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A REVIEW OF SOME NORMATIVE AND CONCEPTUAL ISSUES IN OCCUPATIONAL SAFETY AND HEALTH

*Mark MacCarthy**

I. INTRODUCTION

Controversy has surrounded public policy toward occupational safety and health at least since the establishment of the Occupational Safety and Health Administration (OSHA) in 1971.¹ Political, legal, and economic conflicts have surfaced in debates over the existence and nature of rights to safety and health on the job, the use of economic criteria in setting safety and health standards, and the principles that are to guide public policy in this area.² Many of these issues were raised in recent court cases. In *Industrial Union Department, AFL-CIO v. American Petroleum Institute*³ (the benzene case), the Supreme Court decided that OSHA must make a threshold determination of significant risk before lowering the permissible exposure level of a toxic substance. In *American Textile Manufacturers Insti-*

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1. The agency was established by the Occupational Safety and Health Act of 1970, Pub. L. No. 91-596, 84 Stat. 1590, codified at 29 U.S.C. §§ 651-678 (1976), and is part of the Department of Labor.

2. For two introductions to these debates, from opposite points of view, see N. ASHFORD, *CRISIS IN THE WORKPLACE: OCCUPATIONAL DISEASE AND INJURY* (1976); and R.S. SMITH, *THE OCCUPATIONAL SAFETY AND HEALTH ACT* (1976).

3. *Industrial Union Dept., A.F.L.-C.I.O. v. Amer. Petroleum Inst.*, 100 S. Ct. 2844 (1980). See text at notes 79-83 *infra*.

*tute, Inc. v. Donovan, Secretary of Labor*⁴ (the cotton dust case), the Supreme Court upheld OSHA's policy of setting exposure levels for toxic substances at the lowest feasible level. In February 1981, the Reagan Administration issued an Executive Order addressing these problems.⁵ It sets the maximization of net benefits to society as the goal for all regulatory agencies and bars any major regulatory action unless its potential benefits to society outweigh its potential costs. Controversy continues over the appropriateness of this cost-benefit approach to occupational safety and health.⁶

Although legal, political, and economic perspectives dominate these debates, the best means of improving the quality of public policy decisions concerning occupational safety and health is by clearly understanding the philosophical issues involved. This article identifies and describes the major issues of occupational safety and health that are in need of and amenable to philosophical clarification. It begins with a discussion of the nature of occupational risk that emphasizes the crucial distinction between individual health risks and group outcomes, draws attention to some features of occupational health risks that separate them from other threats to health, and notes the unequal distribution of these risks. In the next section, the discussion turns to the ethical basis for public control of occupational risk. Collective action to reduce health threats in the workplace is required to protect workers' rights, to ensure a more equitable distribution of occupational risks, and to implement the shared public values that lie behind the concern for workplace safety. The following section discusses the appropriate criteria for setting public policy on occupational safety and health. The economic techniques of cost-benefit and cost-effectiveness analysis are examined, and the argument is made that these analytic techniques neglect normative considerations and can incorporate them only in inappropriate and misleading ways. Further, the use of cost-benefit and cost-effectiveness analysis as the sole or principal rules for policy in this area would tend to undermine the convictions that motivate public concern about the issue of occupational safety and health. The final section surveys alternative public policy principles, including cost containment approaches, risk-averse strategies, and the current official OSHA policy of feasibility analysis. The incompleteness of these approaches suggests the need for the development of a decision

4. *Amer. Textile Manufacturers Inst., Inc. v. Donovan*, 101 S. Ct. 2478 (1981). See text at notes 84-89 *infra*.

5. Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (1981).

6. Kelman, *Cost-Benefit Analysis: An Ethical Critique*, 5 REGULATION 33-40 (1981).

framework that would more adequately integrate health and economic information while allowing concerns over workers' rights, distributive justice, and public values to influence public policy materially.

II. THE NATURE OF OCCUPATIONAL RISK

Before addressing the major philosophical questions, several preliminary remarks may help to identify the special nature of the occupational safety and health problem. First, individual risks must be distinguished from group outcomes.⁷ Risk, in general, is the probability of an adverse outcome. Occupational risk is the probability of an injury or illness due to hazards in the workplace. These hazards, such as noise, toxic substances, or unguarded machinery, often produce a regular, predictable number of injuries and illnesses in the exposed worker population. At the individual level, the outcome is hypothetical; an individual worker may or may not be killed, injured, or made ill by workplace hazards. At this level, workers take their chances. In many situations, however, the outcome at the group level can be accurately predicted, and one may, then, expect a certain number of illnesses and injuries to appear in the exposed worker population as a whole. At this level, chance gives way to certainty.

A. *The Individual and the Group*

This distinction between the risk each individual takes and the overall outcome for the group is a conceptual distinction, related to the difference between statements about individuals and statements about the groups to which individuals belong. This distinction raises two questions regarding many kinds of risks. Consider, for example, coffee, which is allegedly involved in cancer of the pancreas.⁸ If coffee is involved in producing half of all pancreatic cancers, a noncoffee drinker aged fifty to fifty-four has seven chances in one hundred thousand of developing cancer of the pancreas in any single year. A coffee drinker's chances are doubled or tripled to approximately fourteen to twenty-one out of one hundred thousand. Should a person, then, avoid this extra risk by not drinking coffee? A different question arises with respect to the population as a whole. If coffee is

7. For a discussion of this distinction see Oi, *On the Economics of Industrial Safety*, 38 LAW & CONTEMP. PROB. 670 (1974).

8. Cohn, *Harvard Scientists Find Link to Pancreatic Cancer*, Wash. Post, Mar. 12, 1981, at A-1, col. 1, A-9, col. 9. See also MacMahon, *Coffee and Cancer of the Pancreas*, 304 THE NEW ENG. J. OF MED. 630 (1981).

implicated in producing half of all pancreatic cancers, then the consumption of coffee in the United States produces about twelve thousand of those cancers annually. Should steps be taken to reduce this number?

In the first example, we focus on the decision of the individual agent. His or her choice is essentially a private one. In the second case, we are concerned with the balance between two collective goals: the protection of public health and the provision of other social goods, including individual freedom of choice. This is a paradigm problem in public decision making.

This example illustrates the logical difference between the question, "Is this risk too great for me?" and the question, "Does the social value of this risky activity balance the certain harm that can be expected to result from it?" An answer to the first question is not necessarily an answer to the second. The distinction between questions concerning individual risk and questions concerning group outcomes (and group responsibility for these outcomes) parallels the difference between private and public choice.

In the area of occupational safety and health, the distinction between individual risk and group outcome is reflected in the difference between two approaches to public health. Economists typically take an individualistic approach. They are concerned with the rational choices individuals might make when confronted with a probability or an uncertainty about some harm.⁹ The other approach, more typical of doctors and other public health professionals, concerns predictable group outcomes and whether they are acceptable. The difference in focus is related to a difference in public policy goals: in the one instance, the problem is that the probability of an actual outcome is too large for the individual to accept; in the other, the aggregate outcome is too severe for society to tolerate.

It is fair to suggest that the label "risk" encourages, even if it does not strictly imply, an individualistic self-regarding (as distinct from group-regarding) approach to occupational safety. That may seem appropriate. Individuals face risks; it is they who bear them. The most familiar context in which people evaluate risks is personal—are the chances of being killed in an automobile or airplane accident too great for me? Will cigarettes give me cancer? Is this job too risky for

9. T.C. Shelling expresses the individualist view forcefully when he asserts that investments in safety and health buy "a reduction in individual risks. The lives saved are usually a mathematical construct." Shelling, *The Life You Save May Be Your Own*, in *PROBLEMS IN PUBLIC POLICY EXPENDITURE ANALYSIS* 161 (S. Chase ed. 1968).

me? Will coffee ruin my pancreas? These are familiar questions which we, as individuals, ask ourselves.

Yet there are other questions concerning risk which we may ask ourselves not as self-regarding individuals but as members of a society. We may wonder, for example, whether the yearly toll of automobile deaths is socially acceptable. Are risks imposed by various products—cigarettes and coffee among them—of the sort that should be left to individual discretion? The problem of workplace safety, at least as much as the problem of highway safety or product safety, has a public dimension.

The sheer amount of injury or death may be an appropriate cause of public as well as individual concern. From the individual point of view, a probability of death or injury, say one in a thousand, remains the same whether ten or ten million people take the same risk. From the social point of view, however, the difference is important: it could mean the loss of a thousand lives. How should we respond as a nation to these numbers? When occupational safety and health information is presented in terms of individual probabilities only, an evaluation typically follows in terms of the individual, not the group. By describing the problem this way—in terms of individual risks rather than community costs—we may commit ourselves to a subtle but powerful bias toward individualistic rather than community norms and values.

B. Hazards to Health

Occupational hazards are threats to health. These threats are special in that what may be lost—life or functional capacity—is irreplaceable. In the case of loss of life or limb, the irreplaceability is obvious. But the functional impairment of lungs or ears caused by exposure to hazards is also often irreversible, and the impairment becomes permanent. Techniques to reverse these effects are sometimes available, but in many instances, for example, chelation therapy for lead poisoning, the cure can be worse than the disease.

In addition, people cannot always be compensated for a loss of health. Damage to one's health is not altogether like damage to one's automobile. The insurance received for a damaged car, in principle at least, restores the owner to the earlier level of well-being. Compensation, in short, can be paid in full. In occupational fatalities, however, the precondition for any compensation is precisely what is lost. Any payment that could feasibly be made to workers with permanent disabilities, moreover, would not be compensatory in the technical sense that the workers would just as soon have the compen-

sation payment as their ability to walk or breathe. Normally, spending money, or what money can buy someone with diminished capacities, on disabling injuries and illnesses may be better than not doing so, but prevention may be better still.¹⁰

Health is a precondition for a wide variety of other activities; it is an instrumental good. In fact, health is a precondition for such a wide variety of other activities that it is best viewed not simply as a value in itself, but as a condition of many or most other values. As such, it is not only an individual good, but also an element of social infrastructure, that is, an item that is needed to make possible the basic social and economic activities we engage in. From this point of view, maintaining an adequate public health system is in the same category as providing an adequate transportation system: widespread defects in either would have serious consequences for almost everything else we do. In contrast, other commodities have a much smaller range of activities that depend on them. If bicycles, three-piece suits, and garbage cans are not available, then certain desirable and socially worthwhile activities are foreclosed. But the range of such activities is small compared to the range of activities that depend upon public health or an adequate transportation system.

Health and physical integrity are also intrinsically valuable. They are social requirements not only in the sense that they are needed for other activities, but in the sense that they are desirable in and of themselves. They are primary goods in that they are things that all rational people want regardless of whatever else they want.¹¹ This does not imply that risk minimization is a primary good, for this entails that people who risk their lives for good reason, for example, to conquer Mt. Everest or to free others from oppression, are irrational. Rather, the idea is that what is being risked—health—is a primary good that even risk takers would prefer not to lose.

C. Risk in the Workplace

The conditions under which risks occur in the workplace differ from those associated with other activities, for example, participation in recreational sports. People sometimes seek or actively court danger. The danger itself is sometimes satisfying because, among

10. For a discussion of the role of compensation in the occupational context see J. CHELIUS, *WORKPLACE SAFETY AND HEALTH: THE ROLE OF WORKERS' COMPENSATION* (1977). Most discussions grant the impossibility of compensation for permanent disabilities and death. See Oi, *supra* note 7, at 670.

11. See J. RAWLS, *A THEORY OF JUSTICE* 92-95 (1971) for a discussion of primary goods.

other things, it provides an opportunity for people to test themselves. Hence, dangerous sports like hang gliding are popular. In this sport—as in other risks people seek—the participants feel that their responses are crucial and they are engaged by and prove themselves against challenging conditions.

