Title: What is the needle we are trying to move in access to veterinary care (A2VC)? A scoping review of risk factors for access to veterinary care, metrics of access to veterinary care, and consequences of access to veterinary care. Tuesday, July 13, 2023

Registration:

The protocol will be made available on-line at Systematic Reviews for Animals and Food (SYREAF) available at: http://www.syreaf.org

Authors and contributions:

Annette M. O'Connor (oconn445@msu.edu): Conceived the idea and developed the draft protocol.
Sarah Totton (private consultant) : provided critique and refinement of the protocol
Michelle Hernandez: provided critique and refinement of the protocol
Emily Meyers: provided critique and refinement of the protocol
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Amendments:

None to report

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Conduct guidelines and Reporting Guidelines

We will use a modified version of the Campbell Collaboration conduct standards for checklists for evidence and gap maps modified as relevant to a scoping review. (see attachment at the end of this document). No protocol format specific to scoping review protocol is available therefore, we used a combination of the PRISMA-P and PRISMA-ScR to report this protocol [1-3]. For reporting the scoping review, we will use the PRISMA-Scr.

Rationale:

Companion animals, and especially but not only cats and dogs, play an essential role in the lives of many families, providing love, companionship, and a sense of purpose. Studies have shown that pets can improve mental health by reducing stress and anxiety, increasing social interaction and physical activity, and decreasing feelings of loneliness. For individuals struggling with loneliness or post-traumatic stress disorder (PTSD), pets can be especially valuable sources of comfort and support [4-6]. However, not all families have the resources to care for pets, and some may face barriers to pet ownership, such as housing restrictions or financial limitations.

Despite the many benefits of pet ownership, accessing veterinary care can be a significant challenge for many families in the United States. There are many barriers to accessing veterinary care. One of the primary obstacles is the high cost of veterinary services, which can be prohibitive for those on a tight budget. Unlike human healthcare, there is no universal insurance system for animals in place to help defray the cost of care. As a result, many pet owners may delay or avoid seeking veterinary care altogether, leading to preventable health problems for their pets. Additionally, many families live in areas that lack access to veterinary clinics or after-hours emergency services, making it difficult to obtain care when it is needed most. For low-income families, the added burden of transportation, child care, and work schedules can compound these challenges, further limiting their ability to access veterinary care. These metrics have similar dimensions to factors that impact access to human health care. In human health care, factors that impact access to care are grouped into five A's of access to care: affordability, availability, accessibility, accommodation, and acceptability. *Affordability* is determined by how the provider's charges relate to the client's ability and willingness to pay for services [7, 8]. *Availability* measures the extent to which the provider has the requisite resources, such as personnel and technology, to meet the needs of the client. *Accessibility* refers to geographic accessibility, which is determined by how easily the client can physically reach the provider's location. *Accommodation* reflects the extent to which the provider's operation is organized in ways that meet the constraints and preferences of the client. Of greatest concern are hours of operation, how telephone communications are handled, and the client's ability to receive care without prior appointments. And finally, *acceptability* which captures the extent to which the client is comfortable with the more immutable characteristics of the provider and vice versa. These characteristics include the age, sex, social class, and ethnicity of the provider (and of the client), as well as the diagnosis and payment options available to the client.

