Reviewer's report

Title: Chronic diseases and multi-morbidity - a conceptual framework for countries in health transition

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Reviewer: Nathan Shippee

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Overall
This paper gets at a potentially interesting issue in a seemingly novel context. However, it requires much greater use and understanding of existing literature, more discussion about practical applications and model paths, and a greater consideration of how the specific context the authors are emphasizing (LMICs) or disease combinations (NCD/infectious multimorbidity) may influence some of the otherwise commonplace ideas (e.g., care coordination).

Major Compulsory Revisions

Abstract
The summary is vague in outlining the model, which has the effect of making it seem as if the model isn’t very innovative beyond other models that are out there. It may be very innovative, but the lack of specificity masks this. Since the model is the point of the article, a slightly more specific description would help. For instance, saying that the model “takes into account multimorbidity” doesn’t indicate anything innovative, since other models of complexity already do that. Altering this to emphasize some way in which the model accounts for multimorbidity of communicable/non-communicable diseases specifically would help. The rest of the aspects listed suffer from this same issue. I’m interested in the model generally, but this section of the abstract, which should pull me in as a reader, currently doesn’t.

Background
Supporting citations are needed. Readers of BMC PH won’t all be experts in the areas of this paper—and therefore won’t be able to verify any of the background claims.

The second paragraph in the background is confusing and contains unclear reasoning. Why would prevalence “increase further… with improving health services”? Diagnosed prevalence might increase, but I’m not sure why improved health services would cause increased actual prevalence of multimorbidity. If we are indeed talking about detected/diagnosed prevalence, then it is truly a separate issue than what the authors are getting at—if detection is simply improved, then the issue isn’t an increase in disease burden, but rather an increase in treatment burden as more of these conditions are treated under the
improved health services. Also, I don’t understand how longer life expectancy will contribute to multimorbidity “in younger persons.” It will contribute to multimorbidity in older age (since people live longer in “older age”), but it shouldn’t have much bearing on young people’s multimorbidity, should it? If these statements are implying correlational or co-occurring patterns due to other confounding factors (e.g., more “Western” lifestyles with greater excess-calorie diets, etc., alongside these improved health services), then leaving them implicit confuses the argument and leaves us readers unclear about what the paper is supposed to address.

In the third paragraph, it would help to clarify that when saying “the increasing prevalence of multimorbidity,” I think the authors are actually drawing specific attention to multimorbidity involving both infectious and N-C diseases. That, to me, seems clearly to be the “hook” of the paper, and so rather than talking about multimorbidity generally, it would be more effective to focus on this type of multimorbidity in LMICs/transitioning countries. As a matter of fact, it might help to use some term/acronym that stands for this type of multimorbidity; if a term exists in prior studies, you could adopt it, or make one of your own.

Discussion section
Given that the third paragraph discusses the creation of an NHI, it might help readers to briefly identify what payment structures currently predominate/have predominated there.

The last sentence of this section needs some editing for clarity—the list of things that are incorporated in the model is a bit hard to follow (e.g., it “incorporates clinical, patients…”—clinical what?).

Conceptual framework
As an overall statement, it is important to note that when conceptual models are proposed, it helps to understand what they’re based on—whether that is an extensive literature search, results from some empirical study, clinical opinion and expertise, or developmental methods work. I’m not clear on what that is here, but it would strengthen the receptivity to the model if the authors could state its basis in a formal way.

Regardless of the original basis, this article could benefit from a more thorough literature review to ascertain where it is innovative and where it incorporates other work (I suggest some areas in the sections below).

Finally, it would help if there were some clarity, either in this section or elsewhere, where this model’s intended impact could be: is it at the point of care, or a top-level design/redesign of a whole healthcare system? It seems to cross many levels, which is fine, but that leaves me (and perhaps others) with the question of: what will this model actually do? Either a suggestion of this in the “conceptual framework” section, or within each of the sub-heading sections for the model (I ask the “how” questions below), or a new section after the model description, would help.
Disease-specific interactions

It is indeed important to understand disease-disease interactions. However, a number of models already do this either implicitly or directly. Work by Piette and Kerr (including their 2006 piece in Diabetes Care and subsequent research articles) would be useful to inform this section and what the current authors wish to be unique, and other studies have examined comorbidity in terms of conditions which are “related/unrelated” in etiology, treatment, etc. Others have gotten more specific on this front; a quick Google Scholar search using “communicable non-communicable comorbid” results in several potential sources (e.g., Marais et al.’s 2013 piece in The Lancet Infectious Diseases on TB comorbid with communicable/NCDs is relevant here).

In addition, it would help to understand how the NHI should incorporate

Patient perspective

Incorporating the idea that the NHI should pay attention to patient perspectives is a good idea—the question more directly is how a national health system can do this; providing an illustration or some key practical implications would really help.

Health provider perspective

I believe that the literatures on shared decision making, minimally disruptive medicine, clinician burnout, teams, and care coordination should be leveraged here.

And, again, how would/could this look in practice in the case example of the NHI?

Health system perspective

The literatures on health IT, implementation of EHRs, and use of registries in care coordination or collaborative care programs should inform this section.

Summary

Once the comments about the above sections are addressed, I would expect that this section will look different.

Final comment

As noted above, it may be useful to introduce additional material regarding two things: 1. How the different components of the model intersect; and 2. practical applications the authors propose. Most of this model description seems to outline things that should be considered, but it doesn’t outline the connections between them or what they would look like in practice.

Minor or discretionary revisions

Formatting:

The section headings seem strange (the use of “discussion” for a lit review-type section, in particular, seems out of place). Why not use either more conventional
headings in a more conventional way, or at least headings that are simply descriptive) so as not to distract the reader?

**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:**

Non-financial: I am an author on a paper that the authors cite and use in their model.

Otherwise, I declare that I have no competing interests.