

# How do scientists set health-based guidelines?

## An example using a non-cancer approach

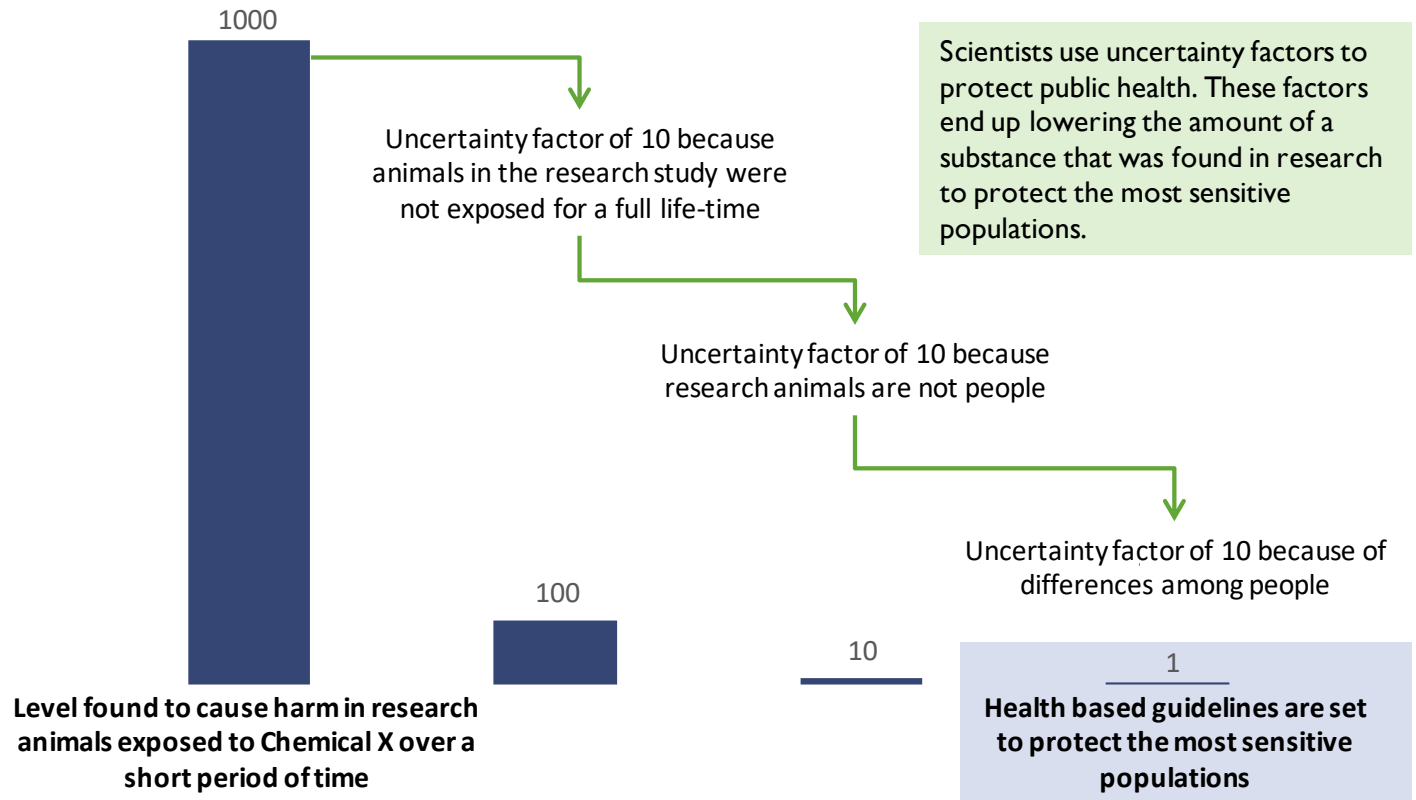


### Scientists use health numbers to recommend amounts of a substance that people can consume and still be safe.

State and federal agencies use research studies to set numbers to determine the amount of a substance that can be in water and are not expected to cause health problems. These numbers take into account sensitive populations like people who are pregnant. This is an example of how numbers are arrived at for non-cancer health effects.

Often, the scientific information we have on a chemical does not directly describe what health effects may occur in people exposed to substances over long periods of time. This is why scientists account for scientific uncertainty to protect public health, using something called an “uncertainty factor.”

For example, Chemical X has a total uncertainty factor of 1000 ( $10 \times 10 \times 10 = 1000$ ).



### Sometimes we have strong research on health effects in human populations and do not need to account for the scientific uncertainty.

For example, we have studies that show specific effects on vulnerable populations when they drank water with levels of Chemical Z higher than 10 milligrams per liter. In this case, the uncertainty factor is 1 because the number is based on effects found in a sensitive population of people.

However, guidelines for most substances need to account for scientific uncertainty, as with Chemical X above.

