or how much thought they had invested in the acquisition decision.

There was no link between cost of acquisition and length of ownership for cats. Cats acquired at no cost were as likely to be owned as long as those acquired at considerable cost. Dogs acquired at little or no cost were over-represented amongst those owned for the longest time. In fact, very few of the most expensive dogs had been owned for more than four years and all the dogs that were owned for more than 16 years were acquired for free. Perhaps this reflects a change in acquisition patterns over the last 14-16 years when a greater proportion of dogs were acquired at low cost, perhaps from friends and neighbours in a similar fashion to cats, with fewer 'expensive' purebred dogs acquired. Notably, the dogs acquired at the greatest cost in this study were identified as coming from breeders, although it is not known if these were registered purebred dog breeders. Australian National Kennel Council Statistics (ANKC) (Anon, 2009) indicate that the numbers of registered purebred animals in Australia has declined by approximately 21% over the last 16 years, yet estimates of dog ownership in Australia have only declined by approximately 3.5% (BIS Shrapnel Global Marketing Intelligence and Forecasting, 2006). It might be surmised therefore, that there would be a greater proportion of 'less expensive' dogs acquired today. However, it is also possible breeders are not registering animals with the ANKC to the same extent as in the past, or that a greater percentage of more expensive mixed-breed, or 'designer dogs' are being purchased from breeders. The relationship between cost of acquisition and decreased longevity for dogs is interesting and possibly concerning, however large scale epidemiological studies are required to determine whether this may simply be an artefact of this sample.

In this sample, the cost of acquisition for a cat or dog did not preclude the animal receiving good veterinary care; older animals saw the vet more often than younger animals regardless of their cost. This appears to refute suggestions that 'inexpensive' animals tend to receive poorer care.

([www.leadtheway.org.au/aboutthebill.html](http://www.leadtheway.org.au/aboutthebill.html) retrieved 30/06/2009). However, it may simply be that

increased longevity is associated with more frequent visits to the veterinarian. To determine the relationship between acquisition source, cost of acquisition and ownership patterns would require a large randomised study. Length of ownership was important in determining the pattern of veterinary visits with animals owned for the longest times over-represented amongst those presented most recently and (for dogs) most frequently at the vet clinic. Perhaps this is not surprising, as animals owned for longer would be older and have greater health requirements, but it may also reflect a greater owner commitment and attachment to long-time companions.

### **Factors relevant to the visit to the clinic**

Most participants were visiting their regular practice and came to see the veterinarian. Approximately two-fifths of the sample had visited the vet in the past two months, although 1.9% had not visited the veterinarian in more than a year. Cat owners tended to have a slightly longer period between visits than dog owners (mean = 6.08 and mean = 4.43 months respectively). The inter-visit period identified in this study for cats is much shorter than the 18 months period reported in a recent Australian study (Toribio et al., 2008). Significant differences between cats and dogs were seen in the pattern of visits with a greater proportion of cats visiting the veterinarian once a year or less (37% of cats versus 20% of dogs).

Vaccinations and annual health checks were the most common reasons for cats and dogs to be taken to the veterinarian. Desexing comprised less than 1% of the reasons for visits. Reasons for bringing an animal to the clinic varied significantly between cats and dogs, with a greater proportion of cat owners seeking treatment for injuries, eye, urinary and renal problems and desexing compared to dog owners. A greater percentage of dog owners sought treatment for cancer, minor medical conditions, skin, allergies, musculo-skeletal and anal gland problems. It appears that cats tend to receive treatment primarily for more acute and serious conditions than dogs. Perhaps this indicates that cats enjoy a generally better health than dogs, but it is equally likely that owners only notice or respond to their cat's illness when its condition is more serious. Notably, participants provided regular checkups and vaccinations at a similar level for dogs and cats. The percentage of cats receiving annual health checks (87.3%), adult vaccination (93.3%) or kitten vaccinations (88.1%) is similar to that reported elsewhere (Leslie et al., 1994; Toribio et al., 2008),

While dog and cat owners generally tended to seek similar care for their pets, cat owners were significantly less likely to seek pre-purchase advice, socialisation, advice on diet, weighing, referral to a specialist, heartworm treatment, external parasite treatment and advice prior to relinquishment than dog owners. Dog owners tended to seek treatment for internal parasites, contraception, breeding advice and geriatric care more frequently than cat owners. Interestingly, the proportion of dog and cat owners who stated that they would seek desexing for their pet was identical.

## Factors associated with Reproduction

When participants were asked what age they believed female cats become sexually mature, almost one-third of the sample did not know, or did not answer the question. Almost two-fifths of the sample did not know the answer, or did not answer the question, for male cats. The mean age of perceived sexual maturity given was 6.8 months for female cats and 6.75 months for males. Almost half of the sample (46.9%) believed that female cats become sexually mature at six months of age or older. Being a cat owner did not affect the perceived age of sexual maturity for female cats. These findings are somewhat concerning because not only was almost one-third of the population uncertain when cats become sexually mature, but also because nearly half the sample believed that female cats needed to be older than 6 months to reproduce. In fact, female cats can become sexually mature earlier than this (Webb, 2004) and, although most tend to have only two or three oestrus cycles per year (dependent upon day length), some short-haired varieties can cycle all year (Beaver, 2003). Therefore, there is a window of opportunity for unplanned pregnancies to occur, due to owner ignorance.

The situation for dogs is somewhat better. Fewer participants felt that they did not know when female dogs (22.3%) and male dogs (32.6%) became sexually mature. The mean age of sexual maturity for dogs (8.41 months for bitches dogs and 8.09 months for males) was somewhat older than that of cats.

Animals acquired from welfare organisations were more likely to be desexed than those acquired from any other source. Given that it is a legal requirement for animals to be desexed prior to sale in the state of Victoria, this is not surprising. However, it is a little concerning that only 78.4% of participants who acquired their animals from a shelter actually reported that their animal was desexed at acquisition. This might simply indicate that the owners are unaware of the desexed status of their animals, or that some shelters are not complying with legislative requirements, or that older animals were acquired from shelters before the relevant Codes of Practice came into effect (Department of Primary Industries, 1998). There was a trend for more cats to be desexed at acquisition than dogs, with 30.6% of these animals being desexed. However, as this is exactly the percentage sourced from shelters and veterinarians, it is not surprising.

More than 60% of dogs and cats were desexed after acquisition, at a mean age of 9.57 months, with no difference observed between dogs and cats. If unintentional litters are resulting through lack of knowledge about the age of sexual maturity, then there may be scope to reduce the numbers of unwanted cats and dogs by desexing pre-acquisition. However, there were relatively few litters presented in this sample and most of these were planned. Over two-fifths of the dogs in this sample were desexed before six months of age. This is a far higher percentage than that reported by dog enthusiasts (Masters et al.,

2008), who desexed nearly three-fifths of their dogs between six and 11 months. However, Masters and McGreevy's study (2008) contained a far higher percentage of pedigree dogs, who may have been kept entire for longer due to their owners wishing either to evaluate their show potential or to use as breeding stock.