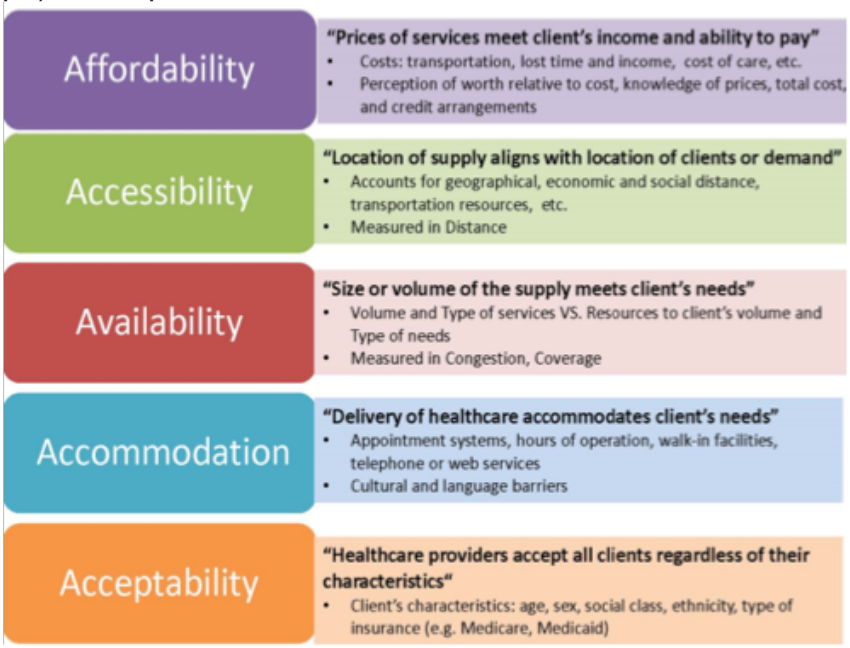


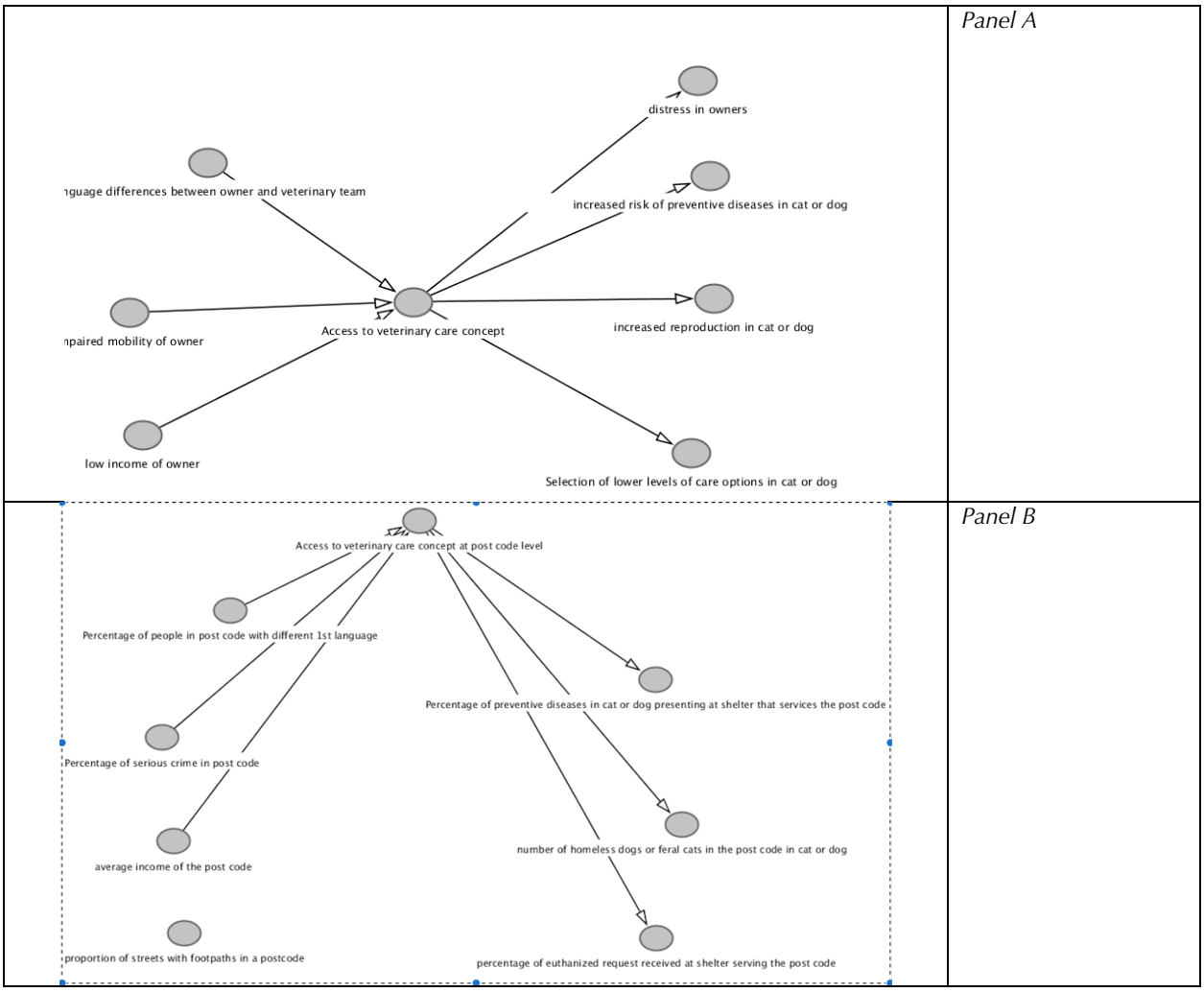
Figure 1: Dimensions of Access to Care described in human health care. [7, 8].

