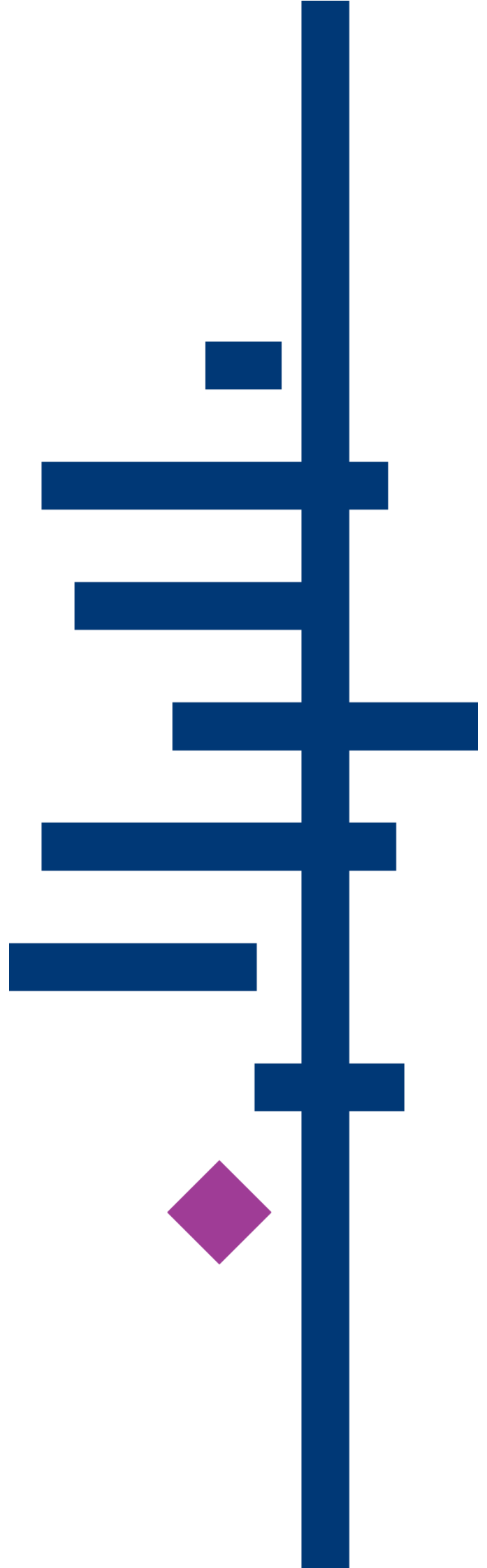


CRG Networks Innovation Fund 2019

Request for grant applications for
the CRG Networks Innovation Fund
2019





Use of Microsoft Academic Graph and automation tools to establish and maintain new CRG Specialised Registers of Economic Evaluations alongside existing CRG Specialised Registers of controlled trials

CRG Network Lead: Dr Robert Boyle, Cochrane Children and Families Network

Other CRG Networks involved: Key deliverables can be implemented in all CRGs and Networks.

Project team:

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Executive summary

In order to make judgements about health interventions, decision-makers need to consider not only their beneficial and adverse health effects but also their impact on resource use, and the associated costs. Cochrane reviews can incorporate and synthesise economic evidence, but how this can be best accomplished in a low-cost, reproducible way that is applicable for all Cochrane Review Groups (CRGs) across the CRG Networks needs to be established.

Using conventional searching and study selection methods to identify eligible economic evaluations for consideration in Cochrane Reviews is a resource-intensive task. This project will therefore design, evaluate and implement a semi-automated workflow for establishing and maintaining CRG Specialised Registers of Economic Evaluations alongside existing CRG Specialised Registers of controlled trials.

The project will build on the methods, tools and workflows developed for Evidence Pipeline (part of Project Transform) for identifying RCTs and quasi-RCTs eligible for inclusion on existing CRG Specialised Registers and publication on the Cochrane Central Register of Controlled Trials (CENTRAL). It will also build on current pilot work that we are undertaking with the Cochrane Tobacco Addiction Group (TAG) on using [Microsoft Academic Graph \(MAG\)](#) to further improve the efficiency of study identification workflows for both CRG Specialised Registers of controlled trials and Cochrane Reviews.

