Protocol of consensus study for development, dissemination and implementation of a Swedish perinatal Core Outcome Set for management of labour and delivery at or near term (SpeCOS)

Abstract

Background

Choice of outcome measures is a key issue for design of clinical studies and for clinical practice. Outcomes in obstetric studies vary largely which complicates their comparison, analysis, and clinical implementation. Severe perinatal morbidity is rare and its long-term effects on children's health and future development is not always clearly known. Many studies, including observational and randomized clinical trials, have been criticized for the choice of surrogate outcomes without actual clinical importance or a combined perinatal outcome with a disproportionally high weight of less relevant outcomes, which impairs validity and reliability of the studies. It is also difficult to compare healthcare between obstetric units and follow their development over time if different measurements are used. It would be desirable to obtain a national perinatal Core Outcome Set (COS) to be used in research, audit, and comparison between hospitals within birth care.

Methods

A Swedish national steering group, including clinicians, researchers, and patient representatives, has been established to oversee the development of this COS. The methods will be guided by the Core Outcome Measures in Effectiveness Trials Initiative Handbook. Perinatal core outcomes will be developed by undertaking a systematic review of studies evaluating interventions for peripartum management at or near-term including decisions regarding timing and type of onset of labour, intrapartum care, and mode of delivery. The list of potential outcomes will be entered into a two-round Delphi survey. A consensus meeting will be held to reach a final agreement. Key stakeholders including clinical professionals, researchers, and lay experts will be invited to participate. Once core outcomes have been agreed, standardized definitions and recommended measurement instruments for each outcome will be established.

Discussion

The aim of development and implementation of a Swedish perinatal COS is to ensure that perinatal outcomes reported in obstetric research, audit, intra- and interhospital comparison will be selected, collected, and reported in a standardized way. This would improve obstetric research including production, uptake, implementation, and adherence, as well as clinical practice, audit, comparison, and quality assurance in health care.

Trial registration

Core Outcome Measures in Effectiveness Trials (COMET) registration number: 1593, registered 2nd July 2020, https://www.cometinitiative.org/Studies/Details/1593

International Prospective Register of Systematic Reviews (PROSPERO) registration number: 212954, registered 6th November 2020, https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=212954

Background

Almost 140 million children are born yearly in the world, of which 120 000 in Sweden. Childbirth is one of the most important events in an individual's and families' lives. While it is a physiological process and a majority of births are uncomplicated, there is also an acknowledged potential of important adverse outcomes. Severe perinatal morbidity in developed countries is rare, its definition is not standardized, and long-term consequences for the future health and development of the child is not always completely understood. Regardless specific background condition, clinical question or healthcare setting, the goal of good management of labour and delivery is universal and includes health, safety, and well-being of the mother and her child, as well as a positive childbirth experience, while avoiding unnecessary interventions, unwarranted anxiety, and waste of resources.

Management of labour and delivery at or near term includes a large amount of decisions, often made on an uncertain basis with suboptimal evidence, related among others to timing of delivery, type of labour onset (spontaneous, delivery induction or planned caesarean section), a variety of questions regarding intrapartum care (for example foetal surveillance, support

during labour, pain management, umbilical cord clamping, etc.), and mode of delivery (caesarean section or spontaneous or operative vaginal delivery). Choice of perinatal outcomes and their measurability is crucial for assessment and improvement of quality of care and research within the area.

Unwarranted variations in pregnancy outcomes reported for different conditions or clinical situations in obstetrics and neonatology are widely discussed (1 – 5). Many clinical studies in general and within children's and women's health in particular have been criticized for the choice of surrogate outcomes without actual clinical importance or a combined perinatal outcome with disproportionally high weight of less relevant outcomes, which impairs validity and reliability of the studies (6 – 14). It is also difficult to compare obstetric healthcare between different units and follow their development over time if different measurements are used. Moreover, women's perspective on their conditions can differ from clinicians', and the research often fails to focus on family-centred, patient-important outcomes (15, 16).

