

Let's Put  
**Breast Cancer**  
**Out Of Work!**



## Factsheet 1: Brophy/Keith – Breast cancer risk in occupations with exposure to carcinogens and endocrine disruptors



# HAZARD ALERT

**New study:  
Work-  
place  
chemical  
exposures  
and in-  
creased  
breast  
cancer  
risk**

Young women working in the automotive plastics and food packing industry are ***five times more likely to have breast cancer*** than their peers working in other industries.<sup>1</sup>

This is the key finding of a groundbreaking new study about breast cancer published in Environmental Health. This six-year Canadian study involved more than 1,000 women with breast cancer and a control group from the same communities in Ontario.

Researchers found that women who worked for 10 years in the automotive, agricultural, plastics, canning, and the casino, bar and racetrack sectors had elevated breast cancer risk. The highest risk factors—nearly 5 times higher than in the control—were for pre-menopausal women working in the automotive plastics and food-canning sectors.

These workers have higher-than-normal exposure to and body burden of carcinogenic and endocrine disrupting chemicals, which are chemicals that act like estrogens and other hormones. Exposure to complex mixtures of these chemicals may cause worse health effects than the sum of chemicals' individual effects.<sup>2</sup>

Let's say this again: these industries have more likely exposure to chemicals that act like estrogens and other hormones. And pre-menopausal women who work in these industries, according to this study, are five times more likely to have breast cancer.

### What does this study mean for USW members?

This study is the first of its kind to correlate breast cancer among premenopausal women and workplace exposure to carcinogens and endocrine disrupting chemicals that. These chemicals include styrene, acrylonitrile, vinyl chloride, phthalates, BPA, brominated flame retardants, heavy metals, some solvents, and complex chemical mixtures.

The implications of this study are broad and affect USW members across the US and Canada who work with many of the same chemicals in industries including plastics manufacturing and food canning, metalworking, rubber, oil refining, coated paper manufacturing, the chemical industry, and others.

As union members we can:

1. Educate our members about the health hazards of chemicals;
2. Use our collective voice to win health and safety improvements in our workplaces, such as substituting less hazardous chemicals or using engineering and design controls to prevent worker exposures to harmful chemicals; and
3. Tell our elected representatives that we support reforming outdated chemical laws.

Contact the USW Health, Safety & Environment Department for more information.



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<sup>1</sup> Brophy et al.: [Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: a Canadian case-control study](#). Environmental Health 2012 11:87.

<sup>2</sup> Dematteo et al. [Chemical exposures of women workers in the plastics industry with particular reference to breast cancer and reproductive hazards](#). New Solutions 2012 22(4): 427-448.

## **Factsheet 2: Toxic Soup – Chemical exposures of women workers in the plastics industry**

A study on **Chemical Exposures of Women Workers in the Plastics Industry with Particular Reference to Breast Cancer and Reproductive Hazards** was done in coordination with the Brophy/Keith study. It reviews the major occupational health hazards found in the plastics industry.

The environment inside plastics plants has been described as a “Toxic Soup” containing a complex mixture of chemicals. Plastics workers are not exposed these substances one-at-a-time. Instead they are exposed to complex mixtures of chemicals used and produced during the production process.

High temperatures and pressures applied to resins result in the release of various emissions from resin melt. The overheating of plastic materials during processing, cleaning, purging and maintenance operations can expose workers to a complex mixture of combustion by-products.

Some of these chemicals include: styrene, acrylonitrile, vinyl chloride, phthalates, bisphenol-A (BPA), brominated flame retardants, heavy metals, phthalates, a host of solvents, and complex chemical mixtures.

Workers in the plastics industry are exposed to these chemicals at higher levels than the general public. For this reason, they also have higher levels of these chemicals in their bodies when their blood and urine levels are tested.

Current occupational exposure limits do not take into account that some of these chemicals can make workers sick at very low levels of exposure. This is especially true of chemicals that act like hormones and are called endocrine disruptors.

