

# The Evolution of Fetal Protection Policies

Marjorie E. Starrels

*University of Michigan*

**ABSTRACT:** This article examines the evolution of fetal protection policies (FPPs) by detailing their historical legacy and a range of contemporary social forces that have contributed to their maintenance. It is based on a case study of the 1977 U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) hearings to revise the industrial lead standard, the 1991 U.S. Supreme Court decision that such policies are unconstitutional (*United Auto Workers v. Johnson Controls*, 1991), and the case law preceding that decision. A primary issue is the notion that women and fetuses are disproportionately susceptible to lead. This study reveals the ways in which this belief is framed, disputed, and appropriated by various parties to the fetal protection policy debate. Implications of this case study for family health policy are also discussed.

**KEY WORDS:** employment discrimination, exclusionary policies, gender roles, occupational health, occupational segregation.

## Introduction

In March 1991, the U.S. Supreme Court announced its decision in *United Auto Workers v. Johnson Controls*, a landmark case for gender equality. Reversing lower court decisions, the U.S. Supreme Court held that gender-based fetal protection policies (FPPs) on the part of employers are unconstitutional. Such policies have excluded women for many years from production jobs in lead industries such as automobile battery manufacturing and smelting unless they could demonstrate infertility. Companies argued that FPPs were necessary to protect the health of any fetus a female worker might conceive. Johnson

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Marjorie Starrels is a Lecturer at The University of Michigan, Department of Sociology, 3012 LS&A Bldg., Ann Arbor, MI 48109-1382. Her research interests include work-family linkages, intergenerational relations, and caregiving across the life course. She received her Ph.D. from The University of Pennsylvania. She gratefully acknowledges Tadlock Cowan and Beth Anne Shelton for helpful comments and Marc Hallee for research assistance.

Controls is far from alone in implementing exclusionary policies. Many large companies, including General Motors, Gulf, Dow, and Du Pont, adopted FPPs for women even though such policies deprived women of millions of jobs, often on the basis of inconclusive information, faulty assumptions about female frailty and fetal vulnerability, and disregard for sterility and birth defects caused by exposure of males to lead (Bertin, 1989).

Protection of this sort has far-reaching practical as well as legal consequences. The primary legal effect of case law upholding such policies was to "cut the heart out of Title VII [of the Civil Rights Act of 1964] and out of the Pregnancy Discrimination Act [of 1978]" (Marcus, 1990). In addition, some experts have argued that FPPs violate the equal protection clause of the U.S. Constitution's Fifth Amendment on the grounds that exclusion of women of childbearing capacity is drastically underinclusive and overinclusive. It is overinclusive in that some women do not want children, are unable to have them, postpone childbearing, or would terminate a pregnancy by abortion. It is underinclusive because it did not consider adverse effects on male reproductive capacity (U.S. Department of Labor [USDOL], 1977, pp. 11, 13 [Exhibit 148]).<sup>1</sup> Furthermore, FPPs treated female employees as a class rather than as individuals. The treatment of women as a sexual class is a major, long-standing source of gender bias in judicial decisions (Eisenstein, 1979). Some have argued that special treatment for women infringes on their economic rights and sets them apart as a separate, inferior class.

The practical consequences of FPPs included protecting women *out of* some relatively secure, high-paying jobs in predominantly male sectors of the economy—to "sanction the resegregation of the work force" so that "women will end up in the jobs where they began before Title VII was passed" (Marcus, 1990). An even more dramatic effect of FPPs was that many female employees were sterilized so they could retain or secure employment in the lead industry. After the Occupational Safety and Health Administration (OSHA) revised the lead standard in 1978, industries that exposed workers to lead increasingly denied jobs to women unless they could furnish proof of infertility (Richardson, 1981). A well-publicized series of sterilizations occurred in 1979. Four female employees of American Cyanamid in West Virginia were sterilized after a company official implied that the surgery might help save their jobs. Eight women were informed of their imminent transfer to other jobs because of potential hazards to a fetus. They were to receive their current salaries for ninety days ("Four Women," 1979).

The decision in *United Auto Workers v. Johnson Controls* (1991) re-affirmed and extended the government's commitment to gender equality in the workplace. Such principles are articulated in Title VII of the Civil Rights Act of 1964 (Title VII) as amended by the 1978 Pregnancy Discrimination Act. Because no justices dissented from the majority opinion, however, one wonders why FPPs were practiced with impunity and upheld by the courts for so long. If the decision rested on issues about which legal scholars might reasonably disagree, one would expect such ambiguity to be reflected in the *United Auto Workers v. Johnson Controls* decision. This article argues that FPPs survived in the United States for many years because of a historical legacy reinforced by continued social, political, and economic legitimation. It analyzes the 1977 OSHA hearings to revise the industrial lead standard, situates them within a particular historical and legal context, and details a range of social forces which have contributed to the maintenance of FPPs.

### The Historical Context

Sex-specific exclusionary policies have been around for about a century. Protective labor laws were enacted in the nineteenth and early twentieth centuries (see Kenen, 1993). They included laws to protect women from long hours, night work, physically taxing work such as heavy lifting and bartending. The four main types of protective laws regulated minimum wages, working conditions, hours, and type of occupation (Conlin, 1975). Paradoxically, protective laws were not always in the best interests of the women they were designed to serve. Rather, they were often based on ideological assumptions that made them appear reasonable and necessary. As Lichtman<sup>2</sup> suggested, much of this legislation was enacted to protect women who were considered to be fragile and in need of the state's intervention. Protective legislation implies, however, that women cannot care for themselves (Chafe, 1972). Thus the legal codification of protection for women is based on the notion that women are more fragile and susceptible to a whole host of dangers than men. Moreover, earlier protective laws, like FPPs, often operated to oppress women economically (USDL, 1977, p. 3 [Ex. 148]).

Moreover, protective laws were frequently applied only to women even though they would have benefits for male health as well. Many scholars believe that although some protective laws were reasonable, necessary, and, therefore, beneficial to women, a sizable proportion

were arbitrary, discriminatory, ideological, and constraining for women. Justice Felix Frankfurter of the U.S. Supreme Court and other early proponents of protective laws for women recognized that both genders needed protection and that the ultimate goal of these laws was to regulate industry to protect all workers. Justice Frankfurter argued that men and women needed protection in different degrees, a view consistent with the treatment of women as a class (Hill, 1979). As one might expect, the belief in greater female susceptibility is mirrored in *United Auto Workers v. Johnson Controls* (1991) as well as in debates regarding the 1978 revision of the lead standard. Both are rooted in age-old notions regarding the characteristics and proper functions of women and men.