A potential way to improve the situation is the development of Core Outcome Sets (COS) (17, 18). COS are agreed, clearly defined minimum sets of outcomes that can be measured in a standardized manner and reported consistently (19). The necessity of COS in obstetrics and neonatology is stated by editors of about 80 journals on women's health that have started an initiative to support their development, dissemination, and implementation, the Core Outcomes in Women's and Newborn's Health Initiative (CROWN initiative) (20, 21). The Core Outcome Measures in Effectiveness Trials Initiative (COMET) database is established in order to register and coordinate COS development in effectivity trials.

There are some important and interesting studies recently completed or in progress, developing specific standardized outcome sets for a variety of conditions or complications within the area of pregnancy and childbirth, for instance for preeclampsia, intrauterine growth restriction, postpartum haemorrhage, and postpartum depression (22 – 31). However, to our knowledge there is no general COS study, completed or ongoing, focused on short-term perinatal outcomes for management of labour and delivery at or near term, despite the demand by researchers and clinicians (32). We found it highly desirable to obtain such a COS to be used both in research, audit, and comparison between hospitals within birth care. As it is very important to keep the process robust, transparent, and inclusive, we plan to conduct this national study in Sweden, inviting all relevant stakeholders including researchers,

representatives for every obstetric and neonatological unit in the country, representatives for the national quality registers, and lay experts.

Objective

Given the importance of childbirth for the life of infants and their families, the broad spectrum of clinical decisions to be made related to labour management, the high proportion of health care resources and research dedicated to this field, there is an obvious need for a robust set of outcomes that allow research analysis and uptake, combination of data, clinical follow up, comparison, and audit. The large variation in the reported outcomes and use of surrogate outcomes or poorly designed combined outcomes are limiting the reliability and implementation of research and obstruct the improvement of clinical practice (17, 20). Our objective is to develop, disseminate, and implement a COS for short-term perinatal (newborn) outcomes for management of labour at or near term, including decisions on timing of delivery, type of labour onset, mode of delivery, and intrapartum interventions. This COS could be included in national quality registers to improve quality of research and audit. In order to enable a broad inclusion of relevant stakeholders and increase adherence to the resulting recommendations, we plan a national study in Sweden, while supporting international collaboration and dissemination.

Methods

The study is planned according to the COMET Initiative Handbook (19). Our study protocol is influenced by published protocols for other core outcome set development studies on women's and newborn health, as well as by Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) Guidelines (33 – 40).

This protocol is reported according to Core Outcome Set-STAndardised Protocol Items according to the COS-STAP Statement, recommended by Enhancing the Quality and Transparency Of Health Research (EQUATOR) Network. (Appendix 1, Table 1) (41). The flow chart for development of our COS is shown in Fig. 1 below.

