
Received: 11 February 2026; Accepted: 27 February 2026; Published: 28 February 2026

**PREVALENCE OF FELINE CORONAVIRUS CASES DURING AUGUST-
SEPTEMBER 2025 AT VETOPET 1 ANIMAL CLINIC, CIKARET, WEST JAVA**

**PREVALENSI KEJADIAN *FELINE CORONAVIRUS* PERIODE AGUSTUS -
SEPTEMBER 2025 DI VETOPET 1 ANIMAL CLINIC, CIKARET, JAWA BARAT**

Muh Rifky Rachman, Tetty Barunawati Siagian*

Paramedic Veterinary Program, Vocational School, IPB University, Jl. Kumbang No. 14,
IPB Cilebende Campus, Bogor City, West Java 16128, Indonesia

*Corresponding author email: tettybarunawatisiagian@apps.ipb.ac.id

How to cite: Rachman MR, Siagian TB. 2026. Prevalence of Feline Coronavirus cases during August-September 2025 at Vetopet 1 Animal Clinic, Cikaret, West Java. *Bul. Vet. Udayana* 18(1): 337-346. DOI: <https://doi.org/10.24843/bulvet.2026.v18.i01.p32>

Abstract

Feline Coronavirus (FCoV) can mutate into Feline Infectious Peritonitis (FIP), which has high morbidity and mortality rates in cats worldwide and is transmitted through the fecal-oral route. The highest incidence of FCoV infection occurs in Europe (47.6%), including Germany (100%). Research on the prevalence of FCoV in Indonesia has not been widely reported. The objective of this study was to determine the prevalence of FCoV infection at Vetopet 1 Animal Clinic. Primary data were obtained from rapid combo test results (GIA, FCoV, FPV) confirmed positive for FCoV infection by veterinarians, and secondary data was obtained from the cats' medical records. The prevalence of FCoV during the period of August–September 2025 at Vetopet 1 Animal Clinic, based on breed category, was 69% in non-domestic breeds ($\chi^2 = 0.044$; $P < 0.05$). Based on sex, the prevalence was 69% in male cats ($\chi^2 = 0.025$; $P < 0.05$). Kittens showed a prevalence of 59% ($\chi^2 = 0.002$; $P < 0.05$). Based on living environment, indoor, semi-indoor, and outdoor cats showed a prevalence of 50%, while households owning more than one cat showed a prevalence of 78%. The results of this study indicate that the prevalence of FCoV infection at Vetopet 1 Animal Clinic falls within the moderate category.

Keywords: cats, feline coronavirus, prevalence, vetopet

Abstrak

Feline Coronavirus (FCoV) dapat bermutasi menjadi *Feline Infectious Peritonitis* (FIP) dengan morbiditas dan mortalitas yang tinggi pada kucing di seluruh dunia dengan penularan melalui fekal-oral. Infeksi FCoV tertinggi terjadi di benua Eropa (47,6%), salah satunya di negara Jerman (100%). Penelitian terkait prevalensi FCoV di Indonesia belum banyak di laporkan. Tujuan dari penelitian untuk menguraikan tingkat kejadian infeksi FCoV di Vetopet 1 Animal Clinic. Data primer diperoleh dari hasil pemeriksaan *rapid test combo* (GIA, FCoV, FPV) yang terkonfirmasi positif terinfeksi FCoV oleh dokter hewan dan data sekunder diperoleh dari rekam medis kucing. Prevalensi kejadian FCoV periode bulan Agustus –

September 2025 di Vetopet 1 Animal Clinic berdasarkan kategori ras kucing yaitu ras non-domestik sebanyak 69% dengan uji *chi-square test* 0,044 ($P < 0,05$), kucing jantan sebanyak 69% dengan uji *chi-square test* 0,025 ($P < 0,05$), anak kucing sebanyak 59% dengan uji *chi-square test* 0,002 ($P < 0,05$), lingkungan pemeliharaan secara *indoor*, *semi-indoor*, dan *outdoor* sebanyak 50%, dan jumlah peliharaan kucing lebih dari satu sebanyak 78%. Hasil penelitian menunjukkan prevalensi kejadian FCoV di Vetopet 1 Animal Clinic termasuk kategori sedang.