Another assumption that informed many judicial pronouncements on protective policies was that female anatomy and resultant social roles create economic dependency for all women.<sup>3</sup> Not surprisingly, this rationale was also given for FPPs. This belief is inconsistent with the fact that most working women during the 1920s were sole supporters of themselves, their children, or their families (Hill, 1979). In more recent decades, many women subjected to FPPs either did not want children or had already completed their families. Lundquist argued that single mothers without child support payments from any source "desperately need the higher paying jobs to be found in factories either because of the pay or because of the hours of work" (USDL, 1977, pp. 4515-4516). Because of their economic and caregiving responsibilities, single mothers needed good jobs as much as if not more than fathers. After divorce, men's financial status increases an average of 200%, while women's and children's status decreases about 48% (Weitzman & Dixon, 1983). Furthermore, women remarry less often and later than men.

*Goesaert v. Cleary* (1947) reflects some of the more ideologically based gender role assumptions underlying protection. The court ruled that women could not be bartenders unless they owned the bar or were related to the owner. The key rationale was "moral and social problems" that developed when women tended bar, although these problems were vaguely defined. The court formed its conclusions without any proof or specific allegations regarding the existence of such problems. Moreover, affidavits of barmaids alleged that they had not experienced any such incidents while they tended bar (ranging from four to seventeen years) (Babcock, Freedman, Norton, & Ross, 1975).

A law that generally excluded women from bartending could be construed as blaming or penalizing the victim rather than the perpetra-

tor of antisocial behavior. This method of correcting the "social problem" was to protect barmaids (thereby depriving them of their jobs) rather than to penalize customers who acted disreputably (Babcock et al., 1975). In a later case (*Dothard v. Rawlinson*, 1977), the U.S. Supreme Court excluded women from jobs as prison guards because of the risk of rape from male inmates, even though male guards were also vulnerable to assault.

Some witnesses in the OSHA hearings noted similarities between FPPs and earlier protective laws. Miller and Madar noted "a clear parallel between the paternalistic state protective laws . . . and the present widespread practice of restricting women from jobs involving exposure to lead" (OSHA, 1977, pp. 1138, 4728-4729). Rosen agreed that women have been excluded from certain jobs because of paternalistic attitudes on the part of employers and labor unions. Although Hawes approved of protective laws, she disapproved of "the way protective legislation, including the OSH Act, can be used as a battering ram to divide women against men" (USDOL, 1977, p. 6743). Notwithstanding the similarities between FPPs and their legal predecessors, they may be distinguished according to their rationales. Although FPPs were often legitimated by scientific evidence, protective laws that regulated occupations such as bartending typically emphasized moral considerations. Thus there has been a clear discursive shift from a moral to a scientific rhetoric of exclusion.

FPPs are contemporary examples of a long-standing trend to exclude women from certain occupations. The rationales and economic consequences of FPPs are similar to those in earlier protective laws. The most dominant legitimations were that females are frail or more susceptible to a host of workplace dangers and that women were relatively marginal to the labor force because of their normative economic dependence on men. An important distinction, however, is that FPPs relied exclusively on scientific argument whereas protective laws often cited moral considerations (see Starrels, 1994, for a detailed discussion of various types of legitimation).

### Legal Challenges

A series of legal decisions, culminating in *United Auto Workers v. Johnson Controls* (1991), declared that protective laws were discriminatory. In 1969, the Equal Employment Opportunity Commission (EEOC) issued a guideline on protective labor laws which stated that

they "tend to discriminate rather than protect" and they "conflict with Title VII of the Civil Rights Act of 1964" (EEOC, 1969). Additionally, EEOC claimed that the bona fide occupational qualification (BFOQ) defense of employers to charges of employment discrimination under Title VII may not include state protective laws because such laws conflict with Title VII. A BFOQ is a condition "reasonably necessary to the normal operation of that particular business." The second major defense to Title VII, that of business necessity, holds that production of a product safely and in conformity with the law is an acceptable business purpose. But to manufacture a product in an atmosphere that the employer has itself deemed unsafe for nearly half the workforce cannot constitute a business necessity (Trebilcock, 1978).

A 1972 amendment to EEOC's guidelines invalidated laws that prohibited employment before and after childbirth (Babcock et al., 1975). The 1978 Pregnancy Discrimination Act further barred employers from discriminating against women on the basis of their reproductive status. By allowing reproduction and production to be complementary rather than mutually exclusive for women, the act marked a fundamental gain in reproductive freedom. In its 1978 revised lead standard, OSHA discouraged exclusionary policies because the removal of females from the workplace, when fertile females and males were equally at risk, constitutes disparate treatment based on sex, a violation of Title VII. Even where a specific toxin does not pose equivalent risks to male and female reproduction, it is still a Title VII violation if the employer "protects" members of only one sex through exclusion. Indeed, the EEOC had suggested through guidelines and decisions that such practices violated Title VII. It also recommended narrow interpretation of the BFOQ.

In *United Auto Workers v. Johnson Controls* (1991), the U.S. Supreme Court held that FPPs violate Title VII because they were facially discriminatory rather than facially neutral, as the appellate court had ruled, because they did not apply similarly to males and females, despite evidence that lead has debilitating effects on the male reproductive system. Since FPPs involve disparate treatment through explicit facial discrimination, the business necessity and its shifting of the burden of proof to the plaintiff, required by *Wards Cove Packing Co. v. Antonio* (1989), were held to be inapplicable. And although in *United Auto Workers v. Johnson Controls* (1991) Johnson Controls also argued that a safety requirement for its employees constituted a BFOQ, the court ruled that the safety exception is limited to instances in which sex or pregnancy actually interferes with the

employee's ability to perform job-related activities that are essential to that business. The unconceived fetuses of respondent's female employees are neither customers nor third parties whose safety is essential to the business of battery manufacturing. Moreover, the incremental cost of employing members of one sex cannot justify a discriminatory refusal to hire members of that gender (*United Auto Workers v. Johnson Controls*, 1991, pp. II & III). Neither could Johnson Controls claim a BFOQ owing to concern about the welfare of the next generation and the potential for lawsuits. Title VII mandates that decisions about the welfare of future children be left to parents. If "Title VII bans sex-specific fetal-protection policies, the employer fully informs the woman of the risk, and the employer has not acted negligently, the basis for holding an employer liable seems remote at best" (*United Auto Workers v. Johnson Controls*, 1991, p. III).

Some experts have also claimed that FPPs violated the equal protection clause of the Fifth Amendment because exclusion of women of childbearing capacity is drastically underinclusive and overinclusive. It is overinclusive in that some women do not want children, are unable to have them, postpone childbearing, or would terminate a pregnancy by abortion. It is underinclusive in that it does not consider adverse effects on male reproductive capacity (USDL, 1977, pp. 11, 13 [Ex. 148]). In addition, Lichtman argued that requiring evidence of sterility is both socially unconscionable and a direct invasion of privacy rights (USDL, 1977, p. 14 [Ex. 148]). Miller claimed that it is particularly burdensome in cases in which a woman supports her family herself, has voluntarily finished childbearing, has an intrauterine device or takes birth control pills, and wishes to work in a smelter that is the only major employer in her area (USDL, 1977, pp. 4730-4731).

