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# Consumer Preferences for Pet Health Insurance

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## **Abstract**

This study uses a choice experiment survey to examine pet owner's preferences for Pet Health Insurance policies. Our results indicate that pet insurance premium, reimbursement level, unlimited benefits and wellness included in pet health insurance plan have significant effects on their purchase decisions.

## **Introduction**

According to the National Pet Owners Survey<sup>1</sup> 65 percent of U.S. households, or about 79.7 million families, own a pet. Pet spending in the U.S. has increased at a fast rate, from \$38.5 billion in 2006 to an estimate of \$60.59 billion by 2015 (APPA, 2015). Animal companions or pets have become a significant part of many families' lives, not only in the U.S. but other developed countries such as England, Canada and China. The growth in the number and quality of relationships between human and animal companions has gotten some attention, with media talking almost daily about pet-related trends, care, and entertainment. But the introduction of a companion animal also brings additional spending and risk into a consumer's personal budget in the form of pet food, toys, grooming, and animal health care. The human-animal bond defines consumer's willingness to spend on their pets, including veterinary care: as the human-animal bond increases, so does consumer spending on pets (Brockman, 2008). Unlike human health care, most pet owners do not own pet healthcare insurance and consequently consumers pay the majority of pet health expenses out of their own pockets. With some procedures running into the thousands of dollars, consumers are often forced to make difficult decisions, and in some cases, choose to forgo needed treatment.

Understanding consumer choices regarding their companion animals, particularly with respect to health care, could help to identify consumers who are more likely to forgo healthcare treatments for their pets. Brockman et al. (2008) define different types of emotional attachment from pet owners towards their pets. They find that pets can be considered as a cherished other, seen as possessions or simply considered part of a family. While they look at individual cases in

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<sup>1</sup> 2015-2016 National Pet Owners Survey was conducted by the American Pet Products Association (APPA).

terms of the relationship between an emotional attachment toward pets and health care choices, they do not quantify spending among each level of attachment.

Owning a pet can sometimes bring with it a great deal of risk. Some pet breeds are more prone to health defects or diseases. There is also the possibility of injury due to an accident or unforeseen illnesses. When these illnesses or injuries occur, pet owners can sometimes be faced with hefty veterinary bills. Uncertainty is a significant and inevitable part of the future. In other areas, consumers protect themselves against future loss through the purchase of various forms of insurance policies, for example: health insurance, auto insurance, homeowner's insurance, life insurance, and insurance for electronic purchases. Consumer preferences on insurance purchases depend on the consumer's lifestyle, location, demographics, and risk preferences.

Pet health insurance is one small, but growing industry that could increase consumer spending on pet healthcare. Pet insurance has existed globally since the 1900's, however North America's pet health insurance sector posted record growth in 2015, with a combined total premium hitting \$660.5 million and the total number of pets insured reaching 1.4 million according to the NAPHIA State of the Industry report<sup>2</sup>. Pet insurance can be considered as a variation of human health insurance, where pet insurance companies reimburse the owner after the pet has received care and the owner submits a claim to the insurance company.

Such insurance is expected to increase the likelihood that a pet owner will choose to treat any health conditions that unexpectedly arise in their companion animals, allowing them to trade the risk of infrequent but expensive medical costs for more manageable monthly pet insurance premiums. This research aims to understand pet owners' attitudes toward risk, the role of risk and risk reduction in the demand for veterinary services (pet health care), their demand for pet insurance and identify characteristics that contribute to their decision to purchase pet insurance as well as their maximum willingness to pay for pet insurance premiums. A quantitative research method based on an online survey of pet owners is used.

Our approach is based on the consumers' demand, motivations and behavior as well as market characteristics and attributes of the product provided by existing companies. Our analysis will

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<sup>2</sup> North American Pet Health Insurance Association (NAPHIA), 2015

help insurance companies to understand the demand for their services and direct future efforts and marketing that could boost insurance sales as well as demand for veterinary services.

## **Literature review**

Multiple studies have been conducted on pet ownership. One such study is Brockman (2008), who finds that consumers' levels of emotional attachment to animals largely drive the nature of their decisions on veterinary care. Their findings point to the possibility of appealing to consumer emotions, in the provision of pet-health care as a tool of marketing communication between services providers and clients. In another study, Holbrook et al. (2001) explore the consumption experiences from pet owners through the use of an integrated approach to marketing and consumer research method called the Collective Stereographic Photo Essay. They conclude that companion animals hold a special and even sacred role in their owner's lives that places them above the function of pets as possessions.

