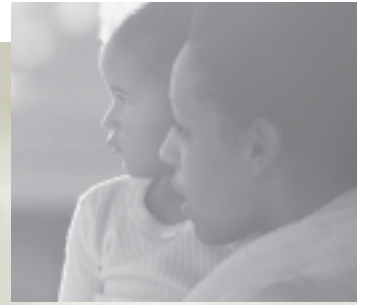


CONFRONTING

toxic

contamination IN OUR
communities



Women's Health

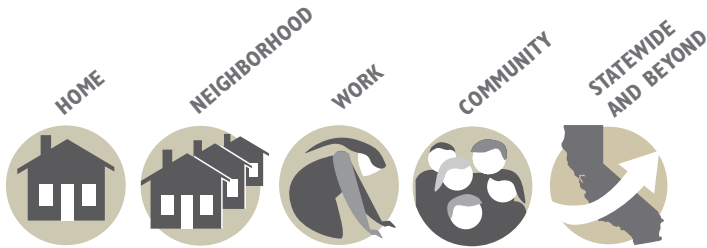
and California's Future

the WOMEN'S
FOUNDATION
of CALIFORNIA

Our Partners

• American Autoimmune Related Diseases Association • Breast Cancer Action • Clean Water Fund • Center for Environmental Health
• Center for Community Action and Environmental Justice • Commonweal • Endometriosis Association • Environmental Working
Group • Pesticide Action Network • Physicians for Social Responsibility - Los Angeles • United Farm Workers •

It is difficult to find a place free from chemical contamination. In this report, we reveal how women and their families are exposed in homes and neighborhoods, at work, in the broader community, and across the state. These icons identify exposure in these different spheres. Also in this report, we highlight individuals and organizations working to improve human health and fight toxic contamination in different areas of California. The map below identifies where their work is based.



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S designates statewide issues

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American Autoimmune Related Diseases Association
www.aarda.org

Breast Cancer Action
www.bcaction.org

Clean Water Fund
www.cleanwateraction.org

Center for Environmental Health
www.cehca.org

Center for Community Action and Environmental Justice
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Endometriosis Association
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INTRODUCTION

Every day, new chemicals are being introduced into the environment in the name of convenience, progress, and profit. We wipe our counters with cloths that have been pre-soaked in cleaning solutions; we spray our yards to prevent weeds from growing. We purchase food that has been manufactured to last on grocery store shelves for weeks or months. We treat our pets to rid them of fleas. At work, chemicals are used to keep fields clear of pests and to manufacture, clean, and assemble products. **Exposure to toxic chemicals occurs without our informed consent in every neighborhood in California.**

“We are the bodies of evidence.”

— NANCY EVANS,
BREAST CANCER FUND
CONSULTANT, AND WOMAN
DIAGNOSED WITH BREAST CANCER¹

For the past five decades, corporations have worked to convince us that “better living through chemicals,” as this Dow Chemical marketing slogan says,² is in our best interest. Since the post-World War II industrial boom, production of synthetic materials has increased approximately 350 times³ and billions of pounds of synthetic chemicals have been poured into the environment — 8.8 pounds of pesticides per American each year alone.⁴ The U.S. chemical industry is the largest in the world, accounting for 25% of all chemical production, and more than 63% of chemical production is centered in 10 states including California.⁵

Every day, humans are unknowingly exposed to myriad toxic chemicals that contaminate our air, soil, food, and water and accumulate in our blood, fat, breast milk, organ tissues, semen, and urine. Certainly not all chemicals are harmful, yet, in the U.S., with a few exceptions,

evidence of safety is not required for the majority of industrial chemicals to which we are regularly exposed.⁶ Monitoring of environmental chemicals and health effects commands only a minute amount of federal and state government resources.

EXPOSURE LEVELS:

the amount of pollutant or radiation present in a given environment that represents a potential health threat to humans or other living organisms.

Effects on the body are complex and influenced by many factors, including the route and site of exposure (skin, oral, injection, inhalation) the timing, the duration and frequency of exposure, and the susceptibility of the individual exposed. Current federal risk assessment policy fails to fully consider the range of health responses to toxic chemicals. Very few women’s health concerns, including the effects of exposure passed from mother to fetus, are taken into account when government agencies or corporations set “safe” exposure levels.⁷ Yet **tests show that chemical exposures are suspected to play a contributing role in countless diseases and illnesses including allergies, asthma, autism, birth defects, learning and developmental disabilities, endometriosis, infertility, multiple sclerosis, Parkinson’s disease, Alzheimer’s disease, and cancers.**

What’s more, according to Sharyle Patton, Co-Director of the Collaborative on Health and the Environment, “It may well be impossible to prove harm from possibly toxic chemicals to particular individuals because we all have unique histories, both genetic and environmental. Our chemical body burden at any given moment is as unique as our fingerprint.” We must also consider socio-economic status, and exposure to threats such as radiation from the hole in the ozone layer and new disease vectors created by climate change. Patton adds, “All these factors make definitive large populations studies difficult. And, of course, there is no control group for such a study because no one on the face of the earth has not been exposed. We need to make decisions based on the weight of evidence rather than the burden of proof.”

While problems may seem insurmountable, much *can* be done to prevent further harm. People in California and around the world are working to raise awareness and change policies to make our communities healthier. The explosion of the organic agriculture industry in California is one small example of how people are making food, soil, and water safer. New businesses are offering practical, cost-effective alternatives to toxic products. Recycling efforts have grown. Local governments are proposing legislation that will protect citizens from harmful emissions and industrial waste.

By allowing untested chemicals to be used, released, and disposed of in our environment, the current regulatory system violates the basic right of individuals to a healthy environment.⁸ Several United Nations

conventions support the human right to freedom from chemical contamination and the right to a non-polluted environment.⁹ In Europe, nations such as Sweden take a preventive approach to chemical exposure. Through education and continuing research, California can lead the United States, and a good part of the world, in advocating for a standard that would include, in the words of the Environmental Health Alliance, “prevention, precaution, and protection of all living beings.”¹⁰

METHODOLOGY AND LIMITATIONS

Research for this report was gathered primarily from published sources, including journal articles, books, fact sheets, and organization and government websites, with additional information from interviews and correspondence with researchers, Steering Committee members (listed on page 48), and experts in the field.

AN IMPORTANT NOTE: TOXIN/TOXICANT/TOXIC

Technically, **toxin** means a naturally occurring substance or agent that may injure an exposed organism. It can also mean a poison produced by living organisms. **Toxicant** means a human-made chemical or mixture that presents a risk of death, disease, injury, or defects in organisms that ingest or absorb them. In this report, we are using the words interchangeably. The word **toxic** means of, relating to, or caused by a poison or a toxin.

DATA LIMITATIONS

This report represents an introduction for the Women's Foundation of California to complex data with very sensitive public policy implications. As we look to the future, we are looking forward to engaging primary databases as we seek to refine our recommendations and draw the nexus to sound public policies. In writing this report, we identified the following challenges:

1. Research to determine specific links between exposure and adverse health effects requires taking into account multiple factors, including dose, timing and pathway of exposure.
2. The specific vulnerability of individuals and the characteristics of the communities where they live and the sites where they work are additional confounding factors. Exposure to toxic chemicals is not uniform but instead varies widely by neighborhood and city.
3. Limited scientific tools exist to assess chronic low-dose exposures to multiple chemicals.
4. Data that takes gender and ethnicity into account is limited, as is California-specific data. This is partially attributable to the fact that environmental health is still an emerging field of study.
5. Historically, women have not been the primary subjects of occupational studies, which have provided some of the first opportunities for understanding the impact of toxic exposure.
6. Most gender-specific studies have focused on reproductive health outcomes on developing fetuses and newborn children.
7. Long lag times often exist between exposure and disease, which makes it difficult to establish links.
8. Companies are not required to adequately screen new chemicals for safety before they are widely used.
9. This report relies on secondary research, including reports from public health and medical journals, research, and environmental agencies.

The reader is urged to read the sources cited in the endnotes for a more complete analysis than space allows here.

PATHWAY:

the route a chemical takes to move. Pathways can be through air, water, soil, or the foods we eat.

WHY FOCUS ON WOMEN AND GIRLS?

WOMEN: STEWARDS OF THEIR BODIES, FAMILIES, COMMUNITIES, AND THE ENVIRONMENT

A recent poll conducted for the federal Office of Women’s Health found that nearly two-thirds of women indicated that they alone were responsible for health care decisions for their family, and 83% had sole or shared responsibility for financial decisions regarding their family’s health.¹² As the people who provide care for ill or disabled family members and as health care decision makers for their families, women bear direct witness to the suffering that results from environmental degradation.

“We don’t all bear equal risks when contaminants are allowed to circulate in our environment and our bodies. People aren’t uniformly vulnerable. Women and children are disproportionately affected... and our future generations will be affected.”

— SANDRA STEINGRABER,
LIVING DOWNSTREAM:
A SCIENTIST’S PERSONAL
INVESTIGATION OF CANCER
AND THE ENVIRONMENT¹¹

In California and around the world, women take the lead in solving community problems. According to focus group research conducted by the Center for Health and Environmental Justice, women across all party lines, and Democratic and Independent men, were considerably more likely than other voters to be concerned about the environment.¹³

Women have often been the ones, according to Women Assessing the State of the Environment (WASTE), to “sound the alarm about environmental crises that disrupt community, air and water quality, food safety, and children’s health.”¹⁴ Many women are recognized in their communities and beyond for their advocacy of government regulation and industry accountability. Still, women from the most adversely affected communities — with large numbers of minorities — have been marginalized and their perspective on the environment has been ignored. At the same time, there is a significant absence of women serving in high-level leadership positions with the capacity to shape environmental policy in corporations, government, and financial institutions.

WOMEN AND THEIR CHILDREN: DISPROPORTIONATELY AFFECTED

Women have traditionally borne the consequences of contamination, whether on their health or the health of loved ones. According to WASTE, women’s bodies are often “the markers of environmental contamination through diminished fertility, abnormal fetal development, increased rates of cancers, and other spiraling forms of environmental illness.”¹⁵

Women’s health as a field of study is based on the existence of differences in disease occurrence, severity, and outcomes on men and women.¹⁶ Yet the science of risk assessment often bases its threshold level for chemical exposure on 150-pound adult men. Potential differences such as higher body fat content, relatively smaller body size, pregnancy, hormonal changes throughout a woman’s life, and gender division of labor are typically not taken into account.¹⁷

Low-income women and women of color tend to be even more disproportionately affected. There is a propensity to locate industrial and agricultural production and disposal sites in low-income neighborhoods, and jobs such as manufacturing and domestic help and farm labor have high incidences of chemical exposure. Often, low-income families have limited access to health care and lack information about toxins in their midst. As long as women have limited access to adequate health care and fail to recognize dangers associated with exposure and the need for medical attention, their families will continue to be at risk.

Despite women’s leadership in the movement for environmental health and justice and growing scientific recognition of the need to examine gender differences in medicine, only limited research on health impacts for women exists. This report seeks to reframe the environmental health and justice debate to

DES DAUGHTERS: A TRAGIC LESSON

Between 1938 and 1971, an estimated 5 to 10 million pregnant women in the United States were encouraged to take DES — Diethylstilbestrol — a synthetic estrogen that originally was prescribed by doctors for women who were at risk for miscarriage.¹⁸ Increasingly, physicians came to believe the DES would prevent miscarriages and pre-term (early) births. Inexpensive to produce and unpatented, DES was soon widely prescribed to women with no apparent problems and became the active ingredient in some vitamin supplements given to pregnant women.

In 1953, published research concluded that DES did not prevent miscarriages or premature births, however the drug continued to be prescribed. In 1970, a rare cancer called CCA (clear cell adenocarcinoma) began to show up in unprecedented numbers of young women. CCA is a type of vaginal and cervical cancer that, before 1971, was considered rare and diagnosed primarily in women who were more than 70 years old. When studies in 1971 and 1972 identified DES as a cause of this cancer in young women who had been exposed to DES in the womb, the Federal Drug Administration (FDA) issued an alert advising against its use.^{19, 20}

BEYOND CCA — THE FRIGHTENING STATISTICS:

- Researchers found that DES daughters were **40 times more likely** to develop cancer of the vagina and cervix than women who were not exposed to the drug.²¹
- A study of DES and breast cancer showed that women over 40 whose mothers took DES were **2.5 times more likely to experience breast cancer** than were women whose mothers didn't take the drug.²² Studies have consistently reported a 30% increased risk for mothers who took the drug.²³

- DES sons and daughters were shown to suffer from **unusually high rates of immune system disorders**. Many daughters have **reproductive tract abnormalities**, including irregularly-shaped uteruses, which place them at high risk for infertility, tubal pregnancies, and pre-term labor.²⁴
- Researchers found that 64% of DES daughters delivered a full-term baby during their first pregnancy, compared to 85% of unexposed women.²⁵
- Studies performed on mice have raised the possibility **that there may be a third generation effect** from DES on the granddaughters of women who were prescribed the synthetic estrogen, even though they have no known direct exposure.²⁶



incorporate the experiences and concerns of women and girls, their families, and their communities.

In this report, we begin by providing a general framework of current health issues and disease trends and describe how biological and physiological differences contribute to women's and girls' susceptibility to environmental exposure. Based on an explanation of the deficiencies of existing regulations, we provide an analysis of the multitude of ways in which humans

are exposed to harmful toxins — both over the course of their lives (from gestation to old age) and in different spheres of life (home, neighborhood, work, broader community, and statewide). An analysis of the economic costs of pollution follows. A section on public policy urges the adoption of a more precautionary approach and offers recommendations on priorities for funding. A call to action at the end of the report is for use by policy makers, funders, individuals, and community activists.

CURRENT CLIMATE

An estimated 85,000 synthetic chemicals are registered for use today in the United States. Another 2,000 chemicals are added each year — far too many for toxicologists and regulatory agencies to test for their impact on health and the environment.²⁷ And, in order for the company that produces chemicals to be required to test a product for its effect on health, regulatory agencies have to *first* show that the chemical poses an unreasonable risk.²⁸ **An overwhelming majority of the synthetic chemicals in use have never been tested for their effects on human health.**²⁹ Many of these can be found in cosmetics, personal care products, pesticides, household cleaners, fuels, and plastics.

TOXICS RELEASE INVENTORY:

a publicly available database from the Environmental Protection Agency that contains information on releases of nearly 650 chemicals and chemical categories from industries including manufacturing, metal and coal mining, electric utilities, and commercial hazardous waste treatment reported annually.

In California, as reported in the 2000 Toxics Release Inventory, **75.6 million pounds of chemicals were released into the environment** by 1,442 facilities around the state.³⁰ Petroleum refineries, manufacturing facilities, and commercial hazardous waste facilities accounted for the bulk of these pollutants. Every day, toxicants are released into surface water or into the air, injected or buried underground, and deposited in landfills.

Many synthetic and naturally-occurring chemicals persist for hundreds, if not thousands, of years. Long after prospectors used mercury to ply the California hills for gold in the 1850s, the mines they left behind are a major source of mercury pollution in our water and in the fish we eat.³¹ Long after planes sprayed DDT in agricultural fields in the 1960s, we are finding it in the breast milk of women in the Bay Area. Long after we have poured bleach down the drain, it damages wildlife in our bays.

Scientists have detected 40 possible carcinogens in drinking water, 60 in the air, and 66 that are routinely sprayed on food crops as pesticides.³² **Four million Californians live within half a mile of an area where pesticides are most likely to impact both air and water quality and public health.**³³ With the limited resources allocated to agencies such as the National Toxicology Program, it is impossible to evaluate the dangers of all the chemicals now in circulation. Even less safety information is available on the toxicity of a combination of chemicals. According to author and scientist Dr. Theo Colburn, “it is beyond the capacity of modern science to test all mixtures, or even all common mixtures.”³⁴ To fully understand and begin to reverse the problem, we must study chemicals individually and for combined effect, as well as for effects from generation to generation, and from mother to fetus.³⁵

HEALTH IMPACTS

In the years after World War II, the incidence of all types of cancer in the U.S. has risen by 49.3%. Today, about 48.2% of all men and 38.3% of all women in the U.S. will be diagnosed with some type of cancer.³⁶ In California, cancer is the second most common cause of death after heart disease, accounting for one out of every four deaths.³⁷ But cancer is only one disease that researchers are now linking to environmental contamination. These include:

- **Asthma** — Approximately 3 million Californians have asthma, nearly 700,000 of them children. Asthma is the most common chronic disease in children and is the leading cause of school absenteeism.³⁸
- **Autism** — Over the past 30 years, the number of children receiving services for autism has more than doubled. According to the California Birth Defects Monitoring Program, genetic defects and exposure to toxic chemicals are likely causes for autism.³⁹
- **Impaired Fertility** — In the U.S., between 1938 and 1990, male sperm density declined at a rate of 1.5% per year.⁴⁰
- **Birth Defects** — More than 16,000 babies are born in California each year with structural birth defects, having a body part that is missing or malformed.⁴¹
- **Cancer** — In 2003, California will see approximately 133,300 new cases of the most common cancers. Approximately half of those cases will be diagnosed in women.⁴²
- **Breast Cancer** — An estimated 21,500 women had breast cancer in 2000 in California. The incidence rate for that year was 132.4 cases per 100,000 women.