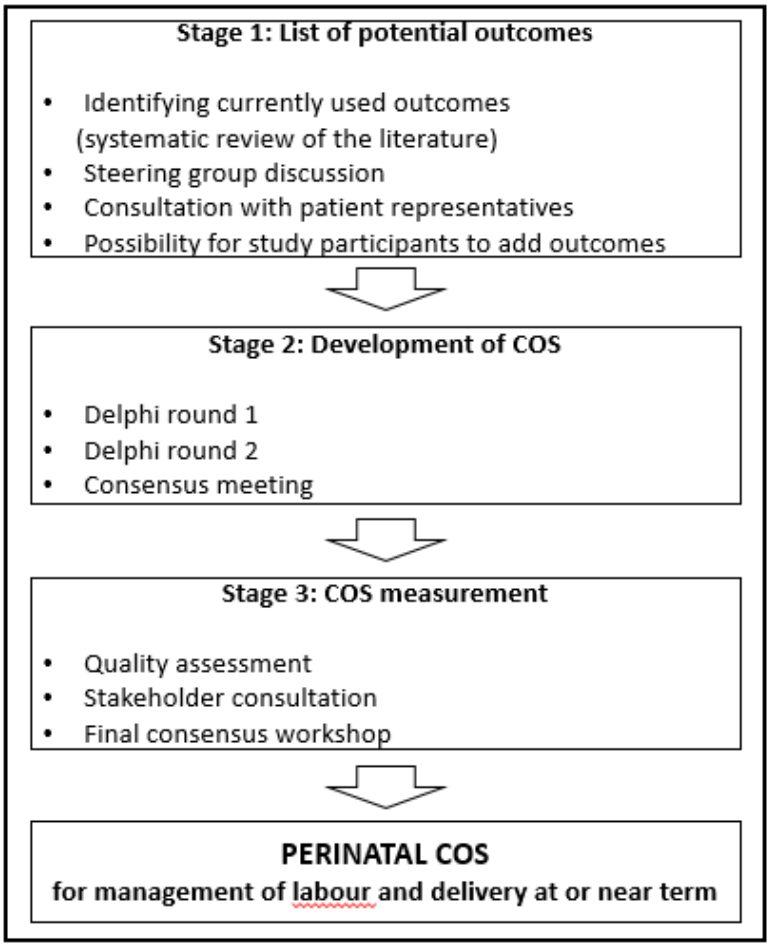

Figure 1. Flow chart for developing of perinatal core outcome set (COS)

Prospective registration

This study has been registered with the Core Outcome Measures in Effectiveness Trials (COMET) Initiative (registration number: 1593) and the systematic review which is part of this study has been submitted to the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: 212954).

Steering group and participants

A national steering group, including obstetricians and neonatologists from Swedish Perinatal Working and Reference Group (Perinatal-ARG), the Swedish Pregnancy Register and Swedish network for national clinical studies in obstetrics and gynaecology, as well as midwives and patient representatives, has been formed to organise the study, agree about objective and methods, and to invite relevant stakeholders. Clinicians from all Swedish labour wards and neonatological units, researchers, medical journal editors, and national quality

register holders, as well as lay women with experience of giving birth will be invited to participate in development of this COS.

Scope of the core outcome set

This COS will apply to short-term perinatal outcomes for management of labour at or near term, including decisions on timing of delivery, type of labour onset (induction, planned caesarean section or expectant management), mode of delivery (caesarean, vaginal instrumental or non-instrumental), intrapartum interventions (for example, but not limited to augmentation of labour, foetal surveillance, patient support, pain management or umbilical cord clamping). We define "short-term perinatal outcomes" as foetal outcomes or outcomes for newborns within 28 completed days after birth. This COS will not be limited by specific condition or pregnancy complication, foetal presentation, singleton or multiple pregnancy, type of intervention or obstetric setting. We are not seeking to reach consensus on the standardization of the definition of labour onset, normal labour progress, outcomes for preterm delivery (before 34 gestational weeks), maternal or long-term infant outcomes.

Identifying currently used outcomes

We will conduct a systematic review to identify potential perinatal core outcomes. Given the broad field of labour and delivery management and a huge amount of studies within the area, we have chosen to limit our search to the highest quality evidence with the strongest impact on clinical practice and assess Cochrane reviews related to term labour management.

We will search the Cochrane Database of Systematic Reviews (CDSR) with the combination of free-text words and standardized subject terms (controlled vocabulary) and browse by topic and by Cochrane review group.

Cochrane systematic reviews focused on management of labour and delivery at or near term (from 34 gestational weeks), including choice of timing of delivery, onset of labour (induction of labour, planned caesarean section or spontaneous onset i.e. expectant management), mode of delivery (caesarean section, operative or spontaneous vaginal delivery), and intrapartum interventions, will be included. Reviews focused on prenatal care, postnatal interventions, preterm deliveries before 34 gestational weeks or those not reporting perinatal outcomes will be excluded. No date or language limits will be applied.

All reviews identified in the search will be screened based on title and abstract. Screening will be performed by two reviewers independently and any discrepancies resolved by discussion or by a third reviewer if needed. The full-text article will be reviewed for all Cochrane reviews meeting the inclusion criteria and those where this cannot be determined from the abstract alone. Data on all reported perinatal outcomes from each included publication will be collected and reported using a specifically developed pilot-tested Data Extraction Form.

We will report the systematic review with reference to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions (42).

Determining core outcomes by Delphi process

All outcomes identified as described above will be reviewed, combined, and discussed by the steering group in order to organise the final outcome list and make it comprehensive and clear. The wording of the outcomes will be discussed with the patient representatives. We aim to include a maximum of the 120 most frequently reported outcomes in the final outcome list to make further evaluation feasible. The final list will be entered into the two-round Delphi survey.