Given the accumulation of countervailing argument, policy, and legal precedent, many find it extraordinary that FPPs were not outlawed until 1991. Yet the case law that preceded the U.S. Supreme Court decision reflected marked judicial ambivalence. For example, a case regarding lead exposure, *Oil, Chemical, and Atomic Workers International Union v. American Cyanamid Co.* (1984), was lost in the court of appeals. Judge Robert Bork's opinion stated that the women's decision to be sterilized was an "employee reaction to the employer policy" for which the company could not be held liable. In *United Auto Workers v. Johnson Controls* (1991), the appellate court upheld FPPs for two reasons. First, it ruled that infertility could legitimately be construed to be a BFOQ. Second, despite the lack of legal precedent,

corporate fear of lawsuits from persons exposed to lead in utero was held to be justifiable. California ruled similarly, in *Johnson Controls v. California Fair Employment and Housing Commission* (1990), that excluding fertile women was necessary, especially when employees failed to prove availability of less discriminatory alternatives. In addition, Title VII was weakened by the U.S. Supreme Court's decision to increase employees' burden of proof in disparate-impact cases (see above, *Wards Cove Packing Co. v. Antonio*, 1989).

The Occupational Safety and Health Act of 1970 (OSHAct), of which the lead standard is a part, also formed the basis for another important legal challenge to FPPs. That is, some experts argued that a worker's right to a safe and healthful workplace is guaranteed by the OSHAct. This act (which applies to the reproductive systems of both women and men) assures that insofar as practicable, "no employee will suffer diminished health, functional capacity, or life expectancy as a result of his [or her] work experience" (USDL, 1977, p. 1142). Many witnesses (e.g., Madar, Lichtman, Hawes, Rosen, Woodcock) maintained that the lead standard must protect all workers, regardless of gender, reproductive capacity, or intent (USDL, 1977, p. 6751; 5906; p. 9 [Ex. 71]; pp. 2, 4, 5, 6 [Ex. 148]; p. 22 [Ex. 171]). According to Madar, "carving out a huge sector of the workforce from OSHA's protection contradicts that goal of Congress" (USDL, 1977, p. 1142). Many held that coercing sterilization, requiring proof of infertility, reducing wages, raising the possibility of job loss, and thereby making it difficult for workers to engage in production as well as healthy reproduction violated workers' rights to reproductive freedom.

Furthermore, the act places the burden of providing a safe workplace on the employer. Yet a policy of excluding fertile women shifts that burden to employees at the expense of their jobs. The act also prohibits discharge of or discrimination against workers who speak out against health and safety problems in their plants. Within the context of FPPs, however, Madar suggested that a fertile worker could not freely complain about excess lead exposure if she could lose her job should overexposure be proven (USDL, 1977, p. 1142).

Several key judicial precedents reflect a conservative trend in the courts before the U.S. Supreme Court decision. As argued in the conclusion of this article, these legal disputes and trajectories are particularly relevant today because of the widespread Republican victories in the 1994 elections. In the next section, the social and economic underpinnings of FPPs will be examined more fully. These social forces, viewed within their legal context, help to explain why FPPs were practiced with impunity until 1991.



## The Social and Economic Context

Overall, protective laws for women are problematic in three primary respects. First, some women do not require them. Second, many men would also benefit from them. Third, gender-defined protective laws easily become a basis for exclusion (Hill, 1979). The lead industry is a prime example of these issues. Women are not equally susceptible to the hazards of lead, men as well as women are vulnerable, and the policies have resulted in exclusion of women. Therefore, it is important to attempt to understand why protective laws held sway for so long. This article argues that a dual labor market, economic utility, and demographic conditions regarding work and family roles were largely responsible for the maintenance of FPPs.

### *The Dual Labor Market*

The dual labor market is defined as a labor market in which many occupations are labeled as male or female. This market may help to explain why FPPs were adopted in some workplaces but not others (see also Draper, 1993). Many scholars view protective laws as partially if not totally motivated by desires to keep women out of men's jobs. In addition, protective laws were good examples of how employers, dictated by considerations of managerial convenience, could turn workplace problems into problems with specific workers. Blaming the victim does indeed justify the status quo. If women are naturally handicapped, less than equal workers, then occupational segregation is natural, not the contrivance of discriminatory employment practices (Kaminer, 1990).

Exclusionary policies were used increasingly by unions to keep women out of men's jobs (Babcock et al., 1975). Both FPPs and earlier protective laws were applied selectively to male-dominated jobs. The premise of occupational segregation (or dual labor market) theory is that women are excluded from better jobs reserved for men and are therefore crowded into the few jobs that men do not want (Blumrosen, 1980). Women have been excluded from higher-paying jobs such as those involving night work and lifting heavy weights (Chavkin, 1979). In the United States, job segregation by gender began in the nineteenth century in the New England mills.

Evidence indicates that industrial jobs closed to women paid higher wages than traditionally female jobs with similar hazards that were not closed to women. For example, FPPs were prevalent in predominantly male industries that exposed workers to lead, benzene, zinc,

and microchips, but there were no exclusionary policies regarding reproductive hazards from x-rays, anesthetic gases, and video display terminals (VDTs) (Bell, 1979; Chavkin, 1979; Meier, 1987; Petchesky, 1979; Wright, 1979). In 1978, OSHA mandated lower levels of waste gas in operating rooms so that no exposed female employees would be forced to choose between sterilization and job loss. Similarly, the nation's first law regulating VDTs was signed in 1990.

Similar concerns for female workers at the Harris Semiconductor plant are also consistent with a dual labor market explanation of FPPs. After a 1986 study found increased miscarriage rates among wafer fabrication workers who mass produce microchips at Digital Equipment Corporation, Harris compared three groups of female workers at the plant—those in fabrication areas with chemicals, those in nonfabrication areas with chemicals, and those who work with neither. Researchers found that a small group of female engineers had a higher rate of miscarriages than other female workers or the general population. Their failure to study male workers or partners of female workers, notwithstanding evidence of male reproductive hazards in *United Auto Workers v. Johnson Controls* (1991) and other cases, is logically consistent with occupational segregation theory.

### *Economic Cost-Benefit*

In addition to maintaining job segregation, FPPs have also satisfied corporate needs for a reserve army of labor (generally composed of women and minorities). Frequently, women are part of a reserve labor force that will work in a less permanent fashion and for lower wages than men. A market economy seeks growth of production, which in turn depends upon adequate resources, cost-trimming practices by management, technological innovation, sales, and profits (Felker, 1982). Adequate resources include a ready supply of wage laborers, while cost-trimming practices include the lowest expenditures on wages and occupational safety.

