

User-friendly reporting and formatting of Cochrane Reviews of interventions: Final report

**EPOC Development project from
October 2017- December 2019**

Report from June 2019

Summary

Background: Cochrane’s mission is to promote evidence-informed health decision making by producing high-quality, relevant, accessible systematic reviews. But Cochrane Reviews are long and complex, posing difficulties for both review users and review producers. Goal 2 in the Cochrane Strategy to 2020 is to make Cochrane evidence accessible and useful to everybody, everywhere in the world. For Cochrane intervention reviews to be accessible to people making decisions, users need to be able to quickly find the information they need and to understand that information.

What we did: From October 2017 to December 2018, we developed a prototype of a new interactive format for intervention reviews that would make them easier to navigate and understand for both expert and non-expert target audiences, as well as less time consuming for authors and editors to write and peer review. We reviewed evidence about presenting findings from systematic reviews and drew on our own experience. We used a human-centred design approach, which entailed cycles of prototype development, feedback collection, and analysis, and idea-generation. We collected feedback from a wide range of stakeholders, through queries to an Advisory Group, individual user-test interviews, and meetings at Cochrane events where we presented and discussed prototypes.

What we learned: There was enthusiastic support for a new interactive and layered format for Cochrane Reviews. Key features of this new format that received positive feedback were:

- A layered format with three layers:
 - a summary that enables users to quickly find the key messages
 - a report using a concise journal article format for readers who want more information
 - further details, including in-depth description of methods, figures and tables
- Reducing repetition by combining the abstract and the plain language summary in the top layer
- Making the main summary of findings table part of the summary (outside of the pay wall)
- Including information for decision makers to help patients and the public, healthcare practitioners, and policymakers put the findings of the review into a decision-making context
- Making the text concise and easy to read in the second layer
- New standard tables that:
 - summarise what the review authors searched for and found (in the top layer)
 - address the applicability of the evidence (in the Discussion section of the second layer)
 - summarise agreements and disagreements with other studies or reviews (in the Discussion section of the second layer)

- Putting much of the methods, tables, figures, and additional information in the third layer
- Making the characteristics of included studies a proper table

Next steps: There are plans to establish a working group responsible for implementing changes that are agreed. It is important for that group to continue to focus on user- and producer experiences during implementation phases. Several changes require further investigation before implementation, including:

- How patients and the public experience the summary
- Pilot testing preparation of information for decision makers by review groups
- Further development and evaluation of guidance and training for review authors and editorial teams
- Pilot testing preparation of reviews using the new format by review groups
- Pilot testing translation of reviews using the new format
- A glossary with standard terms that can be linked to from reviews
- An interactive summary of findings table
- A table summarising intervention details
- Standard tables for reporting subgroup analyses
- Evidence to decision tables
- Media messages

Acknowledgements

This project was initiated by Sasha Sheppard and Simon Lewin from the EPOC satellite in Norway, and funded by the Norwegian Institute of Public Health.

The following working group from EPOC managed and carried out the project: Sarah Rosenbaum, Andy Oxman, Newton Opiyo, Simon Lewin, Claire Glenton and Sasha Sheppard. Nandi Siefried re-wrote four example reviews.

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Background

Cochrane reviews are long and complex. This makes them difficult to read and use. Key information required by decision makers and other users, such as guideline developers, may be difficult to find. The length and complexity of reviews also means that they are very time-consuming to write and to edit. Much information is repeated, and there are frequently inconsistencies in how results are reported and interpreted within a review.

The objective of this work was to explore ideas for a future interactive format for Cochrane Reviews of interventions with the aims of being:

- More responsive to the needs of users
- Less time consuming to write
- Easier to edit and to peer review
- Compatible with key [MECIR standards](#)

We have also aimed to find solutions that might better meet needs related to knowledge translation and language translation of Cochrane Reviews.

Platform considerations

We created prototypes for online reviews published on the Cochrane Library platform and accessed via desktop, with some consideration for mobile devices. However, the current publishing system for Cochrane Reviews has a lot of built-in constraints. Rather than keeping within the existing confines of that system, we have focused on generating ideas from an understanding of users' needs, even when these ideas were not necessarily possible to implement within the current system. Our rationale was that the technical publishing system is under continuous development, and we should take this opportunity to provide a long term visionary direction for that development.

PDF considerations

This project was driven by considerations for online, interactive presentation of reviews, not primarily by considerations for PDF formatting. Design of the PDF format should be carried out as separate project, when there is general consensus about structuring the content for online presentation.

Considerations for author guidance

All of the information currently available within a Cochrane Review was included. In order to ensure that any new content in the proposed prototypes would be possible for other people to write, we limited ourselves to content that can be clearly described in author guidance. We produced a draft of this guidance as a part of the project output.

Timeline

We started this project in October 2017. We stopped at the end of December 2018 at Karla's request not to spend more time until a new plan for how to organise and prioritize further work could be put in place.

Aim of this report

This report is a documentation of the work carried out from October 2017-December 2018, to inform the next steps of the work. The appendices provide in-depth detail.

Issues marked in red throughout the document indicate areas for **future work**.

Methods

We use the word “prototypes” to mean ideas and sketches regarding any aspect of review content, structure, visual design, and interactive functionality.

Overarching approach

This work was grounded in a human-centred design approach(1), where the needs of multiple stakeholders drove design decisions and development, through cycles of prototyping and feedback.

