



Evaluation of training of authors of Cochrane systematic reviews in New Zealand and a pilot of a web-based alternative

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Executive Summary

Systematic reviews are a synthesis of the best available evidence for healthcare and assist clinical decision making and for developing health policy. The Cochrane Collaboration (CC) publishes systematic reviews in an electronic format that requires specific training. The CC has over 25,000 authors from over 80 countries and providing training and support to these authors presents a significant challenge. The approach that has been used in New Zealand and Australia has been a traditional didactic training programme known as the Cochrane Protocol and Analysis (P&A) course. This project considered the development and evaluation of an electronic educational programme.

The aim of this research was to assess the current Cochrane Protocol and Analysis course for authors of Cochrane systematic reviews and to compare with a newly developed electronic educational course.

The electronic learning educational programme was developed and then evaluated using a feedback form that was specific to the course content. The new course was compared with the traditional Cochrane Protocol and Analysis course. Descriptive statistics with narrative data were used to report on the two different course evaluations. Pre- and post-knowledge testing and surveys for both the current didactic and the pilot web-based course was undertaken. The assessments were summative in nature and the questioning formats were formal and both objective and subjective.

The evaluation of the didactic courses suggested that the majority of participants improved their knowledge. The evaluation of the web course pilot was limited by the number of recruited participants which in turn has limited any useful conclusions. However it is recommended that a modified web course could be developed as a useful tool, adjunct to the current didactic workshop.

Background

The Cochrane Collaboration (CC) is an international organisation that prepares and publishes summaries of health information in a series of Systematic Reviews (SRs). Cochrane SRs collect and appraise studies and then where appropriate pool data using meta-analysis. These SRs are concerned with the effects of healthcare interventions and diagnostic tests and are published each month as The Cochrane Library (www.Cochrane.org).

The process of producing a systematic review is summarised in Figure 1. Cochrane SRs have four phases: title registration, protocol for a review, review and updated review which all undergo editorial review. .

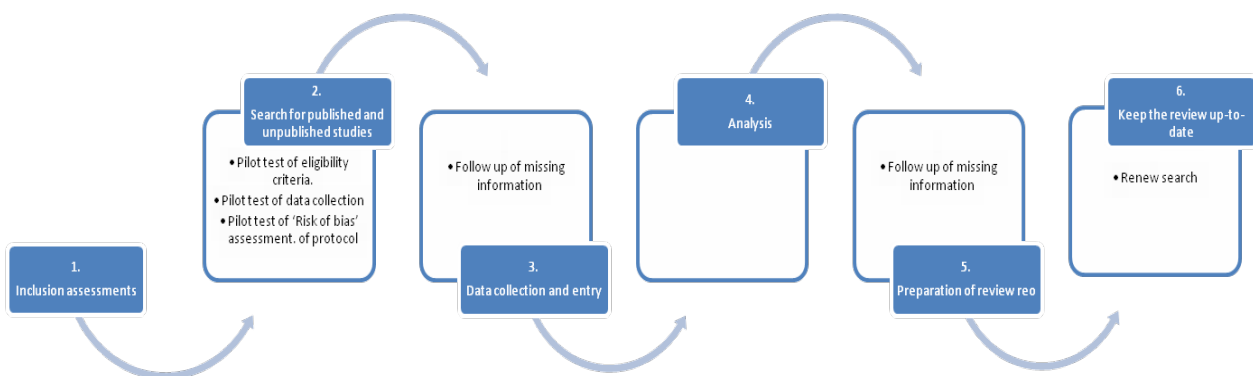


Figure 1: Steps involved in the development of a Cochrane systematic review (Higgins and Green 2008)

The CC has specialised software for use in the preparation and ongoing maintenance of their reviews, known as Review Manager (RevMan). The software is used to prepare SRs and is also able to perform meta-analyses and present the results graphically. In addition to RevMan, the CC has a central server, known as Archie, used for managing documents, editorial workflows and contacts details. Archie is an internet based repository for the CC's documents.

