Reviewer’s report

Title: Nation-scale adoption of new medicines by doctors: an application of the Bass diffusion model

Version: 2 Date: 27 March 2012

Reviewer: Agnes Vitry

Reviewer’s report:

Minor essential revisions
First line page 4: 90 months: is it correct?
Second sentence last paragraph: Why does the sentence starts by “However”? It does not seem to be an opposition between evidence in first and second sentence of the paragraph?
“Seminal work of Coleman” repetition with first paragraph on page 3.
First paragraph on page 3: you stated only sporadic evidence following Coleman’s work but you give many following references on page 3.

Major essential revisions

Methods
The methods are incomplete. I don’t understand how you calculated the p and q values in the model. No information is given on the statistical methods used and on the type of comparisons that are done. No information is given on the methods used to collect data that have helped you to interpret the results of the modeling (eg relative effectiveness of drugs). No information is given on what are the methods used to conduct a “more detailed examination “ of statins compared to other drugs.

Last paragraph page 9/ first paragraph page 10: the model does not account for the fact that drugs can be severely restricted or withdrawn after marketing, and that they have a different safety and efficacy profile. These are serious limitations of the model that should be discussed in the discussion and raise the question of why such the use of such a model could be envisaged in the first place. Moreover, drugs maybe first in the class or me-toos and this characteristic is not taken into account in the model although it is highly likely to influence the diffusion rate.

Results
Figure 3: no legend and no idea of how to interpret it!
Figure 4: no legend, no idea of which drug is related to which curve.

A detailed look at statins: I suppose that many readers would jump on their chairs reading this analysis! The authors infer their statement of rosuvastatin superiority over other statins on a single reference on the risk of myopathy with high dose simvastation (ref 54). In contrast a recent review of the 3 main trials comparing
outcomes with higher and lower doses concluded “The results show that raising the dose of simvastatin or atorvastatin to 80 mg confers no mortality advantage, an increase in adverse reactions and only a slight decrease in myocardial infarctions and stroke versus a lower dose” (Spector and Snapinn 2011). To my knowledge there is no trial evidence showing that the greater potency of rosuvastatin translates into any clinically demonstrated benefit in terms of cardiovascular morbidity and mortality compared to other statins. Some countries have used enormous resources to persuade prescribers to use low cost older statins instead of the newer most expensive ones as they think they do not provide any cost-effectiveness advantage. (Godman, B, Sakshaug, S, Berg, C, Wettermark, B & Haycox, A 2011, ‘Combination of prescribing restrictions and policies to engineer low prices to reduce reimbursement costs’, Expert Review of Pharmacoeconomics & Outcomes Research, vol. 11, no. 1, Feb, pp. 121-129.). There is no information on the fact that rosuvastatin and atorvastin were placed in the F1 PBS category with an important price differential compared to other off-patent statins in the F2 PBS category and that, as a consequence, these expensive drugs were heavily promoted by their respective manufacturers unlike off-patent statins.

Discussion
It seems to be an underlying assumption that new medicines are all innovative. Confusing innovation with new seems to be the major issue in the paper. Several studies have shown that only a fraction of the new medicines are truly innovative and bring a therapeutic advantage (refs below). So a more interesting question to examine would be whether medicines with a demonstrated therapeutic advantage have a quicker adoption rate than me-toos. It does not make sense to raise a question “is adoption too low” for all new medicines, but only for the ones with a definite advantage.

Conclusion
I don’t understand what the use of the Bass diffusion model adds to our understanding of the adoption of new medicines by doctors. As stated earlier, its limitations and the fact that medicines are not ordinary goods but are heavily regulated goods raise doubt about the usefulness of this model for pharmaceuticals. I don’t think that the conclusion is supported by the results presented.

References


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

**Quality of written English:** Acceptable

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