Risks encountered on the job are typically quite different. First, while it is possible that police officers, fire fighters, and other workers sometimes seek and take satisfaction in the dangers they face, this is not true of most workers. Those put at risk by toxic chemicals, for example, hardly feel challenged by the hazards they confront.¹² These risks do not call upon workers to show special strength or dexterity. They may feel as if they were sitting ducks instead. In general, workers would like to avoid or minimize occupational hazards they face.¹³

Secondly, risks on the job typically have no natural consequences that are desired. Coffee and cigarettes produce feelings of well being. Hence, despite the risks involved, people are willing to spend large amounts of money to consume these items. Occupational risks are quite different in that, by and large, they have only undesirable natural consequences. Natural consequences of occupational risk that are genuinely relished are hard to locate, and certainly are not sufficient in themselves to outweigh these risks in the minds of those who must bear them. For this reason, workers, perhaps like financial investors, would have to be compensated in some way to be persuaded to take risks.

A third distinction can be made between risks encountered on and off the job. Many risks, from children's games to casino gambling, have a social meaning. When risk taking has trappings of moral import, what is at stake is less important than the fact that undergoing the risk helps to structure social life. Esteem, honor, dignity, respect, and status all flow from withstanding symbolic gambles.¹⁴

12. For a sense of the anguish caused by exposure to toxic substances in the workplace see the account of the asbestos poisoning of chemical workers in P. BRODEUR, *EXPENDABLE AMERICANS* (1973).

13. This is explicitly acknowledged in the standard economics literature where occupational risk is viewed as an undesirable job characteristic similar to hectic workplace, long workdays, and poor advancement opportunity. For a theoretical discussion see Thaler & Rosen, *The Value of Saving a Life: Evidence from the Labor Market*, in *HOUSEHOLD PRODUCTION AND CONSUMPTION* 268-86 (N. Terleckyj ed. 1975). For a description of grass-roots concern over occupational safety issues see Howard, *Do-It-Yourself Safety*, 5 *IN THESE TIMES* 12-13 (1981).

14. This notion of "status gambling" is crucial to understanding the persistence of betting behavior that would be irrational if one considered only the monetary stakes. See the discussion of this problem in Geertz, *Deep Play: Notes on the Balinese Cockfight*, 101 *DAEDALUS* 1 (1972).

In unusual occupations, such as airplane testing, occupational risks can become symbolically important in just this way.¹⁵ For most workplace risks, however, such "status gambling" may have less to do with heightening the meaningfulness of life and more to do with manipulation and self-deception. The transformation of occupational risks into symbolic risks can either be imposed deliberately on workers as a way of avoiding hazard control or can be spontaneously generated by workers themselves as a defense mechanism to cope with their powerlessness. What seems clear, however, is that typical occupational hazards are not deliberately sought and that, if they were suddenly removed or greatly reduced, the "status gambling" attitudes fostered by the hazards would either wither away or find another focus.

Finally, exposure to occupational hazards is, by and large, involuntary. For most people in our society, work is unavoidable. If individual workers find themselves facing unacceptable occupational risks they cannot simply withdraw from the market. They must choose among available occupations—and so some must accept risky jobs. This does not mean that workers are coerced into taking risky jobs in the same way that draftees are. But external conditions frequently limit options so severely that coercion is not needed. The labor market sometimes structures risks so that those who bear them are not the informed, mobile risk-bearers of economic theory. Adequate information is often lacking; the power to insist on less risk does not exist; and there is no possibility of mobility. These limitations on choice characterize occupational as opposed to recreational or aesthetic risks.

D. The Distribution of Occupational Risk

Those who gain from risky work are not always those who do it. When hazardous working conditions lead to lower production costs, consumer prices go down and profits of business firms go up. But workers may suffer as a result. The distribution of risks among various industries, moreover, is plainly unequal. Some occupations and industries are extremely dangerous, while others are comparatively safe.¹⁶ This unequal distribution of risk is made all the more

15. For an account of risk taking among test-pilots see T. WOLFE, *THE RIGHT STUFF* (1979).

16. The Bureau of Labor Statistics in the Department of Labor collects statistics on occupational injuries and illnesses and publishes them by industry in an annual report, *OCCUPATIONAL INJURIES AND ILLNESSES IN THE UNITED STATES BY INDUSTRY*. The differences in injury rates across industries have been stable since the survey began in 1973.

problematic because the burden of occupational risk apparently falls hardest on the comparatively disadvantaged.¹⁷

Those who bear occupational risks, moreover, sometimes form small specific groups—vinyl chloride workers and native American uranium miners are examples. Others form large, but identifiable, social groups, as is the case with cotton textile workers, coal miners, and steelworkers. These workers tend to share common attitudes and interests that make them recognizable as a group. They are likely to regard occupational risk reduction as a matter of group interest.¹⁸ Risks associated with riding in automobiles or consuming saccharin-sweetened drinks or breathing polluted air, on the other hand, are likely to cut across recognizable social divisions. People face these latter risks either as isolated individuals or as members of rather more abstract and encompassing aggregates. This fact raises questions concerning the distribution of risk, not only among individuals, but also among groups.

Finally, the circumstances of occupational risk are unique because of the political dimension they introduce. Labor and management approach each other as adversaries on a wide variety of workplace issues. Very often an issue concerning occupational safety will also be an issue concerning the control of the workplace. The presence of job hazards is then used as an example of how things can go wrong if management is allowed unrestricted discretion in making decisions concerning the organization and pace of work. On the other hand, militant action in favor of reducing occupational risks can sometimes be resisted, not because management is opposed to risk reduction, but because of a feeling that labor is too forcefully infringing upon management prerogatives to organize production. The general issue concerning control over the workplace therefore colors the issue of occupational risk.¹⁹

III. ETHICS AND GOVERNMENTAL INVOLVEMENT IN OCCUPATIONAL SAFETY AND HEALTH

The previous discussion suggests that occupational safety and health is at least partly a matter of moral and social concern. But the justification of government involvement in the area is more and

17. For example, the raw correlation between occupational risk and hourly wage is negative. See Thaler, *supra* note 13, at 290.

18. For an indication of the group interest in workplace safety among southern textile workers see M. CONWAY, *RISE GONNA RISE* 58-75 (1979).

19. For a description of the role of labor-management issues in occupational safety and

more frequently being stated in terms of market failure, not moral principle. The labor market, it is argued, does not provide sufficient information for workers and management to make informed decisions about occupational risk.²⁰ Furthermore, because of transactions costs, it would be more efficient to let government set national standards based upon a centralized body of knowledge concerning safety and health problems, especially in the areas where risks are likely to be misperceived or the effects are chronic rather than acute. In addition, the government provides compensation programs that prevent workers and management from bearing the full social costs of workplace illnesses and injuries. The government may legitimately, then, enforce a limited amount of command and control regulation to deal with these information gaps and externalities.²¹

This justification of government involvement is based upon considerations of efficiency in the satisfaction of personal preferences. According to this view, the labor market does not provide an amount of safety on the job that maximizes the satisfaction of these individual preferences. Behind the market failure justification for government involvement there lies a utilitarian principle. Several other ethical bases for government involvement exist, however, that are not derived from a utilitarian tradition. For analytical purposes, the following discussion divides these justifications into those based on workers' rights, those based on distributive justice, and those based on public values.

A. *Workers' Rights*

The framework of individual rights provides one ethical perspective on the problem of occupational safety and health. This framework emphasizes that people should be treated as ends and not as mere means. People have rights that protect them from others who would enslave them or otherwise use them for their own purposes. In bringing this idea to bear on the problem of occupational safety, many people have thought that workers have an inalienable right to

health see D. BERMAN, *DEATH ON THE JOB, OCCUPATIONAL HEALTH AND SAFETY STRUGGLES IN THE UNITED STATES* (1978). For information on the general issue of control over the workplace see R. EDWARDS, *CONTESTED TERRAIN* (1979).

20. This is especially true with respect to toxic substances. See 46 Fed. Reg. 4,412, 4,413-16 (1981) (Dep't of Labor, OSHA, Hazards Identification).

21. See Nichols & Zeckhauser, *Government Comes to the Workplace: An Assessment of OSHA*, 49 *THE PUB. INTEREST* 43 (1977). See also CHELIUS, *supra* note 10. For a statement of the "market failure" justification for government intervention in general see C.L. SCHULTZE, *THE PUBLIC USE OF PRIVATE INTEREST* 29-46 (1977).

earn their living free from the ravages of job-caused death, disease, and injury.²² Philosophers have offered strong defenses of the right to be free of the infliction of cancer on the job.²³ Behind this contention lies the idea that people need rights to protect them from unreasonable health hazards where they earn their living. If the unrestricted market does not automatically satisfy this right to safety on the job, then the government must intervene in order to protect it.

What does it mean to say that someone has a right to safety and health on the job? According to one view, people have rights to something when they have a valid claim upon society to protect them in the possession of it.²⁴ This general idea does not specify whether the entitlement in question is negative (noninterference) or positive (recipience), or partly both.²⁵ The right to safety and health on the job has sometimes been seen as derivative from the right not to be killed or severely injured by others.²⁶ From this perspective, workers would have a negative right to noninterference and protection against persons who threaten life or limb in a direct way. On the other hand, a right to safety and health on the job can be construed as a species of a positive right to life.²⁷ From this perspective, workers are entitled to that share of society's resources needed to provide a minimum level of protection against hazards on the job. This minimal level of protection obviously varies with the available resources of the community. For a given amount of resources, the minimal standard may not be the optimal level at which to provide safety and health on the job, but it provides a floor below which protection should not be allowed to fall.

This right to minimum protection on the job is held by workers but it imposes duties on employers. These duties require employers to refrain from the use of hazardous materials or processes that would impose a significant risk of killing or seriously injuring workers—a negative duty corresponding to a negative right. Additionally, or alternatively, these duties could be construed to require adequate

22. This is the way Rep. Philip Burton (D. Ill.) expressed the right to occupational safety and health. *Quoted in Nichols, supra* note 21, at 46.

23. See Gewirth, *Human Rights and the Prevention of Cancer*, 17 AM. PHILOSOPHICAL Q. 117 (1980). For an opposing philosophical view that endorses a willingness-to-pay approach to public policy toward lifesaving see Bayles, *The Price of Life*, 89 ETHICS 20 (1978-79).

24. This notion of rights is defended in J.S. MILL, UTILITARIANISM, BOOK V at 42-57 (1971). See also H. SHUE, BASIC RIGHTS (1978).

25. For a discussion of positive and negative rights see C. FRIED, RIGHT AND WRONG 110-14 (1978).

26. See Gewirth, *supra* note 23, at 117.

27. A positive right to life is defended in McClosky, *Right to Life*, 84 MIND 403 (1975).

levels of protection against serious threats to worker safety and health—a positive duty corresponding to a positive right.²⁸ These employer duties call for the expenditure of resources to provide safety on the job, either in form of opportunity costs or actual expenditures. The allocation of resources to the fulfillment of this duty has a certain priority over their allocation to the production of other commodities. The existence of a right to safety on the job, then, implies that the pursuit of private interest must take the provision of safety and health on the job as something of a side-constraint, although not necessarily an absolute one.

A right to occupational safety and health would also have a certain priority over collective or social goals. According to one popular theory, rights are political trumps to the effect that the collective good is not a sufficient justification for imposing some loss or injury on the individuals holding these rights.²⁹ A more moderate view would allow some compromises between the satisfaction of rights and the satisfaction of common goals. Even if a more moderate view is adopted, however, a right to occupational safety and health could not be overridden by relatively minor increases in the satisfaction of some collective interest.