While some studies have been conducted on various aspects of pet ownership, none uses an economic approach to study preferences regarding pet health insurance in the United States. Research about pet insurance has been done in countries like England, China and Canada but no research has been conducted about pet insurance in the United States. As a consequence, our study adds to the literature by providing an examination of pet owner's preferences towards pet health insurance policies based on choice experiment data.

## **Experimental design and Data**

Stated preference techniques are a series of methods or approaches to estimate the value of goods and services not commonly bought and sold in existing markets (Mitchell and Carson, 1989). These methods usually simulate market situations by creating hypothetical scenarios in which respondents make decisions that mimic the reality of markets. Once the attributes of interest are chosen, the attribute levels can be determined. The information obtained from choice experiments can be used in designing policies and can also be used in cost benefit analysis (Hanley et al. 2001; Mogas et al. 2006). The method has been employed in a series of studies related to environmental economics, transportation, and health economics (e.g. Alfnes et al. 2006, Mercade et al. 2009, Roe, Sporleder, and Belleville 2004, Bergtold, Fewell, and Williams 2014).

We used a choice experiment survey to elicit pet owners' responses and other important information that were then used in this study. First, we established a set of pet insurance plan attributes for the experimental design based on a literature review and after comparing different policies offered in the market of pet health insurance. We selected five plan attributes to include in pet insurance plans: monthly base premium, annual deductible, reimbursement level, unlimited maximum annual benefits and wellness coverage. Attributes and attribute levels included in the Choice Experiment design are shown in Table 1.

We constructed a D-optimal experimental design with the OPTEX<sup>3</sup> procedure in SAS, where 12 unique choices were created and subsequently randomly assigned to pet owners in groups of 6 choice sets each. Each respondent evaluated 6 choice sets, choosing among three options. The first two options referred to pet insurance plans and the third alternative to no interest in purchasing pet insurance plan at the moment. An example of a choice set scenario is presented in Figure 1. The choice experiment data was collected exclusively from either dog and/or cat owners in the United States and before respondents were shown the choice scenarios, they were introduced to a table describing each of the attributes in the experiment. Table 2, indicates the descriptions of all the pet insurance plan attributes.

The survey consisted of three parts: the first section contained general set of questions regarding pet ownership. The second part presented a brief summary about pet insurance plans attributes followed by choice experiment sets. Lastly, the third part contained pet owners risk preferences and risk perceptions along with demographic characteristics of respondents.

The survey was constructed using Qualtrics survey software (Qualtrics Labs, Inc. Provo, UT) and respondents were reached through Qualtrics Panel services via email. The use of email or online surveys allows collecting information from a variety of people with low-cost and offers convenience to respondents since they can finish or stop it at anytime and continue with it later. Online research reduces the risk of data loss and simplifies the process of transferring data into a computational database (Baron and Healey, 2002).

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<sup>3</sup> A linear D-optimal design procedure minimize the D-error of the design

## Conceptual and Empirical Model

To model the choices of participation in pet insurance, we assume pet owners maximize expected utility according to a von Neuman-Morgenstern utility function defined over wealth (W). Due to the discrete nature, the producer compares the expected utility among alternative choices: no insurance,  $EU_N(W)$ , pet insurance,  $EU_I(W)$ .

The expected utility model of the alternative choices of no participation or pet insurance participation decisions can be written as:

$$\begin{aligned} EU_N &= \beta_N' X + \varepsilon_N \\ (1) \quad EU_I &= \beta_I' X + \varepsilon_I \end{aligned}$$

The terms  $\beta_N$ , and  $\beta_I$  are vectors of coefficients on exogenous variables  $X$  and  $\varepsilon_N$  and  $\varepsilon_I$  are random disturbances.

In order to analyze the data and account for the extensive heterogeneous preferences implied on our pet owner's sample, we specified a Mixed Logit (ML) or Random Parameter Logit (RPL) model for equation (1). In contrast to the traditional Multinomial Logit Model (MNL), the RPL specification accounts for scale difference (i.e. relaxing IIA assumption), Following Revelt and Kenneth (1998) the utility that individual  $i$  obtains choosing alternative  $j$  in choice situation  $t$ , can be written as:

$$U_{ijt} = \beta_i' X_{ijt} + \varepsilon_{ijt}$$

Where

$$\beta_i = b + \eta_i$$

Thus,

$$U_{ijt} = bX_{ijt} + \eta_i X_{ijt} + \varepsilon_{ijt}$$

where the vector of coefficients  $\beta_i$  is respondent specific and is randomly distributed with a density function  $f(\beta_i|\theta^*)$ , where  $\theta^*$  is the parameters of the distribution,  $\varepsilon_{ijt}$  is the random term that is distributed iid extreme value, independent of  $\beta_i$  and  $X_{ijt}$ . The conditional

probability that individual  $i$  chooses alternative  $j$  in choice situation  $t$  given  $\beta_i$  is standard logit:

$$P_{ikt|\beta_i} = \frac{e^{\beta_i' X_{ikt}}}{\sum_j e^{\beta_i' X_{ijt}}}$$

Since  $\beta_i$  is not observed, it is integrated out to obtain an expression for the unconditional probability which will depend on the parameters of its distribution:

$$P_{ikt}(\theta^*) = \int P_{ikt|\beta_i} f(\beta_i|\theta^*) d\beta_i$$

The integral is estimated by the simulated maximum likelihood where values of  $\beta_i$  are randomly drawn from the specified distribution.

Conceptually, the utility evaluation of these choices will be conditioned upon the decision maker's risk preferences and subjective evaluations of the risks (Lusk and Coble). Thus, the individual's risk preferences measured by risk aversion,  $r$ , enters the model. Risk aversion is measured through various measures including a relative measure of willingness to take risk as compared to others or an alternative measure eliciting the certainty equivalent of a lottery.

The pet owner perception of the risk,  $\rho$ , can be expressed by the subjective assessment of the pet's health. This is captured through a question, as "How likely is your pet to become ill in the next year?"

Various attributes of the insurance policy are also identified as potentially influencing willingness to pay for insurance. Our survey explicitly evaluated five policy attributes, these attributes include: premium, deductible, reimbursement level, unlimited annual benefits, and whether wellness benefits are included.

Finally, various socio-demographic variables and pet-relationship variables address the pet owner's affinity to the pet.

$$P(\text{Choice} = t) = f(w, r, \rho, p, A, S)$$

Reported in Table 6 is a summary and description of all the variables used in our econometric models.



## **Results**

A sample of 526 pet owners in the United States were surveyed and two observations were eliminated due to incongruences in responses. Table 1 presents demographic and socioeconomic statistics of the sample.

The mean age in the sample was 46 years old with a close proportion of gender (45% of our respondent were males and 54% females). 78% of our survey sample had at least attended college while only 22% had high school or less. The average number of pets owned in our sample was at least 1 dog and/or 1 cat per household.

A significant group of pet owner respondents considered their pet as a family member with a 75% of the sample while 57% of the total sample allowed their pet to sleep in their bedroom (either on their bed or on the floor).

The average spent on the selected pet during 2014 including food, vet bills, etc. was \$676.60. The average spent exclusively on medical treatment for the selected pet was \$248. Only 37 of the respondents covered that medical treatment with a pet insurance policy. From the group of respondents that used pet insurance on their medical treatment, an average of \$396 was spend exclusively on medical treatment. When we asked these respondents what they looked for when purchasing pet insurance 51% (19 individuals) revealed they were looking at the insurance premium, 38% (14 individuals) the type of insurance, and 10% (4 individuals) were looking at other unknown factors.

When asked about risk preferences, most pet owners identified to be indifferent to risk. Table 5 summarizes the fact that over half of the surveyed pet owners classified themselves as a risk neutral individual. The major challenge appears to be whether pet owners act according to their statements, what they believe, and what factors impact their decisions in life. To answer that question, we elicited their risk preferences and risk perceptions.

### ***Econometric Results***

The Random Parameters Logit (RPL) allowed us to capture individual preferences by accounting for heterogeneity and allowing the model parameters to vary randomly between responses. However, sources of heterogeneity can't be explained by implementing the model. In

an attempt to explain the sources of heterogeneity we include interactions of decision for pet insurance plan with socio-economic variables (Revelt and Kenneth, 1998). To check for potential “status quo (SQ) bias”, the alternative specific constant (ASC) was specified as a Decision Dummy Variable (Decision Dummy) taking the value of 1 if pet insurance plan was one of the alternatives picked and 0 otherwise. The RPL model is estimated using NLOGIT 5.0 and results are shown in Table 7.

