

# **Causes of pet loss in relation to management system and owners' attitude towards existing veterinary service**



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**Causes of pet loss in relation to management system  
and owners' attitude towards existing veterinary  
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## List of Abbreviations and Symbols Used

Abbreviations and symbols	Elaboration
CVASU	Chittagong Veterinary & Animal Sciences University
TTPHRC	Teaching and training pet hospital and research center
FPV	Feline panleukopenia virus
FIP	Feline infectious peritonitis
CKD	Chronic kidney disease
FLUTD	Feline lower urinary tract disease
HCM	Hypertrophic cardiomyopathy
FCoV	Feline coronavirus
US	United States
USA	United States of America
e.g.	Example
<i>et al.</i>	And his associates
etc.	Et cetera
%	Percent
/	Per
>	Greater than
≥	Greater than equal
≤	Less than equal

## Abstract

Pets (dogs & cats) are the most commonly kept companion animals in Bangladesh. Consciousness about the causes of death in pets constitutes important message to owners, veterinarians, and researchers, aiming at reducing the number of deaths. In order to determine the main causes of death in pets in Dhaka city, Bangladesh, data from 15<sup>th</sup> February to 15<sup>th</sup> March were collected and evaluated. In that short period, 63 dogs and cats were analyzed to identify the cause that was responsible for death. Among them, small number of pet's death found in 80.95% (51) owners, medium number in 12.70% (8) and large number in 6.35% (4) owners. Maximum number of deaths found in kitten/puppy which was 60.32% (38), in adults 30.16% (19) and in elderly 9.53% (6). Feeding of homemade food practiced in 53.97% (34), commercial in 11.11% (7) and both homemade and commercial feeding practiced in 34.92% (22). In term of housing system, 73.02% (46) seen indoor housing system whereas in 26.98% (17) cases were free range housing system. Regarding vaccination and deworming status, 61.90% (39) and 65.08% (41) of pets had proper maintained vaccination and deworming schedule, respectively. The main cause of death was seen in feline panleukopenia virus (19.05%), followed by high rise syndrome (12.70%), feline infectious peritonitis (7.94%), chronic kidney disease (7.94%), Urolithiasis (7.94%) worm infestation (7.94%), cardiac problem (6.35%), flea infestation (6.35%), car accident (6.35%), unknown (6.35%), respiratory tract infection (4.76%), wrong treatment (4.76%) and parvovirus infection (1.59%), respectively. These results exhibit the need for owner awareness, as well as establishment of prophylaxis and vaccination programs, aimed at reducing the number of deaths and thus increasing life expectancy in the pet population.

**Key words:** Pets, death, vaccination, deworming, feline panleukopenia, feline infectious peritonitis, urolithiasis, parvovirus, accident.



## Introduction

Populations of unowned cats exist throughout the world (Levy et al., 2003), and cats have been closely linked to human society for thousands of years (Robertson, 2007). Report regarding the common causes of death in an animal species is useful to veterinary practitioners, owners, breeders, and other stakeholders. Information on the causes of death of a given species constitutes an important tool to provide epidemiological studies with data, and thus enable the planning of methods for prevention and treatment of high-prevalence diseases (Santo, 2007). The preparation of a set of statistical data on the causes of death of pet animals are usually based on the primary cause of death, and do not include other associated factors that contribute to the death of the animal, as in chronic diseases. For this reason, few studies addressing the comprehensive causes of mortality of a given species have been conducted, which can be justified by the difficulty in obtaining reliable data for epidemiological analysis (Figuera et al., 2008).

Pets, mainly dogs and cats, are domesticated according to the routine of humans, which often leads to incorporation of bad habits into their way of life, and can deprive them of their natural behavior. These inflicted influences can contribute to reduction of their life expectancy (Berzins 2000). Estimates of survival for a given animal population is informative for present and prospective owners, veterinarians, and researchers, comparing differences and similarities in mortality rates across breed or gender preferences and suggesting theories about the causes and possible evolutions of a disease (Bonnett et al., 2005).