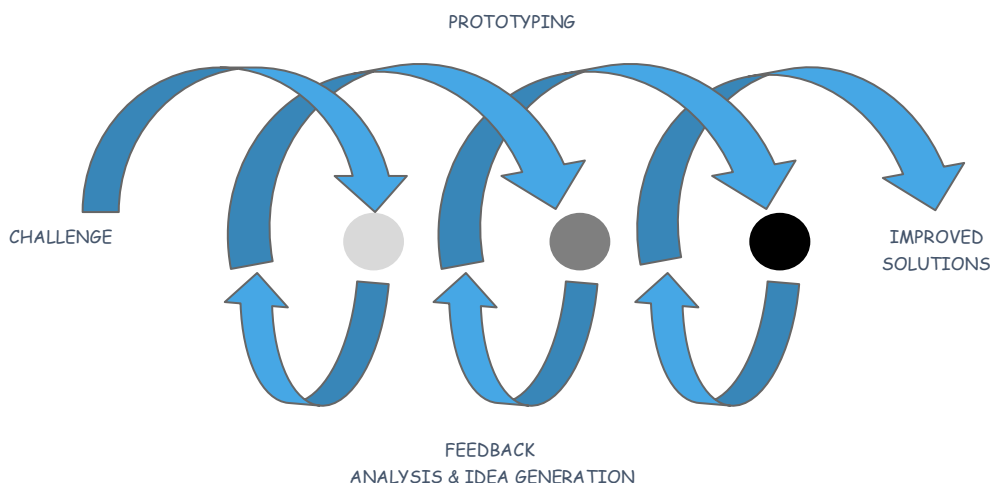


Figure 1. Human-centred design approach, characterised by cycles of development, informed by feedback from multiple groups of stakeholders

Stakeholders

We defined three main groups of stakeholders:

Review users, from the Cochrane Knowledge Translation Framework 2017

- consumers and the public
- health practitioners
- policy-makers and healthcare managers
- researchers and research funders

Review producers

- authors
- editorial teams

People who support these groups, for instance

- guideline developers and methodologists
- journalists
- health librarians

Overview of methods used

We used the methods described in *Table 1* to create prototypes, seek feedback from stakeholders, analyse problems, review suggestions and generate ideas for improvement. For an in-depth description of methods for Advisory board feedback, User-test interviews and Analysis methods, see *Appendix 1 – Project protocol*.

| Aim | Method | Who | Platform or location |
|--|---|--|-----------------------------------|
| Consulting existing literature, explore good examples of how others format systematic reviews | Literature search, reviewing other publisher's solutions | Working group w/ librarian | |
| Explore how well a prototype can work for different types of review content | Example-testing | Working group and Nandi Siegfried | Word |
| Explore ideas, sketch solutions to use as a basis for feedback and discussion | Paper prototype sketching | Working group | Adobe XD (interactive prototype) |
| Collect feedback about prototypes: stakeholder experiences, challenges and concerns, barriers and facilitators to use, suggestions for improvement | Advisory board feedback | Review users, producers and supporters as well as IT specialists | Email |
| | User-test interviews | Review users, producers and supporters | Face-to-face or online interviews |
| | Other feedback | People attending meetings or workshops | Notes from group discussions |
| Analyse feedback, identify problems, review suggestions from stakeholders, generate ideas for improvement | Analysis and idea generation | Working group (also including direct suggestions from stakeholders) | Word, excel |
| Anchor project with Cochrane editorial leadership; align with editorial / communication / technology / translation strategies | Cochrane project-group meetings | Karla Soares-Weiser (with Harriet MacLehose Sylvia De Haaen Charlotte Petridge Jo Anthony Roger Tritton David Tovey) | Monthly Skype meetings |