The level of sexually entire cats in this study (3.7%) is similar to the 2.69% observed in another Australian study (Toribio et al., 2008) but much lower than the 29% reported in a Canadian study (Leslie et al., 1994), suggesting that cultural differences exist regarding desexing. However, there is nothing in the literature that the authors could find relating to this. However, cultural factors do affect other ownership behaviours, such as numbers of cats owned and may similarly affect how owners feel about desexing their pet.

Significantly more cats (94%) than dogs (89.7%) were desexed at time of survey. This may be a reflection of the tendency for cats in the study to be older than the dogs or, reflect the fact that it is easier for dog owners to manage the reproductive behaviour of their pets by other strategies, such as confinement. The levels of desexing identified in this study are higher than those reported elsewhere. For example, in 1995 the Australian Bureau of Standards (Australian Bureau of Statistics, 1995) reported that 78.5% of cats and 57.5% of dogs were desexed, and a more recent nationally representative survey identified that 93% of cats and 78% of dogs were desexed in 2006 (Headey, 2006). It could be expected that owners who provide veterinary care for their pets may be more likely to desex their pets than the average Australian, having been advised to do so by their veterinarian. These findings also provide some support for the contention raised in the National People and Pets Survey (Headey, 2006) that pet owners have become more responsible in the last decade.

The numbers of entire animals (47) is too small to make any definitive comments however, none of the cat owners and only 12 (28.6%) of the dog owners expressed any intent to breed their pet. Reasons given for potentially wanting to breed a dog included: breeding dogs with good temperament as pets, breeding for show, being a responsible breeder, wanting to have pups, producing small numbers of working dogs infrequently, for financial reasons and as a hobby.

The majority (63.8%) of people with a sexually entire pet intended to desex their animal. The mean age that participants intended to desex their animals was 18.9 months, which is well after sexual maturity for both dogs and cats. The most common reason given for this was to prevent unwanted pregnancies and offspring being produced. Some participants believed that behavioural benefits were associated with desexing, particularly for males. Reasons for not desexing an animal included: showing, breeding, 'not necessary', 'being able to manage a sexually entire dog', 'animal is too old' and 'cannot catch stray cat mother to desex her'.

Strategies used by owners to prevent unwanted pregnancies focused primarily on physical management/containment and desexing before sexual maturation. Some participants felt that desexing was unnecessary because they had male dogs, their dog was too old or their dog was too lazy. Gender differences have been identified in owners' perceptions about desexing (Blackshaw & Day, 1994) and it is interesting to note that people who owned male animals felt no need to desex them, simply because they were male. As the primary motivation for desexing was to prevent pregnancy or unwanted offspring, perhaps these arguments appealed more strongly to the owners of female animals, as these individuals have to care for their animal through pregnancy and birth, and then deal with the resultant offspring.

With regard to any litters produced by their animals, 25.5% of the owners of entire animals believed that they would find homes for the progeny, 21.3% would sell them, 10.6% believed that they could manage their pets so that they would not reproduce, 6.4% would give the puppies or kittens away, about 4% would take the offspring to the shelter and 2% would euthanase them. Unfortunately, 36% did not respond to this question.

The majority of participants with sexually entire animals recalled being advised about desexing by their veterinarian, with most (70.2%) reporting that they had been advised them to desex their animal. Almost one-fifth (19.1%) reported that they had been advised not to desex their animal. About one third (36.2%) of those advised to desex, were advised to desex their animals at six months of age, 15% were advised to desex before six months, 6.4% were advised to desex as soon as possible and 4.3% were advised to desex after six months. It is uncertain how well clients remember messages they are given by their veterinarians. However; the high level of owner recall indicates that veterinarians have successfully communicated the advantages of desexing, at least to this group.

Thirty-three cats and dogs had produced at least one litter, with 32 of these being owned animals. No statistical difference was identified between the number of litters produced by cats and dogs. Each breeding dog produced a greater number of offspring than each breeding cat; 11 cats produced 66 kittens (i.e. an average of 6 kittens each) and 16 dogs produced 164 puppies (i.e. an average of 10 puppies each), totalling 230 progeny. The vast majority of the puppies produced were sold, whereas kittens were more likely to be given away. It is interesting to note that 6.6% of the puppies produced died of natural causes, yet none of the kittens did. This suggests that pet cats may generally be reproductively healthier than pet dogs.

### **Owner Response to Desexing Strategies**

Clients were asked about how much they supported or opposed the possible introduction of mandatory desexing of dogs and cats before six and three months of age. The majority of dog and cat owners supported desexing dogs and cats by six months of age with both dog and cats owners being slightly more supportive of desexing pet cats by six months of age (82.8% of dog owners and 84.2% of cat owners) than they were of desexing dogs by six months of age (71.8% of dog owners and 81.4% of cat owners). However, there was considerably less support for the mandatory desexing of both species before three months of age. Only 42.8% of dog owners and 47.3% of cat owners supported desexing cats before three months of age. The only statistically significant difference identified between dog and cat owners regarding the proposed desexing strategies, related to support for desexing dogs before three months of age. Significantly more cat owners supported early age desexing (EAD) for dogs; 40.2% of cat owners compared with 29.2% of dog owners. Notably, over a fifth of dog and cat owners did not know whether they supported or opposed EAD of either species.

The possible introduction of mandatory desexing by six months of age is supported by both dog and cat owners. However, the potential introduction of EAD is far less acceptable, due primarily to concerns associated with the age of desexing. Mandatory EAD is likely to be better supported by cat owners than dog owners, who were generally less supportive of EAD for both species and without significant attitudinal change are likely to oppose its introduction. Notably, almost half of the dog owners opposed the introduction of EAD for dogs.

The most common reasons given for owners to support the introduction of MD included reducing the number of unwanted companion animals (24.3%) , that it is the responsible thing to do (7.8%) and 6% felt there were behavioural or health benefits associated with desexing. Others did not support MD legislation, perceiving it as unnecessary as they were already desexing voluntarily (14.1%) or believing that the desexing decision should be made in consultation with their veterinarian, and others supported MD but expressed concerns regarding the age at which it would be legislated, the cost of desexing and the ability of breeders to gain exemptions. Others expressed a concern that pet ownership would become more difficult, as MD would reduce the numbers of pets available. To ensure the greatest acceptance of MD legislation, should it be introduced, awareness campaigns should not only focus on population control messages but answer the other concerns raised by owners.

## **Registration**

A significantly greater percentage of cats (21%) were not registered with their local council compared with dogs (8%). Reasons given for registering a pet included complying with legal requirements (20.5%), to help find a lost pet (17.8%), to avoid a fine (15.8%) and 12.5% registered their animal to fund animal management. Legal reasons and the avoidance of penalties seem to be the main motivators for the registration of pets, rather than the funding of animal management activities. This suggests that many pet

owners perceive registration in a primarily negative manner, rather than a positive one of providing animal management activities. This may provide councils with an opportunity to portray registration in a more positive manner.

