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Dangerous substances and the US worker: current practice and viewpoints

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Since 1970 there has been growing recognition in the United States of the human and economic costs of occupational illnesses, injuries and deaths. One reason is that mechanisation in the 1950s and 1960s resulted in a rapid increase in workplace accidents, which rose by 29 per cent from 1961 to 1970.

But a more important reason is the discovery that many toxic substances used in the workplace cause serious, often fatal diseases. US chemical production has doubled every five years since the Second World War, making possible a significant improvement in the nation's standard of living. But as new discoveries of job-related cancer, lung disease, sterility and other health problems became common, many government, management, and labour union officials and scientists began to realise that the country was paying a high price for its economic progress.

Recent government studies have measured the dimensions of the problem. About 21 million Americans—or one out of every five workers—are exposed to hazardous substances on the job, and more than twice that many are exposed to such substances some time during their working life. One out of four Americans will suffer from cancer during his or her lifetime, and up to 38 per cent of all cancers in the United States are related to substances in the workplace. Between 8 and 11 million workers have been exposed to one cancer-causing substance, asbestos, since the Second World War, with more than 2 million of those expected to die from asbestos-related cancer. Two million workers face exposure to benzene, a highly toxic chemical which can cause leukaemia. Another 1.5 million workers are exposed to arsenic, also a cancer threat. Three out of four coalminers now receiving a pension have an irreversible lung disease caused by coal dust. About 800,000 cases of job-related skin disorders occur each year as the result of exposure to toxic substances.[1]

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While some progress has been made during this decade in controlling toxic substances, it is only a beginning. In a few instances there has been co-operation between the groups involved, but in general progress has been delayed by battles over issues ranging from how to identify hazards to how to set standards for their control and how to implement those standards. There are differences of opinion within each group, of course, but on most issues there are two basic opposing positions: one held by employers, the other by the unions, with government choosing sides in some cases but straddling the fence in most.

Some of these controversies are peculiar to the United States, involving legal or administrative issues which grow out of the country's particular political system. But many of them involve issues that are being faced by all industrialised societies and will also be of concern to countries in the process of industrialisation, which can learn from the mistakes and achievements of their predecessors.

Responsibility for controlling toxic substances

Most workplaces in the United States are covered by a national law passed in 1970 known as the Occupational Safety and Health Act.[2] The law makes it the duty of every employer to provide a place of employment free of "recognised hazards".

To enforce that obligation, the law created the Occupational Safety and Health Administration (OSHA) as an agency within the US Department of Labour. OSHA has the authority to issue standards for the control of workplace hazards, including toxic substances. These standards are first published in draft form so that interested groups or individuals can comment on them before they become final. OSHA then has the authority to send inspectors to workplaces to monitor conditions, and to fine employers who are not complying with the standards.

The law also created the National Institute for Occupational Safety and Health (NIOSH), which conducts research on the effects of substances used in industry. When it discovers the need for improved control of a toxic substance, it sends its recommendations to OSHA. Between 1970 and 1977 NIOSH identified 25,000 toxic substances used in US industry and sent OSHA recommendations for standards for about 80 of those.

As of November 1978 OSHA had issued standards for fewer than 25 substances, including asbestos, benzene, cotton dust, lead, arsenic, coke oven emissions, acrylonitrile and vinyl chloride. For about 400 other substances it has adopted as legal standards the "threshold limit values" previously established as voluntary guidelines by industrial hygienists. Those values are not based on current scientific evidence in some cases, nor do they reflect the viewpoints of workers and their representatives, nor do they include the requirements for monitoring exposure levels, medical testing, training and education for employees, and labelling of toxic substances that the other OSHA standards include.[3]

Interpretation of scientific evidence

Before controls can be implemented, the hazardous effects of toxic substances must be identified. One way this is done is through epidemiology—studies of humans who have been exposed to a particular substance on the job. But there are limitations to human studies. First, they depend on waiting until people are sick or dying before a hazard is discovered. Second, the diseases caused by toxic substances often have a long latency period, so that they may not be discovered until 20, 30 or 40 years after the workplace exposure took place. Third, humans are exposed to so many occupational and environmental influences that it is often difficult to tell which factor is responsible for a disease.