Table 1. Overview of aims and methods

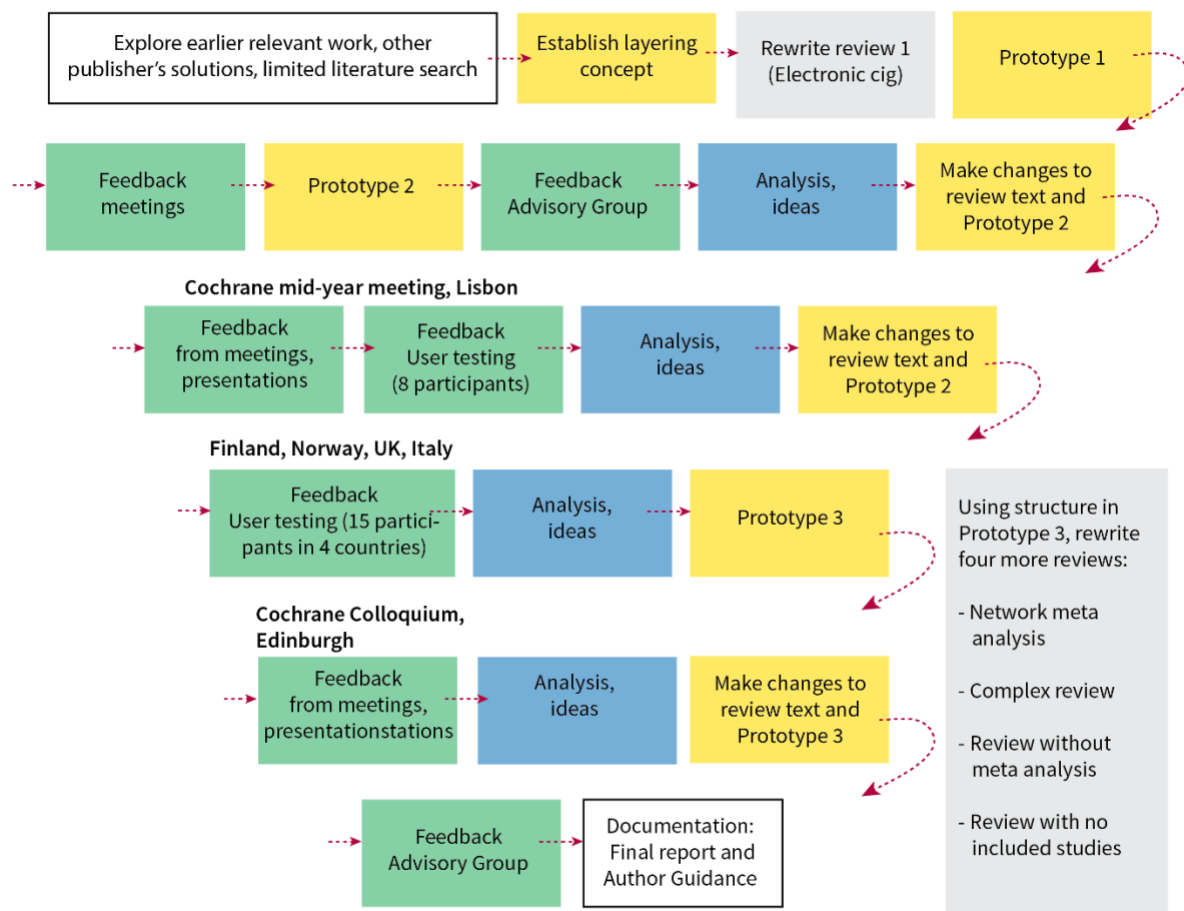


Figure 2. Flow chart, showing the cycles of prototyping, feedback, analysis/idea generation

Results

Previous work and literature search

Our approach was largely informed by lessons learned from our own earlier work, interactions with users and other stakeholders developing the [Summary of Findings](#) (2, 3), [Plain Language Summaries](#) (4, 5), guidance for [how to report the effects of interventions](#), [SUPPORT Summaries](#) (6), [rapid response briefs](#) (7), and [policy briefs](#).

It was also informed by interviews with policy makers and clinicians on the barriers to using evidence from Cochrane Reviews (8), a Cochrane EPOC review of interventions to improve the use of systematic reviews for clinical and commissioning decision-making (9), and the experience of the review groups collaborating on this project (all of the review groups in the Public Health Network and the Pregnancy and Child Birth group) of editing Cochrane Reviews.

We examined the formats used for publishing systematic reviews in journals, such as PLOS Medicine, BMJ, JAMA, and others.

We carried out a limited search for relevant studies, but did not have the resources to conduct a systematic review. We retrieved 2006 articles, and one person screened

abstracts. One of the aims of this search was to discover any highly relevant research on presentation format of systematic reviews that may have been unknown to the Working Group, which we did not find.

Based on our own experiences and on evidence from research about how to present evidence from systematic reviews for decision makers, we established a few principles at the beginning of the project:

- use of a graded-entry (layering) format
- use of plain language (in top layers, but as much as possible)
- including Summary of Findings tables in the top layer
- multiple representation of results (both as numbers and text, graphics where possible)
- using absolute effects, where possible and always including the certainty of the evidence where effects are presented

For evidence underlying this work, see *Appendix 2 – Core features and evidence*

Defining layers and rewriting one review

We rewrote content from the review *Electronic cigarettes for smoking cessation (2016)*, as it was a relatively simple review (few outcomes and comparisons) with a topic that would be widely familiar to a broad range of people. We initially created a four-layered structure, but after a round of feedback, we reduced the number of layers to three and adjusted the review text accordingly. This three-layered structure received positive feedback throughout the rest of the project and remained therefore relatively unchanged:

Layer 1: Summary

- Designed to address the needs of readers from professional and consumer target audiences who want a quick summary
- Includes short background text, and minimal information about methods
- Highlights key messages based on the Summary of Findings tables and uses plain language standardized statements for reporting effects of interventions
- Builds on existing plain-language summary work and designed to merge and replace both the plain-language summary and abstract

Layer 2: Full text

- Layer 2 provides more information in a concise journal article format for readers who want more information. The writing in this layer should also follow plain-language writing principles as much as possible so that it is not unnecessarily complex.

Layer 3: More detail

- Much of the review details is moved to this section, e.g. in-depth description of methods, the search strategy, as well as most figures, tables and analyses. All items in this layer should be accessible from Layer 2 as links.

Formatting prototypes

After creating the first prototype using Word and InDesign, we built an interactive prototype using Adobe XD software, which we updated after each round of feedback.



Figure 4. Review content in three layers

Description of the core features and evidence (Appendix 2)

In this document, we describe the core features of the new format and a short summary of relevant evidence relating to each feature.

Links to the interactive prototypes:

Prototype 3 - with Main findings first in Summary layer:

<https://xd.adobe.com/view/c6012f82-e92d-4d3c-551e-5e87a30583e4-b030/?fullscreen&hints=off>

(Use mouse wheel or track pad to scroll.)

Alternative Prototype 3 - traditional order of items in Summary layer:

<https://xd.adobe.com/view/645fff4a-49f6-48b6-4cd2-e819771531d2-126e/?fullscreen&hints=off>

PDF version of Prototype 3¹ (Appendix 3)

This is a static pdf generated from one of the interactive prototypes below. It is not intended to be a proposal of what a new PDF version of the review should look like (which is outside the remit of this project), but is just a snapshot of what the interactive prototype looks like.

Advisory group participants

¹ Notes about results presentation in Prototype 3:

In the Electronic cigarettes review that we used as an example text for the designed prototype, the authors merged the two comparisons and reported per outcome instead of per comparison. Although some review authors may choose to do this, it is atypical. In the pdf, there is an alternative formatting for presentation of results per outcome (for the full text layer) on page 51.