In recent years, there has been a growing interest in research into access to veterinary care. This is an emerging field that, compared to other areas of One Health importance, is still in its infancy, but research in this area has the potential to shed light on the root causes of the problem and inform strategies for addressing it. This research also aligns with broader movements in the veterinary profession to promote equity and inclusivity. Thus far, much of the research has focused on identifying the extent and nature of the problem, including the geographic areas and populations most affected by limited access to veterinary care [9-14]. However, to make meaningful progress toward addressing this issue, researchers must move beyond simply identifying the problem and assess interventions that can improve access to veterinary care in underserved areas.
Interestingly metrics of access to veterinary care are used in two ways in veterinary studies, as illustrated in Figure 1. First, access to veterinary care measures can be used as an explanatory variable to understand the consequence of poor A2VC, i.e. A2VC leads to →. For questions about the consequences of A2VC, randomized controlled trials are the preferred approach for assessing the effectiveness of interventions, RCTs may not be feasible in the context of research into access to veterinary care. Instead, quasi-experimental designs that measure the outcome of interest before and after the intervention will likely be necessary. While this approach has limitations, it can still provide valuable insights into the impact of interventions. For example, when mandatory seat belts were introduced in cars, the number of deaths resulting from automobile accidents decreased by nearly 50% (National Highway Traffic Safety Administration, 2021). While it is difficult to establish causality using quasi-experimental designs, the seat belt example shows that meaningful changes can still be observed and inferred. However, the absence of clear metrics for measuring the impact of interventions in the context of A2VC represents a significant challenge for this research area. Identifying outcomes that are both relevant and measurable and that are considered important by researchers and the involved community will be critical for evaluating the effectiveness of interventions.
To highlight the importance of identifying relevant outcomes early in a research topic we can use examples from human health. [15]. Another body of work that uses A2VC is risk factor research, This is also shown in Figure 2. In this body of work, the researchers investigate what factors impact A2VC. As can be seen in Figure 2 the A2VC variable is in the middle of this research picture and therefore, it is critical to understand what is being measured and what it represents in the manner of possible interventions.
However, one issue we have observed is that A2VC is defined in many ways in veterinary sciences. Such inconsistencies in measures can create problems. Inconsistence metric measurement have caused problems for people trying to use health care research, illustrated by the following two examples from [16](1) a review of oncology trials found that more than 25,000 outcomes appeared only once or twice [17] and (2) in 102/143 (71%) Cochrane reviews, the authors were unable to obtain the findings for key outcomes in the included trials, with 26 (18%) missing data for the review's prespecified primary outcome from over half of the patients included in the research [18]. In addition, variability in how outcomes are defined and measured can make it difficult, or impossible, to synthesize and apply the results of different research studies. For example, a survey of 10,000 controlled trials involving people with schizophrenia found that 2194 different

measurement scales had been used [19]. Similar experiences have occurred in studies of animal welfare, animal health, and food security [20-22]. The problem arising from this is obvious. If everyone creates their own outcome of A2VC, then there is no comparison to determine if the findings are consistent. This leads to enormous research wastage. Indeed, inconsistent outcomes are a major driver of research wastage[23].

One of the effective proposed solutions is identifying core outcome sets for a topic. The COMET Initiative (https://www.comet-initiative.org) defines a core outcome set (COS) as an agreed-upon standard set of outcomes that should be measured and reported, as a minimum, in all studies of a specific health condition or intervention [15]. A COS can be developed through a rigorous consensus-building process, which involves key stakeholders, including patients, healthcare professionals, researchers, and policymakers. The idea behind a COS is to reduce heterogeneity in outcome selection, measurement, and reporting in clinical trials and other research studies, which can improve the comparability of findings across studies and ultimately help to advance clinical practice and health policy decisions.

*Figure 2: Two simplified directed acyclic graph (DAG) describing the hypothesized role of measures of access to veterinary care at individual (**Panel A**) and ecological levels (**Panel B**) in veterinary research as an outcome and an explanatory variable (NB the variables listed as risk factors and consequences are not exhaustive, and this DAG is not intended to represent a completed hypothesized causal pathway model*



The use of a COS can help researchers by promoting consistency and standardization in outcome selection, measurement, and reporting, which can improve the quality and utility of research findings. With a COS, researchers can be assured that the measured outcomes are important to key stakeholders and are consistent with best practices in the field. Furthermore, a COS can facilitate the pooling of data from multiple studies, which can increase statistical power and provide more precise estimates of treatment effects. Overall, a COS can improve the relevance, efficiency, and transparency of research and ultimately lead to better health outcomes for patients.

Therefore, this project has several aims. 1st, The primary aim is to understand how the variable A2VC is measured by veterinary researchers. The secondary aims are to understand what variables are causes of and consequence of A2VC. By evaluating the A2VC metrics measured and the dimensions of access to care measured, the project seeks to identify the metrics used in prior research and evaluate their effectiveness but also to consider the meaning and implications of these metrics for access to care. Once this analysis is complete, researchers and the community can come together to decide upon a standardized set of outcomes that reflects what is important for access to veterinary care, i.e. **"What is the needle we are trying to move"** This approach is essential for responsible

research, particularly in the context of an emerging field where metrics may have been developed based on data availability rather than consultation with the wider community

Objectives

This research area reflects its broader mission to promote equitable access to veterinary care, and its efforts will help drive progress toward this important goal. **With this broader goal in mind, the objectives of this scoping review are to catalog the definitions of the variable A2VC used by researchers, metrics used as risk factors for A2VC, and consequences of A2VC at the individual and group (ecological) level. Further, we will map the risk factors to the characteristics into five A's of access to veterinary care: affordability, availability, accessibility, accommodation, and acceptability.**
With this information, we will be able to conduct a consultative project with experts and community members to capture opinions about the dimension of A2VC captured by the metric and value (high value/ low value), mutable and immutable consequence, and individual and group level metric of impact. We will then develop a proposal for a core set of outcomes and definitions and dimensions for use by future researchers and purposely design studies that assess the impact of interventions to access these issues.

