NIOSH Comments to DOL

POST-HEARING BRIEF OF THE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ON
THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
PROPOSED RULE ON
OCCUPATIONAL EXPOSURE TO COTTON DUST

29 CFR Part 1910
Docket No. H-052E

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health

December 14, 1983

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Mr. Tom Hall
Division of Consumer Affairs
Occupational Safety and Health
Administration
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. Hall:

During the informal hearings held on September 19, 1983, regarding OSHA's proposed cotton dust standard, NIOSH was asked to provide comments on two specific questions in a posthearing brief. Subsequent to that request, OSHA provided NIOSH with a report prepared by ERG Consultants, Incorporated concerning cotton dust concentrations, as well as medical surveillance data in knitting and hosiery mills. This letter responds to all three issues.

The first issue pertains to the protocol one should follow to determine which alternative sampling device would provide results comparable to those obtained when using the vertical elutriator. The second issue pertains to whether or not oil mist present in weave rooms might affect the dose response relationship for the adverse health effects that have been associated with cotton dust.

With respect to the issue of alternative sampling devices and the protocol needed to determine their equivalency to the vertical elutriator, NIOSH has reviewed the protocol submitted to OSHA by Wadsworth and Rockette under Contract No. B9F26482, Project No. E-24-611. This review was provided by Mr. Kenneth A. Busch, Senior Advisor for Statistics, Division of Standards Development and Technology Transfer, NIOSH, in the enclosed memorandum dated December 1, 1983. In summary, Mr. Busch identified five problems with the protocol submitted by Wadsworth/Rockette. The problems concern the definition of the accuracy standard; methods for keeping track of the units being tested; the test of significance used by the authors; the estimation of the error distribution; and the determination of the variance of differences observed when using the different methods.

These five problems, as well as an alternative protocol for determining comparability between devices, are discussed in detail in Mr. Busch's memorandum.

The second issue, raised by Mr. Neil King of the American Textile Manufacturers Institute (ATMI), concerns whether or not oil mist contributes to the adverse health effects associated with cotton dust. This question

was raised in particular reference to the dose response relationship that was developed from studies conducted by Dr. James Merchant in 1969 and 1970. NIOSH has no data that will specifically answer Mr. King's question. Whether or not exposure to oil mist along with cotton dust protects workers, causes no additional effects, or enhances the effects of the cotton dust is unknown.

As stated above, OSHA has provided NIOSH with a late Docket submission from Andrew F. Oberta of ERG Consultants, Incorporated. In that submission, Mr. Oberta summarized and analyzed employee exposure and medical evaluation data obtained in knitting and hosiery mills. NIOSH has reviewed that submission and offers the following comments.

Oberta presents summary data suggesting that mean dust concentrations and the prevelence of pulmonary function abnormalities in certain knitting and hosiery mills, which he was employed to survey, were higher than in those facilities described by Boehlecke and Battigelli. NIOSH has previously cautioned OSHA regarding the Boehlecke and Battigelli study in comments submitted on September 1, 1982:

> "There may be a strong selection bias, not under the control of the investigators, of which OSHA must be cognizant, which throws into question the generalization of the results of this study to the entire knitwear and hosiery industries."

The concluding sentence of the Boehlecke and Battigelli report highlights the same concern. In the authors' words:

> "Determination of whether these findings are applicable to the entire industry may require consideration of additional information regarding the representativeness of the study group."

Oberta states that in a survey of 42 knitting and hosiery mills which use cotton, only 22 had taken some action to implement a medical surveillance program. To understand Boehlecke and Battigelli's findings, it is important to remember that their study was performed among workers in facilities that volunteered to participate; this may have resulted in the selection of facilities that had lower mean dust concentrations than were generally found in the industry. Had more plants with greater dust concentrations been included in the Boehlecke and Battigelli report, that report's conclusion ("Overall, there was little evidence in these data of a significant chronic effect of knitting room exposure on the respiratory system.") may have been different.

NIOSH cautions OSHA about Oberta's current comparison between ERG environmental data and the Boehlecke and Battigelli environmental data. Oberta contends that the mean dust concentrations in his client's facilities

were greater than those determined by Boehlecke and Battigelli for the facilities that they studied. However, it is not possible to determine if Oberta calculated the means from the two studies in the same way. The means calculated by Oberta from the Boehlecke and Battigelli data appear to be means of plant means, but the mean values presented by Oberta for the facilities that he studied appear to be means of area means, or possibly means of all samples.

NIOSH also cautions OSHA about Oberta's current comparison between the ERG pulmonary function data and the Boehlecke and Battigelli pulmonary function data. Although Oberta states that pulmonary function among the workers in the population he studied was lower than the pulmonary function observed among workers studied by Boehlecke and Battigelli, Oberta has not considered the smoking status of either population in his comparison. Furthermore, Oberta's report offers no objective indication of the technical quality of ERG's spirometry.

In its present state, firm conclusions cannot be drawn from Oberta's summary report. However, further analysis by Oberta of his data could prove useful in the establishment of a defensible standard for knitting and hosiery manufacturing.

Sincerely yours,

Richard A. Lemen
Director
Division of Standards Development
and Technology Transfer

Enclosure

Enclosures and/or attachments that are not included are available free of charge from the NIOSH Docket Office [513/533-8450].

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16. Abstract (Limit: 200 words) This testimony summarized the position of NIOSH concerning the proposed rule on occupational exposure to cotton dust. Topics included cotton dust concentrations, medical surveillance data in knitting and hosiery mills. NIOSH has reviewed the protocol submitted to OSHA regarding alternative sampling devices for cotton dust. Problems concerning the definition of the accuracy standard, methods for keeping track of the units being tested, the test of significance used by the authors, the estimation of the error distribution, and the determination of the variance of differences observed when using the different methods were noted. An additional issue concerning whether or not oil mist present in weave rooms contributes to the adverse health effects associated with cotton dust was considered. The representativeness of study groups used was discussed.

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