Pets may bring benefits or risks to a community, depending on how they are cared and managed (Garcia et al., 2012). Factors such as the large numbers of cats housed by the feline charities (many of which will be admitted in poor health, with an unknown vaccination history), the rapid turnover of cats and the potential for stress caused by a cattery environment may increase the risk of infectious disease and disease problems ultimately affecting the cats' risk of mortality. Risk factors for mortality, resulting from natural death or euthanasia, among cats and kittens housed at Bangladesh colonies have not previously been investigated and may be different from risk factors for mortality of privately owned cats and kittens.

There are a number of factors that may causes the loss of pets in relation to the management issues. Factors includes avoiding proper vaccination and deworming schedule, feeding practices, cat proof housing status, accident and others infectious diseases. Knowledge about mortality in felines is applicable to the understanding and correlation between associated



factors and specific characteristics, such as eating and living habits, breed, gender, age, and origin. Still from the epidemiological standpoint, it suggests patterns of occurrence of certain diseases, facilitating the establishment of differential diagnoses based on clinical manifestations or complementary tests, such as laboratory and histopathological analyses. From these findings, it provides subsidies to the establishment of prophylactic measures, promoting a better quality of life and reducing the percentage of deaths due to a specific illness, such as infectious diseases (Figuera et al., 2008).

The lack of published data relating to the causes of feline mortality is surprising as this information is crucial to furthering our understanding of specific diseases, feline welfare and the variation that might exist in different populations of cats, particularly cats in adoption centers. Whilst studies have been conducted into the causes of mortality in populations of Swedish insured dogs (Bonnett et al 1997, 2005, Egenvall et al., 2005), Danish Kennel club registered dogs (Proschowsky et al., 2003), US domestic cats (Hamilton et al 1969) and a combined sample of dogs and cats (Lacheretz et al., 2002, Moreau et al., 2002), The majority of studies published on cat mortality have focused specifically on the prevalence and causes of kitten mortality (Scott and Peltz, 1978, Lawler and Monti, 1984, Cave et al., 2002, Sparkes et al., 2006), the causes of mortality in older cats (Landes et al., 1984), or investigated risk factors for the stillbirth of kittens (Sparkes et al., 2006).

Infectious disease was reported by Cave et al (2002) to be the most common cause (55%) of kitten attributed specifically to feline parvovirus (FPV). The rescue shelter kittens were significantly younger and were more likely to have a viral infection, in particular FPV, than the kittens from private homes. Stillborn kittens have been reported to account for approximately 7-10% of all cases of kitten mortality (Scott and Peltz 1978, Sparkes et al 2006), and 91% of the deaths of kittens dying within the first 3 days (Lawler and Monti 1984). Sparkes et al (2006) analyzed data relating to 915 litters of pedigree cats and reported that an increased risk of having one or more stillborn kittens was associated with increasing litter size, the presence of congenital defects in the kittens and breed.

Client satisfaction in veterinary service is seen as a desired outcome of veterinary services to assess the quality of health care for pets and livestock. Customer satisfaction evaluation studies are important to identify the causes and challenges that led to customer dissatisfaction and to eliminate them in the future. It is expected that client evaluation would lead to improved quality



of care as patient satisfaction is assessed to find out which services need improvement according to the patient's preference (Verbeek et al., 2001).

The aim of this study was to identify and quantify risk factors for mortality of pets and also client satisfaction survey and perceptions of quality of veterinary services in Dhaka city, Bangladesh.

## **Material and Methods**

### **Study area and duration of study:**

This study has been carried out at teaching and training pet hospital and research center (TTPHRC), CVASU. A total of 63 pet loss cases record of Dhaka city area were collected during the 1-month study period (15<sup>th</sup> February – 15<sup>th</sup> March, 2022).

### **Sampling strategy:**

The methodology of sampling has been applied by simple random method. Prior to this study, a questionnaire was designed and followed during the sampling time. Questions were close ended and covered issues regarding to the study. At the time, 63 registered sample was conducted where the pet owner's losses their pets.