Because of the limitations of human tests, many scientists believe that animal tests must be used as well. However, there is a great deal of disagreement over their proper use and interpretation.

The Toxic Substances Control Act, passed in 1976, authorises the Environmental Protection Agency (EPA) to require pre-testing of certain chemicals before they are introduced into commerce, including use in the workplace. The testing is to be done at the producer's expense. Manufacturers of new chemicals must give EPA at least 90 days' notice before production is scheduled to begin, and must provide EPA with all test data already on hand. EPA can limit the use of a hazardous substance, or seek a court order banning it altogether, if it poses an "unreasonable risk of injury to health or the environment". No one knows exactly how the new law will work because, after two years with limited funding and staff, EPA had not even completed its first task of compiling a list of all the chemicals now in use.

Most employer groups opposed the toxic substances law on the grounds that it would be too expensive, estimating the cost at about $2,000 million per year. The Government estimated in 1975 that compliance will cost $80 million to $200 million per year, or between 1 and 3 per cent of the chemicals industry's annual profits of $6,500 million. One independent scientist estimates that pre-testing of *all* new chemicals—about 700 per year—would cost $140 million.

In addition to the concern over cost, industry has raised another objection to the use of animal tests (for cancer-causing substances), as expressed by the medical director of Exxon Corporation:

> A regulatory programme based on experimental screening models to evaluate new chemicals prior to their introduction into the environment, however, will hinder the better documentation of this correlation [between animal test results and hazards to humans]. When a carcinogen is prevented from entering the environment on the basis of screening results, there can be no data regarding that exposure in man.

OSHA intends to make more systematic use of animal tests, as outlined in a proposal issued in October 1977 for the regulation of cancer-causing substances. The agency makes the following points:

(1) The fact that a substance causes cancer in animals is a good indication that it also does in humans. Of the 28 chemicals proven to cause cancer in humans, at least 26 also do in animals.

(2) The use of very high exposure levels in animal tests is scientifically sound and necessary. A substance which would cause 20,000 cancers in the US population would only affect one test animal in 10,000, assuming an equivalent exposure caused an equivalent number of cancers. Obviously, it is not practical to test such large numbers of animals. In addition, some chemicals cause cancer at lower doses in humans than in animals, so that a low-level dose for animals might not uncover the threat to people. Of course, the dose must be set below the level at which the animals will die before there is a chance for cancer to develop.

(3) There is no way, even with animal tests, to establish "safe" or "no-effect" levels for exposure to cancer-causing substances. Although the mechanisms of cancer are still not well understood, it appears that even a small number of extremely small doses of certain substances can cause cancer.

(4) Recently devised "short-term" tests are useful only for identifying substances which require long-term animal testing. A number of tests have been developed which can in a few weeks determine whether a substance causes genetic mutations. (The most common is know as the Ames test.) In many cases, ability to cause mutations has proved to be a good indication of ability to cause cancer. But the reverse is not true: not all substances which cause cancer also cause mutations.

On the basis of these assumptions, OSHA proposes to regulate cancer-causing substances by setting up four categories. Category I would include substances found to cause cancer in humans, in animal tests with two species of mammals, or in tests with one species if the results are confirmed either by a second set of tests or by short-term testing. If a substitute is available, the substance would be banned altogether. If not, OSHA would require that exposure be limited to the lowest feasible level. Employers would have to use engineering controls—such as better ventilation or changes in manufacturing processes—and improved maintenance to meet the OSHA standard. Personal protective devices such as respirators would be required while the engineering controls are being installed, as well as in emergencies. There would also be strict requirements for periodic medical examinations, monitoring of exposure levels, and labelling of substances.

Category II would include substances shown to cause cancer in one test with one species. OSHA would not require that exposure to these substances be reduced to the lowest feasible level.

Category III would be for substances which have not been found to cause cancer, and Category IV would be for substances which are not found in US workplaces.[4]

The cost of controlling toxic substances

As OSHA admits, the most costly aspect of its cancer regulations and its other toxic substances standards is the requirement of engineering controls to reduce exposure to the lowest feasible level. This requirement is based on the mandate of the law creating OSHA, which directed the agency to set standards which would assure, "to the extent feasible, ... that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard ... for the period of his working life". The word "feasible" has been interpreted by several courts to refer to the ability of employers to make technological changes without massive costs that would force an industry to shut down. On the other hand, another court has ruled that OSHA must calculate the benefits of a standard and weigh them against the costs. These conflicting rulings will eventually have to be resolved by the Supreme Court.