Eligibility criteria

Eligible population: Companion animal (dogs, cats, pocket pets, equids, or any other companion animal) populations (including free-roaming/unowned/stray). We will not translate studies, therefore the language will be restricted to English. Animals that are involved in commercial enterprises are not eligible.
Eligible study designs: As shown in Figure 2, one type of studies that are relevant to the scoping review can be asking about the consequences of A2VC. Using the vernacular of reviews, these studies would be asking a PICO (population, intervention, comparison, outcomes) question. The other type of relevant study is researching risk factors for A2VC, which is a PECO (population, exposure, comparison, outcomes) question in review vernacular. Therefore, studies that use A2VC as an outcome of risk factors or that use A2VC as an explanatory variable for the consequence of A2VC are eligible. These studies will be either comparative observational studies (cross-sectional, cohort or case-control) and trials or quasi-experiments (before-and- after trials). Single-group studies and ecological studies are also eligible. Reviews are not eligible.

Information sources:

A literature search will be conducted in a range of relevant bibliographic databases and other information sources containing both published and unpublished (gray) literature. We will search PubMed and CAB Abstracts in the MSU Web of Science interface. In addition, a hand-search of the table of contents of the following relevant conference proceedings from the previous three years if the research reports are >500 words: If publicly available, we will search

- ASPCA and U of MN put on an Access to veterinary care conference
- ASPCA Maddie's shelter medicine conference (https://www.vet.cornell.edu/aspca-cornell-maddies-shelter-medicine-conference)

- We will use the report from the veterinary care symposium in 2019 hosted by the U of Tenn and Dr. Blackwell's research group: https://pphe.utk.edu/wp-content/uploads/2020/09/avcc-report.pdf
- Animal care expo - https://humanepro.org/expo
- Best friends national conference
- https://www.humananimalsupportservices.org/

We will also search the citations lists of relevant studies using a Citation chaser and export references into Distiller. We will also search for possible relevant studies that have cited the studies that pass level 2 screening https://estech.shinyapps.io/citationchaser/. We will use the de-duplication system is SRdistiller.

Search:

The search will include two concepts 1) the population and 2) measures of A2VC in PubMed will be in Table 1

Table 1: Search strings used in PubMed (MSU library interface) date 30th June 2023

String	Number of hits
#1 AND #2	706
(("animals"[MeSH Terms:noexp] OR "animal"[All Fields] OR ("horse s"[All Fields] OR "horses"[MeSH Terms] OR "horses"[All Fields] OR "horse"[All Fields]) OR ("rabbit s"[All Fields] OR "rabbits"[MeSH Terms] OR "rabbits"[All Fields] OR "rabbit"[All Fields]) OR ("ferrets"[MeSH Terms] OR "ferrets"[All Fields] OR "ferret"[All Fields]) OR "guinea pig"[All Fields] OR ("veterinary"[MeSH Subheading] OR "veterinary"[All Fields]) OR "cat"[All Fields] OR ("dogs"[MeSH Terms] OR "dogs"[All Fields] OR "dog"[All Fields]) OR ("pet"[All Fields] AND "Or"[All Fields])) AND "companion animal"[All Fields]) OR ("canine s"[All Fields] OR "dogs"[MeSH Terms] OR "dogs"[All Fields] OR "canine"[All Fields] OR "canines"[All Fields]) OR ("cats"[MeSH Terms] OR "cats"[All Fields] OR "felines"[All Fields] OR "felidae"[MeSH Terms] OR "felidae"[All Fields] OR "feline"[All Fields]) OR "pony"[All Fields] OR ("donkey s"[All Fields] OR "equidae"[MeSH Terms] OR "equidae"[All Fields] OR "donkey"[All Fields] OR "donkeys"[All Fields]) OR ("ponies"[All Fields] AND "Or"[All Fields] AND ("equidae"[MeSH Terms] OR "equidae"[All Fields] OR "mule"[All Fields]))	587,282
"access to veterinary care"[Title/Abstract] OR "access to care"[Title/Abstract] OR "low income"[Title/Abstract] OR "underserved"[Title/Abstract] OR "Unserved"[Title/Abstract] OR "socioeconomic"[Title/Abstract]	231,146

Table 2: Search strings used in CABI abstracts from Web of Science (MSU library interface)

#1: TI=(("veterinary deserts" OR "access to veterinary care" OR "access to care" OR "low income" OR underserved OR Unserved OR socioeconomic))
#2: AB=("veterinary deserts" OR "access to veterinary care" OR "access to care" OR "low income" OR underserved OR Unserved OR socioeconomic)

#3: #1 OR #2
#4 TS=(Animal OR horse OR rabbit OR ferret OR "guinea pig" OR veterinary OR cat OR dog OR pet Or "companion animal" OR canine OR feline OR mule OR donkey)
#3 AND #4

Selection of sources of evidence:

Search results will be downloaded in a tagged format into bibliographic software as RIS files. Separate files will be available for PubMed and CABI search. These files will be imported into online systematic review software (DistillerSR®, Ottawa, ON, Canada) and de-duplicated. Before both abstract and full-text screenings, data extraction, the reviewers assigned to each step will undergo training to ensure consistent data collection using forms created in DistillerSR®.