Industries also contain costs when they minimize safety hazards, pay very low fines to OSHA, and pay an occasional lawsuit won by an injured or diseased worker. Thus an economic cost-benefit analysis of corporate investments in a safe workplace suggests that significant efforts to improve working conditions may not always be financially prudent. Many industries, however, were reluctant to risk a third-party lawsuit by an injured child. To some analysts, "the real villain

of this story is the tort liability system with its excessive payments based on what often appears to be the whim of the juries involved" (Richardson, 1981).

### *Work and Family Roles*

Demographic factors related to women's and men's work and family roles have also contributed to shifting views of FPPs. Although protective policies have been challenged for nearly a century, the intensity and outcome of these debates have varied widely. Recent legal evaluations of FPPs may have been partially influenced by changing demographics as well as shifting currents of cultural sentiment (see Starrels, 1994, for an analysis of various social definitions of conflict that are relevant to FPPs).<sup>4</sup> There have been dramatic changes regarding marriage, divorce, fertility, and labor force participation. Specifically, many Americans have been postponing childbearing and having fewer children. There are fewer traditional, two-parent families, and more adults live in households and raise children without a spouse or partner present. In addition, women rapidly entered the labor force during the past two decades. Thus we have witnessed marked alterations in women's relative involvement in employment and family roles. Concomitantly, the view that marriage and childbearing may not be the primary goals for all women has been gaining greater acceptance.

These social forces challenge one of the dominant assumptions undergirding FPPs—that it is appropriate to define work and family roles differently for men and women. Thus they reinforce legal and moral arguments that FPPs are unfair and discriminatory. Furthermore, lower court decisions in *United Auto Workers v. Johnson Controls* (1991) may represent backlash strategies frequently evident during periods of economic transition and changing social roles. It is probably not accidental that traditional gender roles are fostered during times of high unemployment and economic crisis. Nor is it coincidental that heightened pressures toward traditionalism occur at a time of rising female reproductive and economic independence as well as more prevalent worker struggles for occupational safety (Felker, 1982).

At a broader level, FPPs are consistent with several assumptions regarding the proper roles for men and women: (a) particular occupations are differentially suitable for females and males; (b) females require more protection than men; and (c) reproduction is mainly a fe-

male function. At a policy level, these notions help to explain the intense corporate concern about third-party lawsuits. Although officials cited such lawsuits as a primary reason for excluding women, this concern presupposes that children of female workers are more likely to sue than children of male workers.

The social and economic underpinnings of FPPs, viewed within their legal context, help to explain why FPPs were practiced with impunity until 1991. The following case study of the OSHA lead hearings presents scientific evidence regarding female, male, and fetal susceptibility to lead. Moreover, it explores the ways in which such evidence may be appropriated or used by industrial and other organizations to serve specific socioeconomic goals including those discussed previously (e.g., maintaining a dual labor market, realizing economic profit, and preserving a good corporate image by avoiding third-party lawsuits).

### **Case Study of the OSHA Hearings**

This case study analyzes expert testimony from the 1977 OSHA hearings to revise the lead standard. In particular, it examines the ways in which expert testimony supports or resonates with the historical, social, and economic themes discussed previously.

#### *Scope and Consequences of FPPs*

Many witnesses reported cases of exclusion, some linked directly to exclusionary policies and others the result of more informal practices. Because of the possibility of fetal intoxication, Ryer stated that a number of companies considered banning women from jobs in plant areas where they could be exposed to lead (USDL, 1977, pp. 6080–6081). According to Lundquist, physicians opposed employment of fertile women except in work involving solely solid metal, thereby demonstrating their preference not to expose fetuses to lead (USDL, 1977, p. 5 [Ex. 151]). Lorio would not endorse use of women workers in the production area, especially those of childbearing age, regardless of contraceptive measures they might have taken (USDL, 1977, p. 2833).

Four companies (General Motors, Bunker Hill, ASARCO, and AMAX) claimed that they did not place women in production areas and unequivocally stated their concern for fetuses. Six others (Pres-

tolite, General Battery, National Lead Plant, Bell Battery, East Helena, and Perth Amboy) banned females from heavily leaded production areas in practice but did not acknowledge having an exclusionary policy. At one plant, only two people had ever had blood lead levels over 80 milligrams. Miller claimed that "irrespective of this and despite the lack of any concrete evidence of harm to a fetus at such levels of exposure, the company has barred any fertile woman from keeping a job inside the smelter" (USDL, 1977, p. 4732). Prestolite considered such a policy, East Helena was unclear as to its rationale for placement, and Bell excluded women because it was too small to invest financially in separate facilities for female employees. Finally, three plants (KW, Hamburg, and Reading) demonstrated no gender restrictions.

Sullivan, a lead worker at Bunker Hill, confirmed that the smelter required proof of infertility.<sup>5</sup> Similarly, General Motors placed females in occupations with lead exposure only if they were postmenopausal or provided evidence of tubal ligation or hysterectomy and, in the opinion of the plant physician, were incapable of conception (USDL, 1977, p. 5 [Ex. 225, Attachment A]). This bilevel screening process—requiring outside evidence to be corroborated by corporate personnel—permitted a notable degree of discretion in decisions regarding whether a woman was reproductively capable. Clearly, companies varied considerably with regard to various dimensions of FPPs—their existence, acknowledgment by corporate representatives, justifications, extent, and practical implications. Most companies did implement FPPs, and some imposed sterility requirements on female workers.

### *The OSHA Lead Standard*

In 1975, OSHA proposed a rule to modify the standard for industrial lead exposure to 100 micrograms per cubic meter and to provide for environmental monitoring, medical surveillance, employee training, and other protective measures. It requested submission of written comments, data, and opinions (USDL, 1978b, p. 52953). In 1977, OSHA announced the availability of technological feasibility and economic impact statements and gave notice of an informal hearing to begin in Washington, D.C., on March 15, 1977. Two regional hearings were also scheduled to begin in April and May. During the seven-week Washington hearings, OSHA presented fifteen expert witnesses. National Institute of Occupational Safety and Health (NIOSH) and approximately fifty public participants also testified. Public parties

also testified in the regional hearings, nine in St. Louis and thirteen in San Francisco. The record was reopened from November to December to hear additional evidence on medical removal protection (USDL, 1978b, p. 52953).

The preamble to the proposal indicates that OSHA intended to set a standard applicable to all workers. Yet it permitted 100 micrograms/m<sup>3</sup> of lead, which some considered to be unsafe. Therefore, many civil rights, public health, and feminist groups mobilized around this issue during the hearings. The testimony set forth conflicting views on how much lead in the ambient air environment can be safely withstood by workers without clinical or subclinical symptoms. Opinions also varied with regard to the hazards of lead and the best medical and employment policies for industry and government to adopt. The testimony extensively addressed reproductive hazards.