Industry argues that "safe" levels for cancer-causing substances should be determined by conducting animal tests with a variety of doses. Even when a no-effect level cannot be determined, the agency should determine what level of risk is "socially acceptable". According to the major industrial group, the American Industrial Health Council, "sound public policy must take into account the inevitability of some risk". The council suggests that the risks should be considered along with economic factors, such as costs to industry.[5] During public hearings on the OSHA policy, employer groups argued that cancer does not pose as serious a threat as some claim.

Industry also opposes the required reliance on engineering controls rather than on less expensive personal protective devices. In defence of the engineering controls requirements, OSHA maintains that personal protective devices do not always fit every person properly, may cause infections or other health problems, may impede breathing in situations involving strenuous work, and are uncomfortable to wear.

Labour generally supports OSHA's positions, although union officials argue that OSHA standards should be "technology forcing", that is, should force the companies to develop technology for better control of toxic substances than is possible today. For instance, an AFL-CIO specialist criticised OSHA's acrylonitrile standard, claiming that the exposure limit was merely what could be achieved with present technology, without forcing innovation to provide workers even better protection from cancer.

Labour also points out that past industry estimates for the cost of complying with OSHA standards for toxic substances have proved inaccurate. In 1974 when OSHA proposed lowering its standard for exposure to vinyl chloride from 500 parts per million of air to 1 part per million, the head of the largest manufacturer of the substance said that the lower level "cannot be obtained at this time or in the future". Industry

estimated that 2 million jobs would be lost, and that the cost to the economy would be $65,000 million to $90,000 million because vinyl chloride would no longer be produced and industries which used it would be unable to find a substitute.

Yet after the standard became final, manufacturers quickly developed new technology for controlling vinyl chloride exposure and recovering residues for reprocessing. The industry was soon in compliance with the standard, and by 1976 production rose to record heights. New plants were opened, no workers were laid off, and the total cost was about one two-hundredth of what had been predicted.

Government officials suggest a number of reasons why industry cost estimates may not be accurate. Once a standard is issued, employers often find cheaper engineering controls than they originally thought possible. More emphasis is put on saving money through better maintenance. The new engineering controls may increase efficiency and productivity. Controls for one hazard may help control another hazard as well. As a larger volume of control equipment is produced, the cost for each unit may go down.

Difficult as it is to predict the costs of control of toxic substances, it is even more difficult to measure the benefits. Of course, there is no monetary value for pain and suffering, a widow's grief, or the loss of a parent for small children. However, some of the costs of *not* controlling hazards can be estimated in monetary terms. For example, US employers now pay $11,000 million per year in worker's compensation following job-related injuries and illnesses. The National Safety Council, using statistics supplied by employers, estimates the economic cost of workplace accidents alone at $20,700 million per year; the cost of workplace illnesses may be as much or more. The Government has estimated that cancer in the United States costs the economy more than $15,000 million each year.

Some of the costs of work-related injuries and illnesses include health care and health insurance; lost productivity and buying power; welfare payments; losses from absenteeism, turnover in workforce and safety-related strikes; and low productivity, equipment damage, and waste of materials due to inefficient operations. Industry figures show that ten times more workdays are lost each year owing to job-related accidents than to strikes; again, the number of workdays lost to occupational illnesses may be even greater. If improved conditions could bring about a reduction in absenteeism of one day per worker per year, an estimated $15,000 million could be added to the US output of goods and services. The costs of workplace hazards are passed on to the consumer, of course, fuelling the problem of inflation.

The effect of safety and health controls on employment

Labour leaders argue that improved safety and health controls often result in increased employment. For example, OSHA estimates that its

standard limiting exposure to cancer-causing coke oven emissions in steel mills will create 5,000 new jobs for maintenance and workplace housekeeping.