Selection process: In the first round of screening, abstracts, and titles will be screened for inclusion using the eligibility criteria, which is reflected by the screening question. Two reviewers will independently evaluate each citation for relevance using the following screening questions:

1. Does the study describe a primary research study that either assesses risk factors for, or consequences of, any metric of access to veterinary care in companion animals?
    - Yes – include for full-text evaluation.
    - Unclear - include for full-text evaluation.
    - No – exclude with no further review.
    - No, but this looks like a potentially relevant review – exclude with no further review

Citations will be excluded if both reviewers respond “no” to the screening question. If both reviewers say "yes", the citation will move to full-text assessment. All conflicts will be resolved prior to exclusion. A pre-test will be conducted by all reviewers on the first 185 abstracts to ensure clarity of questions and consistency of understanding of the questions. For all citations that are retained after title/abstract screening, eligibility will be assessed through full-text screening. The review team members will obtain the full text from MSU library. Two reviewers will independently evaluate the full-text articles, with any disagreements resolved by consensus. If a consensus cannot be reached, a third reviewer will be consulted.

1. Is the full text available?
    Yes – proceed to Q2
    No – exclude with no further review
2. Is the full text in English?
    Yes – proceed to Q3
    No (specify language) – exclude with no further review

3. Is the study about access to veterinary care for companion animals (including unowned/stray/free-roaming)?
   Yes – proceed to Q4
   No – exclude with no further review
4. At what level does the access to veterinary care metric apply?
   Individual – proceed to Q5
   Household (e.g., distance to a veterinary clinic) – proceed to Q5
   Postal Code (e.g., number of veterinary clinics in the postal code) – proceed to Q5
   City/County/State/Province (e.g., number of veterinary practices in the state) – proceed to Q5
   Other (e.g., vet clinic employees) (specify) – exclude with no further review

5. Correct design. Is the study design of interest?
   - ☐ The study compares risk factors that impact A2VC – proceed to data extraction
   - ☐ The study compares the consequences of A2VC – proceed to data extraction
   - ☐ The study is a relevant review article – exclude with no further review
   - ☐ None of the above – exclude with no further review

The full-text screening form will be pre-tested on one reference by all reviewers.

Data items extracted.

For all studies, we will extract the following.

- Type of study population:
  - Individual/household
  - Ecological – e.g. postcode, zip code , county, parish, state, provinces,
- The population studied: Authors' definition of population.
- The country
- The year of conduct
- The author's definition of A2VC. These will be the extracted text so that the exact text definition can be text-matched between reviewers using the software. Extract the entire sentence for definition in text and extract the entire phrase for A2VC metric in tables. If the same is A2VC variable is in both places extract only the most complete definition.
- Study type: Risk factors and/or consequences of A2VC. NB some authors may not differentiate between the consequences or risk factors in models or follow a directed acyclic graph. So this factor will be driven by the model used, i.e., is the outcome A2VC, or is A2VC the explanatory variable?
- For risk factors studies, we will extract all risk factor measures assessed. Use the same approach to extracting the risk factors.
- For risk individual factors, we will also extract if the risk factors are measured self-reported. For example, if a survey was conducted and survey respondents were asked to provide their income, this would be self-reported. However, if instead the survey was conducted, and respondents were asked to indicate their location, and then

government-based metrics of income based on the census tract were used to "assign" that individual or household an income – that would not be self-reported.

- For risk factor variables, the reviewer will assign one of the dimensions of access to care: affordability, availability, accessibility, accommodation, and acceptability.
- For consequence studies, we will extract all the consequences reported on animals and people. Use the same approach to extracting the A2VC metrics.
- For consequences studies, we will map if the consequence is animal or human-related. For example, if the consequence is changes in the number of dogs/cats spayed or neutered, this is an animal metric. However, if the study modifies a metric of A2VC and measures the number of veterinary visits in the subsequent year – this is a human-level outcome.

Proposed critical appraisal of individual sources of evidence:

We will not critically appraise the studies identified.

Proposed synthesis of results:

The results will be summarized from frequency and an evidence map created, if applicable, using R shiny software. The discussions and next steps commentary on the implications of the findings will be created in consultation with the collaborator.

