

In view of today's increasing amount of technological by-products, health and safety specialists are now beginning to judge these products, and consequently other materials found in our environment, upon broader criteria. Among the more significant of these criteria is the carcinogenic risk factor.

With cancer-causing agents so prevalent in our news headlines and therefore in the public mind, it becomes of great importance that no unnecessary alarms be set off as a result of inadequate assessment methods, which prematurely indicate a cancer risk.

Such was the case in the evaluation of the cancer risk of asbestos in building materials and insulation.

A recent five-year study now reveals that both the seriousness and the magnitude of the cancer risk of asbestos have been overstated and, in fact, are minimal in most cases.

The study was conducted by Industrial Hygienics, Inc. (IHI), a leading occupational and environmental health consultant. The results of the study were first made public at the 1980 American Industrial Hygiene Conference,



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Evaluating the cancer risk of asbestos

When the hazard involved is a carcinogenic risk, and the population exposed varies from children to senior citizens, the complexity is increased significantly.

held in Houston, Texas, attended by over 5,000 of the nation's industrial and governmental health professionals.

DATA The IHI asbestos study was based on data collected from standard NIOSH techniques, certified test methods which relied on

Data indicate that the seriousness of asbestos risks is overstated.

over 400 air samples, analysis, data interpretation and risk limitation.

Over 100 general occupancy buildings, located in urban, suburban, rural and natural environments, including: schools, churches, offices, hospitals, libraries, industrial plants, ships in port, and businesses, were involved in the study.

The study presents data on 40 of these buildings where the source of the asbestos fiber was insulating materials either sprayed on for fireproofing or used on piping.

The air samples were taken in environments with asbestos installations to measure the concentration of fibers. Then the amount of time it would take to develop a tumor (or the carcinogenic factor) was calculated for the general

population exposed to these environments.

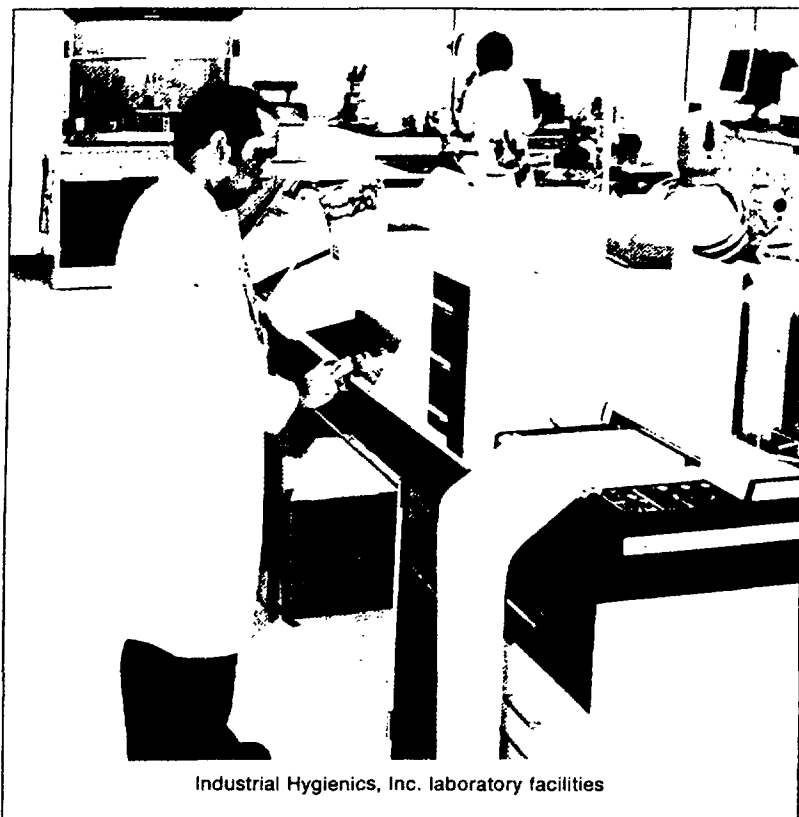
This time-to-tumor equation and model were previously used by federal agencies in establishing asbestos standards. (The Consumer Product Safety Commission used this equation and model in banning asbestos wall patching materials.)

RISK? The time-to-tumor calculations, based on the levels found in these environments showed that the risk of cancer was negligible. The time-to-tumor exceeds the reasonable life span of persons exposed.

In reaching the conclusion toward the assessment of health hazards of asbestos installations, the IHI staff was hampered by several significant factors.

There was the population risk in a cross section of the general population (infants to senior citizens) to contend with, and also the varying exposures periods existing in the different general occupancy buildings.