We recruited 39 people to the advisory board based on suggestions from the Working Group and the Steering Group, including: editors, authors, research librarians, coordinators, EBM teachers, methodologists, health professionals, journalists, guideline developers, and policy makers.

| New Cochrane Review format advisory group suggestions | | | |
|---|--------------------------|---------------------------|-----------------------------|
| 2-LMIC | clinician | Cameroon | Pierre Ongolo |
| 2-MD | | Mexico | Giordano Pérez Gaxiola |
| 2-MD | | Norway | Atle Klovning |
| 2-MD | | UK | Kamal Mahtani |
| 3-PM | policymaker | Canada | Robert S Nakagawa |
| 3-PM | | Norad | Olsen, Ingvar Theodor Evjen |
| 1-J | patient /journalist? | Australia | Ray Moynihan |
| 1-J | | Uganda | Esther Nakkazi |
| 1-C | | UK | Gill Gyte |
| 5 | | WHO | Metin Gülmezoğlu |
| 5-GR | methodologist | GRADE | Elie Akl |
| 5-GR | | GRADE | Gord Guyatt |
| 5-GR | | GRADE | Holger Schönemann |
| 4-EBM | | HB | Rachel Churchill |
| 4-EBM | | HB | Julian Higgins |
| 4-EBM, C-ed | | IT | Chris Mavergames |
| 4-EBM | | SMG & RoB | Doug Altman |
| 4-C-ed | editor | CC | Sophie Hill |
| 4-C-ed | | CEU | Karla Soares-Weiser |
| 4-C-ed | | CEU | David Tovey |
| 4-C-ed | | EPOC | Simon Lewin |
| 4-C-ed | | EPOC | Sasha Shepherd |
| 4-C-ed | | ID | Paul Garner |
| 4-C-ed | | PCB | James Neilson |
| 4-C-ed | | PCB | Zarko Alfirevic |
| 4-C-ed | | PH | Rebecca Armstrong |
| 4-C-ed | | PH | Hilary Thomson |
| 4-C-co | review group coordinator | EPOC | Elizabeth Paulsen |
| 5 | Guideline developer | UK - NICE | Sarah Cumbers |
| 5 | | UK - NICE | Nicole Taske |
| 4-C-ed | editor | Dpt of Primary Health Car | Kate Cahill |
| 5 | KT | Norway | Marita Fønhus |
| 1-J | From Gary | journalist | Sharon Begley |
| 1 | | patient advocate | Casey Quinlan |
| 4-C-IT | | IT | Gabriel Rada |
| 4-C-ed | From Karla | | Lisa Bero |
| 4-C-L | From Liz | research librarian | Marit Johansen |
| | From Andy | Researcher/health prof | Paul Glasziou |
| | From Andy | Researcher | Tammy Hoffman |
| | | Researcher/Health prof | Per Vandvik |

Figure 3. List of people recruited to the Advisory Group

We conducted two rounds of Advisory Group feedback, via email.

Advisory Group Round 1

December 2017

Prototype 1

21 of 39 people responded

Advisory Group Round 2

December 2018

Prototype 3

21 of 39 people responded

User test participants

We carried out two rounds of user-testing in individual face-to-face interviews.

User testing Round 1

March 2018

Prototype 2

2 pilot test participants in Norway
6 participants from mid-year meeting in Lisbon

Table 2 describes user test participant characteristics:

| # | Training | Familiarity with reviews - Expert - Moderate - Rough idea - Unfamiliar | Review PRODUCTION role | Review USER role | Review SUPPORT USER role | English 1st language? |
|--|----------------------------------|--|----------------------------|------------------------|--|-----------------------|
| 1 | Research & Allied Health prof | Expert | Author | Health professional | KT | yes |
| 2 | Research & Nurse | Expert | Author, Editor, leadership | | Researcher, support decision makers | Yes (?) |
| 3 | Research & Pharm & Public Health | Expert | Author, administrator | Policy maker, consumer | Research, support staff (KT too, based on interview) | No |
| 4 | Research & paediatrician | Expert | Author, administrator | Health professional | Teacher | No |
| 5 | Research, dietician | Expert | Author, editor, leadership | | Researcher, teacher | Yes |
| 6 | Medical | Expert | Author, editor, admin | Health professional | Researcher, teacher | No |
| Since the feedback from the pilot was similar to that of the user testing, we included it in our analysis. | | | | | | |
| (7) pilot | Medical | Expert | | Health professional | Researcher, support staff | Yes |
| (8) pilot | Research | Expert | Author | | KT | No |

Table 2: User Testing Round 1 - participant characteristics

User testing Round 2

June-July 2018

Prototype 2

15 participants from four countries

Four teams from the Cochrane Public Health and Health Systems Network carried out user testing in Finland, UK, Norway and Italy.

| # | Current position | Familiarity with reviews - Expert - Moderate - Rough idea - Unfamiliar | Review PRODUCTION role | Review USER role | Review SUPPORT USER role | Country |
|---|--------------------|--|------------------------|--|----------------------------|---------|
| 1 | Student Nurse | Moderate | - | Health professional, Consumer, degree research | Patient education | UK |
| 2 | CR Managing Editor | Expert | Author, Editor, Admin | Policy/manager/admin, Consumer | Support dec.maker, teacher | UK |