Only 11.2% of the sample had not registered their animal. Owner factors such as ignorance, laziness and attitudes and perceptions were given as key reasons for not complying with registration. Non-compliance was associated with negative perceptions of council, inability to perceive the value or relevance of registration and a perception that the registration was simply a council revenue raiser. Whether an animal was microchipped or not also appeared to be a relevant factor with some participants perceiving that the presence of a microchip precluded the need for registration, presumably because it was a more effective method of finding a lost animal, or that the requirement for a microchip before registration created a barrier to registration in some way.

A greater proportion of people felt that they did not receive value for their registration compared with those who did. Less than 40% of dog and cat owners perceived that they received value for their registration fees, suggesting that the majority of the pet owning community are dissatisfied with registration. Given the punitive nature of the main motivating reasons for registration identified in this sample, coupled with the negative perceptions of councils and the perceived lack of relevance of registration to animal issues, perhaps it is not surprising that compliancy is an issue for many councils.

### **Microchipping**

The majority of dogs and cats in this sample were microchipped, with a significantly greater proportion of dogs (82.9%) than cats (68.6%) microchipped. Approximately one-sixth (14.6%) of the sample had not microchipped their pet. The primary reason given for microchipping was to help find a lost animal (57.4% cat owners and 69.8% of dog owners). Many dog and cat owners did not see the need for microchipping, either because the animal was never allowed out unsupervised or lived completely indoors (40.5% of people who had not microchipped their pet), or because it had other forms of identification. About a quarter of the sample had concerns that microchipping could compromise an animal's health and well-being due to old age or poor health.

### **Time Pets Allowed Outside without Supervision**

With regard to time allowed unsupervised outside the owner's property, cats and dogs are treated significantly differently. While the majority of dogs are (85.3%) are never allowed out unsupervised, 62.8% of cats are unsupervised outside of their owner's property for at least some period of time and 18.6% are allowed outside unsupervised half of the time. This largely reflects the regulations that apply to



both species. While the State of Victoria requires that dogs are not allowed off the owners' property without supervision, the requirement for a cat to be confined to an owner's property is dependent upon local government regulation. Currently, relatively few Councils require cats to be confined in this way. It is therefore somewhat surprising that almost 15% of dog owners report allowing their dog outside their property unsupervised. The percentage (62.8%) of cats allowed a mixture of indoor/outdoor activity in this study is somewhat less than that reported (72.6%) in another study Australian study (Toribio et al., 2008). However, this sample, which is drawn from veterinary clientele, might represent owners who are more committed to their pets' health and welfare compared to a random sample of owners drawn from the general population in the Toribio study. This might explain the difference between the two studies.

Interestingly, male cats were allowed outside unsupervised to a greater degree than female cats. It is unlikely that this is because female cats are easier to confine than male cats, perhaps the owners of female cats are more aware of the consequences of allowing a female to roam. Further research is required to clarify this. Somewhat disturbingly, there was no difference observed in amount of time that sexually entire and desexed cats were allowed outside however, this may be an artefact of the sample which contains very few sexually entire cats.

Less than half the sample took the opportunity to provide a freeform comment at the end of the survey. Those that did used the opportunity to voice strong support for research aimed at reducing the level of euthanasia of pets in the community, with a similar number supporting MD (even though some did not support EAD). Some owners believed that stronger requirements should be placed on breeders, owners and councils to ensure greater responsibility for breeding and owning animals. Other owners emphasised that legislation may not be the best way to create behavioural change but that education may be more effective at increasing responsible ownership,

### **Veterinarian Surveys**

The majority (72.5%) of practices recruited into this study were located in urban areas of Victoria, with some rural (21.6%) and regional (5.9%) practices represented. Veterinarians rated their clients as somewhat wealthier and better educated than average. This agrees well with the client surveys and indicates that veterinarians have an accurate perception of these factors in their client base.

Nearly three-quarters (70.25%) of the clients were described as of Anglo Australian or New Zealand heritage, with a further sixth perceived as European, primarily English, Italian and Greek. People of Asian heritage formed approximately one-tenth of the clientele. Other cultural groups formed much lower percentages of the clientele. No significant difference existed between urban, regional and rural practices regarding the cultural heritage of the clientele except for a non-significant trend for Indigenous

Australian/ New Zealand clients to be seen at rural practice and for clients of African heritage to be seen at regional and rural clinics. Unfortunately, with the sample of veterinarians being so small it is hard to generalise from these findings to the general population, but if the homogeneity of cultural groupings is representative of the greater population, then it indicates that any strategy to reduce overpopulation targeted via veterinarians may not need to be tailored to specific cultural issues in different areas.

## **Animals Seen**

On average, cats and dogs formed the vast majority of animals presented to the practices sampled. Not surprisingly, the mix of species presented varied with practice location. Livestock comprised a significantly greater percentage of rural and regional practices, wildlife and fish contributed significantly more to rural practices, while reptiles and birds contributed more to urban practices.

Veterinarians were asked to estimate the contribution of fully owned, casually owned, semi owned, ownerless and feral populations to their practice. Fully owned animals comprised the majority of animals seen (79.6% of cats and 86.2% of dogs), with approximately one-tenth, of both species, being casually owned and about 5% of cats being either semi-owned or ownerless. Significantly more casually owned, semi-owned, ownerless and feral cats were seen than dogs. Whilst practitioners believe that they see primarily fully owned animals, they also estimate that they see approximately one-tenth less responsibly owned animals. Therefore, veterinary clinics may provide an avenue to reach some of these hard to access owners.

Rural and regional practices see a significantly greater proportion of unowned and feral cats and semi-owned dogs compared to urban practices. There is a significant association between low client income levels and the number of feral cats presented to a clinic. Lower socioeconomic status (SES) has been associated with increased shelter admission rates (Rinzin et al., 2008). Targeting low cost/no cost desexing into low income areas might be a productive strategy in reducing the number of feral cats.

Participating practices saw significantly greater numbers of puppy litters than kitten litters each year, although the numbers of these were generally low. There was considerable variation in the number and type of litters seen between practices. Four practices saw no kitten litters at all, while one practice saw over a hundred kitten litters, of which 99% were planned purebred kittens. Notably, the same practice also saw over 100 litters of puppies, of which 98% were planned purebred dogs. By contrast, three practices saw no litters of puppies at all. Over 60% of practices saw less than 5 kitten litters annually, while just over 40% of practices saw less than 5 litters of puppies, 21.6% of practices saw 6-10 puppy litters and a further 21.6% saw 11-20 puppy litters per year. Whilst the majority (70%) of the puppy litters resulted from planned matings, the situation for cats was a little different with 33.8% of kitten litters

resulting from unowned or found animals and 25.6% the result of accidental matings. Perhaps the high level of unplanned kitten litters result from the greater difficulty in confining cats. The extremely high percentage of planned purebred litters of both cats and dogs at one particular practice may indicate that breeders tend to seek specific expertise or that this particular practice may simply be located in an area convenient to many breeders.

