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WOMEN IN THE WORKPLACE

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Table of Contents

PREFACE	1
EXECUTIVE SUMMARY	ii
INTRODUCTION	A-1
RESEARCH ON TOXIC SUBSTANCES	B-1
AGENCY ACTIVITIES	C-1
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	C-1
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH..	C-3
NUCLEAR REGULATORY COMMISSION	C-4
ENVIRONMENTAL PROTECTION AGENCY	C-4
NATIONAL CANCER INSTITUTE	C-5
STATE OF OREGON, DEPARTMENT OF HUMAN RESOURCES	C-6
THE PROPOSED LEAD STANDARD	C-8
SAFETY STANDARDS FOR WOMEN	D-1
EQUIPMENT CERTIFICATION	D-3
RECOMMENDATIONS	D-5
HOW OTHER COUNTRIES PROTECT WOMEN IN THE WORKPLACE	E-1
LEGAL CONSIDERATIONS	F-1
POLICY RECOMMENDATIONS	G-1

GOVERNMENT RESEARCH	G-3
PRIVATE SECTOR RESEARCH AND DEVELOPMENT	G-4
INFORMATION SYSTEMS/DATA.....	G-5
TASK FORCE WORKING GROUP AND POLICY DEVELOPMENT	G-7
EDUCATION AND INFORMATION	G-9
SAFETY STANDARDS FOR WOMEN.....	G-10
INTERNATIONAL RELATIONS.....	G-12

ATTACHMENTS

LIST OF PERSONS INTERVIEWED.....	H-1
MINUTES OF NIOSH MEETINGS.....	I-1

PREFACE

The Policy Analysis Staff was faced with a particularly complex and difficult task in defining the policy considerations relating to those groups of employees in the workplace who are deemed highly susceptible. The issue of how to protect these groups is complicated by a number of factors:

- o Perhaps the most important concern is that the universe to be studied has never really been defined. In effect the number of highly susceptible workers varies from substance to substance. Furthermore, since generally accepted professional standards (e.g., American Conference of Governmental Industrial Hygienists, "Threshold Limit Values for Chemical Substances in Workroom Air," 1978, p.1) have always assumed that hypersusceptible workers would be screened out by preplacement health examinations, there never seemed to be a real problem. For these reasons, no comprehensive listing of who might be affected, under what circumstances, and at what exposure levels appears to exist. The Policy Analysis Staff has therefore decided the only manageable approach to the subject is to try and define meaningful subgroups and analyze their problems separately.
- o Many groups simply do not want to be identified as highly susceptible. The Veterans and Handicapped Worker Program in the Office of Federal Contract Compliance Programs, Department of Labor, explains that the handicapped have resisted being single out for special treatment. They feel that they are already more conscious of safety and health--an take more precautions than the average worker--by virtue of their having sustained a handicapping injury or illness. They are primarily concerned about fighting against the discriminatory stereotypes that exist in the minds of many employers and thus do not wish to add to their visibility in this fashion.
- o "Highly susceptible" is often too sweeping a characterization. In the case of a blind or deaf person, the only requirement for differential treatment may be to make some minor adjustments in the workplace in order to insure a "safe work pattern," for example, not depending on either light or sound signals to indicate changes in the work cycle. Otherwise, everything would be the same as for other workers.

- o Affected workers fear that if publicly identified as highly susceptible, employers will strengthen their efforts to employ only the healthiest candidates and that "marginal" workers might systematically find themselves screened out despite the enactment of legal safeguards.
- o Accident rates already are lower among the handicapped, generally because they are more carefully than other workers due to their previous work history and experiences. Moreover, many argue, if the OSHA workplace standards that currently exist were adequately enforced, such as keeping aisles cleared and installing proper guards on machines, employers could effectively protect not only the handicapped workers but all workers.
- o Highly susceptible groups are not necessarily monolithic. For example, asthmatics have differing opinions among themselves as to what additional protection they might need, if any.
- o Personal characteristics correlations may present problems. Witness sickle cell anemia and hypertension in the case of Blacks, "Mediterranean anemia" in the case of Greeks and Italians, etc. In such cases, OSHA clearly runs the risk that extending standard coverage broadly would cause perfectly healthy and innocent workers to be selected out of certain workplaces simply because of their race or ethnicity.
- o Finally, society is just beginning to confront basic questions on of the responsibilities which accrue to individuals in safeguarding their own health and their right to life, such as tobacco, alcohol, seat belt interlock systems, euthanasia, etc. Specifically, susceptibility to health disorders rises sharply for smokers, particularly heavy smokers, exposed to cotton dust, coke oven emissions and a host of other hazardous substances. Should smokers therefore be extended the same protections that other highly susceptible groups might receive?

Given the scope of the problem it makes sense, therefore, to divide the workplace issues relating to highly susceptible groups into three different policy papers.

The first paper will cover "Women in the Workplace." This is, by far, the largest group of highly susceptible workers, more than 36,000,000 strong and growing at a rapid rate. Their susceptibility seems to relate to their capacity to bear children and, more often than not, relates more directly

to the future health of the fetus that they are carrying rather to their own proper health. Moreover, of all the highly susceptible groups, their vulnerability alone is a discretionary one. Pregnancy can be avoided. Pregnancy can also be terminated. Finally, the growing activism of women's groups is creating special pressures that make it useful to look at the special health concerns of this group separately.

The second group, the handicapped, may or may not consider themselves highly susceptible as a class. Definitions of who is covered as seen above, are still imprecise. Positions as to the extent and types of protection are not fully evolved or articulated. The focus here also would primarily be on safety concerns. The Policy Analysis Staff held a small conference on this subject on June 22, 1976 that provides a sound basis on which to build a second paper. Completion of this paper is not anticipated until Spring, 1977.