CARCINOGEN:

any substance that can cause or aggravate cancer.

- **Learning disabilities** — The number of cases of learning disabilities nearly doubled from 1977 to 1994.⁴³ In California there are 347,595 students ages six to 22 who have a Specific Learning Disability.⁴⁴ While *equal* numbers of girls and boys have been found to have reading disabilities, boys are *three times* more likely to be evaluated and treated.⁴⁵

There are other factors — behavioral and genetic, for example — that contribute to the chronic diseases and disabilities that Californians suffer, but **exposure to toxic chemicals has been studied the least and is the most preventable**. Federal and state budget cuts, combined with cuts in funding for regulatory agencies, have eroded the efforts that have been made to protect public health and the environment.

BODY BURDEN, BODY FAT, AND BIOACCUMULATION

Each human being has a chemical **body burden** — the sum of chemical substances detected in a person’s body at a given time.⁴⁶ To find a person’s body burden, fluid and tissue samples are tested to measure the presence of specific chemicals.⁴⁷

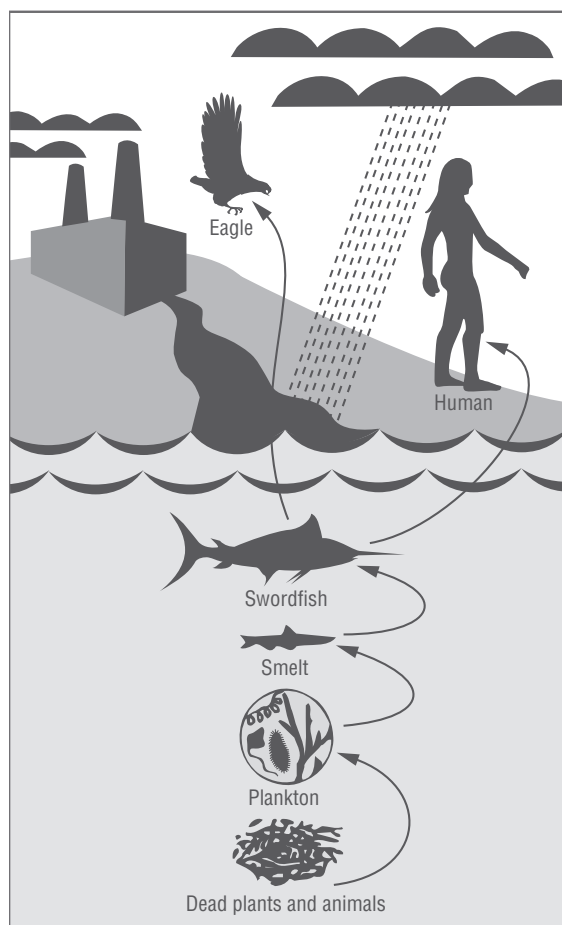
A recent study by the Centers for Disease Control (CDC), the *Second National Report on Human Exposure to Environmental Chemicals*, monitored blood, urine, and tissue samples for 116 chemicals from a civilian population for two years. **Examining 2,500 children, adolescents, and adults, this national survey is the most extensive assessment of the U.S. population’s environmental exposures.** The tests found that multiple toxic chemicals used or produced by industry, in agriculture, and in some popular consumer products are present in the bodies of average Americans. It also found that children and minorities have more chemicals in their bodies than do other Americans. The chemicals found in the test group included ones that are no longer produced or used domestically, but which clearly remain in the environment and in human tissue.⁴⁸

Body fat is considered an especially sensitive indicator of exposure to persistent environmental contaminants. A number of synthetic chemicals are soluble in fat and collect in tissues with high fat content — such as breasts, the liver, bone marrow, and the brain. Many fat-soluble synthetic chemicals are classified as probable or known carcinogens. Women, on average, have a two to 10 percent higher proportion of body fat.⁴⁹ Mothers pass their body burden to their unborn children in utero and to newborns through breast milk.

REGULATORY CHALLENGES TO PROTECTING PUBLIC HEALTH

Safety standards in place today are not based purely on health risk, but rather on compromises based on what is considered an acceptable level of risk given the cost and availability of technology to reduce contaminants.⁵⁰ Because there is uncertainty about our scientific estimates of risk levels, current Environmental Protection Agency (EPA) regulations aim for a wide “margin of safety” where there is “no observed adverse effect level.”

Although a “tolerable” or “acceptable” level of exposure to a single chemical or toxin can often be defined, assessing exposures to combinations of chemicals and their interactions is extremely difficult. Because we are exposed to hundreds of chemicals at any given time, it is almost impossible to attribute an adverse health effect to a single chemical.⁵¹ What’s more,



BIOACCUMULATION occurs when a compound is absorbed, or taken into the body and stored at a faster rate than it is metabolized (broken down) or excreted.

BIOMAGNIFICATION occurs when chemicals that persist in the environment become more concentrated as they move up the food chain and concentrate in tissues or internal organs. Each step in a typical food chain results in increased bioaccumulation, and therefore, biomagnification. An animal at the top of the food chain (such as predatory birds and humans), through its regular diet, may accumulate a much greater concentration of chemicals than organisms lower on the food chain.⁵²



ON THE SEMICONDUCTOR ASSEMBLY LINE

Santa Clara Center for Occupational Safety and Health (SCCOSH)

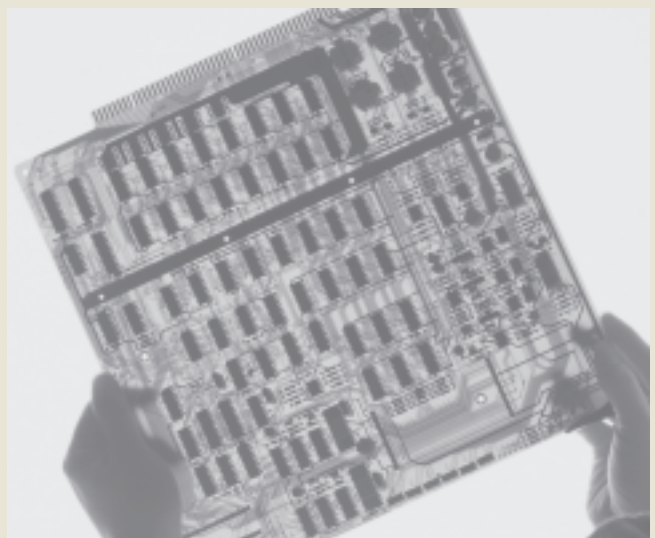
SITUATION: High-tech companies face an increasingly competitive market, and incentives to bring down production costs are great. Low-income women — 70% of whom are immigrants, migrants, and people of color — comprise a large percentage of Silicon Valley's manufacturing labor force. These workers typically assemble and solder electronic parts — computer motherboards, circuit boards for telephones, cell phones, cameras, and other equipment. The pay scale for assembly line work ranges from minimum wage to \$10 to \$18 per hour for experienced senior workers. Typically, a worker can complete a motherboard in four hours; the completed product is sold for upwards of \$1,000. Many women also bring work home in an attempt to make more money by assembling pieces during evening and weekend hours and by eliciting help from family members. For instance, for making I/O resistors, which requires threading copper wire through small holes, women are paid \$0.25 per piece.

Not only is the practice of taking piecework home illegal, it also carries health and safety risks. **Manufacturing computer equipment uses more than 1,000 materials, many of which are highly toxic, such as chlorinated and brominated substances, gases, metals, photo-active and biologically active materials, acids, plastics, and plastic additives.** Studies are beginning to emerge that link chemicals used in computer manufacturing with serious medical conditions. The illness rate of workers at semiconductor factories is three times greater than that of manufacturing workers in other industries. A study of women workers at a national semiconductor factory in Scotland found a large number were suffering from breast, uterine, and cervical cancer.⁵³ Studies have also shown that women who work in semiconductor fabrication rooms face a 40% or higher incidence of birth defects and miscarriages than do non-manufacturing workers.⁵⁴ The toxic cleaning solvents used in production and soldering require industrial-grade ventilation and protective gear, neither of which are available or regulated when work leaves the factory. Bringing piecework home, onto kitchen tables and counters, exposes families to a range of chemicals whose health impacts are simply unknown.

TAKING ACTION: As dangers associated with computer manufacturing are brought to light, more workers are speaking up and demanding safe conditions and information about the materials they work with. The Santa Clara Center for Occupational Safety and Health (SCCOSH), a community-based organization that advocates for safe working conditions, is playing a critical role in this process. SCCOSH offers occupational safety and health training tailored to Silicon Valley's workforce and coordinates public-action campaigns to heighten awareness of the health impact of workplace chemicals. SCCOSH also lobbies companies to examine and amend their dangerous practices.

SUCCESS: By educating workers, SCCOSH is enhancing the health of many Silicon Valley families. SCCOSH also played a pivotal role in getting trichloroethylene (TCE), a commonly used cancer-causing solvent, banned from use by semiconductor plants. The organization has helped initiate successful lawsuits to make companies safer, healthier places to work, and to protect workers and whistleblowers who speak up against health violations. In 1995, SCCOSH launched the Justice for Rodrigo Cruz Campaign. Cruz suffered brain damage from using faulty air equipment while working for the ROMIC recycling and hazardous waste management corporation cleaning toxic waste from a tanker. This campaign brought together community members, workers, and litigators against ROMIC. While this case was formally resolved in 1999, the campaign is on-going as ROMIC continues to violate OSHA and Department of Toxics Control regulations.⁵⁵

For more information, see <www.sccosh.org>.



we have yet to come up with a foolproof method for setting standards, as risk management is often inadequate because it takes into account legal, social, economic, and political factors rather than pure health factors. Risk assessment is also problematic because scientists and regulators often disagree on tests and methods used to determine the health effects of chemical exposure; therefore, a variety of tests often garner a variety of results and interpretations.⁵⁶

The public relies on regulatory laws to protect their health and the health of the environment, yet these laws are inadequate for several reasons:

1. The U.S. Environmental Protection Agency needs to have cause for concern before they can require testing of chemicals, and cause for concern is nearly impossible to prove without tests.⁵⁷
2. Underlying all regulatory testing is the traditional assumption that higher doses have a greater effect than lower doses. Yet researchers have begun to identify effects from contamination levels far lower than those previously assumed to be safe.⁵⁸ Chronic low-level exposures have been linked to occupational diseases, congenital anomalies, cancer, fertility problems, and behavioral and immune system disorders.
3. The long-term effects of chemicals are unknown until decades following their use. The health effects of PCBs, mercury, and dioxin, for example, were only discovered after billions of tons had been released into the environment.
4. Safe exposure limits set by regulatory agencies for toxins do not take into account exposure to multiple chemicals.⁵⁹
5. Depending on age, sex, and hormonal status, the same dose of a toxin or endocrine-disrupting chemical (EDC) can have wildly different effects, depending on whether the exposed person is male or female; a postmenopausal woman; an adult, a child, or a fetus developing in the womb.⁶⁰

ENDOCRINE-DISRUPTING CHEMICALS

The endocrine system is the communication network of glands, hormones, and target cells that regulates the body's internal functions and guides growth, development, and reproduction throughout life.⁶¹ **Endocrine-disrupting chemicals (EDCs)** are natural and synthetic substances that interfere with hormones, the body's chemical messengers, and can distort the chemical signals that carry out the body's functions

So far, scientists have found 51 synthetic chemicals that have adverse effects on the endocrine system. Many of them resist excretion and accumulate in the body. Some act like estrogen, while others affect thyroid metabolism and other parts of the system.⁶² Agricultural pesticides and herbicides, dioxin, DDT, and PCBs are just a few examples of EDCs. For a comprehensive list, see www.ourstolenfuture.org/Basics/chemlist.htm.

Scientists are beginning to notice that for a fetus or a newborn, endocrine disruption can occur at levels of chemical exposure *far lower* than those of traditional concern.⁶³ Prenatal and neonatal exposure to estrogen can make a developing fetus highly sensitive to estrogens and, perhaps, make it more vulnerable to certain cancers later in life. There are indications that an exposed fetus may also be susceptible to permanent changes to brain, immune system, and reproductive organ development.⁶⁴

To complicate matters further, scientists have new tools to measure tissue for the most minute concentrations of synthetic chemicals in human tissue. It is believed that even these minute sums may be dangerous.⁶⁵

Our current regulatory framework makes these problems seem insurmountable. But many environmental and women's activists are working for major public policy shift — one that no longer accepts risks to human health as a norm of industrialization, but, rather, ensures the standards of prevention and safe alternatives.

EXPOSURES IN DIFFERENT SPHERES OF LIFE

Women play multiple roles in society — in their homes as mothers, partners, caregivers, and consumers; in their neighborhoods as residents and organizers; in the workplace as employees and managers; and in their communities as activists, leaders, and decision makers. Organizations profiled throughout this report are addressing toxic crises in every sphere of life across California. Many of these organizations exist because of the efforts of women. As activists and policy advocates, women have demonstrated a clear understanding that their health and the health of loved ones is closely linked to the well-being of the planet.

The following list offers some examples of how, throughout the day, women can be exposed to a variety of natural and synthetic chemicals.



How Women are Exposed: Home

- Harmful chemicals in household cleaners such as bleach and glass cleaners and residues on recently dry cleaned clothes pollute the air in our homes (see page 12).
- Arsenic and lead flow through the pipes in our kitchens and bathrooms, into glasses we drink from, and into pots of food on our stoves (see page 19).
- Packaged foods, meats and poultry from the grocery store often contain either synthetic chemicals or hormones. Fish contains mercury, pesticides, and polybrominated dipheyl ethers (PBDEs) (see page 20).
- Pots and pans used for cooking are often covered in Teflon, which contains toxic chemicals.⁶⁶



How Women are Exposed: Neighborhood

- Municipal waste incinerators discharge harmful toxicants, including dioxins, into the air.
- In certain areas around the state, like Richmond and Long Beach, residents live within a few miles of oil refineries that have occasional spills or fires. When this happens, particulates are released into the air, and local residents are required to stay indoors (see page 38).
- In agricultural areas, nitrates used in fertilizers and antibiotics from animal waste from mega-dairies leech into groundwater and local wells shared by neighbors (see page 11).



How Women are Exposed: Workplace

- In assembly plants, workers — often immigrant women — use hazardous chemicals in “clean rooms” to construct chips and other computer parts without proper safety protections or training (see page 8).
- Farm workers and food packers in agricultural companies in the Central Valley get pesticides on the clothes and skin — and into their lungs (see page 15).
- Cosmetologists and manicurists work eight to 10 hours a day, six days a week applying polish, acrylic nails, and hair dyes in enclosed, unventilated rooms (see page 17).



How Women are Exposed: Broader Community

- Millions of cars carrying goods along highways and through towns discharge toxic contaminants, and air quality standards are often exceeded (see page 36).
- On Native American tribal land and in other low-income communities, untreated toxic waste is dumped without adequate resources for cleanup (see page 33).



How Women are Exposed: Statewide and Beyond

- Produce is grown with pesticides along with fertilizers that can contain carcinogenic heavy metals and water contaminated with a host of toxins.
- Workers in *maquiladoras*, factories across the Mexico border owned by American and other foreign companies, use synthetic chemicals to manufacture products such as furniture, plastics, and electronics. Limited regulations exist to protect the health of workers or the water and air of neighbors across the California–Mexico border.
- Perchlorate (rocket fuel), the legacy of the aerospace industry, leaches into groundwater and flows along the Colorado River, the primary source of water for 20 million residents of California, Arizona, and Nevada (see page 27).



HEALTH DANGERS IN TULARE COUNTY'S DAIRY INDUSTRY

Migrant Photography Project

SITUATION: *It is common knowledge that in Tulare County, everything seeps into the groundwater. This is why every migrant worker family in Tulare must spend from \$40 to \$60 per month on bottled water.*

*Tulare County is the biggest producer of milk and cheese in the nation. Annual operations earn \$3.49 billion.⁶⁷ It is commonplace for industrial dairy farms to use pesticides, antibiotics, and steroids in their processes. **Half of all antibiotics manufactured in the U.S. are used on industrial farms where they are ingested or injected into cows.** Each day, each cow excretes between 30 and 50 pounds of urine and between 30 and 70 pounds of feces.⁶⁸ Add this to the pesticides, herbicides, and fertilizers that are used in abundance by the area's vast agribusiness industry and you see why bottled water is a necessity. In fact, in some areas, **town officials require residents to keep receipts from their purchase of bottled water — as proof that they are not using the contaminated tap water.***

Tulare dairies often require migrant workers to live in company-provided housing. In some cases, the housing is on the dairy's property, surrounded by the cows, the holding pens, the machinery, and all the chemicals used in dairy processes. In California, there is no mandated testing of water on agricultural land for human safety.⁶⁹ What's more: the urine and feces from one cow each day contains 5.4 billion fecal coliform bacteria and 31 billion fecal streptococcus bacteria. Dairy workers also suffer the health effects of long-term exposure to nitrates — agents that are linked to bladder cancer and “blue” babies (infants that suffer from a lack of oxygen) — at nearly three times the acceptable statewide threshold levels.⁷⁰

TAKING ACTION: *In 2001, local residents created the non-profit Migrant Photography Project (MPP). Based in Lindsay, a town of 9,000, the project's goal is to document the lives of migrant families. Latina migrant workers involved in MPP learn photography skills to create images of their community. Participants photograph homes,*

schools, churches, streets, stores, fields, dairy farms, packinghouses, factories, and restaurant kitchens. To give voice to these images, the Migrant Photography Project organizes lectures and conducts interviews with subjects. As the water situation has grown dire, MPP has branched out, creating a special project called, “Water: The Right to Know/El Agua: el Derecho de Saber” — a collection of photographs, educational materials, and interviews of community members on the subject of water contamination.

SUCCESS: *The women behind MPP have created powerful written materials, which have been widely disseminated, and a Web site about the water issues. As part of the Project's bi-monthly newspaper, the town's only Spanish-language paper, initiative members write a health column highlighting water-related developments. Members are also beginning to collaborate with scientists to collect and test their water. The initiative has given the very women who are affected by the water crisis the tools to document and their situation. The stories of the women and families of Tulare County are now being shared.*

For more information, see
www.migrantphotographyproject.org.





HEALTHY HOUSEKEEPING — FOR CLEANERS AND OWNERS

Women's Action to Gain Economic Security (WAGES)

SITUATION: Conventional cleaning products found in most homes, offices, and schools are potentially harmful to both those who use the products and those who live and work in these buildings. Most commercial cleaning products contain petrochemicals and/or organochloride compounds, both of which have been shown to cause birth defects, cancer, and reproductive and developmental disorders.

Women who make their living as residential cleaners bear disproportionate health risks from day-to-day exposure to cleaning products. While warning labels often assure products' safety, these warnings assume only occasional use and not the everyday exposure that professional cleaners experience. Toxins in these chemicals tend to enter the body through inhalation. Much cleaning work takes place in poorly ventilated areas such as bathrooms. Resulting health problems include rashes, allergies, asthma, respiratory irritation, dizziness, and headaches. Residential cleaning jobs rarely offer health care benefits, so these women often lack the resources to treat conditions or the more serious disorders that can result from long-term exposure

TAKING ACTION: A group of Bay Area women, predominantly immigrants from Mexico who make their livings as residential cleaners, became alarmed at the number of health problems they felt were related to chemical-based cleaning products. With the assistance of Women's Action to Gain Economic Security (WAGES), an Oakland-based nonprofit organization that helps women launch and manage cooperative businesses, the women formed environmental cleaning cooperatives serving San Mateo, Santa Clara, and Alameda Counties. Cleaners use products such as vinegar, baking soda, and liquid vegetable-based soaps, and make every effort to reduce solid waste and monitor their usage of water and other utilities. **By replacing two conventional all-purpose and glass cleaning products with less toxic ones, each cooperative is reducing exposure to pollution by 85%, or 1,802 pounds per year.**⁷¹ These practices protect the health of the cleaners, their clients, and the environment at large, as well as providing a living wage through sustainable woman-owned and operated businesses.

SUCCESS: Each woman is a worker-owner, earning \$12 to \$14 per hour as compared with the conventional house-cleaning wage of \$7 per hour. Cooperative members report fewer headaches and skin irritations. One worker says, "I have cleaned houses for four years, and before WAGES, I used a lot of bleach and other strong chemicals. Some of the women I worked with were pregnant and would get dizzy. I used to get colds and was sick a lot too. Now, the best part is not using toxic chemicals."⁷²

After battling initial skepticism, the cleaners have won the trust of their clients. As both the workers and their clients begin to spread the message about the negative impacts of conventional house cleaning products, it is hoped that more consumers will look to organizations such as WAGES for safer alternatives.

For more information, see <www.wagescooperatives.org>.



MAKING THE CASE FOR CHANGE

It is extremely difficult to identify direct or causal links between specific toxins and health risks with the approximately 85,000 chemicals currently registered for use. In this section, we attempt to unravel some of the complexities involved. Some of the many considerations that factor into a person's health include:

route (at point of entry), **dose**, **timing**, and identity or **nature** of the chemical (as not all chemicals are toxic). All these elements are as important as the presence or absence of exposure itself. Chemical interactions with genetic, biological, behavioral, and physical factors in the body also impact human health and development. Below, we show how humans, particularly women, are vulnerable to toxic exposure throughout their life.

LIFECYCLE IMPACTS ON WOMEN: FROM CONCEPTION TO GRAVE

Women have additional factors to consider with environmental exposure; when pregnant, women transfer their lifetime-accumulated toxins to their fetuses in utero and later through breast milk. For a child, these exposures accumulate with a lifetime of contact with synthetic chemicals that all people experience through food, air, and water. In some phases of life, shifting concentrations of hormones and changes in metabolic rates increase a woman's susceptibility to exposure to environmental agents. And, as women age, their bodies become more susceptible to health risks.

ENVIRONMENTAL IMPACT ON WOMEN'S HEALTH					
LIFESPAN	CHILDHOOD		REPRODUCTIVE YEARS	PERIMENOPAUSE	ELDERLY YEARS
	PRENATAL	ADOLESCENCE			MENOPAUSE
DISEASES	Congenital Defects Prematurity Mortality	Asthma Childhood Cancers Precocious Puberty	Miscarriage Infertility Ovarian Dysfunction Cervical Cancer Endometriosis Premature Menopause Early-Onset Breast and Ovarian Cancers	Breast Cancer Ovarian Cancer Autoimmune Disease	Neuro-Degenerative Diseases – Alzheimer's – Cognitive Function Osteoporosis

CREDIT: Dr. Barbara J. Davis, Laboratory of Women's Health, NIEHS; Artist: Sue Edelman, Image Associates

LIFE STAGE: IN UTERO EXPOSURES AND TRANSGENERATIONAL EFFECTS

Slightly more than one of every eight U.S. births occurs in California — 527,000 in 2002.⁷³ One of every 33 newborns in California has a structural birth defect such as missing limbs, malformed hearts, and neural tube defects.⁷⁴ Surprisingly, only 20% of birth defects have identifiable causes. In 2002, nearly 13,000 birth defects in California had an “unknown origin.”⁷⁵

The level of chemical contamination a woman experiences affects a fetus' development from the time of conception. **Throughout gestation, chemicals cross the placenta and may disrupt fetal development, resulting in serious health effects that may not be evident until a child reaches puberty or adulthood.**

Because scientists believe that females are born with their total lifetime supply of ova (or eggs), women exposed to toxicants in utero are at an increased risk of passing the effects of contaminants on to the next generation. As with DES (see page 5), exposure to chemicals as a developing fetus or an infant may result in permanent changes in function, while similar exposure as an adult may have no detectable effect.⁷⁶ A fetus can be exposed to higher doses of thyroid hormone interruptions such as PCBs in utero than later exposures in food or breast milk, and are at higher risk for developing permanent neuro-developmental problems.⁷⁷

LIFE STAGE: INFANT BREAST MILK — CONTAMINATING NATURE'S PERFECT FOOD

At birth, a newborn's internal organs and nervous, respiratory, reproductive, and immune systems are not yet fully developed. While nursing, a mother draws on her fat stores, and contaminants that accumulated over decades in body fat are passed on to the next generation.⁷⁸ According to Theo Colburn, the chemical concentrations are “10 to 40 times greater than the daily exposure of an adult.”⁷⁹ In many cases, adds Sandra Steingraber, these toxic residues are “in excess of limits established for commercially-marketed food.”⁸⁰

STRUCTURAL

BIRTH DEFECT:

involves a body part that is missing or malformed. Examples of structural defects include heart defects, spina bifida, and oral and facial clefts. These types of defects can have both genetic and environmental causes. Other terms often used for these types of defects include anomalies, malformations, and deformities.

Despite the presence of certain contaminants in breast milk, studies indicate that breastfeeding may in fact reverse any damages that may have occurred in utero.⁸² **Mother's milk is the still the best source of nourishment for developing infants.** It has health-promoting attributes such as antibodies, white blood cells, and proteins that protect against infection and allergies that make it superior to infant formula. In fact, formula runs the risk of contamination from tainted water and the plastic bottles used for feeding and exposure to phytoestrogens (plant estrogens) and pesticides used to produce soy crops.

“The contamination of breast milk is a symptom of the environmental contamination of our communities.”

— CONSUMER VOICE,
A QUARTERLY TRILINGUAL
HEALTH NEWS BULLETIN OF THE
EUROPEAN COMMISSION ⁸¹

LIFE STAGE: YOUNG WOMEN'S DEVELOPMENT — EARLY ONSET PUBERTY

Exposure at very early ages to endocrine-disrupting chemicals, including insecticides and growth hormones in meat and dairy products, may help to explain the phenomenon of early-onset puberty.⁸³ Lab research and human studies corroborate a link between chemical exposure and the progress of sexual development. In the United States, **girls are reaching puberty on average one to two years earlier** as compared to historical data. In one study, 48% of African American girls and 15% of European American girls had begun to show the initial signs of sexual development by age eight.⁸⁴ Girls with the highest prenatal exposures to certain chemicals began menstruating up to a year earlier than those girls exposed to lower levels.⁸⁵ Other factors believed to contribute to include hormones in milk, contamination in food, and increased obesity.⁸⁶

LIFE STAGE: ADULTHOOD

Women cross paths with a multitude of synthetic chemicals while in the home — in cleaning products, in kitchenware, in food. As stories in this report demonstrate, women in California constitute a majority of the workforce in many service occupations and in certain manufacturing sectors. For example, there are approximately 28,000 dry cleaning workers in California, most of whom are women.⁸⁷ Dry cleaners are continually exposed to perchloroethylene, a known organic solvent (see chemical-by-chemical explanation, below).⁸⁸ Women are field workers, commercial and residential cleaners, microchip assemblers, and cosmetologists and manicurists.

LIFE STAGE: ELDERLY YEARS

California is home to more elderly people than any other state — approximately 3.7 million people, or 11 percent of the total population.⁸⁹ Nearly 2.15 million of them, or 58%, are women.⁹⁰ As our bodies age, we are more susceptible to environmental hazards that may cause or aggravate chronic or life-threatening conditions. Older women have accumulated a lifetime of environmental and occupational contaminants. A lifetime accumulation of estrogen from external sources, including food, chemical pollution, and pharmaceuticals such as hormone replacement therapy, are now understood to contribute to breast — and perhaps ovarian — cancer.

The industrial boom that started after World War II radically changed our environment and way of life. We will not know what effect a lifetime of exposure to synthetic chemicals — through air pollution, heavy metals (including lead and cadmium), pesticides, and various pathogens found in water — will mean until 2010 when people born in the 1940s and '50s reach their golden years.⁹¹ Under Christine Whitman's leadership, the EPA initiated an effort to examine specific impacts on elder Americans. It is unclear whether this program will continue under new EPA leadership.

A CHEMICAL-BY-CHEMICAL EXPLANATION OF HEALTH EFFECTS

Scientific research has provided some proof that certain chemicals have adverse effects on human health. In this section, we highlight some of these findings as examples of the widespread problem.

Much of the gender-specific research on environmental contamination has focused on women's reproductive role. In this report, we do not wish to limit our analysis exclusively to women's reproductive health. We provide a sample of studies highlighting links between families of chemicals and human conditions. The chemical-by-chemical approach — the most common in research — is a useful process for identifying risk, but it has limitations because it does not address the effect of multiple chemicals on the human body.



PESTICIDES GROW GIANT HEALTH PROBLEMS

Pesticide Action Network of North America (PANNA)

SITUATION: California is called the salad bowl of the U.S.: approximately one-third of its 100 million acres of land is devoted to agriculture, producing 55% of the country's fruits, nuts, and vegetables.⁹² To maximize productivity, California's growers rely on pesticides, using one quarter of the 1.2 billion pounds of pesticides used in the nation.⁹³

Farm laborers in California are potentially exposed to 97,500 tons of pesticide annually through planting, weeding, thinning, irrigating, pruning, harvesting, and processing crops, and living near pesticide-treated fields.⁹⁴ Pesticides are known to be responsible for more than 300,000 illnesses in farm workers annually in the U.S.⁹⁵ Some 95% of the 700,000⁹⁶ farm workers in California's agribusiness are immigrants. Women constitute approximately one-fifth of this labor force.⁹⁷

At least one third of the pesticides in use in California are known to be toxic to humans and are classified as carcinogens, reproductive toxicants, endocrine system disrupters, and/or neurotoxins.⁹⁸ Immediate symptoms caused by pesticide exposure include blurred vision, diarrhea, nausea, vomiting, wheezing, seizures, irritation of eyes, nose, or throat, headache, skin rashes, and dizziness.⁹⁹

A recent study of 146,000 California Latino farm workers showed that, compared with the general Latino population, farm workers were more likely to develop leukemia and cervical, uterine, and stomach cancer.¹⁰⁰ To compound the problem, less than one-third of California's farmworkers has any form of health insurance.¹⁰¹

TAKING ACTION: Pesticide Action Network of North America (PANNA) works to document, quantify, and study the widespread use and impact of pesticides. PANNA's strength lies in its ability to bring research and critical analysis to the grassroots level, educating farm workers on the dangers of pesticide exposure, bringing media attention to the crisis, and documenting and chronicling the illnesses and deaths associated with pesticide exposure.

SUCCESS: The number of reported acute poisoning cases has dropped in the past five years, indicating some success. Still, many pesticide-related illnesses go unreported and untreated because farm workers have limited health care or fear the loss of their jobs. Doctors also often fail to recognize and report pesticide-related illnesses. PANNA is focusing efforts on raising awareness to improve recognition, treatment, and reporting of pesticide-related illnesses. One female farm worker from Porterville tells PANNA, "I had rashes and pain all over my body. I went to the doctor, but he never told me anything. I didn't think it was chemical, and I didn't know that I should report it to my boss."¹⁰²

PANNA's ability to partner with farm workers by providing sound scientific evidence regarding pesticides is an important step in addressing the complex problem. The organization's work moves the industry toward the goal of protecting workers when hazardous pesticides are used, regulating the use of those pesticides and enforcing regulations and, eventually, eliminating their use altogether.

For more information, see <www.panna.org>, <www.pesticideinfo.org>, and <www.pesticidereform.org>.





MANICURISTS AND THEIR TOXIC WORKPLACE

SITUATION: *The rapidly growing cosmetology and manicure fields are dominated by women and people of color. In 1996, there were approximately 125,000 nail salons across the country, employing more than 500,000 nail technicians.¹²¹ As of 2001, there were 38,176 employees providing hair, nail, and skin care in California alone.¹²² Professionals of Vietnamese background operate 80% of all nail salons in California and 37% of all salons nationwide.¹²³ These cosmetologists and manicurists, mostly women, typically work long hours. In 2001, they earned an average of \$15,700 per year.*

*Manicurists routinely handle solvents, chemical solutions, and glues. Many of these chemicals are irritants and can cause allergic reactions or affect the body's central nervous system. Manicurists often report health problems including **headaches, asthma, chronic cough, dermatitis, runny or dry nose, and fatigue or depression.** Two chemicals are believed to be the principal culprits: methyl methacrylate liquid monomers (MMA) and ethyl methacrylate (EMA) Although banned in 1974, both these chemicals are still commonly used in salons and found, in small amounts, in many nail products.¹²⁴ According to the National Institute for Occupational Safety and Health (NIOSH), both can trigger asthma, dermatitis, and allergies of the eyes and nose.*

A number of other chemicals used in nail salons, including acetate, toluene, and formaldehyde, have also been linked

*to **headaches and skin and respiratory disorders;** formaldehyde is also a suspected **cancer-causing agent.**¹²⁵ Nearly all cosmetology and nail products carry advisories that the product is to be used in a properly ventilated area, but lack of ventilation is common in salons.*

ACTION NEEDED: *The cosmetology and nail industries have historically been ignored. Little research has been conducted on the long-term health impacts on employees or customers, or the economic and human ramifications.¹²⁶ Currently, the Asian Law Caucus in San Francisco is initiating an educational outreach program to women working in nail salons.*



Dioxins

Dioxins are by-products of chlorine-based industrial processes such as the bleaching of paper products and the incineration of hospital, municipal, and hazardous waste.¹²⁷ The EPA lists all dioxins as carcinogens.¹²⁸ Ninety percent of human exposure to dioxins occurs through diet, particularly fatty foods.¹²⁹ **Americans ingest a daily amount of dioxins that is 300 to 600 times higher than the EPA's safe dose.**¹³⁰ In their first year of life, nursing infants can absorb 30% to 90% of the maximum recommended *lifetime* dose of dioxin.¹³¹ In fact, the average daily dioxin intake of a nursing infant is 50 to 100 times higher than the average adult (on the basis of body weight).¹³²

Prenatal exposure to dioxin can cause **irreversible effects on the reproductive system** of a fetus — including lower sperm counts, undescended testicles, and hypospadias, an abnormal positioning of the opening of the urinary tract.

- There is evidence that exposure causes **immune system abnormalities** and **brain dysfunction** in babies. Dioxin may have a greater impact on female babies.¹³³
- Investigators have found a correlation between higher dioxin levels in breast milk and **lower thyroid levels** in infants. In pre-term and low-birth-weight babies, decreased thyroid hormone levels have been associated with an **increased risk of neurological disorders.**¹³⁴
- Dioxins have been linked to **endometriosis, diabetes, neurotoxicity, decreased fertility, and reproductive dysfunction** in both women and men.¹³⁵

On July 1, 2003, the Institute of Medicine of the National Academy of Science released a report urging the federal government to encourage the public to reduce dietary exposure to dioxin by eating fewer sources of animal fat. The report suggested preventing exposure to dioxin in girls and women during the years well before childbearing to lessen the accumulation of the compounds in their bodies, which could be passed on to their children through the placenta and breast milk.¹³⁶

Polychlorinated Biphenyls (PCBs)

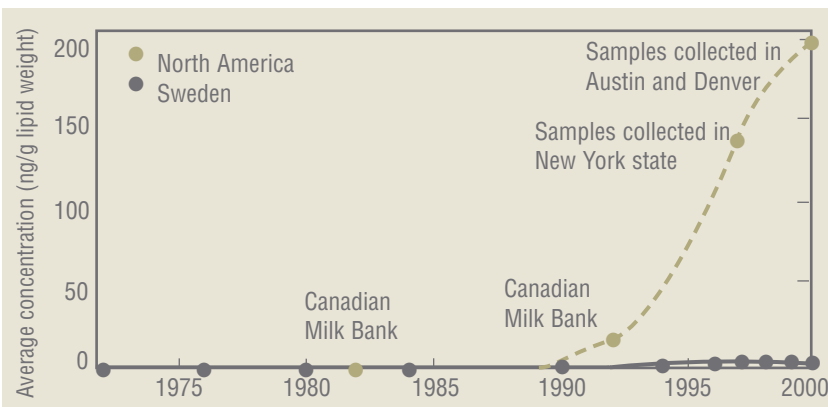
PCBs are used primarily as coolants and lubricants in electrical transformers and in fluorescent lighting fixtures and other appliances. Despite the fact that they have been banned in most industrialized countries since the late 1970s, PCBs are persistent and bioaccumulate in the environment.¹³⁷

- Researchers have identified correlations between prenatal PCB exposure and **poor performance in gross motor function, memory, and visual recognition**. The higher the level of PCBs in umbilical cord blood, the worse a child's mental development. One test showed that children whose mothers ate fish contaminated with PCBs were more likely to have poor mental development.¹³⁸
- Five percent of babies in the U.S. are exposed to enough PCBs in breast milk to affect their **neurological development**.¹³⁹
- Infants with the highest exposure to PCBs through umbilical cord blood and breast milk have **abnormal reflexes** and **less developed attentiveness** to visual and auditory stimuli. Even 3.5 years after birth, these children have **multiple behavioral problems**, as well as **impaired thyroid and immune systems**.¹⁴⁰
- Researchers have linked PCB exposure to **increased risk of malignant breast cancer**.¹⁴¹

Polybrominated Diphenyl Ethers (PBDEs)

PBDEs are flame-retardant chemicals found in electronic equipment, plastics, and foams. They not only bioaccumulate but also biomagnify (*see definition, page 7*). Women in California may be at higher risk

from exposure because of stringent fire safety standards that mandate greater use of fire retardants. Since the 1970s, the levels of PBDEs in **human breast milk have increased 40 fold**.¹⁴² A study by the California Department of Toxic Substances Control found that **concentrations of PBDEs in breast fat tissue samples from Bay Area women are among the highest detected world-wide**.¹⁴³ As recently reported in the New York Times, "in response to rising concern, a number of companies (including Intel, Ikea, and Sony) are phasing PBDEs out of their products."¹⁴⁴



Levels of PBDEs in Swedish women are much lower than the U.S. and Canada. Levels in U.S. women's bodies appear to be increasing rapidly while levels in Swedish women decreased rapidly after PBDEs were banned in 1995.

- PBDE interferes with thyroid functioning and neurological development and has the potential to contribute to **learning disabilities** and **hyperactivity**.¹⁴⁵
- Researchers have found that a single dose of PBDE administered to infant mice and rats **affects brain development**, causing "measurable changes" in **learning ability, memory, behavior, and hearing**.¹⁴⁶

HEAVY METALS

Exposure to hazardous metals can occur in a variety of ways — inhalation, through food or water, and absorption through the skin. Once absorbed, metals are distributed in tissues and organs and tend to persist for decades. This report highlights the health effects of three metals: arsenic, lead and mercury.

Arsenic

Arsenic is a naturally occurring metal found in the earth's crust. As minerals from aging rocks and soils dissolve, arsenic seeps into ground water, contaminating drinking water. Inorganic arsenic, in the form of chromated copper arsenate, has, until recently, been commonly used as a wood preservative. Both forms are known human carcinogens.¹⁴⁷ California now requires that the synthetic form, CCA, be phased out.

CREDIT: Courtesy of Environmental Working Group



ARSENIC IN WATER: THIRSTY FOR JUSTICE

Center for Race, Poverty and the Environment — Alpaugh Clean Water Project

SITUATION: *Alpaugh, a small town in the southern San Joaquin Valley, is home to 900 people, most of who are low-income migrant farm workers. Like many poor, rural towns of the Central Valley, Alpaugh has faced a host of environmental and social injustices, including proposals to locate a toxic waste incinerator and five commercial dairies in the area.*

Alpaugh's water supply is highly contaminated with arsenic, a known carcinogen: at 74 parts per billion, it far exceeds government-established levels.¹⁴⁸ Alpaugh residents have been instructed by local authorities not to drink or cook with their tap water, so residents must buy bottled water. For families earning a combined household income of \$675 to \$900 each month, paying for bottled water is a heavy burden. A political feud between two water districts has caused a dramatic price increase in Alpaugh's water rates; recently the monthly cost tripled to \$60, a fee residents must pay even though they cannot use the water.

TAKING ACTION: *When Alpaugh's K–12 school lost its accreditation, 19 women with little formal education formed the Committee for a Better Alpaugh. Under the leadership of Sandra Meraz, a long-time resident, grandmother, and environmental activist, the Committee*

expanded its mission and teamed up with the San Francisco-based Center on Race, Poverty, and the Environment to create the Alpaugh Clean Water Project.

SUCCESS: *The water project is conducting extensive research on Alpaugh's water quality, installing filters throughout the area and educating the community on water problems and other social justice issues. A suit has been filed against one water district for failing to properly announce a rate increase. And Sandra Meraz has been elected to the Water Works District Board, where she is the only female member. Meraz is giving a voice to previously excluded community members, including renters and Spanish-speaking residents. More residents are becoming involved in decision making and learning how to speak out for their community's safety.*



- Early symptoms of arsenic poisoning include **vomiting, esophageal and abdominal pain, and diarrhea**. Long-term arsenic exposure has been linked to **skin, lung, bladder, and kidney cancers**, and the development of atherosclerosis and skin-related ailments.¹⁴⁹
- Women drinking contaminated water have an **increased risk of spontaneous abortion and stillbirth**.¹⁵⁰
- Researchers have established links from arsenic exposure to **hypertension, cardiovascular disease, diabetes, reproductive disorders, and certain cancers**.¹⁵¹

Lead

In 1925, an international covenant banned the use of lead in paint, acknowledging that the neurotoxin had the ability to damage or destroy nerve tissue. However, because of industry

pressure, the U.S. continued to use lead until 1978, when the federal government initiated a ban against its use in paint and gasoline.¹⁵² Yet each year, more than 300 million pounds of lead is released or transferred into the environment through mining, smelting, manufacturing, recycling, and disposing of lead-containing automotive components — primarily batteries — and through normal vehicle use.¹⁵³ Lead pipes in homes, often in rural areas, pose an additional risk to exposure through tap water. In women, lead settles into bones and teeth, and can be released with calcium during pregnancy and transferred to the developing fetus.

- Health effects include **miscarriage, spontaneous abortion, stillbirth,**¹⁵⁴ **developmental neurotoxicity, reproductive dysfunction, and toxicity to the kidneys, blood, and endocrine systems.**¹⁵⁵



MERCURY IN SEAFOOD

Hightower Discovers Something Fishy Mercury Policy Project

SITUATION: While working as an internist in a San Francisco hospital, Dr. Jane Hightower began seeing a string of patients with similar, unexplained symptoms — nausea, abdominal pain, hair loss, muscle weakness, and stiffness. Her investigations turned up high levels of mercury in the majority of those patients. Plus, she found that the higher the mercury level in a patient, the more common the symptom.¹⁵⁶

When she found the mercury link, Dr. Hightower asked her patients to stop eating fish for six months. When she retested these patients, their mercury levels — and their symptoms — had declined dramatically. Energized to test her theory further, Hightower embarked upon a year-long study of 720 patients, which showed mercury rates to be 10 times higher than the national average.

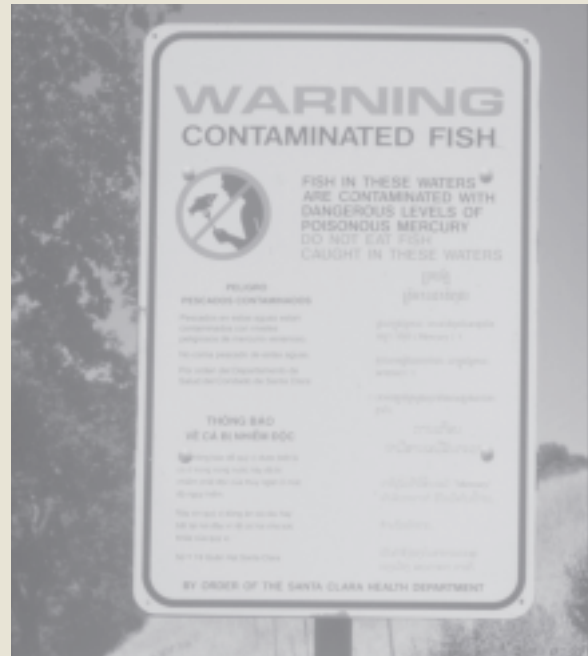
We now know that mercury, the second most toxic element on earth, can be harmful to humans at every dose. Humans face the most serious mercury risk from food, primarily the consumption of fish. Nearly all fish contain at least some quantity of methyl mercury. Methyl mercury accumulates easily in all tissues and especially tissue of the brain, muscles, kidneys, and liver. It is found in breast milk and can collect in fetal blood. Mercury is classified as a neurotoxin and is known to affect brain development in fetuses and infants. It has also been linked to tremors, impaired vision and hearing, paralysis, insomnia, reduced fertility, and heart attacks.

The Environmental Protection Agency (EPA) estimates 7 million women and children are eating mercury-contaminated fish at or above a “safe level.” Approximately 8% of women of childbearing age exhibit higher-than-normal

mercury levels, exceeding that which the Environmental Protection Agency/EPA considers to be the maximum level allowed to avoid adverse health effects.¹⁵⁷ Yet no controlled clinical trials have ever been done. We have been relying on epidemiologic studies of after-the-fact exposures.

TAKING ACTION: Dr. Hightower’s study brought important attention to the problem of eating commercial fish laden with mercury. Her research has not only shed light on mercury poisoning but has helped bring women into the realm of medical research on toxic contamination. Today more, large-scale research studies are in the works, and there is a growing movement towards strengthening seafood regulation and educational labeling. In response to concerns about mercury exposure risks, the Food and Drug Administration (FDA) is hosting a series of meetings to develop a new consumer advisory for women and children regarding mercury.¹⁵⁸

For more information, see <www.mercurypolicy.org>.



- Even at low doses, lead exposure during gestation has long-term effects on behavior and intelligence, including **developmental delays, aggression, poor language skills, hyperactivity, and delinquency.**¹⁵⁹
- Recent studies supported by the National Institute of Environmental Health Sciences suggest that a young person’s lead burden is not only linked to lower IQ and declining high school graduation rates but also to **increased delinquency.**¹⁶⁰

Mercury

The largest sources of mercury pollution are coal power plants and municipal incinerators, but mercury is also found in dental amalgam, batteries, fluorescent lights, thermostats, nasal sprays, and flu and tetanus shots. The consumption of fish and seafood is the most significant means of exposure to mercury for humans. While the average mercury level for a resident of the U.S. is less than one part per million,¹⁶¹ even trace amounts of methyl mercury (so called in its organic form

when mercury is attached to carbon) in a pregnant woman can be pumped into a fetus' bloodstream. As pregnancy continues, mercury levels in the umbilical cord blood can surpass the levels in a mother's blood.¹⁶²

- Some studies consistently find higher levels of methyl mercury in a newborn's blood than in the mother's blood.¹⁶³ Researchers found, when these children were tracked and tested seven years later, that these same children experienced **deficiencies in memory, learning and attention** that were proportional to the level of mercury in umbilical cord blood. The more mercury the child was exposed to before birth, the more poorly the child performed on the tests. The study also discovered **cognitive problems at very low exposures** — levels previously considered harmless.¹⁶⁴
- Children born to women with blood mercury levels higher than 5.8 milligrams per liter are at a higher risk for having neuro-developmental problems, such as **reduced developmental IQs and motor skill problems** such as hand-eye coordination, and language.¹⁶⁵
- The National Academy of Science estimates that 60,000 children are born each year in the U.S. with a **risk of neurological effects** from mercury because of the contaminated fish eaten by their mothers.¹⁶⁶

Children of women who consume large amounts of fish and seafood during pregnancy — especially Southeast Asians, Filipinos, Pacific Islanders, Latinos, Native Americans, and others who rely on fish for the bulk of their dietary protein — are likely to be overexposed to mercury.¹⁶⁷ Women who frequently eat certain commercial fish such as swordfish and tuna are also at risk.

PHthalATES

Phthalates are the softening agents used in plastics such as food and beverage containers, medical equipment, personal care products, and, until recently, children's toys. The U.S. produces over one billion pounds of 25 different phthalate compounds each year. These are easily absorbed through the skin and accumulate in fat tissue.¹⁶⁸ Women between the ages of 20 and 40 were found to have phthalate levels 50% higher than men's.¹⁶⁹

- Phthalates show endocrine-disrupting properties, and effects such as **developmental delays and birth defects of male reproductive organs**.¹⁷⁰ Bisphenol A, used in making a number of plastics, has been found to mimic estrogen¹⁷¹ and can contribute to **hormone disruption**.
- For more than 20 years, large numbers of baby girls in Puerto Rico between the ages of six months and two years have been experiencing **premature breast development**. Phthalates were present in the blood of 68% of these girls, compared to 17% of a control group.¹⁷²

In 2003, the European Parliament prohibited the use of certain phthalates in cosmetics, but in the U.S., manufacturers are not required to label phthalates in their products or test their effects on health.¹⁷³

OZONE AND CARBON MONOXIDE

Cars, trucks, and other mobile sources cause the majority of the pollution released into California's air. Carbon monoxide is primarily released from vehicle emissions, while ozone pollution is formed in the atmosphere from pollutants released by both vehicles and industrial sources.

- A study of pregnant women who live in areas of Los Angeles with elevated ozone and carbon monoxide levels showed evidence that their newborns were three times more likely to suffer from serious **heart defects**.¹⁷⁴ Typically, there are more than 930 cases of these defects in California each year.¹⁷⁵
- Exposure to air pollution during the third trimester of pregnancy also contributed to **low birth weight** of children.¹⁷⁶ And UCLA researchers believe that elevated pollution from stagnant air conditions in winter months contributes to high rates of **low birth weight** and **pre-term babies**.¹⁷⁷
- An ongoing University of Southern California/South Coast Air Quality Management District study of children in Riverside County found that children exhibited **weak lung capacity** and **slow lung growth** from prolonged exposure to diesel aerosol.¹⁷⁸
- Carbon monoxide pollution from cars is believed to contribute to **cardiovascular disease**,¹⁷⁹ which is the leading cause of death for post-menopausal women.¹⁸⁰

For a more detailed listing of chemicals and their impacts, see Appendix 1, page 39.



GASPING FOR AIR IN THE INLAND EMPIRE

Center for Community Action and Environmental Justice

SITUATION: *More Californians die from respiratory illness caused or aggravated by particulate matter than from car accidents, murders, and AIDS combined.*¹⁸¹ Riverside and San Bernardino counties, collectively known as the Inland Empire, have such a dire air pollution problem that a child born there will be exposed to as many cancer-causing agents in its first 12 days of life as most people are in 70 years.¹⁸² The area, a 30,000-square mile region that is home to 1.7 million people, is consistently in violation of federal health standards for airborne particulates.

Riverside County has the fourth highest particulate pollution in the world.¹⁸³ **San Bernardino County has one of the highest level of ozone pollution in the country.**¹⁸⁴ Cars, trucks, industrial facilities, agricultural operations, and mines all discharge exhaust, soot, soil, dust, metals, and chemicals into the air. When breathed in, the particulates — tiny particles that lodge themselves deep in the lungs — can cause aggravated breathing, lung disease, pneumonia, heart disease, and even some forms of cancer. The Inland Empire has the highest pediatric asthma rate in California, and its respiratory death rate is double that of the rest of the state.¹⁸⁵

Low-density in the Inland Empire encourages the use of cars; emissions from diesel trucks is also a problem since diesel particles are carcinogenic. One of the biggest problems is emission from diesel-powered vehicles, since diesel particles are carcinogenic. Studies by the Southern California Particle Center and Supersite at UCLA found that diesel aerosols penetrate lung tissues and invade the heart and nervous system, including the brain.¹⁸⁶ The rapid expansion of the ports of Los Angeles and San Pedro now draw thousands of diesel trucks into neighborhoods near schools, homes, and parks. According to a USC Children's Health Study, children in the Mira Loma community of Riverside County have the slowest lung development and weakest lung function of all children in southern California.¹⁸⁷

TAKING ACTION: *The Center for Community Action and Environmental Justice (CCAIEJ) was formed as a community movement to lobby for the cleaning of the Stringfellow Acid*

Pits, California's worst toxic waste site. At the end of the 25-year battle, the community reaped a new drinking water system at the polluters' expense, decision making rights in relation to the cleanup, and recognition that an informed community can force beneficial policy changes. Center director Penny Newman guides CCAIEJ actions along two guiding principles: the right to know and the right of affected persons to participate in decisions. The organization galvanizes community support to understand, fight, and work to clean up the area's pollution.

