Author’s response to reviews

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

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Author’s response to reviews: see over
We attach a revised version of our submission to Environmental Health, “Consumer-Perceived Risks and Choices About Pharmaceuticals in the Environment: A Cross-Sectional Study.” The comments from reviewers were very helpful, and we have attempted to respond to all suggestions as part of this new revision while doing our best to keep within the word limits of the journal. A detailed accounting of our latest revision follows.

**Reviewer 1**

1) (Major Essential Revision). The focus of chapter „severity of illness“ should be broadened by including the issue of consumers’ (patients’) risk perception and decision-making. So far, the introduction mainly focuses on the technical or pharmaceutical side of the problem, neglecting the user side and related factors (e.g. severity of illness) in patient decision-making.

*In response to this comment, we have revised the description of the Health Belief Model (page 7) to strengthen the connection between perceptions of health risk and treatments decisions. Our hope is that this change, along with the description of work by Turk et al. (also on page 7) addresses the reviewers concern.*

2) (Major Essential Revision). Since the paper investigated health-related consumer decisions, why was respondents’ health status not assessed? I am convinced, that the inclusion of this user factor will explain further variance in trade-off-decisions and in drug regulation acceptance.

*We regret that we do not have a good answer to this question other than it did not occur to us at the time. The original intent of our research was to study environment-health tradeoffs in consumers’ and patients’ decisions about drug treatments. At the time we designed the study, we elected to ask the questions (reported in the MS) of a random sample of consumers. We agree, however, that the respondents’ health status is an important variable. In the discussion, we added that it is possible that people with a poorer health status are less willing to accept a less effective drug for the benefit of environmental health and that this factor might explain further variance in trade-off-decisions (page 24). We intend to account for the reviewers question directly in a future study.*

3) (Major Essential Revision). I wonder about the comparability of the operationalization of the ecological cost factor in the medical and agriculture scenario. I think the ecological consequences (decline in the reproductive rate of the rainbow trout vs. increase in the number of antibiotic resistant bacteria) are not comparable in the two scenarios, since their differing relevance for consumers. In the agricultural scenario, the ecological costs might have direct consequences for the consumer (cattle as part of the food chain), whereas the decreasing population of rainbow trout does not directly affect him/her.
We agree that the medical and agriculture scenario differ per se. However, we felt strongly that we should make an attempt at comparing judgments about human and agricultural pharmaceuticals because of differences in how the two seem to be portrayed. Agricultural pharmaceuticals seem to be the primary target of critiques about secondary, deleterious environmental consequences. Meanwhile, human pharmaceuticals seem to receive less attention by contrast. We wanted to test for this potential difference in our study. Of course, the benefits of using the two categories of drug are quite different (human health vs. more conventional consumer benefits). We believe our results comparing human and agricultural pharmaceuticals are interesting and should be included in the paper. However, we also agree with the reviewer that contextual differences between human and agricultural pharmaceuticals warrant closer scrutiny. We will take this up in our future work.

4) (Minor Essential Revision). For completeness reasons: could you please report if (or not) there were any statistical interactions in the ANOVAs?

In the revision of the manuscript, we added all interactions. No interaction was significant.

5) (Minor Essential Revision). In order to improve the comprehensibility of the choice task results (p. 18): could you please add the version number to the “drug pairs” in the text? Otherwise it is difficult to switch between the text (where drug names are used) and the figure (where version numbers are used).

In line with this comment, we added the version number to the drug pairs in the text (page 18).

6) (Major Essential Revision). In the discussion you refer to the affect heuristic to explain the lower risk perception ratings for pollution caused by drugs used in medicine. How do you exclude that respondents’ information deficits about negative environmental effects of disposing drugs caused reduced the risk perception ratings?

We agree with the reviewer. In response, we have added the following section to page 25: “Related, we expect that some of the respondents in this study will have been better informed, and more knowledgeable, about the deleterious environmental effects of pharmaceutical products than others. It’s reasonable to hypothesize that these more knowledgeable people would have been more careful about their decisions to use pharmaceuticals, especially when they were accompanied by negative environmental consequences. Because we surveyed a random sample of adults, we are confident in the general findings drawn from this study; namely that the environmental impact of a drug is discounted in decisions about treating severe ailments. However, in a future study, it would be interesting to explore interactions between risk perception, decisions, knowledge, and—as alluded to above—respondents’ health status.” We intend to follow through on this comment in a future study.