| | | | | | | |
|----|---|---------------------|--------|---|--|----------|
| 3 | Retired nurse assessor/lead nurse | Unfamiliar | - | Policy/manager/admin Health professional | - | UK |
| 4 | Postdoc Researcher | Rough idea | Author | - | Support dec.maker | UK |
| 5 | Information Specialist | Moderate | Admin | Consumer | - | UK |
| 6 | Practising physician | Rough idea | - | Health professional | - | Finland |
| 7 | Researcher, medical training | Rough idea | - | - | Support dec.maker | Finland |
| 8 | Researcher, medical training | Moderate | - | - | Support dec.maker | Finland |
| 9 | Researcher | Moderate | - | Policy/manager/admin | Support dec.maker | Finland |
| 10 | Specialist in training | Rough idea | - | Health professional | - | Finland |
| 11 | Health prof, KT | Moderate-rough idea | - | Health professional | Support dec.maker | Norway |
| 12 | Researcher, KT | Moderate-rough idea | - | - | Developer decision aids | Norway |
| 13 | Information specialist NHS | Moderate | - | - | Support dec.maker, and OTHER: tech - evidence into point of care systems | UK |
| 14 | Information specialist at regional level for national research body | Expert | Author | For research proposals | Support dec.maker, Teacher | (Italy?) |
| 15 | Information specialist, regional patient library (2 people, interviewed as 1) | Expert | - | - | Support dec.maker | Italy |

Table 3: User testing Round 2 - participant characteristics

Future work: As the participant table above shows, we did not collect feedback from any consumers/members of the public. This should be carried out before any further developments.

However, participants did represent users with varying degrees of familiarity with Cochrane Reviews, as illustrated in *Figure 4*.

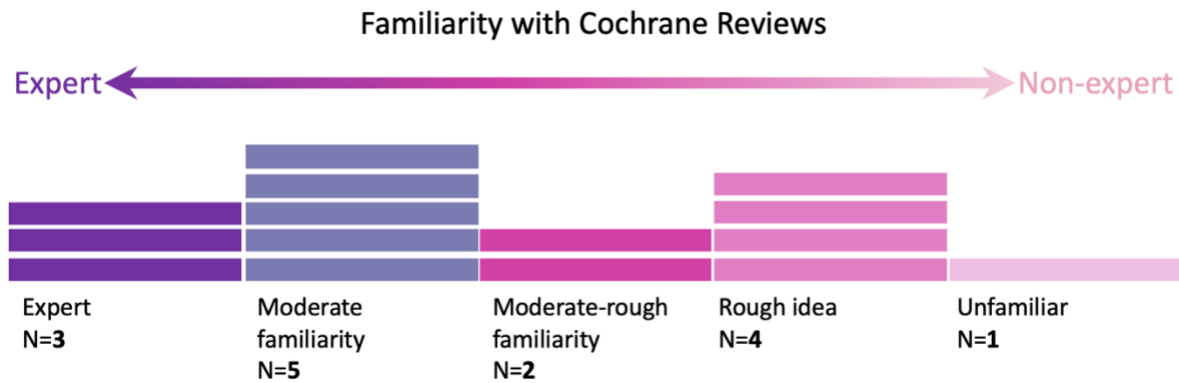


Figure 4: Round 2 User test participants' self-reported familiarity with Cochrane Reviews

Meetings and presentations

We presented and solicited informal feedback at the following:

Cochrane mid-year meeting 2018, Lisbon:

- KT advisory meeting
- Network meeting
- Co-ed meeting
- Centre directors meeting

Cochrane Colloquium 2018, Edinburgh:

- Network meeting
- IT meeting
- Translation group meeting

Feedback from Advisory Group and User testing

In *Appendix 1 – Project protocol* we describe in detail how we analysed feedback. In short, we coded findings according to our interpretation of user's experience:

- XXX Show-stopper problem for user
- XX Serious problem for user
- XX Minor problem for user
- Positive/praise from user
- OO Suggestion from user

Although we used a qualitative methodology (and are therefore not 'tallying' results), it can be helpful to see the distribution of the codes for the comments we extracted as data from each round of feedback.

