



## Review Article

## Influenza A virus in cats – Why it needs global attention?

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Abstract	Manuscript Information
<p>Recent outbreak of H5N1 avian influenza among cats in Poland has increased the concerns over the spread of Influenza A virus and potential public health risks it poses. Influenza An outbreak in cats are rare, but reported ones are of public health significance, which have involved human infections also. Symptoms in infected cats are variable, sometimes getting severe and ending up fatally. There are no commercially available vaccines against Influenza A for cats, which demands further research and development. Timely detection, isolation and treatment measures are imperatives to control and prevent outbreaks. One Health approach is obviously the best way to address this growing concern of Influenza A infection in cats and other mammals including humans.</p>	<ul style="list-style-type: none"> <li>▪ <b>ISSN No:</b> 2583-7397</li> <li>▪ <b>Received:</b> 20-12-2023</li> <li>▪ <b>Accepted:</b> 25-01-2024</li> <li>▪ <b>Published:</b> 28-01-2024</li> <li>▪ <b>IJCRM:</b>3(1);2024:99-101</li> <li>▪ <b>©2024, All Rights Reserved</b></li> <li>▪ <b>Plagiarism Checked:</b> Yes</li> <li>▪ <b>Peer Review Process:</b> Yes</li> </ul> <p><b>How to Cite this Manuscript</b></p> <p>Vishnu Prasad Santhosh Pillai, Tony Sajan Varikatt, Sneha Aji Reji, Nayana Prakash. Influenza A virus in cats – Why it needs global attention?. International Journal of Contemporary Research in Multidisciplinary. 2024; 3(1):99-101.</p>

**Keyword:** Influenza A, Public health, Cat, One health, infections, Symptoms.

### 1. Introduction

Recently, in June 2023, several cats were tested positive for highly pathogenic H5N1 avian influenza in Poland, resurging concerns about the public health threats it poses <sup>[1]</sup>. Although outbreaks of Avian Influenza (AI) in feline species are rare, some sporadic reports suggest a critical look into the likelihood of AI infection in cats and further into the zoonotic potential it could have. Meanwhile, transmission from humans to cats is also pertinent <sup>[2]</sup>. In the backdrop of a One Health approach, the occurrence of AI in cats is worthy of discussion.

The etiological agent of AI is Influenza, a virus (IAV) that belongs to the *Orthomyxoviridae* family and has been classified into several subtypes based on Hemagglutinin (HA) and Neuraminidase (NA) surface proteins. It is a single-stranded RNA virus with eight segments, which predisposes the virus for

genetic reassortments, enabling immune system evasion and host shifting <sup>[3]</sup>. Some subtypes, such as H5N1, have been recognized to be of significant zoonotic importance pertaining to the outbreaks reported in humans <sup>[4]</sup>. Human infections of Influenza A have been shown to elicit variable symptoms in patients ranging from fever and respiratory illness to severe inflammation, even leading to death if pre-existing disease conditions have debilitated the patient <sup>[5]</sup>.

### Influenza A in animals

Influenza A virus, depending on the host, can be categorized as avian influenza, swine influenza, or other animal influenza <sup>[14]</sup>. IAV caused an influenza pandemic in 2009, which rapidly spread over the world. The virus, labeled Influenza A/(H1N1) pdm09, was born out of a reassortment between human, swine,

and avian influenza viruses [15, 16, 17, 18]. It reiterated the significant threat posed by IAV circulation among swine populations, which are often termed "mixing vessels," facilitating genetic reassortment [16, 20]. Avian influenza virus subtypes A (H5N1) and A (H9N2) are known to be zoonotic [19, 21]. But emerging zoonotic subtypes like A (H3N8), A (H7N9), A (H5N8), and A (H5N6) have been reported [22, 23, 24, 25].

### Influenza A in cats

Experimental studies have shown that cats are susceptible to IAV infections, which are zoonotic in nature [6]. There have been incidences of IAV transmission from dogs to cats, but outbreaks in cats were rare. Most of the outbreaks were reported in shelters where animal-animal interaction is significant. During 2016-17, IAV infections in cats were reported in New York, where in nearly five hundred cats were tested positive and transmission rate between cats were higher. A veterinarian and a shelter worker, associated with these infected animals were also found to be positive for IAV, showing mild respiratory distress [2]. Previously, IAV was reported in a colony of 90 cats in Italy, where in 25 cats succumbed to death and nearly half of the animals showed symptoms ranging from respiratory illness to gastrointestinal problems [7]. Recent outbreak of HPAI H5N1 in cats in Poland has raised the concerns of AIV infection in felines. More than half of the cats tested were found positive. Contamination via poultry meat feed was suspected and one sample was positive for the virus, suggesting a possible route of infection, although not conclusive [1]. Epidemiological studies investigating likely routes of transmission is an imperative. Experimental studies have shown that cats can have severe symptoms following infection, involving cat-cat transmission. Shedding of virus via excreta have been found, which could increase the likelihood of transmission [2,8]. H5N1 infection has been previously reported in tigers and leopards that have elicited severe symptoms including pneumonia. Those animals were reported to be fed with fresh chicken carcasses, which could have been the source of IAV. Occurrence of IAV infection in endangered wildlife stands out to be a great threat to biodiversity [9].

### Challenges and possible interventions

Since no IAV vaccines are commercially available for cats, prophylaxis through vaccination is a major concern [2]. Administration of the heterologous avian H5N1 IAV vaccine in cats was found effective, offering protection against H5N1 infection [10]. Further studies are necessary to develop vaccines to immunize felines against different subtypes of IAV. Since the IAV is prone to mutations and genetic reassortments resulting in host shifting, the prevalence of this virus among different species should be monitored to prevent outbreaks in the future [13]. Quarantine and isolation procedures should be adopted following outbreaks, since cat-cat transmission is possible. Timely diagnosis and biosecurity interventions are critical to handling outbreaks [11]. Care should be taken while cats are fed fresh chicken carcasses since it is a potential route for AI virus infection. Diagnostics involving RT-PCR and serological assays

can be employed for rapid detection and further control measures [2].

### Conclusion

From a One Health point of view, zoonoses pose a major threat to global health [12]. In the context of IAV infections with significant public health risks, a one-health approach can be very effective to address the issues and reduce outbreak incidences. From poultry to humans, IAV is a crucial health threat that needs to be mitigated by collective action from different sectors such as veterinary medicine, human medicine, and environmental science, embraced by policymakers and governments.

### Abbreviations

AI: Avian Influenza, IAV: Influenza A Virus

### Declarations

**Conflicts of interests:** The authors declare that they have no competing interests.

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