### **Data analysis:**

All data were tabulated using commercial software (Microsoft Excel version 2016, Microsoft, USA), analyzed with a statistical program (STATA-14) and results expressed as frequencies, proportions and ratios.



## Results and discussion

A summary of the information's regarding pet loss statistics for dogs and cats included in the study is presented in bellow tables.

**Table-1: Frequency distribution of pet's number of owner**

Number of pets	Frequency	Percentage (%)
Large size (>10)	13	20.63
Medium size (6-10)	11	17.46
Small size (1-5)	39	61.90
<b>Total</b>	<b>63</b>	<b>100</b>

For the present study, the author categorized having number of pets of owners into 3 groups. Among them small size pets have in 39 owners constituting 61.90% of total. Similarly, large size pet number have in 13 (20.63%) owners and medium size in 11 (17.46%) owners respectively.

**Table-2: Frequency distribution of number of pet loss of owners**

Number of pet loss	Frequency	Percentage (%)
Large (>5)	4	6.35
Medium (3-5)	8	12.70
Small (1-2)	51	80.95
<b>Total</b>	<b>63</b>	<b>100</b>

The owner who lost their pets only the cases take place in this study. In pet loss number parts, also divided into 3 categories according to number of pet loss and these are small, medium and large number of pet loss. 51 number of owner loses small number of pet and represent about 80.95% of total. Medium number pet loses in 8 (12.70%) owners and small number in 4 (6.35%) owners respectively.

**Table-3: Frequency distribution of species of death of owners**

Species (Pet loss)	Frequency	Percentage (%)
Both	1	1.59
Cat	53	85.13
Dog	9	14.29
<b>Total</b>	<b>63</b>	<b>100</b>

During the defined period, 63 owners with pet loss were selected for this study and found in 85.13% (53) owners lost only cat species followed by 14.29% (9) owners lost dog species and 1.59% (1) owners lost both cat and dog species.

**Table-4: Frequency distribution of age of pet during loss**

Age (during loss)	Frequency	Percentage (%)
Kitten/puppy ( $\leq 1$ year)	38	60.32
Adults ( $\geq 1$ to 11 years)	19	30.16
Elderly ( $\geq 11$ years)	6	9.53
<b>Total</b>	<b>63</b>	<b>100</b>

Regarding age, animals were classified into three categories according to Trapp et al. (2010): Kitten/puppy ( $\leq 1$  year of age), adults ( $\geq 1$  year to 11 years of age), and elderly ( $> 11$  years of age). Of the total of 63 records assessed, 38 (60.32%) cases found kittens/puppies during the loss of pets of owner, whereas 19 (30.16%) cases were adults and remaining 6 (9.53%) cases were in old stage of life.

**Table-5: Frequency distribution of feeding practices followed by owner**

Feeding practices	Frequency	Percentage (%)
Homemade	34	53.97
Commercial	7	11.11
Both	22	34.92
<b>Total</b>	<b>63</b>	<b>100</b>

Table-5 showed highest 53.97% (34) owners use homemade food for their pets. Only 11.11% (7) owner's practices commercially available foods and remaining 34.92% (22) owners provide both homemade and commercially available foods.



**Table-6: Frequency distribution of housing system provided by owner**

Housing system	Frequency	Percentage (%)
Indoor	46	73.02
Free range	17	26.98
<b>Total</b>	<b>63</b>	<b>100</b>

In contrast of housing system, Indoor housing system for pets observed in 46 (73.02%) cases where 17 (26.98%) cases found free range housing system.

**Table-7: Frequency distribution of cat proof established or not**

Cat proof	Frequency	Percentage (%)
Yes	32	50.79
No	31	49.21
<b>Total</b>	<b>63</b>	<b>100</b>

There is a significant relationship between high rise syndrome and proper cat proof establishment. Due to lack of proper cat proof the number of the falling floor and the type of affection increased in cat population. In this study, the author analyzed 50.79% (32) owners maintain proper cat proof their building access to prevent cat falling and on the contrary, 49.21% (31) owners did not establish proper cat proof.