The third and final group are those special groups who, while covered by definitions of handicapped under Section 503 of the Rehabilitation Act of 1973, PL 93-112 (which requires the Secretary of Labor to take affirmative action in the placement of handicapped workers), raise special health concerns because of their medical vulnerabilities, for example, epilepsy, diabetes, asthmas, kidney disorders, leukemia, sickle cell anemia, etc. Since the research here will be more difficult to carry out, such a paper would not be completed before July 1977.

The first paper is attached. It represents a starting point rather than a conclusion. It also provides a grouping for the first time of major points--demographic, medical, legal, economic, governmental--that are necessary background for the initiation of useful dialogue. It enumerates some first steps that OSHA might take toward the development of an official policy toward women in the workplace.

However, it suffers several deficiencies. It concentrates primarily on pregnancy as the most significant and obvious vulnerability with which working women must contend. It ignores the important question--and possibly others too--of size and weight as a potentially serious factor in protecting working women's health. It does not examine the health problems of Asians and others who are also generally smaller and lighter than the average white male worker, the model that regulations have generally sought to protect. It only briefly mentions the impact of toxic substances on male semen and, from thence, on the fetus. While some of these areas of concern may appear to be unrelated to the special health concerns of working women, determining the extent to

which men, Asians and other identifiable groups are affected by the same toxic substances as women of childbearing capacity will permit a better assessment of the dangers associated with particular exposure levels of toxic substances and demonstrate the breadth of adverse impact that they might have on workers.

These questions are not explored here because they would appear to be more appropriately handled by the Task Force on Women in the Workplace and the Special Working Group on Women that the Policy Analysis Staff recommends OSHA create. These bodies will have the time, experience, and resources to address such matters in the depth necessary to develop substantive recommendations.

In conclusion, the issue of highly susceptible groups in the workplace has only been broached. The Policy Analysis Staff realizes that its work has just begun. It is already at work on the other two papers. It also stands ready to assist the Task Force and the Special Working Group in their endeavors. While much remains to be done, a useful first step has been taken.

INTRODUCTION

The increasing number of women in the workplace, when coupled with the demographic trends that emerged over the past five years, is not only an indicator of societal changes but also poses significant questions for the Occupational Safety and Health Administration (OSHA). Thirty-six million women--46 percent of those 16 years of age and older--are working or actively seeking work today. This is a 74 percent increase since 1955.¹ The respective increase of working men is only 19 percent.² (Total U.S. Population gain since 1955 is 28 percent.²)

Almost all American women will work at some time during their lives. A substantial number will work as many years as men, if not longer. This represents an impressive change in female employment patterns. In order to assure a safe and healthful work environment for all the 60 million working Americans covered by its legislation, OSHA must begin to address the special health concerns relating to working women arising from childbearing considerations.

Twenty years ago the majority of women between ages of 18 and 24 worked three or four years before getting married and raising children. After they left the labor force to have a family, many never returned. Today, most younger women are working, and fewer working women are leaving the labor force to have children. Those electing to raise a family remain out of the workforce for much shorter periods of time. The number of working mothers with children under six years of age has increase 24 percent over the past 20 years. Between 1940 and 1974, the number of single women working increased

¹ Wall Street Journal, May 3, 1976, p.1.

² U.S. Census Bureau, Population Reports.

by 1.5 million. The number of widowed, divorced and separated women in the labor force rose even more sharply--up by 3.8 million. The most noticeable rise, however, has been among married women--a fivefold increase between 1940 and 1974--4.2 million to 20.4 million.¹ Currently, 60 percent of all women working are married.

While the primary cause of the rising numbers of working women is financial need emanating from either increases in the cost of living or rising expectations, other significant socio-economic factors also help to explain the heightened expectations of women at work and the ensuing changes in their life styles:

- ROSS V BFS
- o Improved educational backgrounds have given women a greater impetus to seek careers.
 - o Increased opportunities have arisen in the service and clerical professions, jobs traditionally held by women.
 - o Landmark legislation/court decisions have prohibited employment discrimination based on sex.
 - o Social prejudice against women working has been disappearing.
 - o Declining birthrates and greater utilization of day care services have reduced child care responsibilities, thus freeing women to work.
 - o Rising divorce rates and decreasing marriage rates have increased the number of women who must now work in order to support themselves and, in many cases their families.

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Given that the basic structural changes that the labor force is undergoing seem likely to continue, greater numbers of women will continue, greater numbers of women will continue to be exposed to workplace hazards. As women begin to understand better the risks of exposure, their concerns about health and childbearing capacity will increase. This attention, coupled with the existing state of knowledge and standards as to the effects of workplace hazards on women, presents OSHA with a difficult challenge. There is also a complicating factor. Major women's interest groups have reacted forcefully against any proposed protective regulations, relating to either their health or that of the fetus, which might restrict their job and promotion opportunities. The question, then, is how should OSHA move to deal with women in the workplace?

While the answer is not clear, a start must be made. A thorough investigation of the scientific, legal and economic implications involved in assuring women a safe and healthful workplace is required.

Recently, the National Institute for Occupational Safety and Health (NIOSH) estimated that 1 million women between the ages of 16 and 34 years of age are exposed to chemicals which may have a damaging effect on all otherwise normal pregnancy.¹ More than 100,000 unique toxic substances are in use today in the workplace and 4,000 new chemical compounds are being added each year to the registry of chemical substances with poisonous effects.

The number of workers exposed to toxic substances is a cause for concern. But of even greater concern is the current lack of knowledge as to what constitutes a safe

level of chemical traces in the workplace environment or at what level of chemical assimilation does damage to health begins, especially as regards the reproductive process. In general, most chemicals are not now systematically tested to determine their potentiality for causing cancer (carcinogens), mutations or chromosome alterations (mutagens), or malformation of a fetus (teratogens). Even under the new Toxic Substances Control Act, it is not clear to what extent health tests will take these concerns into consideration.

In addition, the incidence of female and fetal reactions to toxic substances in the workplace is almost impossible to determine without monitoring programs covering maternal health difficulties and birth defects and without information systems supplying the occupational histories of both parents.

There simply does not now exist enough reliable data, especially studies that track particular subjects of exposure over a number of years, to provide definitive guidance. Yet, the existing evidence, as discussed in Section B, signals clear risk of danger and seems to support NIOSH's warning that many working women may be damaging their health as well as that of any offspring. For example, research has pointed to the fetus as perhaps the most susceptible part of a pregnant woman's body. Even in the absence of incidence data, it seems fair to assume that, if the pregnant worker is subjected to even low-level toxic exposure, complications or special health problems as a result of rapid cell division, effects of toxic substances crossing the placenta and the complexity of the fetal growth process could be caused. The threshold limit values, the current health standards, are now set at levels that protect only the average adult white male worker. Moreover, the American Conference of Governmental Industrial Hygienists makes it clear in a recent publication that such standards are not to be considered safe for workers with a special susceptibility.

Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect.

Because of wide variation in individual susceptibility; however, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit; a smaller percentage may be affected more seriously by aggravation of a preexisting condition or by development of an occupational illness.

Simple tests are now available¹ that may be used to detect those individuals hypersusceptible to a variety of industrial chemicals (respiratory irritants, hemolytic chemicals, organic isocyanates, carbon disulfide). These tests may be used to screen out by appropriate job placement the hyperreactive worker, and thus in effect improve the "coverage" of the TLVs." (Emphasis added.)

While the ACGIH did not have the problems of working women of childbearing capacity in mind, the basic point that it makes it valid in this regard: standards that are set for the average worker will not necessarily protect workers with special conditions that might make them more susceptible to exposure to a particular toxic substance.

¹ Journal of Occupational Medicine 15: 564, 1973; Ann. N.Y. Aca Sci., 151, Art. 2: 968, 1968.

² "Threshold Limit Values for Chemical Substances in Workroom A Adopted by ACGIH for 1975", p.1.

In order to protect the pregnant worker and the health of her current or future fetus, the primary concern of women of childbearing capacity, it would seem that the approaches for employers are limited:

- o to lower the toxicity of the workplace to a safe level for all workers--which raises financial, technological and competition problems;
- o to warn women of childbearing capacity of the potential dangers they might face on the job they are entering-- which does not absolve employers from legal liability;
- o to bar such women from employment in areas which may have deleterious effects on future generations--which exposes employers to potential suits on the grounds of discrimination;
- o or, to transfer all pregnant women to safer jobs during their period of temporary disability--which raises real questions of feasibility for some employers and still ends up potentially exposing women to toxic substances during the most dangerous period of their pregnancy, the first 6 to 8 weeks.

The apparent straightforward approach to solving the problem--uniform protective regulations for women--conflicts with numerous recent court decisions which have overturned: dual weightlifting standards, restrictions on night hours for women, mandatory pregnancy leaves, etc. These rulings have asserted the need to treat women as separate individuals with different capabilities rather than as a class. But many industries continue to ban any woman of childbearing capacity from employment which might affect her health or that of the fetus. The Federal Government, through OSHA, should not adopt such a course of action. Major women's interest groups have already expressed their concern to the

Solicitor of the Department of Labor with regard to the proposed lead standards, arguing that OSHA should adopt only those standards that would protect all workers and, in particular, should avoid issuance of a special standard for women of childbearing age.

OSHA needs more and better information about the numbers of women at risk in particular industries and the types of risks faced to help resolve the dilemma of protecting the health of women workers without foreclosing their employment or advancement possibilities. But the research projects studying the effects of chemicals on the female reproductive capacity are few in relation to the scope of the problem. Moreover, virtually no efforts are aimed at investigating the effects of chemicals found in the workplace on the male reproductive capacity. Scientists note that cumulative effects of chemical may take a life-time or even several generations to determine. Reliable data and methodologically sound correlations are hard to find. Every source interviewed by the Policy Analysis Staff agreed on the need for these data, improved data collection systems, and more careful analysis of the effects of toxic substances on women and men.

Section 17(k) of the Occupational Safety and Health Act states OSHA must demonstrate for a "serious violation" that:

there is a substantial probability that death or serious physical harm could result from a condition which exists...
(emphasis added)

"Substantial probability" basically means "beyond a reasonable doubt based on reliable evidence." The need for more evidence is therefore clear. Without such evidence on the levels of toxic substances to which women of childbearing capacity can safely be exposed, employers will remain fearful of lawsuits. Employers, especially large corporations,

are being counselled to take positive steps to protect themselves from liability suits stemming from alleged industrial malpractices. The simplest and most effective remedy here is to screen out all potential problems. For example, to limit their liability, they react by excluding all women of childbearing capacity from the workplace. Employers conclude that such women are, potentially, in a constant state of pregnancy and therefore present too great a risk. As an example, data shows that the fetus/infant can be harmed by exposure to some toxic substances like lead both before pregnancy (the body's capacity to cleanse itself of excess lead is slow) and after birth (the excretion of lead through breast feeding). It is no surprise, that employers are therefore, beginning to behave more conservatively in regard to whom they hire. Although this is not related uniquely to women of childbearing capacity, they are currently bearing the brunt of corporate protectiveness.

There is evidence that companies in lead-related industries already have taken steps to exclude women of childbearing capacity from exposure to toxic substances. Moreover, the Lead Industries Association recently recommended that the industry employ no nursing, pregnant or fertile women until more data becomes available on the effects of lead on female reproductive systems.¹ The Dow Chemical Corporation has decided not to hire any women for jobs where they might be exposed to known human teratogens and transplacental carcinogens.²

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² The Spokeswoman, July 15, 1976, p. 7
 2 Ibid.