[http://pubget.com/paper/23207955/Chemical\\_exposures\\_of\\_women\\_workers\\_in\\_the\\_plastics\\_industry\\_with\\_particular\\_reference\\_to\\_breast\\_cancer\\_and\\_reproductive\\_hazards](http://pubget.com/paper/23207955/Chemical_exposures_of_women_workers_in_the_plastics_industry_with_particular_reference_to_breast_cancer_and_reproductive_hazards)

### **Factsheet 3: Breast cancer in young women**

A February 2013 statistical analysis called **Incidence of Breast Cancer With Distant Involvement Among Women in the United States, 1976 to 2009** shows that advanced breast cancer is increasing in women under the age of 40 in the United States.

It is still uncommon for a young woman to be diagnosed with breast cancer – only 7% of cases in the US are in women under 40. However, the rate of breast cancer in American women under 40 years old has almost doubled since 1976 from 1.53 to 2.9 out of every 100,000 women.

This increase is too large to be by chance. It has been documented among both white and black women in both rural and urban areas.

Breast cancer in young women tends to be more aggressive and harder to treat. Survival rates for young women with breast cancer are much lower than for older women with the disease.

The authors write, "An increasing number of young women in the United States will present with metastatic breast cancer in an age group that already has the worst prognosis, no recommended routine screening practice, the least health insurance, and the most potential years of life."

A hypothesis in the study says the trend could be that young women are predisposed to breast cancer because of a variety of lifestyle changes that have occurred since 1976 including diet, exercise, obesity, earlier onset of menstruation, use of birth control, delayed pregnancy and other factors. The authors of the study said that researchers should investigate the reason for this increase in breast cancer among young women.

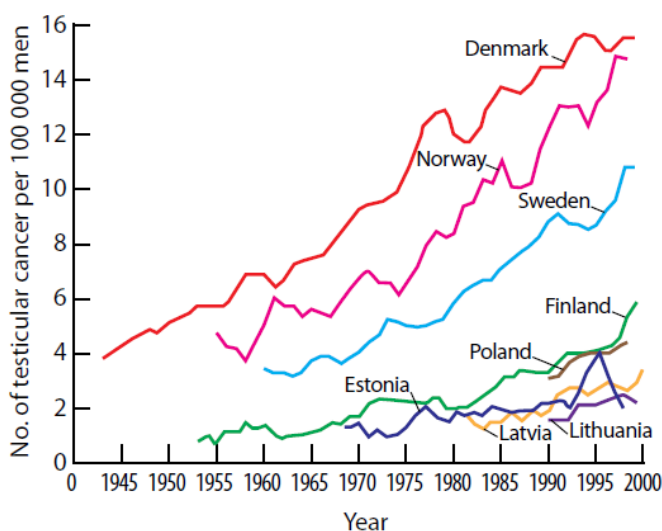
<http://jama.jamanetwork.com/article.aspx?articleid=1656255>



## Factsheet 4: State of the Science – Endocrine-related cancers around the world

The **State of the Science of Endocrine Disrupting Chemicals-2013** is a report by the World Health Organization. It shows that the rates of endocrine related cancers (breast, ovarian, prostate, testicular and thyroid) and other hormone-related diseases are increasing globally and that reducing chemical exposures needs to become an important focus.

Figure 7. Testicular cancer rates across northern Europe (from Richiardi et al., 2004; used with permission of the publisher).



The speed with which the increases in disease has occurred means that the explanation can't be genetic factors. Genes take many generations to change. Numerous laboratory studies support the idea that chemical exposures contribute to endocrine disorders in humans and wildlife.

[Humans and animals need a healthy and functioning endocrine \(or hormone\) system to reproduce and develop normally. The effects of endocrine disrupting chemicals can be seen at even low levels of exposure, particularly when exposure happens during development.](#)

Nearly 800 chemicals are known or suspected to affect the endocrine system. However only a small fraction of these chemicals have been tested.

Endocrine disrupting chemicals can be found in pesticides, flame retardants, plastic additives and cosmetics which may result in contaminants in food and other products.