Kata kunci: *feline coronavirus*, kucing, prevalensi, vetopet

INTRODUCTION

The trend of keeping companion animals has increasingly become a lifestyle among Indonesian society. Based on a survey conducted by TGM Research (2023), 71% of Indonesians own pets, with cats being the most popular companion animals, accounting for 75% of pet ownership. Indonesia has the highest cat population in the Asia–Pacific region, reaching 47% (Rakuten Insight, 2021). Cat ownership requires considerable care, as owners must pay attention to health conditions, nutritional intake, physical care, and environmental hygiene management (Putra *et al.*, 2023). Cats are susceptible to diseases caused by various microorganisms, including bacteria, viruses, parasites, protozoa, and fungi (Mirahsanti *et al.*, 2022). One viral disease that can infect cats is Feline Coronavirus (FCoV) (Stadana *et al.*, 2024).

Feline Coronavirus (FCoV) has two biotypes, namely the avirulent Feline Enteric Coronavirus (FECV) and the virulent Feline Infectious Peritonitis Virus (FIPV) (Yu Gao *et al.*, 2023). Infection with FECV generally causes mild diarrhea, vomiting, decreased appetite, weight loss, or may present without any clinical signs (Fitrawati *et al.*, 2025). Cats infected with FECV often become asymptomatic carriers, harboring the virus in their intestines while appearing clinically healthy (Mulyani *et al.*, 2024). Transmission of FCoV occurs primarily through the fecal–oral route or direct contact with feces and saliva from infected cats to healthy cats (Ningsih *et al.*, 2023). Cat owners often perceive these conditions as normal and tend to ignore them, unaware that their cats may be infected with FECV (El-Tholoth *et al.*, 2023). When a cat's immune response is compromised, FECV infection can mutate into FIPV, leading to a fatal systemic disease known as Feline Infectious Peritonitis (FIP) (Hamin & Wibowo, 2023).

Research on FCoV and its prevalence in cats in Indonesia remains limited; therefore, prevalence data collection is necessary. Such data are expected to provide information on the relationship between FCoV incidence and factors such as cat breed, sex, age, type of housing environment, and number of cats owned. These data can assist veterinarians and veterinary medical personnel in providing education to pet owners regarding the importance of proper cat management, thereby reducing the number of FCoV cases in Indonesia. This study aims to describe the prevalence of FCoV infection in cats at Vetopet 1 Animal Clinic, Cikaret Branch, West Java.

RESEARCH METHODS

Study Design and Research Objects

The study design began with field observation, followed by data collection and data processing. This study employed a purposive sampling method based on clinical signs observed in cats experiencing gastrointestinal disorders, including diarrhea, vomiting, lethargy, fever, pale mucous membranes, and dehydration. Medical record data of cats from August to September 2025 at Vetopet 1 Animal Clinic, Cikaret Branch, West Java, were used in this study. A total of 32 cats tested positive for Feline Coronavirus (FCoV) infection and 36 cats tested negative, resulting in 68 cats examined using a rapid antigen combo test (FPV, FCoV, GIA) with the Vet Diagnostix[®] brand.

Data collection consisted of primary and secondary data. Primary data were obtained from clinical examinations of cats confirmed positive for FCoV infection by veterinarians using the rapid antigen combo test (FPV, FCoV, GIA) with the Vet Diagnostix[®] brand. Secondary data were obtained from medical records of cats during the August–September 2025 period at Vetopet 1 Animal Clinic, Cikaret Branch, West Java (6°28'37.3"S, 106°50'40.4"E).

Research Variables

Research variables were derived from feline medical record data and categorized based on breed, sex, age, housing environment, and number of cats owned. The collected data were processed and analyzed to determine the prevalence of FCoV infection. Bivariate analysis using the chi-square test was conducted to evaluate the association between the studied variables and the incidence of FCoV infection, while simple logistic regression analysis was performed to determine the odds ratio and assess the magnitude of risk of each variable in relation to FCoV infection.

Data Collection Methods

Data collection techniques included primary and secondary data. Primary data were obtained from the examination results of cats confirmed positive for Feline Coronavirus (FCoV) infection by veterinarians using a rapid antigen combo test (FPV, FCoV, GIA) with the Vet Diagnostix[®] brand. Secondary data were obtained from feline medical records from August to September 2025 at Vetopet 1 Animal Clinic, Cikaret Branch, West Java. The working procedure began with a physical examination to determine the cat's health status, which was conducted by a veterinarian and assisted by a veterinary paramedic. The veterinarian informed the cat owner of the physical examination results and observed clinical signs, after which additional diagnostic testing using the rapid antigen combo test (FPV, FCoV, GIA) with the Vet Diagnostix[®] brand was recommended. Upon owner consent, fecal specimens were collected via rectal swabs to determine positive or negative FCoV infection status.