Specifically, we will extend our current work to include Cochrane Incontinence; and broaden its focus by using a similar approach – the use of MAG and machine learning classifiers – to support the efficient identification of economic evaluations for: (a) inclusion on new CRG Specialised Registers of Economic Evaluations; and (b) consideration in Cochrane Reviews. This will create a step change in Cochrane’s capability to identify economic evaluations in a reliable, low-cost manner.

The UCL team has already built more than 50 machine learning classifiers which are currently integrated within the Cochrane CRS-Web system. Should the evaluation prove successful, we will publish additional machine learning and data services that can be incorporated in a similar way; thus making the outcomes of this work available across the organisation.

Project Plan

Purpose/ organisational need:

In order to make judgements about health interventions, decision-makers need to consider not only their beneficial and adverse health effects but also their impact on resource use and associated costs. Incorporating economic evidence into Cochrane intervention reviews alongside evidence for clinical effects can make their findings more useful for decision-making. Cochrane therefore needs to establish systems and processes to support the efficient identification of reports of economic evaluations for consideration in reviews.

This project will address these needs, leading to an improvement in the content and quality of the Cochrane Library by making the process of incorporating economic evidence into Cochrane intervention reviews more efficient, by reducing the study identification workload of review authors and editorial base staff. The addition of this economic information to Cochrane Reviews will enhance their usefulness to key stakeholders, including decision-makers, funders and policy makers. Finally, the project will help harmonise review production processes when rolled out across other CRGs within our Network and beyond.

This project will build on several strands of current and ongoing work in Cochrane:

CRG Specialised Registers of controlled trials

CRG Specialised Registers of controlled trials are topic-based repositories that aim to include records of all study reports of controlled trials (and other types of study designs) that fall within the scope of a CRG. Developing and managing a Specialised Register of controlled trials is a core function of CRGs within Cochrane.

The purpose of a CRG Specialised Register of controlled trials is to provide a reliable pool of reports of trials for review authors which makes them easily retrievable; and to share the content of individual registers with users of the Cochrane Library worldwide, via the Cochrane Central Register of Controlled Trials (CENTRAL).

Evidence Pipeline

Cochrane's investment in Project Transform's Evidence Pipeline component has demonstrated net savings for the organisation. By automating the systems and processes used to identify reports of potentially relevant randomised controlled trials (RCTs) and quasi-RCTs, Cochrane has reduced the study identification workload for editorial base staff and review teams. Outputs from Evidence Pipeline include: the bespoke Screen4Me service, which gives Cochrane authors reports of RCTs likely to be eligible for consideration at the touch of a button; an integrated RCT classifier that automatically assigns a probability to each record in the pipeline to quantify the likelihood that it reports an RCT or quasi-RCT (Marshall 2018); and similar classifiers designed to allocate records that fall within their scopes to each individual CRG (i.e. to individual CRG segments in the Cochrane Register of Studies). In parallel, Cochrane's new Centralised Search Service has streamlined the process of simultaneously searching multiple electronic databases for eligible study reports (including, but not limited to, trial registry records).

Identifying economic evidence

For interventions likely to have impacts on resource use and costs that are important for decision-making, Cochrane Reviews can become more useful by incorporating evidence collected from eligible economic evaluations. In line with the latest methods guidance in Chapter 20 of the Cochrane Handbook 6.0 (Shemilt 2018), this can be achieved by developing a brief economic commentary or conducting an integrated full review of economic evaluations to sit alongside and enhance the main clinical effectiveness findings. Both brief economic commentaries and integrated full reviews of economic evidence therefore require a separate search to identify eligible economic evaluations in parallel to the search for studies of effects.

Using conventional searching and study selection methods to identify eligible economic evaluations is a resource-intensive task. A small investment is therefore needed to enable us to develop and evaluate a new semi-automated workflow for the identification of economic evaluations for consideration in Cochrane Reviews. This approach is likely to produce additional efficiency gains alongside those already being generated by Evidence Pipeline and the Centralised Search Service with respect to identifying RCTs and quasi-RCTs.

