

“The global distribution of unintentional acute pesticide poisoning: estimations based on a systematic review” – article published in BMC Public Health 2020
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Rebuttal by the authors of a planned retraction by the journal’s editor

1 Background

We, the authors of the above-mentioned article, were informed by BMC Public Health on 29.04.2023 that they plan to retract the paper. The decision was reportedly taken based on one Editorial Board member's assessment. The reason for this was given as the dissatisfaction of a reader with the answer we gave on 05.01.2023 to his critique on the use of a French study in our review.

Following a request by the authors for additional information we were informed that the Editorial Board member and the reader had concerns not just about the data of France but also with respect to some other countries. Following a further request by the authors the names of these countries were provided. No analysis by the Editorial Board member or reader was provided for these additional countries.

The concerns assume that generally an overestimation of poisonings cases occurs by using a reported “history of pesticide poisoning” or poisoning in an unspecified time frame for annual estimations. This assumption is wrong. Acute poisonings are by definition bound to a reasonably short time span (e.g. 24 h) after exposure. Acute poisonings can occur repeatedly when exposure occurs repeatedly, so many times in a year. Pesticides can be applied on a weekly basis by the same persons, for a number of crops. For example, Tomenson & Matthews (2009) – an industry-led international survey on pesticide poisoning – reported for Cameroon that within 12 months there were 1418 incidents by 154 users, so 9.2 cases per person per year. In general, there is little interest in studying lifetime incidence in surveys of acute intoxications and it is reasonable to assume that respondent’s report of acute poisonings refer to the repeating periods of pesticide application.

We discussed at length in our article the heterogeneity of the included studies as well as the consequences of low data-coverage of countries and provided results from sensitivity analysis. This was obviously to the complete satisfaction of the peer-reviewers of the paper.

In what follows, we first give detailed answers to the critique on using data on France and the other countries for which the Editorial Board member and reader had concerns. We show that this critique is unfounded and false and-- if true-- the effect on our results would be negligible. We then turn to the procedure by which the journal managed the critique and point to the scientifically unsound exclusion of authors and expertise in this process. Finally, we rebut the plan for retraction also due to the fact that two of the three parts of our article consist of a state-of-the-art systematic review and the analysis of a routine database, neither of which are addressed by the critique at all.

2 The critique in detail

We provide a detailed inspection of the critique on the inclusion of studies from France and several other countries, and our comments on them.

2.1.1 The “French reader” critique

Critique taken from the reader’s email to BMC Public Health as reported on 03.01.2023 to the authors	Reply by authors
“I was rather surprised by the very large number found, and decided to have a specific look at the estimate for my own country, France. Indeed, the paper states an estimate of 7 fatal poisoning every year. See Table 7 on... and 139,357 non fatal poisoning”	The figures are wrongly cited. The figures mentioned are not for France but for Western Europe.
“These numbers are way larger than current estimates generally agreed in France.”	Where does this come from? Which estimates? Are there any documents supporting this claim? Neither the information nor the source of the information have been provided so the claim cannot be examined or included.
“The paper states ‘A history of pesticide poisoning was reported by 845 individuals (6.1%) among the 13,900 who completed the information (89.7%). ‘ Thus, a few percent of the respondent have declared to have suffered AUPP once in their lifetime. It appears that the authors of the paper have used this percentage as if it was representative of a yearly frequency, thus increasing the frequency of poisoning (and therefore the number of yearly UAPP) by a factor of 30-40.”	This is a wrong assumption, since a “history of pesticide poisoning” logically does not mean “once in a lifetime”. A history of pesticide poisoning also includes a person with acute poisoning in every year-- or even several times per year. All such incidents would be counted just as one poisoned person, if a poisoning history was reported. In fact, the exact question of the study referred to, by Baldi et al., was “Have you ever been intoxicated by a pesticide?” with answer categories: “Never - Once - Several times. If yes, in which year(s)” 3 answers were possible. The said study reports the prevalence of poisoning with no indication that only the “once”-category was analysed. The enrollment phase was 2005-2007. The “factor of 30-40” mentioned by the critic is without references and therefore without validity.

Even if this criticism was justified, deletion of the French data in total would change our global estimations by 0.04 %! The critique is not just wrong but overall negligible to the estimate.

