Reviewer’s report

Title: Consumer-Perceived Risks and Choices About Pharmaceuticals in the Environment: A Cross-Sectional Study

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Reviewer: Rodrigo Vidaurre

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Dear Editorial team,

I would like to highlight that I believe the study to be very interesting and exploring in novel ways the trade-offs between environmental aspects and other aspects of medicine use – a growing subject. I am highlighting this at the beginning because I am labelling it “Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions”, not because I see any major issues with the article, but because I believe some of the interpretations have to be considered more carefully. (Coming from an environmental policy background, I take issue with some of the conclusions regarding policy, for instance.) In some cases the wording should be more precise, to avoid providing confusing messages. I also believe that some additional work on the conclusions would greatly improve the quality of this paper. However, I do want to insist on my being very favourable to its being published in your journal.

1) (Minor Essential Revision) Abstract, paragraph 4 (Conclusions): The sentence “pharmaceuticals with large benefit for humans” is very vague. Does this refer to an individual compound, or to a compound group? Antibiotics cure diseases that range from insignificant to life-threatening. I would suggest to link it with the health risk that is being addressed through the compound, and not with the compound, as it is now.

2) (Minor Essential Revision) Section “Toxicological effects of pharmaceuticals in the environment”, paragraph 1: Statements are too conclusive. Whereas I would agree that re. current knowledge pharmaceuticals do not pose a severe threat to humans (e.g. WHO report 2012), the jury is still out on the environmental effects. Not enough science has been done in this field.

3) (Minor Essential Revision) Section “Risk management”, para 1: I get the point, but it is not being expressed correctly. The last sentence establishes a connection between frequency of detection and actual environmental risk, which is not there. One could argue that consumers guess quite correctly the difference in environmental hazard that these different compounds pose.

4) (Minor Essential Revision) Section “Participants”: 29 should be changed for 39.
5) (Major Compulsory Revision) Section “Results – Support of Environment Policy”: The direct comparison of the two scenarios does not work. The questions asked were too different: on the one hand there is an “environmental policy” that is compulsory and that can require the patient to take a less effective drug for his/her cancer treatment, on the other hand we have an environmental policy that is based on providing information which the patient can decide or not to act upon. Apart from a qualitative exploration of these differences and the difference in responses, I don’t think one can make more general statements, along the lines of “different support for environmental policy”. Not all policy is equal.

6) (Minor Essential Revision) Section “Discussion”, para 2: The first two sentences convey a wrong impression: they equate being aware of the risks with recognising the severity of the problem. Two different things. I also believe the evaluation of the risk perception of consumers could be less speculative.

7) (Major Compulsory Revision) Section “Discussion”, para 5: The difference between the Option 1 and Option 2 answers for the cancer treatment is not very high. Clearly respondents are more in favour of Option 1 (less environmentally favourable), but the acceptance for Option 2 is surprisingly similar. I believe the first sentence of this paragraph should be toned down, to reflect a certain, minor preference of consumers for more effective/less environmentally friendly options in cases of significant health risk. However, the small difference in the values for Option 1 and 2 in the cancer scenario, coupled with the high acceptance for less effectiveness in the case of the simple cold, show that as soon as the health risk is smaller people are (surprisingly) willing to accept a trade off in favour of the environment. (I personally agree that a patient’s health comes first, but in my opinion the responses do not justify as clear a statement as the one that you provide at the beginning of the paragraph.) One could see this to indicate that, if people are this supportive, a policy that would prescribe the most environmentally friendly drug when drug effectiveness is similar would receive quite widespread support.

8) (Major Compulsory Revision) Section “Conclusions”, first sentence: I believe this statement has to be toned down (“hardly considered” is far too strong wording when one compares the answers of Option 1 and Option 2 in the cancer scenario). As I mentioned above, I believe the data shows a surprising willingness to consider environmental criteria, albeit not in situations when there is a serious health risk involved. Again, I would argue that the decision is not related to the pharmaceutical (“pharmaceuticals with large benefits...”), but to the perceived health risk. Whereas in this example they go hand in hand, in other cases they don’t. The wording “pharmaceuticals with large benefits for humans” does not do justice to the issue: I would argue that it is not a quality of the object (pharmaceutical), but a function of the relation of the subject to it (perceived health risk), on which the decision hinges.

9) (Major Compulsory Revision) Section “Conclusions”, second sentence: The wording is too imprecise to my taste. What does that mean, “to balance health and environmental considerations”? The study determines that people are willing
to accept trade offs re. The effectiveness of their treatment for the sake of the environment, and I believe that this should be made clear.

10) (Major Compulsory Revision) Section “Conclusions”: Conclusions in general can be expanded.

Best regards,
Rodrigo Vidaurre

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

**Quality of written English:** Acceptable

**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.