

# Human-Directed Dog Aggression; A Systematic Review

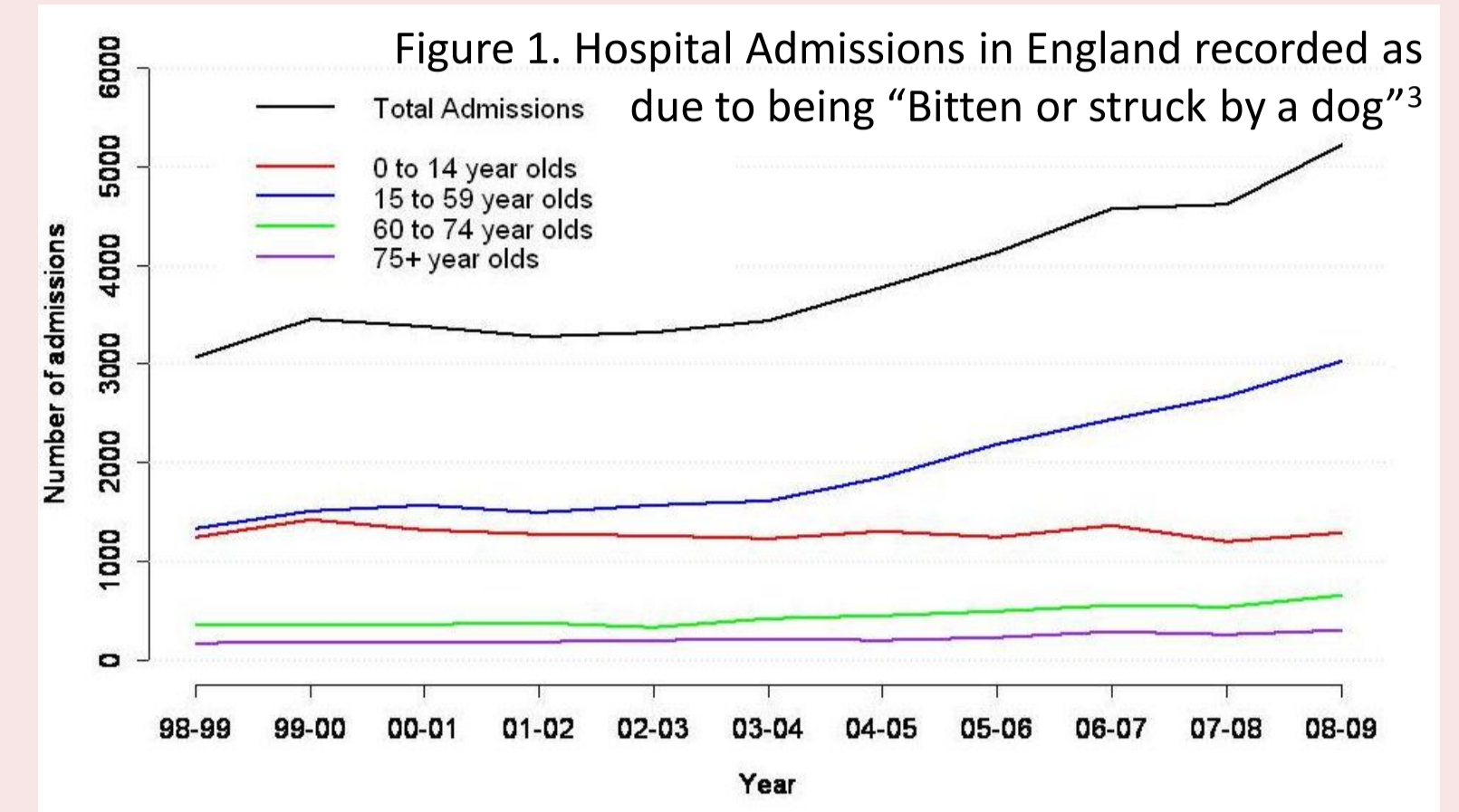


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## Project Overview

Canine aggression is the most important behaviour problem in dogs, because of both its frequency and consequences. An estimated 740 per 100,000 population<sup>1</sup> are bitten annually in the UK, with 230,000 individuals per year attending for emergency treatment of dog bite injuries<sup>2</sup>. As illustrated in figure 1, recorded hospital admissions for the treatment of dog bite wounds have shown a marked increase over the past decade.

Studies of the risk factors and prevalence of dog bites have drawn diverse and often conflicting conclusions. To an extent this may be because they have used differing populations; hospital attendances are likely to capture a different set of circumstances and injuries to self reported aggressive acts for instance.



