

# Preliminary Results from FIP monitoring in Greece & Cyprus

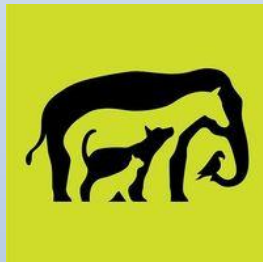
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Evangelia Georgiadi, Saverio Paltrinieri,  
Maria-Eleni Filippitzi, Stella Mazeri.

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# Overview

A few words about FIP outbreak in 2023

B. Research Study in Cyprus

C. Research study for FIP in Greece

D. Take home messages





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# The 2023 FIP outbreak in Cyprus





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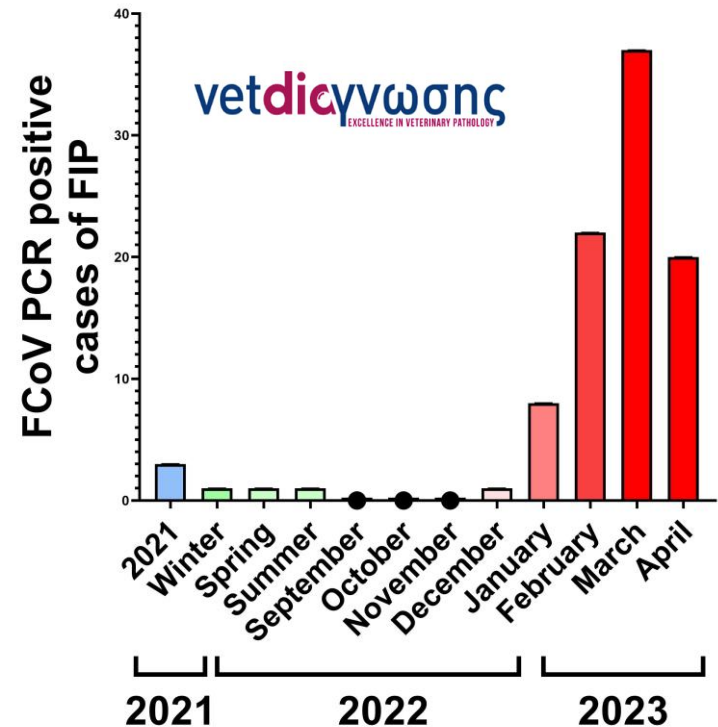


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## The early days...

- Jan - March 2023
- Vets started noticing high numbers of FIP cases
- Vet Dia Gnosis laboratory, noticed a spike in the diagnosis of FIP compared to previous years





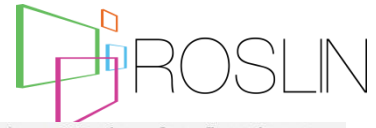
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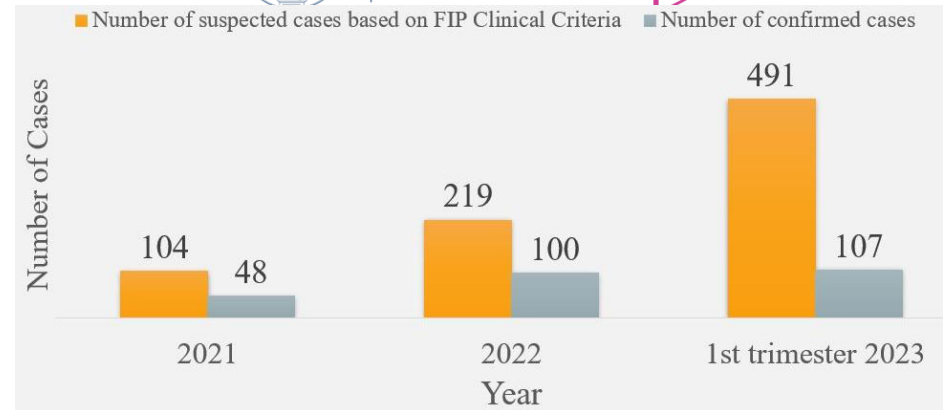
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## The early days...



