APPLETREE

Agency for Toxic Substances and Disease Registry's **P**artnership to **P**romote **L**ocal **E**fforts **T**o **R**educe **E**nvironmental **E**xposures

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NH DIVISION OF Public Health Services
Department of Health and Human Services

APPLETREE

Agency for Toxic Substances and Disease Registry's **P**artnership to **P**romote **L**ocal **E**fforts **T**o **R**educe **E**nvironmental **E**xposures

NH Environmental Health Guide (NH-EHG) Introduction

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

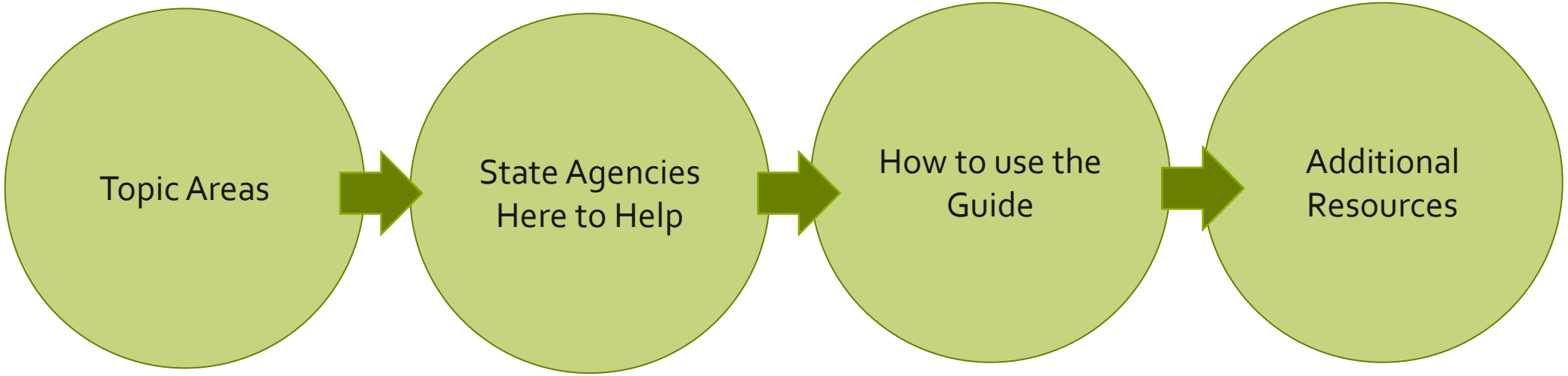
NH DIVISION OF Public Health Services
Department of Health and Human Services

Dartmouth Cancer Center

Dartmouth Health

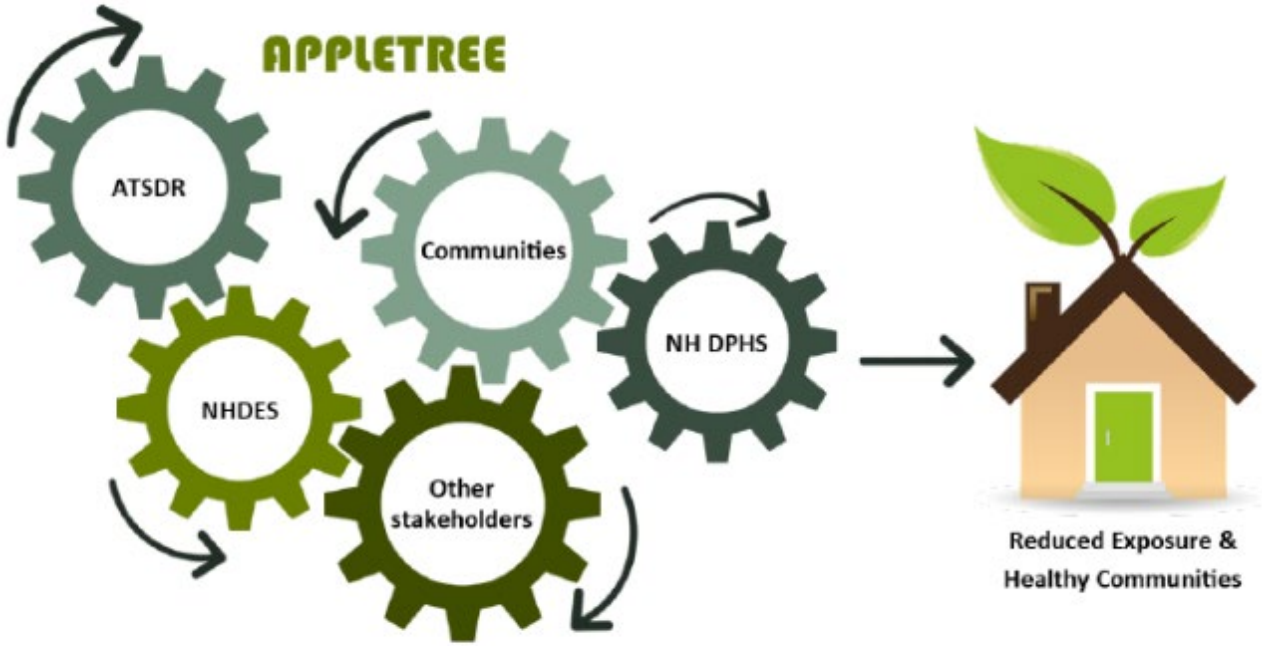
Dartmouth GEISEL SCHOOL OF MEDICINE

NH Environmental Health Guide (NH-EHG) Introduction:



APPLETREE

A partnership in NH that promotes and pulls together stakeholders, organizations and communities for local efforts to reduce environmental exposures



Agency for Toxic Substances and Disease Registry's Partnership to Promote Local Efforts To Reduce Environmental Exposures

With receipt of federal funds from the Agency for Toxic Substances and Disease Registry (ATSDR) the APPLETREE program at NHDES has funded Dartmouth College to develop resources for your continuing training.

Department of Environmental Services

Air Resources Division
- Air quality

Waste Management Division
- Waste management/remediation (hazardous & solid waste)

Water Division
- Groundwater
- Drinking water
- Wastewater
- Watershed management

Environmental Health Program, including the APPLETREE Program, works across all DES Divisions and in partnership with DPHS

Division of Public Health Services

Infectious Disease Control
- Disease surveillance
- Public health systems
- Immunization program

Laboratory Services
- Water testing; Special testing

Public Health Statistics and Informatics
- Environmental Public Health Tracking Program (EPHT)
- Health Statistics & Data Management

Public Health Protection
- Food Protection Section
- Healthy Homes & Environments Section/Radon Program
- Radiological Health Section

Population Health and Community Services
- Chronic Disease Prevention and Screening Section
  - Cancer program
- Nutrition Services Section

Office of Legal and Regulatory Services:
administrative rules, legislative affairs

When your community has environmental health questions…

…where do you find the answers?

NH Environmental Health Guide

Why is this guide needed?

- ✓ To give access to resources & connections in a timely manner
- ✓ To help answer questions from local community members
- ✓ Assures connection to the right resources

Example of how to use this guide…

START LEFT → READ ACROSS

d they want to know n

New Hampshire Environmental Health Guide (NH-EHG)

Environmental health community concerns	Environmental health categories	Specific environmental health concerns	Resources to help you find the answers you nee
Drinking water quality *(continued)*	Private well drinking water	Home filters: point of use, point of entry, reverse osmosis, NSF standards	• Dartmouth Arsenic and You • NHDES Arsenic in NH Well Water
		Regulation and testing	• NHDES Private Well Testing • NH DHHS Water Analysis Laborato • NH DHHS Water Testing Guide
		Miscellaneous quality issues, e.g., taste, smell, color	• NHDES Water Testing: Private We • NHDES Arsenic in Well Water • NH DHHS Water Testing Guide
		Infection risk and outbreaks	• NHDES Watershed Beach Maps • NHDES Harmful Algal Blooms • NHDES Bacteria in Surface Waters
		Chemical contaminants: PFCs, Arsenic, Lead, TCE, NDMA, Chlorine/ chloramine	• NHDES PFAS Private Well Testing Form • NHDES PFAS in Well Water • NHDES Arsenic in Well Water • NH DHHS Is There Arsenic in Your Drinking Water? • Dartmouth Arsenic and You • NH DHHS Data Portal: Drinking Water
			• NHDES Private Wells • NHDES Private Well Laboratory Testing