One of the key issues was that some companies have been reluctant to hire fertile women for jobs involving substantial exposure to lead. They were concerned that these women could become sterile, miscarry, or bear defective offspring. Some officials warned their fertile female employees of the reproductive hazards of lead, suggested they undergo sterilization procedures, or transferred them to lower-paying jobs with less exposure. On the basis of previous studies, OSHA proposed before the hearings that pregnant women should perhaps be considered an especially susceptible group of employees: "Pregnant employees and their fetuses, as well as employees with the sickle cell trait,<sup>6</sup> may have increased susceptibility to lead" (USDL, 1975, App. A, p. 45947).<sup>7</sup> OSHA argued that a child born to a lead-exposed parent of either gender is more likely to have birth defects or behavioral disorders, to be mentally retarded, or to die within the first year of life (USDL, 1978b, p. 52954).

OSHA's proposal clearly reflects a gender bias. Although it states that children "born to a lead-exposed parent of either gender" are at risk, it claims that the only susceptible groups are pregnant employees and fetuses. Men are characteristically omitted from the prevailing definition of susceptibility. Although the definer in this case was OSIIA, several expert witnesses echoed this view. Thus a major purpose of the hearings was to determine if, and to what extent, certain groups were especially susceptible to lead. A related goal was to ascertain how any finding of greater susceptibility should affect the lead standard (USDL, 1975, p. 45934). Five potential policies were that fertile women might (a) not be hired; (b) be removed from jobs with high levels of exposure; (c) be transferred to less reproductively hazardous jobs in the same industry without a reduction in wages or

loss of seniority and other benefits; (d) participate in a medical surveillance program with mandatory or voluntary pregnancy testing; and/or (e) contribute to the formation of separate standards for exposure to lead—a lower one for women and a higher one for men.

Eleven industries or trade associations claimed that they would use a finding of greater susceptibility to exclude women of childbearing age (or another subclass of women) from jobs with heavy lead exposure or to set separate standards for males and females. Spokespersons from labor, feminist, medical rights, public health, industrial hygiene, and government groups opposed exclusion and recommended a joint yet higher standard that would be safe for all workers, fetuses, and children. They also advocated a medical removal program with the option to transfer to another job without a reduction in wages.

OSHA's final standard mandated  $50 \text{ mg/m}^3$ , a lower level of exposure, although many civil rights advocates believed this was not low enough sufficiently to protect women's and men's reproductive health (USDL, 1978b, pp. 52959–52960, 52965–52967). The standard included provisions for environmental monitoring, record-keeping, employee education and training, medical surveillance, medical removal protection, hygiene facilities, and other practices (USDL, 1978b, p. 52952). In particular, it permitted paid removal upon medical advice for up to eighteen months. Pregnant employees as well as women and men planning to conceive were eligible for removal (USDL, 1978b, pp. 52974, 52976).

Following is an analysis of the testimony relevant to the historical, social, and economic themes discussed previously. In particular, it presents evidence regarding female, male, and fetal susceptibility. Moreover, it explores the ways in which such evidence may have been appropriated or used by industrial and other organizations to serve specific social and economic goals.

### *Female Susceptibility*

The proposed rule suggested that females may be more susceptible than men to lead. It claimed that a particularly susceptible group was female employees of childbearing age. This statement is based on evidence that lead absorbed into the bloodstream of pregnant women crosses the placental barrier and enters the blood of the fetus (USDL, 1975, p. 45936). Many witnesses shared this view, although protection of women from lead contradicts a U.S. Supreme Court case, *U.S. v. Darby* (1941), which explicitly approved protection for both sexes.

Consistent with *U.S. v. Darby*, many witnesses claimed that exclu-

sionary practices were discriminatory even if well-intentioned. Many also argued that OSHA's definition of female susceptibility was improper, imprecise, overinclusive, and underinclusive. Several criticized the language of the notice, which describes the at-risk population to be female employees of childbearing age. For example, Lundquist suggested a more medically precise term—fertile, gravid, or lactating women—because only women who are or plan to become pregnant or who are breast-feeding should be categorically excluded (USDL, 1977, p. 4512). Similarly, Miller argued that “fertile women should not be reckoned with as a class but should be regarded as individual human beings” (USDL, 1977, p. 4730).

Furthermore, studies suggest that females may not be more susceptible than men. According to Woodcock, animal studies have demonstrated that lead harms the reproductive health of both males and females (USDL, 1977, pp. 5041–5042). Moreover, Stellman, speaking on behalf of the Coalition for Labor Union Women, discussed a study of 150 male workers that was conducted by Lancranjan and his colleagues (1975). This study found abnormal spermatogenesis with blood lead levels below 60 milligrams, and it noted an obvious and highly significant decrease in fertile ability because of asthenospermia (decreased motility), hypospermia (decreased numbers), and especially teratospermia (malformed sperm) (USDL, 1977, pp. 1151, 1160–1161).

Arguments of female susceptibility are also based on assumptions that the lead level is similar in maternal and fetal blood and that the fetus is more susceptible. Fetal susceptibility was considered to be possible because children had increased susceptibility. Because some mothers with high blood lead levels have normal children, however, lead may not be a teratogen. In addition, according to Stellman “there is no evidence concerning effects on the fetus at low levels of exposure” (USDL, 1977, pp. 1159–1160, 4726–4727). Seven witnesses, including industry officials, concurred. Although General Motors acknowledged decreased fertility in males, it would not accept that teratogenesis (abnormal offspring) is linked to male exposure (USDL, 1977, p. 5 [Ex. 225, Att. A]) or that male and female exposure has similar consequences for fetal development (USDL, 1977, p. 6 [Ex. 225]).

Linking the current debate on female susceptibility to historical precedent, Stellman revealed that policymakers' use of “fallacious historical references” to female susceptibility and “the use of fallacious data or a biased perspective for evaluating the incidence and effect of



occupational diseases on women" has been a long-standing practice (USDL, 1977, p. 1155). The work of Thomas Oliver in 1902, for example, "which continues to make its way into the literature with persistent doggedness," states that "females contract lead poisoning more readily, the symptoms are usually more acute, they suffer more severely and succumb to it more quickly than males" (USDL, 1977, p. 1155). Oliver claimed that lead is a teratogen that affects women between the ages of 18 and 23 mainly during periods such as adolescence and pregnancy (USDL, 1977, p. 1158). Baetter (1946), however, could not locate convincing evidence that women were more susceptible than men. Rather, the notion arose largely from repeated quoting in the literature of statements made by one or two industrial health authorities. In many cases, arguments were based solely on personal opinion (USDL, 1977, p. 1155).