The assignment of a safety right to workers still allows the possibility of trading the right for additional wages.³⁰ A right to safety, however, could also be viewed as inalienable. On this view, market transactions involving the exchange of *minimum* safety and health protections for wages would not be allowed. The reason for this is to ensure that everyone would enjoy the substance of the right. This restriction does not necessarily prohibit *all* wage/risk transactions. One possibility would be to permit employers to charge workers (via lower wages) for the provision of extra safety over and above the social minimum. A further possibility would be to allow employers to charge for the provision of the social minimum. One could argue that just as a right to safe consumer products allows manufacturers to charge extra to make their products free of unreasonable risks, so a right to occupational safety allows employers to

28. Section 5(a)(1) of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 655(a)(1) (1976) states: "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees." This section clearly imposes the duty to provide safe and healthful workplaces on employers.

29. R. DWORIN, *TAKING RIGHTS SERIOUSLY* (1977).

30. *But see* the Coasian analysis of wage differentials as resulting from worker liability, not the sale of worker rights in Chelius. *The Control of Industrial Accidents: Economic Theory and Empirical Evidence*, 38 *LAW & CONTEMP. PROB.* 703 (1974).

charge extra to make their workplaces free of unreasonable risks. On the other hand, one could argue that the unavoidability of work makes the consumer product analogy inappropriate. On this view, the cost of providing worker safety is a cost of doing business, and must be passed on to the consumer or taken out of profits.

Some people propose that jobs with unreasonable risks should be made available to workers if the alternative is unemployment.³¹ On the average, let us say, workers will be better off taking these risky jobs than being unemployed. It would therefore be rational for them to accept these jobs. Why prohibit them from doing so? This way of stating the issue may be misleading. A better way may be to ask whether these risky jobs should be made available at all. In effect, the provision of unsafe jobs offers one way of providing employment for the unemployed. It has to be evaluated, therefore, against other strategies for reducing unemployment, including a deliberate national policy of full and safe employment. One argument for such a policy might be that, in its absence, workers would face a choice between jobs with unreasonable risks and no jobs at all.³²

The framework of individual rights, then, may provide principles that justify government intervention in the area of occupational safety and health. Furthermore, the principle of ensuring minimal levels of safety and health protection provides some guidance in setting levels of effort in mandated programs. There are, however, some limitations on the framework of individual rights.

The first reason the individual rights framework is limited is that it does not determine any particular level at which safety should be provided to workers. The right to safety and health on the job is not a right to an absolutely risk-free workplace, but only to a minimum amount of safety and health on the job. But what is the level of safety to which workers are entitled? Some philosophers have argued that workers have the right to the maximum feasible level of safety.³³ But is this true? Suppose a worker faces an extremely low level of risk, so low that the worker cannot distinguish it from zero. This risk can, however, be lowered or eliminated at a large, but affordable, cost. Is

31. This suggestion is made in ZECKHAUSER & NICHOLS, *THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, 96TH CONG., 2D SESS. AN OVERVIEW, STUDY ON FEDERAL REGULATION*, VOL. VI 163 (1978) (report prepared for the Senate Comm. on Gov't Affairs).

32. A strong argument can be made that by banning extremely risky jobs society commits itself to providing jobs that are free of excessive risk. See A. OKUN, *EQUALITY AND EFFICIENCY: THE BIG TRADEOFF* 21 (1975).

33. For the view that people have the right to be protected against all but the most minimal risk of cancer see Gewirth, *supra* note 23, at 124.

this worker entitled to demand the safety expenditure as a matter of right? Recall that this expenditure is purely for a trivial reduction in the already small probability of illness or injury. It is not a case of someone demanding a large expenditure in order to avoid his or her own death or serious injury. It seems that no worker has such a right, and so no worker, except, perhaps, in special cases, has the right to the maximum feasible level of safety. This is not to argue that a collective goal of maximum feasible safety is unjustified, but it does suggest that if it is to be justified, one must look elsewhere than to a theory of individual rights.

Once the idea of rights to maximal feasible safety is abandoned, no other choice for an appropriate level appears satisfactory. One way to see the difficulty is to note that the framework of rights focuses on the problem of occupational safety and health at the individual level. At this level, the problem is that workers are facing too high a probability of injury or illness on the job. But what probability of injury or illness on the job is a violation of an individual's rights? What probability of violating an individual's rights is itself a violation of his or her rights? The choice of one probability rather than another may appear arbitrary, and there seems to be no satisfactory mapping of other considerations onto these probabilities.³⁴

One attempt to deal with this problem introduces the idea of a standard threat. Rights provide guarantees not against all possible threats to their enjoyment, but only against standard threats. The notion of a standard threat is complex, but involves the ideas that the threats are (1) pervasive, common, ordinary; (2) serious; and (3) remediable, or feasibly resisted. What threats are standard is in part an empirical question, and may vary from context to context.³⁵ This idea of standard threats probably captures the heart of the intuition that rights are involved in occupational safety and health. It does not, however, provide guidance as to what levels of risk are consistent with an individual's rights.

A second reason the individual rights framework may be inadequate lies in its attention to minimal levels of protection. It ties the right to safety and health to the notion of a minimally decent level of protection, assuming that those who lay claim to maximal levels, as a

34. See R. NOZICK, *ANARCHY, STATE AND UTOPIA* 74-75 (1974).

35. See SHUE, *supra* note 24, for the notion of a standard threat. He develops this idea further in his article *Exporting Hazards*, to appear in *BOUNDARIES: NATIONAL AUTONOMY AND ITS LIMITS* (P. Brown & H. Shue eds. 1981). The notion of standard threat captures the ideas of significant risk and feasibility that played a large part in the benzene and cotton dust decisions.

matter of right, are wrong. But the question for public policy is best approached as this: what is the optimum level of protection to provide? The Occupational Safety and Health Act, for example, goes beyond the requirement to provide minimal levels of protection and suggests an interpretation of the optimal level of protection as the highest feasible level.³⁶ To the extent that it does this, the Act appears to go beyond the mere assignment of rights at a certain level of safety, and moves into the area of enforcing widely accepted public values concerning safety and health on the job.

Finally, the individual rights framework fails to do justice to some of our considered judgments concerning the public health impact of safety and health hazards on the job. It may be, for instance, that the probabilities of harm facing each worker are so low as to escape the charge of posing a *significant* risk. Nevertheless, the number of people exposed may be so large that a significant number of cases appears. At this point it may be reasonable to conclude that an insufficient level of protection is being provided, despite the fact that the risk facing each worker is perfectly consistent with the protection of his or her rights.

B. *Distributive Justice*

A second reason for the government to be involved in the area of occupational safety and health is to eliminate or reduce inequities in the distribution of occupational risks. The following example may clarify our intuitions about the idea of equal protection against occupational threats. Suppose firms were taxed at a fixed rate for each unit of worker exposure to a toxic substance. The result of this would be to encourage firms to control exposures up to the point where it becomes cheaper to pay the tax. Firms that could reduce toxic exposures cheaply would provide more protection for their workers than would firms that could reduce toxic exposures only at great expense. Workers would therefore receive unequal protection against toxic substances depending upon whether their employing firm faced high or low marginal abatement costs.³⁷

36. See note 77 *infra*. See also the discussion of feasibility analysis, text at notes 76-100 *infra*.

37. Albert Nichols and Richard Zeckhauser suggest a tax on exposure to noise in the workplace. See Nichols, *supra* note 21, at 66-67. See also Smith, *The Feasibility of an 'Injury Tax' Approach to Occupational Safety*, 38 LAW & CONTEMP. PROB. 730 (1974) for a discussion of the technical details of the idea. The proposal to tax firms that do not provide safety is parallel to the idea of taxing firms that pollute the air or water. For a discussion of these effluent or emission charges see A. KNEESE & C. SCHULTZE, *POLLUTION, PRICES, AND PUBLIC POLICY* (1975). It

Why is this example unsettling? Certain intuitions about distributive justice are touched, but exactly what are they? Suppose that different plants provide unequal protection, but none is so lax that it violates the threshold level of protection guaranteed by right. Is any worker being treated unfairly? What if no rights were being violated, but there were extreme inequalities in protection? What if the extra risks were borne disproportionately by the powerless and the poor?

A review of several approaches to distributive justice may provide a way to address these questions. Utilitarian and procedural views regarding distributive justice provide some guidance. A utilitarian approach to the distribution of occupational risks would call for whatever distribution maximizes total or average utility. If we suppose, in the spirit of welfare economics, that ideal markets maximize utility, or at least achieve Pareto optimality,³⁸ the most natural application of the utilitarian approach to occupational safety and health would result in support for market mechanisms, except in the case of demonstrated market failure. In the above example, this would therefore call for setting the tax so as to produce the efficient level of protection against health impairment. The utilitarian approach, then, supports the intuition that a distribution of risks based upon abatement costs may be just.³⁹

A utilitarian approach to justice may be contrasted with a procedural approach. It provides that whatever distribution results from fair principles of acquisition and transfer is just. Hence, no overriding aim in the distribution of safety and health on the job needs to be specified, and no governmental action is needed to achieve a predetermined end state. Instead, occupational risks are allocated in an occupational risk market in which workers receive wage premiums for risky work. The model here is a gamble in which

should be noted that a policy of marketable permits to pollute or to reduce safety in the workplace does not avoid the distributional problem mentioned above, namely, the arbitrariness of distributing safety (or clean air and water) on the basis of firms' marginal abatement costs. For a discussion of the differences between a tax policy and a permit policy see Tietenberg, *Transferable Discharge Permits and the Control of Stationary Source Air Pollution: A Survey and Synthesis*, 56 *LAND ECONOMICS* 391 (1980).

38. A nontechnical summary is provided in Varian, *Distributive Justice, Welfare Economics, and the Theory of Fairness* in *PHILOSOPHY AND ECONOMIC THEORY* (F. Hahn & M. Hollis eds. 1979). A state of affairs is Pareto optimal when some groups can be made better off only by making other groups worse off.

39. This is not to say that utilitarian views imply antiegalitarian policies. Many utilitarians, for instance, use the principle of diminishing marginal utility to argue for an equal distribution of income. See A.C. PIGOU, *THE ECONOMICS OF WELFARE* (1932). Utilitarians, however, favor egalitarian policies only insofar as they increase total or average utility. Extreme inequalities in the distribution of job risks, then, are not inherently objectionable for utilitarians.

the conditions are fair, the bets are made voluntarily, no one cheats, etc. In a fair gamble involving money, whatever distribution of cash results is just. In this view, the occupational risk market, to the extent that it resembles a fair lottery, would be governed by pure procedural justice in which there is no independent criterion for the right result.⁴⁰ Those who hold this view would reject the setting of a "toxic exposure" tax as an imposition of a social goal that legitimately overrides just principles of transfer and acquisition.⁴¹

Utilitarian and procedural approaches to distributive justice, then, tend to work against a policy goal of reducing inequalities in the distribution of occupational risk. The utilitarian would substitute overall efficiency for that goal; the procedural approach would deny that any goal should be set. A more hopeful basis for this policy may lie in egalitarian conceptions that tie justice to equality on a theoretical level.⁴² The following are several possible principles of justice in the distribution of occupational risk that could be examined in such an egalitarian framework.

The first principle declares that extreme inequality in the dangers associated with different jobs is in itself objectionable. It is not fair on this view that illnesses and injuries should be concentrated in particular jobs, occupations, and industries. The mere inequality in risk, and not just its distribution among nonoccupational groups, is objectionable. Some policy implications of this view are that high-risk industries should be targeted first, that exposure levels to toxic substances should be set at background levels, and that where risks cannot be eliminated they should be spread more equally among a larger population.

