

Group A Streptococcus in Household Dogs: Zoonotic Risk Assessment and Case-Based Insights

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Introduction

The Centers for Disease Control and Prevention (CDC) recognizes that interactions between humans and companion animals can contribute to the transmission of certain diseases. The One Health initiative was thus created to promote collaboration in preventing these zoonotic diseases.¹⁻⁴

Anecdotal reports have suggested possible transmission of Group A Streptococcus (GAS) from domestic dogs to humans, but this has not been a major focus of One Health research.⁵⁻¹⁰ The Infectious Diseases Society of America (IDSA) asserts there is no credible evidence supporting GAS colonization in dogs or their involvement in recurrent human infections.¹¹ Accordingly, in 2012 the IDSA advised against routine canine screening for the management of recurrent GAS pharyngitis in humans,¹²⁻¹⁴ basing this recommendation largely on studies involving *Streptococcus canis* (Group G Streptococcus) rather than GAS.^{5-6, 15}

Although contact with human GAS carriers has been implicated in pharyngeal infections, the carrier transmission rate remains low, ranging from 3% to 11%.¹⁶ Importantly, advances in rapid antigen detection testing have improved specificity for GAS, reducing the likelihood of cross-reactivity with Group G Streptococcus. This enhanced diagnostic reliability lends itself to reconsidering IDSA's previous recommendations. Given that many patients continue to experience recurrent GAS pharyngitis without an identifiable source, further investigation into potential zoonotic reservoirs, including domestic dogs, should be explored.¹⁷⁻¹⁸

Case Report

An 8-year-old male presented to the pediatric clinic with his fourth sore throat in five months, characterized by odynophagia, low-grade fever (101.8 °F), and pharyngeal erythema with pustular exudates. Past history included recurrent streptococcal pharyngitis and prior tonsillectomy at age 7. A rapid throat culture confirmed *Streptococcus* infection, and empirical Penicillin-VK was initiated.

Given the recurrence despite household treatment, the family's asymptomatic dog (Golden Retriever) was cultured at the recommendation of a veterinarian familiar with zoonotic transmission potential. The dog tested positive for Group B Streptococcus and was treated with a 10-day antibiotic course.

Following concurrent treatment of both patient and pet, the child remained free of streptococcal infections for 18 months, suggesting the pet may have been a persistent, asymptomatic reservoir.

Methods

An observational cross-sectional study was conducted over four months to assess the prevalence of GAS colonization in canines. The McKesson Rapid GAS test kit was used to collect oropharyngeal swabs via single-sample clustering from dogs in veterinary clinics, dog parks, and daycare facilities across the greater Atlanta area, Ohio, and Florida. Results were categorized as positive, negative, or invalid.

Additionally, all swab samples were accompanied by a survey to collect data on canine demographics, household composition, health history, and symptoms such as coughing or allergies.

To view the full survey, scan the following QR code:



Inclusion criteria included all canines while the exclusion criteria involved canines with inaccessible owners who were unable to complete the survey.

Statistical

The prevalence of GAS colonization among the canine population was analyzed using chi-square testing, and survey responses were reviewed.

- **Null Hypothesis:** No significant association exists
- **Alternative Hypothesis:** A significant association exists

Analysis:

Discussion

While the case report raised the possibility of GAS transmission between canine and human species, the study's findings were less convincing. A chi-square test was not conducted due to the absence of positive results, thus suggesting that dogs in the studied population were unlikely to serve as reservoirs for GAS pharyngitis in humans. However, descriptive and frequency data collected from the owners' survey illuminate other areas in which to focus future investigations.

- As shown in **Figure 1**, most dogs (95%, n=191) were primarily kept indoors, with only 3.7% falling into the *No/Yes* group—owners who developed strep after acquiring their dog. This may suggest that dogs in lower-exposure environments are less likely to be associated with new strep cases. However, in more socially active groups—such as dogs that go to parks or are boarded—*No/Yes* cases were slightly more represented (3.3% and 4.8%, respectively). While small, this consistent pattern raises questions about whether canine environmental exposure may influence interspecies GAS transmission.
- **Figure 2** further may suggest the notion that symptomatic dogs are not strongly linked to new GAS infections in humans. The majority (85.1%, n=171) of dogs were asymptomatic, and only 4.7% of these belonged to the *No/Yes* group. Conversely, it was observed that symptoms such as "increased drooling," "runny nose," and "watery eyes" tended to be more common in the *Yes/No* group—where owners had strep before acquiring their dog. Given the trend, no statistically significant inferences can be made at this time.

