

# The term 'pilot study' is misused in veterinary medicine: a critical assessment

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## Introduction

Various authors and institutions have defined the term 'pilot study' as a small, preliminary study examining the feasibility of the study design, data collection methodology and anticipated data analyses of a larger, more comprehensive hypothesis-testing study.

Importantly, this definition deliberately excludes any testing of the hypotheses that are to be subsequently investigated and any reporting or interpreting of the results. However, veterinary authors have appended the term 'pilot study' to the titles of small studies that do exactly what the definition prohibits, that is, presentation of results and drawing conclusions from their findings.

The aim of this study was to better understand the use of the term 'pilot study' in the veterinary literature, to determine what this term adds to the study and to examine whether authors fulfil their implied promise of following up the preliminary observations with a more comprehensive, appropriately powered study. Through these evaluations, the study hoped to determine whether the term 'pilot study' has merit, or whether it might harm progress in veterinary medicine.

## Approach

The PubMed database was searched to obtain a list of all articles published in the veterinary literature between 2008 and

## KEY FINDINGS

- Articles with the term 'pilot study' in the title increased in frequency during the study period, but the term was used haphazardly and inconsistently.
- Common features of these manuscripts included a small sample size, failure to subsequently replicate the study with a larger study, consistent reporting and interpretation of results without consideration of the possibility of error and frequent citing in review articles.
- No authors defined the term 'pilot study' or justified the term's inclusion.

2012 that included the term 'pilot study' in the title. For each of the pilot studies identified, a Web of Science citation index search was performed to identify any subsequent follow-up studies, assuming that the authors would cite their pilot study in the larger study.

The frequency with which the term occurred across the years was compared, and articles that were similar in scope, sample size and methodology but did not include the term 'pilot study' were also compared to determine whether the term was being applied consistently. In addition, the number of citations garnered by each pilot study, and whether the citations were in primary literature or review articles, was evaluated.

## Results

Overall, 73 articles were found that used the term 'pilot study', and at least one comparable study was found for each of these that did not use the term. Only

17 (23 per cent) of the pilot studies had a subsequent follow-up study, but 10 of these had a sample size similar to that of the original pilot study. Use of the term 'pilot study' increased between 2008 and 2012.

These pilot studies had a median sample size of 10 subjects, but the authors of 85 per cent of these studies considered their outcomes positive and definitive. Pilot studies generally garnered few citations, but 74 per cent were cited at least once in a review article.

## Interpretation

The findings of this study suggest that the term 'pilot study' is used in veterinary literature counter to the accepted definition in the medical literature. The studies are small and are consequently underpowered to identify a true effect, but results are uniformly reported by authors as 'absolute'. The use of the term by the authors could, therefore, be interpreted as a plea for leniency by reviewers, editors and readers – tacitly acknowledging that the study is small, lacking in conclusive findings and of limited value to scientific progress.

Because of the high citation rate of pilot studies in review articles, such studies could harm progress in veterinary medicine, as most readers of the review will accept them at face value as evidence of efficacy, giving them inappropriate validity.

## Significance of findings

Because the term 'pilot study' is largely meaningless, used haphazardly and, when used, causes more harm than good, it is suggested that this term is abandoned in the veterinary literature. If authors choose to include the term 'pilot study', it is recommended that reviewers and editors require the authors to explain in the manuscript exactly why the study warrants this term.

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