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Campbell Collaboration checklist for evidence and gap maps: Conduct standards
Title and protocol checklist
Developed by Howard White, Vivian Welch, Terri Pigott, Zack Marshall, Birte Snilstveit, Christine Mathew and Julia Littell
DRAFT Version 1.2 (11 April 2018)

Note for authors: This document provides a detailed checklist for title registration form and protocol for Campbell evidence and gap maps (EGMs).
Status:
Mandatory means that a new title or protocol will not be published if this standard is not met.
Highly desirable means that this should generally be done but that there are justifiable exceptions. There may be legitimate variation between or within Campbell Coordinating Groups in the relative emphasis placed on compliance with highly desirable standards. The emphasis placed on compliance with highly desirable standards will remain at the discretion of each Campbell Coordinating Group.
Optional means this is done at the authors' discretion.
T= Title registration form
P= Protocol

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP1	Mandatory (T & P)	Formulating scope	Ensure that the topic and scope is important to stakeholders, and report the process for formulating the scope of the EGM.	Campbell EGMs are intended to support research prioritization, not just scientific curiosity. The needs of stakeholders play a critical role in Campbell EGMs and these stakeholders should play an important role in defining the scope of the EGM. The protocol should report the role of stakeholders in defining the scope of the EGM. Where enabled by a formal Advisory Group, authors should indicate who the members are and the process by which meetings are held (time, frequency, and mechanism).	ER15
EP2	Mandatory (T & P)	Pre-defining objectives	Define in advance the objectives of the EGM, including the types of evidence and research questions which will and will not be covered.	Objectives stating the EGM focus must be clear before appropriate eligibility criteria can be developed.	ER18

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP3	Mandatory (P)	Pre-defining framework	Define in advance the dimensions (e.g. intervention and outcome categories and sub-categories) to be used as the framework for the EGM.	Campbell EGM's are presented in a matrix framework with dimensions. Intervention and outcome categories and sub categories are common. This framework should be defined with reference to key strategy documents and stakeholder consultation. In practice, there will be some iteration to finalize the framework based on analysis of initial included studies. The framework will inform the inclusion and exclusion criteria of the EGM. Therefore it will be critical for authors to adequately define the population, interventions and outcomes, depending on the scope.	ER18

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP4	Mandatory (P)	Pre-defining unambiguous criteria for the eligible population	Define in advance the eligibility criteria for participants in the studies.	Pre-defined, unambiguous eligibility criteria are a fundamental pre-requisite for an EGM. The criteria for considering types of people included in studies in an EGM should be sufficiently broad to encompass the likely diversity of studies. Considerations when specifying participants include setting, age, identifying personal characteristics, demographic factors, and other factors that differentiate the participants. Any restrictions to study populations must be based on a sound rationale, since it is important that Campbell EGMs are widely relevant.	ER23

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP5	Highly desirable (P)	Pre-defining a strategy for studies with a subset of eligible participants	Authors define in advance how to handle studies in which only a subset of the sample is eligible for inclusion in the map.	Sometimes a study includes some 'eligible' participants and some 'ineligible' participants, for example when an age cut-off is used in the study's eligibility criteria. In case data from the eligible participants is not reported separately, a mechanism for dealing with this situation should be pre-specified.	ER23
EP6	Highly desirable (P)	Considering equity and specific populations	Consider in advance whether issues of equity and relevance of evidence to specific populations are important, and plan for appropriate methods to include them if they are. Attention should be paid to the relevance of the topic to populations such as low socioeconomic groups, low or middle-income regions, women, children, people with disabilities, and older people.	Where possible EGMs should be coded to allow identification of studies reporting evidence on equity or for specific sub-groups.	
EP7	Mandatory (P)	Pre-defining unambiguous criteria for interventions	Define in advance the eligible interventions.	Pre-defined, unambiguous eligibility criteria are a fundamental pre-requisite for an EGM.	ER24

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP8	Mandatory (P)	Pre-defining a strategy for studies with a subset of eligible interventions	Authors define in advance how to handle studies in which only a subset of the interventions covered by the study are eligible for inclusion in the map.	A single study may cover multiple interventions, some of which may not be eligible. In case data from the eligible interventions is not reported separately, a mechanism for dealing with this situation should be pre-specified.	ER24
EP9	Mandatory (P)	Clarifying role of outcomes	Define in advance the outcomes, if any, which will be used for inclusion criteria.	Outcome measures need not always form part of the criteria for including studies in an EGM. However, some EGMS do legitimately restrict eligibility to specific outcomes. If authors do exclude studies on the basis of outcomes, care should be taken to ascertain that relevant outcomes are not available because they have not been measured rather than simply not reported.	ER25
EP10	Mandatory (P)	Considering potential adverse outcomes	Consider any important potential adverse and unintended outcomes of the intervention(s) and ensure that they are included in the EGM.	It is important that adverse and unintended outcomes are included if applicable in order to avoid one-sided summaries of the evidence.	