Results

In total, 201 canines were swabbed and included; 0 canines were excluded from the study based on our exclusion criteria. All 201 included canines were negative for GAS.

There were 201 surveys completed and demonstrated the anecdotal trends described below:

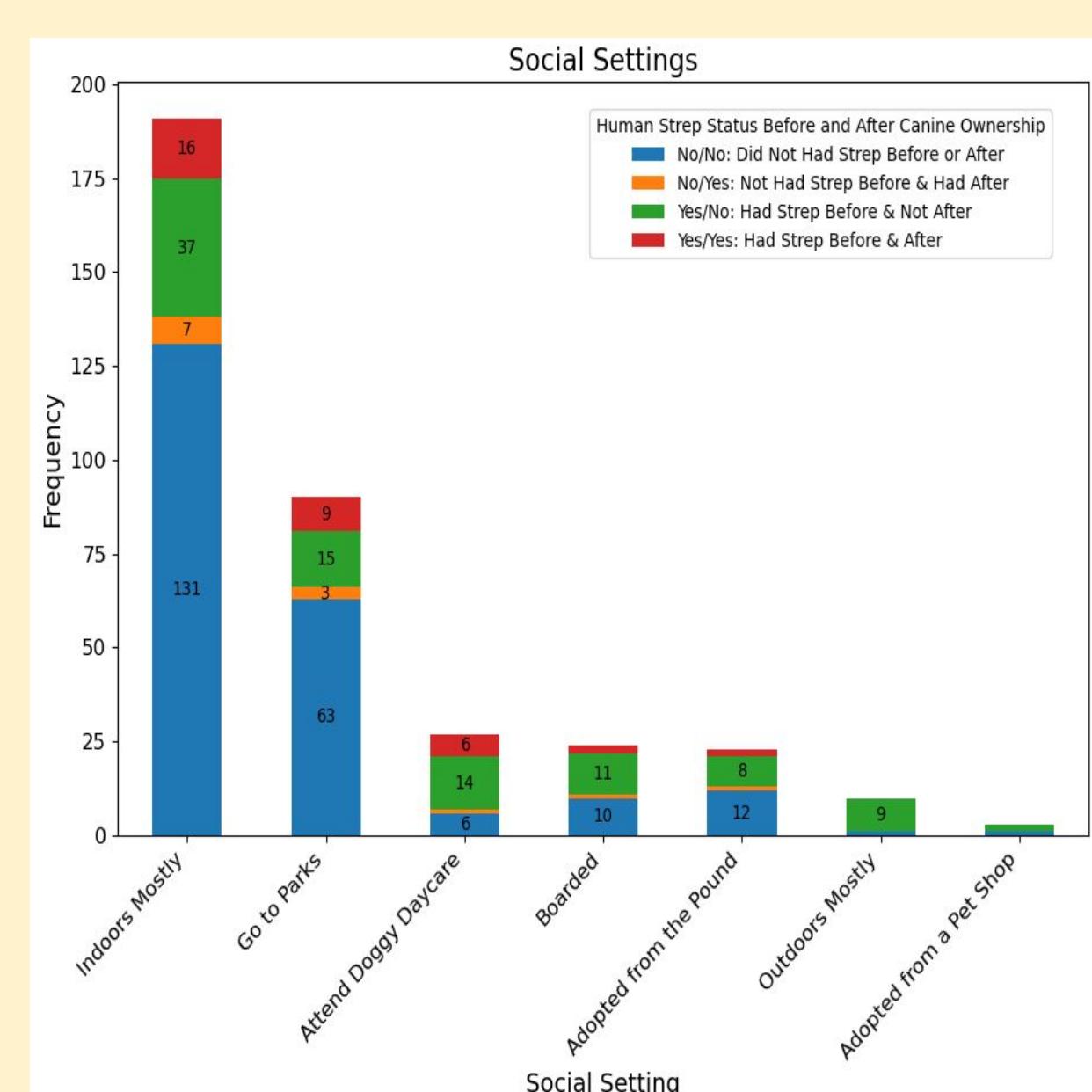


Figure 1: Canine Social Settings
Trends of canine social interactions relative to self-reported history of human-positive GAS diagnosis before and after acquisition of household dog (n=201)

- **Indoors Mostly** was the most common canine social setting (191 total); majority if these pet owners (131) reported **no strep** history before or after acquiring their canine pet.
- **Go to Parks** (90): Mostly owner reported no strep history before or after acquiring pet (63); while 15 reported strep episode(s) prior to canine pet ownership, but not after.
- **Doggy Daycare** (26): High rate of owner strep history prior to acquiring canine (14) vs after.
- **Boarded & Shelter Adoptions** showed similar trends as doggy daycare—a mix of no owner history of strep, and strep prior to canine.
- **Outdoor Dogs & Pet Shop Adoptions:** Few responses; mostly **strep before, not after**.