Exxon Corporation will probably recommend that no women of childbearing capacity be hired in a job where they are exposed to benzene until the effects of such exposure on women become clearer.³

What about reducing the level of exposure so that all workers can work in safety? Would it not be easier simply to protect everyone? While logical, industry claims this is seldom feasible. Retrofitting existing plants is usually a costly and difficult undertaking. With a reduced number of years of useful plant life available, it is often impossible to amortize the additional investment before the plant is closed down. Sometimes, the technology is just not available. With certain substances, it is difficult to keep the workplace sufficiently free of hazardous traces to avoid the hyper-reactiveness of the susceptible worker, particularly that of a fetus whose tolerance level is extremely low and whose mutation risk, because of the rapid cell division taking place early in the gestation process, is substantially higher.

Finally, the substantial capital investments necessary to bring American industry into compliance with standards set at levels to protect all workers, including the highly susceptible groups, could create great financial difficulty. In many cases, operating costs would probably increase. Plants that operate at the margin or those saddled with capital formation problems would be particularly hard hit and could be forced to shut down.

In summary, then, some balance will have to be struck between the difficulties caused by major operating changes and the need for substantial capital investment, on the one hand, and the risks of damaging future generations, on the other. While the industrial state cannot realistically be dismantled--witness the recent environmental concessions--the nation also cannot ignore the great potential for

The Policy Analysis Staff has discussed the issue of protecting women in the workplace with a variety of organizations and agencies. The legal, economic and political implications of providing a safe working environment for women of childbearing capacity, particularly pregnant women, are manifold. Many believe that the need to protect the health of working women may be incompatible with the goal of providing equal opportunity for women to pursue employment in all types of jobs in all industries. A senior Exxon executive exemplified the predicament which employers find themselves when he proclaimed that his company would rather face a charge of sex discrimination than run the risk of a deformed baby. This point of view seems widely held by members of the business community.

The facts defining the problem remain:

- o The existing research data cautions that exposure to certain toxic substances can adversely affect the entire reproductive process.
- o Women of childbearing capacity are being denied certain jobs and are not being given equal opportunity to compete with men for employment in the more hazardous and often higher paying jobs.
- o Employers receive little guidance from the Federal government on how to comply its conflicting requirements to promote safety in the workplace while having to hire more women in the very occupations that appear most hazardous to their health.

This paper describes OSHA's possible role in dealing with the issues associated with the exposure of working women to toxic substances in industrial workplaces. Various policy options will be presented for consideration. While there will be no perfect or easy solution, the Policy Analysis Staff outlines steps that OSHA can take to protect the health of working women, deny them an equal opportunity in the workplace.

EXECUTIVE SUMMARY

On July 10, 1976, an explosion occurred at the Icmesa Chemical Plant outside Seveso, Italy. A highly toxic chemical, dioxin, was released into the atmosphere. At first, the villagers thought little of the incident. Then cats, dogs, and chickens started to die. Soon afterwards, human symptoms began to appear. Eight hundred people ultimately had to be evacuated for their safety.

A senior health official warned pregnant women of the substantial risk that existed: their children might now be born deformed because of the exposure to the poisonous gas that escaped from the factory. Whether they were employees in the plant or simply lived in the community, the risk would be the same. Although abortions are usually illegal in Italy, Justice Minister Paolo Bonifacio would later rule that women from Seveso might have abortions if a doctor decided that their mental health could be endangered by the worry of carrying a deformed fetus.¹

A freak accident? An isolated incident? It would appear that this is no longer true. For example, John F. Finklea, M.D., Director of the National Institute for Occupational Safety and Health (NIOSH), has estimated that one million American women of prime childbearing age are currently exposed to chemicals which may have a damaging effect on a normal pregnancy.²

¹ From numerous reports in The Washington Post, July-August 1976.

² Hearing, House Appropriations Subcommittee for Labor - HEW, May 4, 1976.

This exposure to risk represents a big change. The meaning of the new labor force statistics is, in fact, only beginning to make itself known. More women are working today than ever before. Forty-six percent of all women over the age of 16 years--36 million women--are in the current U. S. labor force. A growing number of these women are coming into contact with toxic substances--substances that might affect the reproductive system or harm the fetus. Many of them are in the midst of having a family. Sixty percent of all women working are married. Thirty-nine percent of all births have been found to be unplanned. Sixty percent of American women who work will continue to do so during their first pregnancy. Since the maximum danger to the fetus from toxic exposure tends to occur at the very beginning of pregnancy, normally before a woman would even realize that she was pregnant, the special susceptibility of women in the workplace raises valid questions.

While the evidence is sketchy, there is good reason to be concerned about the special health problems that may face women of childbearing capacity in the workplace. As the public becomes more aware of the problem, it is likely that increasing pressure will be brought to bear on OSHA to provide the Nation's women workers a safe and healthy work environment. The question is how to achieve that objective.

Most of the solutions proposed to date will not work. Banning women from high-risk workplaces appears illegal. Setting standards at levels that would be safe for all workers usually does not turn out to be either technologically or economically feasible. Monitoring women workers to detect pregnancy raises questions of privacy and practicality. Defining the exact nature of the hazards to which the human reproductive system may be exposed proves to be extremely costly and very difficult.

So the problem of how to deal with the special health concerns of this highly susceptible group, working women, remains.

Industry worries about the liabilities it may face from employing women. Women's groups worry about discrimination in hiring, promotions and work assignments. Unions worry about seniority and transfer rights at full pay for women members during pregnancy. Individuals worry about their health, their offspring and their financial needs.

There is no central place where the relevant facts relating to women in the workplace have been gathered. The legal issues are complicated. The medical research generally cited appears to be scanty and contradictory. Finally, the role of OSHA in this area is not clear. The Preface explains in greater detail why it was necessary to divide the treatment of highly susceptible groups into three subgroups, the first one of which, working women, is considered here. It is against this backdrop that the Policy Analysis Staff undertook this study.