In sum, divergent views on susceptibility seem to be based on two conditions—first, insufficient scientific attention to the effects of lead on males, and second, improper interpretation of studies. Madar claimed that FPPs rested on conclusions falsely drawn from fragmentary scientific work on the effects of low levels of lead exposure (USDL, 1977, pp. 1133–1134). Moreover, these conditions have important implications regarding possible motives for FPPs. If fetal health was the overriding concern, it is curious that males would not have been studied systematically. Dr. Bridbord from NIOSH confirmed that not a great deal of work had been done to define who is susceptible.

Inadequate research could signify industrial and/or scientific resistance to the possibility that male exposure could contribute to birth defects. Although reduced sperm counts, male infertility, and spontaneous abortions from paternal exposure to lead are fairly well documented, many scientists do not consider birth defects to be a likely outcome of paternal exposure (Richardson, 1981). Miller claimed that they proffer this perspective despite the fact that the testes have been identified by scientists as the most sensitive organ in the body (USDL, 1977, p. 11 [Ex. 155A]). In addition, some children of male lead workers have experienced excess lead levels as well as lead poisoning.

Industrial attempts to define susceptibility were problematic for other reasons as well. Stellman claimed that groups of workers at greater risk of lead-related symptoms were many and varied, including those with renal or kidney disease, blood dyscrasias, sickle cell propensities, and cardiovascular disease (USDL, 1977, p. 1146). Dr. Epstein emphasized that "these 'sub-groups' represent an important

and large element of the total working population at risk, rather than merely a specialized, small population" (USDL, 1977, p. 14 [Ex. 68]). Bridbord similarly argued that people with certain preexisting diseases involving organ systems affected by lead should be considered potentially susceptible (USDL, 1977, pp. 1803–1804).

In addition, toxicological and epidemiological evidence suggests that workers exposed to lead who already have a lead body burden are probably more susceptible to getting one of these diseases (USDL, 1977, p. 1153). Stellman further asserted that data on subclinical effects suggest possible adverse effects of lead for all workers over and above the cited effects for "more susceptible workers" (USDL, 1977, p. 1147). Moreover, Stellman argued that stillborns, miscarriages, spontaneous abortions, and other reproductive mishaps are associated with levels of lead known to have many other toxic effects and to make nearly the whole workforce "susceptible" (USDL, 1977, p. 1159).

Therefore, many find it inappropriate to designate fertile women as more susceptible. Rather, according to Miller, susceptibility should refer exclusively to individuals with a predisposing pathology, such as kidney dysfunction or anemia, interpreted as a "decrement in health which would be exacerbated by exposure to lead. . . . The capacity to bear children would hardly fall under the heading of predisposing pathology" (USDL, 1977, p. 4727). Bridbord claimed that with regard to gender differences, NIOSH concluded that "evidence is not really clear cut that one could say that women are definitely more susceptible than men" (USDL, 1977, p. 1802). According to Lundquist, industrial hygienists also remained unconvinced that females are more susceptible (USDL, 1977, p. 4519). Indeed, the Lead Industries Association (LIA) conceded in its posthearing brief that the hearings revealed that females are not more susceptible than males. Stellman concluded that there is no scientific justification for defining all women of childbearing age as especially susceptible. "The blood levels that would probably prevent adverse effects on spermatogenesis is comparable to the level probably necessary to prevent adverse fetal development" (USDL, 1977, pp. 1161–1162).

Dr. Hunt similarly characterized the concept of increased susceptibility as inappropriate, or a "specious concern," because lead has toxic effects on biological systems according to individual dose responses. According to Hunt, persons in the labor force have heterogeneous responses that are unpredictably governed by genetic and somatic endowment (USDL, 1977, p. 660). Bridbord and Dr. Cole con-

curred that there is a wide range of individual variation in susceptibility to lead. At lower airborne lead levels, blood lead levels can range from 40 to 80 mg/100g (USDL, 1977, p. 20 [Ex. 57]). Witnesses also argued that medical and industrial notions of susceptibility may have been misguided because they focused on relative weaknesses rather than strengths. According to Miller, "our very thinking about susceptibility may be somewhat turned around. Rather than talking about certain groups or individuals as being susceptible, should we not instead describe their counterparts as being super immune" (USDL, 1977, p. 4727).

With regard to the social and economic context discussed previously, the testimony counters traditional views regarding work and family roles (i.e., occupational suitability and the need for protection). Traditional gender role conceptions suggest that women do not need well-paying jobs as much as men and that motherhood should be the paramount female role. Motherhood has been a long-standing obstacle to equality (Schwartz, 1989, discusses another example, the "mommy track"). Lichtman claimed that protective laws are discriminatory and contribute to the dual labor market. They are attempts to restrict women's employment options in certain jobs and in specific historical periods in which their services are not considered necessary or valuable.

### *Fetal Susceptibility*

Interestingly, after LIA revoked its assertion of greater female susceptibility, it shifted its attention to fetal hazards (USDL, 1978a, p. 54398). This shift in its rationale for exclusionary policies was an important turning point in the FPP controversy. Because its argument for protecting women had been successfully refuted, it needed to find another justification for excluding women. Although *United Auto Workers v. Johnson Controls* (1991) adopted the terminology *FPPs*, the hearings used the term *exclusionary policies*. Importantly, this distinction reflects a reframing of the discourse. Because the consequences for women were the same regardless of the guise under which they were excluded, it is conceivable that exclusion was the desired outcome and rationales were interchanged to achieve this end.

There was virtual consensus among expert witnesses (i.e., Epstein, Needleman, California Department of Health, Piomelli, Woodcock, Lichtman, Hunt) that a fetus is equally if not more vulnerable than adults to lead (USDL, 1977, p. 14 [Ex. 68]; p. 1 [Ex. 69]; p. 1 [Ex. 211];

p. 20 [Ex. 57]; p. 5041; p. 6 [Ex. 148]; p. 659). The margin of certainty and the extent of vulnerability became subjects of intense debate, however. Exclusion has sometimes been based on minimal evidence of high blood lead levels and potential fetal danger. In these instances, exclusion could be premature, if not totally unwarranted. Anecdotal evidence of fetal harm includes the case of one woman at the Bunker Hill smelter. After being denied a leave of absence in 1974 when she was four and a half months pregnant, she quit and had a miscarriage one week later (USDL, 1977, pp. 6128–6129).

There is not much scientific evidence on fetal hazards of lead. Scholars generally believe that a fetus, because of its rapidly developing tissue, is more susceptible to toxins than are adults. Notwithstanding the overall accuracy of this claim, it may not always be true. The Coalition of Labor Union Women (CLUW) argued that the evidence that lead is responsible for birth defects is “rather preliminary” (USDL, 1977, p. 1 [Ex. 203]). According to Miller, there is no evidence of fetal effects at low levels of exposure (USDL, 1977, p. 12 [Ex. 155A]). Furthermore, the fetus may respond differently to lead than to other toxins. Lundquist argued that “in humans, factors as yet unidentified may mediate transfer of lead across the placenta” (USDL, 1977, p. 3 [Ex. 151]).