A second principle objects to extreme inequality in the prevalence of occupational illnesses and injuries among certain nonoccupational groups. It is not fair, on this view, that occupational illnesses and injuries should fall disproportionately on the poor, minorities, and the powerless. Nor should extra risks fall on people in morally irrelevant groups such as those who work in medium-size establishments or those for whom abatement costs are especially high. The difference between the two principles is that the first objects to any unequal distribution of occupational risks while the second objects only when

40. For a defense of the procedural view see NOZICK, *supra* note 34. For a discussion of pure procedural justice see RAWLS, *supra* note 11, at 86.

41. For example, Robert Nozick argues that a market in air pollution permits is objectionable because it requires a central authority to set overall clean air goals. See NOZICK, *supra* note 34, at 81.

42. For the most elaborate example of current egalitarian views see RAWLS, *supra* note 11.

the distribution has been determined in what seems an unjust way. A policy implication of the second principle is that special attention and effort should be given to those groups that experience extra occupational risk because they are poor, powerless, or victims of illegitimate discrimination.

These two principles each suggest that large increases in efficiency would be needed to balance the loss in equity resulting from the application of market principles such as a "toxic exposure" tax. A third principle might propose that, if occupational risk is concentrated in groups that are already disadvantaged, programs for the reduction of occupational risk should have priority over programs to reduce risks that are spread more evenly throughout the general population. Thus, if we have to choose between saving an equal number of asbestos workers and motorists, equity considerations should make us favor the asbestos workers.⁴³

All three distributive principles are in need of further theoretical support. They do not, moreover, specify the extent to which these egalitarian goals should be pursued in the face of conflicts with other goals. In addition, they are silent on the overall level of protection we should provide. They, therefore, do not determine the level of effort at which government programs in this area should operate. More complete guidance for occupational safety and health policy might be found by referring to widely shared public values that lie behind the concern over workplace safety.

C. Public Values

The concept of public values provides an important ethical justification for government involvement in occupational safety and health. This perspective is based on a distinction between individuals' preferences for their own personal welfare and their values and moral principles concerning the kind of society they think desirable or the collective policies they think worthwhile.⁴⁴ These public values

43. This example is used by Nicholas Ashford. See Ashford, *The Usefulness of Cost-Benefit Analysis in Decisions Concerning Health, Safety, and the Environment*, in *Joint Hearings on the Use of Cost-Benefit Analysis by Regulatory Agencies, before the Subcomm. on Oversight and Investigations and the Subcomm. on Consumer Protection and Finance of the House Comm. on Interstate and Foreign Commerce*, 96th Cong., 1st Sess. (1980).

44. Similar distinctions between public and private preferences or values are made by Harsanyi, *Cardinal Welfare, Individualistic Ethics, and Interpersonal Comparisons of Utility*, 63 *J. OF POL. ECON.* 315 (1955); Marglin, *The Social Rate of Discount and the Optimal Rate of Investment*, 77 *Q.J. OF ECON.* 93 (1963); Arrow, *Values and Collective Decision-Making*, in HAHN, *supra* note 38, at 116-17; Thurow, *A Theory of Groups and Economic Redistribution*, 9 *PHILOSOPHY & PUB. AFF.* 31-32 (1979). For a discussion of environmental policy in terms of the con-

can concern the rules to be followed in the pursuit of private interests (such as property rights) or they can address some concrete common concern like national defense or environmental quality. When adopted by the community these public values become collective goals.

Not all public values are well defined. There is often no consensus supporting them; the criteria for community acceptance are not always clear. Yet in the case of occupational safety and health these concerns are not always problematical. One public value at stake in the question of government involvement in occupational safety and health, for example, is the uncontroversial belief that a society in which fewer people are killed or seriously disabled on the job is, other things being equal, better than a society in which more people are killed or seriously disabled on the job. This value may derive from a more basic judgment that people have a dignity and a worth that make it wrong to use them as mere means to any end including efficiency. This judgment leads to the idea that a special regard for the health and safety of workers is required to avoid treating them simply as components in the production process. This moral ideal underlies the passage of the Occupational Safety and Health Act, which established job safety and health as a national goal.⁴⁵

From the perspective of public values, the problem of occupational safety and health is not simply that occupational risks are inequitably distributed and that individuals are receiving less protection against threats to their safety and health on the job than they are entitled to by right. The problem is, in addition, that the level of injury and illness may be unacceptably high, even if rights are respected and the distribution of job risk is equitable. Both rights and justice are important public values. But if too many workers are killed or disabled on the job, the public may determine that the meager level of effort devoted to the reduction of this toll displays a disregard for the value we place on human life.

This evaluation of occupational safety is not necessarily accomplished by examining risks at the individual level. We may want to prohibit hazardous activities that are fully rational for each individual even when there are no violations of rights or justice involved. Recall the coffee example mentioned earlier. For a more ex-

trast between self-regarding preferences and public values see Sagoff, *Economic Theory and Environmental Law*, 79 MICH L. REV. 1393 (1981).

45. The Supreme Court's decision in the cotton dust case supports this "public values" interpretation of the Act. See text at note 89 *infra*.

treme example, imagine a nonoccupational death lottery in which people could accept a risk of death in return for a cash payment.⁴⁶ The death risks and the payments could probably be arranged so that many people would play. But deliberation regarding whether to allow such a death lottery would concern more than the size of the death risk, the monetary compensation involved, and the individuals or groups likely to play. It would also concern such matters as whether a sufficient respect for the value of life was displayed by this type of transaction, and whether the value of individual choice in the matter outweighed the damage done to the value of life. Also relevant would be the purposes behind the death lottery and the social outcomes to be expected, which would vary even if the individual-level death risks did not.

In the occupational risk market, where the group outcomes are often regular and predictable, the perspective of public values would similarly require a direct consideration of the importance of the activities producing these outcomes. The role of government would be to reflect this evaluation and to regulate or prohibit certain activities on the job when the outcomes that would result violate this public judgment.

To approach occupational safety on the basis of public values, however, is to encounter a familiar problem. The approach justifies some degree of government involvement, but does not specify the level. Moreover, it has a special difficulty in explaining why society has more of an interest in regulating the outcomes of occupational risks than in regulating other risk-taking behavior. The beginnings of an answer are to be found in the social nature of employment, the fact that it is not an avoidable activity, and the irreversible and non-compensable nature of injury and death. But more work would have to be done to distinguish the cases so as to avoid the use of principles that would also justify intrusiveness and intolerance.

IV. ECONOMIC CRITERIA

While moral principles involving rights, justice, and public values may help to justify centralized programs regulating occupational safety and health, they do not completely determine the level of government effort required. It has been suggested that various *economic* criteria may be used to supplement these moral principles

46. The rise of "Toughman" contests in which unemployed steel and auto workers are recruited for amateur boxing exhibitions suggests that this example is not entirely fanciful. The frequency of death in these contests is alarming.

in determining a desirable level of effort. This section examines the economic approach to occupational safety and health. It focuses on the difficulties in applying economic techniques in this area, notes some tensions between the use of these techniques and the normative considerations just discussed, and attempts to sketch an appropriate role for these techniques.

According to this economic approach, the goal of occupational safety and health policy should be to minimize the sum of workplace accident costs and workplace accident prevention costs, or equivalently, to maximize the difference between the benefits of workplace safety programs and the costs of these programs.⁴⁷ A number of techniques have been proposed to achieve this goal. They divide into cost-effectiveness and cost-benefit rules. A program is cost-effective when it maximizes its objectives for a given cost, or minimizes its cost for a given objective. A program is cost-beneficial when its benefits exceed its costs. The cost-benefit criterion goes beyond the cost-effectiveness criterion in assigning a monetary value to the benefits involved, thereby allowing direct comparisons of the positive and negative consequences of a program in monetary terms.⁴⁸ In examining the economic approach it is helpful to treat these criteria separately.

A. *Cost-Effectiveness*

Cost-effectiveness criteria were never intended to determine levels of safety. They presuppose that the desirable level of effort has already been set or that some cost constraint has already been imposed. The major use for cost-effectiveness approaches is not in setting levels, then, but in achieving in an efficient way goals determined on some other basis. Even this role, however, is limited by the need to balance efficiency against other values.

Despite this inherent limitation, cost-effectiveness can be a useful measure of the desirability of alternative workplace safety and

47. See G. CALABRESI, *THE COSTS OF ACCIDENTS* (1970) (arguing for the cost minimization goal). James R. Chelius states the equivalent benefits maximization policy in Chelius, *supra* note 30, at 702. For general arguments and empirical data supporting the economic approach see SMITH, *supra* note 2, and J. MILLER III & B. YANDLE, *BENEFIT-COST ANALYSIS OF SOCIAL REGULATION* (1979). See also Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (1981) (requiring cost-benefit analysis and mandating that "regulatory objectives be chosen to maximize the net benefits to society").

48. The difference between cost-benefit and cost-effectiveness analysis is well-known. See, e.g., L. ANDERSON & R. SETTLE, *BENEFIT-COST ANALYSIS: A PRACTICAL GUIDE* 16-17 (1977). For a discussion of the contrast in the context of regulatory policy see L. LAVE, *THE STRATEGY OF SOCIAL REGULATION* 19-25 (1981).

health programs. Consider, for example, the problem of what to do about noise in the workplace. Suppose that one program calls for the use of engineering controls as a way of preventing cases of hearing impairment; another calls for the use of hearing protectors that prevent the same number of cases of hearing impairment, but at a much lower cost. In this hypothetical example, a cost-effectiveness approach would favor the use of the less expensive hearing protectors. Only rarely, however, is the choice quite that simple. The actual controversy in the case of noise in the workplace is whether hearing protectors do in fact provide the same level of protection as engineering controls.⁴⁹ If the less expensive hearing protectors provide less protection, then the fact that they are less expensive does not make them more cost-effective. Alternative programs can be compared with respect to cost-effectiveness only when they achieve the same level of effect or impose the same costs.

Some misunderstandings of this point have resulted in the idea that a program that imposes the lowest average or marginal cost per accident avoided is cost-effective, while programs with higher unit costs are not cost-effective.⁵⁰ This is not so. If the program that avoids more accidents or injuries has higher unit costs, this may reflect the familiar fact of diminishing returns, and indicates that if we want to avoid more incidents it will simply cost us more per incident to do it. Relative to our objectives, each program may be equally efficient.

Some analysts who use a cost-effectiveness framework propose to equalize the marginal cost per incident avoided.⁵¹ An example of this approach would be to set different levels of exposure to toxic substances for different industry segments depending upon the cost

49. For a discussion of the effectiveness of ear protection *see* 46 Fed. Reg. 4,078, 4,111-12 (1981).

50. This is especially true in some studies published by the United States Environmental Protection Agency. *See* UNITED STATES ENV'T'L PROTECTION AGENCY, KRAFT PULPING 8-37 (1978) (the three regulatory alternatives having the highest marginal cost per ton of emissions removed are rejected as "not being cost-effective").

Even as sophisticated an observer as Lester Lave can abuse the notion of cost-effectiveness. "Comparing the cost of preventing an adverse health effect under the oxidant and toxic substances standards shows that the former is not cost-effective." *See* LAVE, *supra* note 48, at 108. What he means is that the cost per case prevented is greater under the oxidant standard than under the toxic substances standard. In itself, this gives us no indication of its economic value and does not address the efficiency question of whether the oxidant standard achieves its goal at lowest cost.