The rapid antigen combo test (FPV, FCoV, GIA) is a diagnostic tool designed to detect antigens of feline panleukopenia virus, feline coronavirus, and *Giardia* protozoa, demonstrating high sensitivity and specificity for identifying gastrointestinal pathogens (Vojtkovská *et al.*, 2022). The testing procedure involved collecting fecal samples using a cotton bud or cotton-tipped applicator from the rectal area of the cat, followed by insertion and homogenization of the swab in an assay buffer. The assay buffer mixture was then dispensed into the test well using the provided dropper. Test results were observed within 5–10 minutes to determine positive or negative outcomes (Setyawati *et al.*, 2025). According to Prasetyaningsih *et al.* (2020), a rapid test result is considered positive if a red line appears in the test (T) region, negative if a red line appears only in the control (C) region, and test results should not be interpreted after 15 minutes.

Data Analysis

Research data were obtained from both primary and secondary sources and analyzed quantitatively and qualitatively. Quantitative analysis involved calculating the prevalence of FCoV infection, followed by bivariate analysis using the chi-square test and simple logistic regression to identify associations between each study variable and the occurrence of FCoV infection in cats. Data processing and statistical analysis were performed using SPSS version 26. Qualitative analysis was conducted by describing and discussing the quantitative findings, supported by relevant literature to strengthen the interpretation of results. The outcomes of the analyses were presented in descriptive tables. Prevalence in this study was calculated using the following formula (Amoroso *et al.*, 2022):

$$\text{Prevalence} = \frac{\text{Number of FCoV-infected animals}}{\text{Total number of animals examined}} \times 100\%$$

RESULTS AND DISCUSSION

Results

Prevalence data collection of FCoV infection in outpatient and hospitalized cats was conducted through recorded anamnesis, signalment data, and clinical signs. A total of 32 cats tested positive for FCoV at Vetopet 1 Animal Clinic, Cikaret Branch, West Java, from August to September 2025, out of 68 cats examined using a rapid antigen combo test (FPV, FCoV, GIA) with the Vet Diagnostix[®] brand. The percentage of FCoV infection among cats at Vetopet 1 Animal Clinic during the August–September 2025 period was 47%. According to Ramos-Martínez *et al.* (2024), prevalence categories are classified as very low (1–<5%), low (5–<20%), moderate (20–<50%), high (50–<80%), and very high (≥80%). The results of this study indicate that the prevalence of FCoV infection in cats at Vetopet 1 Animal Clinic, Cikaret Branch, West Java, during the study period falls within the moderate category. A moderate prevalence category suggests that FCoV is circulating endemically in the area, indicating active transmission and a potential risk for mutation into Feline Infectious Peritonitis (FIP) (Marzok *et al.*, 2023).

Clinical signs observed when cats were presented to Vetopet 1 Animal Clinic and examined by veterinarians and veterinary paramedics prior to confirmatory testing with the rapid antigen combo test included lethargy, fever, diarrhea, pale mucous membranes, and dehydration. These signs were accompanied by decreased appetite and episodes of vomiting, as reported by the cat owners. According to Hermawan *et al.* (2023), clinical manifestations of enteric-type FCoV infection include gastroenteritis or inflammation of the gastric and intestinal mucosa, characterized by diarrhea, vomiting, and fever. Diarrhea is most commonly observed in kittens or young cats (Norsworthy *et al.*, 2025). These clinical signs occur due to the replication of FCoV in the epithelial cells of the intestinal and colonic mucosa (Widhyari *et al.*, 2018). Several factors may influence the incidence of FCoV cases, including feline characteristics, housing environment, and the number of cats kept within a household (Felten *et al.*, 2023).

Discussion

Cats that tested positive for Feline Coronavirus (FCoV) were grouped by breed, showing the highest percentage in non-domestic breeds (69%), including mixed-breed, Persian, Himalayan, and British Shorthair cats, and the lowest percentage in domestic breeds (31%) (Table 1). This finding may be attributed to a greater preference among cat owners for keeping non-domestic breeds due to their distinctive body conformation and diverse coat colors compared to domestic cats. Owners of non-domestic breeds often keep more than one cat in the same household for breeding purposes to obtain superior or purebred offspring for participation in cat shows. Keeping multiple cats in the same environment facilitates viral transmission. The chi-square test results showed a significant association between FCoV infection during the August–September 2025 period and cat breed ($p = 0.044$; $P < 0.05$) (Table 2). The incidence rate in non-domestic breeds (57.9%) was significantly higher than that in domestic breeds (33.3%). Simple logistic regression analysis indicated that non-domestic breeds had a 2.75-fold higher risk of exposure to FCoV infection compared to domestic breeds.

