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From: eohtlg@gwumc.edu
Sent: Sunday, March 11, 2007 5:59 PM
To: NIOSH Docket Office (CDC)
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Subject: 099 - Roadmap Comments

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Comments
I am writing this comment on the asbestos research roadmap in a personal capacity but with three relevant qualifications: I am currently President of the American College of Occupational and Environmental Medicine, I am past President of the Association of Occupational and Environmental Clinics, and I am the former chair of the ad hoc Task Force convened by the American Thoracic Society to revise the diagnostic criteria for asbestos-related disease, which delivered its report in 2004.

Why study asbestos?

Asbestos ranks among the most heavily studied environmental and occupational hazards in history, with 9297 MedLine citations. The world knowledge base on asbestos is unrivaled for any occupational exposure save lead and noise. Few, if any, other hazards will ever be as well characterized and it is not reasonable or affordable to expect to make the same investment in research on other hazards.

Despite this deep fund of knowledge, we still do not know everything we need to know about asbestos.

We certainly know enough to act with assurance by taking a drastic public health action: a total ban on exportation, importation, and use. There is no rationale for continuing its use, given the high risks and costs imposed on society and workers. However, history has shown that overwhelming detail in research, answering virtually every question, is almost always required for definitive policy solutions to occupational hazards.

The so-called "third-wave" of lung cancer and mesothelioma cases in countries, mostly developing, that continued to import and use asbestos after developed countries restricted its use has, sadly, recapitulated the earlier history of the United States and Europe, where asbestos-related diseases are now falling or projected to fall. This has now been demonstrated for country after country (not to mention provinces and
regions) with monotonous redundancy; the epidemic curves are essentially identical (with minor variations) and could mostly have been predicted from the earliest studies done. While we do not need to document the toll of asbestos-related disease in every jurisdiction in the world, it is a tragic fact of life in occupationa health that decision-makers usually demand local data before they will act.

Clearly we as a society do not know enough if there is sufficient confusion about asbestos to delay implementing definitive action (such as a ban on asbestos mining and products)and to cause confusion on issues important to adjudication and compensation. If decision-makers and elements in society genuinely think they need more information to act, we should supply it, to the best of our ability.

At this stage, we do not need to characterize every possible nuance of asbestos-related risk for

scientific reasons but this is demanded to support pressing policy decisions:
+ cement pipe for clean water can be made without asbestos evaluating
+ the carcinogenic potential of chrysotile, which appears to be
a source of some confusion
+ defining cancer risk for low exposure, which is proposed to be above a
linear extrapolation from high-level exposure
+ evaluation of the role of genetic susceptibility as a cause of
mesothelioma
+ the association between asbestos and colon cancer.

There are other reasons to study asbestos. Precisely because it has been so well studied, asbestos is the very model of an occupational hazard. Its study has informed research into inhaled fibers, interactive effect, nongenotoxic carcinogens, clearance, passive exposure, and tumor biology.
It is a prime example of a multipotential carcinogen, violating the specificity criterion of the Bradford-Hill criteria. The cohorts followed for asbestos-related disease are showing us the relationship of occupational disease risk and aging. Asbestos studies have trained a generation of occupational epidemiologists and exposure assessment specialists, largely because the basic methodological issues were already worked out.

Practical reasons to study asbestos further are as outlined in the
roadmap:
+ to further characterize the mechanism of nongenotoxic carcinogens to
+ validate the Stanton hypothesis and understand the effect of fiber
length
+ to assess the carcinogenicity of asbestos in other target organs
+ besides
lung and pleura
+ to extrapolate findings to other asbestiform minerals

We also study asbestos because it is a model for occupational disease and because we know enough to generalize, synthesize, and integrate. With the extensive database available and numerous studies, some similar and some disparate, to compare, we are learning useful lessons about limitations of meta-analysis and interpretation using asbestos as the test case. Few other occupational hazards have a sufficient database available to support this.

We ought not to have to repeat prevalence studies again and again in new populations, but local decision-makers seldom accept data from elsewhere.

Instead, we need to create a flexible, generalizable model of asbestos to understand nuances of exposure and response because we know it well enough to interpret what we see.

Finally, we study asbestos because its risks are not obsolete, as we are discovering anew in Libby, Montana. Perhaps above all, we need to continue to study asbestos so that we do not make the same tragic mistakes in the future. In occupational health, we seem to need to study a problem forever in order not to forget it. We need to study asbestos because our very knowledge makes it the relevant test case for all of occupational health.

Tee L. Guidotti