**Table-8: Frequency distribution of pets either vaccinated or not**

Vaccination status	Frequency	Percentage (%)
Yes	39	61.90
No	24	38.10
<b>Total</b>	<b>63</b>	<b>100</b>

Regular vaccination of pets is one of the most important to prevent life threatening infectious diseases. Out of 63 observations, 61.90% (39) owners completely maintained vaccination for their pets and 38.10% (24) owners avoided vaccination. Promotion of regular pet vaccination may be crucial since even no vaccinated pets may be less susceptible to infectious diseases in the midst of a well vaccinated population (McKay et al., 2009).

**Table-9: Frequency distribution of pets either dewormed or not**

<b>Deworming status</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	41	65.08
No	22	34.92
<b>Total</b>	<b>63</b>	<b>100</b>

Deworming another important routine work for pets to keep sound health. Among the presented numbers, 65.08% (41) owners routinely follow deworming schedule whereas 34.92% (22) owners did not maintain proper deworming schedule.

**Table-10: Frequency distribution of causes of pet's death**

<b>Causes of death</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Accident (car)	4	6.35
Feline panleukopenia virus (FPV)	12	19.05
Feline infections peritonitis (FIP)	5	7.94
Parvovirus infection	1	1.59
Chronic kidney disease (CKD)	5	7.94
Cardiac problem	4	6.35
Respiratory tract infection	3	4.76
Urolithiasis	5	7.94
High rise syndrome	8	12.70
Flea infestation	4	6.35
Worm infestation	5	7.94
Wrong treatment	3	4.76
Unknown	4	6.35
<b>Total</b>	<b>63</b>	<b>100</b>

The cause of death documented and assessed for the study corresponded to the history of the owner, trauma, infectious diseases and other associated causes. Aiming to facilitate the analysis of the data and interpretation of the results, all documented causes of death were classified as mentioned to the table-11. Of the total of 63 records assessed, highest 12 (19.05%) cases showed cause of death due to feline panleukopenia virus. This is probably because of ignorance to vaccinate the cats.



Another important cause of death found in case of high rise syndrome accounts in 8 (12.70%) cases. The cause of the fall in most cases is related to play when the animal jumps from the window or over the balcony, when chasing a bird or insect, or slipping whilst walking on the edge of the balcony railing or window (Papazoglou et al., 2001). Severe internal injuries cause death of pets due to falling from height.

In 5 (7.94%) cases cause of death were feline infectious peritonitis (FIP), worm infestation, chronic kidney disease (CKD) and urolithiasis. FIP is a sporadic disease caused by mutation of an endemic virus (feline coronavirus, FCoV) (Pedersen, 2009). In study of Grieco et al., 2021, records feline infectious peritonitis (FIP) was diagnosed in 13/40 cases (32.5%): five cats were female, seven were male, and the sex was not recorded for one cat which very higher frequency than present study. Parasites were reported as the cause of death in five cats in this study which is similar to the study of Grieco et al., 2021. Renal failure is often associated with chronic kidney disease (CKD), which has been identified as an irreversible and progressive loss of renal function that occurs most commonly in geriatric domestic cats (>12 years of age) (Marino et al., 2014). Feline lower urinary tract disease (FLUTD) was quite prevalent (32.20%) in the study of Withoef et al., 2019, compared to present study. It is a multifactorial disorder often associated with the ingestion of industrialized dry diets, which favor the formation of calculi, as well as of diets rich in minerals such as magnesium, phosphates and calcium, which favor the appearance of urolithiasis, in addition to low water intake, characterized by the peculiar habits of some animals. Sedentary lifestyle and obesity may also be considered predisposing factors for FLUTD (Rosa & Quitzan, 2011). FLUTD is prevalent in male (84.21%) and adult (61.40%) cats, and is associated with the anatomical conformation of the urethra of the males, which favors the installation of obstructive processes, mainly by formation of urethral plugs (Reche Junior et al., 1998). Discontinuation of urinary flow may also lead to post-renal azotemia, evolving to renal failure and death (Finco & Barsanti, 1984).