### **Type of Care Provided**

Significant differences exist in the types of care that veterinarians expect to provide dog and cat owners. Whilst dog owners were expected to use a significantly wider range of services than cat owners who were expected to provide only desexing, care for minor injuries, emergency medical and trauma care, euthanasia and routine surgery for their animals. Significant differences existed between urban and country practices and the types of services that veterinarians expect to supply dog and cat owners. For example, a significantly greater proportion of urban dog and cat owners were expected to vaccinate their kittens and puppies and treat their pets for internal parasites. Urban cat owners were expected to provide significantly more euthanasia and geriatric care for cats and urban dog owners provided more heartworm treatment than owners from regional or rural practices.

Significant correlations existed between the client income level and the types of treatment that veterinarians expected their clients to access. For both cats and dogs, income level was significantly and positively correlated with attendance at socialisation classes, weighing, health checks, external parasite treatment, behavioural advice, geriatric care and microchipping and with heart worm treatment for dogs. Veterinary care for cats appears to be more sensitive to client income levels than care for dogs. High income levels were significantly and positively correlated with cat vaccinations (both kitten and adult), internal parasite care, diet advice, general diagnostics and the treatment of minor health problems, minor injuries and chronic conditions. Dog owners were expected to utilise these services regardless of income level.

Urban vets expected to provide a greater number of services to a greater proportion of their clients than rural/regional practices. Possibly the clientele of rural and regional practices have lower incomes and this determines the services accessed, or possibly clients from these areas perceive the needs of their pets somewhat differently. From a compliancy point of view, the relationship between microchipping and income level, particularly for cats, may be important. To ensure adequate levels of compliancy, the cost of microchipping may need to be reduced for low income households.

### **Provision of Desexing Advice**

The vast majority of all practices advised clients (96.2% of dog owners and 99.7% of cat owners) to desex their animals, with little difference observed between the mean recommended age for desexing dogs and cats. Notably, practices that recommended desexing at an older age for dogs also recommended later desexing for cats.

### **Response to Proposed Desexing Strategies**

The majority of veterinary participants believed that the introduction of mandatory desexing prior to six months of age but would reduce the population of casually owned cats in the Victorian community without affecting the numbers of fully owned cats and dogs. While almost half of the veterinarians believed that this strategy would also reduce semi-owned cat numbers to some degree, a similar number believed that it would make no difference. Veterinarians were a little less optimistic about the effect of this strategy on reducing the numbers of ownerless cats. Approximately one quarter of veterinarians believed that desexing prior to six months would reduce numbers of feral animals significantly but the majority did not believe that this strategy would affect the numbers of feral cats and dogs at all.

Veterinary perceptions regarding the possible effects of EAD are complex. Most veterinarians did not believe that EAD would alter the numbers of animals in any of the population groups, with the exception of casually owned cats, where it was felt that there might be some reduction. However, more than 40% of veterinarians believed that this strategy would decrease the numbers of fully owned cats and 37.3% believed it would result in some decrease in the number of fully owned dogs. It is debatable whether a strategy thought likely to decrease the numbers of fully owned animals would be well received. This is particularly true in the case of cats where veterinary epidemiologists have predicted that the current level of desexing renders the pet cat population unsustainable (Baldock et al., 2003) and other reports indicate that cat ownership is in decline (BIS Shrapnel Global Marketing Intelligence and Forecasting, 2006; McGreevy et al., 2003; Toribio et al., 2008). Also, the perception that implementing EAD for cats would also affect dog populations could affect acceptance of this strategy.

Notably, veterinarians perceived that desexing before six months would be more effective at reducing the numbers of semi-owned, ownerless and feral cats than desexing at three months of age. Given this perception, authorities seeking to introduce MD will need to provide veterinarians with convincing reasons supporting desexing before three months of age.

Participants were asked what effect encouraging voluntary desexing of cats and dogs before three months of age might have. Veterinarians perceived that believed that this strategy, of the three strategies explored in this study, would produce the largest increases in fully and casually owned cats and dogs, although they also believed that the numbers of semi owned, ownerless and feral animals would increase.

It seems that veterinarians do not perceive that any one of the three proposed strategies would achieve the most desirable outcome i.e. increasing the number of owned animals while reducing unowned, semi-owned or feral animals.

Suggestions for appropriate incentives to encourage voluntary EAD primarily involved monetary issues such as reducing council registration for desexed animals or reducing the cost of desexing (or making it free). Several participants took the opportunity to express their disagreement with desexing prior to three months of age.

### **Veterinarian Perceptions Regarding EAD**

Veterinarians were asked to rate their agreement with various statements concerning EAD. Generally their ratings were similar for both cats and dogs with two notable exceptions. EAD was perceived as significantly more likely to increase incontinence in dogs and veterinarians were more likely to advise dog owners to let their animals have a season before desexing. Whilst not statistically significant, they tended to agree that desexing reduces aggression in dogs to a greater extent than in cats and that performing EAD on kittens is more difficult than performing it on puppies. In general veterinarians did not feel that they needed extra training or equipment to perform EAD, nor that dogs and cats should have a litter before desexing, nor was EAD appropriate for owned puppies and kittens but that it was appropriate for shelter animals, particularly cats.

The greatest frequency of freeform comments concerned clinical risks associated with EAD and the appropriateness of EAD for owned animals. Other participants felt that MD at any age would not target less responsibly owned or ownerless cats, and that providing targeted low cost desexing or widespread community education would be more effective strategies than MD.

### **Summary**

While an increased risk of relinquishment has previously been linked with little or no cost at acquisition (Patronek, Glickman, Beck, McCabe, & Ecker, 1996), this study found that cost of acquisition was not an important determinant of care provision, at least in this sample of people who frequent veterinary clinics. Animals acquired at little or no cost received the same veterinary care as those acquired at greater cost and were over-represented amongst longer lived animals. It is possible that only a very small proportion of animals acquired at little or no cost are ever presented at a veterinary surgery, but that those who are receive care equivalent to their more expensive counterparts. Likewise, our data appear to contradict claims that animals acquired from a pet shop are less cared for or are more likely to be relinquished than

animals acquired from other sources. However, the non-representative sample restricts such generalised conclusions being made and further research, based on a representative population would be necessary to clarify this issue.

Cats tended to cost far less at acquisition with almost half of them acquired at no cost. By contrast, relatively few dogs were acquired for no cost and some cost a significant amount of money. Cats tended to live longer and visited the veterinarian less often than dogs, which suggests that either they are generally healthier or possibly that people are less inclined to spend money on them. The former contention is somewhat supported by a lower mortality rate amongst offspring for cats (although numbers are too low for any statistical significance to be determined). The latter contention is somewhat supported as cat owners tended provide a more restricted number of services than dog owners and the care provided was sensitive to income level. This suggests that the provision of veterinary care for cats may be more sensitive to economic factors than for dogs, particularly for individuals with limited means, such as pensioners. This may also affect compliancy with mandated requirements, particularly for cats, such as microchipping. To ensure compliancy for low income households, the cost of mandated requirements such as microchipping and desexing may need to be reduced or subsidised. Future research should explore the interaction of social and financial factors with veterinary care patterns using a longitudinal study.

