

Routes of Exposure to Environmental Chemicals

What is an exposure? An exposure is the interaction of behavior and the environment. There are many types of exposures, and these may be naturally occurring or made by humans.

Primary Routes of Exposure



Inhalation

(e.g., indoor, outdoor air, shower)



Ingestion

(food, water)



Skin/Eye Contact

(direct contact bathing/swimming)

Inhalation + Ingestion + Skin/Eye Contact Exposure = Total Exposure

- The three primary routes of exposure are inhalation (what we breathe in), ingestion (what we eat or drink), and skin/eye contact.
- Total exposure is the combination of all contaminants absorbed through inhalation, ingestion, and skin/eye contact.
- Exposure varies between individuals and across communities.

Dimensions of Exposure



Duration (How long?)

Acute – short-term exposure
Chronic- long-term, potentially constant exposure



Intensity (How much?)

Concentration/quantity
May reflect either cumulative or peak/maximum exposure



Frequency (How often?)

More than once a day?
Daily or weekly?
Monthly or yearly? Yearly?

- Asking questions about the dimensions of exposure can help us better understand which individuals have the most and the least exposure.
- Sometimes exposures stay the same across our lifetime (e.g., our genes) and sometimes they may change daily (e.g., our physical activity).

Vulnerable populations



Pregnant women and the developing fetus



Infants and children



Elderly individuals



Immunocompromised individuals



Economically vulnerable communities

- At certain points over the life course, individuals may be more susceptible to the potential adverse effects of different types of exposure.
- We may also define vulnerable populations in terms of other characteristics that may make them more susceptible to adverse health outcomes, more likely to experience severe disease, or more likely to be exposed to environmental contaminants

Where to learn more:

<https://www.des.nh.gov/home-and-recreation/your-health-and-environment>

<https://www.epa.gov/expobox/exposure-assessment-tools-routes>

https://www.atsdr.cdc.gov/pha-guidance/conducting_scientific_evaluations/exposure_pathway_s/exposure_routes.html



NEW HAMPSHIRE
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Reducing Exposures to Harmful Chemicals



In your home

- Test for Radon
- Test your private well
- Use HEPA air filters to improve indoor air quality
- Eliminate sources of lead exposure in the home
- Avoid stain resistant carpet and furniture
- Wet dust/mop and use a vacuum with a HEPA filter
- Choose safer cleaning products



In your food

- Eat more home-cooked, whole food-based meals, and less ultra-processed food
- Eat a varied diet
- Be a conscientious consumer of seafood and game meat
- Choose glass or stainless-steel food containers
- Avoid non-stick cook and bakeware



On your body

- Reduce the number of personal care products that you use daily
- Choose products with safer ingredients
- Use fragrance free products



Making one or two changes can have a big impact



Small changes add up over time



Prioritize the changes that are most important to you

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