Endocrine-related diseases and disorders that are on the rise are:

- Endocrine-related cancers including breast cancer
- Earlier breast development in young girls (a risk factor for breast cancer)
- Low semen quality that reduces a man's ability to father children
- Increase in genital malformations
- Adverse pregnancy outcomes such as miscarriages, pre-term birth and low birth rate
- Neural behavior disorders associated with thyroid disruption

<http://www.who.int/ceh/publications/endocrine/en/index.html>

## Factsheet 5: Breast Cancer and the Environment: Prioritizing Prevention

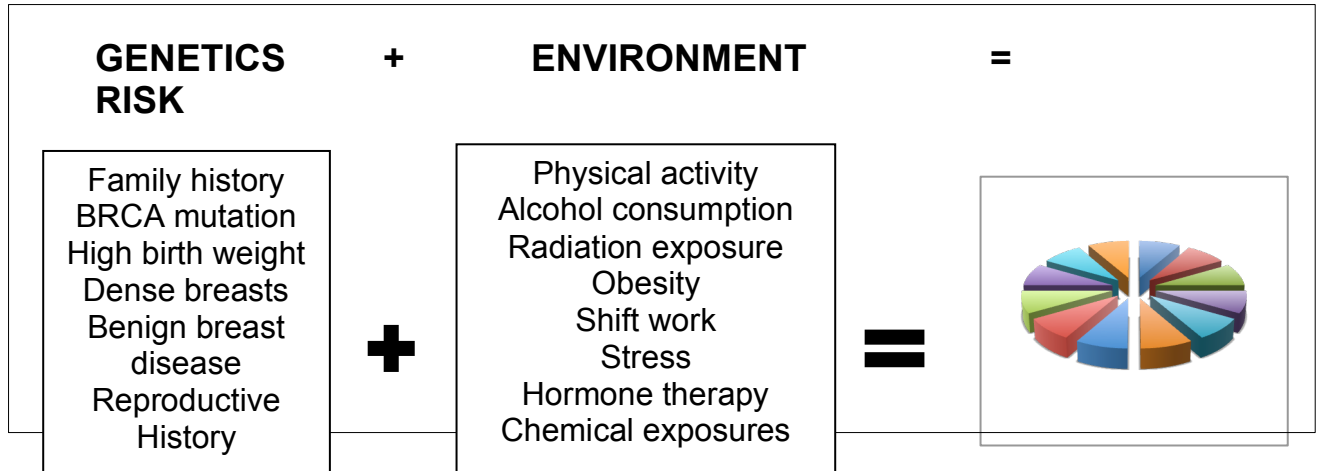
Congress mandated that the Interagency Breast Cancer and Environmental Research Coordinating Committee to examine the current state of breast cancer and the environment research and make recommendations for eliminating any knowledge gaps in this area. In February 2013 the Committee released their report called ***Breast Cancer and the Environment: Prioritizing Prevention***.



The report says that prevention is the key to reducing the emotional, physical, and financial burden of breast cancer on individuals and our health care system. It also says that despite decades of research, the number of women diagnosed with breast cancer continues to rise:

- In 2012 in the United States, about 227,000 women and 2,200 men were diagnosed with breast cancer. Approximately 40,000 women died from it.
- Worldwide, breast cancer is the most common cancer and accounts for 14 percent of cancer deaths.
- Most women who get breast cancer have no family history of the disease. The science shows that both genetic and environmental factors increase breast cancer risk. Since environmental factors can be identified and modified, focusing on this presents a tremendous opportunity to prevent breast cancer.

There are many factors, both genetic and environmental, that play a role in a woman's risk of getting breast cancer. Each factor carries a different weight in each person, and the combination of those factors leads to woman's risk of breast cancer.



The report recommends that the government develop a national breast cancer prevention strategy. It also recommends more investment in research for prevention of breast cancer, particularly by reducing exposure to key environmental factors.

[http://www.niehs.nih.gov/about/assets/docs/ibcercc\\_full.pdf](http://www.niehs.nih.gov/about/assets/docs/ibcercc_full.pdf)

## **Factsheet 6: How the Reproductive Problems of Florida Panthers and American Men Connected**

Like some frogs and sports fish, Florida's panthers are in serious trouble. Florida's panthers are plagued by low sperm counts, abnormal sperm, and undescended testicles.



Most of the males suffer from "cryptorchidism", meaning that one or both testes remain lodged in the abdomen. These undescended testes can contribute to sperm defects. They produce less sperm and more defective sperm making them unable to impregnate a female.

These fertility problems in Florida's panthers are eerily similar to reports of undescended testicles and fertility problems in American men. Undescended testicles are common in male babies. Up to 30 percent of boys born early and 3 percent to 5 percent of boys born on time have at least one undescended testicle.

Infertility, defined as the inability to conceive after one year of

unprotected sex, now affects one in six couples of childbearing age in the U.S. In 40% of cases, the problem is with the man; in 40% it's with the woman, and in 20% the problem is a combination of problems with both the man and the woman.

Scientists believe that the fertility of both panthers and people are being hurt by a group of chemicals called "endocrine disrupters." Animal studies have shown how these chemicals can get in the way of the actions of natural hormones, which are crucial for processes like sperm formation and testicular descent. The chemical culprits include dioxin, DDT, and PCBs, phthalates (pronounced tha-lates) and BPA.

## **Questions**

- 1. How are the reproductive problems of Florida panthers and American men connected?**
- 2. Does the information in this fact sheet support the *Old Thinking: Animals aren't people?***



## **Factsheet 7: Agent Orange**

### **What We Learned From an Uncontrolled Experiment on American Soldiers and the People of Southeast Asia**

From 1962 to 1971, the U.S. military sprayed 19 million gallons of Agent Orange and other chemicals on the forests of Vietnam, Cambodia and Laos. These chemicals were used as an herbicide - a plant-killer - to remove the jungle canopy of foliage and to destroy crops that could benefit the armies the U.S. was fighting.



American soldiers serving in Southeast Asia and the people of Viet Nam, Cambodia and Laos were exposed to these chemicals when they were sprayed. Many exposed people got a skin rash called chloracne. At that time, military doctors told their patients that this type of acne would be the only problem they would have from their Agent Orange exposure.

Now health professionals and research scientists know that information was terribly wrong. But they learned that from the suffering and the organizing of Vietnam Veterans and their families. When Vietnam attention to the health problems they believed were connected to

military service, Congress passed the Agent Orange Act of 1991. The legislation mandated the national Institute of Medicine to evaluate the scientific and medical information on the health effects of exposure to Agent Orange and other herbicides used in Vietnam every two years and report their findings to the Veterans Administration so compensation and treatment can be provided. No other chemical receives this kind of comprehensive and consistent review.

Because the law requires that scientists look for the evidence, Vietnam veterans who were exposed to Agent Orange can be compensated for one kind of leukemia, two kinds of lymphoma (Hodgkin's Disease, non Hodgkin's lymphoma) other kinds of cancer as well as diabetes, a type of heart disease and Parkinson's disease. The VA also compensates when the child of a Vietnam veteran is born with the birth defect called spina bifida that results in incomplete closing of the spine.

The story of Agent Orange shows how one chemical we were told was safe can cause many diseases many years after exposure, including in children born decades later.

## **Questions**

- 1. What did we learn from the uncontrolled experiment on American soldiers and the people of Southeast Asia?**
- 2. Does this information support the *Old way of thinking: Unique diseases come from a single cause?***

## Factsheet 8: Breast cancer and DDT

### How Timing Can Matter More Than Dose

Women in some parts of the United States are more likely to be diagnosed with breast cancer. One of these places is Long Island, New York. In 1993, the higher-than-average breast cancer rates lead the federal government's National Cancer Institute to sponsor a series of breast cancer studies of Long Islanders.



One of those studies looked at the link between DDT and breast cancer. Between the 1940s and the 1970s, the pesticide DDT was routinely sprayed across Long Island to control mosquitoes.

The 1993 study looked at the DDT levels of women who had breast cancer. Then researchers compared those levels to the amount of DDT in the blood of a similar cross section of adult women who did not have breast cancer. The study found that there was no link between the amount of DDT in and the incidence of breast cancer in the adult women

who were studied. So scientists declared that DDT does *not* raise the risk of breast cancer.

Fourteen years later, in 2007, a study was published that also compared DDT in women who had breast cancer and women who did not. But this time researchers used stored blood to measure how much DDT women had in them when they were girls going through the breast development of adolescence. This 2007 study showed that women who are exposed to higher levels of DDT before their breasts are fully developed are five times more likely to develop breast cancer: Put in an other way, the timing of the dose mattered much more than the dose itself.