2.1.2 Critique on other countries

After repeated inquiry, we received information on further countries of concern to the Editorial Board Member by email from the team Manager, BMC Series from 27.04.23: “The other countries on where concerns have been raised by the reader and Editorial Board Member include the UK and Cameroon where ‘ever’ prevalence has been used as an annual estimate. Furthermore, the concerns also flag that you have assumed annual exposure where the timeframe is not reported in other countries (e.g. Nigeria, Tanzania, Zimbabwe).”

We provide a detailed exploration of the studies with respect to the above-mentioned countries and highlight sections relevant for the time-frame of exposure.

(i) Countries with alleged “Ever” prevalence of poisonings

Cameroon:

For Cameroon our national estimations could be based on 5 surveys, including one strictly reporting an annual prevalence. We used the overall mean prevalence of 49 %, which is lower than that of the pesticide-industry study by Tomenson and Matthews (2009) reporting annual prevalence for Cameroon.

Achancho et al. 2019: 21% “... it was found that 21% of them said that they experience headache, **after spraying**”.

Assokeng et al. 2017: 39 % “As far as discomforts of gardeners are concerned, various health problems were observed **during handling**: headache, transpiration, cold, burns and eye aches.”

Pouokam et al. 2017: 40.3 % “Concerning themselves, 158 farmers interviewed declared to have experienced **at least one** case of pesticide accident **during manipulation**.”

Tandi et al. 2014: 84.9% “Most farmers (85.0%) reported at least one symptom of acute pesticide poisoning **following spraying**.”

Tomenson & Matthews 2009: 59% “... shows the percentages of users experiencing **incidents in the last 12 months**.”

UK

For UK, our national estimations could be based on only 1 survey. Deleting UK data would reduce our global estimate by 211,580 non-fatal cases, which translates as 0.05 % of the estimate; and this in itself would provide an error as acute unintentional pesticide poisoning does occur in UK, as documented in this study and others that did not meet the systematic review criteria.

Solomon : “whether any of 12 listed symptoms had ever been experienced **within 48 h of using such pesticides**”

(ii) Countries with alleged not reported time frame

Nigeria:

For Nigeria (Africa Western) results could be based on 3 surveys. We used the overall mean prevalence of 60.9 %, which is lower than that of studies strictly reporting cases occurring during use of pesticides. In the following studies, the various surveys asked farmers what symptoms they experienced after using pesticides, and surveys were reported as being taken in a specific year, or reported the month and year.

Bassi et al 2016: 42% “Thus, clients present with multiple finding or symptoms. In this study most farmers experienced chest pain/tightness, cough, headache, dizziness, reddening of the eyes; sneezing and rheum **more often**”.

Oluwole & Cheke 2009: 91.3% “For the human health effects, only acute symptoms that appeared within 48 hours of pesticide sprays were considered... Each interview took about 15–25 minutes to complete and all were conducted during March 2008.” And: “By asking the farmers if they experienced any health weakness (discomfort) **in their day-to-day handling** of chemical pesticides. A majority (91.3 per cent) responded that they or someone in their family had **suffered from pesticide-related health symptoms during or after application of pesticides.**”

Ugwu et al 2015: “One hundred and one (101) farmers corresponding to 74% of the sample reported having experienced **at least one of the symptoms on occasion of pesticide handling.**” Data reported in this study was collected in 2014- see Table 4.

Tanzania

For Tanzania (Africa East) results could be based on 4 surveys including one reporting annual prevalence and one reporting 3-month prevalence. We used the overall mean prevalence of 76.4 % which is comparable to studies strictly reporting an annual prevalence or shorter.

Da Silva et al. 2016: 61 % “Pesticide users were asked if they had experienced the symptoms during or **soon** after direct contact with pesticides. To be counted as a pesticide-related symptom, the exposure had to be direct contact, and the symptoms had to occur **on the same day or the next day.** We also **asked for the frequency of experienced** acute health symptoms.”

Lekei et al 2014: 93 % “Approximately 93% of respondents reported previous poisoning by pesticides in their lifetimes (past year inclusive) with **frequency ranging from 1 to a maximum of 7** times; 76.4% of the poisoned respondents reported two or more poisonings and 63.5% reported 3 or more poisonings at some point in the past. The 112 farmers with **past APP reported approximately 432 past poisonings in total.**”

Manyilizu et al: 76.6% “Every disease symptom out of 12 (symptoms) had occurred to an average of 51% (66/128) farm workers **in the past three months.**”

Tomenson & Matthews 2009: 74.8 %. “... shows the percentages of users experiencing **incidents in the last 12 months.**” Good example for multiple intoxications. 154 users experienced poisonings and reported 1418 incidents, so 9.2 per user and year.”