### Response from the PanCyprian Vet Association

- Launched a questionnaire to gather data on FIP cases to estimate the real size of the problem
- **Alerted the authorities** (Director of the Veterinary Services, the Ministry of ARDE and the Cyprus Ministry of Health)
- Requested the **permit** for the “under the cascade” use of “adenosine analogue” treatment options available and approved for human COVID-19.





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## The early days...

### Response from the PanCyprian Vet Association

- Organised Webinars for Veterinarians and Animal Custodians
- Briefed the public through frequent media briefings/ Facebook posts/ TV/ Radio

**WEBINAR**  
Λοιμώδης Περιτονιτιδα της γάτας. Πρωτόκολλα διάγνωσης και θεραπείας για την αντιμετώπιση της επιδημίας στην Κύπρο.

Maria Lyraki DVM, MSc, Dip ECVIM-CA, MRCVS

16 Μαΐου 2023  
20:00

ΠΑΓΚΥΠΡΙΟΣ ΚΤΗΝΙΑΤΡΙΚΟΣ ΣΥΛΛΟΓΟΣ





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## The early days...

- Started to form a **task force**
  - Dr Charalampos Attipa (Pathology)
  - Dr Maria Lyraki (Feline Internal Medicine)
  - Dr Demetris Epaminondas (Pan-Cyprian Vet Association)
  - Dr Stella Mazeri (Epidemiology)
- Support from Vet Dia Gnosis





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## The early days...

- Alerted Prof. Danielle Gunn-Moore, an internationally renowned expert in feline medicine, who specialises in FIP
- Joined the task force
- Supported the first publication, media coverage and facilitated links to other international FIP experts
- Creation of the FCoV-23 International Research Consortium





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# The first publication

- Alerted the veterinary and research community of the outbreak
- **20-fold increase** in PCR-confirmed cases within 12 weeks compared to the previous year
- Historically outbreaks are reported in shelters
- We reported cases even in indoor only cats
- Suggested **travel requirements** for cats prior to travelling outside of Cyprus

## Letters & Notices



### WILDLIFE

#### The welfare of wild animals

ALTHOUGH it is encouraging that the profession is beginning to debate the welfare of wildlife, the nature of recent correspondence (VR, 6/13 May 2023, vol 192, pp 377, 378) suggests if we are to influence society and legislators, we will first need to narrow the gulf in values that exists in the profession.

In particular, I question whether exterminating one species arbitrarily deemed 'vermin' to protect another on the basis of nothing more than tradition and anecdote is sustainable either as an intervention against wildlife or as a position for the profession to adopt. That the killing methods used are mostly inhumane is an indictment against us all.

The main legislation that seeks to protect wildlife in Great Britain, the Wildlife and Countryside Act 1981, is long overdue for revision. Unlike the situation with birds where every species is protected unless a licence is issued, the act provides little protection for mammals unless listed in the act or elsewhere (eg, the badger protection acts).

This means that there is little protection for rabbits, stoats, weasels and foxes – there are no closed seasons, no limits on numbers, no competence requirements and precious little control over methodology. A revised Wildlife and Countryside Act which gives the same protection to mammals as it does to birds would not preclude killing mammals.

### FELINE DISEASE

#### Concerning feline infectious peritonitis outbreak in Cyprus

WE are alerting colleagues to an outbreak of feline infectious peritonitis (FIP) in Cyprus that started in the capital city Nicosia in January 2023. An increasing number of cases has gradually been observed in the districts of Larnaca, Limassol and Famagusta. Within 12 weeks the number of PCR-confirmed FIP cases increased more than 20-fold compared to the previous year.

Cavitary fluids, abdominal lymph node fine-needle aspiration biopsies or tissue biopsies from cats with clinical signs compatible with FIP were submitted to Vet Dia Gnosis in Limassol. Following cytological or histopathological examination the samples underwent automated total nucleic acid extraction and RT-PCR for the detection of feline coronaviruses (FCoV) at Laboklin Bad Kissingen, Germany.<sup>1</sup>

There were three and four PCR-confirmed FIP cases in 2021 and 2022 respectively, while from January to April 2023 98 PCR-confirmed FIP cases were reported.

Outbreaks of FIP have been documented in the UK, the USA and Taiwan but were restricted to catteries and rehoming centres.<sup>2-4</sup> This outbreak became widespread in different districts of the island very quickly, with local veterinarians reporting clinical cases even in indoor-only cats. This is extremely alarming and suggests that a highly virulent strain of FCoV is



“  
**This outbreak became widespread in different districts of Cyprus very quickly, suggesting a highly virulent strain of feline coronavirus is present on the island**

Cyprus. Any seropositive cat should not travel outside Cyprus until we have a better understanding of the current outbreak. Ideally, if a cat is allowed to travel it should be kept indoors for 10 to 14 days and retested, as acutely infected cats will likely seroconvert at a later stage.<sup>5</sup>

The implementation of travel requirements for cats travelling from Cyprus must be a priority for the UK. This is due to the high numbers of animals travelling between the two countries reflecting the historic links that exist; parts of Cyprus are British overseas territories and a notable number of British immigrants are based permanently or seasonally in Cyprus. Previously, we have seen introduction of other infectious agents to the UK via dogs travelling from Cyprus, such as *Hepatozoon canis* and *Leishmania infantum*.<sup>6</sup>

We are in the process of analysing



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## Cyprus becomes 'island of dead cats' after outbreak of feline coronavirus kills 300,000

Experts warn that Britain

By Sarah Newey, GLOBAL HEALTH EDITOR  
11 July 2023 • 4:05pm

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Animals

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### Experts warn about feline coronavirus after 'thousands' of cat deaths in Cyprus

'Alarming' reports of sudden rise in feline infectious peritonitis thought to point to more virulent strain



Hannah Devlin and Linda Geddes

Tue 18 Jul 2023 16:20 BST



# Cat Covid that's killed 300,000 may come to UK

A FELINE coronavirus which has swept across Cyprus could threaten pets in Britain, experts have warned.

A charity worker has estimated that 300,000 cats may have died in Cyprus.

The island often known as the 'island of cats' could soon be dubbed the 'island of dead cats', according to one animal welfare volunteer.

The coronavirus has led to an alarming outbreak of feline infectious peritonitis (FIP) in Cyprus, which started in Nicosia at the end of 2022 and spread across the island within a few months.

Dr Charalampos Attipa, who has been investigating the outbreak from the University of Edinburgh, said: 'It spread like wildfire and is like nothing we have seen in a lifetime.'

'The UK is at risk from the virus, because a notable number of British people are based permanently or

By Victoria Allen  
Science Editor

advice is for them to get their cats tested for the coronavirus antibody before they leave Cyprus, but that can't be enforced at this stage.

'It is very much like what we faced with the human coronavirus, but for the cat population, so it is alarming.'

Researchers are genetically sequencing the coronavirus infecting stray and domestic cats in Cyprus, which they believe has mutated to become more virulent. One school of

### 'Spread like wildfire'

thought is that cats exposed to the Covid pandemic may have developed antibodies to that type of virus, forcing the feline coronavirus to mutate and become more harmful.

However more research is needed to understand exactly what has happened.

across Cyprus in a survey at the start of the year, with tests confirming the virus was present in around 300 animals.

The number of cases reported by vets in the first few months of the year is around 20 times the total seen in 2022.

an article in the journal *Nature*.

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NEWS

THE CONTEXT

### Thousands of cats die from Covid strain in Cyprus

NHS waiting lists for hospital treatment pass 7.5 million for first time

20:48

Daily Mail

Date: 13 July 2023  
Page: 11



# Research Project DF25FE-701 – Monitoring of FCoV23 in Cyprus

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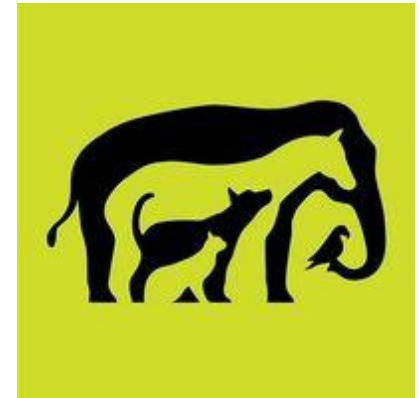


# Project Overview

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**Project title:** The epidemiology of FCoV-23 in the cats of Cyprus



**PI:** Stella Mazeri & Charalampos Attipa



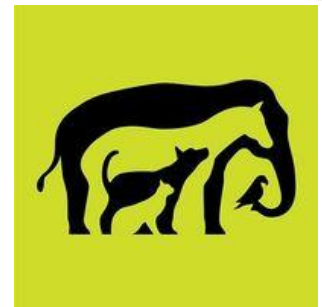
# Specific Objectives

**Objective 1.** FCoV-23 surveillance in shelters distributed around Cyprus by sampling visits every 3 months, for a period of 2 years.

**Objective 2.** FCoV-23 surveillance in owned/cared for cats presented with FIP signs in veterinary practices across the island of Cyprus

**Objective 3.** Understand the route of transmission of FCoV-23 amongst cats.

**Objective 4.** Monitor virus evolution over a period of two years by sequencing a subset of positive cases.



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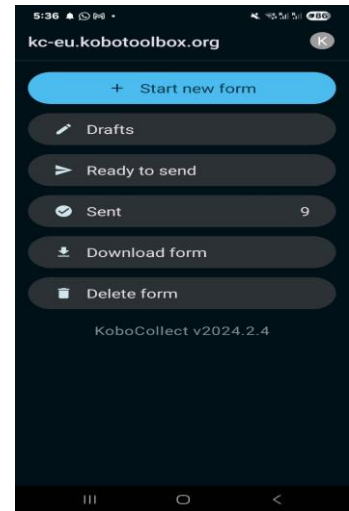
# Execution and Preliminary results

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# Objective 1.

## FCoV-23 surveillance in shelters. Execution

- 3 shelters recruited
- Shelter visits every 3 months (8 repeats)
- Swab Sampling from 20 cats (oropharyngeal, conjunctiva, faecal)
- Aiming sick cats mainly
- Metadata are collected via smartphone app



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# Objective 1. FCoV-23 surveillance in shelters

- Sampling start date: July 2025
- Shelters sampled so far: 3 shelters x 3 times (March 2026)





Photo of the cats sampled from the first shelter visit

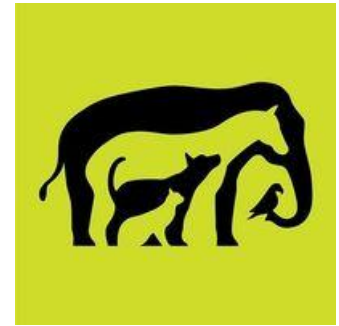
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# Objective 2. Monitoring FIP cases in owned/cared for cats