The majority of cats are allowed to roam unsupervised outside their owner's property for some period, with male cats allowed more outdoor access. Somewhat surprisingly, there was no difference identified in the amount of roaming allowed desexed and entire animals, although it should be noted that there were very few sexually entire cats represented in this survey. If this finding is generalisable to the larger community, it is of concern, as it obviously increases the potential for unplanned reproduction and social nuisance.

The very high levels of desexing reported indicates good acceptance of voluntary desexing in both veterinarians and their clients, with veterinarians almost universally promoting desexing at about six months. The public has a somewhat greater acceptance of desexing for cats than dogs, although there were some attitudinal differences between the owners of male and female animals regarding desexing. This indicates that different arguments will be required to encourage them to desex their animals, should this be desired.

The issue of 'when to desex' is problematic for cats e.g. a significant proportion of the sample did not know when cats became reproductively mature and 46.9% believed that female cats are sexually mature when aged more than six months i.e. after sexual maturity. Ten months was the mean age of desexing for animals that were not desexed at acquisition. However, as dogs mature at around six months and cats

from about four months, this provides an opportunity for unplanned litters to occur for both species. Considering that this sample, which was recruited via a veterinary clinic, is likely to be better informed about such matters than many other pet owners, there may be a significant opportunity to reduce the numbers of unwanted litters in the general population by educating owners that their pets, particularly cats, become sexually mature before six months of age. Without an accurate understanding of this matter, the public cannot make informed decisions regarding when to desex their pet.

With regard to the proposed strategies, clients are generally supportive of voluntary desexing particularly by six months of age but are far less supportive of EAD. EAD would be better accepted by cat owners than dog owners, who will need significant education to allay their concerns. Many clients relied on their veterinarian to advise them about the best age to desex their pet. Should MD legislation be introduced, awareness campaigns should not only focus on population control messages but answer concerns such as the cost of desexing and breeder exemptions to ensure the greatest acceptance. Bearing in mind the pivotal role that veterinarians will perform in encouraging EAD, the opinions of clinicians in relation to these strategies is critical.

Veterinary opinion regarding the probable effects of the proposed strategies is mixed, with none of the three proposed strategies thought likely to achieve the optimal outcome of maintaining/increasing the number of owned animals while reducing the numbers of unowned ones. Desexing before six months was felt to be more effective at reducing unowned and semi-owned cats than desexing at three months of age. Veterinarians expressed a number of concerns regarding EAD including the fear that EAD, even if implemented only for cats, might reduce the numbers of fully owned cats and dogs and that performing kitten EAD on kittens was more difficult than performing it on puppies. Some veterinarians expressed concern that legislating desexing, at any age, would not increase compliance from individuals who were not complying with existing legislation nor would it target unowned animals. Rather targeted low cost desexing and community education were felt to be more effective strategies. Indeed, the association between lower socio-economic areas and the percentage of feral cats presented to a clinic suggests that targeting low cost/no cost desexing in low income areas might be a productive strategy to reduce the number of feral cats. Given these perceptions, authorities wanting to introduce EAD need to provide veterinarians with convincing arguments to support desexing before three months of age, particularly for dogs, and counter any clinical concerns that would compromise a practitioner's duty of care to their clients' animals.

Owner attitudes and perceptions were key factors in determining compliance with council registration and included negative perceptions of council, lack of perceived value for money and the perception of registration fees as a council revenue raiser. Coercive factors such as compliance with the law and penalty avoidance were the main factors motivating registration compliance, rather the more positive aspects of

funding animal management activities or assisting in finding a lost animal. Councils therefore, may have an opportunity to portray registration in a more positive manner. However, if registration is primarily promoted as a method of finding a lost animal, then microchipping may actually be a barrier to compliance, as microchips are perceived as a more effective method of finding a lost animal than registration. Over one-fifth of cats in this sample were not registered, indicating that even amongst these caring and possibly more responsible owners, cat registration was not be seen to be particularly advantageous or alternatively, that the likelihood of being caught was considered so remote that it was not motivating.

Strategies to reduce numbers of unwanted companion animals in our community need to reach 'hard to access' populations. This study has identified that two of these groups can be accessed, to some degree, via veterinary clinics. These are the estimated 10% of the client base believed to be composed of 'less responsible' owners and the 37.9% of veterinary clients that were cat semi-owners. The level of cat semi-ownership in this sample of people who are likely to be 'responsible and caring' owners is somewhat unexpected and supports Toukhsati et al.'s (2006) contention that caring for cats is an important motivator for this behaviour.

Importantly the low number of litters of puppies and kittens presented to participating practices plus the high rate of desexing and the low numbers of progeny taken to shelters all suggest that if mandatory desexing laws only reach the types of owners who frequent veterinary practices, who are felt likely to represent the responsible pet owners in our community, then they will have a limited effect on the numbers of unwanted cats and dogs in our community.

## **Study Limitations**

Care must be taken in generalising these findings to the total population of cat and dog owners as participants were recruited via veterinary clinics. This may have biased the sample towards people with a higher income level, those more committed to their animals or simply to those who had time available to complete such a survey. However, in this case the aim of this study was to investigate people thought to be most likely to be responsive to strategies aimed at reducing the numbers of unwanted cats and dogs in society and it is likely that participants do represent this group.



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# APPENDIX A – Owner Survey



Characteristics of animals and clients who visit veterinarians  
Client Questionnaire  
Monash Research Project No: 2007/1613 LIR

*This survey is part of a Monash University study on pet ownership in Victoria. It is designed to help us identify ways to reduce the numbers of unwanted companion animals in our society and to increase our understanding of pet ownership. In order to participate, you must be aged 18 years of age or over.*

*No personally identifying data are collected in this survey. Participation is completely voluntary and you do not have to answer any question that you do not wish to. However, this research will benefit greatly from your full and honest participation. This information will help us find ways to reduce the number of unwanted animals being euthanased by shelters and pounds each year.*

1) Is this your regular veterinary clinic (Please circle)? Yes No

2) Did you come today to see a **Veterinary Nurse** or **Veterinarian** (Please circle)?  
Nurse Veterinarian Other (e.g. to pick up food)

3) Please indicate the species of animal that you brought for veterinary treatment today (if more than one animal of any type please indicate number)?

**Dog** .....If more than one dog is this a litter of puppies? (Please circle) Yes No

**Cat** .....If more than one cat is this a litter of kittens? (Please circle) Yes No

**Rabbit** ..... **Bird** .....  
**Fish** ..... **Reptile/Amphibian** .....  
**Other (specify)** .....

*If you brought more than one animal to the clinic today, please complete the rest of this survey describing the details of the oldest animal brought to the clinic. If several animals are the same age then please pick one and complete the rest of the form with regard to that animal.*

4) How long since you visited a veterinarian with this animal before today (in months)?  
..... months

5) How many times a year (on average) would you visit a veterinarian with this animal?  
..... times

6) What sex is the animal you brought for treatment today (Please circle)? M F Unknown

7) What was the main reason that you brought this animal to the clinic today?  
.....  
.....

