Author's response to reviews

Title: Use of point-of-sale data to track usage patterns of residential pesticides

Authors:

Nyree Bekarian (nyree1@gmail.com)
Devon Payne-Sturges (payne-sturges.devon@epa.gov)
Stuart Edmondson (stuart@kellyreg.com)
Bill Chism (chism.bill@epa.gov)
Tracey J Woodruff (woodruff.tracey@epa.gov)

Version: 3 Date: 25 October 2005

Author's response to reviews: see over
Dear Drs. Black and Hoppin,

Thank you for considering this manuscript for publication in Environmental Health: A global access journal. We appreciate the time you have taken to review this paper and make comments. We have made changes per your recommendations and have added comments explaining our edits. It is our hope that our revisions and responses are adequate.

The following are your comments, each followed by our response.

**Reviewer #1, Dr. Kathleen Black, University of Medicine and Dentistry of NJ**

Comment 1: years that NHANES, NHEXAS etc were conducted. Since we know that pesticide exposures change over calendar time, it's important to include this.

Response: We have included the years during which NHANES, NHEXAS and NOPES were either conducted or reported on. Please see page 6 and 7 of the manuscript.

Comment 2: a more direct link to the Kelly solutions data. The home page doesn't get you to where you want to be.

Response: We decided to not include a link to the Kelly solutions data since a more direct link is only available to subscribers and is password protected.

Comment 3: pounds sold...is this pounds AI or pounds product? I was confused

Response: Pounds sold is pounds of AI. We have edited the text to clarify this point.

Comment 4: Market trends page 16. "increased from $780K to about $3.5 mil." In what year were sales $780K?

Response: This was in 2001; the year was added to the text.

Comment 5: References 12 and 33 seem inappropriate to describing the use of permethrin to treat mattresses, since these are toxicology papers. There must be some label information on approved uses that is more appropriate to cite.

Response: References 12 and 33 were replaced by reference 34, EPA's Pesticide Product Label System (PPLS) Search website, [http://oaspub.epa.gov/pestlabl/ppls.home](http://oaspub.epa.gov/pestlabl/ppls.home). Using this website, one can search the database by company and product number. We have included information for a sample search to link the user to a product label for a permethrin-based product which lists the domestic uses for the product. The uses listed include clothing, upholstered furniture, carpets, rugs, and mattresses.
Comment 6: The authors may want to mention that this method misses commercial application of permethrins in homes, since the information only looks at residential use.

Response: We have clarified this point in two locations in the manuscript; First on page 9 under the description of the database, where we added the statement: Vista’s data, which covers non-commercial (e.g. sold over-the-counter) pesticide products intended for residential use, came from individual retail companies and stores who voluntarily supply information …” and second on page 17 in the first paragraph of the discussion where we include “non-commercial” to reiterate the fact that the database does not contain commercial-use products.

Comment 7: Figures need some more added to title "as estimated by database" So that individuals who just copy the figure know that they're getting an underestimate.

Response: We have added “as estimated by the database” to the figures.

Reviewer #2: Dr. Jane Hoppin, National Institute of Environmental Health Sciences

Comment 1 and 2: the presentation of the results and the need to clearly recognize the limitations of the database, especially in light of the small market share that it covers. The authors clearly state three uses of the database (to determine anomalous trends, most common application types, differences in indoor and outdoor product sales). I think this could be expanded to include comparisons between different active ingredients and regional/seasonal differences. However, the presentation of results does little to support these utilities. I had expressed a concern that the text unnecessarily reiterated the graphs. The authors responded that much of the text was edited. My impression is that many of the graphs were omitted but the text describing them remained, making it very confusing. The graphs showing national trends in both pounds of active ingredient and units sold were very informative (as were many of the others). It is less informative to state in the text that sales started at 8,700 pounds in 1997 and grew to 9,700 pounds in 2002. This can be easily seen from a graph and, given that the utility of the database is in determining trends rather than absolute numbers, a text simply stating a steady increase or a fluctuating sales would show the authors’ intent for the database (to show trends and comparisons). In short, graphs illustrating the data were more accessible; the text should focus on interpretation.

The limitations of the database need to be in the abstract and conclusion. It should be clear that the data represents, at best, less than 1/3 of the residential sales. The discussion of the impact of the mass market channel is very important. My interpretation is that sale from the two remaining channels are about 1/3 of what was initially covered by VISTA. Given that VISTA does not cover all residential purchases (clearly stated by authors) and 17% of the data were unavailable due to poor coding, any data that the authors can give about the reliability of this database would be helpful. For three years (1997, 1998 and
1999), all three channels were available. Did the mass merchant channel always represent about 2/3 of the total or did it vary each year? Are the relative percentages (indoor/outdoor, regional, season, formulation) the same in the mass merchant channel as in the other two combined? If the mass market channel is very different, this casts doubt on the utility of the database for predicting even relative trends.