Zimbabwe

For Zimbabwe (Africa East) results could be based on 1 survey. This adds approximately 2 million non-fatal poisonings to the Africa East estimation of 51 million.

Magauzi et al. 2011: 45.1 % “We assessed the health effects of agrochemicals in farm workers in commercial farms of Kwekwe District (Zimbabwe), in 2006... Forty-five percent of the participants stated that they had suffered some multiple symptoms at one point in time that they knew or suspected to have been caused by pesticide exposure”.

3 Comment on scientifically unsound action and process of BMC Public Health

There was no information provided to the authors about any kind of investigation into our paper, nor about an additional critique, prior to being informed about the planned retraction. We, the authors, were piece-wise informed about the reasons, only after repeatedly asking for them. In view of conflicting statements by BMC Public Health, we still do not know whether the “Research Integrity Group” of the journal was involved. We are informed that only one Editorial Board Member had concern about some of the data used, and that this evaluation is the basis of the retraction. We learned by email on 26.04.2023 “... that the details of the investigation remain confidential.”

Editors in general have several ways of handling articles in dispute:

- inviting the critic to a correspondence making the dispute open to the scientific community,
- starting a new review process to make sure that expert’s knowledge is involved,
- considering need for a correction of a paper.

None of these options have been used by BMC Public Health. The Editor seems to prefer to plan a retraction based on a critic who obviously is a well-known pesticides aficionado in France and who by his own account from a comment since deleted on twitter is acting “on a subject that is not in my strict field of competence.”



Francois-Marie Bréon on Twitter: "Mais à la base, il y avait ..."

3 days ago — (supprimé depuis) **qui** affirmait qu'il y avait plusieurs centaines ... sur un **sujet qui ne relève pas de mon domaine de compétence strict.**

Dr. Bréon’s area of expertise appears to be as a scientist specializing in climate change and measuring CO₂ emissions, and he has not written a scientific publication on pesticides or pesticide poisonings that we could find; instead he has engaged in public commentary on pesticides on twitter. The Editor assumes that this reader’s critique has escaped the attention of several reviewers during the review process. The Editor further mentioned a letter to the editor, Dunn et al 2021, published by 3 employees of the global pesticide industry. The authors replied to this letter in the journal.

We know of the desire of the pesticide industry to downplay the incidence of acute unintentional pesticide poisoning, but that is not an acceptable reason for a reputable journal to retract a paper. We found only one study carried out by the pesticide industry on acute unintentional pesticide poisoning – that of Tomenson & Mathews (2009) which we used in our estimate. The annual prevalence reported in their paper was in line with or above that reported in other studies.

4 Rebuttal in general

The editor of BMC Public Health is obviously not aware of the overall structure of our article. The paper consists of 3 parts:

1. a systematic review of the literature, carried out and reported by PRISMA standards,
2. an analysis of data from WHO cause-of-death database for fatal poisonings,
3. a synopsis of surveys on non-fatal poisonings.

We know of no critique concerning the first two parts, still a retraction of the paper would affect these parts and suppress important results based on scientifically sound methods. We furthermore have shown that the mentioned critique to part 3 is unfounded. In the best case, this discussion should be open to the scientific community—an important exchange which would be suppressed by a retraction.

We urge BMC Public Health to stop immediately all steps leading to a retraction of our article. If the entire Editorial Board wishes to review the critique of our paper and our responses to that critique, we would be willing to participate. Meanwhile, an apology would be welcomed. The precipitate proposal to retract a paper that has been in the public domain for more than 2 years on the basis of a single reader with inadequate understanding of the research, not only wrongly undermines the integrity of the authors but also risks damaging the otherwise good reputation of the journal itself.

Studies like ours, making use of the best available data, are standard practice in an effort to generate information that may allow for the appropriate directing of resources in the interest of public health and harm prevention. In global health, acting on the precautionary principle in order to save lives means that waiting for perfect estimates is not ethical, nor is it feasible. Withdrawing the paper is likely to do more harm than good, which is against the ethos of global health. Given the apparent conflict of interest of the reader, the letter to the editor by Dunn et al., and that the paper was so rigorously peer reviewed-- a retraction by the journal undermines the integrity of the scientific process.

04.05.2023 Wolfgang Bödeker, Meriel Watts, Peter Clausing, Emily Marquez