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP11	Mandatory (P)	Pre-defining types of evidence	Define in advance the eligibility criteria for types of evidence in a clear and unambiguous way.	Different types of evidence may be shown in an EGM. While EGMs typically present evidence of effectiveness, they can also include both quantitative and qualitative evidence. Specify which of the outcomes will be addressed using each type of evidence.	ER19

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP12	Mandatory (P)	Pre-defining inclusion criteria for different types of evidence	Define in advance the eligibility criteria for including different study designs in a clear and unambiguous way, with a focus on features of a study's design rather than design labels.	Pre-defined, unambiguous eligibility criteria are a fundamental pre-requisite for an EGM. Some labels commonly used to define study designs can be ambiguous. For example, a "double blind" study may not make it clear who is blind; a "case control" study may be nested within a cohort, or be undertaken in a cross-sectional manner; or a "prospective" study may have only some features defined or undertaken prospectively. If qualitative research will be included in this EGM, briefly describe the study design that will be included.	ER19 ER21

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP13	Mandatory (P)	Justifying choice of study designs	Justify the choice of eligible study designs.	The particular study designs included should be justified with regard to appropriateness to scope of the EGM and with regard to potential for bias.	
EP14	Mandatory (P)	Including studies regardless of publication status	Include studies irrespective of their publication status, and their electronic availability.	Obtaining and including data from unpublished studies (including grey literature) can reduce the effects of publication bias.	ER22
EP15	Mandatory (P)	Including on-going studies	Include on-going studies	EGMs are most commonly used to inform research decisions. It is mandatory that on-going research is included.	
EP16	Highly desirable (P)	Pre-define a decision rule for uncompleted studies.	State a decision rule for the inclusion of on-going studies for which there is uncertainty as to whether they will be completed.	Not all registered studies are completed. It may be possible to determine where this is so, and exclude those studies, or a registration cut-off date may be used, before which on-going studies are not included.	

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP17	Mandatory (P)	Pre-defining outcome domains and sub-domains	Define the outcome domains and sub-domains, defining the outcomes and identifying the range of outcomes included in each.	EGMs are typically broad in scope, covering a wide range of outcomes. At a minimum main outcome domains should be defined, and as with interventions, doing so in consultation with stakeholders and using commonly accepted definitions if they exist.	ER26

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP18	Mandatory (P)	Designing and ensuring comprehensive search strategy	Plan in advance the methods to be used for identifying studies. Refer to “Searching for Studies” in the Campbell information retrieval guide to ensure that all relevant databases have been properly searched. Ensure that the search includes appropriate national, regional, and subject specific bibliographic databases.	Searches should be informed by the eligibility criteria for the EGM and it is important to consider all types of eligible studies when developing the strategy. Searches should be systematic and cover a broad range of literature, keeping in mind that they cannot always be as comprehensive as a systematic review because of the broad scope. Ensure the search strategy is sufficiently broad to not miss any bodies of literature. There is no minimum set of databases to search, but authors should consider consulting with a research retrieval specialist to avoid unnecessary duplication of effort.	ER27

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP19	Mandatory (if applicable) (P)	Searching for different types of evidence	If the EGM has specific eligibility criteria around study design to address adverse effects, economic issues, or qualitative research questions, undertake searches to address them.	Sometimes different searches will be conducted for different types of evidence, such as for non-randomized studies for addressing adverse effects, or for economic evaluation studies.	ER27 ER30
EP20	Mandatory (if applicable) (P)	Searching primary study and systematic review registers	When relevant, search trials and systematic registers and repositories of results.	To include on-going studies the search strategy needs to include registries for primary studies (e.g. clinicaltrials.gov, 3ie RIDIE) and systematic reviews and systematic reviews.	ER27
EP21	Mandatory (P)	Searching for grey literature	Search relevant grey literature sources such as reports/dissertations/theses databases and databases of conference abstracts.	Searches for studies should be as extensive as possible to reduce the risk of publication bias and to identify as much relevant evidence as possible.	ER27
EP22	Mandatory (P)	Searching within reviews, other maps and reference lists	Search within reviews and other maps on the same or similar topic. Check reference lists in included studies, systematic reviews and maps identified.	Searches for studies should be as extensive as possible to reduce the risk of publication bias and to identify as much relevant evidence as possible.	ER27 ER31

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP23	Highly desirable (P)	Searching by contacting relevant individuals and organizations	Contact relevant individuals and organizations for information about unpublished or ongoing studies.	Searches for studies should be as extensive as possible to reduce the risk of publication bias and to identify as much relevant evidence as possible. It is important to identify ongoing studies, so that when an EGM is later updated these can be assessed for possible inclusion.	ER27 ER35

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP24	Mandatory (P)	Restricting database searches	Justify the use of any restrictions in the search strategy on publication date, publication format, or language.	Date restrictions in the search should only be used when there are date restrictions in the eligibility criteria for studies. They should be applied only if it is known that relevant studies could only have been reported during a specific time period, for example, if the intervention was only available after a certain time point. Searches for updates to EGMs might naturally be restricted by date of entry into the database (rather than date of publication) to avoid duplication of effort. Publication format restrictions (e.g. exclusion of letters) should generally not be used in Campbell EGMs, since any information about an eligible study may be of value.	ER29

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP25	Mandatory (P)	Planning the assessment of risk of bias, study quality or confidence in the included studies	Plan in advance the methods to be used for assessing risk of bias, study quality or confidence in included studies, including the tool(s) or codes to be used, how the tool(s) or codes will be implemented, and the criteria used to assign studies to risk of bias or quality categories (at outcome- and/or study-level), for example, low risk, high risk, and unclear risk of bias; low quality or high quality.	Pre-defining the methods and criteria for assessing risk of bias/study quality is important because analysis or interpretation of the EGM may be affected by the judgments made during this process. Assessment of quality of systematic reviews is mandatory. Assessment of primary studies such as randomized trials is optional (the Cochrane risk of bias tool is a recommended option for RCTs).	ER37 ER44