8) Do you own this animal (Please circle) Yes No

A) If you do OWN this animal

1 Where did you acquire this animal? (Please tick appropriate response).

- a) From a pet shop
- b) From a veterinarian
- c) From a shelter/welfare organisation
- d) From a neighbour/friend/family member
- e) From a breed rescue group
- f) Animal adopted you
- g) From a breeder
- h) Other (Please Specify) .....

2 If you bought your pet from a breeder or pet shop did you receive pedigree papers? (Please circle) Yes No

3 How did you find out about the animal? (Please tick appropriate response)

- a) I contacted the breed club or breeder
- b) I saw it at a vet clinic or pet shop
- c) I saw it advertised in the newspaper/ local shops
- d) I searched for it on the internet
- e) I visited a shelter/pound to find it
- f) I heard about it from a friend/neighbour/family member
- g) It just turned up on my doorstep
- h) Other .....

4 If you paid for the animal, please indicate how much you paid (in dollars)? \$.....

5 How old was this animal (in years and months) when you acquired him or her?  
...Years .... Months

6 How old is the animal now (in years and months)? ...Years .... Months

7 How much did you think about getting this animal before you did so? (Please tick appropriate response)

Not a lot of thought  
(an impulse acquisition)

Some thought

A lot of thought

B) If you DO NOT OWN this animal, why did you bring the animal to the vet clinic (Please tick appropriate response)

- a) Found it injured
- b) Found it lost
- c) To care for it because no one owns him/her
- d) Belongs to a friend and I am caring for him/her
- e) Bought him or her on behalf of a family member who owns animal
- f) Other (Please specify) .....

9) At what age (in months) do you believe cats and dogs are generally able to reproduce?  
Female Cat..... Male Cat.....Female Dog.....Male Dog.....

If the animal brought to the clinic today is not a dog or a cat go to Q. 22. If it is a dog or cat please continue.

10) Please indicate how many litters (of puppies or kittens) your dog or cat has produced.

**0**    **1**    **2**    **3**    **More than 3**

**11) If this animal HAS had any litters then**

- a) **How many puppies or kittens has this animal produced? .....**
- b) **Please indicate what happened to these puppies or kittens (write number of animals for each option)?**
  - i) **Sold to a pet shop** .....
  - ii) **Sold privately** .....
  - iii) **Died of natural causes** .....
  - iv) **Euthanased** .....
  - v) **Given away to friends and family** .....
  - vi) **Placed free to good home advertisements** .....
  - vii) **Taken to a shelter** .....
  - viii) **Don't know** .....
  - ix) **Other (please specify).....**

**12) Is your animal desexed (Please circle)?** Yes No Don't Know

- a) **If this animal IS DESEXED, was it desexed before you acquired it?** Yes No
- b) **If it was NOT DESEXED when you acquired it but is NOW please indicate at what age desexing took place (in months).** ..... months

If this animal IS DESEXED please go to Q. 18. If this animal is not desexed please continue.

**13) Are you planning on breeding from this animal?** Yes No

- a) **If you ARE planning to breed from him or her, what is your main reason for doing so?**  
.....

**14) Do you intend to have this animal DESEXED (Please circle)?** Yes No

- a) **If you INTEND TO HAVE THIS ANIMAL DESEXED, what is your primary reason for doing so?** .....
- b) **If you INTEND TO HAVE THIS ANIMAL DESEXED, at what age do you intend to have him or her desexed?** .... years .....months
- c) **If you DO NOT INTEND TO HAVE THIS ANIMAL DESEXED, please indicate the main reason why not?**  
.....

**15) How do you intend to prevent any unplanned pregnancies occurring while your animal is not desexed?** .....

**16) If your animal produces a planned or unplanned litter, what do you think will happen to the kittens or puppies?**  
.....

**17) Has your veterinarian advised you about desexing this animal? (Please Circle) Yes No**

- a) **If so, did they advise you to have the animal desexed? (Please Circle)** Yes No

b) If they advised that this animal should be desexed, at what age (in months) did they advise desexing? ..... (months)

18) In relation to this animal, have you, or would you, ever visit a veterinary practice for the following reasons (please tick response)?

	YES	NO		YES	NO
Pre-purchase advice			Microchip implantation		
Puppy/kitten socialisation			Routine health check		
Puppy-kitten vaccinations			Heartworm treatment		
Internal parasite prevention or treatment			External parasite prevention or treatment		
Regular weighing			Adult vaccinations		
Advice on diet			Blood tests and laboratory diagnostics		
Treatment for minor health problems (hotspots, coughs etc)			Treatment for chronic health conditions (diabetes, heart condition, arthritis)		
Desexing			Routine surgery		
Contraception for your pet			Behavioural advice		
Breeding & pregnancy advice			Remove stitches following surgery		
Care for minor injuries			Geriatric Care		
Emergency medical care			Emergency trauma care		
Referral to veterinary specialist			Advice prior to relinquishment		
Euthanasia			Other (please list) .....		

19) For what percentage of the time is your cat or dog able to wander freely outside your property unsupervised? (please circle)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

20) Is this animal REGISTERED with a council? (Please circle) Yes No

a) If he or she is REGISTERED, then what is the MAIN reason that you registered your animal? (Please tick appropriate response)

- (1) To comply with a legal requirement
- (2) To avoid being fined
- (3) Registration pays for animal management
- (4) Registration increases the chance of finding a lost animal
- (5) Other (please specify).....

i. Do you feel that you receive value for your registration fee? (Please circle) Yes No

b) If this animal is NOT REGISTERED, then what is the MAIN reason that you have not registered him or her?

.....

21) Is this animal microchipped (Please circle)? Yes No

a) If he or she IS MICROCHIPPED, please indicate your MAIN reason for doing so (Please tick appropriate response)

- (1) To comply with legal requirement
- (2) Microchipping was recommended by the veterinarian
- (3) The animal was already microchipped when I got him/her
- (4) Microchips increases the chance of finding a lost animal
- (5) Other (please specify).....

b) If this animal is NOT MICROCHIPPED, please indicate your MAIN reason for not doing so .....

.....

22) A strategy currently being considered to reduce the number of unwanted companion animals living in our community is the introduction of legislation requiring that all pet DOGS be desexed BEFORE SIX MONTHS OF AGE.

a) To what extent would you support this strategy (Please tick one response)

- 
- Strongly Oppose Don't Know Support Strongly Support

b) Why would you oppose/ support it?

.....

23) A strategy currently being considered to reduce the number of unwanted companion animals living in our community is the introduction of legislation requiring that all pet CATS be desexed BEFORE SIX MONTHS OF AGE.

a) To what extent would you support this strategy (Please tick one response)

- 
- Strongly Oppose Don't Know Support Strongly Support

b) Why would you oppose/ support it?

.....



.....

**24) Another strategy being considered to reduce the number of unwanted companion animals living in our community is the introduction of legislation requiring that all pet DOGS be desexed BEFORE THREE MONTHS OF AGE? Which of the following best describes your feelings on this matter?**

**a) To what extent would you support this strategy (Please tick one response)**

Strongly Oppose     Oppose     Don't Know     Support     Strongly Support

**b) Why would you oppose/ support it?**

.....  
.....

**25) Another strategy being considered to reduce the number of unwanted companion animals living in our community is the introduction of legislation requiring that all pet CATS be desexed BEFORE THREE MONTHS OF AGE?**

**a) To what extent would you support this strategy (Please tick one response)**

Strongly Oppose     Oppose     Don't Know     Support     Strongly Support

**b) Why would you oppose/ support it?**

.....  
.....

**25) If compulsory desexing of all pet dogs and cats (with special exemptions available for owners who wished to breed their animals) was introduced, would you comply with this legislation (Please circle)?**

Yes                  No                  If my vet advised me to                  Don't know

**a) Please indicate your main reason for complying or not complying with this legislation**

.....

*To finish up here are a few general questions about you:*

**26) What is your Post Code** .....

**27) How old are you (in years)?** ..... years

**28) Are you Male or Female (Please circle)?**                  M                  F

**29) How many adults (over 18) live with you at home?** .....

**30) How many children (under 18) live with you at home?** .....

31) What is the highest level of education that you have reached? (Please tick one)

- a) Completed primary school
- b) Completed part of secondary school
- c) Completed secondary school or equivalent
- d) Completed undergraduate degree
- e) Completed postgraduate degree

32) Which of the following best describes where you live? (Please tick one)

- a) House
- b) Townhouse
- c) Flat/Apartment
- d) Hobby Farm/ Acreage (< 5 acres)
- e) Farm (> 5 acres)
- f) Other (Specify).....

33) What is your annual income (to the closest \$10,000)? .....

34) How many cats do you own? .....

35) How many dogs do you own? .....

36) Have you ever fed a cat that you believed was unowned (Please circle)? Y N

37) How would you describe your cultural heritage e.g. Anglo-Australian, Asian etc?

.....

38) Which language/s do you speak at home?

.....

39) Are there any comments that you would like to make

.....  
.....  
.....  
.....

*Thank you for taking the time to complete this survey. Your help in this research is invaluable and greatly appreciated. Please seal the completed survey in the envelope supplied and post it back to the researchers.*

## APPENDIX B - Veterinary Practice Survey

### CHARACTERISTICS OF ANIMALS AND CLIENTS WHO VISIT VETERINARIANS VETERINARY PRACTICE SURVEY (Monash Research Project No: 2007/1613 LIR)

#### 1. Approximately what percentage of your practice is made up of the following animal groups?

Dogs	_____ %	Cats	_____ %
Pocket Pets (guinea pigs, rats, mice etc)	_____ %	Birds	_____ %
Large domesticated animals (cattle, sheep, horses)	_____ %	Wildlife	_____ %
Fish	_____ %	Reptiles	_____ %
Amphibians	_____ %	Other	_____ %

#### 2. Approximately what percentage of the dog and cat owning clients that you see in your practice would you EXPECT to consult a veterinary practice for the following reasons?

(Note that this question is not about how often you perform these procedures, but the type and level of veterinary care you believe is provided to cats and dogs by the clients you see at your practice).

	% Cat Owners	% Dog Owners		% Cat Owners	% Dog Owners
Pre-purchase advice	_____ %	_____ %	Microchip implanting	_____ %	_____ %
Puppy/kitten socialisation	_____ %	_____ %	Routine health check	_____ %	_____ %
Puppy-kitten vaccinations	_____ %	_____ %	Heartworm treatment	_____ %	_____ %
Internal parasite prevention or treatment	_____ %	_____ %	External parasite prevention or treatment	_____ %	_____ %
Regular weighing	_____ %	_____ %	Adult vaccinations	_____ %	_____ %
Advice on diet	_____ %	_____ %	General diagnostics	_____ %	_____ %
Treatment for minor health problems (hotspots, coughs etc)	_____ %	_____ %	Treatment for chronic health conditions (diabetes, heart condition, arthritis)	_____ %	_____ %
Desexing	_____ %	_____ %	Routine surgery	_____ %	_____ %
Chemical contraception	_____ %	_____ %	Behavioural advice	_____ %	_____ %
Breeding & pregnancy advice	_____ %	_____ %	Remove stitches following surgery	_____ %	_____ %
Care for minor injuries	_____ %	_____ %	Geriatric Care	_____ %	_____ %
Emergency medical care	_____ %	_____ %	Emergency trauma care	_____ %	_____ %
Referral to veterinary specialist	_____ %	_____ %	Advice prior to relinquishment	_____ %	_____ %
Euthanasia	_____ %	_____ %	Body Disposal	_____ %	_____ %

Other (please list)

\_\_\_\_\_ % \_\_\_\_\_%

**3. Approximately what percentage of your cat and dog owning clients do you advise to desex their animal?**

Dogs \_\_\_\_\_%                      Cats \_\_\_\_\_%

**4. Assuming healthy body weight, at what age in weeks do you advise your cat and dog owning clients to desex their animal?**

Dogs \_\_\_\_\_ weeks                      Cats \_\_\_\_\_ weeks

**5. Approximately how many litters of puppies and kittens do you see in your clinic annually?**  
(Please circle)

Cat litters	0	1-5	6-10	11-20	21-50	51-100	Over 100
Dog litters	0	1-5	6-10	11-20	21-50	51-100	Over 100

**6. Of the litters that you see annually, approximately what percentage do you estimate fall into the following categories?**

**Cat litters**

Planned purebred litters \_\_\_\_\_%

Planned mixed breed litters \_\_\_\_\_%

Accidental purebred litters \_\_\_\_\_%

Accidental mixed breed litters \_\_\_\_\_%

Unowned/Found litters \_\_\_\_\_%

---

**Dog litters**

Planned purebred litters \_\_\_\_\_%

Planned mixed breed litters \_\_\_\_\_%

Accidental purebred litters \_\_\_\_\_%

Accidental mixed breed litters \_\_\_\_\_%

Unowned/Found litters \_\_\_\_\_%

---

7. For each of the following categories, please write the approximate percentage of kittens and puppies from these litters that you believe are subject to each of the following fates. (Please write 0 in the column or cell, if you don't see any animals that fit into a particular category)

Type of Animal	Type of Litter	Retained by breeder	Sold to new owner	Given away to new owner	Sold or given away to pet shop	Taken to shelter/pound	Adopted via vet clinic	Abandoned/dumped	Euthanased	Don't know
<b>Kittens</b>										
	Planned litter	____%	____%	____%	____%	____%	____%	____%	____%	____%
	Unplanned litter	____%	____%	____%	____%	____%	____%	____%	____%	____%
	Unowned/Found litter	____%	____%	____%	____%	____%	____%	____%	____%	____%
<b>Puppies</b>										
	Planned litter	____%	____%	____%	____%	____%	____%	____%	____%	____%
	Unplanned litter	____%	____%	____%	____%	____%	____%	____%	____%	____%
	Unowned/Found litter	____%	____%	____%	____%	____%	____%	____%	____%	____%