As we stated before, the introduction of random parameters accounts for sample heterogeneity and identification of the antecedents of heterogeneity but each random parameter could potentially trigger parsimony effects and limit model estimation. In order to avoid an unstable model estimation and allow for a reasonable convergence (Russ 1996), we only specified the Discrete Choice Experiment attributes as random parameters.

Due to the nature of a choice experiment study, our primary focus is centered on the sign and significance of attribute parameters proposed in pet insurance plans. Based on estimated parameters, the marginal willingness to pay (WTP) were calculated using the *Wald* command (Delta Method) in NLOGIT 5 and results are reported in Table 8.

The price coefficient is negative and statistically significant, indicating that as price increases the probability of a consumer purchasing pet health insurance declines. The coefficient for deductible is not statistically significant, but it does have the expected negative sign. The variable for reimbursement percentage is statistically significant and positive, which indicates that as the reimbursement percentage increases, a consumer is more likely to purchase pet health insurance. Similarly, the coefficients for unlimited benefits and for a wellness plan are also both statistically significant and positive. The inclusion of those two attributes will increase the probability that a consumer will purchase a pet health care plan.

The coefficient for the variable in which respondents were asked how likely they thought their pet would become ill in the next year, defined as a risk perception variable, is positive and statistically significant. This would suggest that the more likely a consumer believes their pet will need medical care, the more likely they are to purchase pet insurance. A consumer’s risk preference was not found to be statistically significant in our model.

The decision dummy variable is negative showing a ‘Status Quo bias’ but is not statistically significant and it reflects how respondents will prefer the things to remain the same, or that change impact to be as little as possible. Focusing on the socio-demographic characteristics, age employment or retirement status, and rural location impact significantly the probability of choosing a pet insurance plan.

The respondent’s age was found negatively influencing with the probability of purchasing pet health insurance. In other words, the older respondents were less likely to purchase insurance than younger respondents. The coefficient for the variables indicating respondents who are employed as well as respondents who are retired are both positive, indicating that those individuals who are employed or retired are more likely to purchase insurance for their pets than someone who is unemployed. The coefficient for rural is statistically significant at the 10% level, indicating that individuals living in rural areas are more likely to purchase pet health insurance than somebody living in a medium size city. The coefficients for income levels were not statistically significant; suggesting that the income categories created on this study did not play a role in a consumer’s decision to purchase pet insurance.

The marginal rate of substitution for each attribute- that is marginal willingness to pay (MWTP) reveals that by increasing the deductible by \$100, a pet owner willingness to pay for a pet insurance policy is reduced by \$1.39. If the reimbursement level of pet insurance increases by 1%, pet owners are willing to pay one more dollar per month and it is notable that pet owners are also willing to pay for wellness coverage and unlimited benefits included on the plan, \$41 and \$29 respectively.

## **Conclusions**

The results obtained in this study revealed that pet owner's initial preferences regarding pet health insurance attributes. The pet insurance market that started to emerge recently will likely be influenced by the knowledge of premium policy and attributes that should be included in the plan. Certain attributes such as reimbursement rate and whether or not benefits are unlimited positively impact the likelihood that a pet owner would purchase an insurance policy. Pet owners also expressed an interest in seeing wellness visits included in their policies, an attribute that is not widely available in the current marketplace. We also found that pet owners who believe their pet is more likely to become ill in the next year are more likely to purchase insurance. While this result is not surprising, it presents the issue of adverse selection that must be addressed by insurers. Overall, pet owners expressed a great deal of interest about the topic, but many agreed that the pet insurance offered should be fair and adjusted to their needs and lifestyles.

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Table 1. Demographic and Socioeconomic Statistics of the Respondents

<b>Variables</b>	<b>Description</b>	<b>Mean</b>	<b>Std dev<sup>a</sup></b>	<b>Min</b>	<b>Max</b>
Age	Average age of respondent	46	15.56	18	83
Male	Proportion of men in sample	0.4561	0.4981	0	1
Child	Proportion of households, husband and wife with children present	0.3092	0.4049	0	1
Education	Proportion of respondents that at least attended college	0.7870	0.4094	0	1
Employed	Proportion of respondents that are employed either full or part time.	0.5076	0.4999	0	1
Retired	Proportion of respondents retired	0.2186	0.4133	0	1
Unemployed	Proportion of respondents unemployed	0.2737	0.4459	0	1
Rural Area	Proportion of respondents living in a rural area (less than 2,500 people)	0.3631	0.4809	0	1
MinMedC	Proportion of respondents living in a minor/medium city (2,500-50,000 people)	0.2186	0.4133	0	1
Urban Area	Proportion of respondents living in a big city (>50,000 people)	0.4182	0.4932	0	1
LMIncome	Proportion of respondents receiving less than average American family yearly income (<\$54,999)	0.6121	0.4872	0	1
MedIncome	Proportion of respondents receiving between \$55,000 - \$84, 499 yearly income	0.2186	0.4133	0	1
HIIncome	Proportion of respondents receiving more than \$85, 000 yearly income	0.1673	0.3732	0	1

