Reviewer's report

**Title:** Forecasting the need for medical specialists: the application of a System Dynamics model in Spain

**Version:** 1  **Date:** 14 December 2009

**Reviewer:** Rafael Garcia Rodriguez

**Reviewer's report:**

The authors pose an interesting question and add to existing literature by using a system dynamics approach, which is appropriate although not extensively used in this field. The paper is well written and easy to read: it adheres to standards for reporting data, discussions and conclusions are supported by the data, and the abstract is both concise and informative.

- **Major Compulsory Revisions**

  - The paper discusses a system dynamic simulation model without presenting any equation; it is thus quite difficult to both interpret results and offer additional commentaries on the underlying model. Whether the decision to publish the whole set of equation, although suggested, will depend on the editorial policy, equations should be submitted for a complete review.

  - Some important bibliographical references about methodology are missing. In particular, the importance of delays, feedback loops, policies and rationality constraints of policy makers, which play an important role in a system dynamic model, is not discussed.

- **Minor Essential Revisions**

  Figure 1: The level variable “Especialists” should be relabeled as “Specialists”.

- **Discretionary Revisions**

  - The model should be explained in terms of feedback loops, as those induced by the opportunism of health professionals, for instance. In fact, the analysis of feedback loops would help to better understand the topic being studied.

  - The contribution of system dynamics, as applied to health system problems, should not be limited to the estimation of future values of interest variables. In fact, its main objective is to simulate the consequences of different policies aimed at improving the capacity of the Spanish health system. In order to include this feature in the model, a number of policies may be considered. The number of students admitted to the Faculty of Medicine each year (the “numerus clausus”) should not be set as a parameter, which the policy makers can modify depending on their objectives and preferences. Actually, the “numerus clausus” should be a function of the estimated need of health professionals, for example, where estimation methods themselves could be the object of different policy options.
other words, choice variables should not be seen as decision parameters, but as the result of different policies among which a policy maker might choose. Simulation, thus, will provide the results of the implementation of different policy options, and not the estimation of interest variables depending on the value of parameters. To clarify this point, and to propose another idea for improving the paper, one additional example of choice variable, which might be replaced by different policies, is the number of physician admitted as intern residents by specialty: the model should identify the mechanism through which the number of residents is fixed instead of setting it as a parameter.

**Level of interest:** An article of importance in its field

**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.