Reviewer's report

Title: Towards a better approach for physician and nurse requirements planning in Serbia: learning from the past

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Reviewer: Thomas Ricketts

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HRH 2012

Major revisions:
1. The paper needs to be written in standard English. There are many instances of awkward usage.

2. I suggest rewriting the abstract to say: Background: Unemployment* among health professionals in Serbia has risen in the recent past and continues to increase. This highlights the need to understand how to change policies to meet real and projected needs. The study identified variables that were significantly related to physicians and nurses' employment rates in the public healthcare sector of Serbia from 1961 to 2008 and used these parameters to forecast physicians and nurse requirements for the public healthcare sector through 2015.

3. (I have starred (*) the term unemployment because I am not sure whether that is actually what the article is about. That implies that physicians will not have jobs. Later in the document we read about shortages due to out-migration That later part also discusses some factors that are excluded from the model but must be include—outmigration and private sector employment.

4. The remaining parts need to be made more precise in describing what was modeled—identify clearly the dependent variable(s) and do not use the term ‘correct’ to describe the results. The conclusions fall short—they ask for change in the modeling, when, in fact, it is production and training policies that need changing.

5. The opening justification for the article needs to recognize the political and institutional content in specific and direct ways, not as generalized references to “social, economy, policy, technology, environment and epidemiology context (sic)”.

6. I am confused by the description of the various plans for HRH in Serbia. The text implies that there were adjustments to training policy but that is followed by “Hence, the national strategy for HRH development has not been created. Instead, the staffing in healthcare institutes continues according to the by-law, which has been slightly updated after its adoption in 2006.” If the “By-law” (which needs to be identified in detail) does set policy, then it needs to be described. (Discretionary)
7. The statistics about unemployment (supply) of physicians and nurses needs to be presented more directly: what is the total number of physicians residing in Serbia and eligible for work, and what is the number “unemployed”, the number in “private” practice, the number employed in other fields. Also, there is rarely a dichotomy here, how is partial employment considered? The change in rates could be supported by a table or chart to give us a sense of how the percentages were calculated. The discussion of ratios of practitioners to population for districts should also give a sense of whether those should be equal. (Major change)

8. The description of the variables and their sources and the methods used are understandable, but a very clear explanation of the dependent variables is needed beyond what is provided. The dips in the trend need explanation (Necessary change)

9. There needs to be a full table that lists the variables and their characteristics (rather than the list at the end of the complex table of output statistics, e.g., max, min, net change. I realize this is a moving process and the charts provide some description, but the figures are too numerous and a fairly detailed table would help.

10. The use of the word “correct” is not appropriate in several parts of the article; as in this sentence: “Both physicians and nurses’ employment models have been statistically correct” (P. 7). “Robust” or “stable” are more appropriate. Or, some term used that conveys the means of what they analysis is meant to do—which is apparently to determine if moving average values are correlated with physician and nurse supply. Again, what is the dependent variable?

11. I cannot follow the sentence: “With regard to forecasting, for the period from 2009 to 2015, the annual enrolment rate will be higher by about 20% than the graduation rate at public medical faculties (in absolute numbers 1771 v 1415). Thus, it will equal to the public workforce generation ratio [35-36] of about 6.68 % calculated as the ratio of the number of physician graduates and the total number of physicians in public sector.” I understand this to mean that the graduation rate will be less than 100%, but the use of the term “ratio” confuses me. Is 6.68% the new entry proportion for supply?

12. The paper draws inappropriate cause and effect inferences: “This study revealed that in Serbia the GDP rate has influenced the number of inpatient care discharges” (P. 12). The discharge rate may be associated with the change in GDP.

13. P. 12 also makes a bold claim: “This study has provided evidences of the inadequate inter-sector coordination at the highest HRH authority level in Serbia.” I do not think that can be said based on the presentation. There are no data on inter-sector coordination. There is evidence that production exceeds need.

14. The paper should contrast this form of projection with alternatives, such as stock and flow. It should also provide direct references to good examples of this form of projection and how it might be used.
15. The paper references projections of physician shortages and nurse shortages that have been superseded by newer data.

16. The paper makes much of its being “correct” when, in fact it is primarily projecting a continued upward trend in numbers of physicians and nurses. It is the trend and its relative dimension that is important, not the specific accuracy. That paper also needs to condition this on the absence of other specific factors that affected the downward slopes from time to time.

17. The analysis is also a bit awkward in that the hospitalization rate (in patient care discharges) is very endogenous to the supply. That trend is also important for its upward slope that ought to be correlated with the age structure of the population.

18. Table 2 is labeled “Requirements”. But that is clearly not what that is, it is supply.

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

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.