The CC is an independent non-profit organisation. It has a formal structure (Figure 2), with five working components (centres, fields, a consumer network, methods working groups and review groups). The CC has an overarching governing body known as the Steering group. The thirteen Cochrane centres are concerned with promotion and education, while the fifty-two Collaborative review groups each have a clinical focus and are concerned with the editorial processes involved in SR publication in their topic area.

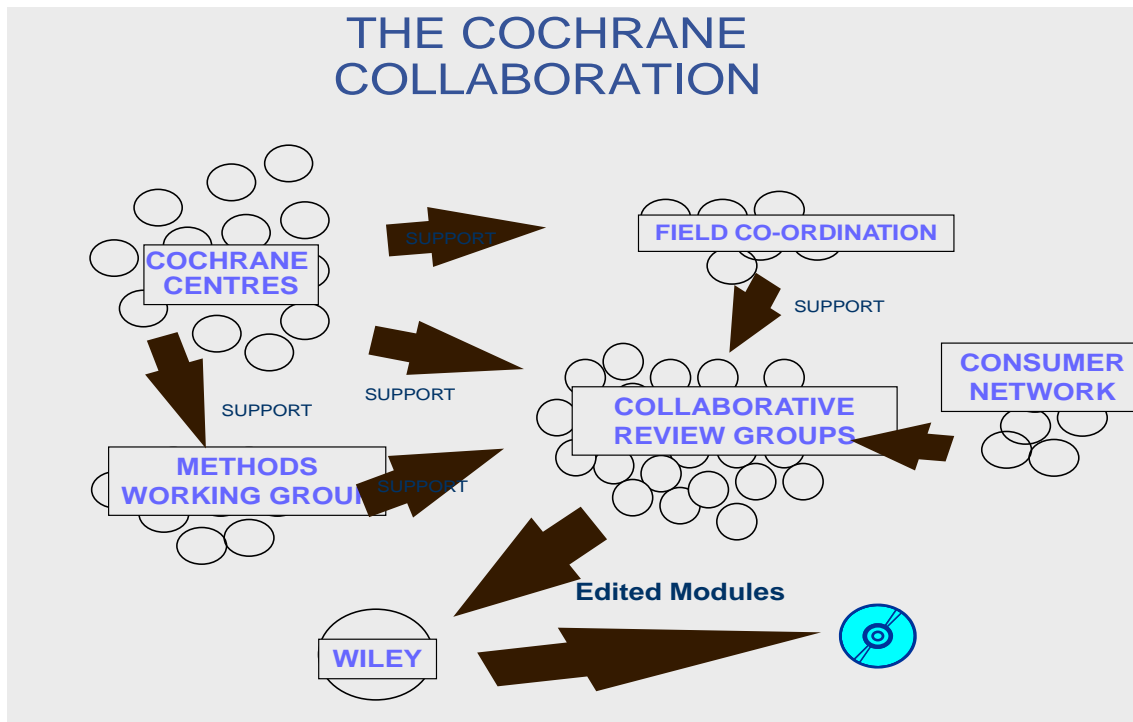


Figure 2: The Cochrane Collaboration structure

Currently, 25,000 individuals from 80 countries and over 50 specialties are involved in the preparation of systematic reviews. Most of the work of preparing the reviews is undertaken by volunteers who require training. There are 358 New Zealand-based Cochrane contributors, who include both authors and editors. Over the past ten years the annual publication rates of CRs has grown exponentially and there are now over 4000 Cochrane reviews. Cochrane reviews have been described as having greater methodological rigor and are more regularly updated than systematic reviews or meta-analyses published in paper-based journals (Moher 2007).

The Collaboration derives its name from Archie Cochrane, a Scottish epidemiologist whose significant contributions were primarily within the development of the science of epidemiology and clinical trial methodology. Archie Cochrane is best renowned for *Effectiveness and Efficiency: Random Reflections on Health Services*, published in 1972 (Cochrane 1972). In this book, Cochrane suggested that only those forms of healthcare that have been reliably proven to be effective should be used. The first Cochrane centre was established in 1992 in Oxford, United Kingdom followed by the launch of the international Cochrane Collaboration in 1993. Rapid growth and support for the collaboration from a broad group of stakeholders that included lay people, policymakers and other areas within health, soon followed.