The core outcomes will be determined by using a Delphi survey which is an established method for achieving a consensus on a specific subject by collecting opinions from respondents with expert knowledge of that particular subject using a series of questionnaires (43, 44).

Representatives of all relevant stakeholders as described above will be invited to participate. Recruitment will be facilitated by national professional organizations and patient organizations, including the Swedish Neonatal Society (Svensk Neonatalförening), the Swedish Society of Obstetrics and Gynecology (SFOG), the Swedish network for national clinical studies in Obstetrics and Gynecology (SNAKS), the Swedish Association of Midwives (Barnmorskeförbundet), and the Swedish Infant Death Foundation (Spädbarnsfonden). Potential participants will receive information about the study objectives and Delphi survey instructions written in plain language as well as the list of potential outcomes identified by the systematic review. We plan to invite about 150 participants.

When participants register to complete the survey, they will complete a questionnaire regarding their profile including stakeholder group(s) they identify with, age, place of birth, and information about their professional and/or personal experience of childbirth, in order to enable analysis of the impact of this parameters on the survey results. They will also get a possibility to suggest additional outcomes that are missing in the received list. To prevent the missing data, non-responders will get a reminder. Participants who do not complete the Delphi survey will be asked about reasons for that. Differences between the stakeholder groups are going to be identified, analyses, and discussed. Only core members of the steering group will have access to the study dataset. We plan to conduct the Delphi process online and manage it using DelphiManager software developed by the COMET Initiative.

All participants will be invited to register with the online survey and will be allocated a unique identifier to enable anonymization of their responses. They will be asked to rate individual outcomes numerically according to their importance which was recommended among others by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group to facilitate the ranking of outcomes according to their importance and has been adopted widely by COS developers (45, 46). We plan to use a 5-point Likert scale anchored between one ("not at all important") and five ("extremely important"),

Outcomes rated as very or extremely important (4-5 Likert scale) by more than 70% of responders and rated as not at all important or slightly important (1-2 Likert scale) by less than 15% of responders will be included to the COS ("consensus in"). Outcomes rated as not at all important, slightly or moderately important (1-3 Likert scale) by more than 50% responders and rated as very or extremely important (4-5 Likert scale) by less than 15% responders will be excluded from the list of potential outcomes ("consensus out"). Remaining outcomes will be included into the second round of the Delphi-survey.

Participants will receive a reminder regarding their own scores and feedback about median score for all participants and for each stakeholder group for each outcome from the first round. Participants will be invited to reflect and rescore individual outcomes and will be able to comment their scores and to propose any new outcome or to re-propose an excluded outcome into the second-round list. The same 5-point Likert scale and the same procedure as described above for "consensus in" and "consensus out" will be applied in the second round of the Delphi-survey. Feedback after the second round will be sent to participants.

Consensus meeting

The results of the Delphi survey will be discussed at a consensus development meeting including caregivers, researchers, lay persons with experience of childbirth, and other relevant stakeholders. Outcomes from all predefined domains will be considered, including all outcomes that were scored as very important (4-5) by 70% of at least one stakeholder group, those given the highest score in each domain, and those suggested by meeting participants. We aim to include a maximum of 30 outcomes for discussion at the meeting for pragmatic reasons. Participants will be able to leave their comments in advance and discuss any outcome upon request. The objective of the consensus development meeting will be to develop a final perinatal COS for management of labour at or near term. We deem 24 as a maximum reasonable number of outcomes to be included to this COS.

Determining core outcome measures

Once the decision is made on the perinatal COS, it will be necessary to determine the definition or measurement of each outcome. This will be achieved by a purposely organised workshop with the relevant stakeholders. Potential measurement instruments will be quality assessed using the Core Outcome Measures in Effectiveness Trials (COMET) and the Consensus-Based Standards for the Selection of Health Measurement Instruments (COSMIN) Initiative framework (47).

