



# Is there a stress component to GI disease in cats? A look at the environmental and behavioural risk factors.

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## Summary

Using data from owner questionnaires from the Bristol Cats Study (a longitudinal prospective cohort study of 2444 cats), risk factors for chronic gastrointestinal signs were identified using multivariable logistic regression. Using owner-reported incidents of vomiting and diarrhoea, results show that by 2.5 years of age, **6.82%** of cats were reported as having chronic gastrointestinal signs.

Multivariable Logistic Regression was performed and 3 risk factors were identified:

**Having restricted outdoor access (OR 2.816), Moving house (OR 2.480) and Having cat fights (OR 2.342).**

## Introduction

The prevalence of chronic enteropathies in domestic cats in the UK is unknown and no risk factors have been identified. In humans, it is widely accepted that idiopathic chronic gastrointestinal disease has a stress component. Other environmental risk factors have been identified in humans though often inconsistently. It is reasonable to compare similar diseases between species and anecdotally among vets, stress is thought to cause gastrointestinal upsets in cats.

### The Study has two aims:

1. What is the prevalence of chronic gastrointestinal signs among the Bristol Cats?
2. What are the environmental risk factors for chronic gastrointestinal signs?

### Research Hypotheses are:

1. Cat characteristics, environmental conditions and owner management factors represent risk factors for the occurrence of chronic gastrointestinal signs.
2. Environmental factors that cause psychological stress are risk factors for the occurrence of chronic gastrointestinal signs in domestic cats.

## Methods and materials

- Between 2010 - 2013, **2444** cat guardians were recruited to the Bristol Cats Study.
- Questionnaires were completed when the kittens were aged 8 weeks, 6 months, 1 year, 18 months and 30 months.
- Guardians were asked about their cat's health, early life factors, home environment, diet and behaviour.
- In each questionnaire guardians were presented with a list of medical complaints including "Diarrhoea" and "Vomiting". They were asked to indicate whether their cat had experienced these signs in the last year and whether it had resulted in a veterinary consultation.
- 'Chronic gastrointestinal signs' in this study was defined as **2 occasions of vomiting or diarrhoea** after the age of 6 months, regardless of whether a vet visit was involved.
- Multivariable logistic regression was used to identify risk factors for chronic gastrointestinal signs.



## Results

1. **Prevalence of chronic gastrointestinal signs** in the cohort is **6.82%** (138/2022 cats who had sufficient data).

### 2. Risk Factor Analysis

**Univariable analysis:** Variables significant to p-value < 0.2 were:

*Single cat households, Pedigree cats, Having cat fights, Having moved house, Indoor cats, New children in household, Spraying, Treats given every few days or every day, Restricted access to outside (meaning not having 24 hour access and control).*

**Multivariable analysis:** 3 variables were found to be significantly associated with chronic gastrointestinal episodes:

**Having cat fights, having moved house and restricted access to outside.**

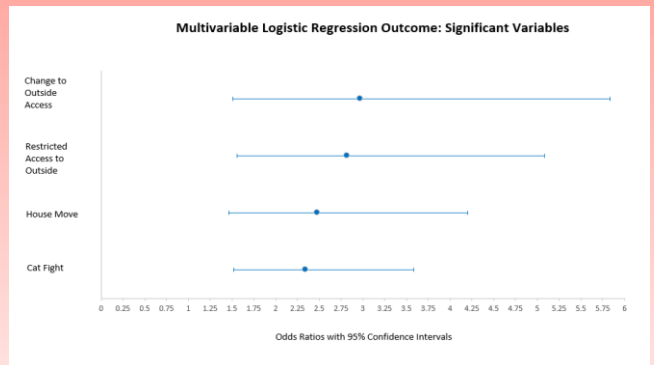


Fig 1: Dot-and-whisker plot of significant variables associated with cases of chronic gastrointestinal upsets

Variable	p-value	Odds Ratio	95% C.I.
<b>Cat Fight</b>			
No cat fights		1	
Cat fight	0.000	2.342	1.530 – 3.584
<b>House Move</b>			
No House Move		1	
House Move	0.001	2.480	1.465 – 4.199
<b>Restricted Access</b>			
Unrestricted Access	0.001	1	
Restricted Access	0.001	2.816	1.562 – 5.078
Lots of change	0.002	2.970	1.511 – 5.837

Table 1: Multivariable logistic regression results for significant variables associated with chronic gastrointestinal upsets

## Conclusion

This is the first study that supports the hypothesis that environmental risk factors in cats may influence chronic gastrointestinal signs.

Moving house, having a cat fight and not being able to control outside access involve changes to the environment, lack of control or social antagonism, all of which are widely considered to be potentially distressing to cats.

The association of these environmental risk factors with an increased likelihood of having repeated gastrointestinal episodes supports evidence from human studies that stress plays a role in idiopathic chronic gastrointestinal disease. Further investigation will determine causal relationships using data from the prospective, longitudinal Bristol Cats Study.