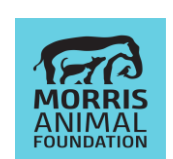
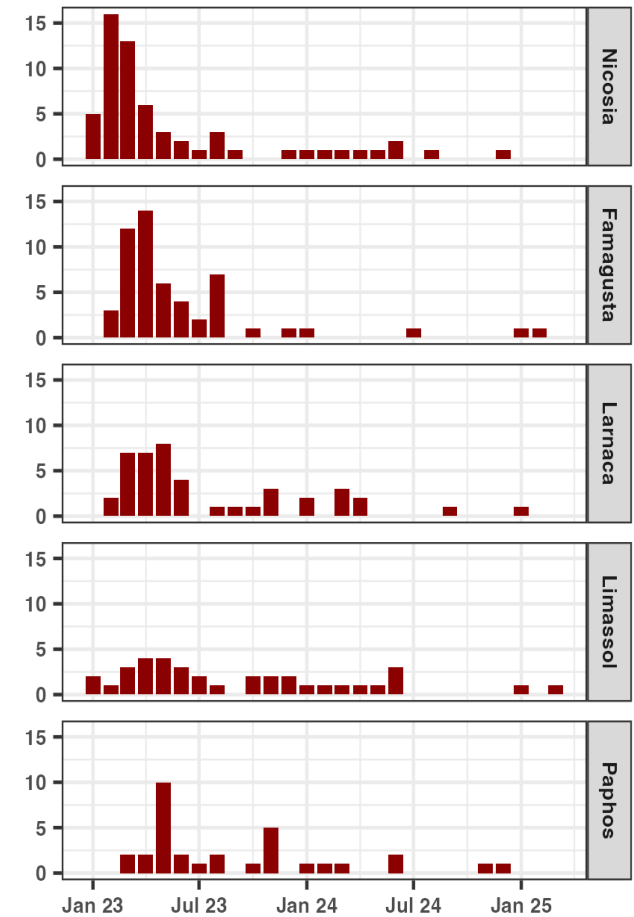
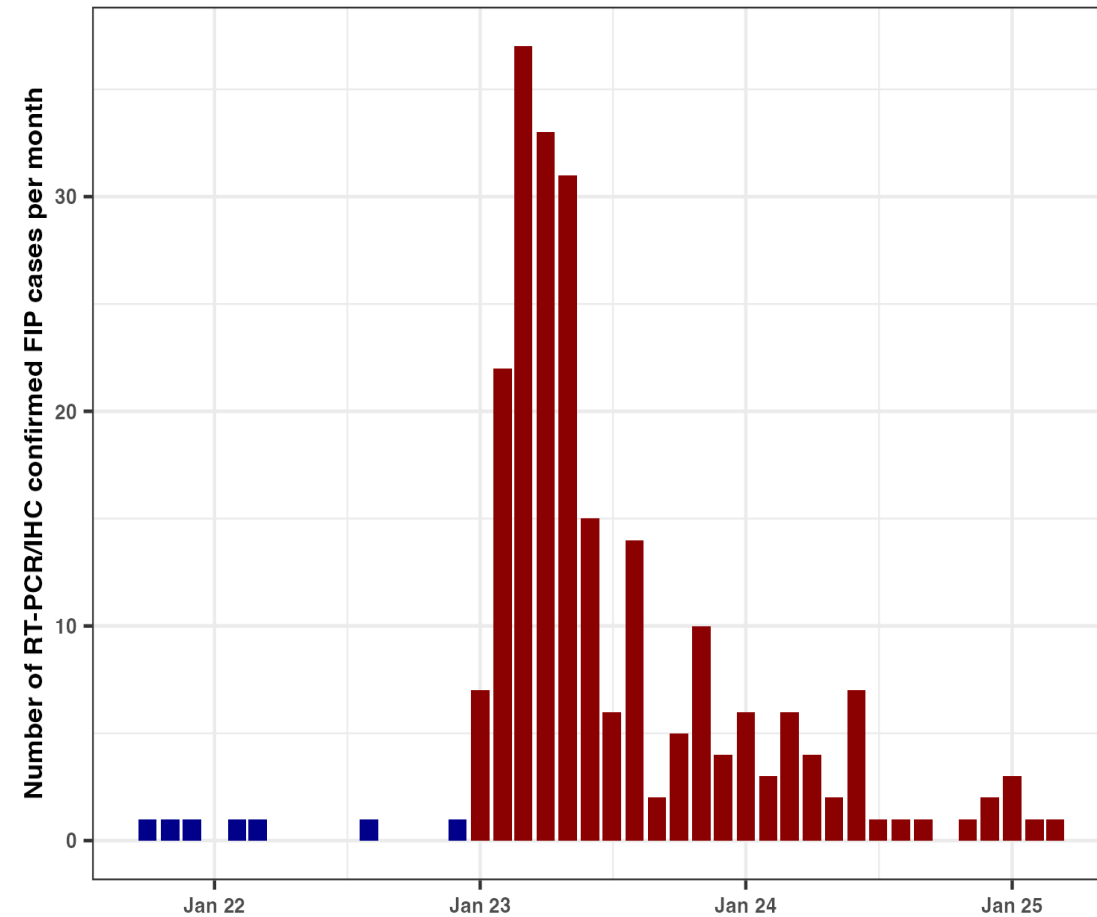
Monitoring FIP cases via 2 data sources:

