Reviewer's report

Title: Healthy people, with nature in mind

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Reviewer: Sander van der Linden

Reviewer's report:

I find this an interesting and generally well-written submission. The link between climate change, public health and the natural environment is incredibly important and has indeed received relatively little attention in the literature thus far. My overall impression is that "healthy people, with nature in mind" covers an important topic and is a nice call for research (and action) that I think will make a useful contribution to the literature and the public health community.

However, I have a number of minor essential and suggested discretionary revisions that I think will help improve the quality and overall contribution of the manuscript. I will delineate these further below:

Minor Essential Revisions

1. I feel that the manuscript skips over some essential literature that has previously called for more attention to the link between climate change and public health. Particularly in the first paragraph/sentence (p.1) and the behaviour change sections (e.g., p 5., lines 21-25 and p. 6). For example, prior research has looked at re-framing climate change as a public health issue and reported on the extent to which the public views climate change as a public health issue (there is currently very little awareness of the health impacts of climate change among the general public). I think the current debate article would benefit from situating itself better within existing literature.

Some suggested references:


2. I also think that the section on exposure to nature and the positive effects on health and PEB (p. 8) misses some other key references and could be expanded a little to drive home the key message. For example, at various points, the authors refer to the "evolutionary" history, basis or human connection to nature (and associated stress responses), but provide no coherent theoretical framework to the reader. I would expect to see at least one of three theoretical frameworks: (1) E.O Wilson's "biophilia hypothesis", Kaplan & Kaplan's "Attention Restoration Theory (ART) or Ulrich's "Psycho-Evolutionary Theory". Whereas the Kaplan's focus more on the restorative effects of nature on attention and cognitive functioning, Ulrich directly suggest that exposure to nature triggers immediate unconscious, automated (emotional) responses that modulate stress, physiology and behaviour (the idea being that responding positively to environments that enhance human survival is evolutionarily adaptive). Wilson makes a similar point. I think that this perspective directly supports the point that the authors are trying to make (i.e., internal vs. external stimuli that automatically trigger PEB etc..) In short, I would like to see a perspective that is just a little more grounded in relevant theory.

Other key references on the positive effects of nature exposure on public health:


In contrast, other sections seem to dwell on things that add little depth to the
article and could be removed, e.g., the paragraph on rat behaviour (p.8, lines 1-5) - this is likely not directly relevant or interesting for most readers.

I'm not sure what the reference limit is for debates (if there is one) but some of the authors' references could probably be replaced with more primary citations.

3. The authors make some sweeping or odd statements at certain places that could be re-worded a little.

For example, "given our evolutionary predisposition for surviving in natural environments" (p. 2, line 1) - this is a strange statement, humans have an evolutionary predisposition for survival, period. What the authors' mean to say (I think) is that because humans evolved living in natural environments (e.g., savanna, canopies), we intuitively respond positively to certain natural settings.

"Responses to stress lead to deactivation of the neo-cortex" (p. 7, line 10) - this is not entirely correct. The authors' probably mean to say that "stress may reduce, impede or suppress neocortical activity".

The second part of the sentence, "evolutionarily, the most recently developed part of the brain" is also questionable. This conjecture is likely based on MacLean's Triune-Brain model (which is contested to say the least). Perhaps it is safer to say "believed to be the most recently developed....etc"

4. In the discussion, it would be nice to actually see some critical reflection on the "need for more nature". For example, is it plausible to assume that if everyone is continuously exposed to nature, its positive effects could wear off over time? In other words, is nature restorative only because we are nature-deprived? What kind of nature exposure is desirable? (e.g., green rooftops vs. "extraordinary nature" experiences). If nature abundance becomes the new norm, will it still instill PEB in the long-term or will we simply shift our baseline? Perhaps fundamentally re-defining and fostering the human connection to nature will indeed promote long-term PEB and values but some reflection on the long-term potential of this approach (for policy) would be informative.

Discretionary Revisions (some recommendations)

4. I don't think the section headings are very nicely structured (nor very informative). Perhaps structuring the article more along the key arguments would be helpful (e.g., introduction, framing the environment as a "public health" issue, behavior change: internal vs. external influences on behavior, nature as an automated external stimuli, relationship between nature exposure and public health, nature and PEB, policy implications etc.).

5. The opening quote seems a bit random to me. Perhaps the authors could find a less opaque and more relevant/fitting quote? (If a quote is desired).

6. On p.7 (lines 1-5), the bit on too much focus on "rational public policy and decision-making". The following reference might be more appropriate which addresses this issue directly and calls for more motivational-based approaches:

7. On p.6 (line 17), instead of the Norm-Activation Model (NAM), Stern et al's. 1999 "Value-Belief-Norm (VBN) Theory might be more relevant, as it draws on the NAM but is directly focused on PEB.

8. "From marketing research, we know that behavior is not changed with one intervention". (p. 9, line 15). I think that we know this from psychology and behavioral science research more generally, but Maibach et al. (2008) might be a good citation here:


Nice job overall. I hope that my suggestions will help improve the quality and impact of this interesting and topical manuscript.

**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'