SUCCESS: *Working with local Inland Empire grassroots organizations, CCAIEJ has provided the scientific information and public pressure needed to prompt the California Air Resources Board to tighten air requirements for allowable levels of diesel exhaust in the area. Their work also prompted the South Coast Air Quality Management District to conduct the first health risk analysis of the impact of air pollution on just one community rather than on the entire region.*

CCAIEJ's Environmental Justice Initiative, in partnership with community residents, stopped more than 700 acres of land from being developed for industrial purposes. In addition, Riverside County now requires a 1,500-foot buffer zone between diesel sources and homes and schools and limits the amount of time trucks can idle. And, when the county is granting development permits, they must perform mandatory environment and community impact assessments. Currently, CCAIEJ is hard at work fighting a new proposal that would locate a mega-dump adjacent to Joshua Tree National Park. The dump would bring 40 million pounds of garbage to the area every day for the next 100 years.

For more information, see <www.ccae.org>.



ENVIRONMENTALLY-LINKED DISEASES BESIEGE WOMEN

Between 1991 and 1998, the use of toxicants that impact women's health increased 20% in California — from 25.8 million pounds to 30.1 million pounds.¹⁸⁸ This rate, coupled with the rate of disease proliferation and the costs involved, add up to an unsettling future. (For a reference guide, see Appendix 1 on page 39.) We have elected to highlight three diseases that vex women around the country. The prevalence and severity of endometriosis, breast cancer, and autoimmune disease have increased at an alarming rate.

ENDOMETRIOSIS

There is no cure for endometriosis. This hormonal and immune system disease occurs in women when tissue like the lining of the uterus — the endometrium — grows in other parts of the body such as the ovaries, uterus, bowel, abdomen, lungs, arms, and thighs. Endometriosis affects between two and 10 percent of all girls and women.¹⁸⁹ Although it affects an estimated 5.5 million women in the U.S. and Canada, endometriosis is still under-recognized, under-diagnosed, and under-treated. It takes, on average, nine to 10 years from the onset of symptoms to diagnosis. Far more common today than it was 50 years ago, **endometriosis is now a leading cause of female infertility** (30 to 40% of women with endometriosis are infertile¹⁹⁰), **chronic pelvic pain**, and **gynecologic surgery**. It is also the cause of more than 120,000 of the 500,000 hysterectomies performed in the United States annually.¹⁹¹

Teens and pre-teens are a significant portion of the endometriosis patient population today. In Riverside and San Bernardino counties, girls as young as 14 have been diagnosed with the disease. According to Mary Lou Ballweg, President of the Endometriosis Association, “The rising number of cases parallels the increase in use of hormonally active chemicals since World War II, and particularly organochlorines.”¹⁹²

The precise cause of endometriosis is unknown, yet research indicates that certain environmental toxins, such as dioxins and PCBs, damage the immune and endocrine system and can cause the development of endometriosis. **Analysis of rhesus monkeys exposed to dioxins for four years showed that endometriosis was directly connected with dioxin exposure. The severity of the disease was dependent on the dose administered.**¹⁹⁴ Because primates (monkey and apes) are the only other menstruating species, these studies are particularly telling. Effects are seen in monkeys at dioxin levels two to 20 times lower than the average levels in American women today.¹⁹⁵ Growing evidence supports the hypothesis that PCBs (polychlorinated biphenyls) can cause endometriosis by stimulating chronic inflammation.¹⁹⁶

Many women and girls with the disease also experience a range of problems such as allergies, asthma, eczema, and autoimmune diseases including fibromyalgia, chronic fatigue syndrome, thyroid disease, diabetes mellitus, lupus, multiple sclerosis, rheumatoid arthritis, and Sjögren's syndrome. Recent studies have even shown an elevated risk of certain cancers.¹⁹⁷

BREAST CANCER: THE #1 KILLER OF WOMEN BETWEEN 34 AND 54

After skin cancer, breast cancer is the most common cancer in women. Rates of breast cancer have nearly tripled in the United States in the past 50 or so years: **the lifetime risk of a woman developing breast cancer in the 1940s was one in 22; in 2002, the risk was one in eight.** The disease is the number one killer of women between the ages of 34 and 54.¹⁹⁸ The rates of breast cancer among women in the urban San Francisco Bay and Los Angeles areas of California have been historically higher than in many other areas of the U.S. and the world.¹⁹⁹ Northern California's Marin County has the highest breast cancer rates in California.²⁰⁰

Established risk factors such as early puberty and late onset of menopause only explain between 30 to 50% of breast cancer cases.²⁰¹ The only known *cause* of breast cancer, to date, is ionizing radiation — such as x-rays and nuclear waste.²⁰² There is growing agreement among scientists that environmental factors contribute to this problem. Strong evidence shows that estrogen

“I am 16 and have recently been diagnosed with endometriosis. It has literally taken over my life. The pain is excruciating.”

— TRACY¹⁹³

ORGANOCHLORINES:

a class of industrial chemicals that are made from chlorine and carbon-based organic matter. At least 16 organochlorines or groups of organochlorines have been shown to cause mammary cancers in laboratory animals and, in some cases, in humans as well.

plays a part in some cases, and numerous synthetic substances mimic estrogen.²⁰³ These chemicals often lodge in fatty tissue, such as the breast, where they can influence cell growth. The cells of the vagina, uterus, and breast all contain large numbers of estrogen receptors — or proteins that estrogens attach to.²⁰⁴ Since 1971, billions of dollars have been spent researching breast cancer; to date, less than three percent of that money has been spent studying environmental links.²⁰⁵

- Researchers believe that exposure to **endocrine-disrupting chemicals in pesticides** may account for the greater incidence of breast cancer in higher-income women.²⁰⁶
- Researchers have found a significant association between breast cancer and **employment in chemical-intensive industries** — with mortality rates 1.64 times higher among pharmaceutical workers and 1.51 times higher among electrical equipment manufacturing workers exposed to high levels of solvents.²⁰⁷
- A study published in the *International Journal of Epidemiology* found that in New Jersey, a state with 111 Superfund sites, **breast cancer mortality** among white women **increased the closer they lived to a hazardous-waste site**.²⁰⁸ Elsewhere, researchers have found that breast cancer rates were 6.5 times higher for residents in counties where hazardous waste sites are located.²⁰⁹
- A study of 981 women who lived near Seveso, Italy during the highest known population **exposure to dioxin** — an industrial explosion in 1976 — shows that **breast cancer risk increased significantly**.²¹⁰ The Seveso study confirmed findings that dioxin spurred development of mammary tumors in mice.²¹¹

There is a fair amount of inconclusive or conflicting research about toxic exposure and breast cancer. The research described above raises concern about certain persistent toxins and indicates the need for continued investigation — and continued efforts toward prevention of exposure to toxic chemicals.

AUTOIMMUNE DISEASES: THE FOURTH LARGEST CAUSE OF DISABILITY AMONG WOMEN IN THE U.S.²¹²

On average, 18 million people in the United States are afflicted with autoimmune diseases²¹³ — nearly one in every 31 people. Autoimmune diseases occur when the immune system attacks the body's own cells and tissues. Disease can involve the nervous, gastrointestinal, and endocrine systems; skin and other connective tissues; and eyes, blood, and blood vessels. There are more than 80 forms of autoimmune disease. It is believed that both environmental and genetic components contribute to the onset of autoimmune diseases,²¹⁴ and there is growing evidence that gestational and direct exposure to hormone-disrupting chemicals and toxic compounds play a part.^{215 216}

Seventy-five percent of autoimmune diseases occur in women, with particular frequency during reproductive years.²¹⁷ Estrogen is believed to accelerate some autoimmune diseases as it may stimulate the production of antibody-producing cells while suppressing helper cells, creating an imbalance. Researchers have found that estrogen accelerates some autoimmune diseases in mice.²¹⁸ The links

between some environmental toxicants and lupus and scleroderma, two autoimmune diseases that disproportionately affect women, is particularly strong.

Lupus

Systemic lupus erythematosus is a disorder in which the immune system can attack parts of the body including skin, joints, and blood — and sometimes lungs, liver, and kidneys. Lupus hospitalizes 102,000 people each year.²¹⁹ Approximately 240,000 Americans have been diagnosed with lupus — 85% of them are female. The disease is more common in African Americans than in Americans of European origin; symptoms usually begin between ages 20 and 45; and it carries an increased chance of miscarriage.²²⁰ Although deaths caused by lupus have increased 60% nationwide in a 20-year period, California does not track statistics for this and other fatal autoimmune diseases.²²¹



Three studies of crystalline silica — used in production of glass, ceramics, and construction materials — show that exposure to the compound increases the risk of lupus ten-fold.²²² Women are exposed to silica in the production of cosmetics, medications, electronic equipment, pottery, and scouring powder. One occupational study showed prevalence of three cases of lupus of every 300 workers among women who at a plant that produced scouring powder with silica, a much higher rate than in the general population.²²³

Scleroderma

Scleroderma is a chronic autoimmune disorder that affects connective tissue such as the skin and the esophagus, lungs, gastrointestinal tract, kidneys, and heart. It may also affect blood vessels, muscles, and joints. This debilitating disease affects an estimated 300,000 people in the United States and four times more women than men.

Four job-related studies found that silica exposure is associated with an increased risk of scleroderma.²²⁴ Chemicals such as trichlorethylene and trichloroethane are also associated with a higher risk of scleroderma. One study recently found an increased risk of the disease when a person was exposed to paint thinners and removers.²²⁵

In the U.S., annual health care costs for treatment of various autoimmune diseases amounts to more than \$100 billion per year. Research into these diseases is currently funded at half a billion dollars.²²⁶

SHORTCOMINGS OF SCIENCE

When we are attempting to study and cure disease, the search for cause is crucial. However,

- We do not fully understand how natural and synthetic chemicals affect human health.
- We know still less about how stressors such as poverty and poor nutrition may impact an individual's susceptibility.
- We do not know what effects chemicals have over long periods of time and as a person ages. Differences in size, gender, and lifestyle all impact our responses to contamination.

Researchers tend to focus on the aspects of a problem that are quantifiable. Each person's exposure to chemicals is fragmented. And no unaffected control group exists because everyone on the planet has been exposed. All of this creates a "scientific patchwork quilt." Despite these admitted gaps, the information we have presents an argument that is, according to Theo Colburn, "compelling and urgent."²²⁷ What's more, **inconclusive or incomplete evidence does not mean that no effects occur; instead, it can mean that not enough time or resources have been spent to look at the problem.**

The harmful effects of DES came to people's attention only because — after nearly three decades of widespread use — a rare form of cancer was being detected in more and more young women, and it caught the attention of medical researchers. Specific clues led these researchers to find the link from DES to cancer and find proof. This begs the question: are we ignoring obvious clues when a disease such as breast cancer is widespread and void of "rare" links?

We risk the health of millions if we take action only in situations of certain proof. Creating better scientific tools and diligent monitoring of chemical use and its link to health will help, but we must act now to protect public health. With widespread chemical contamination saturating the planet over the last 50 years, it may be that chemicals have already done their damage and are continuing to do so. According to the Lowell Center for Sustainable Production, waiting what could be years for conclusive evidence "can increase the risk of costly mistakes that can cause serious and irreversible harm."²²⁹

"When promoted as an impartial mediator, [science] contributes to a failure to protect public and environmental health."

— TED SCHETTLER MD, MPH,
GENERATIONS AT RISK²²⁸

“The economic policies that have yielded the extraordinary growth in the world economy are the same ones that are destroying its support systems.”

— LESTER BROWN,
Eco-Economy, Building an Economy for the Earth,²³⁰

THE ECONOMICS OF POLLUTION

We live in a culture where cost is a critical decision making tool. Therefore, we have included a section on the economics of chemical contamination. It is not easy to come by sound numbers — even when consulting experts. In our reporting, we have used conservative numbers. Our hope by including this section is to inspire further research that can produce more adequate assessment.

MEASURING THE TRUE COST OF POLLUTION

The true cost of “cheap” plastics, “convenient” cleaners, and “easy to use” disposable products is borne by the environment and the legacy we leave our unborn children. Gas in the U.S. is relatively cheap because the price does not reflect the cost of smog and acid rain and their effects on health and the environment. Food prices do not reflect soil depletion, contaminated ground water, and harm to wildlife and humans.²³¹ To find the true costs, we must consider all of these elements. Since we are not able to accurately capture these costs, industry continues to manufacture and sell goods without absorbing the financial burden of the harm.

According to the California Environmental Protection Agency’s (CalEPA) Environmental Justice advisory committee, “tension [exists] between the desire for a clean and healthy environment and the desire for a vital and productive economy. Yet, goals of environmental and economic health are not mutually exclusive and can even be mutually supporting.”²³²

With each new study of environmentally harmful activities, we better understand the actual costs of what are daily practices. Were we able to comprehensively calculate the real cost of pollution, we may rethink how we act as consumers, businesses, and governments.

To find the real cost of pollution we need to add **environmental costs** (resource use, pollution, and waste generated), **remediation costs** (investigation, regulation, monitoring, containment, and cleanup), and **social costs** (lost wages due to illness, health care, and changes in property values).²³³ For example, researchers estimate the mass use of pesticides in the country’s agricultural industry totals approximately \$10 billion annually in combined environmental and social costs.²³⁴ Professor David Pimentel, a researcher in the Department of Entomology, Systematics and Ecology at Cornell University, adds, “If the full environmental, public health, and social costs could be measured as a whole, the total cost might be nearly double the \$10 billion figure.”²³⁵ If in California we were to apply **Full Cost Accounting** — taking into account costs associated with acquiring raw materials, manufacturing, transportation, use, *and* cleanup, eventual disposal, and health — to the costs listed above for products containing toxic chemicals, the total would be in the **hundreds of trillions of dollars**.

The following chart is an analysis of examples of the human health costs of pesticide use:

Estimated Economic Costs of Human Pesticide Poisonings and Other Pesticide-Related Illnesses in the United States Each Year ²³⁶	
<i>Human Health Effects from Pesticides</i>	<i>Total Cost</i>
Cost of inpatient (hospitalized) treated poisonings, 5,000 x 3 days @ \$1,000/day	\$ 15 million
Cost of outpatient treated poisonings, 30,000 x \$1,000	\$ 30 million
Lost work due to poisonings, 5,000 workers x 5 days x \$80	\$ 2 million
Pesticide-caused cancers, 10,000 x \$100,000/case	\$ 1 billion
Cost of fatalities, 25 accidental fatalities x \$2.2 million	\$ 55 million
TOTAL	\$ 1.102 billion



AEROSPACE'S TOXIC LEFTOVERS

Clean Water Fund

SITUATION: *Perchlorate is a known toxin and carcinogen. It is the primary chemical in missile and rocket fuel and is used in the production of fireworks, airbags, and some fertilizers. Thanks, in part, to the power of the Department of Defense, this hazardous material has gone largely unregulated.*

About perchlorate:

- *It is hard to dispose of, since it does not break down in soil or water.*
- *It disrupts the normal functions of human endocrine systems.*
- *It has been shown to affect the functioning of the thyroid gland and to cause certain cancers.²³⁷*
- *Exposed women have a greater probability of delivering a child with mental retardation, impairments in vision and speech, and attention deficit disorder.²³⁸*
- *Water sources have been contaminated from years of negligent disposal practices by the aerospace industry.*

Sacramento, Los Angeles, Orange, Riverside, San Bernardino, Santa Clara, and Sonoma counties all have dangerous levels of perchlorate in their ground water. ²³⁹

In Nevada, a defunct rocket fuel factory polluted the entire lower Colorado River — a water source for more than 20 million people in California, Arizona, and Nevada — with perchlorate. Despite intensive clean-up efforts, 500 pounds of perchlorate still flows into the river every day.²⁴⁰ More than 1.4 million acres of farmland are irrigated with waters from the Colorado River: 90% of the country's winter lettuce, for instance, is grown in this region.²⁴¹ Preliminary studies by the Environmental Working Group show that perchlorate may cluster in plants and therefore be passed on to the people and animals who eat them.²⁴² In 1997, scientists detected perchlorate deep in its massive Colorado River Aqueduct, which pipes water 240 miles into Riverside County.²⁴³

TAKING ACTION: *Clean Water Action & Clean Water Fund (CWA) — a national organization with strong state-based offices — coordinates education, research, and activities around the issue of clean and affordable water. In California,*

CWA has played a pivotal role in raising a red flag about the dangers of perchlorate. The group has built coalitions and advocated for regulatory efforts at the local, state, and federal levels. The Perchlorate Action Group, co-formed by CWA, is a coalition of environmental, public health, and community groups that works toward prevention and regulation.

