

## **Author's response to reviews**

**Title:** A Systematic Review of US State Environmental Legislation and Regulation with Regards to the Prevention of Neurodevelopmental Disabilities and Asthma

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**Version:** 2 **Date:** 6 February 2009

**Author's response to reviews:** see over

## **Reviewer's report**

**Title:** A Systematic Review of US State Environmental Legislation and Regulation with Regards to the Prevention of Neurodevelopmental Disabilities and Asthma

**Version:** 1 **Date:** 1 December 2008

**Reviewer:** Irena Buka

### **Reviewer's report:**

*1. This is a topic which will be of great interest not only to those involved in protection of children from environmental problems, but also to a broad body of children's health professionals, especially those assessing and managing neurodevelopmental disorders and asthma, public health, educators, researchers in policy and health, legislators, and community stakeholders.*

We thank the reviewer for these kind words.

*2. This is a comprehensive review of state legislation and regulation across the US including all 50 states that may influence protection of children from specific environmental hazards linked with neurodevelopmental disorders and asthma. The methods are well described and could be replicated elsewhere providing that local databases not only for environmental regulation and legislation but also for environmental emissions exist.*

We appreciate this comment.

*3. The authors have taken a conservative approach using only those environmental chemicals where links with neurodevelopmental disorders and asthma are robust. One may argue that attention to toxins where the data is limited for human studies, but concerning for animal toxicity and which have been legislated against may be offering significant protection due to this precautionary approach. Measurement of outcomes of these interventions will therefore probably not occur and therefore documentation will not exist. However, attention to these substances e.g. manganese, may raise awareness among legislatures to take protective actions.*

Again, we thank the reviewer.

*4. As the authors point out, one should not underestimate the value of public health policies and education and incentive programs. The authors use the term "model regulation" (pg 10, line 2) and "model legislation" (pg 10, line 19/20 and pg 11, line 6), the definition of this terminology is not clear and I would suggest that the authors add a point of clarity before using these terms.*

We thank the reviewer for calling this to our attention, and have clarified the methods section to highlight this use of terminology prior to its use in the methods section.

*5. Although the evidence in the manuscript is well supported by scientific*

*literature, I draw attention to pg 12, line 16 "no state has executed regulations that would set a lower maximum contaminant level than USEPA and prevent toxicity which has been documented at lower levels of exposure" I suggest that this statement be supported by example and references to improve clarity.*

We have clarified that we found no state to have a stronger MCL than USEPA through our systematic review, and referenced the NAS report on Arsenic in Drinking Water to support the statement that toxicity has been supported at lower levels of exposure.

*6. The discussion and conclusions are well balanced and adequately supported by the data, however, I turn attention to page 17 line 13 "Given that most coal-fired power plants are located in the Northeast and Midwest, efforts to limit mercury emissions from these sources in Southwestern states may not reduce methylmercury contamination of fish eaten by women and children in those states." I draw attention to the fact, as the authors point out later in the same paragraph, that pollutant industrial emissions do not obey state or country boundaries and exposure assessments need to consider dispersion models which rely on meteorological factors, etc. A caveat to the above statement in this regard may add relevance.*

The statement made by the reviewer is perfectly accurate. We have clarified the reference, and thank the reviewer.

*7. This manuscript is well written but does contain a few minor spelling and grammatical errors. The figures and table are valuable addition.*

We have endeavored to correct the spelling and grammatical errors in the revision.

*8. I recommend the paper be published with the relevant minor essential revisions as well as these suggested discretionary revisions.*

*9. All comments may be forwarded to the authors.*

**Quality of written English:** Needs some language corrections before being published

### **Reviewer's report**

**Title:** A Systematic Review of US State Environmental Legislation and Regulation with Regards to the Prevention of Neurodevelopmental Disabilities and Asthma

**Version:** 1 **Date:** 26 January 2009

**Reviewer:** Brian Ladd

### **Reviewer's report:**

Major compulsory revisions

*1. Page 3: A brief opening paragraph defining "environmental chemicals," and indicating where they originate and what accounts for the extent of their distribution in the United States, would be very useful for setting the stage for this paper. I find that the phrase "environmental chemicals" is somewhat ambiguous, since for the most part the chemicals of concern are not of (natural)*

*environmental origin, but rather have become exposure and health risks through the transforming action of human industrial activity (e.g., power generation, hydrocarbon production and consumption, and product manufacture/distribution/use/deposition).*

We are especially thankful for this suggestion. We have included an introductory paragraph that fulfills the spirit of this request.

*2. Page 5, Paragraph 1: it is unclear to what extent the method of chemical selection in the systematic review takes into consideration the effects of chemicals acting in combination or acting sequentially at various stages of child development. I recognize that the authors are likely fully aware of these concerns, but the reason for their exclusion needs to be indicated. Did the lack of high quality human studies prohibit these types of considerations? If so, this very issue (that is, that studies of this kind have not been carried out) is relevant to the whole state-level policy context related to children's environmental health concerns. Perhaps the question could be addressed with a brief discussion of references [9] and [10] in the text.*

We appreciate this suggestion, and have clarified to this effect in the manuscript.

*3. Did the authors use (or adapt) the criteria noted earlier from the World Health Organization for judging the effectiveness of legislation and regulation intended to protect children's environmental health? The criteria that were used (e.g., expected relative effectiveness prior to implementation/impact evaluation) could be spelled out, or at least referenced explicitly.*

We have spelled out the criteria as requested, and thank the reviewer for this suggestion. We recognize in retrospect that this element was not clear. We did not use the WHO indicators in this part of the analysis as they are only tools developed to judge success of legislative/regulatory interventions.