As with studies of clinical effects, the number, combination and functionality of electronic databases being searched for economic evaluations can substantively impact on the resources required to identify reports for consideration in Cochrane Reviews. This is especially the case following the closure of two key tertiary literature databases that indexed economic evaluations: NHS EED (freely available but now closed to new records) and the Health Economic Evaluations Database (HEED) (subscription resource, no longer available). This means Cochrane review authors currently need to search multiple databases for eligible economic evaluations, with a recent methods research study recommending the searching of four separate databases for this type of search (Arber 2018).

Microsoft Academic Graph

James Thomas and Ian Shemilt are currently investigating the use of Microsoft Academic Graph (MAG) to improve the efficiency of Cochrane study identification workflows. MAG is an electronic database containing over 230 million records of research publications (i.e. study reports) from across science. Microsoft makes the MAG dataset available for third party use under a creative commons license.

MAG record fields include a title, abstract, authors, DOI and other standard bibliographic data. MAG has been semantically indexed by Microsoft using a custom algorithm, which uses deep learning to generate word embeddings. Critically, MAG is also a network graph, comprising hundreds of millions of directed links between records based on known features including forwards and backwards citation relationships (known in MAG as ‘references’ and ‘citations’), ‘related documents’ and ‘fields of study’.

We are already developing and evaluating the use of MAG in semi-automated workflows designed for maintaining the Cochrane Tobacco Addiction Group (TAG) Specialised Register and conducting and updating Cochrane TAG intervention reviews. These workflows deploy MAG in conjunction with machine learning classifiers to automate the identification of eligible study reports. Specifically, we are exploiting the graph structure of citation and other types of network relationships among linked records within MAG, alongside other bibliometric features (e.g. fields of study), in order to help us identify eligible studies more efficiently.

Based on our preliminary investigations in the Cochrane TAG use case, we believe that MAG and its network graph structure has the potential to become an important resource to help CRGs and author teams identify eligible reports for their Specialised Registers and systematic reviews; possibly substantively reducing the need to search multiple electronic databases for these purposes. A small investment is therefore needed to extend and adapt our pilot ‘MAG + Classifiers’ workflows to support the efficient identification of economic evaluations for consideration in Cochrane Reviews.

Cochrane Incontinence

Cochrane Incontinence is a CRG within the C&F Network, which manages a portfolio of 105 Cochrane Reviews. The Cochrane Incontinence editorial team is based at Newcastle University, UK and our Co-ordinating Editor, Professor Luke Vale, is also the Chair of the Campbell and Cochrane Economics Methods Group (CCEMG).

Cochrane Incontinence intends to include brief economic commentaries or integrated full reviews of economic evaluations as standard into our published intervention reviews. In order to support the identification of eligible economic evaluations to inform these new components, Cochrane Incontinence would like to establish a new Specialised Register of Economic Evaluations that fall within our scope, to be maintained alongside our existing Specialised Register of clinical effectiveness studies.

Aim:

The overall aim of this project is to design, evaluate and implement a new, semi-automated workflow for establishing and maintaining Cochrane Review Group (CRG) Specialised Registers of Economic Evaluations, alongside an existing workflow for maintaining CRG Specialised Registers of controlled trials. Once established, these workflows (and the methods that underpin them) will be fully transferable to CRGs across the C&F Network and all other Cochrane Networks.

Objectives:

Building on our existing research and development in relevant areas, the specific aims of this project will be:

1. To assess the recall of MAG for:
 - a. study reports included in the existing Cochrane Incontinence Specialised Register of controlled trials; and
 - b. study reports included in the latest published versions of Cochrane Incontinence intervention reviews.
2. To determine factors that explain why some of these study reports are not found in MAG. To note, the EPPI-Centre are already liaising with the developers of MAG at Microsoft to further enhance the utility of this dataset for Cochrane's purposes.
3. To generate and analyse network graphs comprising directed links between:
 - a. MAG records of study reports included in the existing Cochrane Incontinence Specialised Register of controlled trials at a specified historical time-point; and
 - b. MAG records of study reports included in the penultimate published versions of updated Cochrane Incontinence intervention reviews (various time-points).
4. To use findings from objectives 1 to 3 to inform the development of at least one semi-automated workflow, incorporating use of MAG and machine learning classifiers (combined with human effort), designed to identify new study reports eligible for inclusion:
 - a. in the latest updated version of the existing Cochrane Incontinence Specialised Register of controlled trials;
 - b. in the latest published versions of updated Cochrane Incontinence intervention reviews.
 - c. in the new Cochrane Incontinence Specialised Register of Economic Evaluations; and
5. To evaluate the semi-automated workflow(s) by simulating their impacts on recall, precision and workload (resource use) when compared with conventional methods and procedures for:
 - a. maintaining the existing Cochrane Incontinence Specialised Register of controlled trials; and
 - b. conducting and updating published Cochrane Incontinence intervention reviews.
6. To further develop and assess the performance of our machine learning classifier designed to identify economic evaluations, when applied to MAG records of economic evaluation study reports in the workflow developed for 4c.
7. To use findings from 1 to 6 to inform final refinements of the design of our semi-automated workflows – in particular the workflow designed to maintain the new Specialised Register of Economic Evaluations – and to produce documents to detail requirements for this innovation to be scaled-up in preparation for its managed roll-out and implementation in all CRGs and across all CRG Networks.
8. To prepare for the planned conduct or update of eight priority new or updated Cochrane Incontinence intervention reviews to incorporate economics evidence, by identifying all reports of economic evaluations within the new Specialised Register of Economic Evaluations that are eligible for each review.

By addressing these objectives, this project will also help us to answer some key research questions concerning technical aspects of the implementation of our new 'MAG + Classifiers' workflows in

Cochrane use scenarios, which are not being addressed by our current work on the Cochrane TAG use case (nor by previous evaluations of the Cochrane ‘Evidence Pipeline’). These key research questions include:

- What are the (further) efficiency gains achieved from implementing a semi-automated ‘evidence pipeline’ workflow to identify economic evaluations for Cochrane intervention reviews?
- How are MAG’s network graph structure and related metrics best exploited to support the efficient identification of reports of economic evaluations for consideration in Cochrane Reviews?
- Which types of MAG network graphs are optimal to support the efficient identification of reports of economic evaluation studies for Cochrane Reviews?
- Are MAG network graphs designed to support the efficient identification of reports of economic evaluations for Cochrane Reviews more efficient when integrated with MAG networks designed to identify studies of intervention effects, or when generated and used separately from those ‘effects study’ networks?
- Can the performance of our existing ‘economic evaluations machine learning classifier’ in Cochrane use cases be improved by the adjunctive use of a rules-based algorithm (e.g. keywords in titles)?
- Does deployment of an ‘economic evaluations machine learning classifier’ improve the efficiency of a semi-automated workflow designed to identify reports of economic evaluations for Cochrane reviews?

Planned deliverables:

Key deliverables from this project will be:

1. An up-to-date, study-level Specialised Register of Economic Evaluations of interventions relevant to the scope of Cochrane Incontinence, prepared for incorporation into the Cochrane Register of Studies (CRS), alongside the existing Cochrane Incontinence Specialised Register of controlled trials.
2. Semi-automated workflow(s) incorporating MAG and machine learning classifiers, designed to efficiently identify both studies of effects and economic evaluations for consideration in Cochrane intervention reviews with economic components. Within the scope of this project, these workflow(s) will be implemented in Cochrane Incontinence for maintaining its Specialised Registers.
3. We will examine how the MAG data and associated automation workflows might be made available within the CRS, possibly within the Centralised Search Service workflow. This deliverable is pending evaluation work which will inform the way in which this might be implemented.
4. Verbal updates on the project during monthly, CET-led Senior Editors and Associate Editors meetings.
5. A mid-project update presentation in September/October 2019, which could be part of the Cochrane Colloquium presentations in Santiago, Chile in October 2019.
6. A written final report with project results, findings and recommendations for Cochrane.
7. An oral paper presentation at the 2020 Cochrane Colloquium in Toronto.

