LETTER

SEED: a tool for disseminating systematic review data into Wikipedia

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Abstract

Wikipedia, the free-content online encyclopaedia, contains many heavily accessed pages relating to healthcare. Cochrane systematic reviews contain much high-grade evidence but dissemination into Wikipedia has been slow. New skills are needed to both translate and relocate data from Cochrane reviews to implant into Wikipedia pages. This letter introduces a programme to greatly simplify the process of disseminating the summary of findings of Cochrane reviews into Wikipedia pages.

Keywords: Wikipedia, Summary of findings, Automation, Systematic reviews, Reducing waste

Background

Wikipedia contains over 40 million articles with 5.3 m in the English language [1]. Since its creation in 2001, Wikipedia has expanded to attract over 374 million unique visitors each month and around 20% of healthcare-related online searches direct to Wikipedia pages [2, 3]. Every year health pages on Wikipedia receive over 4.8 billion views [4]. Wikipedia is openly editable so any user can access and edit the majority of articles. Wikipedia policy states, however, that all information presented in pages must be "verifiable against a published reliable source" [5].

The Cochrane Collaboration is a non-for profit organisation producing, and maintaining systematic reviews of health care [6]. A systematic review "attempts to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimising bias, thus providing more reliable findings from which conclusions can be drawn and decisions made" [7]. These findings are acceptable on Wikipedia pages if referenced and reliable. The Cochrane Collaboration uses a writing tool—RevMan [8]—to produce its reviews but disseminating the findings of the reviews within Wikipedia necessitates more work. Data have to be extracted, summarised and referenced in the clear and simple way required by Wikipedia. This additional effort and skill set often results in Cochrane reviews being less used in Wikipedia pages than could be the case.

Aim

To produce a tool (Systematic EvidEnce Disseminator, SEED) to auto-generate a Wikipedia-compatible table and accompanying reference direct from Cochrane's RevMan files.

Procedure

The programme was created by students of Applied Health Science with close-to-zero previous knowledge in programming and the help of printed popular texts [9], numerous YouTube tutorials and internet fora. For creating the SEED tool, the integrated development environment 'Eclipse' was used (Neon version) [9]. This open-source programme allows the developed application to run on the programming language Java.

RevMan (v5.3) is an open-access text editor for authors of reviews [8]. It produces structured XML (Extensible Markup Language) review files (.rm5) within which Summary of Findings tables (SoF)—in turn produced by GradePro [10]—are embedded. Because the development team worked within Cochrane Schizophrenia's editorial base they had access to RevMan files. The team had identified Wikipedia pages specific enough to be appropriately seeded with evidence from particular reviews' SoF tables [11].

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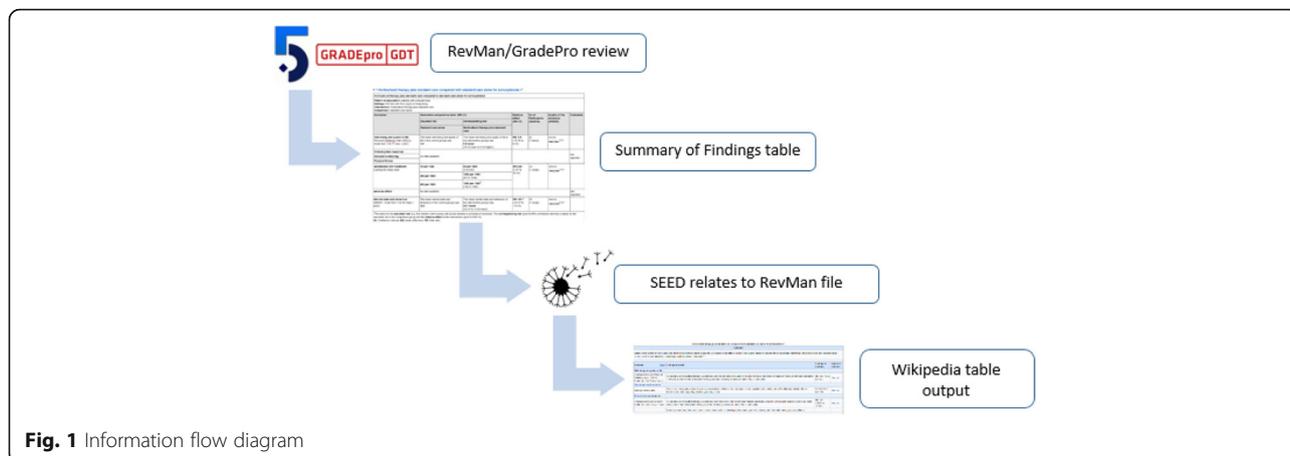Full list of author information is available at the end of the article

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Fig. 1 Information flow diagram

Because each .rm5 file has basically the same structure, this makes it simple to read content automatically. Eclipse parses the XML structure with its 'chapters' and 'subchapters' (children). The parser programme reads and follows relevant roots of XML-format and can jump to the SoF tables section and the references. In combination with the code we generated to parse through the files attributes or elements of the SoF part of the XML file can be converted into 'strings' and these, in turn, embedded in prepared phrases. These phrases were developed with the help of Sense about Science [12], to ensure both accuracy and clarity for Wikipedia readers. After SEED captures the SoF content, it converts it into the special format of Wikipedia tables. This format is standardised [13] and includes code for generating the correct size, font, formatting, colour and shading. We used Swing [14] to build the graphical interface of SEED. Swing is a GUI (Graphical user interface) tool allowing those with low IT knowledge to create a typical window with buttons, text fields and icons.

Output

SEED allows the user to select their RevMan file, choose the relevant SoF table, and then produce compatible Code of Wikipedia tables (Fig. 1) that can be pasted directly into the editing box of the relevant Wikipedia page. This code will produce a clear and attractive table with an accompanying reference to that Cochrane review. One such 'effect of treatment' table is embedded in the Wikipedia page relevant to Early Intervention in Psychosis—Fig. 2 [15].

Specialized team compared to standard care for psychosis[40]			
Summary			
There is emerging, but as yet inconclusive evidence, to suggest that people in the prodrome of psychosis can be helped by some interventions. There is some support for specialized early intervention services, but further trials would be desirable, and there is a question of whether gains are maintained. There is some support for phase-specific treatment focused on employment and family therapy, but again, this needs replicating with larger and longer trials.[40]			
[hide]Outcome	Findings in words	Findings in numbers	Quality of evidence
Compliance with treatment			
Treatment stopped in spite of need. Follow-up: 12 months	Specialized team probably reduces poor adherence to treatment. Data are based on moderate quality evidence.	RR 0.2 (0.1 to 0.42)	Moderate
Follow-up: 24 months	The difference seen at 12 months may disappear over the longer term. Data supporting this finding are based on moderate quality evidence.	RR 0.66 (0.29 to 1.5)	Moderate
Service use			
Average number of days per month in hospital. Follow-up: 5 years	There was no clear difference between groups although the average number of days per month in hospital in the intervention groups was somewhat lower. Data supporting this finding are based on moderate quality evidence.	MD 1.11 lower (3.21 lower to 0.99 higher)	Moderate
Not hospitalized. Follow-up: 5 years	Specialized team probably causes little or no increase to the chance of experiencing the outcomes to do with how much hospital/community care is used, but the difference between the two treatments is not clear. Data supporting this finding are based on moderate quality evidence.	RR 1.05 (0.9 to 1.22)	Moderate
Social outcomes			
Not living independently. Follow-up: 5 years	Specialized team probably slightly reduces the chance of 'dependent living' (in day-to-day life). Data are based on moderate quality evidence.	RR 0.42 (0.21 to 0.83)	Moderate
Not working or in education. Follow-up: 5 years	Specialized team probably does not effect chance of being unemployed or being in or out of education. Data supporting this finding are based on moderate quality evidence.	RR 1.06 (0.92 to 1.23)	Moderate

Fig. 2 Output of SEED as it appears in Wikipedia

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Conclusions

The time of researchers and staff involved in knowledge transfer is finite. As the reviewing process becomes more sophisticated and dissemination in one format is increasingly seen as inadequate more shortcuts will be needed to produce output. SEED is open-access (see Availability of data and materials, below) and greatly increases the efficiency of knowledge transfer into one highly-accessed format.

Abbreviations
EU: European Union; GUI: Graphical user interface; NIHR: National Institute of Health Research; SEED: Systematic EvidEnce Disseminator; SoF: Summary of Findings tables; XML: Extensible Markup Language

Availability of data and materials
SEED is available to download—including the source code https://github.com/CochraneSchizophrenia/SEED/releases/tag/FirstRelease. Examples of pages already containing SEED-produced expandable (press 'open') tables (static versions).
https://en.wikipedia.org/w/index.php?title=Token_economy&oldid=800992548.
https://en.wikipedia.org/w/index.php?title=Asenapine&oldid=798881863.
https://en.wikipedia.org/w/index.php?title=Hypersalivation&oldid=798766696.

Authors' contributions
LS undertook the main body of the programming and research into extraction from XML, undertook the testing and contributed to the write up. JF undertook the main body of the design of the graphical user interface, helped undertake the testing and contributed to the write up. CEA thought up the idea and did none of the programming but helped test and contributed to the write up. All authors read and approved the final manuscript.

Ethics approval and consent to participate
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Consent for publication
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