Feline Coronavirus (FCoV) is an endemic disease that spreads among cats worldwide (Hartono *et al.*, 2022). According to El-Tholoth *et al.* (2023), cats of various breeds are at risk of FCoV infection; however, certain pure breeds such as British Shorthair, Himalayan, and Persian cats

tend to exhibit higher infection or viral shedding rates than mixed or other breeds (Felten *et al.*, 2023). This condition is associated with genetic factors and inbreeding practices in purebred cats, resulting in lower genetic diversity and increased susceptibility to infectious diseases (Erofeeva *et al.*, 2022). Genetic diversity is correlated with disease resistance; therefore, pure breeds such as British Shorthair, Himalayan, and Persian cats tend to have higher FCoV infection or shedding rates due to reduced immune resilience compared to domestic cats (Barua *et al.*, 2024).

Based on sex, FCoV-positive cats showed a higher percentage in males (69%) than females (31%) (Table 1). This may be explained by the fact that male cats are more frequently brought to Vetopet 1 Animal Clinic, Cikaret Branch, West Java, because they tend to roam away from home unnoticed by their owners and return in poor physical condition, often dirty, injured, or ill due to fighting. This observation aligns with Zhang *et al.* (2022) and Duijvestijn *et al.* (2023), who reported that male cats exhibit higher exploratory behavior and are more likely to return home carrying infectious agents. The chi-square test showed a significant association between FCoV infection and sex during the August–September 2025 period ($p = 0.025$; $P < 0.05$) (Table 2). The incidence rate in male cats (59.5%) was significantly higher than that in female cats (32.3%). Simple logistic regression analysis indicated that male cats had a 3.08-fold higher risk of exposure to FCoV infection compared to female cats.

According to Hu *et al.* (2024), both male and female cats are susceptible to FCoV exposure; however, male cats generally have a higher risk. This is attributed to their strong exploratory behavior, resulting in a roaming area approximately twice as large as that of female cats, particularly during the breeding season (Zhang *et al.*, 2022). Consequently, male cats are more frequently exposed to FCoV from the surrounding environment or from other FCoV-positive cats (Duijvestijn *et al.*, 2023).

When grouped by age, FCoV-positive cats showed the highest percentage in kittens (59%) and the lowest percentage in young and mature adults (41%) (Table 1). This finding may be related to the tendency of owners to bring kittens to Vetopet 1 Animal Clinic for treatment. These kittens are often raised from birth or from the first day of life; however, improper management practices are commonly observed due to limited owner knowledge regarding appropriate kitten care (Alghiffari & Siagian, 2025). This is consistent with Klein-Richers *et al.* (2020) and Yu Gao *et al.* (2023), who reported that inadequate health management in kittens increases the risk of infection. The chi-square test revealed a significant association between FCoV infection and age during the August–September 2025 period ($p = 0.002$; $P < 0.05$) (Table 2). The incidence rate in kittens (70.4%) was significantly higher than that in young and mature adult cats (31.7%). Simple logistic regression analysis showed that kittens had a 5.11-fold higher risk of FCoV infection compared to young and mature adult cats.

Klein-Richers *et al.* (2020) reported that cats younger than one year have a 2.5-fold higher risk of FCoV shedding compared to cats aged 1–5 years. This occurs because the immune system of kittens is not fully developed, allowing more consistent viral replication and higher shedding rates than in adult cats (Yu Gao *et al.*, 2023). In addition, kittens experience a decline in maternal antibodies between 6–10 weeks of age, rendering them highly susceptible to FCoV infection (Egberink *et al.*, 2022).

Based on housing environment, FCoV-positive cats showed equal percentages (50%) across indoor, semi-indoor, and outdoor management systems (Table 1). Cats presented to Vetopet 1 Animal Clinic were managed under various housing conditions; however, indoor and semi-indoor cats often shared litter boxes, increasing the risk of fecal–oral transmission. This finding is consistent with Almeida *et al.* (2019), who reported that shared litter box use and multi-cat

housing increase the risk of disease transmission. The chi-square test showed no significant association between FCoV infection and housing environment during the August–September 2025 period ($p = 0.248$; $P > 0.05$) (Table 2).

According to Almeida *et al.* (2019), indoor-managed cats are four times more likely to be seropositive for FCoV due to shared litter box use and higher numbers of cats within the household. Indoor environments facilitate repeated infections and prolong FCoV seropositivity (Tasker *et al.*, 2023). These risks can be mitigated through proper environmental hygiene management by cat owners (Dong *et al.*, 2024).