Proposed methods *(Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Consider including how data will be collected, analysed, and interpreted as well as any resource sharing plans as appropriate. You may also consider including potential problems expected and any strategies to address them):*

The semi-automated 'MAG + Classifiers' workflows to be developed and evaluated in this project will utilise a combination of machine learning (e.g. Marshall 2018), network graph analysis (igraph R package 2019) using R Studio, and conventional study selection methods (Lefebvre 2019). The latter represents the 'manual human resource' input to these workflows (to be provided by the RA and Ian Shemilt; in consultation with Sheila Wallace, who will advise of borderline cases). This will involve applying eligibility criteria to relevant select study reports, from among those prioritised for screening by the semi-automated workflow, for inclusion in: the Cochrane Incontinence Specialised Register of controlled trials; its new Specialised Register of Economic Evaluations; and/or one or more of its Cochrane intervention reviews.

All semi-automated workflows will be implemented in EPPI Reviewer systematic review software (which is available to all Cochrane authors via an Archie authentication); and all input data required for our planned evaluation (see below) will be either: (i) automatically collected by EPPI Reviewer; or (ii) parsed from archived XML versions of Cochrane Incontinence reviews (as per our current work on similar Cochrane TAG use scenarios – see 'Microsoft Academic Graph' above).

Our proposed evaluation of these semi-automated workflows will utilise a combination of relative recall methodology (using study reports included on the existing Cochrane Incontinence Specialised Register of controlled trials as a 'quasi-gold standard') (Sampson 2006); and assessments of relative recall and precision, along with corollary impacts on resource use (workload) and costs (Shemilt 2016), compared with conventional Cochrane study identification methods (for example: Lefebvre 2019). These analyses will be conducted using Excel, Stata and R Studio software. Subject to the terms and conditions of current licensing agreements covering Cochrane data and datasets, we will also make publicly available as much code and data assembled for this project as possible via an online, open access repository.

Project management and internal communications

Project management and budget monitoring will be led by Lindsey Elstub. In addition to verbal updates during monthly CET-led meetings of Senior Editors and Associate Editors, core Project Team members will also hold monthly project business meetings by Skype, to be chaired by James Thomas, Ian Shemilt and/or Luke Vale (co-PIs). Day-to-day project internal communications will be undertaken by e-mail, Skype and telephone, as needed.

Newcastle University will host two face-to-face meetings of core Project Team members during the lifetime of the project (and budget resources are requested to cover the costs of only one of these meetings). See also 'Project Management and Internal Communications' in the attached Gantt Chart (Appendix 3).

Key milestones and timelines (*please highlight responsibilities of the project team members for each stage within the timeline, ideally represented through a Gantt chart*):

Please see also the project Gantt chart in Appendix 3.

Key milestones in the project timeline will be:

- Completing identification of all MAG records of study reports included on the existing Cochrane Incontinence Specialised Register of controlled trials; and generating corresponding MAG network graphs;
- Completing identification of all reports of eligible economic evaluations within MAG network graphs.

- Establishing the new Specialised Register of Economic Evaluations, and finalising ‘MAG + classifier(s)’ workflows to prepare for the incorporation of economics evidence into new and updated priority reviews for Cochrane Incontinence.

Budget (please consider breakdown by type of resource or activity):

Resources required

The time and IT resource from the EPPI-Centre at UCL is a substantial in-kind contribution.

Cochrane Incontinence will need to employ a 0.2 FTE Research Associate (RA) for 12 months in order to provide the human resource inputs needed to deliver this project. The ideal candidate will have some knowledge of, or background in, information science and health economics; and be able to reliably apply eligibility criteria for inclusion in Cochrane Incontinence specialised registers and intervention reviews.

The RA’s tasks will include the following.