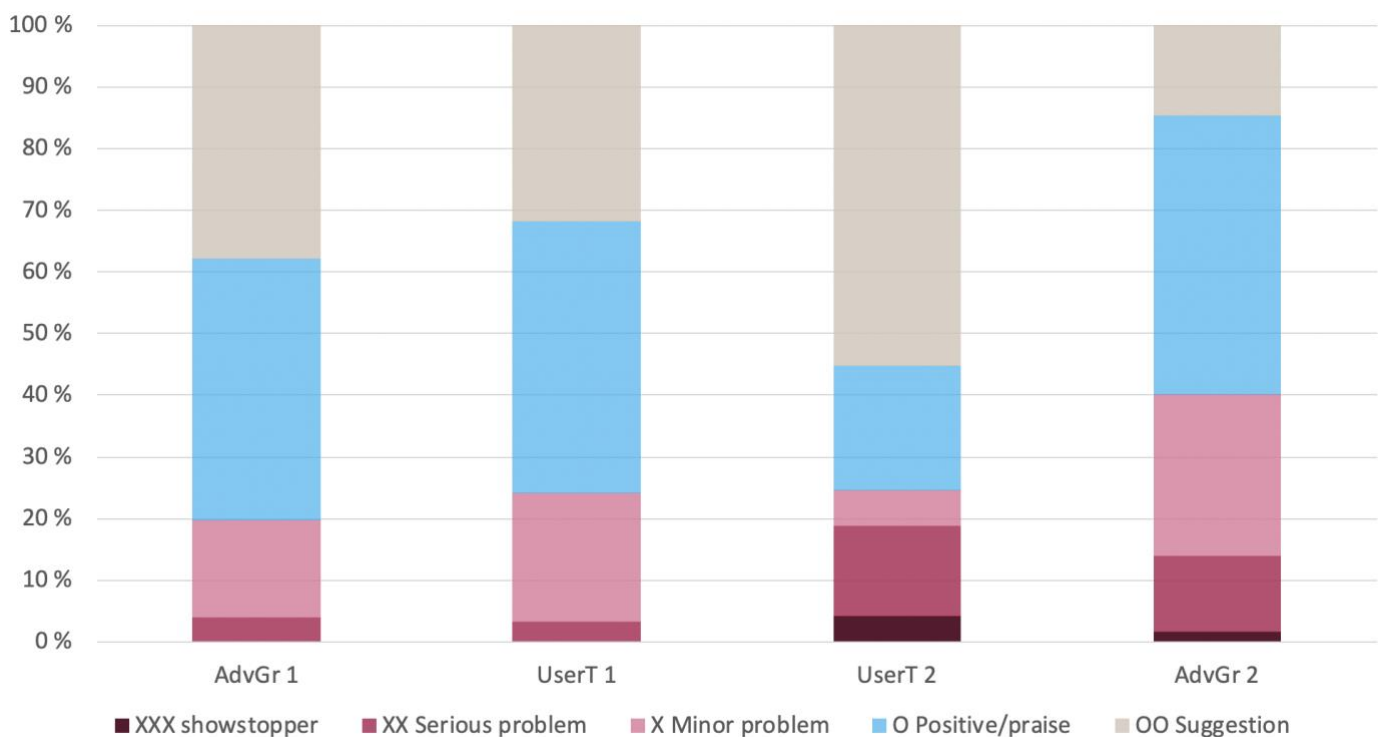


Figure 5. Distribution of types of comments across the four rounds of Advisory Group and User test feedback

The overarching nature of the feedback was positive. While we had initially planned to prioritize addressing feedback categorized as ‘showstoppers’, there were very few of these, and none in two of the the feedback rounds. So we focused mostly on those labelled ‘serious problems’, as well as ‘Suggestions’ that seemed obvious or that appeared often. Following are some of the more salient topics and adjustments we made:

Positive/praise

The single largest number of comments fell in the “Positive/praise” category. Some examples:

- *“This [new format] is clearly better than the present one.” (UT2)*
- *“Looks fantastic! When can it be rolled out?” (Co-ed mid-year meeting)*
- *“More intuitive, shorter, layered. Centered around decision not research (UT1)*
- *“...makes people see and understand better...for people with different levels of expertise and interest.” (UT 1)*
- *“Author perspective – less daunting than existing format – broken into feasible chunks.” (UT 1)*
- *“I tend to search on Cochrane using biomedical reference databases, but something like this might make me come to Cochrane Library instead” (UT2)*
- *“Overall this seems to be working well – striking a good balance between simplicity and comprehensiveness” (AG 2)*

People appreciated specifically:

- 3 layered structure with tab navigation
- Distribution of information across these 3 layers, including merging abstract and PLS
- Main findings in bullet list
- Use of tables, including the new ones, especially “What authors searched for/found”, and new “Characteristics of included studies”
- ‘Additional information for decision makers’
- ‘Messages for media’

Problems, solutions, future work

Layer 1 - SUMMARY

- *What information should be included at this level, how much is enough detail?*
- We used the [Plain language summary template](#) and the Abstract as a starting point. We resolved the problem about to keep the length short through use of links, e.g ‘More detail about [the intervention]’, ‘What authors searched for and found’ (a narrative summary of the table that appears in the Full text), and link to a definition of a Cochrane Review, so that different audiences could easily jump to more detail as needed.
- *Order of items, some wanting main findings higher up*
- Several people suggested placing main findings higher up, so we created alternative versions and asked about people’s preferences. In the User Test Round 2, preferences were divided. Among the advisory group, many more people preferred the Main findings to come after the Objectives (and before the Background), so this is the order in the final prototype. However, people who work with lay audiences expressed concern about this format, and we have not yet tested with lay audiences.
- **Future work: user testing with lay audiences should explore this issue.**
- *Date is not prominent enough, want date of most recent search*
- We increased the size of the date under the title, and added “Date of most recent search” and “Assessed as up to [date]” after the publication date, followed by the link to “See what’s changed”.
- *Worries that the ‘Summary’ is not plain-lanugage enough and the SoF table will be off-putting to lay people.*
- We followed principles for writing plain-lanugage summaries. But it is clear that clear, plain-language writing is both an important feature of a summary, and an persistant challenge for many authors.
- In an early prototype, the Sof table took up a lot of the vertical space in the summary. Some people felt the numbers dominated too much and would be off-putting to lay audiences. We changed the design, so that the top section of the table was visible, and

the user needed to click to expand the whole table (a technical solution we have used in interactive Evidence to Decision frameworks), an adjustment that appeared to have resolved this issue.

- **Future work: We need user testing with people from consumer audiences concerning the acceptability of the proposed summary.**
- **Future work: Implementation needs to include training strategies that enable authors and review groups to produce summaries of high quality.**

- *Calling for more prominent placement of new features 'Information for decision makers' (called 'Related content' in an earlier prototype) and 'Messages for media' (for a description of these features, see Appendix 2 - Core features and evidence)*
 - Originally we placed links to these proposed new sections at the bottom of the Summary page, but much feedback called for both of these sections to be placed more prominently, so we moved them up higher in the right column. Some Advisory Group feedback Round 2 called for even more central placement of 'Information for decision makers'.
 - «I really like the 'Information for decision makers' tab but...I feel it should be up there on the front page as it pulls together key issues from the Discussion and Conclusion really well into a new type of summary.» (AdvGr2)

- *Authors' concerns – who would write 'Information for decision makers' and how would it be branded/perceived if it was in a separate section (a part of the review, or supplementary information?)*
 - Although there was positive response to 'Information for decision makers' some expressed concern that it would add burden to authors and that authors would struggle to write it. Also if it is not the result of a systematic search for information, it needs to be labeled clearly and might be confusing to readers.
 - **Future work includes piloting of 'Information for decision makers', to explore feasibility and ways of including it (as a part of the discussion/background material or as a supplementary section). The EPOC satellite will pilot part of this section (information for policy makers) in a few upcoming reviews, to explore placement in the review text and feasibility issues for authors.**

Layer 2 - FULL TEXT

- *Concern that the review would lose coherence and become a "warren of tables" "While its good to move things out - not enough has been left within the full text - it feels a little like a skeleton without enough meat on the bones – "*
 - We addressed this by adding more text leading up to the 'links for more detail' in the methods and results sections. However, this concern highlights an overarching issue, about the importance of the quality of the writing throughout the whole review.