In developing a policy on women in the workplace, it concludes that OSHA should keep the following objectives in mind:

- o All workers should be assured, to the extent feasible, a safe and healthy workplace environment.
- o Discrimination against certain groups of highly susceptible workers should be discouraged.
- o Women, especially those of childbearing capacity, should be treated as individuals in the workplace not as a class.
- o The economic, financial, legal and technological constraints facing industry should be recognized.
- o Employers and employees should be clearly informed of the special health needs of women, especially regarding human reproduction.
- o Equitable transfer provisions without loss of seniority or pay should be available for the temporary disability of childbearing whenever employers cannot meet these special needs.

A policy that successfully incorporated these objectives would provide the most reasonable amount of protection possible at this time. While it represents a compromise, it should benefit more of the affected parties than any other solution that has been proposed. It should also leave all parties in a better position than they are in today and provide industry and the unions with a set of groundrules under which they can successfully operate.

However, such a policy can neither be developed nor enunciated by OSHA alone. OSHA does not have jurisdiction to address all of these issues. It will therefore have to work out a joint arrangement and have the Equal Employment Opportunity Commission, the Office of Federal Contract Compliance Programs and other appropriate Federal agencies issue their guidelines simultaneously in order to achieve all the objectives cited above.

The Policy Analysis Staff provides additional background information in this paper on this proposal and discusses the major problems that this issue presents to OSHA. It also suggests a number of steps that OSHA could immediately take to address the special health concerns of women of childbearing capacity in the workplace. It appears feasible and responsible for OSHA to take the initiative now, perhaps using the proposed lead standard as a precedent, to move toward the establishment of a responsible position regarding the protection of highly susceptible groups.

POLICY RECOMMENDATIONS

GOVERNMENT RESEARCH

- o NIOSH has agreed to include considerations of reproductive pathology for men as well as women in future criteria document recommendations and research planning. OSHA should continue to track the NIOSH effort to assure that an adequate data base is being developed for the standards development process.
- o Center for Disease Control is starting to integrate occupational data into ongoing HEW birth defects monitoring systems. OSHA should actively cooperate with the various projects in this area.
- o OSHA should review the NIOSH health priority list to determine how criteria for teratogenesis and/or mutagenesis could be effectively included in the process of determining a substance's rank.

PRIVATE SECTOR RESEARCH AND DEVELOPMENT

- o OSHA should urge industries to devote a larger percentage of their research and development expenditures to developing new and safer production methodologies, for example, in lead smelters to protect highly susceptible workers.

- o OSHA should search for demonstration projects relating to the development of new technologies to control occupation hazards in high-risk industries and help promote private sector involvement.

INFORMATION SYSTEMS/DATA COLLECTION

- o OSHA's National Emphasis Program reporting forms have been redesigned to include retrieval of data by sex categories to permit correlation of occupational illness and injury data as well as occupation.
- o OSHA should urge the Bureau of Labor Statistics to investigate the feasibility of requesting that Section VII of OSHA Survey Form No. 103 require employers to submit for each establishment a) a breakdown by sex of the accidents and illnesses, and b) a breakdown of the hours worked by males as compared to females, identifying the percentages working fulltime in each category.

ADVISORY COMMITTEES AND POLICY DEVELOPMENT

- o OSHA should set up a short-term Women in the Workplace Task Force to advise it on the special concerns of working women. OSHA should also establish a longer term interagency Special Working Group on Women in the Workplace. It would staff the above Task Force and develop policy recommendations. It would also coordinate policy development and implementation with all related civil rights agencies.

- o Any meaningful policy on women in the workplace should not be developed or enunciated by OSHA alone since it does not have the jurisdiction to address all of the issues involved. A joint arrangement should be worked out with the Equal Employment Opportunity Commission, the Office of Federal Contract Compliance Programs and related Federal agencies to issue guidelines simultaneously once policies have finalized.

More women who are active in this area should be appointed to OSHA Advisory Committees as members.

EDUCATION AND INFORMATION

- o OSHA should develop an employer/employee educational kit - posters, counselling pamphlets, handouts about particular hazards and symptoms to look for, and supplemental materials - for the employer's and union's use to inform all employees of potential risks related to the reproductive process.
- o In conjunction with EEOC, OFCCP, NIOSH and related agencies, "800" toll free telephone lines could be set up to inform women of protection afforded by regulations and problems raised by specific health risks related to women in certain workplaces.

SAFETY STANDARDS FOR WOMEN

- o OSHA should address safety problems relating to working women at the same time it considers their special health concerns.
- o OSHA should encourage NIOSH to conduct anthropometric studies and supply manufacturers of safety equipment - respirators, hard hats, safety shoes - with data on the different body structure of men and women in order to correct current problems with unsafe and poorly fitting protective devices.
- o OSHA could develop a campaign directed toward employees, promoting the use of safety devices around potential hazards.
- o OSHA and NIOSH should study the need to set up a certification laboratory to provide uniform testing services for manufacturers of safety equipment and consider disseminating NIOSH testing and certification results to make known those safety devices that best meet OSHA standards and protect women and men equally well.

INTERNATIONAL RELATIONS

- o The Policy Analysis Staff will continue its research on related efforts and effectiveness in other industrialized countries. Ongoing liaison with the International Labor

Organization and these countries, however, should ultimately be assigned to the Standards Completion Project which, in conjunction with the International Technical Exchange Office, should have the responsibility for keeping all relevant OSHA personnel informed of current developments.

RESEARCH ON TOXIC SUBSTANCES

The effects of toxic substances on working women were first examined in depth during World War I in research performed by Dr. Alice Hamilton... After documenting that certain substances such as lead, radium and cotton dust caused damaging effects to the fetus or induced miscarriages, Dr. Hamilton recommended the enactment of legislation to protect women who, in increasing numbers, were entering industrial jobs during the war.¹⁻³ Such federal legislation was never enacted. As soon as the war ended, men returned home, replacing many of those women who were working in industrial jobs.