### Project Aims

- To utilise the systematic review approach to rigorously and systematically identify and review all available data, published and unpublished, relating to human-directed dog aggression.
- To further investigate risk factors for human-directed dog aggression using meta-analysis, where appropriate in the studies meeting the review criteria.
- To identify specific areas where information is lacking and to provide guidance with regards future research priorities.
- To disseminate the results of this project widely.



## The Systematic Review Process

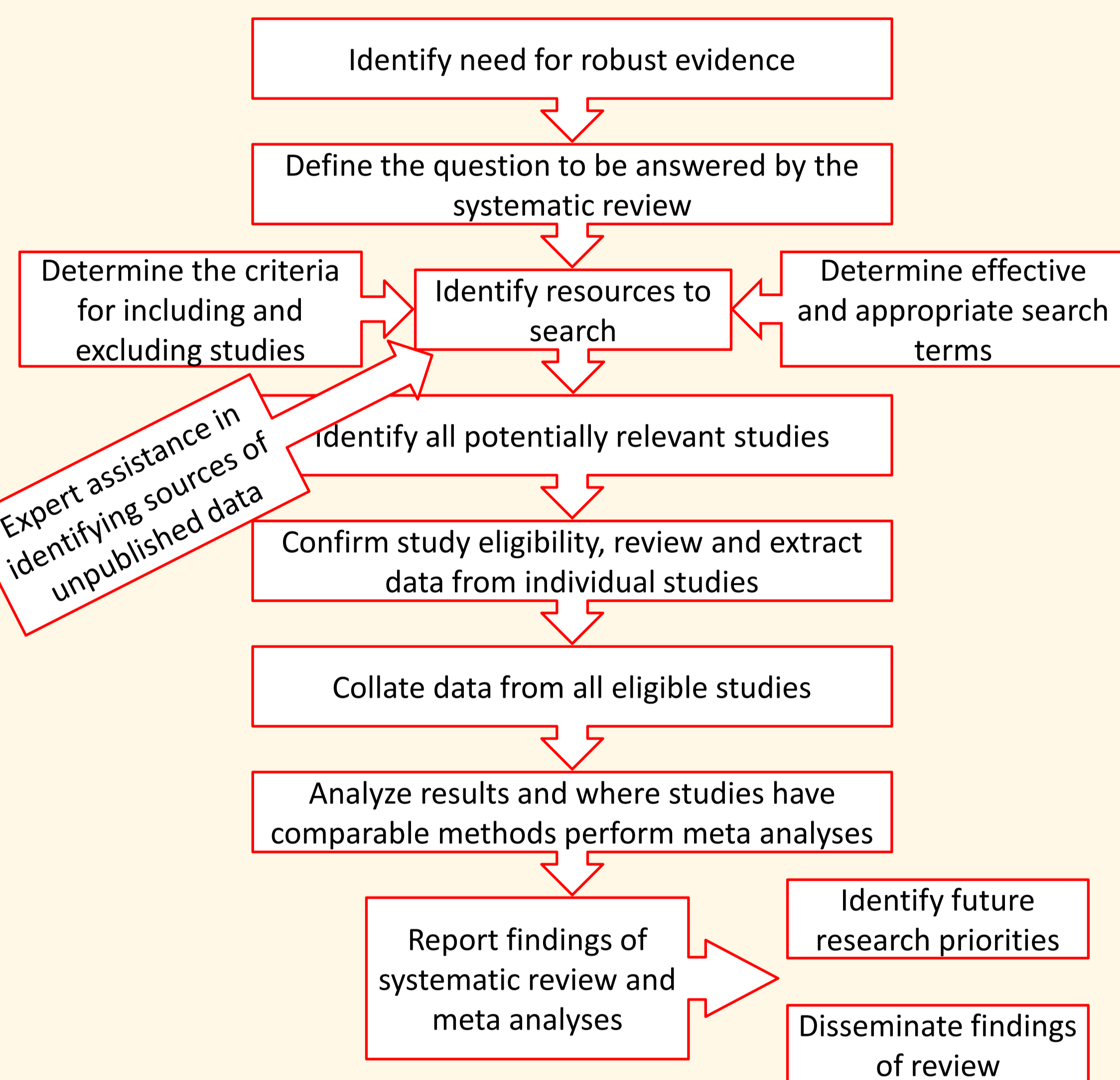


Figure 2. Flowchart outlining the systematic review process

## Issues Identified

Conflicting risk factors identified.

Evidence identified is at best level 2b (cohort study) and majority level 3 (case-control study) or below<sup>4</sup>

Disparity in case definitions – are conflicting risk factors really risks for different outcomes?

Outcomes often poorly defined.