- **Future work: Implementation needs to include training strategies that enable authors and review groups to produce full text of high quality.**
- *Wanting some tables, such as forest plots to be visible in the review text (not hidden behind links).*
- We sought make the Full text section less overwhelming, in part by collapsing most tables and figures into links. However, some people were looking for visual cues to many of these items. We resolved this by designing large thumbnail graphics for standard tables, that could provide visual cues over and beyond the title of the table/figure label.



Table x. Characteristics of included studies: Relevant information about the methods, participants, interventions, and outcome measures for each study included in this review



Table x. Characteristics of excluded studies: Reasons for excluding specific studies that might appear to be relevant for this review



Table x. Characteristics of ongoing studies: Information about the methods, participants, interventions, and outcome measures of studies for which results have not yet been reported



Table x. Risk of bias of included studies: The review authors' judgements about the risk of specific types of systematic errors (bias) and - the basis for those judgements - for each included study



Figure x. Risk of bias summary: An overview of the review authors' judgements about the risk of specific types of systematic errors (bias) for all of the included studies

LAYER 3 –

- *What to call Layer 3?*
- We initially called layer 3 'Appendices'. Although the 'Summary' and 'Full text' labels were widely accepted as layer headings, there was a lot of disagreement about 'Appendices' which people felt was too peripheral for the type of content they found there. However, there was little consensus about what to call this section instead. In the last round of advisory Group feedback we asked people for votes and other suggestions. Result of votes:

| | |
|-----------------------------|----------------|
| 'Expanded details' | 6 votes |
| 'More details' | 4 votes |
| 'Research details' | 4 votes |
| 'Additional details' | 3 votes |
| 'Tables, figures, analyses' | 3 votes |
| (Several suggestions | 1 vote each) |

In the final prototype, we have used 'Expanded details' as a label for layer 3.

Feedback spreadsheets

The spreadsheets of coded and categorised responses from both rounds of User testing and Advisory Group feedback are included as appendices:

Appendix 4 – Feedback spreadsheet Advisory Group Round 1

Appendix 5 – Feedback spreadsheet Advisory Group Round 2

Appendix 6 – Feedback spreadsheet User Test Round 1

Appendix 7 – Feedback spreadsheet User Test Round 2

Example testing

After working with the Electronic cigarettes review, the working group - in consultation with the Steering Group - chose four more reviews to rewrite using the same new structure. We based our choices on an analysis review characteristics that might pose different formatting challenges than the Electronic cigarettes review. The aim of the rewriting was three-fold: a) to test the suitability of the format against different types of intervention review content, b) to identify format features that needed to be adjusted in order to accommodate different types of content, and c) to provide example texts for guidance. Nandi Siegfried (NS) rewrote these four reviews with the help of Andy Oxman and Newton Opiyo. These re-written review examples are included as appendices.

| # | Review type | Anticipated characteristics | Review title | Rewritten manuscript |
|---|-----------------------|---|--|--|
| 1 | Simple review | Few comparisons Few important outcomes | <i>Electronic cigarettes for smoking cessation</i> | Appendix 8 –Simple review See also: interactive Prototype 3 |
| 2 | Network meta-analysis | | <i>Uterotonic agents for preventing postpartum haemorrhage</i> | Appendix 9 –Network meta-analysis |
| 3 | No meta-analysis | Narrative results | <i>Vaccines for preventing influenza in healthy adults</i> | Appendix 10 – No meta-analysis |
| 4 | Complex review | Many comparisons Many important outcomes | <i>Interventions to improve antibiotic prescribing practices for hospital inpatients</i> | Appendix 11 – Complex review |
| 5 | No included studies | ‘Empty’ review, with no findings | <i>Planned birth at or near term for improving health outcomes for pregnant women with pre-existing diabetes and their infants</i> | Appendix 12 - No incl. studies |

Future work: This project was put into «pause» modus before we could create interactive design prototypes of these example reviews. Future work might include creating these prototypes in Adobe XD or other prototyping software.

Feedback from authoring examples

NS rewrote four example reviews from existing review manuscripts; we changed very little to the format in order to accommodate these new review texts. Although rewriting a review to match the new format is a different exercise than writing a review from scratch in the new format, the fact that it was possible provided a good indication that

the format is suitable across all four review types (network meta-analysis, complex review, no meta-analysis, and empty review).

“A lot of my notes and our discussions were about use of language and how to interpret the author’s results, rather than the actual formatting, so it is not as much as I thought. I take that as an overall compliment to the work done on the formatting prior to my involvement, as most of the template worked very well.”
(NS, email correspondence)

NS kept a log while re-writing reviews, and used that as a basis to create a short spreadsheet of feedback, for developers and authors. The figure below illustrates the type of feedback she provided. For her complete feedback, see *Appendix 13 – Example testing feedback for developers and authors*

| | | | | |
|-----------|------------|---------|--------------------------|--|
| Full text | Developers | Results | Effects of interventions | This section must be able to be organised by comparison or outcome |
| Full text | Authors | Results | Effects of interventions | Guidance for authors about which outcomes (or all outcomes) to be reported using PLS guidance; alternatively, if there are multiple outcomes but only 7 outcomes in the SoF then authors require guidance on how to report results which do not undergo GRADE |
| Full text | Developers | Results | Effects of interventions | Specific to NMA, flexibility must be retained in reporting the results when it comes to decision about which interventions to report on in more detail per ranking e.g. authors report on top 3 rankings only but if there are marginal differences, authors should have the choice here |

Figure 6. Excerpt of NS’s feedback from rewriting the four example reviews

Future work: Engage a review group to produce one or more new reviews from scratch, using the new format structure, in order to understand any format- or guidance-related issues that were not captured in re-writing existing reviews.