- RT-PCR/IHC positive cases (Vet Diagnosis Lab) 
- Questionnaires (via Pancyprrian Vet Association) distributed every 3 months) 

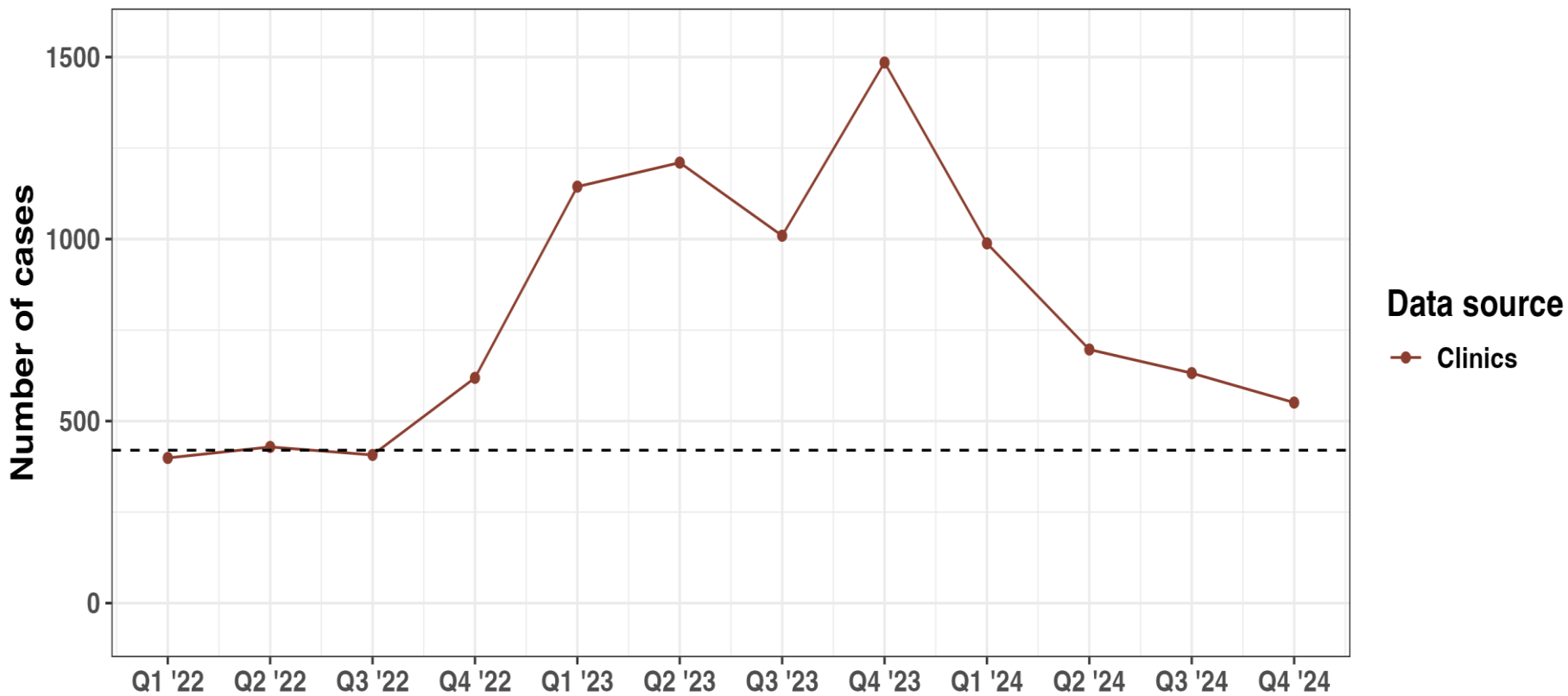


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# Data Source: RT-PCR(+)/IHC



# Data Source: Questionnaire



Data source

—●— Clinics



# Objective 3. Identify Routes of transmission

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Hypothesis: multiple transmission routes (conjunctiva, saliva, surfaces, humans)

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Collaboration with high-workload clinics

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Collecting swab samples (conjunctiva, oropharynx, faeces, environment and humans) from RT-PCR positive cats