The jobs of one group of workers—women—have been threatened in some industries, however. At least a dozen of the nation's largest companies have adopted policies excluding women from jobs in which they might be exposed to toxic substances suspected of posing a risk to unborn children. Such substances include lead, vinyl chloride and fluorinated hydrocarbons. Some women have actually had themselves sterilised in order to keep their jobs.

These policies have been severely criticised by OSHA, the AFL-CIO and a number of individual unions. Critics point out that lead and other substances can also cause sperm abnormalities in men, yet male workers have not been removed from jobs where exposure is likely. OSHA intends in a new lead standard to require employers to lower lead levels for *all* workers, not just women.

Another threat to the jobs of some US workers comes from the transfer of manufacturing operations to countries which have less strict job safety and health standards. Following the adoption of a stricter asbestos standard, for instance, US firms have built or bought large shares in plants in Mexico, India and Venezuela. Imports of asbestos products from Brazil, Taiwan and the Republic of Korea have increased. The number of primary asbestos textile manufacturers in the United States dropped from seven to three in the five years following the announcement of OSHA's standard in 1972. One leading manufacturer of asbestos products which has opened plants overseas since OSHA's standard was issued said in its 1976 annual report to its stockholders that "the escalating costs ... and the uncertain consequences of future government asbestos regulations ... [have] become an essential part of our long-term product and manufacturing plans". In 1973 another major asbestos textile firm abruptly closed a US plant it had opened in 1967; at the same time it began expanding imports from its two plants in Mexico.

For another example, after production of the chemical benzidine was virtually halted in the United States as its cancer-causing properties were recognised, imports of benzidine-based dyes increased by more than 650 per cent from 1974 to 1976, according to government figures. Imports from Romania increased from zero to 79,365 pounds; those from Poland from 3,910 to 32,684 pounds; and those from France from 250 to 17,750 pounds. Industry officials say that the benzidine dyes imported from other countries contain up to 25 times more "free benzidine", which means that US textile workers face an increased cancer risk.[6]

Secretary of Labour Ray Marshall has said that steps must be taken to prevent the "export of hazards" causing illnesses and death for foreign workers and unemployment in the United States, but he has not proposed any specific actions. An influential member of Congress, Representative

Henry Reuss, has asked President Carter to instruct his representatives to the GATT negotiations to seek adoption of safety and health standards as part of any trade agreements. But President Carter's aides said there are no plans to do so.

The workplace and the general environment

One way both to reduce the costs and to increase the effectiveness of safety and health controls is to co-ordinate the regulation of toxic substances as they are used in the workplace, the general environment and consumer products.

US government agencies responsible for the control of toxic substances include not only the work environment agency (OSHA), but also the Environmental Protection Agency (EPA), responsible for regulating pollution of the general environment, the Food and Drug Administration (FDA) and the Consumer Product Safety Commission (CPSC). In the past, there was little co-operation between the four agencies, but in 1977 they began to work more closely together, with regular meetings of staff at all levels to plan joint actions.

The agencies will continue to carry out their own separate functions, but are looking for ways to co-ordinate research priorities, standard setting, standards enforcement, and education and information programmes.

Workers' participation

In a number of European countries, workers' education and participation have been a key element in job safety and health programmes, but that approach is only slowly gaining support in the United States.

In its first six years OSHA made little attempt to educate workers about workplace hazards or their rights under the laws. According to OSHA director Eula Bingham, when she took charge in 1977 the agency was spending only 0.7 per cent of its budget on education. There was no programme for distribution of the few educational materials the agency had produced; materials were simply kept at OSHA offices in case anyone asked for them.

Since 1977 OSHA has responded to demands from the labour movement to increase support for worker involvement in safety and health affairs. OSHA's new philosophy is expressed by Bingham's statement that "it is workers who know on a day-to-day basis what the problems are in their workplaces, and it is workers who have the most stake in getting things changed. With only 1,600 inspectors to cover 5 million workplaces, OSHA cannot do its job without teaching workers to protect themselves."

The right to know

To foster the workers' "right to know" about job safety and health hazards, OSHA started a grants programme in 1978, in which money is given to unions, employers, universities and other groups to help them start their own safety and health education programmes. In the first group of grants, $6.4 million was distributed among 26 unions and 60 other organisations. Larger amounts will be given out in future years.