The CC provides educational support for over 25,000 individuals from over 80 countries to prepare CRs. This is no small task and there are many challenges and constraints to overcome, including multiple languages and resources. For example, currently workshops are taught in English, Spanish, Dutch, Chinese, Italian, and Nordic languages. At present, the CC educates review authors at didactic workshops held over two days. The Collaboration has produced a handbook (current version 5.0.2 updated in September 2009) for SRs of interventions, which describes the process of preparing and maintaining

Cochrane systematic reviews on the effects of healthcare interventions (Higgins and Green 2009). The past decade has seen the development of e-learning technology and therefore it is timely for the CC to consider this approach given both their strong adoption of new technologies such as electronic publications and secondly the challenge of training across the globe.

The aim of this research was to assess the current Cochrane Protocol and Analysis course for authors of Cochrane systematic reviews and to compare with a newly developed electronic educational course.

Methodology

Phase 1: Evaluation of current teaching in New Zealand of Cochrane systematic reviews

At the time of the research each year in New Zealand, two or three Protocol and Analysis (P&A) workshops were held. Each of the workshops was held over two days and followed a traditional workshop format with 5-6 different presenters taking a didactic approach with some small group work completing exercises. The evaluation of this teaching incorporated pre- and post-knowledge testing and surveys of the participants from two P&A workshops conducted in 2009. A test-retest method of evaluation involved the application of the same test to the same participants at the beginning and end of the two-day workshop involved in the evaluation. The knowledge test contained 14 Multiple Choice Questions (MCQs) and two free text questions and included questions regarding Cochrane software, Cochrane SR search strategies and statistical methods. Following the development phase, the test was piloted with twenty-one individuals who attended two different workshops using the same format. There was also an anonymous evaluation form with 12 questions that was completed at the end of each workshop that used a Likert scale of 1-5 for each of the presentations and exercised in the workshop.

Phase 2: The development and testing of a web-based course

During the web-based course development phase the format of the current P&A workshop was maintained including course promotion and course content. The only significant difference was that dubbed versions of all the PowerPoint presentations from the didactic course were included using Articulate authoring software which converts PowerPoint into a Flash authoring application. The software reduces the size of presentations so they download quickly, and the presentations can be distributed on the Web, by Email or on CD-ROM. Three facilitators dubbed the presentations that they would normally present at the didactic workshops. These presentations were uploaded onto the Course Builder software widely used at the University of Auckland for the delivery of web-based courses, which can be found at www.cad.auckland.ac.nz. Participants were provided with detailed instructions on the welcome page and were contacted prior to the pilot phase in order to resolve any logistical issues in advance. Continued support was made available for the participants throughout the course via telephone or email.

In addition to the dubbed PowerPoint presentations, the web-based course included a series of exercises with worksheets. The researcher either personally developed the exercises or adapted existing resources for this purpose. The eight exercises were:

1. Appraisal of a systematic review.
2. Developing a research question which is described in terms of: Population, Intervention, Control, and Outcome(s).
3. Establishing what types and sources of studies will answer this research question considering study design, population, intervention, comparison, and outcome measures.
4. Determining eligibility of studies for inclusion in a SR by implementing an initial screen.
5. Applying inclusion criteria to select eligible studies.
6. Determining the additional forms of information that might be sought from an included study.
7. Appraisal of included studies in a review.
8. Extraction of the data available from included studies.

The web-based course was designed to be supported by the researcher using email and a social networking blog.

(http://flexiblelearning.auckland.ac.nz/elgg/protocol_systematic_review/).