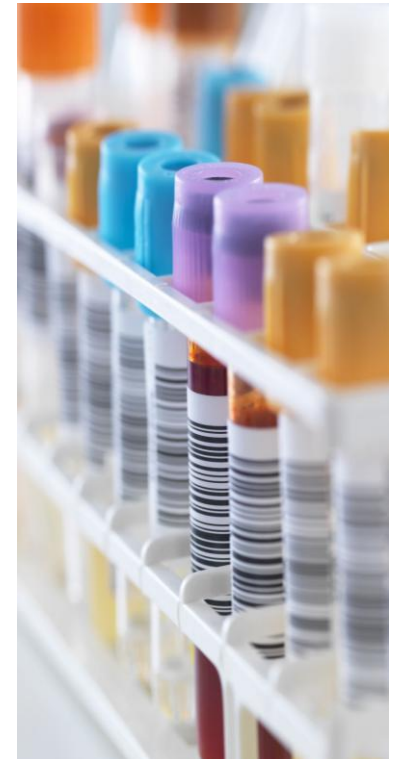
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13 cases identified with 11 positive PCR(+) cases so far

# Objective 4: Monitoring of the virus evolution



- Samples from RT-PCR/IHC positive cases from vet clinics that are sent to the **Vet Diagnosis** laboratory are stored to the **Uni Milan** (-80°C).
- Samples that are collected from Shelters and/or Clinics are stored to **Cy.Biobank facilities** (-80°C).
- Sequencing is done in the **UoE** and samples stored will be sent in batches



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# Research Project DF25FE-704



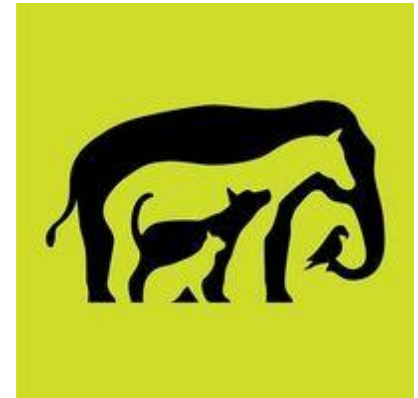
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# Project Overview



**Project title:** The epidemiology of FIP and comparison of the circulating FCoV strains in Greece



**PI:** Maria-Eleni Filippitzi



# Project Objectives

**Objective 1.** “To determine the level of FIP cases resulting from the FCoV-strains, as well as the level of FCoV-23 and of other recombinants circulating in both stray and domestic cats in Greece”



**Objective 2.** “To assess the risk of introduction of FCoV-23 from Cyprus and/or Greece into a previously non-infected country”.



# 1. Six Veterinary facilities recruited across Greece



# First Observations

Collaborating Veterinary facility site	Suspected case from which PCR material was collected and tested negative	Suspected case from which PCR material was collected and tested positive	Suspected case from which PCR sample was not collected	Samples collected from healthy animals	Total
Athens	3	7	0	3	13
Thessaloniki	9	1	1	8	19
Piraeus	8	7	5	2	22
Volos	6	0	0	7	13
Crete	12	1	4	5	22
Syros	5	1	0	7	13
	44	17			102

# Next Steps

- Continue sampling to reach target numbers both projects
- Identify/document risk factors for FCoV23/FCoV infection in domestic cats
- Assess risk of FCoV-23 introduction into countries previously free from infection.

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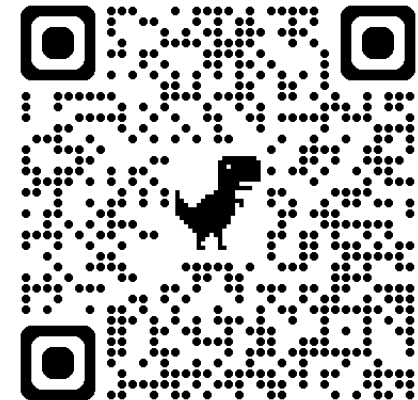
Article | [Open access](#) | Published: 09 July 2025