SUCCESS: *California's water policy has long been dominated by political battles between residents and agriculture. Issues of public health, water use efficiency, and resource protection had largely been absent from the debate until CWA and its colleagues began bringing these issues to the table.*

CWA and other advocacy groups have succeeded in getting California to issue a public health goal of an enforceable drinking water standard for perchlorate. Nationally, the Environmental Protection Agency issued a "reference dose," or a maximum allowable amount in water. It was recently announced that the Department of Defense has agreed to abide by California's safe drinking water standards for perchlorate and communities' right to know as they work to clean up perchlorate contamination. California's Senator Barbara Boxer has led the federal effort to clean up perchlorate contamination.²⁴⁴ In anticipation of issuing national regulations this year, the EPA is conducting a perchlorate risk assessment and collecting data. Without CWA's advocacy efforts, it is unlikely that this move would be under way.

For more information, see <www.cleanwateraction.org/ca>.



Of course, the greatest cost of pollution is the one that is the most difficult to measure — impaired function and loss of life. Toxic pollution has cost many human lives and wiped out entire species of animals. We will never be able to put a price tag on this loss.

HEALTH-RELATED COSTS

To the best of our knowledge, no one has conducted a study of the cost of environmentally associated diseases that affect adult women and their reproductive health. Researchers in New York City created one possible model that estimates the morbidity and mortality costs associated with environmentally attributable diseases in American children. To determine the cost of a group of common ailments, these researchers estimated the percentage of cases that can be linked to environmental pollutants, and then used these percentages to calculate costs of an environmentally attributable disease based upon pre-existing estimates. These calculations include direct costs, such as hospital stays, but also indirect costs, such as financial losses due to premature death, missed work, or disability.²⁴⁵

To determine the costs for leading pediatric diseases, the following formula was developed:

$$\text{Costs} = \text{Disease Rate} \times \text{Environmentally Attributable Fraction} \times \text{Population Size} \times \text{Cost per Case}^{246}$$

Estimated Costs of Pediatric Disease Due to Environmental Origin, U.S. (in billions) ²⁴⁷			
	Best Estimate	Low Estimate	High Estimate
Lead Poisoning	\$43.4	\$43.4	\$43.4
Asthma	\$ 2.0	\$ 0.7	\$ 2.3
Childhood Cancer	\$ 0.3	\$ 0.2	\$ 0.7
Neurobehavioral Disorders	\$ 9.2	\$ 4.6	\$18.4
TOTAL	\$54.9	\$48.8	\$64.8

Using this same model, we have attempted to calculate the estimated costs of environmentally associated diseases for adult women. We consulted a number of sources and experts to gather the necessary disease rates and costs. As there is vast variation of opinion regarding the percentage of disease that may be attributed to environmental sources, when unknown, we have chosen to use the most conservative estimate offered — 5%. (For a detailed explanation, see Appendix 2 on page 40.)

COSTS BEYOND HEALTH CARE

While we can approximate the cost of treating diagnosable diseases and health impairments and begin

to approximate lost wages, diminished quality of life, and shortened life expectancy, we have less ability to measure and understand the more subtle ways in which environmental hazards impact our health.

Estimated Health Care Costs for Diseases with a Strong Environmental Association Affecting Women, U.S. (in billions)	
Disease	Best Estimate
Autoimmune Disease	\$ 3.9
Birth Defects ²⁴⁸	\$ 0.3
Breast Cancer	\$ 2.3
Endometriosis	\$ 2.9
Infertility	\$ 2.8
TOTAL	\$ 12.2

Functional deficits, such as decreased intelligence, reduced motor skills, or impaired senses are not as easily measured as physical anomalies or clinical disease. Researchers suspect that synthetic chemicals are undermining human intelligence across the entire population. Recent studies supported by the National Institute of Environmental Health Sciences suggest that a young person's lead burden is not only linked to lower IQ and depressed high school graduation rates, but also to increased delinquency.²⁴⁹

These impacts confound our cost-benefit models and raise essential unanswerable questions, such as:

- As Theo Colburn asks in *Our Stolen Future*: What is the social impact of a five-point reduction in IQ?
- How will long-term effects of chemical exposure — and health consequences such as diminished intellectual development — influence social factors such as future work forces and crime rates?
- How might decreasing fertility rates — for both women and men — impact our population and family patterns?

The costs of environmental cleanup are likely the costs that researchers, economists, and governmental officials have considered most. In 1995 alone, \$670 million was spent to clean hazardous waste.²⁵⁰ The number of oil spills from tankers and hazardous waste spills by chemical companies is steadily increasing. The 2003 National Priorities List, published by the EPA, shows that California has 96 Superfund sites, 23 in Santa Clara County alone.²⁵¹ According to the Silicon Valley Toxics Coalition, high-tech companies caused the contamination of 24 of 29 total sites in Silicon Valley. Resources for the Future, a non-profit think tank that conducts independent research examining environmental and natural resource policy making, estimates that cleaning all of the sites listed on the National Priorities list in 10 years will cost from \$14 billion to \$16.4 billion. Eight percent of these sites are located in California, and it will cost an estimated \$1 billion just to clean these.²⁵²

Advocacy groups and media campaigns have made efforts to hold polluters responsible for the costs involved, but ultimately the price will be paid by the government and hence the taxpayers. In 1996, the first year after a Superfund tax imposed on corporations expired, the government shouldered nearly one-fifth of the cleanup costs. Under the current administration's 2004 budget requests, the treasury will use taxpayer money to pay for almost four-fifths of the costs.²⁵³ Or, because of lack of funding, these sites are not cleaned up at all. On July 17, 2003, the U.S. EPA announced that it would only fund the cleanup of 10 new sites — half the number of sites designated for cleanup.²⁵⁴

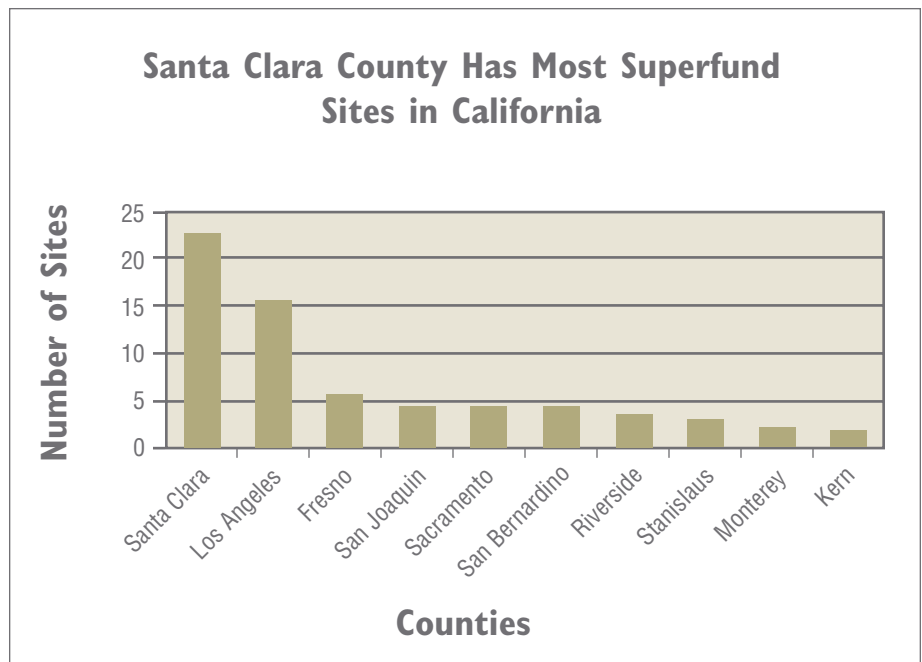
PREVENTION IS CHEAPER THAN POLLUTION

Extensive research tells us that prevention is the most direct, comprehensive, and least expensive way to attack health-related problems. Every dollar spent on childhood immunization saves the health care system \$10 in costs for hospitalizations and other treatments.²⁵⁵ The cost of smoking one pack of cigarettes, in terms of the cost of long-term health care and lives lost, is \$35 per pack.²⁵⁶ Studies show that programs to prevent pregnant women from smoking save

\$2 to \$3 in health costs for every \$1 spent on such programs. Research also estimates that chronic conditions from smoking would cost taxpayers more than \$6 for every \$1 spent on prevention. The price of lead and asbestos cleanup has been minimal compared to what the cost of health care would have been for continued exposure. A study from the Netherlands found that if action had been taken to regulate asbestos in the 1960s, when epidemiologists were correlating asbestos with lung cancer — instead of waiting until the 1990s — the nation would have saved \$30 billion (U.S.) — the amount that it spent on removal, medical treatment of victims, compensation, clean-up costs after “asbestos fires,” disposal, and other attempts to repair the damage.²⁵⁷

SUPERFUND:

Congress established the Superfund Program in 1980 to locate, investigate, and clean up abandoned, accidentally spilled, or illegally dumped hazardous waste that poses a current or future threat to human health or the environment. The EPA administers the Superfund program in cooperation with individual states and tribal governments.



“Not knowing whether an action is harmful is not the same thing as knowing that it is safe.”

— LOWELL
STATEMENT ON
SCIENCE AND THE
PRECAUTIONARY
PRINCIPLE

A CALL TO ACTION

Without notification and without our consent, we are exposed to dangerous, untested chemicals each day. By allowing untested chemicals to be used, released, and disposed of in our environment, the current regulatory system violates the basic right of individuals to a healthy environment.²⁵⁸ The United Nations Human Rights Commission has recognized the right to a non-polluted environment as a basic human right,²⁵⁹ and several UN conventions support the human right to freedom from chemical contamination.²⁶⁰ One of the provisions of the International Covenant on Economic, Social and Cultural Rights includes the human right to a healthy and clean environment and sufficient, affordable, physically accessible, safe and acceptable water for personal and domestic uses.²⁶¹

While the multitude of threats may seem daunting, the progress that community groups and legislators have made has already saved lives. Success provides us with a foundation to build a healthier future.

SETTING AN EXAMPLE: CALIFORNIA AS THE BELLWETHER

Because of the sheer magnitude of California’s area and population, state policies carry national implications. When California mandated a reduction in fuel emissions from passenger cars, national and international automakers began designing and producing cleaner cars. Industry, other governments, and the federal government closely monitor legislation in California.

A few examples where California is leading the way:

- The state established the **first organic law** in 1978. California Certified Organic Farmers (CCOF) was founded in 1974 as one of the first organic certifiers in the nation. It remains one of the leading certification organizations in the country.²⁶²
- Proposition 65 required the state to **publish a list of chemicals that are known to be harmful**, and required companies to **warn employees and the public** before knowingly exposing them to a potentially harmful amount of a chemical. (See Appendix 3 on page 41).
- In 2001, California became the **first state to ban mercury thermometers** and other mercury-laden products.²⁶³
- Despite vigorous opposition from automakers, the California legislature successfully moved to **curb greenhouse gas emissions by requiring automakers to produce cleaner cars** beginning in 2009.
- In 2003, San Francisco became the **first city in the U.S. to adopt the Precautionary Principle**.
- In 2003, the California legislature approved a measure, authored by Assemblywoman Wilma Chan, to **ban the manufacture and use of PBDEs** by 2008. With this law, California is the first state in the country to regulate the use of this chemical, following the lead of the European Union, which imposed a similar ban earlier in the year.
- The board of the South Coast Air Quality Management District recently ruled that dry cleaners in its area **must stop using perchloroethylene** by 2020. The District’s ban is the first of its kind involving dry cleaners, which use about 25% of the hazardous solvent produced in the United States each year.²⁶⁴

SAN FRANCISCO BOARD OF SUPERVISORS: FIRST GOVERNMENTAL BODY IN THE U.S. TO ADOPT THE PRECAUTIONARY PRINCIPLE

After many years of lobbying from environmental, health, science, education, immigrants, women’s, and workers’ rights community groups as well as the business community, the San Francisco Board of Supervisors adopted the Precautionary Principle as city and county policy on June 17, 2003. As passed, the city’s Precautionary Principle mandates the following: (1) anticipatory action to prevent harm, (2) the right to know, (3) alternatives assessment, (4) full cost accounting, and (5) participatory decision making. In other words — prevention before pollution. San Francisco will begin implementing the Principle through its *purchasing* policies, asking manufacturers to disclose the contents of their products. If they do not pass the test for toxicity, San Francisco will not buy.

Currently, the cities of Berkeley and Oakland and Marin County are considering how to implement their own Precautionary Principle legislation.

Much work remains to be done, both in enforcing existing laws and shifting our current approach to safeguard people and the environment. **The starting point must be a vision of how the future can and will look — a vision where all people, regardless of gender, socioeconomics, race/ethnicity, or geography, have the right to:**

- **Clean air and water;**
- **Safe, healthy and affordable food;**
- **Sustainable, toxic-free workplaces and neighborhoods; and**
- **A life without a body burden of toxic substances — so that we are free from the fear of transferring toxins in utero and to newborns.**

The following are five recommendations for individual, state, and policy-making actions. Many are consistent with recommendations from the California Environmental Protection Agency’s advisory committee on environmental justice. None of these recommendations is more important than the others — they all function together, to begin to cure our homes, our communities, our state, and our planet.

RECOMMENDATION I: Adopt a ‘First Do No Harm’ Approach

Recognizing that cause and effect relationships are very difficult to establish, public policy decisions should first do no harm and be made based on evidence that products or projects will not harm those who are most vulnerable (often women and girls). Manufacturers, corporation, builders and developers should aspire to prevent or minimize harm to humans and the environment. With an emphasis on precaution, we would no longer *wait* for harm to appear but take action *before* irrevocable damage has been done. The burden of proof of safety should be shifted to those proponents of projects or manufacturers of products before they receive permission to distribute a product or license a site. All the while, we must remember that, according to CalEPA, “recommendations to enhance precaution should not be interpreted to mean a guarantee of zero risk — or a mandate to act without credible threat of harm.” See *Appendix 3 (page 41) for more detailed information.*

With this recommendation, we prevail upon policy makers, industry officials, and individuals and community activists to take the following actions:

POLICY MAKERS

- Adopt “First Do No Harm” as the guiding ethic in government decision making.
- Enact stricter local and statewide measures to reduce pollution and health risks.
- Shift the focus of environmental health policy from assessment of risk to preventive health efforts and reduction and elimination of harmful substances.
- Support right-to-know labeling requirements.
- Adopt least-toxic policies for purchasing decisions — including materials, supplies, and vehicle fleets.
- Push for statewide adoption of integrated pest management (IPM) policies in school districts. (IPM was already passed in Los Angeles and West Contra Costa districts.)
- Adopt legislation to cease discharge of toxic chemicals into any body of water and the air.
- Enforce regulations to guarantee the public’s right to know about contaminants in their air, food, and drinking water.
- Implement recommendations from AB 599 (Liu), passed in 2003, on how to develop a statewide groundwater quality monitoring program.
- Provide an early warning system to alert communities to immediate health crises.
- Enforce CA Health and Safety Code Sec.105200 which requires that all physicians report to the local health departments all known or suspected cases of pesticide poisoning.

INDUSTRY AND MANUFACTURERS

- Research and invest in developing cost-effective processes using least- or non-toxic alternatives to current production practices.
- Phase out use of the most toxic and harmful chemicals in products.
- Provide clear and complete labeling about toxins on all products.

“Strong leadership is needed at the highest levels of California government, academia, and (community) organizations to transform the current piecemeal approach to research, funding and public information into a coordinated, effective plan of action for the public interest.”

— FUNDERS AGRICULTURE WORKING GROUP, ROOTS OF CHANGE: AGRICULTURE, ECOLOGY AND HEALTH IN CALIFORNIA²⁶⁵

INDIVIDUALS AND COMMUNITY ACTIVISTS

- Join local organizations working to address environmental health and justice issues.
- Organize neighbors and friends to mobilize against local polluting industries.
- Attend public meetings, and provide first-hand accounts of how pollution has affected your family and community.
- Sign up for environmental health action alerts (for example, www.EnvironmentCalifornia.org) that will keep you informed, and offer alternative ways to get involved.
- Find out what pollution sources affect your neighborhood through www.scorecard.org, and use this information to become part of the decision making process in your community.

LOS ANGELES UNIFIED SCHOOL DISTRICT'S (LAUSD) LEAST-TOXIC PEST MANAGEMENT POLICY

In 1999, LAUSD became one of the first large school districts in the nation to implement an alternative approach to pest management called Integrative Pest Management (IPM). Since implementing the program, the District has reduced the number of pesticides used by 75%. The change to IPM involves using less-toxic methods of controlling pests, such as switching from spraying school kitchens with pesticides to more frequent and thorough cleanings, inspecting for pests each month, removing garbage more frequently, steam cleaning garbage bins, and caulking wall holes where pests frequently enter school buildings.