Feedback from translators

We had planned to carry out “translation testing”, involving Cochrane members who routinely translate parts of a review to another language or for a specific setting, to explore the suitability of the proposed format for translation, and uncover any problems. Although we were not able to carry out formal translation testing by the end of this project year, several people who provided feedback also had experience with translation, such as creating KT material for reviews in other languages. Some of their feedback included:

- Appreciation of tables
 - *“Tables much better than text – it’s very difficult to translate text.” (UT1)*
- ‘Information for decision makers’ –helpful start for contextualisation (UT 1)
- Links to ‘more content’ in English can be problematic
 - *“Having links to other pages increases burden for translators – may need to translate more to avoid having links which just go to English pages” (UT1)*

Future work: ‘translation testing’ should be carried out. We have a list of KT translators who are interested in participating in this.

Author Guidance – first draft for Summary layer

In this document we provide a first draft of author guidance for writing the summary (top layer):

Appendix 14 – Draft author guidance - Summary layer

Before implementation of specific elements

Review the existing detailed feedback

People provided many detailed comments about ways to improve specific tables or other individual elements. We coded these as ‘Suggestions’. We acted on many such suggestions, but not all of them. We have not summarised feedback about each individual element. However, responses in the feedback spreadsheets are also labelled according to section-element, so these can be sorted, extracted and analysed as a group. We suggest doing this before any IT implementation is carried out on individual elements, as this may provide useful ideas or perspectives. Examples of these items include:

- What authors searched for and found table
- Characteristics of included studies table
- Overview of analysis, forest plots
- Similarities and difference to other reviews
- Authors conclusions
 - Implications for practice table
 - Implications for research table

Future work: Extract and analyse existing feedback (including authoring feedback from Nandi Siegfried) about individual elements such as tables, from the four feedback spreadsheets before further development.

Changes that may require a separate process or project

Some of the proposed elements are complex and may require more in-depth exploration in a separate project before implementation. This should begin with reviewing the existing feedback relevant to these items, followed by more rounds of focused prototyping and feedback. In *Appendix 2 – Core features and evidence*, we describe some of these items, though after reviewing feedback for individual elements (above), more items might need to be added to this list:

- Interactive Summary of findings tables
- Table summarising intervention details
- Subgroup analysis tables + grading
- A glossary with standard terms that can be linked to from reviews
- Evidence to decision tables
- Messages for media
- Author’s Guidance

Future work: For some elements, a more thorough exploration of prototyping and feedback may be necessary (in addition to extracting and analysing existing feedback).

Discussion and conclusion

The aim of this work was to explore ideas for a future interactive format for Cochrane Reviews of interventions that was easier for people to use and easier for authors and editors to produce, that Cochrane could work towards over time. We developed a new layered format, rewrote an existing review to fit that format, designed an interactive prototype based on the new review text, carried out cycles of feedback and adjustments (from Advisory Group and User testing), rewrote four additional existing reviews to test the suitability of the format to different review types, collected feedback from the author of those example texts, and solicited continuous feedback from the broader community through meetings and presentations. We described the core features and evidence related to the new format, and created a first draft of Summary layer guidance for authors.

Limitations and strengths

Limitations of this work include lack of feedback from consumer target audiences and lack of translation testing. Also the volume of feedback meant that a number of single suggestions labelled as 'minor' problems were not addressed. Since this work was deliberately carried out without explicit consideration for limitations within the existing publishing platform, it is not certain that all the proposed features are feasible to implement.

The main strength of this work is the combined and sustained input over 14 months from a wide range of people with expertise in authoring, editing, designing, publishing and using systematic reviews.

Our conclusions

The format we developed appears to be highly acceptable and desirable to producers of Cochrane Reviews. Based on the overwhelming enthusiasm we experienced presenting this work to a wide range of people within Cochrane, we believe that there is solid support for this approach within the organisation. We think it likely is also acceptable to a wide range of users, though more feedback from non-expert target audiences needs to be explored. The template was flexible and proved to be compatible with content from different types of intervention reviews with varying complexity.

Next steps

There are several next steps, marked in red throughout this report, for further development of the format and content from an author/editor/translator perspective and from multiple user perspectives.

However, a significant next step is to evaluate how this work aligns with the current or future publishing system and other ongoing initiatives in the organisation. To address

this, Cochrane (Cochrane Innovations, Research and Development) is creating a description of the main suggestions from this work, as seen a technical publishing and editorial process perspective. The aim of that work is to describe the initiative in a way that enables an assessment of the consequences of implementation across multiple systems, and bring it into perspective with other planned initiatives. That work is currently labelled “Accessible Cochrane Reviews” and includes the following documents:

- Background and scope
- Summary, Full-text, Enhanced information layers
- Enhancements to Summary of Findings tables
- Enhanced presentation of tables

We are collaborating with this team to try to align the work described here with their documents.

Issues we regards as particularly important moving forward:

- Maintaining the coherence of the proposed format laid out here, while pursuing the implementation of some of the elements or features as separate projects.
- Continued prioritisation of user- and author experience, as the central focus future implementation efforts.

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