The participants in the web-based pilot completed a questionnaire, which surveyed their views of the web-based course. This survey sought data from participants on their use of computers, how this site was used, opinion on all web-based education, perceived strengths and/or barriers of web-based education and their experience of this particular web-based course

Prior to the piloting, testing of all mechanisms of the course content and its delivery was undertaken, including the pre- and post-course knowledge test and the web-based education survey, the web course itself and the related exercises. Three individuals contributed to this test phase and 94 minor technical faults in the web course were identified and were resolved. The test was rerun as a quality assurance measure.

Five participants took part in the pilot of the web-based course. The evaluation of this pilot included data obtained from the pre- and post- course knowledge testing, the perception of a web-based education survey, and the web course exercises. Piloting was designed to consider the validity and reliability of the surveys and the newly developed web-based course. The web participants completed the evaluations and test online.

Phase 3: Evaluation of web-based course

There were two groups involved in this pilot: three course facilitators and five course participants. Both the facilitators and the pilot participants contributed narrative data to the evaluation and these results were summarised accordingly. In addition, the five participants took part in the piloting process, four of whom then completed the pre-knowledge test and three of these participants went on to complete the post- knowledge test and surveys.

Key Findings

Evaluation of current Protocol and Analysis workshop

- The majority of participants showed improvement in their knowledge although some participants performance remained unchanged.
- The mean percentage improvement was 27.75% with a range of zero to 57%. Four participants did not improve their score.
- There was a 5% mean change in knowledge regarding overview of the CC, a 26% mean change in knowledge regarding applied methodologies for SRs, and a 30% mean change in knowledge specialised information retrieval for SRs.
- All participants expressed a high degree of satisfaction with the course.
- The lowest score were for 'small group discussions' and 'understanding the principles of developing a comprehensive search strategy'.
- The majority of participants were content with the nature of the small group work, although some participants evidently preferred lectures to small groups.

Evaluation of the web-based course

Facilitator narrative evaluation (n=3)

- The development and construction of the web-based course proved to be a larger challenge than originally thought by the facilitators and although the tertiary educational facility provided the software, it soon became apparent that a high level of technical support was required to effectively utilise this software.
- The resource implications for the ongoing maintenance of this web-based course (or modified versions of it) were thought to be similar to the didactic workshops. It was thought that the introduction of a web-based course would not necessarily result in savings.
- There was a view that a modified form of the tool may prove to be a useful complement to the didactic workshops provided that there was technical support available
- The process of becoming familiar with the software was considered challenging. There was some technical support available for them; however the overcommitted technical staff that were familiar with the Articulate software were not completely conversant with the web-based Course builder software and vice versa. All three facilitators found the audio dubbing process to be initially difficult.
- All facilitators missed the live interaction and feedback provided from students. This interaction with students provides an opportunity for assessment of how well students understand the content.

Course participant narrative evaluation (n=5)

- Participants accessed the course either at home or at work or a combination of both. None of the participants used the social networking site. Three participants requested technical assistance by telephone, one of whom required assistance three times. Three of the participants had completed e-learning courses previously.

- One participant found the process ‘boring’ and all participants found it time consuming and used over 20 hours of time to complete the course.
- All participants would be keen to participate in a web-based course again. The judgment was to further improve the course.
- Recommendations from the participants were that this web-based course be used as a supplement to formal didactic teaching.
- As with the didactic workshop, reliability and validity were to be explored. However the limited data available made this task impossible to complete.

Limitations of this research

- No conclusions about the comparisons of the two different courses (didactic and web-based) could be made because of the low number of participants who were recruited to complete the web-based course. As a result no content or construct validity could be evaluated.

Lessons learnt from this research

- A formalised recruitment strategy applied across professional bodies would have been more successful in gaining participants for the web-based course.
- Greater time should have been allowed for the development phase of the web-based course and for recruitment of participants.

Recommendations for Cochrane Protocol and Analysis workshops

- That the didactic course should be regularly reviewed especially in regard to methodology changes and in specialist information retrieval.
- That both the host educational facility and its staff are aware of all of the prerequisite and appropriate resource implications for web-based learning.
- That a modified web course be considered to complement the current Protocol and Analysis workshops. Modifications to the web-based course should include compulsory milestones where activities such as exercises are required.

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