51. Peter S. Albin draws attention to "the efficiency requirement that the number of lives saved per dollar of expenditure should be equal at the margin," in S. HOOK, HUMAN VALUES AND ECONOMIC POLICY 96 (S. Hook ed. 1976).

required to control exposures.⁵² If this is done, then the number of cases avoided will be maximized for any given level of expenditure. However, the distribution of cases avoided will differ from that determined by a policy that requires equal protection for all. To equalize the marginal cost of safety conflicts with considerations of distributive justice⁵³ that could motivate government programs. More telling, perhaps, in the context of trying to determine levels, is that this cost-effectiveness rule does not specify at what level marginal costs should be set, or what should be the total social cost of the regulation.

Another cost-effectiveness rule would concentrate attention on the accidents or injuries that can be avoided most cheaply. The policy recommendation here is to set priorities and levels for safety programs on the basis of the lowest unit costs.⁵⁴ The rationale is this: if we proceed up the supply curve for lives saved in this way, then no matter where we stop spending, we will have maximized the number of lives saved for the amount spent. One difficulty with this recommendation is that it is likely to conflict both with the goal of targeting high risk industries and groups first and with the goal of providing equal protection across groups.⁵⁵ Moreover, it does not take account of the total number of lives saved by a particular safety program. For example, when we choose which of two toxic substances to regulate first, it may be better to give priority to the substance that produces more illnesses and fatalities rather than the one that has the lowest per unit prevention costs. This would maximize the number of lives saved in a given period of time although it would be at an increased cost per life saved. Finally, the policy of saving the "cheapest" lives first does not solve the problem of levels since it does not specify at what point we should stop spending to save lives.

B. Cost-Benefit

From within a cost-benefit framework, the limitations on cost-effectiveness criteria appear to stem from the lack of a monetary value for the benefits of occupational safety and health programs.

52. This suggestion was made for the case of cotton dust by the Council on Wage and Price Stability in their testimony in the rulemaking hearing on cotton dust. COUNCIL ON WAGE AND PRICE STABILITY, PROPOSED STANDARD ON COTTON DUST (1977) (comments before the Occupational Health and Safety Administration, Docket No. H-052).

53. See text at notes 37-43 *supra*.

54. The cheap lives first rule is discussed in Zeckhauser & Shepard, *Where Now for Saving Lives?*, 40 LAW & CONTEMP. PROB. 16 (1976); and Singer, *How to Reduce Risks Rationally*, 51 THE PUB. INTEREST 100 (1978).

55. See text at notes 37-43 *supra*.

The cost-benefit approach attempts to move beyond the cost-effectiveness approach by placing a monetary value on these benefits. Cost-effectiveness analysis measures the benefits of safety and health programs in their natural units—lives saved, number of cases of hearing impairment avoided, and overall reductions in occupational illnesses and injuries. Cost-benefit analysis transforms these “naturally” measured benefits into monetary terms by specifying an appropriate monetary value. Since the economic costs of safety and health programs are already in dollar units, a direct comparison of benefits and costs is possible in terms of a single common measure. With this common metric, it is possible to examine clearly whether the benefits of a safety and health program exceed the costs.

A formal cost-benefit analysis, then, requires monetary values for the lives saved and illnesses avoided by safety and health programs. But these items are not typically bought and sold on markets, and so there is no prevailing price to use as a measuring rod. There has been much research, therefore, attempting to measure these benefits indirectly. However, a review of the two principal methods used to value the benefits of programs that save lives reveals severe technical and theoretical difficulties. The first method attempts to assess the social costs of lost lives. Essentially, this amounts to estimating the future earnings of those whose lives would be saved by the program and discounting this estimate to its present value. The benefits of life-saving programs are then measured as reductions in these social costs.⁵⁶ Critics argue cogently that the social cost approach confuses the contribution people make to the gross national product with their social worth; the value of their livelihood with the value of their lives. It has the ethically unacceptable implications that poor people are worth less than the rich, women are worth less than men, blacks worth less than whites, and old people who have no income worth nothing at all. To remedy these difficulties, it has been suggested that a second approach be tried that uses the traditional economic criterion of willingness to pay.⁵⁷

56. Sometimes medical costs are added to discounted future earnings to form a more complete picture of social costs. See D. Rice, Social and Economic Implications of Cancer in the United States (paper presented to the Expert Committee on Cancer Statistics of the World Health Organization and International Agency for Research of Cancer, Madrid, Spain, June 20 to 26, 1978). See also Mushkin & Collings, *Economic Costs of Disease and Injury*, 73 PUB. HEALTH REP. 795 (1959).

57. For general criticisms of the social costs approach and arguments in favor of a willingness to pay approach see Schelling, *supra* note 9, and Mishan, *Evaluation of Life and Limb: A Theoretical Approach*, 79 J. OF POL. ECON. 687-705 (1971). Further theoretical discussion of the relation between the discounted future earnings approach and the willingness to pay ap-

This willingness-to-pay approach is the favored approach in the economics profession, largely because it has a solid basis in welfare economics.⁵⁸ A straightforward application of this traditional criterion is blocked, however, by the fact that there appears to be little sense in asking what payment an individual would make to escape certain death. The accepted solution to this problem is to ask a different question: what would individuals be willing to pay to reduce the probability of death when these probabilities are very small? The monetary value of a person's life is not determined by this procedure, but a monetary value of personal safety is. Once this value is available, then a monetary value of the benefits of a life-saving program can be calculated as the number of people at risk times the probability of death times the value of safety.⁵⁹

The most widespread method of calculating the value of safety is based upon labor market studies.⁶⁰ The labor market is assumed to function as an occupational risk market in which worker demand curves for safety and management safety supply curves intersect in a series of equilibrium points. Attempts are then made to measure the slope of the curve that these market equilibria trace out. This slope represents the wage differential for extra risk and is used as a measure of the value of safety.

There are some technical problems with this approach.⁶¹ First, the evidence is mixed on the existence of these compensating wage differentials. Some studies show the expected positive coefficient, indicating that hazardous work pays more; some show a negative one, indicating that hazardous work pays less; and some show a coefficient that cannot be statistically distinguished from zero at the usual levels of confidence, suggesting that level of risk has *no* influence on wage rates. It is not even clear that there is a risk market then. Sec-

proach can be found in Conley, *The Value of Human Life in the Demand for Safety*, 66 AM. ECON. REV. 45 (1976); and G.W. JONES-LEE, *THE VALUE OF LIFE* (1976).

58. This trend is reflected in an increased use of the willingness to pay measure in recent studies. See J. Graham & J. Vaupel, *The Value of Life: What Difference Does It Make?* 2 (Oct. 1980) (paper prepared for the National Academy of Science Comm. on Risk and Decision Making).

59. For a clear statement of the difference between the value of life and the value of safety see Kneese & D'Arge, *Benefit Analysis and Today's Regulatory Problems*, in *THE BENEFITS OF HEALTH AND SAFETY REGULATION* (A. Ferguson & E.P. LeVeen eds. 1981). The value of safety, moreover, clearly increases with the level of risk.

60. The pioneering study is Thaler, *supra* note 13.

61. For reviews of the labor market studies on the value of safety and some of their technical difficulties see Smith, *Compensating Wage Differentials and Public Policy: A Review*, 32 INDUS. & LAB. REL. REV. 339 (1979); and Brown, *Equalizing Differences in the Labor Market*, 94 Q.J. OF ECON. 113 (1980).

ond, even if a positive coefficient is found, it does not represent a worker demand curve for safety, but the intersection of worker demand curves and management supply curves. For small changes in the risk of death this does not matter, since, at market equilibrium, the amount workers are willing to pay for safety is theoretically the same as the amount management is willing to spend on it. But, conceptually, it is important to note that the estimated coefficient measures management willingness to supply safety as much as it measures worker demand for it. Third, the estimated coefficient may or may not represent an adequately functioning risk market. Lack of knowledge, power, or mobility may prevent workers from expressing their full desire for compensation. Fourth, since the loss of life cannot be measured objectively, there is no way to tell whether the observed compensation is adequate or not.

Further, a dilemma threatens the entire wage differential approach to estimating the value of safety. If risk markets are fully functioning, then workers receive full compensation for bearing risk, and there is no need for government intervention, because any mandated program above and beyond those already in place would cost management more than the fully compensated workers are willing to pay for it. On the other hand, if the markets are not fully functioning, then the estimated value of safety bears no systematic relation to the real value. It would then be illegitimate to value the benefits of a program designed to increase occupational safety in a malfunctioning occupational risk market on the basis of unreliable estimates of the value of safety drawn from these very same malfunctioning markets.⁶²

There is an even more fundamental objection to the wage differential measure. A formal cost-benefit analysis needs a measure of what people are willing to pay for a program that saves lives. What the wage differential coefficient represents, however, is willingness to pay for personal safety, not life-saving programs. The two are by no means the same. The value we want is what people are willing to spend for a social program that will fundamentally alter the options available on the occupational risk market; we, therefore, want to measure individual preferences for structural changes in the labor market. Wage differentials, however, represent people's preferences within a given structure of occupational risk, not what they

62. This objection would not apply, of course, to estimates of the value of safety derived from studies of behavior outside the labor market, for example, from studies of seat belt or smoke detector prices. But then the problem is one of relevance: why should the value people place on safety away from work bear any systematic relation to the value of safety in the total-

would prefer in a labor market with an altered structure.⁶³ It is possible that valuation under the present and the altered structure are systematically related, but individual preferences for structural change in the occupational risk market would have to be measured somehow before this could be established. But if they can be estimated directly, why bother with a surrogate measure?

These difficulties apply to estimates of the wage differentials for injury and non-fatal illness as well. It appears then that the attempt to value the benefits of occupational safety and health programs via wage differentials is not likely to produce useful estimates. If so, the option of using cost-benefit criteria to set levels of effort for government occupational safety and health programs is considerably less attractive.

Economic cost-benefit criteria in general suffer from a more basic limitation that makes them less desirable as public policy guides. They are designed to promote efficiency in the satisfaction of personal preferences. The notions of Pareto optimality and Kaldor-Hicks efficiency that underlie these criteria are admittedly one-sided in their neglect of individual rights, distributive justice, and public values.⁶⁴ For this reason, economic criteria may underdetermine the level of governmental effort required in the area of occupational safety and health. Only if some further reason justifies giving pride of place to efficiency in the satisfaction of private preferences can economic criteria, as traditionally applied, be the principal basis for setting levels of effort in this area.⁶⁵

It may be possible to use ingenious techniques to incorporate distributional considerations and other public values into cost-benefit analyses. Even so, economic criteria may still have a limited role in occupational safety and health decisions. The political preferences

ly different context of work?

63. Bayles, note 23 *supra*, confuses willingness to pay for personal safety and willingness to pay for life-saving programs in his defense of a willingness to pay approach.

64. For a definition of Pareto optimality see note 38 *supra*. A change is Kaldor-Hicks efficient when those who gain from the change can compensate those who lose because of it. For a discussion of these points see J. DE VAN GRAAFF, *THEORETICAL WELFARE ECONOMICS* (1957); I.M.D. LITTLE, *A CRITIQUE OF WELFARE ECONOMICS* (2nd ed. 1957); E.J. MISHAN, *COST-BENEFIT ANALYSIS* 382-415 (1976). An attempt to integrate distributional considerations into cost-benefit analysis can be found at Weisbrod, *Income Redistribution Effects & Benefit-Cost Analysis*, in *PROBLEMS IN PUBLIC POLICY ANALYSIS*, (S. Chase ed. 1968); and Harrison, *Distributional Objectives in Health and Safety Regulation*, in *THE BENEFITS OF HEALTH AND SAFETY REGULATION* (A. Ferguson & E.P. LeVeen eds. 1981).