A major issue in the FPP controversy, according to Ryer, Piomelli, and the U.S. Department of Labor, arose from evidence that the fetus is most susceptible during the first trimester, when a woman may not yet know she is pregnant (USDL, 1977, pp. 6081, 20 [Ex. 57]; USDL 1975, p. 45936). Lundquist stated that the preponderance of medical evidence suggests that fetal hazards are greatest during the first six weeks of pregnancy (USDL, 1977, p. 7 [Ex. 151]). Industrial officials have used this finding to justify exclusion of all women of childbearing age from jobs with lead exposure to prevent fetal exposure before a woman knows she is pregnant.

Yet several arguments militate against such generalizations. First, evidence for first trimester loss is based primarily on studies of acute, severe lead poisoning. Second, fetal nourishment during the first ten to twelve weeks comes primarily from endometrial decidua, not blood nutrients passed through the placenta. Therefore, cord blood, although frequently used to determine fetal lead levels, is not a sensitive indicator of a fetus's uptake of lead. Third, human teratogenic effects of lead have not been reported. Fourth, the fetus is vulnerable throughout gestation. Indeed, Stellman pointed out that a study by Barltrop (1969) found that long-term exposure leads to more serious

symptoms because the lead content of fetal tissue increases throughout pregnancy (USDL, 1977, p. 5 [Ex. 72, App. I]). Fifth, Hunt claimed that probable susceptibility of uterine musculature to lead (above 100 mg/100 ml blood) could lead to expulsive contractions (USDL, 1977, pp. 7, 9, 16 [Ex. 59]).

Finally, evidence that toxic insults to the conceptus in very early pregnancy usually have lethal effects suggests that exclusion of fertile women may be unnecessary or unjustifiable (Wolkowski-Tyl, 1980). If pregnancies are, indeed, terminated before women know they are pregnant, this should alleviate fear of third-party lawsuits (Richardson, 1981). In sum, the above evidence regarding fetal and female susceptibility suggests that exclusion of women is neither the only nor the best way to protect the unborn. Protecting fertile men and, indeed, all workers is the only way to protect all existing and potential offspring, as well as adults.

Notwithstanding the above evidence, industries felt that potential lawsuits from offspring justified FPPs. According to Bell, "we do not hire fetuses. We could get a damage suit as a result of somebody that comes up with a cleft palate developed through the lead, although it [the cleft palate] might be perfectly normal" (USDL, 1977, p. 1674). Madar argued that industrial concern about a fetus is less motivated by humanitarianism than by a fear that the fetus may be born deformed and live to sue them successfully. "As remote a possibility as that is, it weighs heavier on their minds than taking the steps necessary to prevent such harm to any of the offspring of either male or female workers by cleaning up the workplace" (USDL, 1977, p. 1137).

Others have confirmed that the potential for litigation, albeit minimal, is psychologically burdensome. "Although no lawsuit for tort liability as a result of reproductive effects on the fetus through toxic substance exposure has ever been filed, employers live in fear of such cases" (Richardson, 1981). Furthermore, attorneys have been charged with exacerbating the concerns of corporate clients. Attorneys have claimed that a *female* employee with a deformed child in arms would get millions from a sympathetic jury if there were any way that workplace exposure to a toxic substance could be linked to a tragic result (O'Leary, 1981). The image of a deformed child in front of a jury suggests that industries may worry about symbolic as well as monetary and human costs. In addition, courts have held that women are unable to sign away the right of the child to sue for occupationally caused defects (Samuelson, 1977; Stillman, 1979).

It is possible that notions of appropriate work and family roles for

men and women help to explain this corporate concern, which is highly disproportionate to the documented risk. The above attorney's reference to *female* employees reflects the inaccurate belief that females are more susceptible. According to Miller, since evidence of fetal abnormalities caused by paternal exposure is grounds for a lawsuit, a male lead worker's wife may sue on behalf of an injured child (USDL, 1977, p. 4730). Furthermore, two men have brought tort liability suits for birth defects allegedly caused by occupational exposure to toxic substances (Bureau of National Affairs, 1979a, p. 339, 1979b, p. 558).

Industrial concern over suits arising from female exposure has contributed to the exclusion of women. "Employers have chosen to exclude women where men can easily fill jobs as preferable to running even a very low risk of high penalty in a possible tort liability suit" (Richardson, 1981). When the two goals of equal opportunity and avoidance of lawsuits collide, many companies have given priority to the latter. Furthermore, some industries prefer equal employment lawsuits to damage suits from deformed children (USDL, 1977, pp. 6734-6735). For example, Varner from ASARCO stated that the company had three suits pending with EEOC for its exclusionary policies, based on the advice of its medical director (USDL, 1977, p. 6663), even though it foresaw the possibility of such suits.

### *OSHA Conclusions Regarding Susceptible Groups*

OSHA reached the following conclusions from the testimony regarding female, male, and fetal susceptibility:

Exposure to lead results in decreased libido, impotence and sterility in men and decreased fertility, abnormal menstrual and ovarian cycles in women. The course of pregnancy is adversely affected by exposure to lead. There is conclusive evidence of miscarriage and stillbirth in women who were exposed to lead or whose husbands were exposed. Children born of parents either of whom were exposed to lead are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. (USDL, 1978b, p. 52954)

Lead can cause genetic damage to both male and female germ cells (USDL, 1978b, p. 52959), and there is conclusive evidence of a dose-response relationship with respect to teratospermia (USDL, 1978a, p. 54421). Thus effects on male fertility warrant serious concern.

OSHA found little direct evidence of fetal effects yet claimed that the fetus would be at least as susceptible as children. Thus the truly

susceptible groups are fetuses and nursing infants, not all females of childbearing age. Moreover, "damage to the fetus represents impairment of the reproductive capacity of the parent and must be considered material impairment of functional capacity under the OSHAct" (USDL, 1978b, p. 52959). OSHA confirmed that the first trimester is not necessarily the period of greatest danger. Lead increasingly passes through the placental barrier from twelve to fourteen weeks through birth so the fetus is at risk throughout gestation. OSHA recommended that both males and females planning pregnancies should have blood levels below 30 mg/100 gms (USDL, 1978b, pp. 52959-52960). Transferring males and females from high-exposure areas or requiring proof of inability to reproduce is essential (USDL, 1978a, p. 54398).

### Conclusions and Policy Implications

The above discussion reveals the ways in which various historical and social forces have contributed to the maintenance of FPPs. Evidence from the OSHA hearings held before the revision of the lead standard in 1978 shows that industries legitimated FPPs in specific ways that ultimately proved to be unjustifiable. Moreover, serious legal challenges to FPPs foreshadowed the recent U.S. Supreme Court decision that FPPs are unconstitutional. It is curious that FPPs remained a trenchant social policy dilemma for such a long time. The gender division of labor in both the workplace and the family helped sustain FPPs. As this case study demonstrates, job segregation shapes the social organization of reproduction. Similarly, reproductive roles, capacity, and intent have a direct bearing upon whether women enter and remain in certain occupations. FPPs help preserve job segregation, for which several functions have been suggested. Most notably, it supports a system of economic stratification by gender. In so doing, it ensures a reserve army of female workers to fill jobs during periods of economic expansion, war, and other cyclical occurrences. Thus job segregation aids a market economy.