## Questions

- 1. What did we learn about the importance of timing of exposure?**
- 2. Does this information support the *Old way of thinking: The dose makes the poison?***

## Factsheet 9: Biomonitoring Tells Us We Are All Being Dosed With Toxic Chemicals

At the end of the 1990s, the federal Centers for Disease Control and Prevention (CDC) started measuring chemicals in people. The CDC's National Biomonitoring Program specializes in "the direct assessment of people's exposure to chemicals by measuring the chemicals or their breakdown products (metabolites) in blood or urine."

Every few years, the CDC issues an updated report on the biomonitoring of environmental chemicals in a representative cross sample of the American people. Environmental organizations have supplemented the work of the CDC by doing their own biomonitoring testing:

Here's some of what they've found:

Everyone's contaminated with industrial chemicals. Chemicals in our food, air, water and the products we use every day add to the exposure that some people get from their workplace. Hundreds of substances have been identified in people's blood and urine. Babies are being born pre-contaminated,

The Environmental Working Group has tested the cord blood of newborn babies and found lead. Mercury, PFCs like Teflon, PBDE and other flame retardant chemicals, PCBs, dioxin, BPA and perchlorate from rocket fuel.



Mother's lips

Father's hair color

Chemical industry's lead, mercury, dioxin, BPA and perchlorates

The chemical industry says that the presence of tiny amounts of toxic chemicals in our bodies doesn't mean we're being harmed. But tiny amounts of some chemicals can have enormous impacts.

BPA is a good example of this type of chemical. BPA is short for Bisphenol A, a component of epoxy resins and polycarbonate plastics. The CDC has found BPA in more than 90% of Americans and EWG found it in 9 out of 10 of the cord blood samples of newborn babies. Hundreds of animal studies and some human evidence have led the U.S. National Toxicology Program (NTP) to issue the warning that BPA may pose risks to human reproduction.

Bisphenol A creates this risk by fooling our bodies into thinking that it is one of the hormones we need to grow and develop. Understanding how tiny amounts of hormones work is essential to understanding why extremely small amounts of chemicals that act like hormones can be a problem.

Starting with the formation of eggs and sperm and the meeting of the two in conception, growth and development are regulated by tiny amounts of our bodies' natural chemicals called hormones. We manufacture these chemical messengers, which enter our bloodstream and travel throughout our systems, managing our metabolism and controlling the function of our organs. Hormones produce a wide variety of regulatory signals to speed up our heart rate or release an egg from the ovary at part per billion levels in the blood. That's why we have to be concerned about tiny exposures to industrial chemicals that act like hormones when they get into our bodies.

## Questions

- 1. What is biomonitoring and what have we learned from it?**
- 2. Does this information support the *Old way of thinking: The dose makes the poison?***



## **Factsheet 10: How Are Our Occupational Safety and Health Laws Kept From Keeping Up With the Science**

### **Excerpts from Remarks by Dr. David Michaels , Assistant Secretary of Labor for Occupational Safety and Health**

*Public Citizen 40<sup>th</sup> Anniversary Speakers Series, January 18, 2011*

Four decades after the signing of the Act, OSHA is making a difference in the lives of millions of workers. Worker deaths in America are down — from perhaps 14,000 in 1970 to 4,400 in 2009 — in a workforce that has doubled in size. Injuries and illnesses are down — from 10.9 incidents per 100 workers in 1972 to less than 4 per 100 in 2009.

Some of this decline was due to the shift of our economy from manufacturing to service industries. But, clearly, much of our progress is due to tougher government standards and greater awareness of workplace safety practices brought about by OSHA.



Since we began, worker exposure to asbestos, lead and benzene have been dramatically reduced, and in the last decade new standards have helped shield healthcare workers from needlestick hazards and bloodborne pathogens. The clear impact of OSHA can be seen on a daily basis.

Still: While worker deaths, injuries and illnesses are far lower today than 40 years ago; they're not low enough. This country's conscience was rocked recently with the death of 11 workers on the Deepwater Horizon oil platform. Yet 12 workers are killed on the job every single day in this country. If a Deepwater Horizon or a Sago-

like disaster was reported in the news every day, there would be a public outcry. But because these 4,400 deaths a year usually happen one at a time, in towns large and small all across the country, they rarely make headlines. Even less noted are the 4 million more who suffer a serious job-related injury, and tens of thousands more suffer from serious job-related illnesses. What's most important, most of these deaths and injuries are preventable - preventable by basic safety precautions such as providing a safety harness and line to prevent workers from falling off a roof, shoring up a trench to make sure it doesn't collapse, or guarding a machine so a worker doesn't get his hand cut off.

Federal OSHA has only around 1,200 inspectors to cover 29 states. OSHA funded state plans have around the same, so there are less than 2,500 inspectors to cover 7.5 million workplaces employing more than 130 million workers. The maximum fine for a serious violation is \$7,000 — a small fraction of those imposed by other federal agencies. By comparison, the top penalty for violating the South Pacific Tuna Act is \$350,000.

Similarly, the maximum criminal penalty for a worker death associated with a willful violation of an OSHA standard is a misdemeanor with up to six months in jail; yet harassing a wild burro on federal land is a felony with a sentence of up to a year.

In 2001 at a Delaware oil refinery, a tank of sulfuric acid exploded, killing a worker named Jeff Davis. His body literally dissolved in the acid. The OSHA penalty was only \$175,000. Yet, in the same incident, the death of thousands of fish and crabs led to an EPA Clean Water Act citation of \$10 million. How can we tell Jeff Davis' wife and his five children that the penalty for killing fish and crabs is many times higher than the penalty for killing their husband and father?

## **Questions**

- 1. In what ways are our occupational health laws too weak?**
- 2. Does this information support the *Old way of thinking: When the science proves cause, we make new protective policies?***

## Factsheet 11: Formaldehyde

### How Are Our Chemical Management Laws Prevented from Keeping Up With the Science

Formaldehyde is that smell you may remember from the tubs of preserved specimens in the high school biology lab. The chemical is also used to make chemicals and resins and as an adhesive in plywood and particleboard.

Formaldehyde is one of the 62,000 chemicals that were grandfathered in when the Toxics Substances Control Act (also called TSCA or tos-ka) became law. TSCA gave a free pass to formaldehyde and almost all of the other chemicals in commerce with no requirement that they be tested and shown to be safe. Since 1976, new science has shown that formaldehyde can cause cancer, asthma attacks and other breathing problems. It is also suspected of harming the nervous and immune systems.

Because of these health impacts, China makes low formaldehyde plywood for domestic use and to export to the European Union and Japan. But China makes plywood with high levels of formaldehyde for export to the United States. This plywood was used in the trailers that



FEMA, the Federal Emergency Management Agency, supplied to Hurricane Katrina survivors and to the emergency workers cleaning up the BP oil spill in the Gulf of Mexico. After Katrina survivors started getting sick from the formaldehyde fumes, the U.S. Environmental Protection Agency (EPA) was petitioned to regulate this use of formaldehyde.

EPA denied the petition because the agency said it doesn't have sufficient legal authority to take action against formaldehyde under TSCA.

The problems with formaldehyde aren't limited to FEMA trailers. Many building materials and other consumer products used in the United States have dangerous levels of formaldehyde. An Arizona study designed to be representative of the general U.S. population found that the air in 25% of homes had dangerous levels of formaldehyde.

Former EPA Administrator Lisa Jackson inherited these problems with TSCA. Administrator Jackson went to Congress to ask for TSCA reform and ordered her agency to do what it can to act on formaldehyde and other chemicals of concern. But when the EPA tried to update its 1989 report in 1998, the Formaldehyde Council went to their friends in Congress to stop the agency from taking action. The conservative billionaire Koch brothers have led the Formaldehyde Council lobbying effort against EPA action on formaldehyde. Georgia-Pacific, a subsidiary of Koch Industries, is one of the country's top producers of formaldehyde.

## Questions

- 1. What does this story tell us about how our environmental laws are too weak?**
- 2. Does this information support the *Old way of thinking: The US has the most protective laws in the world?***