The Los Angeles district's adoption of IPM has set a state and national standard. In 2000, California passed the Healthy Schools Act, which requires schools to record their pesticide use, notify parents, and post pesticide-related information within all schools. This Act also endorses IPM as the preferred method of school pest control for the state. While a move to IPM may require an initial financial commitment, these less-toxic methods seem to prove to be more cost-effective in the long run. For more information, visit www.calisafe.org and www.environmentalcalifornia.org/reports/saferschools.pdf.

RECOMMENDATION 2: *Improve Research and Data Collection*

We have myriad indications that chemical exposure leads to disease and debilitation, but we do not yet have the research and scientific evidence to draw exact conclusions. Most of the chemicals we use in our everyday lives remain untested. Many of the exposure assessment and risk assessment tests that have been performed do not take into account gender, age, geographic differences, or other demographic differences. We propose that governmental agencies and research organizations **support research that 1) examines the role of gender in environmental exposure; 2) expands efforts to monitor human exposure to toxic chemicals and their long-term impacts; and 3) supports research that traces the health impacts of multiple exposures.**

The need for scientifically supported tools, processes, and decisions must be balanced with a concern that in the past, lack of complete scientific data has been used to delay or prevent reasonable actions. Recommendations to collect data should not result in lengthy delays in taking action to improve health and reduce risk.

We recommend researchers, scientists, policy makers, and funding agencies take specific actions:

RESEARCHERS AND SCIENTISTS

- Examine synthetic chemicals for their potential to disrupt human health.
- Implement studies on the effects of multiple chemical exposures over time.
- Study multigenerational effects of toxins.
- Broaden the scope of research beyond effects we have come to expect — such as cancer — to include system dysfunction, changes in behavior, and shifts in intelligence.
- Track health impacts on women and girls and by ethnicity.
- Study the role of the workplace in women's health.



FROM SACRED LAND TO WASTELAND

Cahto Tribe of Laytonville

SITUATION: *The Cahto Tribe of Laytonville Rancheria²⁶⁶ is located in northern Mendocino County. The tribal homeland was established on 200 acres of land in 1908 and is bordered on two sides by the Laytonville landfill, a solid and hazardous waste disposal facility maintained by the County of Mendocino. According to U.S. Department of Agriculture soil geologists, the fragmented, assorted soil types in the region are conducive to migration of chemical pollutants. The landfill contains transformer waste from Pacific Gas & Electric plants, carcinogenic chemicals including vinyl chloride and benzene, and, possibly, highly toxic waste hauled from Remco, a chrome plating plant, in the neighboring town of Willits.*

Pollution from the landfill is suspected of contaminating the air, water, and land of the Cahto Rancheria and of causing severe health problems including reproductive illnesses among women and bladder, kidney, and skin problems as well as asthma in children. Pollution also severely impacts the cultural activities and traditions of the Cahto people, including swimming and fishing in Cahto Creek and drinking ceremonial waters.

TAKING ACTION: *The Cahto have been conducting outreach and educational efforts to inform tribal members about indigenous rights, environmental law, and health. They have collected health data through surveys and documented the health effects of landfill pollution through photographs and interviews. **Tribal members have found that children have a higher than normal incidence of learning disabilities and asthma compared to children that do not live close to***

the landfill. The tribe is developing a long-term strategy for educating residents, specifically young women, to become leaders and advocates for themselves and their community.

Although U.S. Environmental Protection Agency tests have not been conclusive, the tribe will continue independent investigations of possible contamination from the landfill.



- Examine infertility problems to encompass the impacts of pesticides and other toxic chemicals on the fetuses and women's reproductive cycles.
- Study the role of hormonally active synthetic chemicals in hormonally driven diseases such as breast cancer.
- Involve multi/interdisciplinary teams in the development of hypotheses and research tools.
- Provide data on gender, poverty, and environmental health that takes into account communities that have historically been under-studied, such as female migrant farm workers.
- Track chronic diseases and defects so that officials can

investigate disease clusters and potential environmental causes.

- Collaborate, whenever possible, with community members on multiple aspects of projects — from design to development to application of results.

POLICY MAKERS

- Establish an environmental health tracking system (recent legislative efforts include SB 702 and SB 189) to monitor chronic disease and environmental exposures. Currently few registries exist except for cancer and, in California, birth defects.

- Create and enforce health-based standards for companies to follow in manufacturing and use of chemicals.
- Apply a gender-specific approach to the analysis and establishment of minimum safety standards.
- Encourage public involvement in environmental decision making, with sensitivity to issues such as language barriers.
- Develop criteria, through a public process, for identifying and addressing problems with risk assessments — taking into account issues such as varied populations and limited scientific tools.

FUNDERS (GOVERNMENT AND PHILANTHROPIC ORGANIZATIONS)

- Fund research to assess a variety of forms of environmental impact on health (transgenerational, in utero, multiple exposure, and long-term exposure).
- Support efforts to involve community members of all backgrounds in environmental decision making.
- Fund SB689 (Ortiz): Healthy Californians Biomonitoring Project.

HEALTHY CALIFORNIANS BIOMONITORING PROJECT

Biomonitoring — a type of research that measures the “pollution in people” by analyzing blood, urine, fatty tissue, or breast milk samples for synthetic chemicals — can provide valuable information about trends in chemical exposure, help identify new chemicals of concern, and place emphasis on populations or communities that may be particularly vulnerable. Biomonitoring can help establish a reference exposure level for all Californians and aid in understanding the effectiveness of current regulations — and therefore influence priorities.²⁶⁷

In 2003, State Senator Deborah Ortiz introduced to the legislature Senate Bill 689, which would mandate biomonitoring in California. The bill would establish a pilot program to monitor breast milk — a marker of valuable information about human exposure to toxic chemicals — in a minimum of three economically, racially, and geographically diverse areas in the state. This bill would also require the California Department of Health Services to conduct biomonitoring projects to use as health indicators by January 1, 2007. If signed into law, SB 689 would become effective on January 1, 2004 and would be funded by an additional tax on tobacco products. For more information about the bill, see: <http://info.sen.ca.gov/pub/bill/sen/sb_0651-0700/sb_689_bill_20030507-_amended_sen.html>

RECOMMENDATION 3: *Promote Safer Alternatives*

While Right-to-Know legislation and other types of information dissemination are critical, we need to take the next step to promoting less harmful, more healthy alternatives. We must support governments and businesses in this endeavor, and ensure that better alternatives are accessible and affordable to low-income women and their communities. Simultaneously, we need to support research into non-toxic or less toxic alternatives to current harmful chemicals.

For this recommendation, we prevail upon policy makers, manufacturers, funding agencies, and individual and community activists to take specific actions:

POLICY MAKERS

- Recognize businesses that are promoting safer alternatives via incentives and awards.
- Encourage the elimination of persistent and bioaccumulative substances from products and the use of non- and less-toxic alternatives for municipalities and industry.
- Establish a California Office of Pollution Prevention, or a centralized organization, as a clearinghouse for information on less harmful products and processes.
- Create a program that requires the use of non- and less-toxic alternatives but that takes into consideration technical feasibility and cost, and allows a reasonable transition period.

- Eliminate the use and presence of hazardous waste by-products in commercial fertilizers.
- Support the substitution of less hazardous chemicals and processes in agriculture.
- Require the use of safer building materials and regulation of construction in sensitive areas (such as in or near hospitals and schools).
- Require schools to implement precautionary approaches to reduce and eliminate the use of products such as toxic pesticides, cleaners, paints and inks.
- Require municipalities to redesign traffic flow to limit or eliminate diesel vehicle traffic through residential communities.

INDUSTRY AND MANUFACTURERS

- Redesign production processes to develop cleaner technologies.
- Produce products using the least toxic and most environmentally friendly alternatives, and take into consideration such factors as packaging and longevity.
- Provide affordable, eco-friendly services and products in low-income communities and organize promotional events to educate local residents about their availability.

FUNDERS (GOVERNMENT AND PHILANTHROPIC ORGANIZATIONS)

- Support efforts to conduct research into non-toxic and/or less toxic alternatives.
- Create incentives for businesses that emphasize reduced waste, less pollution, and safer materials.
- Channel government purchasing power to adopt environmentally preferable purchasing practices.
- Support local farmers markets and sustainable agriculture efforts, including development and dedication of open space and seed funding for community gardens.
- Fund advocacy groups organizing public campaigns to educate community members and agencies on the Precautionary Principle.

INDIVIDUALS AND COMMUNITY ACTIVISTS

- Purchase organic and in-season foods, and reduce your consumption of foods that are prone to bioaccumulation (such as cheese and large fish). Avoid fatty animal products and processed foods.
- Use eco-friendly cleaning products. Read labels and avoid products that carry strong warnings.
- Avoid buying personal care products with known or suspected cancer-causing toxins, such as phthalates (see <www.nottoopretty.org> for a list). Buy natural, unscented products.
- Control pests naturally, without harmful pesticides (see <www.beyondpesticides.org>).
- Buy recycled goods; repair household items before replacing them with new products.
- Avoid buying clothes that require dry cleaning, or practice safer “wet-cleaning” alternatives.
- Avoid buying plastic products, especially soft plastics. Buy children’s toys made of natural materials.

RECOMMENDATION 4: *Support Policy Advocacy and Multi-sectoral Collaboration*

To succeed in the endeavor of creating healthier places to live, we need to join forces. It is no longer enough to have one organization, such as an environmental clean-up group, working on one issue, when other issues — like the generation of harmful chemicals — continue unabated. We need to convene and fund organizations that have historically been single issue-focused to join forces.

Few grantmaking institutions are prepared to review and fund proposals for the kind of work necessary to shift policies. To change current policies, funders must invest in a range of actions that include public education, community organizing, policy advocacy, litigation, and leadership development in communities throughout California. One fundamental and yet often overlooked opportunity is to link environmental health organization agendas with those of environmental justice organizations and the broader environmental movement. Collaboration is critical to the long-term success of this effort.

For this recommendation, we encourage policy makers, funding agencies, and individuals to take specific actions:



THE BUCKET BRIGADE

Communities for a Better Environment

SITUATION: *The Alameda Corridor, connecting the ports of Los Angeles and Long Beach, is one of the most polluted industrial areas in the country.²⁶⁸ The area is a hodgepodge of residential, commercial, and industrial zones. Heavy truck traffic crisscrosses the area, releasing diesel particulates into the air every day. Homes and schools are adjacent to industrial facilities. People with economic means have fled this area for cleaner, safer environs.*

TAKING ACTION: *Community activists from the southern end of the Alameda Corridor organized with Communities for a Better Environment (CBE) to set up a simple air-quality monitoring test. All it takes is a cheap bucket, an inexpensive capture bag, and a valve system. CBE volunteers from the community test the air, relieving residents from their dependency on field experts and data provided by the polluting companies. Through this testing, community members can get up-to-the minute information about their air — and the tools to lobby for stricter regulations.*

The bucket air testing method was first developed in Contra Costa County in 1994 when a group of residents demanded a hands-on way of monitoring their air after a refinery leak. Soon thereafter, the EPA opted to sponsor the program and is working with CBE to develop a bucket-testing quality assurance protocol.

SUCCESS: *The bucket method is now in use in more than 20 sites around the world. CBE supports the program by running*

trainings and partnering with local organizations. Polluting companies and government agencies are under pressure to take more accurate and timely air samples closer to areas of chemical release and to improve their practices. According to Manuel Pastor, Director of Center for Justice Tolerance and Community at UCSC, and Rachel Rosner, Coordinator of Community Partnerships at the Service Learning Institute of CSU-Monterey Bay, “Communities often feel that science has been used against them. ‘Experts’ from chemical companies and government agencies dismiss their concerns about risk while statisticians question whether cancer clusters can be attributed to other factors.... This method gives residents their own scientific evidence and provides them with the tools to defend and restore a healthy environment.”²⁶⁹

For more information, see <www.cbecal.org>.



POLICY MAKERS

- Encourage and involve women, particularly women of color, as decision makers, and, when possible, support efforts to look at issues by gender.
- Study the relationship between socioeconomic indicators such as race and income and the location of pollution sources and associated health impacts.
- Prioritize actions and programs that will address existing environmental injustice.

FUNDERS

(GOVERNMENT AND PHILANTHROPIC ORGANIZATIONS)

- Foster collaboration among funders.
- Fund the environmental health and justice movement, including organizations focused on reproductive health,

agriculture, labor, immigrant rights, children and women's health, and other allies.

- Fund not only an organization's programs but its staffing and research efforts too.
- Support organizations trying to implement the Precautionary Principle, and fund programs to educate the public about the principle.

INDIVIDUALS AND COMMUNITY ACTIVISTS

- Form coalitions of existing community-based organizations, such as Clean Water Action (see page 27) and the Bay Area Working Group for the Precautionary Principle, <www.bcaction.org/PDF/BAWGFactsheet.pdf>.
- Keep informed about the latest environmental health developments by reading sources such as <www.EnvironmentalHealthNews.org>.

RECOMMENDATION 5: *Take Leadership to Create Healthier Solutions and Clean Up Existing Contamination*

It is important to recognize and protect economic vitality in California and the nation, but equal weight must be given to protecting our communities from harm from chemical exposure. In the long run, you can't have one without the other. Today, taxpayers are bearing an increasing burden of toxic clean-up costs. Taxpayers' resources should be invested in implementing and enforcing existing environmental laws and helping to support healthier choices. Incentives to produce environmentally-safe products will be created by requiring producers to bear the true costs of their products. **Manufacturers and industrial users of chemicals should assume responsibility for, as well as pay the costs of environmental cleanup and take part in crafting solutions.**

For this recommendation, we prevail on policy makers, industry officials, funders, and individuals to take specific actions:

POLICY MAKERS

- Focus on enforcing regulations and laws to deliver the benefits of environmental protections to all communities, and adopt measures to punish companies that repeatedly violate regulations.
- Create incentives for manufacturers to design environmentally-friendly products.
- Give high priority to remediation projects in areas of known environmental injustice, especially where the contaminated site contributes to cumulative impacts on the community.
- Establish guidelines for cleanup that are based on the intended use of the site — for example, if a school is to be built on the site, regulations should be as strict as possible.
- Assure that agencies and contractors have appropriate technical expertise when overseeing remediation of brownfields, or areas once used for industrial and commercial purposes that have been abandoned because they could be contaminated, creating safety and health risks for residents.
- Use alternative energy sources and promote use of healthier materials in government buildings and facilities.

INDUSTRY AND MANUFACTURERS

- Adopt Extended Producer Responsibility and Stewardship programs, taking responsibility for the lifecycle of a product.
- Take responsibility for agricultural and industrial pollution and its effects — both short and long term — through cleanup, education, and prevention of harmful practices.

FUNDERS (GOVERNMENT AND PHILANTHROPIC ORGANIZATIONS)

- Require full payment of clean-up costs and costs for the replacement of natural resources by industries that cause contamination. Strengthen and enforce existing regulations, holding polluters accountable.
- Support S173 (Boxer): Toxic Cleanup Polluter Pays Renewal Act, which reauthorizes the Superfund tax on polluters.
- Support legislation to mitigate petroleum-related air quality and groundwater quality impacts.
- Purchase products from companies that take responsibility for managing the environmental impact of their goods throughout the product's life by offering Extended Producer Responsibility.

INDIVIDUALS AND COMMUNITY ACTIVISTS

- Purchase products from companies that practice environmentally friendly processes (such as <www.clifbar.com>).
- Get involved with grassroots efforts that encourage companies to take back their products for safe disposal or reuse at the end of their lifecycles (see <www.grn.org>).
- Support organizations advocating for clean production (see <www.cpa.most.org.pl/cpa.html>).
- Prevail upon your legislative representatives to pass laws that hold industry accountable for protecting the health of the community.
- Require the federal government to fully fund Superfund laws.



LAOTIAN GRANDMOTHERS SPEAK UP

Asian Pacific Environmental Network (APEN)

SITUATION: *The city of Richmond in Contra Costa County is surrounded by more than 350 industrial facilities, including incinerators, pesticide manufacturers, and oil refineries.²⁷⁰ The county contains the highest amount of hazardous materials per capita in the state.²⁷¹ Recent EPA data ranks Contra Costa County among the worst 10% of all U.S. counties for risk of cancer from pollution.²⁷² In Contra Costa 68% of the county's residents are people of color. Many are recent immigrants of Asian and Pacific Islander background, and many are not fluent in English.*

TAKING ACTION: *In 1999, a series of chemical explosions from Richmond's Chevron oil refinery released a massive amount of hydrogen sulfide into the air. The county's emergency response broadcast a message mandating residents stay inside — but the message was broadcast only in English, and large numbers of non-English-speaking residents continued their daily activities. **An estimated 200 residents fell ill immediately after the explosion due to direct toxic exposure.** Symptoms included severe breathing problems and skin rashes. Long-term health impacts are unknown.²⁷³*

In response, a group of predominantly Laotian grandmothers began a campaign with the assistance of the Oakland-based Asian Pacific Environmental Network (APEN). Called the Warning System Campaign, these women engaged in a lengthy battle with Contra Costa's Health Services and the Internal Operations Committee of Contra Costa County's Board of Supervisors to implement a multilingual emergency phone-alert system.