<sup>a</sup>Std dev: standard deviation

Average spent on the selected last year (2014)

Table 2. Percentage of Respondents that prefer to buy Pet insurance from:

	<b>Dog Owner</b>	<b>Cat Owner</b>	<b>Total</b>
<b>Veterinary Provider</b>	40%	41%	40%
<b>Insurance Company</b>	35%	24%	30%
<b>Pet Shop</b>	3%	3%	3%
<b>Not interested at this time</b>	22%	31%	26%
<b>Other</b>	0%	1%	1%

Table 3. Percentage of Respondents that prefer the following Pet Insurance payment plans:

	<b>Dog Owner</b>	<b>Cat Owner</b>	<b>Total</b>
<b>Monthly bill payment plan</b>	73%	61%	68%
<b>Annual only-once payment plan</b>	15%	19%	16%
<b>Bi-annual payment plan</b>	12%	21%	16%

Table 4. Percentage of responses to the statement “How likely would you be to purchase pet health insurance in the future if it were recommended by your Veterinarian?”

	<b>Dog Owner</b>	<b>Cat Owner</b>	<b>Total</b>
<b>Extremely likely to purchase</b>	12%	8%	10%
<b>Likely to purchase</b>	44%	33%	39%
<b>Neutral</b>	31%	38%	34%
<b>Not likely to purchase</b>	5%	10%	7%
<b>Not at all likely to purchase</b>	8%	10%	9%

Table 5. Percentage of responses to the statement “Do you consider yourself more or less risk a risk taker than your family members, friends and neighbors?”

	<b>Dog Owner</b>	<b>Cat Owner</b>	<b>Total</b>
<b>About the same</b>	55%	59%	56%
<b>Less</b>	29%	29%	29%
<b>More</b>	16%	12%	15%

Table 6. Percentage of responses of Risk Perceptions about their pet health.

	Dog Owner	Cat Owner	Total
<b>Question: How likely do you think your Pet is to get ill within the next year?</b>			
<b>Less than 20%</b>	2.36%	2.64%	2.48%
<b>20%-40%</b>	24.58%	16.74%	21.18%
<b>40%-60%</b>	11.45%	8.37%	10.11%
<b>60%-80%</b>	3.37%	2.20%	2.86%
<b>More than 80%</b>	2.36%	2.64%	2.48%

Table 7. Random Parameters Logit Model

Attribute	Coefficient	SE <sup>a</sup>
<i>Random Parameters in utility functions</i>		
Price,	-0.01627***	0.00111
Deductible	-0.00023	0.00025
Reimbursement level	0.01633***	0.00212
Unlimited benefits	0.68025***	0.05914
Wellness Included	0.47111***	0.07556
Decision Dummy	-0.18452	0.38486
<i>Non-Random parameters in utility functions</i>		
Risk Perception		
Risk Preference		
<i>Variables that interacted with Decision Dummy</i>		
Age	-0.04376***	0.00482
College Degree	0.13374	0.15342
Employed	0.45536***	0.14909
Retired	0.57373***	0.20557
Rural Area	0.31084*	0.16903
Urban Area	0.19358	0.16146
Medium Income	0.01499	0.15805
High Income	-0.11139	0.17758
Number of observations	3144	
Log-likelihood	-2897.38847	
McFadden Pseudo R-squared	0.1611588	

<sup>a</sup>SE: Standard Error

\*, \*\*, \*\*\* Significance at the 10%, 5%, 10% level

Table 8. Marginal willingness to pay estimates for Pet Health Insurance attributes

<b>Service Attribute</b>	<b>MWTP</b>	<b>MWTP (Std. Error)</b>	<b>95% Confidence Interval</b>
Deductible	-0.01395	0.01517	-0.04368 – 0.01578
Reimbursement level	1.00351	0.13079	0.74717 – 1.25986
Unlimited Benefits	41.8106	4.46706	33.0553 – 50.5659
Wellness Included	28.9562	4.88842	19.3751 – 38.5373



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