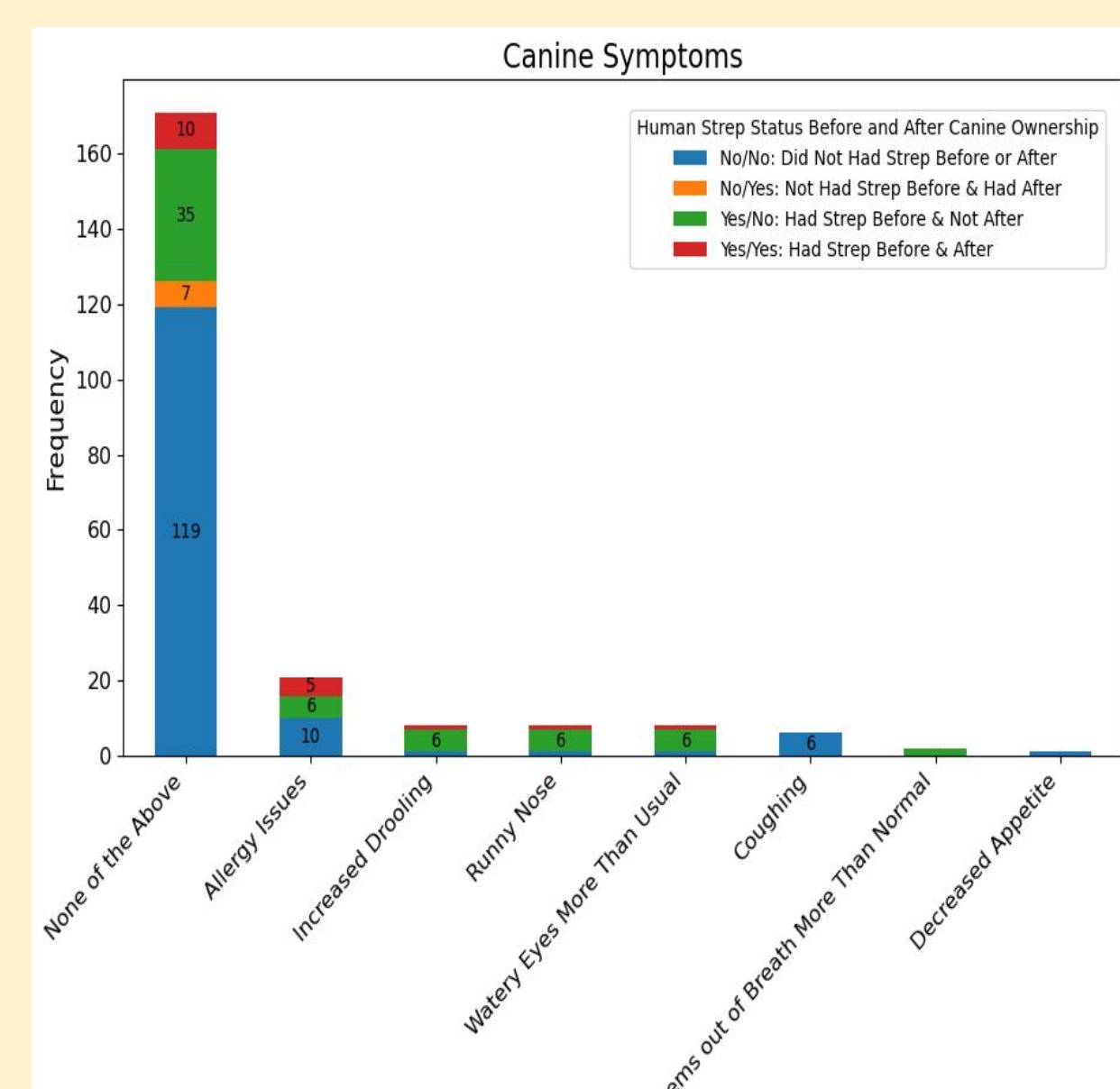


Figure 2: Current Symptoms of Canine
Trends of active canine symptoms relative to self-reported history of human-positive GAS diagnosis before and after acquisition of household dog (n=201)