**Feline infectious peritonitis epizootic caused by a recombinant coronavirus**

[Charalampos Attipa](#) [Amanda S. Warr](#) [Demetris Epaminondas](#) [Marie O'Shea](#) [Andrew J. Hanton](#) [Sarah Fletcher](#) [Alexandra Malbon](#) [Maria Lyraki](#) [Rachael Hammond](#) [Alexandros Hardas](#) [Antria Zanti](#) [Stavroula Loukaidou](#) [Michaela Gentil](#) [Danielle Gunn-Moore](#) [Samantha J. Lycett](#) [Stella Mazeri](#) & [Christine Tait-Burkard](#)

*Nature* **645**, 228–234 (2025) | [Cite this article](#)

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# TAKE HOME Messages

- Monitoring of viral diseases in companion animals can be challenging
- Establishing surveillance systems for companion animal diseases will help preparedness on similar outbreak events

Preprint Article This version is not peer-reviewed.

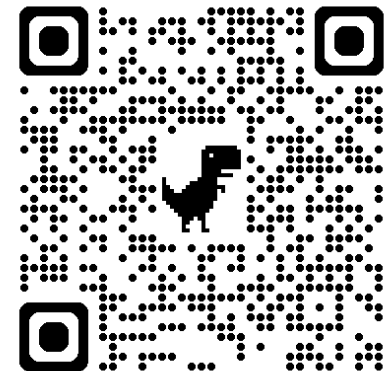
## Epidemiological and Clinical Insights from 68 Veterinarian-Reported Cases of Feline Infectious Peritonitis During the Documented FIP Epizootic in Cyprus

Demetris Epaminondas <sup>1</sup>, Stella Mazeri <sup>2</sup>, Maria Lyraki, Christine Tait-Burkard <sup>3</sup>, Danielle Gunn-Moore <sup>4</sup>, Stavrou Loukaidi, Efstathia-Evangelia Georgiadi, Stavros Loizides, Demetris Demetriou, Zoe Polizopoulou <sup>5</sup>, Charalampos Attipa, Maria-Eleni Filippitzi <sup>1</sup>

### Abstract

In 2023, Cyprus experienced a large-scale epizootic of feline infectious peritonitis (FIP) temporally associated with the emergence of a novel feline coronavirus, FCoV-23. While molecular investigations have elucidated the recombinant origin of FCoV-23, field-based clinical and other epidemiological data from FIP cases reported during the epizootic period were needed to better characterize the outbreak. A prospective study was conducted using a structured 31-item questionnaire embedded in veterinary management software to characterize FIP cases diagnosed during the epizootic period (late 2022–2025). Data were voluntarily submitted by registered veterinarians across Cyprus. Cases were included based on a clinical diagnosis of FIP; virological confirmation of FCoV-23 infection was not required for inclusion. Data from 68 FIP cases reported by 22 clinics (response rate 21.0%) were analyzed. Affected cats were older than typically reported for FIP (mean age 3.9 years; median 3.0; range 0.4–12.9 years; SD 3.4). Most cases were documented in Limassol (51.5%) and Nicosia (25.0%). The most frequently reported clinical signs were non-specific like anorexia (60.3%) and weight loss (54.4%), while a variety of neurological and mental manifestations was documented in 35.3% of cases. An albumin-to-globulin ratio  $\leq 0.8$  was observed in 86.8% of tested cats. Antiviral therapy (GS-441524 or molnupiravir) was administered in 92.2% of cases, with reported clinical improvement in 88.9%. These findings demonstrate the value of questionnaire-based surveillance in documenting outbreak-associated FIP infections, the increased proportion of supports previous molecular evidence

**Keywords:** [feline infectious peritonitis](#)



# Special Thanks

- Maria-Eleni Filippitzi, Aristotle University of Thessaloniki
- University of Edinburgh and Roslin Institute
  - Charalampos Attipa
  - Danielle Gunn-Moore
  - Christine Tait-Burkard
  - Stella Mazeri
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- FCoV-23 Centre of Excellence, especially Drew Weigner and Vicky Thayer
- Morris Foundation, Every Cat Foundation for funding this research
- My family



# Questions & Discussion