65. For useful summaries of criticisms of cost-benefit analysis see SELF, *ECONOCRATS AND THE POLICY PROCESS* (1975) and SUBCOMM. ON OVERSIGHT AND INVESTIGATION OF THE HOUSE COMM. ON INTERSTATE AND FOREIGN COMMERCE, *COST-BENEFIT ANALYSIS: WONDER TOOL OR*

and moral ideals of citizens are poorly represented in a market or surrogate market approach. People sometimes want certain social goals to be achieved, not because there is any personal gain in it for them, but simply because they think it is the right thing to do. The only way an economic analysis can capture these public ideals is by first pricing them. The defect in this procedure is not simply that people are not used to placing a monetary value on their ideals, but that it substitutes a measure of the strength of a preference for an evaluation of an ideal. The evaluation of an ideal, however, is a completely normative undertaking, and is properly done through public discussion, argument, and debate, rather than by assessing the intensity of people's preferences. It might be better, then, to see if the ideals that stand behind our public commitment to occupational safety and health can enter materially into public policy without first being priced by economic techniques.

If economic criteria are not to be the sole basis for occupational safety and health policy, what role should they play in this area? Some economists recommend that cost-benefit criteria be used as basic guidelines in standard-setting, qualified, if necessary, by equity and other considerations.⁶⁶ Others recommend that cost-benefit analysis be done to measure the efficiency impact of policies only. The idea would be to balance economic efficiency as one of a number of perhaps equally important social values.⁶⁷ This multidimensional approach may be attractive; it requires us, however, to specify techniques other than those available within cost-benefit analysis to balance efficiency against other normative considerations. The following section examines some possible ways in which this may be done.

MIRAGE, H.R. DOC. NO. 96, 96th Cong., 2d Sess. 96 (1980) [hereinafter cited as WONDER TOOL].

66. T.C. Schelling has made the case for the priority of economics in the area of risk reduction by arguing that reasons against the use of economic criteria "ought to be explicitly addressed as qualifications to a principle that makes economic sense, rather than as 'first principles' that transcend economics." See Schelling, *supra* note 9, at 147-48.

67. Lee G. Anderson and Russell F. Settle note that "benefit-cost analysis is designed primarily to study the efficiency implications of projects. There are, of course, many other aspects that must be considered such as political acceptability, legality, and income-distributional effects." ANDERSON, *supra* note 48, at 15-16. See also Mishan, *How Valid are Economic Evaluations of Allocative Changes?* 14 J. OF ECON. ISSUES 143 (1980). For the view that a legislative process should be used to set a trade-off value between economic efficiency and important noneconomic objectives of public programs, see Maas, *Benefit-Cost Analysis: Its Relevance to Public Investment Decisions*. 80 Q.J. OF ECONOMICS 208 (1966).

A major defect of these views, however, is their recognition of only one other value (as opposed to practical consideration) that needs to be taken into account, namely distributive justice or equality. For an explicit statement of the view that the only competitor with efficiency is equality see OKUN, *supra* note 32. Guido Calabresi, *supra* note 47, discusses the need for a political trade-off between the two goals of accident law: justice and cost reduction. For

V. ALTERNATIVE PUBLIC POLICY PRINCIPLES

Economic criteria cannot be the sole basis for public policy toward occupational safety and health because they do not adequately take into account the public concerns that motivated government involvement in this area. The Occupational Safety and Health Act was passed to make the workplace *safer*, not necessarily *more efficient*. The public remains concerned, moreover, with the nature of workplace hazards, their distribution, and the degree to which workers have a say in controlling the risks they face on the job. However, in attempting to carry out its mandate, OSHA has been criticized for failing to take into account important economic constraints. If we accept the conclusion of the previous section, that economic criteria cannot be the sole basis for occupational safety and health policy, the question arises whether principles can be devised or guidelines suggested that would both respect economic limits and satisfy public values. Three current proposals for doing this will be described here. One suggestion would be to put a total or unit cost constraint on workplace safety expenditures. Another approach draws upon decision-theory to formulate risk-averse strategies. A final approach is the OSHA strategy of feasibility analysis.

A. *Cost Containment Strategies*

The first cost containment strategy is to adopt a limit on the total amount that can be spent on worker safety and health in a given period. One proposal to do this is the regulatory budget. According to this idea, the level of resources to be mandated each year on occupational safety and health programs would be set by Congress. OSHA could not mandate expenditures above this level, although firms could spend more than the mandated amount if they wished. While the details of this proposal are not fully worked out, the general idea is widely discussed and has some congressional support.⁶⁸ Its chief strength is that by fixing a budget outside the process of setting safety and health standards it allows the use of the cost-effectiveness rules discussed earlier to determine an appropriate level of worker protection. For example, the cost-effectiveness policy of saving the "cheapest" lives first could be followed and a stopping point would be reached when the budget was exhausted.

There are several objections to this idea. First, the proper size of

criticism see Dworkin, *Is Wealth a Value?* 9 J. OF LEGAL STUD. 191 (1980).

68. See DeMuth, *The Regulatory Budget*, 4 REGULATION 29 (1980). This approach is recommended in the minority views in WONDER TOOL, *supra* note 63.

the budget cannot be determined on cost grounds alone. A large expenditure on safety and health may be worth every penny, while a small expenditure may be wasteful. A safety expenditure that would return net economic benefits, for example, could be ruled out by a regulatory budget. Second, by focusing attention on the cost of regulations, the regulatory budget encourages the development of inexpensive regulations, not effective ones. Third, there are a host of practical and administrative difficulties whose resolution appears unlikely.⁶⁹

A second cost containment strategy would be to cap the unit cost of occupational safety and health programs. Suppose, for example, that it could be decided to spend no more than \$3 million per life saved in an occupational safety program. Then OSHA could mandate safety programs up to the point where the marginal or average cost to save a life equals \$3 million. Programs that would save lives at greater unit cost would not be pursued.

It is important to note that this proposal differs from the proposal to determine appropriate levels of safety by estimating what individuals are willing to pay for personal safety on the job. The individual willingness-to-pay measure relies on market or surrogate market analyses, and does not capture people's political preferences for structural change in the occupational risk market.⁷⁰ The unit cost containment strategy, however, need not rely on market-like analyses; nor need it only reflect personal preferences for safety. Congress, for example, could reflect a collective decision to pay no more than a certain amount for avoiding a workplace fatality. Or surveys could be taken to discover not what people are willing to pay for their own safety, but how much people are willing to spend per life saved to increase safety for workers in general.⁷¹ One could, therefore, re-

69. For example, the regulatory budget requires an accounting identification of mandated safety and health expenditures by affected firms. But such expenditures are often made in conjunction with general plant and equipment purchases or provide the occasion for firms to install new equipment that is both more productive and safer. Any accounting separation of these joint costs will be conceptually arbitrary. See DeMuth, *supra* note 68, and LAVE, *supra* note 48, at 19-23, for further discussion of these difficulties.

70. See text at notes 61 to 63 *supra*.

71. In one such study, for example, people were asked both what they were willing to pay for a heart attack program that would reduce their own chances of dying and what they were willing to pay for such a program that saved a certain number of lives per year. See Acton, *Measuring the Monetary Value of Lifesaving Programs*, 40 LAW & CONTEMP. PROB. 66 (1976). For further use of the survey approach to assess public attitudes toward risk see Fischhoff, "How Safe is Safe Enough?" 9 POL'Y SCI. 127 (1978); ENERGY-RISK MANAGEMENT 7-19 (W. Rowe & G. Goodman eds. 1979); SOCIETAL RISK ASSESSMENT: HOW SAFE IS SAFE ENOUGH? 129-42 (R. Schwing & W. Albers eds. 1980).

ject the estimates of the value of safety drawn from labor market studies, and still adopt a unit cost constraint strategy.

This suggestion maintains some of the advantages of the economic criteria discussed earlier,⁷² namely, a sense of overall efficiency and some consistency across programs. There are disadvantages as well. It is not clear that all the benefits of occupational safety and health programs can be treated in this way. Reaching some kind of political consensus on life-saving programs is not totally out of the question, but occupational safety and health programs prevent permanently disabling illnesses and injuries that often lead to premature death. Under a cost containment approach, how should the benefits of avoiding byssinosis, a chronically disabling lung disease affecting cotton textile workers, be evaluated against the benefits of avoiding silicosis, a different chronically disabling lung disease affecting sand blaster and miners? Do we have special surveys? Does Congress reflect a national consensus on each and every type of occupational disease and injury? Clearly, much would have to be delegated to OSHA for administrative judgment under such a strategy. But once removed from the political arena in this way the normative justification for these decisions, namely, that they reflect a national consensus, is much weaker.

There is a second difficulty. It may be unwise to apply the same cost constraint to all programs that save lives in the workplace. If the same cost constraint is applied universally to all occupational hazards, economic factors become the primary concern, while other considerations become less important. But other factors should remain equally important: the nature of the risk, how many people are at risk, how voluntarily it is assumed, who bears the cost, who gets the benefits, whether there is something especially dreadful about the hazard, how much individual freedom has to be sacrificed in order to eliminate it, exactly what economic goods might become more expensive, and so on. Once all these other considerations are given their full due, it is likely that the implied cost per life saved for different programs will differ considerably. Enforcing a consistency along the cost dimension, then, is a way of discounting the importance of equally important factors.

It may at first seem that, since the programs designed to save lives on the job accomplish their goal at a certain cost, any decision to proceed with such a program must be based upon cost considerations. There is, in other words, an implicit value of life-saving present in

72. See text at notes 54 to 58 *supra*.

each decision to proceed. It may seem, then, that calling for the adoption of a unit cost containment figure simply makes explicit a previously hidden decision criterion and therefore opens it up to public debate. This position, however, confuses a consequence of a decision with a basis for it. A decision may imply the acceptance of a certain cost to save a life, but this figure may not have been a primary reason for making the decision. It may not even have formed any part of its justification. It may be that after an explicit decision has been made to save certain lives that a cost per life saved figure can be inferred. When a decision is based on a balance of other factors, the unit cost results from this weighing but does not determine it. Hence, it is not always correct to describe a cost of life figure as a hidden decision criterion.⁷³

A more general problem faces these cost containment approaches: both seem to address the problem of setting levels of occupational hazard control from the wrong direction. They set a cost constraint on some basis or other and allow this decision to determine indirectly the level of protection to be offered. But the problem is in setting the right level of protection, as opposed to simply controlling regulatory costs. Why not determine this level directly? Why not set the level of protection desired in some reasonable way and then let this determine unit and total costs? Strategies other than cost containment may, therefore, be more promising.

B. Risk-Averse Strategies

Risk-averse strategies do not set levels of effort in occupational safety and health programs by employing a fixed cost constraint. Instead, they approach occupational illnesses and injuries as undesirable events whose probability of occurrence should be minimized. One risk-averse rule calls for zero risk, where this is technologically feasible. This rule, of course, gives economic costs no weight and is equivalent to treating risk reduction as lexically prior to all other endeavors. A more balanced rule is obviously needed. It does not follow, however, that zero risk is never a reasonable goal. A ban on the use of asbestos, for example, would reduce the occupational risk of asbestos-related diseases to zero and may in fact be the best policy to deal with this particular hazard, if there are competitive nontoxic substitutes available. It may not be possible to reduce all risks to zero, but this provides no argument against zero risk as a goal in particular cases.