The issue then lay dormant until the start of World War II, when the need to employ women in large numbers, particularly in the heavy industrial sectors of the economy again arose. Exposure of women to industrial chemicals and other workplace hazards quickly prompted reconsideration of the problems highlighted by Dr. Hamilton. The U. S. Army undertook a comprehensive study on the occupational health problems of women, which again supported the contention that special steps should be taken by industry to protect women workers. The study not only cited physical stress as a danger but also identified benzene, carbon monoxide, carbon disulfide,

1. Alice Hamilton, -Do Women in Industry Need Special Legislation?, Publication #12, BLS 1918.

2. Alice Hamilton, Women Workers and Industrial Poisons. Bulletin No. 57, BLS 1926.

3. Daniel Lang, "A reporter at large: a most valuable accident", The New Yorker, May 2, 1959.

hydrocarbons, lead, mercury and radiation as being hazardous to the health of women.¹ This research, while not definitive, forms the basis for much of the current concern about the special health problems of women of childbearing capacity in the workplace.

In spite of the Army study's conclusions, the war ended without the adoption of any remedial legislation and the problems of women workers largely disappeared as a matter of occupational health priority. According to a 1975 report,² little additional research regarding the impact of toxic substances on women has been performed since 1945, despite the growing numbers of women entering the workforce. Consciousness of this lack in women's groups, among others, has led to demands to begin additional research efforts in this area. Understanding of the effects that chemicals, drugs and workplace substances can have on both the fetus and the reproductive systems of men and women has increased over the past few years. For example, originally, the placenta was assumed to adequately protect the fetus from exposure to unhealthy substances. However, exposure to rubella germs, usage of thalidomide, diethylstilbesterol, etc. and ingestion of substances like lead and mercury is now known to cross the placental barrier and enter the blood of the fetus causing damage. Another example arose, when on July 22, 1976, the Food and Drug Administration required that the most widely prescribed tranquilizers in the United States--valium, librium, miltown and equanil--bear a label warning against use of

¹ Anna Baetjer, Women in Industry: Their Health and Efficiency, 1946, Prepared in the U. S. Army Industrial Hygiene Laboratory.

² Vilma Hunt, Occupational Health Problems of Pregnant Women, A report and recommendations for the Office of the Secretary, HEW, April 1975.

the drugs in almost all instances during the first three months of pregnancy. Studies had suggested that they may be associated with the development of cleft lip and other congenital malformations when used during this period.¹

Other examples abound, raising questions about the adequacy of worker protection, particularly for women of childbearing capacity:

- Low level exposure of pregnant workers to radiation has been found to increase the risk of cancers in their offspring.²
- Female anesthetists acquire liver disease up to two times more frequently than unexposed counterparts. Also, the incidence of congenital abnormalities among liveborn offspring of female anesthetists was double that of unexposed female physicians.³
- A number of studies have found that women exposed to lead experience greatly increased numbers of abortions, miscarriages and stillbirths. Lead absorbed into the bloodstream of a pregnant woman crosses the placenta and enters the fetus.⁴
- Vinyl chloride has been found to produce angiosarcoma of the liver not only in female workers exposed to the substance, but also in their offspring.⁵

¹ Wall Street Journal, July 23, 1976, p. 3.

² International Labor Office, Encyclopedia of Occupational Health And Safety, Vol. 2, 1972, p. 1155.

³ Ad Hoc Committee on the Effect of Trace Anesthetics, American Society of Anesthesiologists, "Occupational Disease Among Operating Room Personnel", Anesthesiology, Vol. 41, October 1974, pp. 321-340.

⁴ C. R. Angle and M. S. McIntire, "Lead Poisoning During Pregnancy", American Journal of Diseases of Children 108: 436-439, 1964. Federal Register, October 1975, p. 45926.

⁵ Irving Selikoff, testimony at Senate Commerce Committee Hearings on Dangers of Vinyl Chloride, August 21, 1974, p. 26.

- Organic (methyl) mercury exposure causes teratogenic effects to women's offspring. The ability of methyl mercury to penetrate the placenta has been found to cause a high percentage of children with cerebral palsy and severe mental retardation with no effects to the mother.¹
- Carbon disulfide at certain levels has been shown to cause frequent miscarriages.²
- Cases of benzene exposure suggest that there is an increased rate of birth defects and miscarriages among exposed women. This chemical can also cross the placenta and enter the bloodstream of the fetus.³

Such research documenting the serious effects that certain workplace substances can have on pregnant women and women of childbearing capacity is responsible for the increased concern of major women's groups and labor unions that OSHA protect female workers as fully as male workers.

Looking at the issue from another perspective, some are alleging that men are being discriminated against by focusing the majority of standards and regulations protecting future parents on women alone. The data base currently available on the adverse impacts that some toxic substances can have on male reproductive capacities is beginning to force a reconsideration of the scope of this question. It is interesting to note that some of the same substances have a damaging effect to male reproductive capacities as those associated with female reproductive problems.

¹ Joset Warkany, Congenital Malformations: Notes and Comments, Chicago, pp. 128-129.

² W. Ehradt, "Experiences with the employment of women exposed to carbon disulfide". International Symposium on Toxicology, 1966.

³ Ethel Browning, Toxicology and Metabolism of Industrial Solvents, New York, 1965.

