

Fetal Protection Policies and Corporate Liability of the US Vinyl Chloride Industry, 1974–1991

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In the late 20th century, fetal protection policies barred women from hundreds of thousands of industrial jobs on the pretext that if women became pregnant, their fetuses might be harmed by workplace exposure to toxic chemicals. Beginning in the 1970s, these policies set off a decades-long contest between the chemical industry, government agencies, and the judicial system over how to balance the uncertain reproductive health risks against sex discrimination. This article revives the subject of reproductive health and workplace protections through a historical case study of fetal protection policies at Firestone Plastics, a leader in the postwar vinyl chloride industry. I use formerly secret industry documents to argue that Firestone used scientific uncertainty and gender essentialism to skirt new regulatory pressures and minimize corporate liability. Ultimately, fetal protection policies stymied innovative regulatory efforts to protect all workers—not just women—from reproductive hazards in the workplace. (*Am J Public Health*. 2022;112(2):271–276. <https://doi.org/10.2105/AJPH.2021.306539>)

With numbing regularity, evidence emerges about the dangerous reproductive health effects of environmental chemical exposures. Scientific findings often trickle down into popular consciousness in the form of eye-catching headlines about plummeting global sperm counts or endocrine disruptors in shampoo. Recent iterations of this phenomenon have reminded the public that men, too, are vulnerable to environmental reproductive risks. Even when they note the weak toxic chemical regulations in the United States, articles often end by recommending that people protect themselves and their families by changing their own consumption habits. Discussions of reproductive health risks from chemical exposures appear fixed in an individualistic and gendered paradigm of consumption and choice.¹ Yet this

discourse fails to address the continued presence of unregulated toxic chemicals that workers of all genders encounter every day.

This article revives a discussion of reproductive health and workplace protections through a historical case study of fetal protection policies at Firestone Plastics, a leader in the postwar vinyl chloride industry. In 1974, Firestone announced that women would no longer be eligible for certain jobs because of alleged risks to fetal development from exposure to vinyl chloride monomer, or vinyl chloride. Vinyl chloride is a synthetic chemical used primarily to make polyvinyl chloride (PVC), the ubiquitous plastic found in products from pipes to waterproof clothing. Policies such as Firestone's were implemented voluntarily by companies in rubber, chemical, plastics, paint, and battery

industries for a variety of chemicals. By 1979, women had been barred from approximately 100 000 positions.² Historians of workplace fetal protection have focused on its two most public incidents: the 1978 case of American Cyanamid, a company where five women underwent sterilization only to have their plant close, and the 1991 Supreme Court case *United Auto Workers v Johnson Controls*, which bookended the history of workplace fetal protection by ruling it a form of sex discrimination.

Formerly secret industry documents now available on ToxicDocs, a publicly accessible digital archive, unveil the process of crafting and implementing these policies before they were challenged on the national stage. The primary sources in this article reveal the perspective of the chemical industry,

but the workers whose lives and livelihoods were altered by fetal protection policies are conspicuously absent. Future historical inquiry should examine how everyday workers understood and experienced fetal protection policies.

In this article, I argue that behind early fetal protection policies lay years of uncoordinated, inconsistent, and unprincipled efforts to skirt new regulatory pressures and minimize corporate liability. The records of Firestone Plastics, a subsidiary of Firestone Tire and Rubber Co., offer an exemplary case study of this juggling act. I analyze the company's internal discussions as early iterations of industry tactics that would become central to later debates over fetal protection. First, Firestone protected its corporate interests by leveraging the persistent scientific uncertainty around the health risks and safe exposure levels of vinyl chloride. Second, it minimized liability by invoking gender essentialism, conflating women with their reproductive capacities. When acting in tandem to protect corporate interests, these two tactics reproduced long-standing gender disparities in American industry and stymied innovative regulatory efforts to protect all workers—not just women—from reproductive hazards in the workplace.

WHY FETAL PROTECTION?

Vinyl chloride was first synthesized for commercial use in 1939. By 1974, more than 5 billion pounds of vinyl chloride were produced annually.³ At high levels of exposure, vinyl chloride is a human carcinogen; however, as with many synthetic chemicals from the postwar industrial boom, the health effects of vinyl chloride were unknown in the first several decades of its use. In 1970, the newly formed Occupational Safety and

Health Administration (OSHA) and its research arm, the National Institute for Occupational Safety and Health (NIOSH), were tasked with setting standards for workplace exposure to industrial chemicals. Formal accountability, along with the parallel actions of environmental, labor, and consumer protection groups, prompted a “toxicity crisis” for the plastics and chemicals industries.⁴

In 1974, NIOSH issued a recommendation regarding occupational exposure to vinyl chloride: “it is recommended that no woman who is pregnant or expects to become pregnant should be employed directly in vinyl chloride monomer operations.”⁵ By singling out women's heightened susceptibility, the agency waded into what would become a decades-long contest over how to weigh the uncertain risk of toxic exposure against another federal regulatory project, Title VII of the 1964 Civil Rights Act, which outlawed employment discrimination on the basis of sex.