#### *Minor essential revisions*

*1. Page 5, Paragraph 2: The first sentence reads, "...few studies have compared the effectiveness of environmental interventions..." I think the authors may mean "state-level policy interventions" (or something like that) instead of "environmental interventions," which could include a wide range of public and private sector action within the environment, and not just policy (legislative or regulatory) initiatives. Please check for clarity. Also, in the sentence immediately following, which begins with "Rather than limit our analysis...", I find the explanation of the approach taken in the present analysis to be somewhat unclear. Perhaps there is a more succinct/clearer way of wording this?*

We appreciate the reviewer calling this to our attention, have changed the text as requested, and edited for clarity.

*2. Page 9, Paragraph 1: "The authors then compared states within each domain." I'm unclear to what "domain" refers. Please clarify in the preceding text, or where relevant.*

We thank the reviewer for calling an editing error to our attention, and have clarified the manuscript in this section.

*3. Page 11, Paragraph 3: The authors mention laws requiring notification for pesticide spraying (including bilingual signs in California), and public notification of aerial spraying, then go on to say that these laws empower parents to prevent exposure and should be considered an effective approach for other states to prevent disease. Related to my general concern about the explicitness of the criteria for "model" legislation or regulation, in this specific instance it is unclear why posting signs is seen as a model tactic for other states. The connection between posting signs and parental empowerment to prevent exposure seems tenuous. Signs in this case give the citizen a "choice" to essentially restrict his/her activities or those of his/her family in order to accommodate the application of a toxic chemical. This does not seem empowering, but rather reaffirms the power of the applicator to dictate the (limited) range of short-term choices available to the citizen.*

We agree with the reviewer that this is not an ideal policy. Our methodological approach involved identification of approaches, description of those that states pursued, and identification of model approaches. We agree that this is not a very good model and have clarified the manuscript to this effect.

*4. Page 19, Paragraph 1: The expression "Jeffersonian role" is evocative and hints at a universally approved (or aspirational) role of state legislative activity within the US political system. However, the phrase itself may not be understood or appreciated by non-American readers of the article (like me) without further detail from the authors.*

We have corrected the reference, and clarified for the non-American reader of the article. Our apologies.

*5. There are many typos and some awkward sentences in the document. Finding a scientific writer or good copy editor with some familiarity with the field could be useful.*

We have endeavored to correct the typos and awkwardness. Our many thanks to the review for pointing this out.

#### *Discretionary revisions*

*1. The authors identify three major pathways for children's exposure to pesticides, and choose to weight each of these pathways equally in their consideration of legislation and regulation. The authors may want to recommend*

*policy evaluation criteria that recognize how states differ in the relative importance of each of these exposure pathways, and, as such, how well-tailored their legislation and regulation are to these state-specific realities. For example, a state with a huge, labour-intensive agricultural sector could have “model” (effective) legislation dealing with home exposures when pesticides are used to treat infestations, but lack effective legislation related to take-home exposures for children who work in agricultural settings. Exploring this issue in depth would go beyond the scope of the paper, but the authors could stress the importance of states identifying the most important types of exposures (from a child health standpoint) in their jurisdictions (including those which may be caused in part by extra-jurisdictional sources). This would ensure that the states’ service as “policy laboratories” included “lab experiments” in the development and implementation of processes both to distinguish more from less important children’s environmental health risks and to ensure that those risks are sufficiently prioritized within the decision-making apparatus of the state.*

This is a very thoughtful remark that we deeply appreciate. We wish we could have disaggregated the impact of policy by the pathways of exposure that are most important in each state. In the revision, we have inserted additional caveats regarding this issue, citing the example raised by the reviewer.

*2. A brief overview of important challenges in the development and interpretation of toxicologic and epidemiologic evidence with respect to the regulation of chemicals (e.g., dose assumptions, additive/synergistic effects, epigenetic and intergenerational effects) would be helpful.*

This is also a very helpful remark, one that we did not incorporate in the previous version, but have in the revision. We comment that policy makers apparently have enough difficulty accounting for children as a broad population, let alone focusing on subpopulations that are especially vulnerable on the basis of genetics, additive and coexisting exposures, etc.

*3. In their discussion, the authors might suggest further research to identify common political, economic, or other forces in those states that have “model” legislation or regulation. Since elected officials make laws, the openness and responsiveness of the various state legislatures to adopting model legislation or regulations becomes an important determinant of health in its own right. This no doubt varies from state to state. The paper appears to assume that model state legislation or regulation (typically, that which is more stringent or which focuses more on primary prevention) will be adopted on its epidemiologic or public health merits if only those merits are articulated to policy-makers.*

We could not agree more. We have adopted similar language to that described in the next to last sentence because it captures it so well, with the reviewer’s permission.

*4. Related to the previous point, from a policy development perspective, it would*

*be useful to know something of the history of the development of the policies that exist in many states, versus those that exist in only a few states. This could be stated as a "need for further research." For example, with reference to the regulation of any specific chemical, was there a "pioneer" state that demonstrated a way forward for other states, or was there a cluster of states, that came up with similar policy initiatives outside of the conscious influence of each other?*

We appreciate this request, and have inserted text to make this point.

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Needs some language corrections before being published

**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.