- Ninety percent of a group of males exposed to lead at a storage battery plant whose blood lead levels were over 75 micrograms per 100 grams of blood (ug/100g), higher than the proposed OSHA standard, showed abnormal sperm tests. Decreased fertility, loss of libido and decreased ability to produce healthy sperm existed among workers with lead levels as low as 30-50 ug/100g.¹
- Wives of men who have been exposed to vinyl chloride show greater risk of congenital malformations, miscarriages, and stillbirths than those whose husbands have not been exposed to this substance. Studies in four other countries have also shown that polyvinyl chloride (PVC) workers exposed to vinyl chloride monomer (VCM) have extensive chromosome aberrations. There is a possibility therefore that male exposure to PVC can cause a mutagenic effect that will endanger future generations.²
- Wives of male anesthetists have had a significantly high number of babies with birth defects. The risk for such wives has been 1.25 times that of wives of unexposed medical personnel.³
- Radiation can kill sperm production in the male testes and has been shown to cause a higher rate of sterility among radiological technicians than the general population (Japan).⁴ In addition, gene mutations and chromosome aberrations are passed through male sperm exposed to radiation.⁵

¹ I. Lancranjain, "Reproductive Ability of Workmen Occupationally Exposed to Lead", Archives of Environmental Health, August, 1975, p. 396-401.

² Peter Infante, "Genetic Risks of Vinyl Chloride". Lancet, April 3, 1976. p. 734-5.

³ Ad Hoc Committee on Trace Anesthetics, Lancet, April 3, 1976, pp. 734-5

⁴ Von W. Schottek, 1969 (in German).

⁵ National Academy of Sciences, "The Effects of Population's of Exposure to Low Levels of Ionizing Radiation", November 1972.

- Male workers exposed to carbon disulfide for 3 years were found to have decreased libido in addition to trouble achieving and maintaining erections.¹
- Fourteen males who worked at a Virginia plant manufacturing the pesticide Kepone are now sterile.²

In these studies, the levels of toxicity in the work environment were not always clearly defined. This makes it difficult to compare the results with the levels defined in OSHA standards.³

The research, nevertheless, clearly indicates that men and women carry traces of toxic substances from the work environment which have the potential to damage future generations. Threshold limit values should, therefore, be established at levels safe not only for all workers, but also for any fetuses that may develop. What those levels may be and to what extent such substances affect men as well as women are questions that still need to be answered.

While the lack of reliable data makes it difficult for OSHA to reach sound judgments in this area, OSHA may nevertheless find it awkward to cite this deficiency as the reason for its delay in acting in this area. OSHA's authorizing legislation clearly charges it with the responsibility for generating such data.

The Secretary of Labor, in cooperation with the Secretary of Health, Education, and Welfare, shall issue regulations requiring employers to maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured.....

¹ I. Lancranjan, "Alteration of Spermatic Liquid - Patients Chronically Poisoned by CS₂". Medicina del Lavoro, Vol. 63, pp. 29-33, 1972.

² The Spokeswoman, July 15, 1976, p. 8.

³ The above research studies were referenced in Andrea Fricko's, "A Woman's Guide to Job Health Hazards", joint publication of Labor Occupational Health Program, University of California at Berkeley, and Public Citizen's Health Research Group, 1976.

OSHA must therefore assure the collection of sufficient data on workplace exposure of both men and women to toxic substances in order to adequately protect their reproductive systems from any harm.

At the Society of Occupational and Environmental Health's "Women in the Workplace" Conference (June 17-19, 1976), Washington, D. C., the one recommendation that all representatives and participants agreed on was the pressing need for further research in this area. OSHA and NIOSH can take several steps to fill some of the gaps in the research by providing additional resources for more extensive studies on workplace substances suspected of being either teratogenic or mutagenic.

- NIOSH needs to undertake more longitudinal studies relating to effects of occupational environments on the reproductive systems of women and men. Research is needed to clarify the relative risks of exposing women and men to suspected workplace substances by identifying their transplacental teratogenic, mutagenic and carcinogenic effects and establishing safe threshold limit values.
- A better data base is needed to permit meaningful research on the workplace hazards impacting on reproductive systems. Improved information must be gathered by clinics and hospitals on abortions where the fetus evidences any malformation or physiological problems, miscarriages and irregular births and be cross-referenced with occupational histories of the parents.
- The Center for Disease Control system for collecting data on birth defects should be broadened to include occupational information on both parents.

AGENCY ACTIVITIES

Several agencies are looking into the particular concerns of women of childbearing capacity exposed to toxic substances in the work environment. The different perspectives and approaches may provide some insight into questions facing OSHA and assist in the development of new policies in this area.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

The proposed lead standard represents OSHA's principal effort to address the "increased susceptibility" of some classes of workers. As was discussed in the previous section, research on lead has documented the damaging effects of lead on children, the fetus and persons with sickle cell trait, kidney problems, etc. The Department of Labor's Solicitor's Office questions whether the research is reliable and conclusive enough to withstand litigation from employers who would be adversely affected by such a standard. The due process procedures in the OSHA standard setting process necessitate the full consideration and careful balancing of conflicting claims in order to protect the interests of all affected parties: employers, consumers, employees. Since compliance with the proposed standard would involve the commitment of substantial resources, consensus is usually hard to achieve.

The standards development office has also investigated the effects of ionizing radiation on occupational health to determine a level considered safe for women of childbearing capacity and to identify the economic consequences of requiring employers to comply with this level. The complex scientific, legal and social issues involved here have caused OSHA to carefully examine its definition of what are considered to be safe toxic levels in the workplace. Lead and ionizing radiation have been the subject of more research than most substances. Data exists on the damaging effects that these substances can have on women of childbearing capacity. Even so, the absence of reliable research on the precise toxic effects that these two substances have on the reproductive capacity of working women and men hampers OSHA's efforts to develop standards that would make the workplace fully safe for all Americans. Economic and technological constraints would still play a large role in the standards development process were such research available, but the lack of comprehensive workplace data is still the biggest problem in this area.

In 1975, OSHA started to publish a series of pamphlets describing the hazards of certain toxic substances. Each pamphlet explains the effects, dangers, and methods of protection related to exposure to various workplace substances. Pamphlets on lead, beryllium, mercury, vinyl chloride and carbon monoxide contain information for both workers and the public. None of these, however, mention any special health problems for women of childbearing capacity or suggest protective measures to be taken. A revision of this educational material to include information on the potential dangers that highly susceptible groups such as pregnant women face in the workplace should be undertaken.