For instance, in visits to a public building, an exposure could be as short as five minutes; while school children are subjected to exposures to up to seven hours, and men at sea, aboard ships, would be subject to exposure of twenty-four hours and longer.



Industrial Hygienics, Inc. laboratory facilities

The decision-making process in the asbestos study was further complicated by the fact that the hazard to which people were potentially exposed is a "carcinogenic risk."

HINDRANCE And finally, hindering the delivery of accurate results was a lack of established asbestos

The first sophisticated measurements of asbestos fibers were recorded.

exposure criteria for these general populations and the usual imprecisions that scientific studies are subject to in the collection and analysis of environmental samples.

Still, despite these factors, the IHI study had set before it the task of determining what, in fact, was the actual risk of carcinogenesis as presented in the various microenvironments studied.

Previous attempts to determine the carcinogenic risk of asbestos

in general occupancy buildings involved a test method suggested by the Environmental Protection Agency (EPA) which relies on a physical inspection of the particular building and the assigning of scores to various observations of the state of the insulation material. This testing method was to be carried out by school administrators and other school personnel.

Based upon the total score or "exposure number" assigned to a building, corrective measures were recommended.

In IHI's assessment of the carcinogenic risk of asbestos, the basis of the test method employed involves an environmental measurement technique that can be used to measure concentration of asbestos fibers in the buildings.

This measurement method was the standard "(USPHS/NIOSH) Membrane Filter Method in Evaluating Airborne Asbestos Fibers." If conducted properly, unlike the EPA test method, it does provide

an objective method for risk estimation and risk limitation.

TEST METHOD In addition to its more objective, scientific nature, IHI chose this test method on the basis of several other factors.

This method is generally used for health hazard assessments in occupational environments. It is a method for which there exists an analytical quality control program—NIOSH-Proficiency Analytical Testing Program—and American Industrial Hygiene Association certification. Further, there are dose/response data (for cancer) based upon environmental data collected using this method; and, non-occupational exposures to asbestos have been regulated in the past on data generated by this method.

In using this scientific method, the first sophisticated and accurate measurements of asbestos fibers in closed environments were recorded.

According to the IHI study, the general level of asbestos fiber in the air of those buildings tested was 0.10 of a fiber per cubic centimeter or lower.

The cancer risk reported from IHI's study was small, if not negligible. In a building sampled and showing the highest asbestos level, the rate of potential cancer

The delivery of test results is hindered by a lack of criteria.

cases due to continuous exposure would be 112 cases per million in the population over 40 years, or 2,707 cases in 75 years.

INCREASED RISK Ironically, the IHI study further reveals that this rate of cancer is increased by 20 times once the asbestos has been disturbed as in removing it. Or, similarly, it concludes that the risk of doing something (removing asbestos insulation) increases the rate of potential cancer cases from 112 cases per million in the popula-

tion over 40 years, to 2,245 cases per million in 40 years, or 12,349 cases in 75 years.

Beyond offering the scientific measurements of the levels of asbestos fibers and the assessment of the carcinogenic risk from exposure to these levels, the IHI

Movement of asbestos fiber insulation increases potential cancer risks.

study focuses attention on the significance and need for more formal, scientific studies in the assessment of potential health hazards. In situations such as that of the asbestos insulation exposures, where the lives of many people are affected, and where huge sums of money are allocated toward reducing potential risk factors, it is at once imperative that accurate scientific testing be the foundation for any reports, and measures be taken toward alerting or reducing the potential health hazards posed by a certain material in either the natural environment or given occupational settings.

With respect to the asbestos in building materials and insulation, many new substitutes have been found. In future installations, of course, these new substitutes should be used in order to prevent any potential hazards, no matter how minimal.

For buildings which already have asbestos insulation, it is essential that formal health hazard assessments be made by certified health professionals toward correction and reduction of any existing hazards.

Above all, asbestos insulation should not be removed or disturbed in an effort to reduce a minimal carcinogenic risk which, again, becomes greater by a factor of 20 times with the disturbance of the fibers. Instead, a concerted effort should be made by our nation's health and safety professionals toward educating and in-

forming the general public of the actual carcinogenic risk of asbestos insulation in general occupancy buildings.

The assessment of health hazards is an area of some complexity. When the hazard involved is a carcinogenic risk, and the population exposed varies from children to senior citizens, the complexity is increased significantly. There are no easy ways or quick formula to apply that will give instant

direction for controls. The methods that need be applied are those that consider all of the variations and complexities of the situation.

Competent health professionals, trained and experienced in environmental health can and do provide the basis for the reduction and elimination of health hazards. The use of scientific methods and professional judgement will go a long way in protecting the health of the population. **OH&S**

MANAGEMENT DECISIONS: an occupational health system can be hard or easy to manage



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