Dissemination and implementation

We will aim to describe and disseminate the Swedish perinatal COS through publication in peer-reviewed journals and presentation at relevant professional meetings and events and webpages, including the Swedish network for national clinical studies in obstetrics and gynaecology and SFOG. As we collaborate with Swedish national professional associations for obstetricians, neonatologists and midwives, and national quality registers (the Swedish Pregnancy Register and the Swedish Neonatal Quality Register), we plan to implement the COS through their informational channels and suggest its use in research, clinical practice, audit, and comparison. Study participants will be informed about the results of the study. We plan to start dissemination within the year after the completed study. By broad inclusion of all relevant stakeholders we hope to achieve adherence to the suggested perinatal COS in Sweden

and we also plan to disseminate our results internationally. We welcome international collaboration, are willing to share our experience, and support similar studies at other sites or at a larger level (Nordic, European or global). We will report the Swedish perinatal COS in line with the COS-STAR Statement (48).

Discussion

The importance of COS is widely acknowledged. Among others, the CROWN initiative, supported by about 80 medical journals, calls for development and implementation of COS within the area of women's and newborn's health (20, 21). Nationally, the Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) has pointed out the need of COS, in particular within labour management (32). Internationally, use of COS is recommended by The Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) Statement and supported by Cochrane Pregnancy and Childbirth Group and The National Institute for Health and Care Excellence (NICE) (20, 40).

Management of labour and delivery is a key issue within the field of obstetrics and the final point of care for the foetus that becomes a child in the moment of birth. The goal of intrapartum care is to make this transition as safe and smooth as possible, and at the same time avoid unnecessary interventions. Important short-term perinatal or newborn outcomes are mostly universal, regardless specific condition or intervention considered, even if some additional outcomes can reasonably be added for some clinical situations, as for example preterm delivery. Labour management at or near term includes a large amount of decision points. Development and implementation of COS are likely to be very helpful for the complex decision making on individual, clinical, and national level, for the design and uptake of clinical studies and systematic reviews, and for the development of clinical guidelines. Moving focus from surrogate outcomes to an agreed COS and including the patient perspective will hopefully improve not only quality of care but also families' experience of childbirth and care during labour and delivery.

A potential weakness of our study is the nation-wide design limited to Sweden only. Aware of this, we still chose to prioritize broad inclusion of the representatives for every obstetric and neonatological unit in the country which will hopefully increase understanding of the process, robustness of the results, and adherence to it among researchers, clinicians, and health care

organisers. To reach such representation would barely be feasible for a global consensus study, given the differences in labour management, health care systems, and obstetric culture between countries. However, we expect the results of our study to be applicable globally, regardless country or setting. Otherwise, this study could be viewed as a first step to an international perinatal COS. We appreciate international collaboration and would be happy to share our experience and support similar studies at other sites or participate in international studies of larger scale.

To sum up, we expect the Swedish perinatal COS to have a deep and important impact on peripartum care and research and at length improve long-term infant health and families' childbirth experience.

Trial status

At the moment (210618), the prospectively registered systematic review process is completed, the steering group is established and strategic planning for the Delphi survey is ongoing. We plan to start inviting participants for Delphi-process in august 2021.

Additional materials

Appendix 1. Table 1. COS-STAP checklist according to the EQUATOR Network.

Abbreviations

CENTRAL: Cochrane Central Register of Controlled Trials; CDSR: Cochrane Database of Systematic Reviews; COMET: Core Outcome Measures in Effectiveness Trials Initiative; COMIS: Core Outcome Measurement Instrument Selection project; COS-STAP: Core Outcome Set Standards for Protocols; COS-STAR: Core Outcome Set Standards for Reporting; CROWN: Core Outcomes in Women's and Newborn's Health Initiative; EQUATOR: Enhancing the Quality and Transparency Of Health Research; GRADE: Grading of Recommendations Assessment, Development and Evaluation Working Group; MeSH: Medical Subject Headings; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-analyses; PROSPERO: International Prospective Register of Systematic Reviews; SBU: Swedish Agency for Health Technology Assessment and Assessment of Social Services;

SFOG: Swedish Society of Obstetrics and Gynecology; SPIRIT: Standard Protocol Items: Recommendations for Interventional Trials Statement

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Availability of data and materials

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Authors' contributions

JS and SBW generated the idea and agreed on study design. JS, MB and SBW contributed to writing the protocol. All authors read and approved the final protocol.