In response to the NIOSH recommendation, Firestone released a fetal protection policy that banned fertile women from jobs involving vinyl chloride exposure.⁶ This policy reflected an ethos of precaution that the industry routinely dismissed when it came to other occupational health concerns. For instance, that same year, news that several vinyl chloride workers had died from a rare cancer prompted OSHA to propose drastically reducing the permissible exposure limit for vinyl chloride. In response, the president of Firestone Plastics argued that although the company was “gravely concerned about the potential health hazard” of vinyl chloride, “present medical and scientific data” did not justify the standard.⁷ This exemplifies American industry's long-standing position on toxic chemical regulation: casting doubt about the risks

of its products and resisting regulation by asserting that chemicals should be considered safe until definitively proven otherwise.

In its official 1976 standard, OSHA found insufficient evidence to support the NIOSH recommendation that fertile women be barred from vinyl chloride operations.⁸ Although some vinyl chloride and PVC production companies rescinded their policies in response, Firestone and several of its peer companies elected to keep fetal protection in place. This decision reinforced the existing gendered structure of American industry (that is, a majority male workforce) amid the pressures of new occupational health and civil rights regulations.

Firestone's fetal protection policy was implemented at the same time as public perception of the fetus as a discretely vulnerable entity emerged. Just a decade earlier, thalidomide, a drug prescribed to thousands of women for nausea, had turned out to cause serious birth defects in infants. The episode heightened public awareness about hidden threats to the fetus and was followed closely by an early 1960s epidemic of rubella. It was in this context that national newspapers reported on research indicating that twice the expected rate of infants born with central nervous system defects had been found in areas surrounding PVC production plants.⁹

Unlike thalidomide and rubella, environmental chemical exposure lacked a clear causal pathway and raised questions about who would be responsible for mitigating risk. One possibility was responsibility falling on industry's shoulders. Although workers' compensation protected Firestone from employee lawsuits, companies were theoretically vulnerable to suits on behalf of an employee's child. In the eyes of

Firestone's leadership, the best way to avoid this liability was to preemptively eliminate the possibility of exposing a pregnant woman to vinyl chloride.

THE "CATCH 22"

The legal principle of gender-based workplace protection extends back to 1908, when the Supreme Court ruled in *Muller v Oregon* that limits on women's work hours were constitutional because, "as healthy mothers are essential for vigorous offspring, the physical well-being of women becomes an object of public interest and care in order to preserve the strength of the race."¹⁰ Decades before the chemical industry's fetal protection policies, Progressive Era settlement house worker and industrial toxicologist Alice Hamilton argued that women should not work around reproductive hazards such as lead. Unlike chemical companies, however, Hamilton supported such protectionist policies as a strategic step toward broader workplace safety standards and argued that the principle of gendered protection reflected the social reality of a woman's "double shift" at work and at home.¹¹

State protective laws persisted until Title VII of the 1964 Civil Rights Act outlawed sex-based employment discrimination and established the Equal Employment Opportunities Commission (EEOC) to field discrimination claims and encourage male-dominated fields to hire women. In 1973, women made up just 11% of the industrial chemicals sector. A 1976 EEOC audit of a Pennsylvania Firestone plant showed that 94% of the 140 workers were White men and that out of 25 female job applicants (all of whom were White), the plant hired just one.¹²

One interpretation of Firestone's fetal protection policy is that the precautionary approach of barring a few fertile women from certain jobs was a cost-benefit calculation that companies made to avoid costly lawsuits and maintain stability amid unprecedented regulatory intervention. Women workers, rather than the companies, would bear the cost of vinyl chloride's risks. They would miss opportunities, be fired, be forced into lower-paying positions, or keep their jobs only by undergoing sterilization. It is telling that majority-female workplaces in the 1970s with similarly concerning chemical exposures, including hospitals, electronics manufacturers, and dry cleaners, did not implement fetal protection policies, as the costs of doing so would have been very high.

Firestone did recognize that its fetal protection policy would likely hinder the industry's EEOC imperative to "increas[e] the number of women we have on 'blue collar' type jobs."¹³ As such, a plant manager recommended not informing "female recruitment sources and the State Employment Commission" of the policy, as it would "focus unnecessary attention on our policy and create a new set of problems."¹⁴ By the mid-1970s, the vinyl chloride industry found itself weighing competing prerogatives: to increase female hiring in traditionally male positions and to respond to evidence suggesting that this practice would place fertile women and their potential fetuses at risk. Companies believed that they had been placed in a "catch 22."¹⁵ In 1975, T.C. Walker wrote to the company's hiring department about the fetal protection policy, predicting that it was "merely a matter of time" before it was challenged.¹⁶ However, as a medical director at Exxon put it, companies would "rather face the EEOC than a deformed baby."¹⁷

TACTIC 1: LEVERAGING SCIENTIFIC UNCERTAINTY

The vinyl chloride industry of the 1970s was a tightly knit network of companies that endeavored to align their outward-facing positions and "speak with one voice" through trade organizations.¹⁸ Yet, implementation of fetal protection among vinyl chloride producers was reactive, ad hoc, and frequently contradictory. Companies adopted policies and then abandoned them when new evidence emerged, disagreed over their terms, or did not implement them at all. At a 1977 "Vinyl Chloride Safety Committee" meeting attended by representatives from Firestone and other vinyl chloride producers, a summary report admitted that "exposure of women of child-bearing ability is of much concern" and "is still an unsettled topic."¹⁹ In a 1978 survey distributed by Shell, 23 companies responded. Of those, nine reported either a formal policy or an "established practice" of fetal protection. Shell found that company policies "range from 'no problem, use females in any job' to a strict policy."²⁰

This discord reflected genuine ambiguity surrounding chemical hazards in the mid-1970s. Research was almost always suggestive and provisional, especially for a relatively new synthetic chemical such as vinyl chloride whose adverse health effects might take decades to emerge. Methodological complexities contributed to persistent uncertainty surrounding reproductive hazards. For example, there were questions about how animal toxicology should be applied to humans and concerns that epidemiological studies did not account for confounding variables. The very meaning of "safe exposure level" has

changed over time, shifting in response to new evidence, new research methods, and new disciplines such as risk assessment and cost-benefit analysis. Firestone leveraged this multilayered uncertainty to meet its immediate interests.

In 1976, months before Firestone's first appeal to the EEOC, provisional results were released from an epidemiological study carried out jointly by Firestone, NIOSH, the Centers for Disease Control and Prevention, and the University of North Carolina. The study had revealed excess miscarriages and still-births among the wives of male vinyl chloride workers at a Firestone plant. This finding suggested that men might incur genetic damage that could be passed on to a fetus.

Press coverage and concern within the local union prompted Firestone to assure employees that the company was monitoring the situation and that there was no cause for concern given the new standard for vinyl chloride exposure that was to be implemented that year.²¹ Yet, Firestone's emphatic message that male workers should not worry about vinyl chloride exposure harming their future children was at odds with the company's contention to the EEOC that its fetal protection policy was justified because of recent findings indicating that vinyl chloride exposure had "mutagenic and teratogenetic effects," meaning that it could cause birth defects through both DNA mutations in male sperm and fetal exposure.²²

TACTIC 2: GENDER ESSENTIALISM

In the 1970s, the idea that the health of a fetus could be considered apart from the health of the woman who carried it was only beginning to be articulated in

scientific, legal, and popular discourse. Occupational health proved to be one of the arenas in which broader, less strictly gendered understandings of fetal susceptibility developed. At a 1975 conference on women in the workplace, Sylvia Krikel of the Oil, Chemical & Atomic Workers Union argued that "health standards should be set at levels low enough to protect everyone in the workplace, including the fetus." She saw in "the clamor over women workers in high-risk occupations" not a genuine concern for the safety of women or fetuses but, rather, "little more than a smokescreen to conceal industry's reluctance to place a priority on people rather than profit."²³

Under the leadership of Eula Bingham, OSHA began in 1977 to move beyond gender essentialism in its approach to occupational health. In a speech, Bingham explained that "reproductive hazards have been seen as a 'women's problem'—as if there were no male contribution to the continuation of the species."²⁴ In May of 1978, Bingham penned a letter to corporate medical directors, including Firestone's, that summarized OSHA's position on fetal protection. Bingham wrote that although genuine concern for women and their fetuses was "praiseworthy," similar attention needed to be paid to male reproductive hazards, and exclusion was not a replacement for dealing with the exposures themselves.²⁵

Firestone moved in the opposite direction of OSHA's emerging consensus around reproductive hazards. The company increasingly leaned on gender essentialism by limiting its understanding of fetal harm to the nine months in a woman's womb. In 1977 and 1978, the company took advantage of the uncertainty surrounding the effects of vinyl exposure and

abandoned its previous references to male genetic damage. Firestone then sidestepped the question of male reproductive risks entirely by focusing narrowly on the susceptibility of the fetus to chemical exposure in the womb.²⁶ Some scholars of fetal protection point out that industry concern with fetal health reflected a conservative shift in the 1980s toward embracing fetal rights in opposition to women's.²⁷ But Firestone's arguments reveal continuity with an older view of women's and fetal health as inextricable. Whereas Firestone's policy was concerned with pregnant women, policies crafted after 1980 (e.g., that of Johnson Controls) seem to have placed more emphasis on "unborn children." Slippage between mother and fetus in industry discussions reflects evolving understandings of the fetus in the popular, medical, and legal discourse of the 1970s.

A REGULATORY SOLUTION

In 1980, Firestone Plastics was absorbed by Occidental Petroleum, abruptly ending one chapter in an ongoing story.²⁸ That same year, the EEOC and OSHA released joint guidelines that narrowly defined the situations in which employment restrictions were warranted. If a reproductive hazard was "known to affect the fetus through either parent," excluding only women from employment would be considered sex discrimination.²⁹ In a public response, the Chemical Manufacturer's Association (of which Firestone had been a member before its sale) criticized the guidelines by echoing and extending Firestone's essentialist logic, asserting that transplacental exposures posed an exceptional risk that threatened fetal rights. In spite of

inconsistent policies within the vinyl chloride industry, the Chemical Manufacturer's Association had reached an internal consensus that fetal protection policies buttressed industry interests. The association ended its response with a warning: "the proposed Guidelines ... will probably result in greater numbers of birth defects in children of mothers who would be exposed to certain hazardous substances."³⁰

The response of the Chemical Manufacturer's Association was expected, but women's health and labor advocates also opposed the guidelines. These groups, which usually supported industry regulation, worried that regulations based on limited scientific evidence could chip away at civil rights. As Ronald Bayer pointed out in a 1982 analysis, fetal protection caused both sides of the debate to reverse "their characteristic positions on risk assessment and its implications for industrial policy."³¹ Facing opposition from all sides and the incoming Ronald Reagan administration, which was hostile toward regulatory oversight, the guidelines were withdrawn. With that, any hope of a federal regulatory solution to the "catch 22" between protection and civil rights was quashed. Those opposed to fetal protection policies turned to the courts.

In 1982, Johnson Controls, a car battery manufacturer, instituted a fetal protection policy for lead exposure. In response, the United Auto Workers filed a sex discrimination suit on behalf of seven workers that made its way to the Supreme Court. In 1991, the court ruled fetal protection policies unconstitutional, arguing that women should be able to choose whether to take a job that exposed them to possible reproductive hazards.³² From a strictly civil rights perspective, the Johnson

Controls decision was a victory. But judging fetal protection policies only in terms of sex discrimination ignored intersecting concerns about men's reproductive health and workers' rights. In debates that weigh individual rights against collective well-being, solutions that would satisfy both imperatives are often foreclosed. This is not because they are ethically incompatible but because of the fragmented structure of US regulatory bodies and the outsized influence of industry and corporate lobbying.

Fifty years after the Occupational Health and Safety Act was passed, workers from cosmetologists to surgeons and firefighters are exposed to chemicals for which the long-term reproductive health effects are uncertain.³³ As the United States continues to grapple with the COVID-19 pandemic, the nation's eyes have been reopened to the importance of workplace health and safety. Indeed, the outsized impact of COVID-19 on people of color is explained in part by their disproportionate employment as low-income but "essential" workers.³⁴ This moment should be seized upon as a policy window for the new presidential administration to improve OSHA's standard-setting process, invest in reproductive toxicology research, and embrace a precautionary approach to occupational chemical exposure regulation that protects the long-term reproductive health of all workers.³⁵ **AJPH**

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PUBLICATION INFORMATION

Full Citation: Bergen S. Fetal protection policies and corporate liability of the US vinyl chloride industry, 1974–1991. *Am J Public Health*. 2022; 112(2):271–276.

Acceptance date: August 30, 2021.

DOI: <https://doi.org/10.2105/AJPH.2021.306539>

ACKNOWLEDGMENTS

An early version of this article was presented at the American Association for the History of Medicine conference in April 2019.

Thank you to Professors Stephanie McCurry, David Rosner, and Merlin Chowkwanyun and the Center for the History and Ethics of Public Health writing workshop attendees for their thoughtful feedback on various iterations of the article.

CONFLICTS OF INTEREST

The author declares no conflicts of interest.

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Racism: Science & Tools for the Public Health Professional

Edited by
 Chandra L. Ford, PhD
 Derek M. Griffith, PhD
 Marina A. Bruce, PhD
 and Keon L. Gilbert, DrPH

ISBN: 978-0-87553-303-2
 2019, Softcover
 List Price: \$69
 APHA Member Price: \$48.30

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