73. See Kelman, *supra* note 6, at 40.

Other risk-averse strategies do not aim at reducing the risks of occupational injury or illness to zero. The *maximin* and *minimax regret* rules are borrowed from the literature of decision theory and sometimes applied to problems in occupational safety and health.⁷⁴ The maximin rule directs attention to the most disastrous possible outcome of each regulatory alternative under consideration and requires the decisionmaker to choose the alternative which has the most favorable worst possible consequence. The minimax regret rule is similar. It tells the decisionmaker to focus on the largest foregone benefit of each regulatory alternative and to choose the alternative having the smallest foregone benefit. The foregone benefit of a regulatory alternative would be determined by comparing the consequences of adopting it with the consequences of adopting some other regulatory option. These rules are risk averse with respect to occupational injuries and illness because they do not discount the magnitude of these adverse outcomes by the probabilities of their occurrence.

An example may clarify the use of these rules in the context of occupational safety and health. Suppose the problem is deciding how to regulate a substance that may be a mild, moderate, or strong carcinogen. The maximin rule would direct attention to the possibility of its being a mild carcinogen when considering an extremely stringent alternative, such as a ban, and would focus on the possibility of its being a strong carcinogen when considering the possibility of no regulatory action at all. The decision would then be made by comparing these worst cases. The minimax regret rule would ask the questions: (1) what have we lost by regulating stringently if this substance turns out to be only a mild carcinogen?; and (2) what have we lost by regulating loosely if this substance turns out to be a strong carcinogen? The decision would then be made by comparing these two estimates of loss.

These rules have a number of advantages. First, they do not ignore economic costs the way that a zero risk policy does, for, in comparing the worst cases or foregone benefits, some comparisons of economic costs to possible health gains must be made. Furthermore, these rules may be the best available when exact estimates of the prob-

74. These rules are discussed in detail in H. RAIFFA, *DECISION ANALYSIS* (1968). For their application to cost-benefit analysis see ANDERSON, *supra* note 41, at 103-05. For their suggested application to safety and health on the job see Cornell, Noll & Weingast, *Safety Regulation* in *SETTING NATIONAL PRIORITIES* 469 (H. Owen & C. Schultze eds. 1976). Ashford, *supra* note 43, at 86, urges the use of the "minimize maximum regret" rule. For criticisms see M. BAILEY, *REDUCING RISKS TO LIFE: MEASUREMENT OF THE BENEFITS* 19-22 (1980).

abilities involved cannot be obtained at reasonable cost. Finally, in situations involving small probabilities of enormous harm, these rules can be useful because the harm may be so catastrophic that even a small probability of its occurrence must be avoided.⁷⁵ Thus, these rules are most helpful where the consequences of not regulating quickly and effectively could be genuinely catastrophic and the costs of regulating are relatively modest.

These rules, however, cannot be made the sole basis for decision making. They are not as attractive when the probabilities of harm are more exactly known because they focus attention on the worst cases even when the probabilities involved are vanishingly small. When catastrophic harm is not involved, this may be bad policy. The focus on the worst cases and the disregard for the size of the probabilities involved could, step by step, over a long period of time, impose deadweight economic losses that are themselves catastrophic. Furthermore, these rules presuppose some method of weighing economic costs against health benefits but do not provide help in choosing such a method. A different approach that would provide some guidance in weighing economic costs against health benefits is needed.

C. Feasibility Analysis

The policy of OSHA under Dr. Eula Bingham⁷⁶ was to set standards regulating exposure to toxic substances based upon a criterion of feasibility. This feasibility approach avoids the fixed cost constraint of the cost containment approach, and provides a way of directly setting desirable levels of protection. Like the risk-averse strategies, it generally attempts to minimize threats to safety and health on the job, and yet it provides a bit more guidance in the area of weighing economic costs against health benefits.

The policy, in the most general terms, calls for the lowest *feasible* level of toxic exposure in the workplace, which is consistent with a literal reading of section 6(b)(5) of the Act.⁷⁷ The approach of the

75. For a detailed discussion of what to do about low probabilities of catastrophic harm see Page, *A Generic View of Toxic Chemicals and Similar Risks*, 7 *ECOLOGY L.Q.* 207 (1978).

76. Dr. Bingham headed OSHA from 1977 to 1981.

77. Section 6(b)(5) of the Occupational Safety and Health Act, 29 U.S.C. § 656(b)(5) (1976), states: "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity." For further discussion see Berger & Riskin, *Economic and Technological Feasibility in Regulating Toxic Substances under the Occupational Safety and Health Act*, 7 *ECOLOGY L.Q.* 285 (1978).

agency to regulation may be pictured, roughly and generally, as follows. The agency asks first whether a substance is hazardous, that is, whether any material impairment to health would follow from exposure to it. If no, the agency does nothing. If yes, OSHA tries to determine the level of exposure at which no material impairment would take place. OSHA's generic policy for carcinogens sets this level at zero in the absence of proof to the contrary.⁷⁸ If this zero-level is not technologically feasible, the agency then selects the lowest exposure level that can be met with reasonably available technology. If the affected industries cannot afford to achieve this level, the agency then requires the lowest economically feasible exposure standard. The criterion of economic feasibility might require some firms to close down, namely, those that could not remain profitable and at the same time meet the standard. The industry as a whole, however, could not be crippled or destroyed.

In principle, the constraint of feasibility is simply a matter of what can be done, and the goal of the regulation of toxic substances is to provide the maximum possible protection against material impairment of health. Notice that this approach does not countenance an explicit balancing of costs and benefits in *particular* cases. This is not because the advantages of safety and health on the job do not have to be compared to economic costs and other losses. The reason no trade-offs are permitted in determining particular permissible exposure levels is that the balance between occupational safety and health and other values has already been set by Congress when it in effect declared that lowest feasible level standards are worth whatever trade-offs are necessary in terms of economic costs and other values. Balancing worker health against other values, in short, must be done as part of overall national policy, but the agency cannot substitute its judgment of the proper balance in particular cases for the congressional directive to promulgate lowest feasible level standards.

Despite its consideration of costs, feasibility analysis clearly allows the promulgation of extremely protective standards. Affected industries contend that some of the standards passed under the feasibility criterion are overly stringent.⁷⁹ Inevitably, this criterion for setting occupational safety and health standards has received attention in the federal courts. OSHA's use of feasibility analysis was

78. OSHA's proposed generic cancer policy may be found at 42 Fed. Reg. 54,158 (1977). The final policy is at 45 Fed. Reg. 5,002 (1980). The policy is now under review.

79. See, e.g., Fleming, *The Spiraling Cost of Regulation: Seven Critical Reforms*, 1 CHEM. TIMES & TRENDS 16, 16-21 (1978).

challenged when it set a standard lowering the exposure level for benzene from ten parts per million (ppm) to one ppm.⁸⁰ The American Petroleum Institute (API) challenged the standard before the United States Court of Appeals for the Fifth Circuit, and on preenforcement review won a judgment declaring the standard invalid on the grounds that it was based on conclusions that could not be supported by the administrative record.⁸¹ In particular, the lower court found that the agency had failed to show that the 1 ppm exposure limit was reasonably necessary to provide for safety in the workplace. OSHA appealed to the Supreme Court, the case was argued October 10, 1979, and on July 2, 1980 the Court affirmed the judgment of the lower court by a margin of five to four.⁸² Two questions were presented for decision in this case. First, and most prominent, was whether a standard regulating occupational exposure to toxic substances must satisfy a cost-benefit test. The second question concerned the quantity and quality of health effect information needed to support such a standard.

The Supreme Court ruled that the agency had exceeded its authority in lowering the benzene standard from ten ppm to one ppm because it had not determined that benzene posed a significant risk of material health impairment below the ten ppm level of exposure. But the ruling did not affect the use of feasibility analysis by the agency. In effect, the ruling imposed an additional constraint of determining the existence of a significant health risk at particular levels of exposure before a toxic substance could be regulated. This ruling shifted the burden of proof onto the agency to show that a particular substance posed a health hazard at the regulated levels of exposure. OSHA could no longer justify setting a particular exposure level by noting that no safe level of exposure had yet been determined, and that, therefore, the lowest feasible level of exposure was required. The quantity and quality of health effect information OSHA was required to obtain before regulating was, therefore, greatly increased.⁸³

The benzene decision was silent on the question of setting exposure levels by balancing costs and benefits. Hence, one option in the postbenzene climate of opinion was to retain the lowest feasible level of exposure policy, but supplement it with a significant risk

80. The final standard is codified at 29 C.F.R. § 1910.1043 (1981).

81. 581 F.2d 493 (5th Cir. 1978).

82. *Industrial Union Dep't, A.F.L.-C.I.O. v. Amer. Petroleum Inst.*, 100 S. Ct. 2844 (1980).

83. For further general discussion of this case see D. Doniger, *Defeat in Benzene Exposure Case: No Death Knell for OSHA Standards*, *The Nat'l. L.J.*, Sept. 15, 1980, at 26. *See also A*

threshold test. It was open to the agency to operate under a policy that exposure limits should be set at the lowest feasible levels which are reasonably necessary or appropriate to eliminate significant health risks. While this would supplement the feasibility criterion with a significant risk criterion, it would not require the balancing of costs and benefits in setting particular levels of exposure. It would allow the possibility of determining the significance of the health risks at one decision level and the affordability of the costs at another level. The principle that if it is worth regulating at all, it is worth regulating to the lowest feasible level would remain intact.

OSHA took advantage of this option in its defense of the cotton dust standard.⁸⁴ In 1978, the agency had promulgated a final rule limiting exposures to cotton dust in the cotton textile industry.⁸⁵ The American Textile Manufacturers Institute, Inc. (ATMI) sought to have the standard invalidated in preenforcement review before the United States Court of Appeals for the District of Columbia, but, in October 1979, the Court of Appeals upheld the standard.⁸⁶ ATMI appealed to the Supreme Court, oral arguments were held in January 1981, and on June 17, 1981 the Supreme Court affirmed the judgment of the lower court.⁸⁷

The question presented for review in this case was the cost-benefit question that had been left unresolved in the benzene decision. In particular, the question was whether OSHA was required to show that the improvements in the health of workers that could be expected to follow enforcement of the cotton dust standard were significant in light of the economic costs the standard would impose on industry. OSHA took the position that such cost-benefit comparisons were not required, and furthermore, that the Act prohibited the agency from engaging in individualized cost-benefit comparisons in particular rule-making cases. The individual cost-benefit judgments were prohibited because they would interfere with the con-

Light Rein Falls on OSHA, 209 SCIENCE 547 (1980).

84. See Brief for the Federal Respondent, *Amer. Textile Manufacturers Inst. v. Donovan*, 101 S. Ct. 2478 (1981). The agency also took this option when, in response to the benzene decision, it withdrew some language from its cancer policy and proposed new language. The initial policy called for setting exposure limits for carcinogens at the lowest feasible level. The proposed new requirement would set exposure limits at the lowest feasible level which is reasonably necessary or appropriate to eliminate significant risk. The "reasonably necessary or appropriate" phrase derives from the definition of a standard in § 3(8) of the Occupational Safety and Health Act, 29 U.S.C. § 653(8) (1976). See 46 Fed. Reg. 7,402 (1981).

85. 43 Fed. Reg. 27,350 (1978).

86. 617 F.2d 636 (D.C. Cir. 1979).

87. *Amer. Textile Manufacturers Inst. v. Donovan*, 101 S. Ct. 2478 (1981).

gressional mandate to promulgate standards imposing the lowest feasible level of significant health risk.⁸⁸

The Supreme Court upheld OSHA's position in this case, ruling that the agency was not required to employ cost-benefit analysis to set particular standards regulating exposure to toxic substances. Further, the Court declared that any such standard less protective than one based upon feasibility analysis was inconsistent with the Act.⁸⁹ In effect, then, the Court barred the agency from using cost-benefit criteria to set toxic substances standards, enjoining it instead to use feasibility analysis.