Choice of study population introduces bias and confounding. Emergency Department attendees represent a different population with different risk factors and outcomes to those recruited via phone call for example.

Studies often involve self-reporting of behaviour by owners or victims, introducing reporting bias and inherent problems of perception of an emotive issue.

Controls often absent or poorly selected.

Local legislative variation and endemic disease, notably rabies, creates non-comparable statistics.

## Our Approach

The systematic review process, followed by meta analysis of appropriate studies.

Is variation due to different outcomes being studied (e.g. aggression vs. fatality.) Separate analysis of each outcome.

Acknowledging that we are unlikely to find the gold standard of evidence and working with what is available to produce the most robust review we can.

Identifying areas needing quality research in the future.

Systematic review process and stratification by definition where possible.

Critical appraisal, lack of clear definition of outcome lowers level of evidence.

Stratify by study population.

Identify confounders introduced by choice of population and selection method.

Critical appraisal of study design, evidence of selection bias lowers level of evidence.

Critical appraisal of study design, poor design lowers level of evidence.

Stratification of studies by location to look for confounders.

## Preliminary Findings

As outlined in figure 3, risk factors can be stratified in a number of ways. This framework enables us to think about risk in specific scenarios or between given factors. It appears that there are different trends in the risk factors for the majority of bites as compared to those which cause serious injury.

