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3/13/81

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Russell F. Christman, *Editor*

March 10, 1981
Ms. No. ESO-242

Dr. Ronald D. Snee
Engineering Department
E. I. du Pont de Nemours & Co.
Wilmington, Delaware 19898

Dear Dr. Snee:

Your manuscript entitled DEVELOPMENT OF AN AIR QUALITY STANDARD FOR
LEAD FROM COMMUNITY STUDIES

has been examined carefully by the Editor and has been referred to
reviewers for comment. On the basis of this study, the Editor has decided
that the paper is not acceptable in its present form and requires major
revision before it can be considered further.

Reviewer comments and editorial recommendations are attached. Please con-
sider carefully all suggestions, and either make appropriate changes in
the manuscript or provide suitable replies. If comments call for clarifying
statements, these should be included in the manuscript.

Further consideration is contingent upon revision and/or rebuttal that will
overcome the reviewers' criticisms. Additional review and revision may be
necessary before a final decision can be made.

The next review of the paper will be expedited if you will send us three
copies of the revised version, an itemized list of changes made in the
manuscript, and your answers to the criticisms.

Very truly yours,

Monica M. Creamer

Monica M. Creamer
Editorial Assistant

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ENVIRONMENTAL SCIENCE AND TECHNOLOGY

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MS NO. ESO-242

AUTHOR Ronald D. Snee

TITLE DEVELOPMENT OF AN AIR QUALITY STANDARD FOR LEAD FROM COMMUNITY STUDIES

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ACCEPT AFTER REVISION ☐

REJECT ☒

COMMENTS

The paper is neither a review nor a report of original research. Whilst it has some merits as a discussion of the bases available for standard setting, it is not appropriate for publication in Environmental Science and Technology.

There are some scientific weaknesses:

1. Page 4, section 3. The Azar study has been criticised by Hammond in the OSHA Preamble (Federal Register 43 (225) p 54403). In that study, variations in the contribution of lead from sources other than air were so great that the confidence limits for the regression were broad. Hence the value of B in equation (1) will be variable and both this and the coefficients in the equation will be subject to considerable uncertainty. The variability of B would seem to invalidate equation (4).

2. Page 5, Section 3. The author cites Chamberlain et al. as the source of a blood lead-air lead slope of 1. More recent studies by Chamberlain et al. (Investigations into Lead from Motor Vehicles, U.K. Atomic Energy Authority Report AERE-9198 (1978)) suggest a ratio of ca. 2. The study of Rabinowitz et al. (J. Lab. Clin. Med., 90, 238-48 (1977)) suggests a ratio of 3.5 and indeed most studies imply a ratio of >1. The value of this ratio is fundamental to all standard setting and it is unreasonable of Snee to select a value suiting his own case.

3. Page 5, section 4. The author uses corrected data to derive the blood lead distributions from the Azar data. The validity of the derived distribution will depend upon the validity of the model used to correct the data. It is not possible to judge this without seeing reference 7, which is not yet available.

4. Page 6, section 4. (and elsewhere) The author concludes that the Pearson model provides the best fit to the data. He does not, however, provide any evidence to support this assertion. He also does not provide a formula for the best fit Pearson model, whereas he does provide formulae for the other more common models.

5. Page 13, section 8. The author dismisses the log-normal distribution for blood leads on the basis of Table 6. This does not seem to provide strong evidence for its rejection. Indeed, on most occasions it seems to be perfectly valid. This sort of exercise would have to be carried out on far more data to be able to reject the fairly simple log-normal model.

The author also states "it is important to note that in several instances the skewness is in the negative direction". He uses this to explain away the lower air quality standards derived in Tables 4 and 5. Yet the data in Table 6 show positive skewness to occur as often as negative, so why is only the negative skewness important?

6. Page 15, Discussion. The author directly compares an air quality standard derived from his data with that of the EPA. Yet the two are not directly comparable, as the author himself admits immediately below. Such a comparison is misleading and should not be made. The implication is that the EPA standard is too low and this seems to emphasise the political nature of the paper.

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COMMENTS

It has been several years since I have been involved with environmental studies of lead. I would recommend further review by people actively involved in such studies. I do have some general comments:

The objective of this work is to dissociate air lead from background lead in relation to blood lead levels, in order to establish a quality standard for acceptable air lead levels. This leads at once to several problems:

1. Is the AQS to be established by studies involving the entire population, or a selected population such as children? 2. Has it been demonstrated that children can stand the same lead levels as adults or are they more susceptible, for example because they have a more active calcium metabolism? 3. Blood lead levels represent an index of recent exposure, while the 24-hour samples represent average exposure. Is the "time constant" for blood lead long in relation to 24 hours? If not, one has to deal with peaks of air lead during high traffic periods and whether such peaks represent a hazard or not.

Perhaps questions like this could at least be mentioned to point out the complexity of establishing AQS. It does appear that if the basic assumptions are accepted, the authors have made a case for less restrictive AQS, and it is only fair to point these out.

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Ms No.

Ms Title DEVELOPMENT OF AN AIR QUALITY STANDARD FOR LEAD FROM
COMMUNITY STUDIES

9/18/80

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This manuscript is being considered with the understanding it has been submitted on an exclusive basis. The office noted below will write you of our decision regarding it as soon as possible.

RETURN TO

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