Safe air in the workplace?

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Industrial development in China makes it increasingly necessary to obtain rapid and accurate evaluation of air quality in the working environment and to introduce the best possible methods and equipment for this purpose.

In 1986 over 7 million workers in China were exposed to dust hazards, resulting in nearly 400,000 cases of pneumoconiosis and almost 80,000 deaths (1). This is but one example of the health risks associated with air pollution in the country’s workplaces. Small rural enterprises account for about one-third of China’s industrial production and a significant proportion of its workforce, and they pose major challenges to the occupational health and environmental protection agencies because of their diversity of size, location and management.

Enterprises are legally obliged to establish workplace monitoring schedules if occupational hazards exist. Any person or organization wishing to construct a new industrial facility or expand or alter a facility or production process is subject to controls by the public health authorities. Project designs are reviewed and checks are performed before operations commence. The Occupational Disease Control Act, currently being drafted, is intended to strengthen action in this area.

Rapid industrial development requires China to have a strong occupational health infrastructure in which:

- the occupational health services are integrated with industrial activities;
- the health organization networks at the grass roots are improved to meet the purposes of these services;
- inspections and associated services are adequate in rural areas;
- appropriate technology is obtained for hazard control and personal protection.

Exposure limits

A schedule of maximum allowable concentrations of airborne substances has been drawn up (2) but it is unclear how the established limits compare with those stipulated in developed countries. Nor is it clear whether China’s provinces, autonomous regions and local governments are observing the standards set nationally. The Ministry of Public Health is the main regulatory agency concerned with sampling and analysis in this field, although the Ministries of Labour, Coal Mines and the Chemical Industry are responsible for devising and enforcing standards for their operations.
Methods and equipment

The Ministry of Public Health and the provincial authorities publish manuals of standard methods for sampling and analysis. By no means are all of these standards in international use, and some are outmoded. For instance, the wet colorimetric method for the determination of free silica is time-consuming and subject to errors caused by sampling and operator variables, and in the developed world it has been largely supplanted by X-ray diffraction analysis.

Shortages of equipment used in workplace evaluations are frequently encountered. In a survey of the availability of air sampling pumps, for example, 13 items were taken as indicators of the disparity between what was available and what was required according to guidelines issued by the Ministry of Public Health. Some were found to be in very short supply, and the average availability in 28 counties was only 24% relative to the published standard (3).

External collaboration needed

In order that an acceptable rate of progress be achieved in air sampling and analysis, the following steps should be taken:

- The committee in the Ministry of Public Health which is responsible for stipulating maximum allowable concentrations of air pollutants should seek active collaboration with corresponding groups in developed countries, through intergovernmental contacts, professional societies, and WHO Collaborating Centres.
- Similar collaboration should be arranged with a view to ensuring that the methods of sampling and analysis recommended in the methods manuals are up to date and of the highest possible quality.
- Funds should be provided for a programme of technology transfers which would guarantee the most effective means for sampling and analysis of airborne hazards. There are already examples of such transfers. For instance, Gelman Sciences has donated air sampling filters to Chinese medical universities for training purposes. Such transfers are desirable all the way down to the township level, where there is a need for filter cassettes and constant-flow sampling pumps. Mechanisms that could be considered for achieving technology transfers include co-production, joint ventures, technology sales, and the sale of factory production lines.

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References