In current study, accident, cardiac problem and flea infestation were the cause of death in 4 (6.35%) cases. Deaths resulting from accident or trauma were only the third most frequent, in disagreement with the data obtained by Trapp et al. (2010), who classified this category as the most prevalent cause of death in felines, but in agreement with the identification of deaths caused by car accidents (67.65%) as the most common whereas present study show very low prevalence. A study conducted by Bentubo et al. (2007) with dogs verified that traumas were also the third most frequent cause of death. Traumatic brain injury was the most commonly described (22.06%), differing from data of previous studies, which have observed traumas in

the appendicular skeleton as the most frequent (Vidane et al. 2014). Heart failure, generally related to hypertrophic cardiomyopathy (HCM), was reported in five cases in the study of Grieco et al., 2021, which is more likely similar to the current study.

4.75% (3) prevalence of causes of death found in respiratory tract infection and wrong treatment. Study of Grieco et al., 2021, pneumonia was reported in 19 cats, 10 males and nine females that is much higher than this study.

Only 1 case found cause of death due to parvovirus infection in puppy and 4 cases reported cause of death was unknown in this study.

**Table-11: Frequency distribution of owner's doctor consultation performed or not**

<b>Vet consultation status</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	47	74.60
No	16	25.40
<b>Total</b>	<b>63</b>	<b>100</b>

Any emergency situations doctor consultation is very important to overcome the difficulties of pets. A total of 47 (74.60%) pet owners participated in consultation with doctor for treatment of their pets whereas 16 (25.40%) pet owners was unable to contact with doctor consultation in this study. Doctors always try to minimize the disease or injured condition of pets by providing treatment and essential guidelines to the pet owners. But pet owners who avoid doctor visit may create serious complications. Sometimes pet owners may use home remedy or drugs chosen by themselves also create further emergency situations. So always doctor consultation during disease or injured condition is best option pet owners for saving of their pets.



**Table-12: Frequency distribution of owner's perception about veterinary service provided by veterinarian**

<b>Owners' perception about veterinary service</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Satisfactory	37	58.73
Moderate satisfactory	13	20.63
Non-satisfactory	13	20.63
<b>Total</b>	<b>63</b>	<b>100</b>

Client satisfaction is often a measure of client's perception of quality because the highly satisfied client feels he/she has received a high-quality service, whereas the dissatisfied client is disappointed by the quality of service (Turkson, 2011). Verbeek et al., 2001, reported that patient satisfaction is best defined as patients' evaluation of (aspects of) a health care service based on the fulfilment of their expectations. In present study, the satisfied owners regarding to veterinary service were 58.73% (37) and equal number of owners were moderately satisfied and non-satisfied which is 20.63% (13). The proportions of those satisfied were significantly higher and the responses more positive than those dissatisfied for all the indicators used to assess quality of services in peri-urban Ghana, except cost of drugs (Turkson, 2011). Williams and Healy, 1998, noted that the outcome of a patient's evaluation of services is based on 3 factors: a positive or negative experience; the perceived function of the service; the responsibility of the service for their experience. Vuori, 1991, observed that patient satisfaction is not just an indicator of health care but is a desired outcome of care, and therefore an essential part of its quality.

## **Conclusions**

This work reviews causes of death of pet's research for the first time in local area in Bangladesh and highlights areas for further research as well as some considering to prevent pet loss. The present study shows that feline panleukopenia (FPV), high rise syndrome, feline infectious peritonitis (FIP), urinary problem, cardiac and kidney problem, parasites and trauma are the main causes of death. Proper housing system and feeding practice may reduce the pet losses. Maintaining of vaccination and deworming schedule is very important to prevent pet death in early stage of life. Availability of veterinary faculties and doctor consultations plays a significant role for saving pets life and also for animal welfare.

In this scenario, knowledge of the most common causes of death could make an important contribution to the monitoring of cat populations and their environment and could alleviate emerging animal welfare concerns, allowing rapid intervention.

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