

Cleaner Air Oregon Fact Sheet

Excess Cancer Risk

This fact sheet provides information on cancer health risk from breathing toxic air contaminant emissions and how the [Cleaner Air Oregon](#) (CAO) program regulates this risk to protect communities. For the purposes of this fact sheet, the terms toxic air contaminant and contaminant mean the same thing – these are harmful chemicals known to cause negative health effects when people breathe them, including cancer.

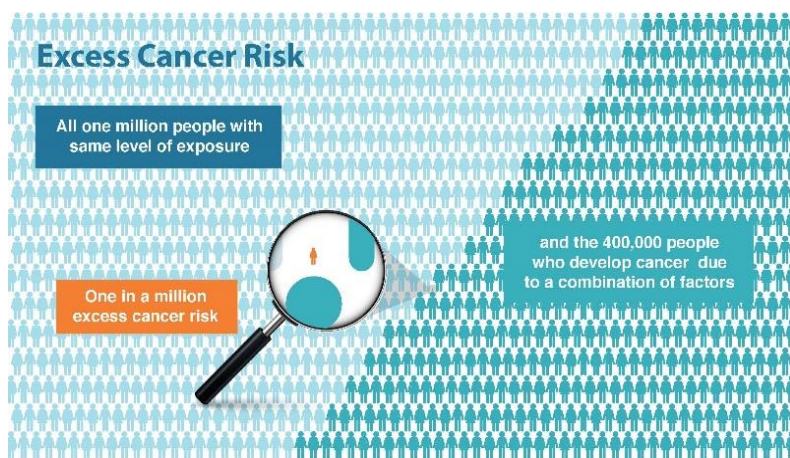
CAO is an air quality program that regulates emissions of toxic air contaminants from industrial facilities by assessing the potential health risks those emissions pose to the surrounding communities. DEQ requires that these facilities assess both the cancer and noncancer health risks that their activities may cause to people who live, work, and congregate nearby.

What is cancer and excess risk from air contaminants?

Cancer is a family of diseases where some of the body's cells grow uncontrollably and spread to other parts of the body. There are more than 100 different types of cancer which can start almost anywhere in the human body.

The American Cancer Society estimates that on average about 400,000 people per million will get cancer at some point in their lifetime in the U.S., or a 40% chance. This is called the background cancer rate and comes from a combination of factors which include age, genetics, diet, tobacco use, random chance, and environmental exposures. Exposure to certain toxic air contaminants can increase a person's risk of developing cancer. Specifically, breathing harmful chemicals may increase the risk of certain types of cancer including lung, nose and throat, and leukemia.

Excess cancer risk is expressed as a **probability**, or chance, that a person will develop cancer over a lifetime of exposure to toxic air contaminants and can be thought of as additional cancer cases in a population. Excess cancer risk from exposure to harmful chemicals is the extra risk above the background cancer rate that a person may face from exposure to those chemicals over a lifetime.



An excess cancer risk of 1 in a million means that one person in a population of one million people exposed to the same level of air contaminant(s), at the same location, could develop cancer over a lifetime in addition to the background cancer rate of 400,000. Cancer risk estimates are used to better understand how exposure to harmful chemicals impact future cancer cases and inform public health protections. It is important to note a cancer risk estimate does not tell us how many people currently have cancer from air contaminant exposure.

Translation or other formats

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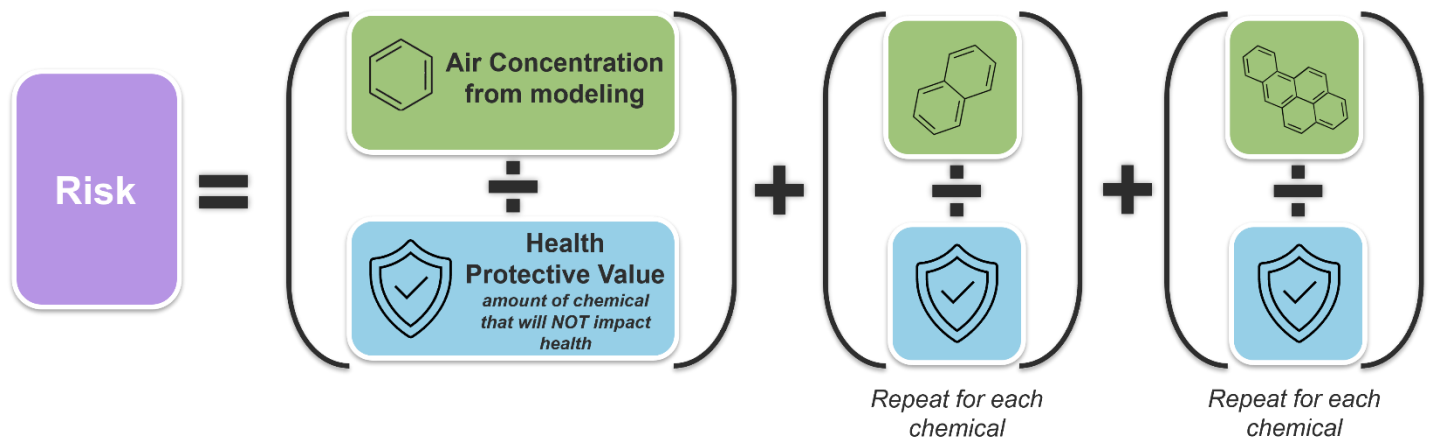
How does CAO regulate excess cancer risk?

The CAO program looks at the excess cancer risk to communities from breathing air contaminants from industrial facilities in addition to the background rate of developing cancer over a lifetime. The risk of developing cancer from toxic air containments depends on how long the contact lasted, the type and amounts of contaminants in the air, and how often a person breathes them. If a person is exposed to multiple cancer-causing contaminants from the air, the risk from each chemical is added up to calculate the person's total excess cancer risk.

There are two pieces of information needed for each contaminant when calculating **excess cancer risk**:

- (1) **Amount of the Contaminant in Air:** In CAO, modeling is used to calculate the amount of the contaminant in the air that is emitted by a facility. These amounts are calculated for locations near the facility where people live, work, learn, and play.
- (2) **Health Protective Value:** In CAO, chemicals are assigned health protective values, called Toxicity Reference Values, or TRVs. These values represent the amount of contaminant a person can breathe at which one person per million people could develop cancer after a lifetime of breathing it. Learn more about DEQ's health protective values [here](#).

Excess cancer risk is calculated by comparing the amount of each contaminant in the air with the health protective value. This comparison is done for each contaminant emitted from a facility that has a health protective value and each result is then added up to provide the **total excess cancer risk**. See the figure below for an example of what this calculation looks like.



When the excess cancer risk is **above 1 chance in a million**, state agency toxicologists look closely at the cancer risk and make conclusions about the public health risks and share that information with communities. The higher the cancer risk number, the higher the potential risk to health.

How does CAO use cancer risk to regulate health risk?

The maximum **excess cancer risk** value determined for a facility by the CAO program indicates if modeled risk levels meet health-based standards, called Risk Action Levels. The Oregon Legislature set these Risk Action Levels (Oregon Revised Statute [468A.343, Sec. 7](#)), which mandate the actions a facility must take if certain risk levels are exceeded. **Facilities with higher risk are required to take more actions to reduce risk.** The [Risk Action Levels fact sheet](#) provides more details.

Program information and non-discrimination statement

If you have additional questions, please contact us at cleanerair@deq.oregon.gov. To find out more about the status of facilities in the CAO program, visit [this website](#). Sign up for updates on the CAO program [here](#).

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