- **Most dogs (171)** were **asymptomatic**; the majority owners had **no history of strep** before or after canine ownership (119).
- **Dog with Allergy Issues** (21): Some association with ongoing or prior owner strep cases.
- Minor dog symptoms (drooling, runny nose, watery eyes): noted trend of owner strep history **prior to acquiring canine, not after**.
- **Dog with Coughing** (6): All reported by owners with **no strep history**.
- Less common dog symptoms (e.g., appetite loss, breath issues): Minimal reports.

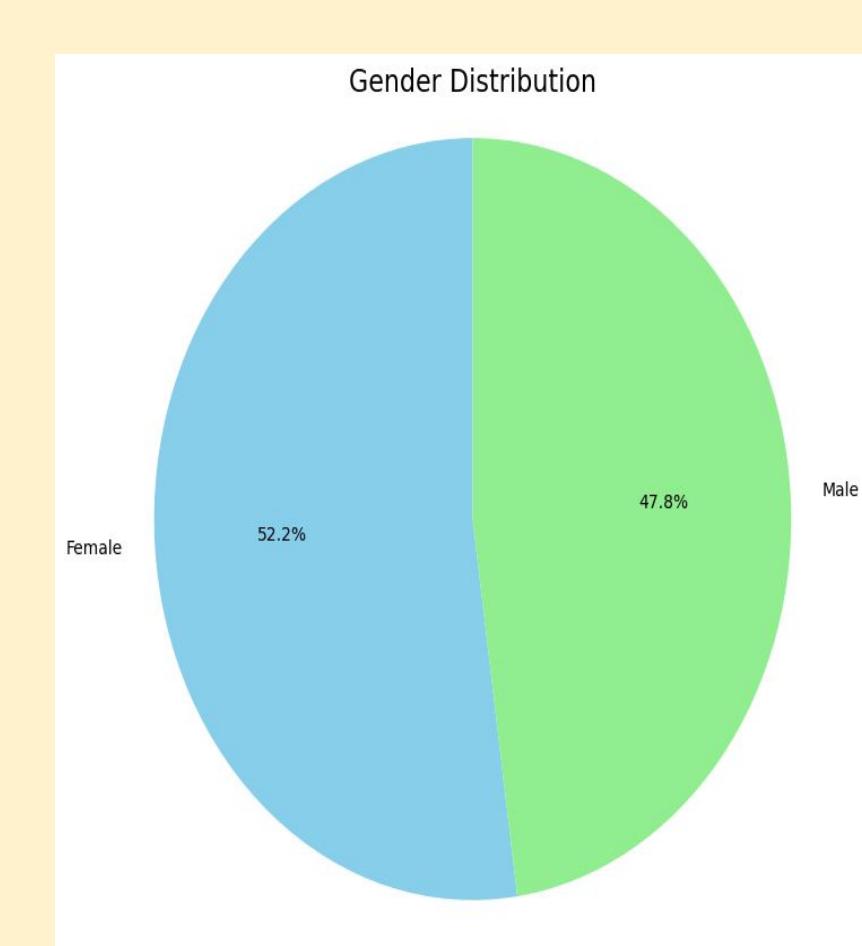


Figure 3: Gender Distribution of Canines Tested
Male and Female genders of Canines sampled were equally represented in this research study (n=201)

Conclusion

Based on our data, it was overwhelmingly demonstrated that none of the canine samples tested positive for Group A Streptococcus (GAS), suggesting that dogs did not serve as a reservoir for GAS transmission to their human household members. However, the study was constrained by a small sample size, limited geographic area, and procedural challenges during swab collection—such as lack of cooperation and blind swabbing without direct visualization—which may have contributed to false negatives.²² Survey-based data were also limited by potential recall bias, missing information on unlisted conditions, and open-ended questions that restricted statistical analysis.¹³⁻¹⁴

Our findings underscore the need for further investigation into the role of canines in GAS transmission. Future research should employ more standardized and objective methods, such as improved swab techniques and broader geographic sampling, to enhance reproducibility and better inform updates to IDSA guidelines.^{12-14, 19-22}