Also in 1978 OSHA began for the first time to make an effort to distribute information on workers' rights. For example, OSHA started a monthly column for the newspapers, bulletin boards and meetings of 3,000 national and regional unions and 18,000 local unions, explaining how workers could participate in OSHA inspections or protest certain OSHA actions they considered too weak, and discussing common hazards.

OSHA also announced new rules requiring employers to make available to workers company records on deaths, illnesses and injuries. Employers with more than ten workers must keep such records. In 1979 the agency will likely adopt rules requiring employers to show workers all company medical records as well, so that workers can help identify patterns of diseases and their causes.

In its cotton dust standard, OSHA for the first time required companies to distribute to workers educational material provided by OSHA on workers' rights and the cotton dust hazard. In this and the handful of other OSHA standards, employers are required to test exposure levels of toxic substances and give workers periodic medical examinations. All test results must be made available to the workers. If exposure levels are above the legal limits, employers must tell the workers what steps will be taken to comply with the standard. Workers must be given training concerning the provisions of the standard.

Since many substances are identified in the workplace only by a brand name which does not indicate the actual contents or potential hazards, OSHA is developing a new standard which would require that all toxic substances be labelled so that employees know what they are working with.

Each of these steps has generally been opposed by the major employer groups. For example, the US Chamber of Commerce has officially protested to OSHA concerning the distribution of educational materials on workers' rights, claiming that OSHA is interfering in workplace labour-management relations. Employers have argued in public hearings that the opening of injury records to workers may result in added administrative costs, and that only a doctor should have the authority to decide whether to show a worker his or her medical records. Employers themselves spend between $7.5 million and $15 million per year, or less than 15 cents per worker, on all job safety and health education, according to an OSHA study. That total includes money spent on the education of supervisors,

which has been the employers' main concern, so the total spent for workers' education is actually much lower.

For the 80 per cent of the US workforce which is not unionised, the "right to know" has only the meaning given it by government regulation. For union workers, who are concentrated in the most hazardous industries, additional rights may also be provided by labour-management collective bargaining agreements.

Most unions have only begun to make demands regarding job safety and health since the passage of the OSHA law in 1970. Contract clauses expanding the "right to know" are still not widespread, but a few examples indicate the direction in which unions are moving. After using the threat of strikes, the Oil, Chemical and Atomic Workers has won the right to periodic inspections by independent experts approved by both the union and employer, company-paid medical examinations, and the provision to workers of annual data on illnesses. The United Auto Workers has successfully demanded that the automobile manufacturers provide information on toxic substances in the workplace, and provide equipment for local union representatives to test for exposure to hazards. The United Rubber Workers and the major rubber producers have established an employer-financed joint research programme in co-operation with two major universities. The research has already helped to establish the link between benzene and cancer.

A number of unions have financed their own education programmes for workers. A few have produced audio-visual materials, and a small number regularly devote space in their union newspapers to the subject. Others make use of university programmes on job safety and health. Some unions have also helped establish local committees on job safety and health, made up of local union representatives, independent experts such as doctors, lawyers and industrial hygienists, and other concerned citizens. Operating in at least five cities or regions, the committees have proved to be an excellent mechanism for using the skills of professionals to aid workers. According to the OSHA study of job safety and health education, all union programmes reach only 35,000 to 40,000 of the 20 million union members each year.

The right to speak out

In order to participate in safety and health activities, a worker must feel that doing so will not result in the loss of employment or other punishment. US employers have traditionally resisted any restrictions on their power to maintain workplace discipline, but both labour and government have begun to push for protection for workers who demand job safety and health.

The 1970 OSHA law prohibits any form of punishment or discrimination against workers for job safety and health activities, such as

complaining about hazards, asking for government inspections, or testifying in legal proceedings involving job safety and health. In 1978 OSHA began a major effort to inform workers of that protection. It contends that this provision covers an employee's refusal to work in a situation causing imminent danger to his or her safety or health, including exposure to toxic substances which could eventually cause serious illnesses. However, employers have convinced middle-level federal courts that the law does not give workers this right. OSHA hopes that the issue will eventually be settled by the Supreme Court.