SUCCESS: *The Warning System Campaign leaders began meeting in each other's kitchens, slowly building support and, with APEN's assistance, learning how to challenge the existing political system. For many of the women, the very notion of questioning the government was radical. One of them says, "Women are supposed to take the role of housewife and work on the farm, take care of the kids. Every political step, only the man takes, not the women.... Back home, we can't demand the government to do anything." Today Contra Costa County has an established emergency alert system that broadcasts in four Laotian languages: Lao, Hmong, Mien, and Khmu. It is the first multi-lingual response system in California, and is being looked at as a model for communities nationwide.*

For more information, see <www.apen4ej.org>.



In challenging economic times, the last thing we need is unnecessary expenses in the form of high hospital bills and pricey environmental cleanup. Governments who have adopted preventive approaches have helped their bottom line. The Toxics Use Reduction Act in Massachusetts was established in 1989 "to promote safer and cleaner production that enhances

the economic viability" of industry and commerce. Thus far, local companies have saved more than \$15 million (not including health and environmental benefits), while reducing the use of toxic chemicals by 40%, emissions by 80%, and chemical waste by 50%.²⁷⁴ California and the rest of the nation need to follow suit.

APPENDIX I: MANY CHEMICALS ARE PHYSICALLY HARMFUL²⁷⁵

The following chart offers a summary of natural and synthetic chemicals, identifies where they are found or used, and explains resulting health impacts.

CHEMICAL	WHERE USED/ FOUND	HEALTH IMPACT/ DISEASE OUTCOME
Arsenic	Contaminated water and soil; treated wood	Associated with birth defects, low birth weight, and an increase in spontaneous abortions; cancer.
Carbon Monoxide	Car and truck exhaust	Associated with intrauterine fetal death and neurological deficits in surviving infants; asthma.
DDT/DDE	Persistent in the environment; fatty foods including whole milk dairy products, seafood, and breast milk	Prenatal exposure associated with premature birth and altered development of reproductive system; menstrual abnormalities.
DES	Pharmaceutical (now banned for most uses) prescribed to pregnant women	Exposure in utero associated with an increase in vaginal and cervical clear-cell adenocarcinoma in female offspring.
Dioxin	Air pollution (released when organochlorines are incinerated); food and soil; industrial processes	Spontaneous abortion, birth defects, hormonal changes, endometriosis, cancer, depressed immune system, interferes with glucose metabolism, contributes to diabetes.
Ionizing Radiation	X-rays; nuclear reactors	Breast and other forms of cancer; congenital defects.
Lead	Food, water, and soil; industrial processes	Increased rates of spontaneous abortion and low-birth weight infants; menstrual disorders and infertility; decreased intelligence.
Mercury/ Methylmercury	Seafood; dental amalgams	Severe brain damage in children; also associated with spontaneous abortions.
Nitrate (converts to nitrite in human infants and some animals)	Agricultural fertilizers; water	“Blue” baby syndrome: methemoglobinemia (lack of oxygen) in children under 6 months; suspected carcinogen.
Perchloroethylene	Dry cleaning residue on clothing; traces found in breast milk, cow’s milk, meat, oil, fruit, fish, shellfish, and algae, and water	Dizziness, headache, skin irritation; possible nervous and reproductive system impacts; esophageal cancer; possibly birth defects.
Phthalates	Consumer products; food and water; industrial processes; plastics	Spontaneous abortion; structural birth defects; hormonal changes.
Polychlorinated Biphenyls (PCBs)	Food (particularly fish and animal products); air, water, and soil	Spontaneous abortion, short gestation length, and low birth weight. Altered menstrual cycles have been reported; female infertility.
Tobacco Smoke	Cigarettes, cigars, pipe smoke	Delayed fetal growth; increased incidence of spontaneous abortion; bleeding during pregnancy; low birth weight; increased incidence of SIDS (Sudden Infant Death Syndrome); long-term delay in physical growth.
Vinyl Chloride	Plastics, vinyl siding	Ovarian dysfunction, benign uterine growths, prolapsed genital organs. Shown to cause liver, brain, and lung cancer, as well as lymphatic and hematopoietic malignancies (such as lymphoma and leukemia).

APPENDIX 2: DATA SOURCES FOR ESTIMATES OF COST

The following is a guide of sources and numbers used in the calculation of risks for and cost of various diseases and health conditions believed to have a strong environmental link.

FORMULA:

Costs = Disease Rate x Environmentally Attributable Fraction x Population Size x Cost per Case.

A QUICK REFERENCE GUIDE TO: AUTOIMMUNE DISEASE

Total number of U.S. cases: 18 million

75% of cases are women

$0.75 \times 18 \text{ million} = 13.5 \text{ million total cases}$

Total annual cost of autoimmune diseases in the U.S.: \$100 billion
(Source: *American Auto-Immune Related Disease Association*, <www.aarda.org>)

Environmentally Attributable Factor (EAF): 5%

Estimated Health Care Costs:

High Estimate: 0.8 (estimated number of non-genetic-caused disease in women) x 100 billion (total annual cost) x 0.05 (EAF) = \$4.0 billion

Low Estimate: 0.75 (estimated number of non-genetic-caused disease in women) x 100 billion (total annual cost) x 0.05 (EAF) = \$3.75 billion

Best Estimate: Average of high and low = \$3.88 billion

Note: To calculate this figure we approximated the number of non-genetic autoimmune diseases, using 80% as the high estimate and 75% as the low. We did not vary the EAF.

A QUICK REFERENCE GUIDE TO: BIRTH DEFECTS

Average medical cost associated with non-specific neo-natal and peri-natal congenital conditions: \$11,958 (for 2001)
(Source: *Medstat Marketscan® 2001 Commercial Claims and Encounters Database of 3.7m lives*. Copyright © 2003 Thomson Medstat.)

Number of babies born with birth defects annually: 150,000
(Source: *March of Dimes*)

Total annual medical costs for birth defects: $150,000 \times \$11,958 = \1.79 billion

High Estimate: Use 0.25 for EAF
(Source: *U.S. General Accounting Office. 1991. Report to the Chairman of U.S. Senate Committee on Government Affairs. "Reproductive and Developmental Toxicants: Regulatory actions provide uncertain protection." GAO/PEMD-92-3, Washington, DC.*)
 $0.25 \times \$1.79 \text{ billion} = \0.09 billion

Low Estimate: Use 0.05 for EAF
 $0.05 \times \$1.79 \text{ billion} = \0.09 billion

Best Estimate: Average between high and low = \$0.27 billion

A QUICK REFERENCE GUIDE TO: BREAST CANCER

Total medical costs associated with breast cancer for 2002: \$6 billion
(Source: *National Cancer Institute*)

Environmentally Attributable Factor: Experts estimate that approximately 30% of the reported breast cancer cases can be traced to a known cause. The remaining 70% may be attributed to pollution and/or toxins found in food and water.
(Source: <<http://breastcancer.about.com/library/weekly/aa063002a.htm>>)

High Estimate: Use 0.7 for EAF
 $0.7 \times \$6 \text{ billion} = \4.2 billion

Low Estimate: Use 0.05 for EAF
 $0.05 \times \$6 \text{ billion} = \0.3 billion

Best Estimate: Average between high and low = \$2.25 billion

A QUICK REFERENCE GUIDE TO: ENDOMETRIOSIS

Average medical cost associated with endometriosis: \$10,454 (for 2001)
(Source: *Medstat Marketscan® 2001 Commercial Claims and Encounters Database of 3.7 million lives*. Copyright © 2003 Thomson Medstat.)

Estimated number of women who suffer from endometriosis in North America: 5.5 million
(Source: *Endometriosis Association*, <www.killercramps.org>)

Environmentally Attributable Factor (EAF): 5%

Best Estimate: $5.5 \text{ million} \times 0.05 \text{ (EAF)} \times \$10,454 \text{ (cost per case)} = \2.87 billion

A QUICK REFERENCE GUIDE TO: INFERTILITY

Average medical cost associated with female infertility: \$7,368 (for 2001)
(Source: *Medstat Marketscan® 2001 Commercial Claims and Encounters Database of 3.7m lives*. Copyright © 2003 Thomson Medstat.)

Number of women ages 15–44 with impaired ability to have children: 6.1 million (1995)
(Source: *National Center for Health Statistics*, <<http://www.cdc.gov/nchs/fastats/fertile.htm>>)

Number of women who have used infertility services: 9.3 million (1995)
(Source: *National Center for Health Statistics*, <<http://www.cdc.gov/nchs/fastats/fertile.htm>>)

Environmentally Attributable Factor (EAF): 5%

High Estimate:
 $0.05 \text{ (EAF)} \times 9.3 \text{ million} \times \$7,368 = \$3.43 \text{ billion}$

Low Estimate:
 $0.05 \text{ (EAF)} \times 6.1 \text{ million} \times \$7,368 = \$2.25 \text{ billion}$

Best Estimate: Average between high and low = \$2.84 billion

APPENDIX 3: UNDERSTANDING THE PRECAUTIONARY PRINCIPLE

CORE ELEMENTS

Risk assessment, the traditional method of decision making with environmental issues, asks: “*How much harm is permissible?*” The Precautionary Principle instead asks: “*How little harm is possible?*” The Principle shifts the burden of responsibility from those exposed to harmful substances to producers, while requiring the establishment of safety rather than harm. For instance, the Principle requires that chemicals be well studied for health and environmental effects *before* being released into the environment.²⁷⁶

The Principle puts into practice the idea that if there is reasonable suspicion or a plausible threat of harm that is established as serious, irreversible, and cumulative, action must be taken, even in the absence of scientific certainty. In plain language, the Precautionary Principle reads “better safe than sorry” and can be expressed through all sorts of actions, including washing fruit before eating it, or opting to wear a seat belt or a bicycle helmet.

The central components of the Precautionary Principle²⁷⁷ include:

- Taking preventive action before harm occurs;
- Shifting the burden of proof of harm for a new technology, process, activity, or chemical from the public and consumers to the initiators and producers, including financial and regulatory responsibilities;
- Examining a complete range of alternatives to potentially harmful activities *before* implementation;
- Increasing public participation in decision making to assure that the process is open, informed, and democratic and includes, in particular, parties who will be directly affected;²⁷⁸
- Setting environmental and health goals and determining desirable outcomes for physical and human well-being.

PRECAUTIONARY PRINCIPLE IN USE

The Precautionary Principle is not just a theoretical tool; it is being put into action around the world. It has been incorporated into several international environmental agreements, such as the Great Lakes Water Quality Agreement signed by the U.S. and Canada, and the Rio Declaration, a United Nations policy statement concerning the environment and development, also signed by the U.S. The European Union often incorporates the Principle into guidelines for its regulatory system. On May 7, 2003, the European Commission released its legislative proposal for sweeping reform in chemicals policy, called REACH. The proposal will require that basic toxicity and risk information is provided within 11 years for all chemicals used in large quantities. Highly risky chemicals will be subject to government approval before they can be used. The goal of the policy is to promote safe practices while moving towards an ultimate elimination of emissions of dangerous substances into the environment. The REACH proposal also places a “duty of care” on all chemical manufacturers, importers, and users to study the hazards associated with their chemicals and institute risk-management measures to ensure safe use. For more information see: <<http://europa.eu.int/comm/environment/chemicals/whitepaper.htm>>.

In a speech before the National Academy of Sciences in 2000, Christine Todd Whitman, then governor of New Jersey and later Secretary of the U.S. Environmental Protection Agency, declared: “Policymakers need to take a precautionary approach to environmental protection. ... We must acknowledge that uncertainty is inherent in managing natural resources, recognize it is usually easier to prevent environmental damage than to repair it later, and shift the burden of proof away from those advocating protection toward those proposing an action that may be harmful.”²⁷⁹ The recent decision by the San Francisco Board of Supervisors to adopt the Principle as its policymaking framework marks a dramatic shift in the Principle’s influence and importance.



APPENDIX 4: EXISTING POLICY TOOLS

The following chart offers a short summary of current federal and state legislation that is intended to safeguard the public's health.

LEGISLATION	GOVERNING BODY	SUMMARY
Clean Air Act	Federal	Originally passed in 1970 and dramatically amended in 1990, the Clean Air Act allows the EPA to limit the level of pollutants in the air anywhere in the U.S. While administered at the federal level, states are responsible for implementing the Act in their regions. States may pass more stringent air pollution regulations but may not weaken those standards set by the Act. The Act mandates that each state create a State Implementation Plan (SIP) to meet the Act's goals. States must involve the public in the development of the SIP. To assist states in meeting the Act's goals, the EPA provides them with applicable scientific research, expert studies, engineering designs, and funding to support clean air programs.
Clean Water Act	Federal	The Clean Water Act sets the regulatory standard for discharges of pollutants into U.S. waters (excluding ground water and water quantity issues) and is the primary means of surface water quality protection for the country. With the goal of restoring and maintaining the chemical, physical, and biological integrity of the country's waters, this Act uses both regulatory and non-regulatory means to: (1) reduce pollution discharges into waterways, (2) support local wastewater treatment facilities, and (3) control polluted runoff.
Food Quality Protection Act	Federal	FQPA was signed into law in 1996, dramatically changing the way pesticides are regulated. The Act establishes a single, health-based standard for all pesticides in all foods that calls for reasonable certainty of no harm. It also provides special protections for infants and children, fast-tracks approval of safer, less toxic pesticides, and creates incentives for the development of effective, non-toxic crop protection tools for American farmers.
Proposition 65: Safe Drinking Water and Toxic Enforcement Act	California	Proposition 65 requires the Governor to maintain and publish a list of chemicals that are known to cause cancer, birth defects, or other reproductive harm. Additionally, businesses with 10 or more employees are required to warn employees and the public before knowingly exposing them to an amount of chemical that poses a significant risk. The Act is enforced through civil lawsuits.
Right to Know	Federal	Passed in 1986 and officially titled "Emergency Planning and Community Right-to-Know Action," the Right to Know forms national legislation on community safety. The law was designated to help local communities protect public health, safety, and the environment from chemical hazards. It has two purposes: 1) acknowledging the public's right to the information necessary to make informed choices and 2) providing information that may explain the interconnections between exposures and diseases. States are required to establish a State Emergency Response Commission (SERC). SERCs are then required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee for each district. These committees must include fire fighters, health officials, government and media representatives, community groups, industrial facility managers, and emergency managers.
Safe Drinking Water Act	Federal	The SDWA is used to ensure the quality of America's drinking water. The SDWA gives the EPA the authority to set standards for drinking water quality and the responsibility for managing the state, local, and water agencies that implement those standards. The Act also requires water utilities to issue Consumer Confidence Reports (CCRs), which tell the public if any pollutants have been detected in their drinking water and whether water quality standards have been violated. All contaminants found in drinking water must also be catalogued in a national database.
Toxic Releases Inventory	Federal	A provision of the Right to Know law, the TRI is a database of 654 toxic chemicals, released via air, land, and water. All states are required to collect annual data pertaining to releases (routine or accidental) and transfers of these toxic chemicals from industrial facilities and to make this data available to the public. While the current TRI database is extensive, it is incomplete, missing many chemicals and even entire industries.
Toxic Substances Control Act	Federal	The Toxic Substances Control Act gives the EPA the ability to track the 85,000 industrial chemicals being produced or imported into the country. The EPA continually screens these chemicals and may mandate specific reporting or testing if they determine that a chemical poses risk to the environmental or public health. When necessary, the EPA may ban the manufacture and import of potentially harmful chemicals. In addition to monitoring chemicals currently in use, the Act gives the EPA the authority to oversee all new chemicals as they are developed. If new chemicals are found to be unsafe, appropriate controls or restrictions are put into place.

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THE WOMEN'S FOUNDATION OF CALIFORNIA

The Women's Foundation of California is the oldest and largest philanthropic fund for women in the western United States, having made \$13 million in grants to more than 1,000 community-based organizations in every region of our diverse and expansive state since our founding in 1979. Our mission is to serve as a voice and advocate for the needs of women and girls; to provide funding and technical assistance; and to convene for dialogue and collaboration. We assist in building the capacity of organizations to respond to emerging needs; invest in social change work addressing women's and girls' agendas; and support the human rights of women and girls by facilitating their participation in the political, social, cultural, civil, and economic arenas.

INITIATIVES FORUM: AN OVERVIEW

The Initiatives Forum was launched by the Foundation in 1998 after a long history of funding innovative direct service provision for women and girls. The Foundation understood that provision of direct services without careful consideration of the context of public policies and laws fails to lay the groundwork for long-term social change. The program grew out of our recognition that it is not enough to fund direct service providers and community organizers. It is also necessary to fund groups working to effect changes in policies, practices, and laws and to build leadership that involves the voices of women and girls, linking them with those making decisions at the local and statewide policy level.

After commissioning the largest survey of California women and girls in the state's history, the Foundation designed the Initiatives Forum to focus on two issues that address the deepest concerns of women and girls and have potential for substantial policy change. The first area, **Women's Health and the Environment: Promoting Wellness from the Ground Up**, supports organizations led by women and girls that work to improve environmental conditions affecting women and their families where they live, work, and play. The second area, **Raising the Value of Women's Work: Organizing for Better Pay and Benefits**, supports community-based efforts that organize women to improve wages, benefits, and conditions in low-wage sectors occupied mostly by women. *Failing to Make Ends Meet: A Report on the Economic Status of Women in California* was issued by the Foundation in 2002 and may be downloaded directly, along with all our other publications, from www.womensfoundca.org.

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