- To add to the existing Specialised Register of controlled trials any reports of studies that are included in Cochrane Incontinence reviews but currently missing from the Register (if needed).
- To manually look-up in MAG any existing Specialised Register records that cannot be auto-matched to a MAG record; and to record MAGIDs, or factors that could explain why a Register record is not found in MAG, using EPPI Reviewer (as appropriate).
- To reliably select new MAG records of study reports eligible for inclusion on (i) the existing Cochrane Incontinence Specialised Register and (ii) its new Specialised Register of Economic Evaluations, from among those MAG records identified and prioritised for manual screening by our prospective, semi-automated ‘MAG + Classifiers’ workflow(s).
- To ensure that objectives feed directly into our priority reviews, both for included trials and economic evaluations, by importing (and ‘studifying’) relevant study reports into these reviews.

This project will also need 1-2 hours per week of administrative support, which will be provided by Eugenie Johnson. Tasks will include arranging and producing minutes of meetings.

In addition to the staff costs outlined in ‘Resources required’ above, the budget includes capacity for one of the two planned face-to-face meetings of the Core Project Team, in addition to registration and travel for one member of the Core Project Team to deliver the project’s findings at an international conference (likely to be the Cochrane Colloquium in Canada 2020).

Staff	10,365.05
Other	2,523.09
Sub-total:	12,888.14
Estates Non-Laboratory	0.00
Indirect	0.00
Sub-total:	0.00
Total:	12,888.14

Appendix 1

Please include all biographical sketches of project team members including the following elements: personal statement - briefly describe why your experience and qualifications make you particularly well-suited for your role (e.g., principal investigator, member) within this project; relevant awards and honors; previous positions, concluding with the present position; selected peer-reviewed publications (no more than 15; including selected publications based on recency/or relevance to the proposed research project).

Please also include any other relevant documents as appendices to support your application as you see fit.

Appendix 1: Project Team Member Biographies

Luke Vale (co- PI)

Luke Vale holds the Health Foundation Chair in Health Economics at Newcastle University and leads the Health Economics and Evidence Synthesis Theme. He has an international reputation in health technology assessment and has contributed significantly to the growth in the use of systematic reviews and economic modelling in this field. Key aspects of his role are in advising researchers, and especially early career researchers, in the design, conduct and reporting of applied health research including trials and systematic reviews. Within Cochrane he is the Co-ordinating Editor of Cochrane Incontinence, an Editor of Cochrane EPOC, an active contributor to a number of other review groups and Chairman of the [joint Economic Methods Group](#) of the international Cochrane and Campbell Collaborations which develops the methods and conduct systematic reviews of interventions in health care and other policy areas.

Ian Shemilt (co-PI)

Ian Shemilt is an Associate Professor of Evidence Synthesis and Economics Methodology based at the EPPI-Centre, University College London, United Kingdom. He has been a Cochrane contributor and member since 2005, when he became research co-ordinator and, subsequently, a co-convenor of the Campbell and Cochrane Economics Methods Group. Ian has been a lead author of the Cochrane Handbook chapter on 'Incorporating economics evidence' into systematic reviews of interventions since 2008. He is also a member of Cochrane Information Retrieval. He served as an inaugural member of Cochrane's Methods Executive committee from 2011 to 2017 and is an Associate Investigator and project team member on Cochrane's Project Transform. Ian's current methods research activity focuses specifically on the use of Microsoft Academic Graph combined with automation technologies for efficient study identification in systematic reviews.

James Thomas (co- PI)

James Thomas is a Professor of Social Research and Policy at the EPPI-Centre, University College London, United Kingdom. He is Director of the EPPI-Centre's Reviews Facility for the Department of Health, England, which undertakes systematic reviews across a range of policy areas to support the Department. James specialises in developing methods for research synthesis and using emerging information technologies such as text mining and machine learning in research. He is an editor of the Cochrane Handbook for Systematic Reviews of Interventions, a co-convenor of Cochrane Qualitative and Implementation, a member of Cochrane Information Retrieval and a PI on Cochrane's Project Transform, co-leading its Evidence Pipeline component. He is also a lead developer of EPPI-Reviewer software for systematic reviews, which is available for use by all Cochrane review authors.