Ethical approval and consent to participate

Not required according to Swedish regulation.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Author details

Julia Savchenko, Department of Obstetrics and Gynecology, Stockholm South General Hospital (Södersjukhuset), Stockholm, Sweden; Department of Clinical Science and Education, Stockholm South General Hospital (Södersjukhuset), Karolinska Institutet, Stockholm, Sweden.

Malin Asp, Chair of the Swedish Infant Death Foundation, Sweden.

Marie Blomberg, Department of Obstetrics and Gynecology and Department of Biomedical and Clinical Sciences, Linköping University, Sweden.

Charlotte Elvander, Clinical Epidemiology Division, Department of Medicine, Karolinska Institutet, Stockholm, Sweden.

Anna Hagman, Department of Obstetrics and Gynecology, Sahlgrenska University Hospital, Gothenburg, Sweden.

Pelle Lindqvist, Department of Obstetrics and Gynecology, Stockholm South General Hospital (Södersjukhuset), Stockholm, Sweden; Department of Clinical Science and Education, Stockholm South General Hospital (Södersjukhuset), Karolinska Institutet, Stockholm, Sweden.

Maria Nelander, Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden.

Béatrice Skiöld, Department of Neonatology, Karolinska University Hospital, Stockholm, Sweden; Department of Women's and Children's Health, Karolinska Institutet, Stockholm, Sweden.

Sophia Brismar Wendel, Department of Obstetrics and Gynecology, Danderyd Hospital, Stockholm, Sweden; Department of Clinical Sciences, Karolinska Institutet, Danderyd Hospital, Stockholm, Sweden.

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Appendix 1.

Table 1. Core Outcome Set-STAndardised Protocol Items according to the COS-STAP Statement, recommended by Enhancing the Quality and Transparency Of Health Research (EQUATOR) Network.

TITLE/ABSTRACT			Protocol page nr
Title	1a	Identify in the title that the paper describes the protocol for the planned development of a COS	p. 1
Abstract	1b	Provide a structured abstract	p.1
INTRODUCTION			
Background and objectives	2a	Describe the background and explain the rationale for developing the COS, and identify the reasons why a COS is needed and the potential barriers to its implementation	p. 2 – 3
	2b	Describe the specific objectives with reference to developing a COS	p. 4
Scope	3a	Describe the health condition(s) and population(s) that will be covered by the COS	p. 5
	3b	Describe the intervention(s) that will be covered by the COS	p. 5
	3c	Describe the context of use for which the COS is to be applied	p. 4
METHODS			
Stakeholders	4	Describe the stakeholder groups to be involved in the COS development process, the nature of and rationale for their involvement and also how the individuals will be identified; this should cover involvement both as members of the research team and as participants in the study	p. 5, 7
Information sources	5a	Describe the information sources that will be used to identify the list of outcomes. Outline the methods or reference other protocols/papers	p. 6

	5b	Describe how outcomes may be dropped/combined, with reasons	p. 6 - 7
Consensus process	6	Describe the plans for how the consensus process will be undertaken	p. 7 – 8
Consensus definition	7a	Describe the consensus definition	p. 8
	7b	Describe the procedure for determining how outcomes will be added/combined/dropped from consideration during the consensus process	p. 8
ANALYSIS			
Outcome scoring/feedback	8	Describe how outcomes will be scored and summarised, describe how participants will receive feedback during the consensus process	p. 7 - 8
Missing data	9	Describe how missing data will be handled during the consensus process	p. 7
ETHICS and DISSEMINATION			
Ethics approval/informed consent	10	Describe any plans for obtaining research ethics committee/institutional review board approval in relation to the consensus process and describe how informed consent will be obtained (if relevant)	p. 12
Dissemination	11	Describe any plans to communicate the results to study participants and COS users, inclusive of methods and timing of dissemination	p. 9
ADMINISTRATIVE INFORMATION			
Funders	12	Describe sources of funding, role of funders	p. 11
Conflicts of interest	13	Describe any potential conflicts of interest within the study team and how they will be managed	p. 12