GRADUATE SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF PITTSBURGH
PITTSBURGH, PENNSYLVANIA 15261

DEPARTMENT OF BIOSTATISTICS

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Dr. Gaven Hildick-Smith
Director, Medical Affairs
Johnson and Johnson
New Brunswick, NJ 08903

Dear Dr. Hildick-Smith:

I've studied the material you sent me. I can't be entirely sure how the NIOSH study was done since the transcript is a bit garbled. Apparently NIOSH studied only men who were X-rayed by the Vermont State Health Department during the period 1940-1970. In addition to being X-rayed, to qualify workers had to have worked for a year or more, with some of the work time in the period 1940-70. Some men must have had repeated X-rays. It doesn't appear that company records were actually used--or if so, it isn't clear how.

The respiratory cancer deaths are certainly curious. There seems to be no reasonable hypothesis to explain them. It's almost as though someone observed some respiratory cancer cases among the miners and as a result called in NIOSH to do a study. If so, there is no way to evaluate the findings. That is, if you start with an excess you're almost sure to end with an excess. No test of statistical significance would be valid in such an instance.

I don't think Ms. Selevan has overinterpreted her findings. She correctly points out that past, not present dust levels are the cause of any observable effects and is clearly puzzled by the contrast between lung cancer in miners vs millers.

Evidence of a problem is much stronger for non-malignant respiratory disease than for cancer. An excess appears in all exposure groups (although numbers are rediculously small in miners) and the excess increases with time since first exposure. On the other hand, 9 of the 12 deaths are from a single company (E). This might simply be a reflection of company size, but this can't be established from the data presented. I don't know why pneumoconiosis and emphysema are grouped here since it's unlikely that there is a common etiological agent. Also, in the attachment it's not clear what X-ray results are presented--given that more than one X-ray was probably taken in most cases. It's interesting, and possibly important, that the same company that produced the non-malignant respiratory disease in millers also produced lung cancer in miners.

You asked what additional information might be helpful. I'd like to know:

1. What X-ray results were reported where more than one X-ray was taken?

2. What were the overall results of the X-rays taken by the State Health Department? Did they show pneumoconiosis? (If so, the study didn't add much).

3. How did Company E differ from the other two companies?

4. What is known about the people who volunteered for X-ray? What evidence is there that they are mainly the healthy workers? (underestimate the risk)

5. Has anyone else observed an excess in respiratory cancer in pure talc mines (the paper suggests someone has)?

6. Is it possible that the miners had mining experience elsewhere—mining industrial talc for example?

I'm not sure the study is capable of definitive answers. Numbers are too small to say much about lung cancer. If pneumoconiosis is of interest, the way to study this is by looking at the X-rays. If chronic bronchitis and emphysema is of interest, this should be studied by history and pulmonary function testing. Mortality data for chronic bronchitis and emphysema are notoriously inaccurate and historically misleading

I think the key here is whether anyone else has observed an excess in respiratory cancer among pure talc miners (or persons or animals exposed to pure talc). Certainly, this study is too small to be definitive for respiratory cancer. If observations can't be replicated, then they are unique and thus unusable.

Sincerely,

Philip E. Enterline, Ph.D.
Professor and Acting Chairman
Department of Biostatistics

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