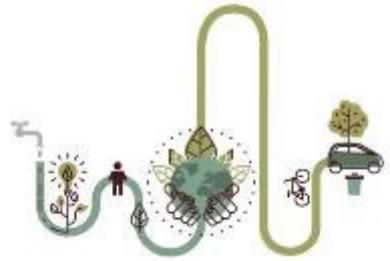
NH Environmental Health Res

Concern

Category

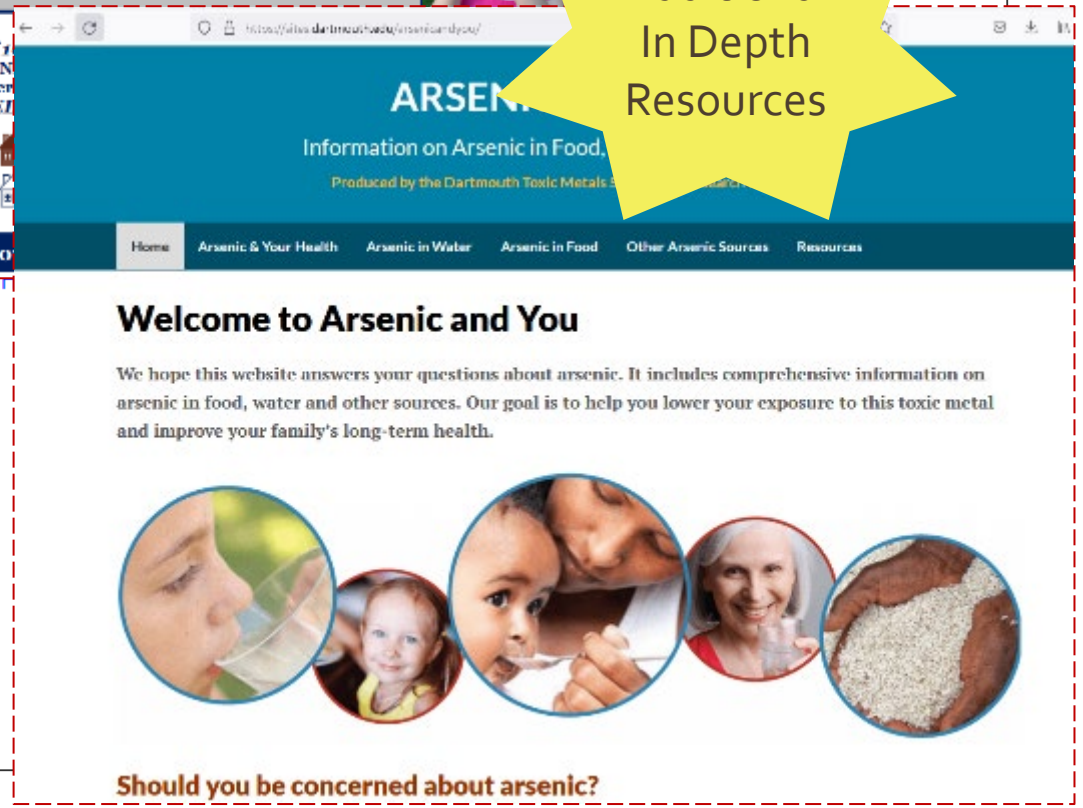
Specific Concern

Resources to start with



updated 04/08/2022

…ral and partner resources
…ding a broader perspective
…A, CDC, …SDR, NIEHS, etc.)



Additional In Depth Resources

Let's look at another examp

Someone is interested in testing thei

START LEFT → READ ACROSS

New Hampshire Environmental Health Guide (NH-EHG)

ed 04/08/2022

Environmental health community concerns	Environmental health categories	Specific environmental health concerns	f		ner resources er perspective R, NIEHS, etc.)
Air Quality	Outdoor air quality	Air quality index, air quality alerts (ozone action days)	• NHDES H • EPA Clea • NH DHHS		ty Table
		Odors	• NHDES C • NHDES C		
		Air emissions	• NHDES A • NHDES N • NHDES A		ollutions
		Wildfires	• NH Daily		ources d Resources
	Indoor air quality	Radon and radon mitigation	• NH DHHS • NH DHHS Radon Mitigation • NH EPHT Radon Risk • NH DHHS Radon Publications	• DHHS/NH DHHS Radon Program Contacts	lity • EPA Indoor Air Quality Training Course • ATSDR Radon Toxicity Course or Air Quality
		Volatile Organic Compounds (VOCs)	• NHDES Air Emissions Inventory • EPA Volatile Organic Compounds Indoor Air Quality Impact	• NHDES Air Resources • NHDES MtBE Remediation • NHDES Organics in Drinking Water	ical Overview of VOCs
		Radon testing	• NH DHHS Radon Program • NH DHHS Radon Program: Free Test Kit	• NH DHHS Radon Program Contacts	don Testing • EPA: Radon
		Woodsmoke	• NHDES Home Wood-Burning Appliances • EPA Wood Smoke Resources	• NHDES Air Resources	• EPA Wood Smoke • ATSDR Asthma: Environmental Triggers of Asthma