Response: The limitations of the database have been added to the abstract and the conclusion. We could not go so far as to say that the data represents less than 1/3 of the residential sales, because the marketing data provided by Vista does not cover 100% of the residential pesticide sales market. Because we do not have information on the % of the residential pesticide sales market that is covered by the Vista data, we were unable to extrapolate the fraction of the market that our data represent. However, we hope that the discussion of the issues and limitations of the database in the discussion section adequately addresses the issue of market coverage and the difficulty of accessing marketing sales information.

In response to your comment on the graphs and their accompanying text, we have added back a graph on outdoor sales by region to illustrate the anomalous spike that occurs in 2001 (Figure 4). Also, we have rearranged the results section so that the national and regional results are grouped together under the subheadings ‘pounds sold’ ‘units sold’ and ‘indoor vs outdoor’. We have also removed much of the text that reiterates the graphs, but have kept these descriptions in where graphs are not used to illustrate the results.

We have also explained, on page 21, about the relative sales trends between the sales channels, which are very similar to each other. Here is what the actual text reads:

Furthermore, analysis of the database shows that, although there is limited data available for examination, the database is sensitive to the number and type of merchants reporting permethrin sales data. For example, while the mass merchant channel was not included in the data for the period from 2000 to 2002 one would assume that this would inhibit further analysis to uncover sales trends. However, an assessment of individual products sold indicates that year to year variability has a greater impact on the reported permethrin sales than the amount sold by each channel. Therefore, despite the exclusion of the mass merchant channel, which is not a favorable condition for overall power of the database, we were still able to analyze the sales database for potential trends in sales for the home center and hardware store channels.

Comment 3: in the abstract (first sentence) and introduction (last sentence of first paragraph) the authors imply that residential use pesticides result in greater exposure than agricultural use pesticides. While, intuitively, residential use affects more people, agricultural exposure in terms of concentrations would be much greater. Their citations
show that residential use is widely reported and that pesticides are commonly found in homes. Comparisons to agricultural use are difficult and unnecessary.

Response: We agree with your comment and have removed the comparison between residential and agricultural exposures to pesticides.

Comment 4; it would be helpful in the section headed "Tracking Home-use Pesticides" to distinguish between reporting of commercial applications (the state level systems) and reporting of residential use (the Oregon system). Also, the plural of sampling medium is media. The authors need to be clear that the surveys/questionnaires show that residential use is widespread but the sampling of environmental media show that pesticides are commonly found in homes (from either residential use/commercial applications/other sources).

Response: We have added some language in the discussion on the different reporting systems to help distinguish which deal with commercially applied and residential-use pesticides. We hope that the added language adequately does this.

Comment 5: the authors still include conflicting statements about the inclusion of the mass merchant channel. On page 9, just before "Description of Sales Channel," the channel was dropped. Three sentences later, it was in the national data. By the end of the paragraph it was dropped again. I would suggest stating here that three channels are used by VISTA and that data reporting changed in the mass merchant channel in the middle of the study and thus only the data from the two channels are presented. The problems and especially, the impact of the mass merchant channel do belong in the discussion.

Response: We have edited the text on page nine to more clearly explain which sales channels were originally included in the database and which we included in the analysis of the database. We have also moved the text on impact of the removal of the mass merchant channel from the dataset to the discussion section.

Comment 6: some statements on page 9, first full paragraph, are repeated in the last paragraph beginning that page.

Response: We have removed the text that repeats itself.

Comment 7: in response to my previous comments, the authors stated that the graphs and text referred to pounds of active ingredient, yet, on page 13, the results are listed as pounds of product. I would not use these interchangeably.

Response: We have fixed the language on page 13 to read pounds of active ingredient instead of product

Comment 8: figures 1 and 2 need legends

Response: We chose to label to graphs directly as opposed to adding legends.
Comment 9: some of the paragraph on permethrin in the Discussion is directly repeated from the Introduction.

Response: We have removed the text in the discussion that repeats the text in the introduction.

Comment 10: the entire discussion of WNV is unconvincing; too little data is presented to include it.

Response: We have decided to leave the discussion on WNV in the manuscript. The spike in sales in 2001, in all regions, but especially the South, may be explained by the spread of WNV to the area. We do not mean to definitively conclude that the spike in sales is a direct result of people reacting to WNV. We simply mean to use it as an example of how information other than sales data may be used in conjunction with the database to help track trends in pesticide sales and use. We use the case of WNV to illustrate this point.