**8. Does your clinic regularly help to find homes for puppies and kittens (Please circle)?**

Puppies	YES	NO
Kittens	YES	NO

**9. If your clinic regularly helps to find homes for puppies and kittens, where do these animals come from?**

	<b>Kittens (please write %)</b>	<b>Puppies (please write %)</b>
Bred by clinic owner or staff	_____ %	_____ %
Obtained from planned litters bred by registered breeders	_____ %	_____ %
Obtained from local pet shop	_____ %	_____ %
Obtained from shelter or pound	_____ %	_____ %
Obtained from clients with unplanned litters	_____ %	_____ %
Obtained from clients who find litters	_____ %	_____ %
Abandoned at clinic	_____ %	_____ %
Other (please write)	_____ %	_____ %

**10. Research in Victoria suggests that cat ownership falls along a continuum, with the following categories recognised. Please estimate what percentage of the dogs and cats you see in your clinic fall into each of these categories.**

Category	Description	% of cats seen in clinic (please write %)	% of dogs seen in clinic (please write %)
<b>Fully owned animals</b>	Are fed, housed, receive regular veterinary care and are registered and/or identified. The person responsible for their care would claim ownership if asked.	_____%	_____%
<b>Casually owned animals</b>	Are fed and housed but may not be registered, identified or receive regular veterinary care. The person responsible for their care would probably claim ownership if asked.	_____%	_____%
<b>Semi owned animals</b>	Are fed and sometimes cared for by specific people who would recognise the cat but deny ownership if asked.	_____%	_____%
<b>Ownerless Animals</b>	Exist in close proximity to humans but are not dependent upon specific humans who intentionally feed them.	_____%	_____%
<b>Feral animals</b>	Are not dependent at all on humans for food or shelter	_____%	_____%

**11. There is significant debate regarding whether legislation should be introduced to reduce the number of unwanted cats and dogs in the community. For each of the following alternatives, please indicate, by ticking the appropriate box, what you think would be the likely effect of the strategy would be on each of the categories of animals described above.**

Option A: Compulsory desexing of all cats and dogs, prior to SIX MONTHS of age, unless an exemption is applied for by owner

	Greatly reduce the number of animals in this category	Slightly reduce the number of animals in this category	Neither reduce or increase number of animals in this category	Slightly increase the number of animals in this category	Greatly increase the number of animals in this category
<b>Cats</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Dogs</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Option B: Compulsory desexing of all cats and dogs, prior to THREE MONTHS of age, unless an exemption is applied for by owner

	Greatly reduce the number of animals in this category	Slightly reduce the number of animals in this category	Neither reduce nor increase number of animals in this category	Slightly increase the number of animals in this category	Greatly increase the number of animals in this category
<b>Cats</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Dogs</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Option C: Increased INCENTIVES to encourage VOLUNTARY desexing of cats and dogs, prior to THREE MONTHS of age

	Greatly reduce the number of animals in this category	Slightly reduce the number of animals in this category	Neither reduce nor increase number of animals in this category	Slightly increase the number of animals in this category	Greatly increase the number of animals in this category
<b>Cats</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Dogs</b>					
Fully owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Casually owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semi owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ownerless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you believe that increased incentives might increase the rate of VOLUNTARY DESEXING prior to THREE MONTHS of age, then please identify what incentives you think might be effective:

.....  
 .....  
 .....



12. To what extent do you agree or disagree with the following statements regarding Early Age Desexing (EAD) of **CATS** in good health and of good body weight? (EAD refers to desexing prior to 12 weeks of age)

Procedure	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<b>Cats</b>					
EAD of <b>female</b> cats is more difficult to perform than later age desexing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD of <b>male</b> cats is more difficult to perform than later age desexing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would find EAD of cats difficult to perform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would require additional training to be able to perform EAD of cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would require access to new equipment and surgical facilities to perform EAD of cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is appropriate for kittens in shelters and pounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not advise clients to desex their owned <b>female</b> kittens at an early age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not advise clients to desex their owned <b>male</b> kittens at an early age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have clinical concerns about EAD of cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is associated with increased health risks for some cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is associated with health benefits in some juvenile cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is associated with health benefits in some adult cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD increases the prevalence of obesity in cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD reduces roaming behaviour in cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD increases urinary incontinence in <b>female</b> cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD reduces spraying in cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EAD reduces aggression in cats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is appropriate for most kittens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I advise my clients to let their <b>female</b> cats have one season before desexing them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I advise my clients to let their <b>female</b> cats have one litter before desexing them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. To what extent do you agree or disagree with the following statements regarding the Early Age Desexing (EAD) of **DOGS** in good health and of good body weight? (EAD refers to desexing prior to 12 weeks of age)

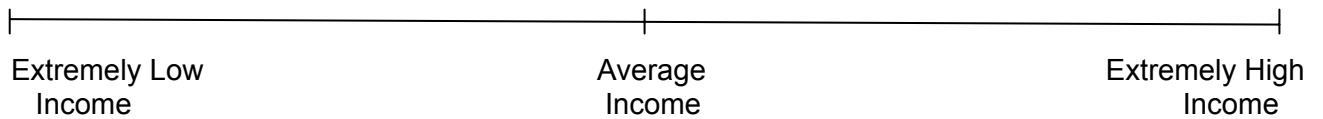
Procedure	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<b>Dogs</b>					
EAD of <b>female</b> dogs is more difficult to perform than later age desexing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD of <b>male</b> dogs is more difficult to perform than later age desexing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would find EAD of dogs difficult to perform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would require additional training to be able to perform EAD of dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would require access to new equipment and surgical facilities to perform EAD of dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is appropriate for puppies in shelters and pounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not advise my clients to desex their owned <b>female</b> puppies at an early age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not advise my clients to desex their owned <b>male</b> puppies at an early age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have clinical concerns about EAD of dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is associated with increased health risks for some dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is associated with health benefits in some juvenile dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EAD is associated with health benefits in some adult dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD increases the prevalence of obesity in dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD reduces roaming behaviour in dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD increases urinary incontinence in <b>female</b> dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD reduces aggression in dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EAD is appropriate for most puppies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I advise my clients to let their <b>female</b> dogs have one season before desexing them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I advise my clients to let their <b>female</b> dogs have one litter before desexing them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**14. What percentage of your clients would you estimate belong to the following cultural groups?**

Anglo Australian /New Zealand	_____ %
Indigenous Australian/ New Zealand	_____ %
European	_____ %
Asian	_____ %
Middle Eastern	_____ %
African	_____ %
American	_____ %
Polynesian	_____ %
Other _____	_____ %

**15. Please indicate, on the following scale, what you believe the average income level of your client base to be:**



**16. Please indicate, on the following scale, what you believe the average educational level of your client base would be?**

Completed Primary School only	Completed some Secondary School	Completed Secondary School	Completed Undergraduate Degree	Completed Postgraduate Degree
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17. What is the postcode of your veterinary practice? \_\_\_\_\_

18. Are there any comments that you would like to make?

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*Thank you for your participation in this survey. Please seal the completed survey in the reply-paid envelope provided and return to the researchers. If you would like to be contacted regarding the findings of this survey please phone (9903 1144) or email (Linda.marston@med.monash.edu.au)*