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP26	Highly desirable (P)	Making inclusion decisions in duplicate	The preferred procedure is for at least two members of the EGM team to independently screen candidate studies and resolve discrepancies by consensus. Where large numbers of studies are involved, samples of the candidate studies might be drawn and rescreened to estimate the reliability of the inclusion decisions.	Duplicating the study selection process reduces both the risk of making mistakes and the possibility that selection is influenced by a single person's biases. The inclusion decisions should be based on the full texts of potentially eligible studies when possible, usually after an initial screen of titles and abstracts. It is desirable, *but not mandatory*, that two people undertake this initial screening, working independentl y.	ER33
EP27	Highly desirable (P)	Assessing risk of bias /study quality in duplicate	Use (at least) two people working independently to apply a risk of bias/study quality tool or coding scheme to each included study, and define in advance the process for resolving disagreements.	Duplicating risk of bias/study quality assessment/ coding reduces both the risk of making mistakes and the possibility that assessments are influenced by a single person's biases.	ER44-46

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP28	Mandatory (P)	Define the unit of analysis for primary studies	Define whether each item represents a report or a study, and what to do when there are multiple reports for a single study, or a report covers multiple studies. (A study is defined as analysis of a unique sample, which may include multiple time points for the same sample).	When multiple primary studies are reported in the same publication it is recommended that each study is represented in the map separately. When there are multiple reports of a single study (sample) these reports should be considered as a single study.	
EP29	Mandatory (P)	Define the study characteristics to be coded.	Define the study characteristics to be coded for use as filters or a study record.	EGMs should make additional information available to the reader including publication details, population sub group, country or region, and study design. The characteristics to be coded should be pre-defined.	

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP30	Mandatory (P)	Using data collection forms	Use a data extraction form, which has been piloted.	EGM team members often have different backgrounds and level of systematic review experience. Using a data collection form ensures some consistency in the process of data extraction, and is helpful if comparing data extracted in duplicate. The original data collection forms should be included in the protocol for the EGM. If the data collection forms are altered during pilot testing, the final data collection forms should be submitted in an appendix with the final report.	ER34

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP31	Highly desirable (P)	Extracting study characteristics in duplicate	The preferred procedure is for at least two members of the EGM team to independently code each study and resolve any discrepancies through discussion and consensus. Where large number of studies makes this procedure too demanding, random samples of the studies can be drawn and recoded by a different team member so that the reliability of the coding can be assessed and reported. The procedures planned for training coders and checking their accuracy before they begin providing data for the EGM should also be described along with the relevant background of those expected to do the coding.	Duplicating the data extraction process reduces both the risk of making mistakes and the possibility that data selection is influenced by a single person's biases. Dual data extraction is particularly important for outcome data, which feed directly into syntheses of the evidence and hence to conclusions of the EGM.	
EP32	Mandatory (P)	Describe the outline and framework for the report and map respectively	Describe the outline and framework for the report and map respectively, specifying the dimensions of the map and sections, tables and figures to be included in the report	The EGM has multiple dimensions, captured in the axes, features of the bubbles, and filters. These should be described. The protocol should describe planned descriptive analysis and presentation for the descriptive report.	

Item No.	Status	Item Name	Standard	Rationale and elaboration	Reporting Standard Item No.
EP33	Mandatory (P)	Describe how all dimensions in the map will be represented	In addition to the two main dimensions of the map axes (often interventions and outcomes), other dimensions can include: (1) number of primary studies or included studies in a review can be shown by the size of the bubble, (2) critical appraisal shown by colour of the bubble, and (3) filters for the evidence shown.	It should be described how the different dimensions will be captured in the map.	

dag {

bb="0,0,1,1"

"Access to veterinary care concept" [pos="0.452,0.378"]

"Language differences between owner and veterinary team" [pos="0.248,0.193"]

"Selection of lower levels of care options in cat or dog" [pos="0.727,0.577"]

"distress in owners" [pos="0.734,0.085"]

"impaired mobility of owner" [pos="0.171,0.392"]

"increased reproduction in cat or dog" [pos="0.750,0.373"]

"increased risk of preventive diseases in cat or dog" [pos="0.746,0.211"]

"low income of owner" [pos="0.184,0.554"]

"Access to veterinary care concept" -> "Selection of lower levels of care options in cat or dog"

"Access to veterinary care concept" -> "distress in owners"

"Access to veterinary care concept" -> "increased reproduction in cat or dog"

"Access to veterinary care concept" -> "increased risk of preventive diseases in cat or dog"

"Language differences between owner and veterinary team" -> "Access to veterinary care concept"

"impaired mobility of owner" -> "Access to veterinary care concept"

"low income of owner" -> "Access to veterinary care concept"

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