Reviewer's report

Title: Public Response to the 2014 Chemical Spill in West Virginia: Knowledge, Opinions and Behaviors.

Version: 2
Date: 22 April 2015
Reviewer: Jim Stewart-Evans

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- Major Compulsory Revisions

1) Summary: the incident and follow-up survey is an interesting case-study, and the methods and results in the paper are generally clear. A little more background information and context would help in the introduction, and the discussion and conclusion could be improved if the study approach and some of the limitations were evaluated and discussed - here, context about the incident and links with existing papers could better evidence some of the general points that are made. Some corrections are needed and it is worth evaluating some aspects of the statistical approach in practice or through discussion in the paper (see below)

2) Introduction, 1st paragraph. Initial advice to the public was via the TV. What other methods of information were used to communicate with the public (what and when)? This is also relevant when evaluating/discussing the results (eg, Figure 1). The introduction also states that the 'do not use' order was unprecedented in scale or scope – but what was the scale and scope (all of WV or just affected counties?). In discussion, it would also be helpful to give a little more context regarding exposure too, as well as the communication aspects: were all the people in affected counties potentially exposed and were there potentially significant differences in exposure, taste and odour of water etc?

3) Introduction, 2nd paragraph, 3rd sentence. Wording: “information… circulates heavily…” could be better put as “is widely circulated”. The paragraph avers that the Kanawha Valley creates a unique cultural, political and economic context for study and that residents are not unfamiliar with the risk of chemical spills – explain why (eg, is it because there is wide heterogeneity in the former areas? Is knowledge of spill risk due to emergency preparedness or past incidents?)

4) Methods, 1st paragraph. What was the rationale for the over-sample of lower socio-economic status?

5) Results, Sampling Characteristics, 1st paragraph, 2nd-last sentence. “The raw data show that the subsample of people living in the affected counties have a lower level of education compared to those living outside this area” – but Table 2 indicates that affected counties had comparatively lower %s of <high school and high school education and higher %s of college or bachelors education compared to unaffected counties (in %s for the sample populations and, to a lesser extent, census data). This needs clarification. It would also be useful to
examine and discuss how the sample characteristics compared to the census data in a little more detail (i.e., comment regarding representativeness, for example, other than education, income in both (affected/unaffected) subsamples versus census data also shows underweights in the $15,000-$34,999 & $35,000-$59,999 band and overweight in $60,000-$100,000). These elements should be included in the discussion (specifically in the 2nd paragraph re: socio-economic aspects) where some discussion of the variables dropped after testing for bivariate associations would also be useful.

6) Discussion. It would be useful to draw out the differences between people’s knowledge of recommended behaviors in affected versus unaffected areas; it was interesting that people in unaffected areas consistently reported higher %s of non-recommended actions. Did they also report lower %s of recommended actions? That’s not entirely clear from the results or discussion, and the discussion could include more context here: where there any differences between the timing, content, sources of advice in unaffected areas? Was their knowledge and behavior different because they weren’t directly targeted and communication was by word-of-mouth etc. This is also relevant to the last line of the conclusion — this general statement would be better supported if the paper was clear about what the differences were in risk communication in practice between affected and unaffected counties.

7) Other studies have found that whether or not as source is trusted significantly affects compliance. This study found that it was not, but it would be helpful to discuss whether this could be due to the study’s definition of trust — it is arguable that a respondent could agree with either of the general statements that the government is ‘run by a few people looking for their own interests’ or ‘run for the benefit of all’, but that this general view does not necessarily indicate whether they trusted the specific advice given by the authorities in this incident — for example, a government ‘generally run for the benefit of all’ is still capable of issuing questionable advice in an environmental incident; a government ‘run by a few people looking for their own interests’ is still capable of issuing credible advice in an environmental incident. It is also worth commenting on how people might answer questions about trust/regulation before an incident (existing views) as well as afterwards (as well as the unaffected/affected area comparison).

8) When looking at the statistical analysis, is adopting a binary definition for Knowledge of recommended behaviors potentially problematic (e.g., a person could check all of the correct response options and just one non-recommended behaviour and return “0”, whereas a person could identify just one correct option and return “1”)? Furthermore, people’s knowledge may have been lower if they were not provided with a list of potential response options. Likewise, the count variable for behavioural compliance seems to be set at 0 if people include any number of non-recommended behaviours. It would be helpful to discuss such aspects of the approach when evaluating the results — cf. last sentence of Results, Knowledge of recommended behaviors — so that some of the potential limitations and caveats are clearer.

9) Conclusion. The study found that the timeliness of receiving information affected compliance, but it is worth considering point 2) above — was the finding
the result of timeliness or was it affected by other factors (such as the means of providing that information)

- Minor Essential Revisions

1) Abstract, Background, last sentence. Typo: add “the” before “…public's views on the need…” Ditto Introduction, last sentence.

2) Abstract, Conclusion, 1st sentence. Typo: “behaviors underling the importance” should read “behaviors, underlying the importance”. Similar typos in Discussion, 2nd paragraph, 1st sentence

3) Methods, 2nd-last sentence. Typo: “KnolwdgePanel”


5) Results, Risk Perception, last sentence. Typos: delete “of” or add “the” in “Most of respondents” and change the “agree” to “agreed”

6) Table 2, Column “Census -all state (%)” , last row. “[{$35,000-$99,999}]” appears erroneous - is a % value missing from this column and should the differing income banding also apply in the other Census columns? A note could be added to the age row to explain %s are %s of the adult population (and do not include children). The 15% for the 30-44 age band for Census – affected counties (%) appears erroneous, as the other Census columns have 25% for this category. If so, the %s for each of the Census columns are identical: is this really the case? As a wider point, the table needs reformatting to show the data more clearly

7) Discussion, 1st paragraph, last sentence. Wording & grammar: “One possibility…” then listing two; overlong sentence would be better put as two points in separate sentences

8) Discussion, 3rd paragraph, 3rd sentence. Wording: “This crisis seems to have exceeded the public’s tolerance for government oversight on environmental regulation…” implies that the public thought there was too much regulation – reword.

9) Discussion. First paragraph states “The majority of respondents living in affected counties (70%) followed the recommended behaviors” – cf. Results, Behavioural Compliance: “The main recommendation was to abstain from drinking tap water, and 69% of respondents living in the affected counties complied… Overall, 74% of respondents living in the affected counties were compliant with at least one preventive measure…” – in some parts of the discussion it may be necessary to distinguish more clearly between %s from descriptive statistics and %s from defined dependent variables

10) Conclusion, 1st sentence. Typo: “…because they are associated to behavioural compliance”

11) Figure 1. Typo: “…ifnromation…”

12) Tables 3 & 4. Add key for “*” notation.
- Discretionary Revisions

1) Abstract, Methods, last sentence. Wording: “…behaviour compliance…” may be better put as “behavioural compliance”, “compliance with recommended behaviours” or just “compliance”. Ditto Discussion, 2nd paragraph, 2nd sentence.

2) Results. Comparing affected versus unaffected areas, and stating whether there were significant differences between them, is useful, but is sometimes inconsistently done in the sub-sections: eg, it is in the Risk perception and Timeliness subsections but not some others (source of information, and Knowledge of behaviours, where it’d be particularly useful to know what % of people in unaffected areas knew of any recommended behaviours). It would help to include more comment re: whether differences were statistically significant throughout; this is included more in the first subsections

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

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