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH, as the research arm that develops criteria documents for OSHA, has identified 181 substances that cause teratogenic or mutagenic effects in animals as a first step toward conducting further epidemiological studies.¹ NIOSH has also indicated that it will give "special emphasis" to women in future research. To date, this activity has consisted of two "Women in the industry, government and the scientific community. NIOSH has chartered additional research related to the effects of lead, vinyl chloride monomer (VCM), polyvinyl chloride (PVC), and other toxic substances on reproduction. Many of the important questions have been addressed (see attachment B), but the Policy Analysis Staff believes that the following areas need further attention:

- The health priority list--which ranks chemicals in the order in which they will be reviewed, based among other things on the number of people exposed and the severity of such exposure--does not include criteria for teratogenesis and/or mutagenesis when determining placement on the list.
- Criteria documents do not require that studies on the effects of threshold limit values on reproductive systems be completed before proposing what constitutes levels of toxicity in the workplace.

Congress has expressed an interest in strengthening NIOSH efforts regarding women's health, particularly Congressman Obey (D-Wisc.) through his work on the House Appropriations Committee. Appropriations for NIOSH to conduct more extensive research on the effects of the workplace environment on women--\$6 million for FY 1978-82²--have been included in the 1977 Labor-HEW appropriations bill.

¹ "Women Workers and Job Health Hazards". Job Safety and Health, April 1975.

- o OSHA should consider the concept of informed consent with regard to susceptible groups, such as women of childbearing age working in lead exposed processes. Such a consent form could include information that the employee has been informed of the inherent risk involved in a given job and that he or she understood the risk involved but still chose to undertake such work. Both employers and employees would have to understand that such a consent would not include any waiver of the right to workers' compensation should the need arise.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC has recommended radiation exposure limits during pregnancy through the distribution of its Guideline 8.13, "Instruction Concerning Prenatal Radiation Exposure".¹ The NRC maximum dosage regulation for all occupationally exposed adults requires exposure not to exceed 1.25 rems per calendar quarter, or 5 rems per year, while the occupational exposure of a pregnant worker is recommended not to exceed .5 rem during the nine month term. The level has not been lowered to .5 rem for all workers. Since 1.5 rem had been found to be the "lowest practicable level" considering the current technological and economic capacities of the industry, NRC in effect merely pointed out the dangers. This approach shifts the burden of identification and special protection for pregnant workers to its licensees. Title 10, Part 19 of the Code of Federal Regulations requires NRC licensees to "inform all individuals of health protection problems associated with radiation exposure". However, no effective measurement of this effort to lessen radiation exposure has been made to date. Whatever success it might have would have to depend on educating employers about their responsibilities, training employees to be aware of potential risks and encouraging employees to take preventive safety precautions.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA is represented on the Interagency Panel on Mutagenesis which reviews research related to mutagenic factors and the adverse effects of toxic substances. The meetings are useful to learn about and exchange research information among different agencies.

¹ U. S. Nuclear Regulatory Commission, Regulatory Guide, Office of Standards, November 1975.

EPA's Office of Radiation Programs, like OSHA and NRC, is also highly concerned about the effects of radiation on the fetus. EPA is attempting to develop a relative risk table to use in educating potential employees working in radiation areas. These tables would describe the risks of working with radiation as compared to other jobs and would have to be considered by all employees before accepting such a position. While this idea is a good one, the lack of statistics on working women has made it difficult to gather enough information on lifespans, illnesses and injuries broken down by sex and industry categories to develop the tables and supporting educational materials. The results of this effort will be interesting to observe. Educational outreach programs would seem to be a better tool for assuring safety than simply depending on governmental inspections. EPA evidences continuing commitment toward obtaining the views of special groups such as women and minorities by their one-third representation on the agency's 19 advisory committees for the agency.

NATIONAL CANCER INSTITUTE (NCI)

NCI and other Department of Health, Education and Welfare laboratory workers handle, on a daily basis, substances suspected of being carcinogenic. The fear of the effects of such exposure on the fetus was responsible for the development of an unwritten policy regarding the utilization of pregnant workers in the laboratory. Discussions between the NCI doctor, the supervisor and the worker relating to safety procedures and job transfer possibilities are required before the on-set of pregnancy. Although few, if any, of the substances at NCI are known to cause cancer, a pregnant laboratory worker is transferred to a safe, temporary position at no loss

in pay as soon as she becomes aware of her pregnancy and so informs management. This procedure is common with other temporary disabilities such as heart attacks or any serious illnesses requiring gradual recovery. NCI has purposely adopted this medically conservative course of action to minimize the potential exposure of a fetus to any suspected carcinogens, mutagens or teratogens that might be under study in their facilities.

STATE OF OREGON, DEPARTMENT OF HUMAN RESOURCES

The Policy Analysis Staff located only one example of standards with mandatory pregnancy protections in the United States. The Radiation Control Program in Oregon's Department of Human Resources passed a ruling in 1972 that utilizes dual standards - one for pregnant women and one for all other workers. It states that no licensee or registrant shall knowingly expose a fetus to more than .5 rem for the entire gestation period. The responsibility for implementing this ruling lies with the employer. The State has had no trouble with law suits, women refusing to tell employers when they are pregnant, or the relocation of pregnant workers to jobs at equal pay during the gestation period. However, most of the estimated 3,000 women affected by the ruling work in hospital or dental facilities where the practice of transferring pregnant workers has been an unwritten policy for years. Although there have not been any discrimination cases concerning this standard, a director of radiology at one hospital did express surprise at the existence of such a standard. His opinion was that most employees were simply not aware of the disparity in the standard.

In spite of the mandatory nature of this regulation, there is some question whether even this policy fully protects the fetus since the most hazardous

effects of radiation occur in the first six to eight weeks, often before a woman discovers she is pregnant.

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