Concern

Category

Specific Concern

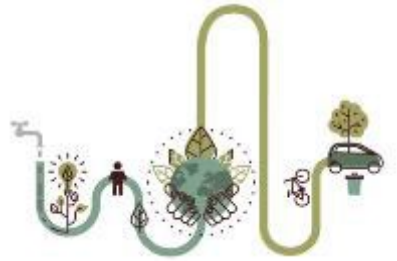
Resources to start with

State Resources

Additional In Depth Resources

Federal Links/Resources

Agencies and Partners Here to Help You



STATE & LOCAL PARTNERS

- APPLETREE
- Department of Environmental Services (DES)
- Department of Health and Human Services (DHHS)

FEDERAL AGENCIES

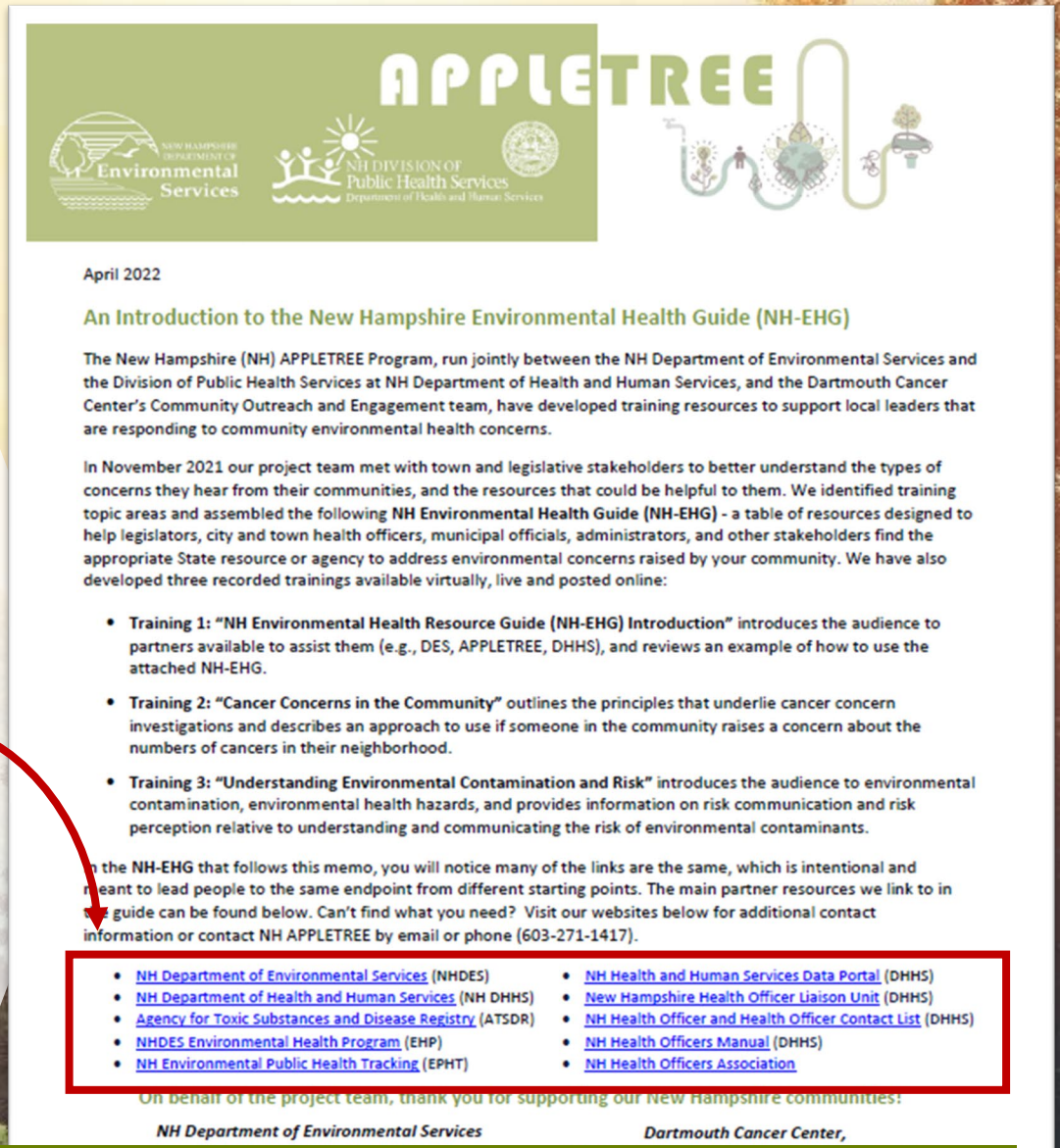
- Agency for Toxic Substances & Disease Registry (ATSDR)
- Centers for Disease Control (CDC)
- Environmental Protection Agency (EPA)
- National Institutes of Health (NIH)
- National Institutes of Environmental Health Sciences (NIEHS)
- National Institute for Occupational Safety & Health (NIOSH)
- Occupational Safety and Health Administration (OSHA)
- US Department of Justice, National Drug Intelligence Center