Lindsey Elstub

Lindsey Elstub has been the Managing Editor for Cochrane Incontinence since October 2017. Prior to that, she spent twelve years in post as Managing Editor for Cochrane Bone, Joint and Muscle Trauma.

Eugenie Johnson

Eugenie Johnson has been Editorial Assistant for Cochrane Incontinence since October 2017 and will be undertaking administration for the project.

Sheila Wallace

Sheila Wallace is the Cochrane Information Specialist with Cochrane Incontinence. She is also an Editor for the Group, an experienced Cochrane author and a Research Fellow, based within the Evidence Synthesis Group, at Newcastle University. She helped with the preparatory work in establishing Cochrane Incontinence and has been with the Group since its inception. She has developed and maintained the Cochrane Incontinence Specialised Register of controlled trials as well as developing its own controlled vocabulary to maximise efficient use of its content. Within Cochrane she is a member of Cochrane Information Retrieval. She has been a co-applicant on a number of successfully completed projects including a number funded by NIHR.

Appendix 2

References

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Appendix 3

Project plan	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20
<i>Set-up phase</i>													
Identify and select eligible Cochrane Incontinence intervention reviews based on evaluation criteria													
Parse the XML for selected Cochrane Incontinence intervention reviews (included and excluded study reports and PRISMA flow data)													
Manually extract key dates from multiple published versions of selected Cochrane Incontinence intervention reviews													
MAG and economic evaluation classifier integrated into EPPI-Reviewer software													
Download latest version of Cochrane Incontinence Specialised Register from the CRS; de-duplicate and clean if needed													
<i>Development and evaluation phase</i>													
Apply existing Register>MAG auto-matching algorithm													
Manually check Register>MAG 'auto-matches', 'maybe matches' and 'no matches'; and code factors that explain why some study reports are 'not found' in MAG [Objectives 1 & 2]													
Generate and analyse MAG network graphs [Objective 3]													
Adapt, implement and evaluate existing semi-automated workflows for the identification of reports of economic evaluations [Objectives 4 & 5]													

Identify reports of economic evaluations within MAG network graphs using the semi-automated workflow [Objectives 5 & 4c]													
Further develop, apply and evaluate the performance of existing economic evaluations machine learning classifier when applied to identified MAG records of economic evaluations [Objective 6 & 4c]													
Establish a Cochrane Incontinence Specialised Register of Economic Evaluations, prepared for integration as a CRG 'segment' alongside/within the existing Cochrane Incontinence 'segment' (and Specialised Register) [Deliverable 1]													
Refine semi-automated workflows based on project evaluation findings [Objective 7].													
<i>Implementation and dissemination phase</i>													
Prepare documents and requirements for the optional (i.e. subject to approval by Cochrane and its relevant committees) scale-up and implementation of Specialised Registers of Economic Evaluations across all CRGs and Networks [Objective 7 and Deliverable 2]													
Prepare for the planned conduct or update of 8 priority new or updated Cochrane Incontinence intervention reviews, to incorporate economics evidence, by identifying all reports of economic evaluations within the new Specialised Register of Economic Evaluations that are eligible for each review [Objective 8].													>
Reporting and Dissemination Plan	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20
Verbal monthly updates on the project during CET-led monthly Senior Editors and Associate Editors meetings [Deliverable 3]													

A mid-project update presentation in October 2019 (potentially at the 2019 Colloquium in Chile) [Deliverable 4]													
A written final report with project results, findings and recommendations for Cochrane [Deliverable 5]													
An oral paper presentation at the 2020 Cochrane Colloquium in Canada, to report principal findings and recommendations.													>
Optional integration of project findings into the online 'publish when ready' version of the Cochrane Handbook (subject to approval by Cochrane and its relevant committees)													>
Discussion with Centralised Search Service Team regarding possible integration of MAG data and associated automation workflows													>
Project management and internal communications	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20
Recruit the Research Associate (0.2 FTE)													
2 x face-to-face meetings of Core Project Team members at Newcastle University – budget costs requested to cover only one of these meetings													
Monthly meetings of Core Project Team members by telephone or Skype (+ e-mails as needed)													

> Beyond April 2020