Several issues remained unresolved by this decision. The use of cost-benefit analysis to determine which toxic substances could be regulated first was not addressed.⁹⁰ In addition, the question of whether cost-benefit analysis could be applied to safety standards was not answered.⁹¹ Finally, the role of other economic approaches, such as cost-effectiveness analysis, was not made clear.⁹²

88. See Brief for the Federal Respondent at 38, *Amer. Textile Manufacturers Inst. v. Donovan*, 101 S. Ct. 2478 (1978).

89. The crucial question turned on the interpretation of § 6(b)(5) of the Occupational Safety and Health Act, 29 U.S.C. § 656(b)(5) (1976). The Court held that

Congress itself defined the basic relationship between costs and benefits, by placing the "benefit" of worker health above all other considerations save those making attainment of this "benefit" unachievable. Any standard based on a balancing of costs and benefits by the Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in Section 6(b)(5). Thus, cost-benefit analysis by OSHA is not required by the statute because feasibility analysis is.

101 S. Ct. at 2490.

90. The Court expressed no view on the question whether "other provisions of the Act . . . may authorize OSHA to explore costs and benefits for deciding between issuance of several standards regulating different varieties of health and safety hazards." 101 S. Ct. at 2490. OSHA had claimed authority to use cost-benefit analysis in deciding which of several health hazards to regulate first. See Brief for the Federal Respondent at 56, *Amer. Textile Manufacturers Inst. v. Donovan*, 101 S. Ct. 2478 (1981).

91. The Court gave conflicting signals on this question stating at one point that "Congress could reasonably have concluded that *health* standards should be subject to different criteria than safety standards," 101 S. Ct. at 2492 (1981), and at another that Congress "chose to place pre-eminent value on assuring employees a *safe and healthful* working environment, limited only by the feasibility of achieving such an environment." *Id.* at 2506 (emphasis added).

92. Section 3(8) of the Occupational Safety and Health Act, 29 U.S.C. § 653(8) (1976), defines a standard as a measure that is "reasonably necessary or appropriate" to provide safe or healthful employment. In a crucial footnote, the Court raised the issue of the use of cost-effectiveness analysis by stating that "if the use of one respirator would achieve the same reduction in health risk as the use of five, the use of five respirators was 'technologically and economically feasible,' and OSHA thus insisted on the use of five, then the 'reasonably necessary or appropriate' limitation might come into play as an additional restriction on OSHA to choose the one-respirator standard." 101 S. Ct. at 2493. There is some indication that OSHA will attempt to use cost-effectiveness analysis. See note 88 *infra* and accompanying text.

Despite these unresolved issues, the general model of decision making that emerges from the cotton dust case is virtually the same as the prebenzene model.⁹³ As before, the agency can be pictured as asking a series of questions. First, is there a significant risk of material impairment of worker health at current levels of exposure? If no, then do nothing. If yes, then determine the level at which this risk is not significant. OSHA no longer claims the authority to use a zero-risk policy at this point; instead it assesses each carcinogen or toxic substance separately, for even if there is no absolutely safe level above zero exposure, the remaining risk may or may not be significant. The determination of significant risk can be made on health grounds, without balancing costs and benefits. Consideration of economic and technological matters takes place later in the process and follows the same feasibility approach as before the benzene decision. As a result of the cotton dust decision, the present Assistant Secretary at OSHA, Thorne G. Auchter, has revised an initial plan to use cost-benefit analysis in a review of the cotton dust and lead standards.⁹⁴

Despite the victory in court, feasibility analysis has some limitations as a model for decisionmaking in occupational safety and health. The threshold test of significant risk which was imposed upon OSHA by the benzene decision is far from clear. Among the questions that must be confronted are these: (1) Does "significance" ap-

93. The Court defined "feasibility analysis" by quoting the Brief for the Respondent Unions where OSHA's procedure is defined as asking a series of questions:

First, whether the 'place of employment is unsafe — in the sense that significant risks are present and can be eliminated or lessened by a change in practices.' . . . Second, whether of the possible available correctives the Secretary had selected '*the standard . . . that is most protective.*' . . . Third, whether that standard is 'feasible.'

101 S. Ct. at 2489.

94. The Secretary of Labor, Raymond Donovan, filed a supplemental memorandum with the Supreme Court after the oral arguments had been heard in Jan., 1981. In this memorandum, he asked the Court to remand the cotton dust case so that the Secretary could explore the feasibility of using cost-benefit analysis in a review of the standard. Motion for Leave to File Supplemental Memorandum, and Supplemental Memorandum for the Federal Respondent, *Amer. Textile Manufacturers Inst. v. Donovan*, 101 S. Ct. 2478 (1978). The Court "declined to adopt" this suggestion, 101 S. Ct. at 2488. Before the Court's decision, however, Thorne G. Auchter announced a review of the lead and cotton dust standards using a three-step evaluation procedure. The first step is the determination of the significance of the risk involved. The second step is assessment of cost and the third is cost-benefit balancing under Executive Order 12,291. See 10 OCCUPATIONAL SAFETY AND HEALTH REP. (BNA) 1444 (Apr. 16, 1981). Since the cotton dust decision, Mr. Auchter has revised this evaluation procedure. The new procedure will include a demonstration of significant risk, a demonstration that the standard will actually protect workers, an assessment of the economic feasibility of the standard, and a finding of cost-effectiveness. See Shabecoff, *Safety Agency to Forgo Cost-Benefit Analysis*, N.Y. Times, July 13, 1981, at A-11, col. 1.

ply to the magnitude of the risk per individual or the magnitude of the expected outcome, that is, the number of deaths or injuries?⁹⁵ (2) Must a chemical or other hazard pose a significant risk in itself, or should the unit for regulation consist of a group of chemicals that act synergistically?⁹⁶ (3) May policy questions be cleanly separated from factual questions in assessing significance of risk?⁹⁷ (4) What should be done, if anything, about hazards that do not pass the threshold test of significant risk but can be eliminated or greatly reduced at little or no cost?⁹⁸

The notion of feasibility, that provides the equivalent of a cost constraint in this approach, is also far from clear. How seriously must an industry be harmed before a standard is no longer economically feasible? Are there criteria for feasibility that impose an effective constraint on the agency? Beyond these questions of clarity, the idea that no trade-offs are allowed in particular cases raises questions of balance. For example, when several toxic substances are used in the same industry it may be economically feasible to control each substance individually, but not all at the same time. Surely some trade-offs would have to be made in instances like this.⁹⁹ The lack of clarity in the concept of feasibility and the likely need to balance costs and benefits in particular rule-making cases may lead to a situation in which balancing judgments are in fact made, but are publicly justified in terms of feasibility.

There is still, therefore, a pressing need for principles that will help to make these balancing judgments. This does not mean,

95. In Justice Stevens' opinion in the benzene case, he argued that a risk of one in a billion is clearly not significant, while a risk of one in a thousand is. *Industrial Union Dept. A.F.L.-C.I.O. v. Amer. Petroleum Inst.*, 100 S. Ct. 2844, 2871 (majority opinion). This suggests that OSHA should determine some probability of harm, say one in half a million, as a cut-off and regulate only risks greater than that.

96. For a discussion of the OSHA cancer policy see 45 Fed. Reg. 5,002 (1980).

97. See Cornfield, *Carcinogenic Risk Assessment*, 198 SCIENCE 693 (1977). He correctly identifies some policy issues in the assessment of the magnitude of the risk of cancer at low levels of exposure. This makes it unlikely that a clean division can be made between a factual assessment of the size of a risk and a policy determination of its significance. In this regard, though, Richard DiSilva makes the useful distinction between policy decisions on how to assess the size of a risk when data or adequate theories are lacking and the essentially normative determination of the acceptability of risk. DiSilva, *Cost-Benefit Analysis for Standards Regulating Toxic Substances Under the Occupational Safety & Health Act: American Petroleum v. OSHA*, 60 B.U. L. REV. 115, 135 (1980).

98. See *The Supreme Court, 1979 Term*, 94 HARV. L. REV. 242 (1980). The idea that risks with no benefits and easily avoidable risks should be eliminated regardless of their size is a staple of the risk assessment literature. See, e.g., Comar, *Risk: A Pragmatic De Minimis Approach*, 203 SCIENCE 319 (1979).

99. This objection to feasibility analysis is made by Page & Robbins, *Cost-Benefit Analysis*, in RECENT ADVANCES IN OCCUPATIONAL HEALTH (J.C. McDonald ed. 1981).

however, that formal cost-benefit analysis is the most desirable approach. The use of economic information is absolutely essential in the occupational safety and health area, and cost-benefit criteria can be useful in assessing the effect of standards on economic efficiency. But cost-benefit analysis does not provide a proper framework for balancing all the relevant values that have to be taken into consideration in setting health and safety standards. It is crucial to recognize, then, that not all balancing need be based exclusively on cost-benefit comparisons. A distinction must be drawn between justifying a level of effort in an occupational safety and health program on the basis of a comparison of the monetary value of the associated costs and benefits, and justifying such a program by weighing the reasons for and against it and deciding that, all things considered, the level of effort in the program is worthwhile. The first method is simply the cost-benefit approach and in effect treats efficiency as the only, or the most important, consideration. The second method considers efficiency, and might sometimes give it pride of place, but also considers individual rights, justice, and competing public values as reasons for or against a level of effort in a program.¹⁰⁰ In the first case, the basis of decision is already given, and the crucial questions are technical. In the second case, most of the technical questions remain, although some are less urgent (for example, the monetary value of safety), but the bases for decision making are unclear. It is here that much further work needs to be done.

VI. CONCLUSION

By calling attention to the fact that occupational safety and health is one of many desirable goals of public policy, proponents of cost-benefit analysis have opened the door for integrating job safety into the framework of a coherent, overall industrial policy. However, the cost-benefit approach and the cost-containment strategies discussed earlier are inherently unable to incorporate all the considerations relevant to occupational safety and health. Risk-averse strategies and feasibility analysis are also incomplete. In formulating a new approach to occupational safety and health policy within an industrial policy framework, the conceptual and normative issues raised earlier cannot be ignored. Hazards in the workplace do not merely increase

100. For a discussion of the importance of weighing competing values, as opposed to simply comparing costs and benefits, see Vaupel, *The Benefits of Health and Safety Regulation*, in *THE BENEFITS OF HEALTH AND SAFETY REGULATION* (A. Ferguson and E.P. LeVeene eds. 1981); Singer, *supra* note 53.

the chances of injury for individuals—they also increase the overall toll of injury and illness for the nation. Moreover, workplace risks are fundamentally different from the voluntarily assumed risks of everyday life because they do not typically challenge the skills of those who must withstand them, they are rarely intrinsically enjoyable or symbolically important, and they normally involve a conflict of interest between labor and management characterized by imbalances of power, information, and mobility. Finally, the distribution of occupational risks among individuals and groups is arbitrarily unequal.

These points suggest that safety on the job is a matter of community interest, not individual discretion, and they lead to several normative guidelines for collective action. First, there is a need to preserve people's rights to protection against unreasonable health threats while they are earning their livelihood. Second, efforts should be made to achieve a more equitable distribution of the occupational risks that cannot be easily eliminated. Finally, social action is required to realize widely shared public values, such as the conviction that conditions of work should reflect a concern and respect for workers' dignity and autonomy, that lie behind the group interest in workplace safety. Although these normative considerations do not determine an overall level of effort, much less the details of particular regulatory actions, their neglect by decisionmakers will inevitably lead to an impoverished occupational safety and health policy.