When grouped by number of cats owned, FCoV-positive cases were highest in multi-cat households (78%) and lowest in single-cat households (22%) (Table 1). Most owners presenting cats to Vetopet 1 Animal Clinic kept more than one cat in the same household and used shared litter boxes, increasing the risk of fecal–oral transmission. This finding supports Felten *et al.* (2023), who reported that shared litter box use between healthy and infected cats significantly increases disease transmission risk. However, the chi-square test showed no significant association between FCoV infection and number of cats owned during the August–September 2025 period ($p = 0.389$; $P > 0.05$) (Table 2).

According to Guarnieri *et al.* (2024), keeping multiple cats in the same environment poses a high risk for FCoV infection, which may mutate into Feline Infectious Peritonitis Virus (FIPV). High-risk environments include shelters, catteries, kennels, and multi-cat households (Felten *et al.*, 2022). These conditions facilitate close contact between infected and healthy cats, shared litter box use, and increased viral shedding in the environment (Felten *et al.*, 2023). Preventive measures to reduce FCoV transmission in high-density cat populations include stress management, strict environmental hygiene, and isolation or quarantine of sick cats (Addie *et al.*, 2020).

CONCLUSION AND SUGGESTIONS

Conclusion

The prevalence of Feline Coronavirus (FCoV) infection in cats at Vetopet 1 Animal Clinic, Cikaret Branch, West Java, during the August–September 2025 period was classified as moderate. Based on breed grouping, the highest prevalence of confirmed FCoV infection was observed in non-domestic breeds, including mixed-breed, Persian, Himalayan, and British Shorthair cats, accounting for 69%, with chi-square test results showing a significant association ($p = 0.044$; $P < 0.05$). Male cats exhibited a higher prevalence of FCoV infection (69%), with a significant association based on chi-square test analysis ($p = 0.025$; $P < 0.05$). Kittens showed a higher prevalence of FCoV infection (59%), and the chi-square test indicated a significant association between age and FCoV infection ($p = 0.002$; $P < 0.05$).

Cats managed under indoor, semi-indoor, and outdoor housing systems showed an equal prevalence of FCoV infection (50%); however, no significant association was observed based on chi-square test analysis ($p = 0.248$; $P > 0.05$). Similarly, cats from multi-cat households demonstrated a higher prevalence of FCoV infection (78%), but the chi-square test indicated no significant association between the number of cats owned and FCoV infection ($p = 0.389$; $P > 0.05$).

Suggestions

Vetopet 1 Animal Clinic, Cikaret Branch, West Java, is encouraged to provide client education to pet owners, particularly cat owners, regarding the risks associated with FCoV infection. This approach may improve owner awareness and promote effective health management practices, thereby reducing the incidence of FCoV infection in pet cats.

ACKNOWLEDGMENTS

The authors would like to thank Vetopet 1 Animal Clinic, Cikaret Branch, West Java, for providing the opportunity to conduct this research.

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Tables

Table 1. Cases of FCoV infection based on associated factors

Variabel	Category	Number (cats)	Percentage (%)
Breed	Domestic	10	31
	Non-Domestic	22	69
Sex	Female	10	31
	Male	22	69
Age	Young & Mature adult (8–120 months)	13	41
	Kitten (0–7 months)	19	59
Housing environment	Indoor	16	50
	Semi-Indoor & Outdoor	16	50
Number of cats owned	Single-cat Household	7	22
	Multi-cat Household	25	78

Table 2. Bivariate analysis using chi-square test and simple logistic regression

Variabel	Kategori	FCoV		Tota l	p	OR	95% CI			
		Negative					Positive		lower	upper
		n	%				n	%		
Breed	Domestic	20	66.7	10	33.3	30		1.00		
	Non-Domestic	16	42.1	22	57.9	38	0.044	2.75	1.01 7.44	
Sex	Female	21	67.7	10	32.3	31		1.00		
	Male	15	40.5	22	59.5	37	0.025	3.08	1.13 8.36	
Age	Young & Mature adult	28	68.3	13	31.7	41		1.00		
	Kitten	8	29.6	19	70.4	27	0.002	5.11	1.77 14.70	
Housing environment	Indoor	23	59.0	16	41.0	39		1.00		
	Semi-Indoor & Outdoor	13	44.8	16	55.2	29	0.248	1.76	0.67 4.67	
Number of cats owned	Single-cat	5	41.7	7	58.3	12		1.00		
	Multi-cat	31	55.4	25	44.6	56	0.389	0.57	0.16 2.03	