In the meantime, a few unions have negotiated contractual protection for those who protest unsafe or unhealthful conditions. The United Mine Workers, for example, has won the right of workers to refuse assignments they believe put them in imminent danger, even if the employer can later prove that the belief was mistaken. Employers must offer affected workers other assignments until the hazard is corrected.

Both OSHA and the unions are beginning to argue that the right to complain about hazards must include protection against loss of pay or other benefits for workers who are transferred to lower-paying assignments in order to prevent further exposure to toxic substances. In many industries, the highest-paying jobs are also among the most unhealthy. Workers who have waited many years to achieve a high pay level have sometimes been afraid to take medical examinations which might result in their transfer, layoff or even firing. Unwillingness to submit to medical tests makes it more difficult to identify hazards. Fear of losing their jobs or benefits also makes some workers reluctant to support strong safety and health standards in the first place.

Under various "rate retention" programmes now being proposed, workers would retain their rate of pay even if transferred because of occupational exposure. The United Steelworkers took a step in this direction by winning limits in collective bargaining agreements on the loss of pay which can be suffered by a worker who is transferred because of overexposure to lead. The OSHA standard on lead issued subsequently contains an even stronger "medical removal protection" provision, which requires transfers with no loss of benefits for all workers with high levels of lead in their blood.

The right to be involved

Figures from a government study show that fewer than 10 per cent of US workers are protected by workplace safety and health committees. Of those, only a fraction have committees with more than advisory functions. These tend to be primarily in the most highly unionised industries. The unions which have contracts establishing safety committees have won a variety of rights, including making workplace inspections and ordering removal of workers from imminently dangerous conditions. In many cases

the companies are free to ignore the committee's recommendations. Some union contracts call for binding arbitration of safety and health disputes, and a few unions, such as the United Auto Workers, have the right to strike if safety and health issues cannot be resolved in any other way. Several unions have forced employers to finance the training of worker committee members.

The unions are just beginning to develop the staff expertise needed to support local committees. An independent survey published in September 1976 found that the major industrial unions employed full time only one medical doctor and seven industrial hygienists. Two years later, they employed two doctors and ten hygienists on a full-time basis.

In order to increase workers' participation in safety and health enforcement, OSHA has required that an employee representative accompanying an OSHA inspector be paid at his or her normal rate by the employer. It has also issued a policy directive requiring that employee representatives generally be included in conferences between OSHA staff and employers.

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Many safety and health professionals believe that the most important improvement needed in the US system for controlling toxic substances and other hazards is the adoption of a legal requirement that every workplace have a labour-management safety and health committee. The law could give the committees the authority to make inspections, halt unsafe work, and review company plans and records related to safety and health. Employers could be required to finance training for committee members.

Enactment of such requirements, which would be similar to provisions already contained in the laws of a number of other industrialised countries, would recognise the fact that the Government will never have enough inspectors to enforce safety and health standards. Protection would be most dramatically improved for the 80 million workers who are not represented by unions.

There is little chance, however, that safety and health advocates will ask Congress to consider such legislation. The battle over such a proposal would become a major test of strength between employers and labour, and in the current US political climate labour would be likely to lose.

Notes

[1] US Department of Health, Education, and Welfare; National Cancer Institute; National Institute of Environmental Health Sciences; and National Institute for Occupational Safety and Health: *Estimates of the fraction of cancer in the United States related to occupational factors* (Washington, 1978); and Center for Disease Control, National Institute for Occupational Safety and Health: *National occupational hazards survey* (3 volumes) (Cincinnati (Ohio), 1977).

[2] See ILO: *Legislative Series*, 1970—USA 1; and G. C. Guenther: "The significance of the Occupational Safety and Health Act to the worker in the United States", in *International Labour Review*, Jan. 1972, pp. 59-67.

[3] US Department of Labor, Occupational Safety and Health Administration: *General industry standards* (Washington, 1976).

[4] Idem: *Identification, classification, and regulation of toxic substances posing a potential occupational carcinogenic risk* (Washington, 1977).

[5] American Industrial Health Council: *AIHC recommended alternatives to OSHA's generic carcinogen policy* (Scarsdale (New York), 1978).

[6] B. Castleman: *The export of hazardous factories to developing nations* (Washington, 1978; unpublished).

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