Reviewer's report

Title: Rural medical education and the impact on rural practice location: a scoping review

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Reviewer: Maria Mathews

Reviewer's report:

Please number your comments and divide them into:

- Major Compulsory Revisions

The question posed by the authors is somewhat new and well defined. The authors ask the questions: “Does medical education in a rural place produce rural doctors? And is there a gradient relationship between time spent in rural based medical education and likelihood of working in rural practice?” It would be helpful to describe or define what the authors mean by rural education and working in rural practice. In the results, through the typology, the authors describe the different types of rural education. They do not, however, define or describe what they mean by “working in rural practice”. This is particularly problematic given that they refer to employment following graduation - but it is unclear whether that mean graduation from medical school or from post-graduate training, or after bonded service. By including work location during residency training, the definition doesn’t generally cohere with studies that look at work location after all post-graduate training is complete (and the study does not seem to distinguish between these outcomes). Please provide definitions for the outcomes used in the study.

The authors suggest that a search of the Cochrane library found no systematic reviews. In fact,

there is a relevant review (Grobler, L., B.J. Marias, S.A. Mabunda, P.N. Marindi, H. Reuter and J. Volmink. 2009. “Intervention for Increasing the Proportion of Health Professionals Practising in Rural and Other Underserved Areas.” Cochrane Database of Systematic Reviews (1). doi: 10.1002/14651858.CD005314.pub2) although the terms were different and somewhat broader. Nonetheless, the review does provide information relevant to the authors’ questions. There is also a related review that provides a very useful typology of the types of medical education interventions and assesses the general strength of the evidence for each intervention. Wilson, N.W., I.D. Couper, E. De Vries, S. Reid, T. Fish, B.J. Marais. 2009. “A critical review of interventions to redress the inequitable distribution of healthcare professional to rural and remote areas. Rural and Remote Health.” 1060:1-21. [published online]. Please provide a rationale for a scoping review, given these systematic reviews.

The methods are somewhat appropriate but they could be better well described.
More details are needed to replicate the work. The authors provide information on their search terms (Table 1) and inclusion/exclusion criteria for the study as a whole (Table 2). It would be helpful to include the number of studies that met each of the inclusion and exclusion criteria so the reader can have a better understanding of article selection strategy. This would also help replicate the methods (since other researchers could compare their results using the same approach).

I have some concerns about the articles that were included in the study. The authors cite one of my studies as an example of a medical education provided completely in a rural place (CMAJ, 2006 175:357-3602). In the article, they state that it was included because the medical school is described as a “provincial medical” school (which I assume they interpreted as rural). In fact, the article describes the sole medical school in a Canadian province and it located in an urban city (albeit a relatively small one). We actually produced another article based on same study (Canadian Journal of Rural Medicine, 2008, 13(1):15-21) that shows up in google scholar and looked at rural work place locations that I would have thought met the study’s inclusion/exclusion criteria. While I’m delighted that the authors included my research in their study, the fact that they didn’t find the rurally focussed paper and chose the other paper makes me less confident in their search and selection strategies.

One of the strongest confounders in the education/work place question is rural background (i.e. whether physicians/trainees came from a rural community). While the authors allude to the relationship between these variables (and discuss it the penultimate paragraph of the discussion), the analysis does not take into account studies that controlled for background and those that did not. Without controlling for rural background, it is difficult to agree with the general conclusion that “indications are positive” or that “there is some evidence to suggest a gradient effect” between rural education and rural practice.

The typology seems to distinguish between interventions (first four categories) and research method (last category). The reason for this distinction is not readily evident since survey research could be used to assess the different types of medical education interventions. Please provide rationale for creating method and intervention specific categories.

The discussion and conclusions are well balanced but not adequately supported by the data. While the authors discuss many methodological issues (including definition of rural, confounding with rural background, small sample size, poor comparability between studies etc.) of the studies included in the review, these discussions seem to be separate from the discussion of the results of the individual studies (see comments above).

While I agree with their final conclusion that cost-effectiveness analyses of medical education interventions are needed, there’s nothing in the study itself to support this claim (for example, they didn’t look for economic studies). Economic evaluations (or other elated terms) were not included in their search terms.
- Minor Essential Revisions

- Discretionary Revisions
For title, I suggest “The impact of rural medical education on rural practice location: a scoping review”. While the abstract alludes to the typology, it is not presented the different categories. To me the conclusion doesn’t really answer the research question.

In terms of writing, it would be helpful to describe the terms used in Australia to describe the various stages of physician training so that non-Australian readers can identify equivalents in their own system (and better contextualize the results).

Please note that both the comments entered here and answers to the questions below constitute the report, bearing your name, that will be passed on to the authors and published on the website if the article is accepted.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests