

# Plastics Industry Workers and Breast Cancer Risk: Q & A

## What is causing breast cancer in women in Canada?

Many cases of breast cancer cannot be solely explained by genetic or lifestyle risk factors (poor diet, alcohol, lack of exercise). There is growing evidence that breast cancer may be caused by a combination of factors, including exposure to occupational and environmental pollutants.

## At what time in history did breast cancer rise sharply?

The incidence of breast cancer rose sharply in the second half of the twentieth century—in the same time frame that saw women entering the workforce in record numbers. This increase also coincided with the dramatic introduction of thousands of new chemicals into industrial production.

## What are endocrine disrupters?

Endocrine disrupters are chemicals that mimic hormones, even at extremely low doses. They can interfere with normal hormone metabolism and functioning. Many chemicals and other materials used in the plastics industry have been identified as endocrine disrupters.

## Why plastics workers?

We already know that several plastics, additives and related solvents have been identified as breast carcinogens in animal studies. Reports of odours, respiratory problems and skin irritations are signs that plastics workers are breathing in or handling hazardous substances. We also know that endocrine disrupters, which are present in plastics manufacturing, have been implicated in breast cancer risk. There has been considerable attention paid to consumer exposures to various endocrine-disrupting chemicals, such as bisphenol A (BPA), but what about those who work everyday with significant exposures to these materials?

## Why women?

Breast cancer is the most commonly diagnosed cancer in women in Canada. Many women are employed by the automotive industry. According to Industry Canada, 48% of plastics firms are located in Ontario where about 51,000 people are employed. Thus, exploring possible breast cancer risks associated with exposures in the plastics sector of the automotive industry may have implications for thousands of women.

## How do carcinogens cause cancer in the work environment?

Developing cancer involves several factors (initiation, promotion and progression). The complex mixture of chemicals in the plastics industry work environment likely increases the probability of contributing to all of these factors.

## What processes are used in plastics manufacturing that could lead to exposures?

- Blending and mixing additives
- Melting resins in the molding machines
- Forcing the melted product under pressure through dies, rollers or into molds for a desired shape
- Drilling, grinding, sanding and buffing
- Prepping, painting and decorating
- Purging to remove heated polymer from the molding machines



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## **Which specific exposures in the plastics industry have known negative effects on health?**

Material safety data sheets have revealed the presence of carcinogens, such as vinyl chloride, styrene, butadiene, acrylonitrile, and heavy metals, along with a several other endocrine disrupting chemicals, such as BPA, phthalates, and fire retardants. Furthermore, it is important to remember that some chemicals can act together to compound the effects of others or the effects of naturally occurring hormones. For example, BPA has been shown to significantly increase the effects of the naturally occurring estrogen, estradiol.

## **Is air monitoring a good exposure measurement tool?**

No. The plastics industry environment is a “toxic soup” which makes it challenging to accurately and meaningfully measure exposure through air monitoring. Moreover, the acceptable threshold limit values for specific air contaminants do not take into account endocrine disruption. Finally, air measurements underestimate the true body burden.

## **What are the barriers to improvements?**

As we’ve seen over the years, the fear of plant closures and job loss can inhibit efforts to improve the work environment. Though some improvements have been made in plants, many remain essentially the same as they were decades ago. Scientific uncertainties persist because most of these substances are only studied in animals, their interactions in the body are complex, and there tends to be a latency period between exposure and effect.

## **Have any plastics workers received compensation for breast cancer caused by the agents that they were exposed to in the work environment?**

No. Despite the strong evidence that women are exposed to agents that can cause breast cancer in the plastics industry environment, no plastics worker in Canada has ever received workplace compensation following a diagnosis of breast cancer. In fact, no provincial compensation board has accepted a claim for breast cancer from any workplace. Furthermore, no public inquiries or commissions have been established to examine the risks to women posed by exposures in the plastics industry nor have there been any focused institutionalized research initiatives, prevention campaigns, educational programmes, or regulatory changes.

## **What is the current policy approach?**

While our scientific understanding of the links between exposures and disease has progressed, occupational health policies have changed very little. Advances in our understanding of endocrine disruption have indicated not only the inadequacy of existing testing protocols, but also the need to re-evaluate all of the regulatory standards and guidelines for occupational health. Scientific advancements have also shown that, while on a chemical-by-chemical basis the allowable exposure limits may not be regularly exceeded in the plastics industry environment, there is a glaring issue with complex mixtures not being evaluated.

## **What can be done?**

From a public policy standpoint, the question arises as to what we should do in the face of scientific uncertainty or, as is often the case, incomplete knowledge. The precautionary principle states that when an activity raises threats of harm to human health or the environment, precautionary measures should be taken, even if some cause and effect relationships are not fully established scientifically. Uncertainty should not be seen solely as a scientific matter, but rather a question of political perspective, power, and the extent to which our society values human and environmental health.