

DEPARTMENT OF PUBLIC HEALTH

2151 BERKELEY WAY
BERKELEY 94704

February 9, 1967

Mr. Victor Sussman
Air Pollution Control Commission
P. O. Box 90
Harrisburg, Pennsylvania 17120

Dear Mr. Sussman:

Dr. Sturgis just today brought to my attention the interest of your Department in the relationship of atmospheric exposures of lead to the lead body burden. I understand that your commission is considering setting an air pollution standard at 5 micrograms per m³ for a 30-day average, using standard methods.

Our Department is preparing a report on lead in the atmosphere and its effects on humans. We intend that the report provide a basis for the eventual development of air quality standards in California. In our analysis we recognize two major problems. The first has to do with the relationship between the atmospheric lead level and the body burden as reflected by the blood lead level. The second has to do with the health effects of any specified body burden.

We find that the published data, including the recently published data from Philadelphia, Cincinnati and Los Angeles, are well described by a linear regression between the log of the blood lead level and the log of the atmospheric exposure on a 24-hour basis. This mathematical expression is

$$\text{Log}_{10} \text{ Blood Lead} = 1.2718 + 0.22928x$$

$$\text{Log}_{10} \text{ Average Atmospheric Exposure}$$

(for males, smoking status not specified)

It is well recognized by authorities that any increase in body burden of this substance is associated with an increased risk to public health. Accordingly, the interpretation of this relationship depends on how large and how significant an increase should be permitted. We feel that an average exposure of 5 micrograms can be predicted to result in an average blood level of about 27 micrograms per cubic meter. There will of course be considerable scatter of values about this mean.

We have also examined experimental data from a variety of sources and find that it is also well reflected by this same regression.

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The interpretation of these body burdens is not so clear-cut since the sensitive criteria of metabolic alteration, increased excretion of porphyrins and delta amino levulinic acid have not been looked for in any series of individuals exposed to community air pollution.

It is therefore my conviction that at this time it is a prudent Public Health policy not to permit long-term atmospheric exposure levels in excess of 5 micrograms per m³ a month and that a case could be made for a lower standard.

I hope this information is helpful to you.

Sincerely,



John R. Goldsmith, M.D., Chief
Environmental Hazards Evaluation Unit

JRG:rw-f

cc: Mr. Malcolm W. Schoenly
Dr. Katharine Boucot Sturgis

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