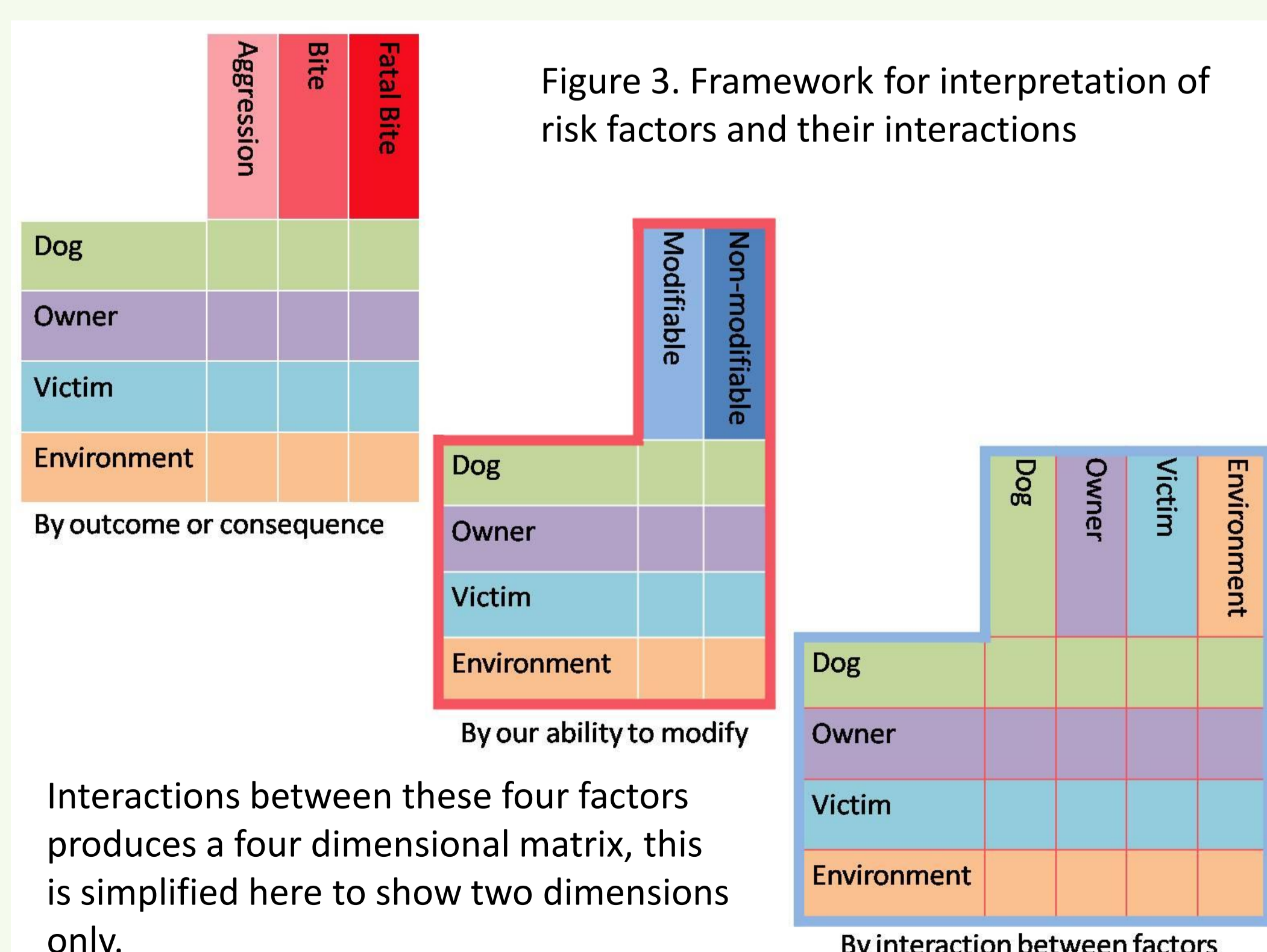


Figure 3. Framework for interpretation of risk factors and their interactions

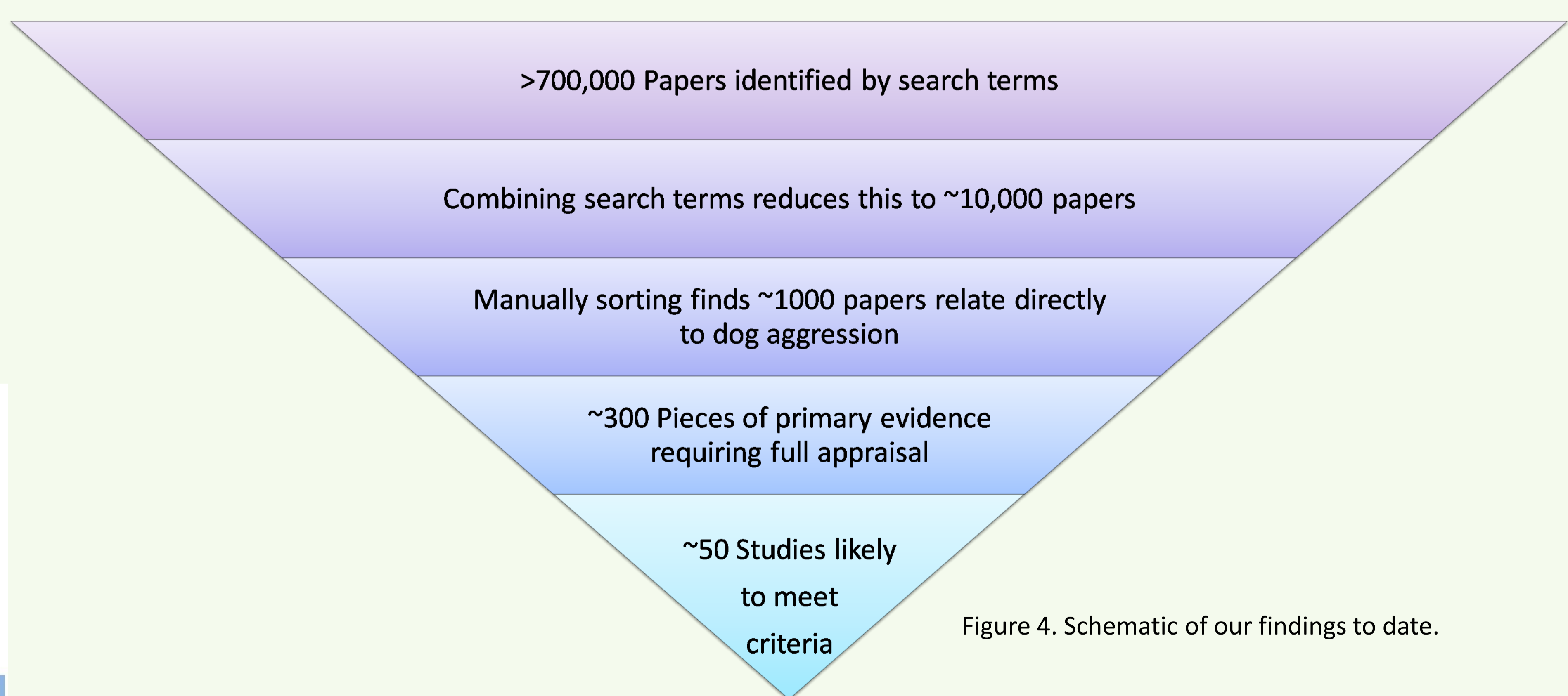


Figure 4. Schematic of our findings to date.

## How can YOU help?

In order to reduce the impact of publication bias on our review findings we are actively looking for unpublished work on human-directed dog aggression.

If you are aware of any unpublished research in this area please get in touch via email; njen@liv.ac.uk

More information on the project can be found at [www.liverpool.ac.uk/dog-aggression](http://www.liverpool.ac.uk/dog-aggression). When it becomes available this site will also host a searchable database of the literature identified by the review.