Several policy implications may be derived from the above case study of FPPs. First, the historical and legal transitions and trajectories evident in this case study demonstrate that family health policy often promotes the interests of some groups over and above those of other groups. Although the U.S. Supreme Court in *United Auto Workers v. Johnson Controls* advocated for workers' and their children's

health in 1991, the judicial ambivalence preceding this landmark decision may well foreshadow the next chapter in family health policy. Despite the relatively clear-cut decision forged in *United Auto Workers v. Johnson Controls* (1991), we witnessed nearly a century of discrimination in which companies practiced FPPs with impunity and courts were in conflict over their legality.

Two primary questions regarding occupational health emerge from this case study. First, to what extent will employers fulfill their responsibilities to protect the health of employees and any present or future offspring? Will employers duly accept the mandate set forth in *United Auto Workers v. Johnson Controls* (1991) and related rulings, or will they simply do business as usual and suffer whatever consequences might befall them? Second, what is the proper role of the government in enforcing occupational health laws? If fines for OSHA violations are small and inspections are infrequent, a cost-benefit analysis (see Starrels, 1994) would tend to dictate a lax corporate stance toward remedying violations of the OSHAct. Similarly, given the concern about future, third-party lawsuits detailed in the present case study, it is not unlikely that many employers will continue to opt for a discrimination suit rather than a tort injury suit from an employee's child.

A broader concern regarding occupational health policy is whether new legislation will be supported and passed by the newly elected Republican Congress. Although it is too early to predict with certainty the implications of the 1994 elections, there is reason to doubt whether the legislature will generate and embrace new laws designed fully to protect occupational health. The final years of this century may not offer a political climate favorable to laws that set new standards for toxins or monitor and enforce current standards. Furthermore, although this case study focuses on one particular family health policy in the arena of occupational health, it may have broader relevance for a range of family health policies. The broader social, economic, and historical forces that appear to have undergirded FPPs and their demise will likely operate in debates over other family health policies as well (e.g., abortion rights and health care).

Thus health advocates in academics, law, policymaking, and service provision may be vitally needed to forge new solutions to old problems. Public education campaigns, involvement of health professionals in corporate settings, and legal and political interventions may offer different yet creative avenues to achieve important occupational health goals as we plan for the next century. Although indus-



trial hygienists and physicians have been instrumental in dealing with occupational health concerns, it may be useful for employees to interact with health professionals who do not tend to represent the interests of management. The trend in managed health care may offer a serendipitous opportunity for health practitioners to educate and advocate for their clients. Similarly, legal practitioners may be able to find new ways to educate employees and employers and to help ensure that hard-won victories in cases such as *United Auto Workers v. Johnson Controls* (1991) provide a legacy for new, significant gains in occupational health.

### Notes

1. Testimony from the hearings is referenced this way throughout the manuscript. Exhibits are abbreviated as Ex.
2. See the Appendix for a list of expert witnesses and their affiliations. Names of expert witnesses throughout the article are listed in the Appendix.
3. See, for example, *Radice v. New York*, 254 U.S. 292, a 1924 case that prohibited women from night work in restaurants.
4. Recent legislative attention to day care and parental leave has also been stimulated in large part by demographic shifts. Changes in labor force participation patterns have normalized the need for day care in a way that feminist ideology could doubtfully accomplish (Kaminer, 1990). Over half of new mothers remain in the workforce and over one-half of two-parent families with children under six are dually employed. Therefore, day care may be more necessary than at any other time since the institutionalization of the nuclear household and separate spheres for men and women in the late nineteenth century.
5. Her employer's policy was to require a physician's statement of infertility before a woman could work in the smelter area. Twenty-nine women, including herself, were removed in 1975 and could not return without such statements. No men were removed. In 1978, Bunker Hill was not hiring *any* women in production, regardless of their childbearing capacity. The six women then working in the smelter area, between age 25 and 50, all produced statements of infertility. Two, including herself, underwent sterilization procedures to save their jobs (USDL, 1977, pp. 6090-6094).
6. The issue of susceptibility of racial and ethnic groups, especially blacks, may not be unrelated to the question of female susceptibility. Since sickle cell anemia is a disorder that affects mainly blacks in the United States, it is important to note that attempts by the lead industry to define women, blacks, and other minority groups as more susceptible could result in exclusion of these groups from the workforce. The major focus of this article, however, is female susceptibility and concomitant corporate policies to exclude fertile women.

7. Other susceptible subgroups include those suffering from renal insufficiency or anemia.

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## APPENDIX

## Selected Witnesses, Organizational Affiliations, and Occupations

Expert witness	Affiliation	Occupation
Dr. Bell	Industrial Consultant, AMAX	Physician
Kenneth Bridbord	National Institute for Occupational Safety and Health (NIOSH)	Physician
Jerome Cole	Lead Industries Association	Physician
Mr. Denham	ASARCO	— <sup>a</sup>
Dr. Epstein	Oil, Chemical & Atomic Workers	Physician
Amanda Hawes	Legal Aid Society, Alameda County	Attorney
Charles Hine	Medical Director, ASARCO	Physician
Vilma Hunt	Penn State University	Associate Professor Environmental Health
Judy Lichtman	Women's Legal Defense Fund	Attorney
James Lorio	Consultant, Independent Association of Secondary Lead Smelters	Physician
Marjorie Lundquist	Lead Battery Plant	Industrial hygiene manager
Olga Madar	President, Coalition of Labor Union Women (CLUW)	—
Claudia Miller	United Steelworkers of America	Industrial hygienist
Herbert Needleman	Director, Lead Exposure Study, Children's Hospital Medical Center, Boston	Physician
Sergio Piomelli	Director of Pediatric Hematology, New York University	Physician
MaryAnne Rosen	CLUW, St. Louis chapter	—
Flo Ryer	Director, OSHA's Office of Special Standards Program	—
Jeanne Stellman	Chief, Occupational Health and Toxicology, American Health Foundation	Ph.D.
Ms. Sullivan	Bunker Hill Smelter	Lead worker
Mr. Varner	ASARCO	—
Leonard Woodcock	President, International Union of United Auto Workers	Union Leader

Source: Hearings on the proposed standard for occupational exposure to lead (unpublished) by USDL, OSHA, 1977, Washington, DC.

Note: Only the last name is included when the first name was not available.

<sup>a</sup>Occupation was not known.