ACADEMIC PARTNERS

- Dartmouth College
- Geisel School of Medicine at Dartmouth
- Dartmouth Cancer Center
- University of New Hampshire

Please visit our websites found in the NH-EHG introduction

or contact NH APPLETREE Principal Investigator
Dr. Robert Thistle
by email Robert.Thistle@des.nh.gov
or phone 603-271-1417



APPLETREE

April 2022

An Introduction to the New Hampshire Environmental Health Guide (NH-EHG)

The New Hampshire (NH) APPLETREE Program, run jointly between the NH Department of Environmental Services and the Division of Public Health Services at NH Department of Health and Human Services, and the Dartmouth Cancer Center's Community Outreach and Engagement team, have developed training resources to support local leaders that are responding to community environmental health concerns.

In November 2021 our project team met with town and legislative stakeholders to better understand the types of concerns they hear from their communities, and the resources that could be helpful to them. We identified training topic areas and assembled the following **NH Environmental Health Guide (NH-EHG)** - a table of resources designed to help legislators, city and town health officers, municipal officials, administrators, and other stakeholders find the appropriate State resource or agency to address environmental concerns raised by your community. We have also developed three recorded trainings available virtually, live and posted online:

- **Training 1: "NH Environmental Health Resource Guide (NH-EHG) Introduction"** introduces the audience to partners available to assist them (e.g., DES, APPLETREE, DHHS), and reviews an example of how to use the attached NH-EHG.
- **Training 2: "Cancer Concerns in the Community"** outlines the principles that underlie cancer concern investigations and describes an approach to use if someone in the community raises a concern about the numbers of cancers in their neighborhood.
- **Training 3: "Understanding Environmental Contamination and Risk"** introduces the audience to environmental contamination, environmental health hazards, and provides information on risk communication and risk perception relative to understanding and communicating the risk of environmental contaminants.

the NH-EHG that follows this memo, you will notice many of the links are the same, which is intentional and eant to lead people to the same endpoint from different starting points. The main partner resources we link to in guide can be found below. Can't find what you need? Visit our websites below for additional contact information or contact NH APPLETREE by email or phone (603-271-1417).

- NH Department of Environmental Services (NHDES)
- NH Department of Health and Human Services (NH DHHS)
- Agency for Toxic Substances and Disease Registry (ATSDR)
- NHDES Environmental Health Program (EHP)
- NH Environmental Public Health Tracking (EPHT)
- NH Health and Human Services Data Portal (DHHS)
- New Hampshire Health Officer Liaison Unit (DHHS)
- NH Health Officer and Health Officer Contact List (DHHS)
- NH Health Officers Manual (DHHS)
- NH Health Officers Association

On behalf of the project team, thank you for supporting our New Hampshire communities!

NH Department of Environmental Services *Dartmouth Cancer Center,*

Access the Guide and other Resources here:
https://www.des.nh.gov/new-hampshire-appletree

NH DIVISION OF Public Health Services
Department of Health and Human Services

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Dartmouth Cancer Center
Dartmouth Health

Dartmouth GEISEL SCHOOL OF MEDICINE

October 2022

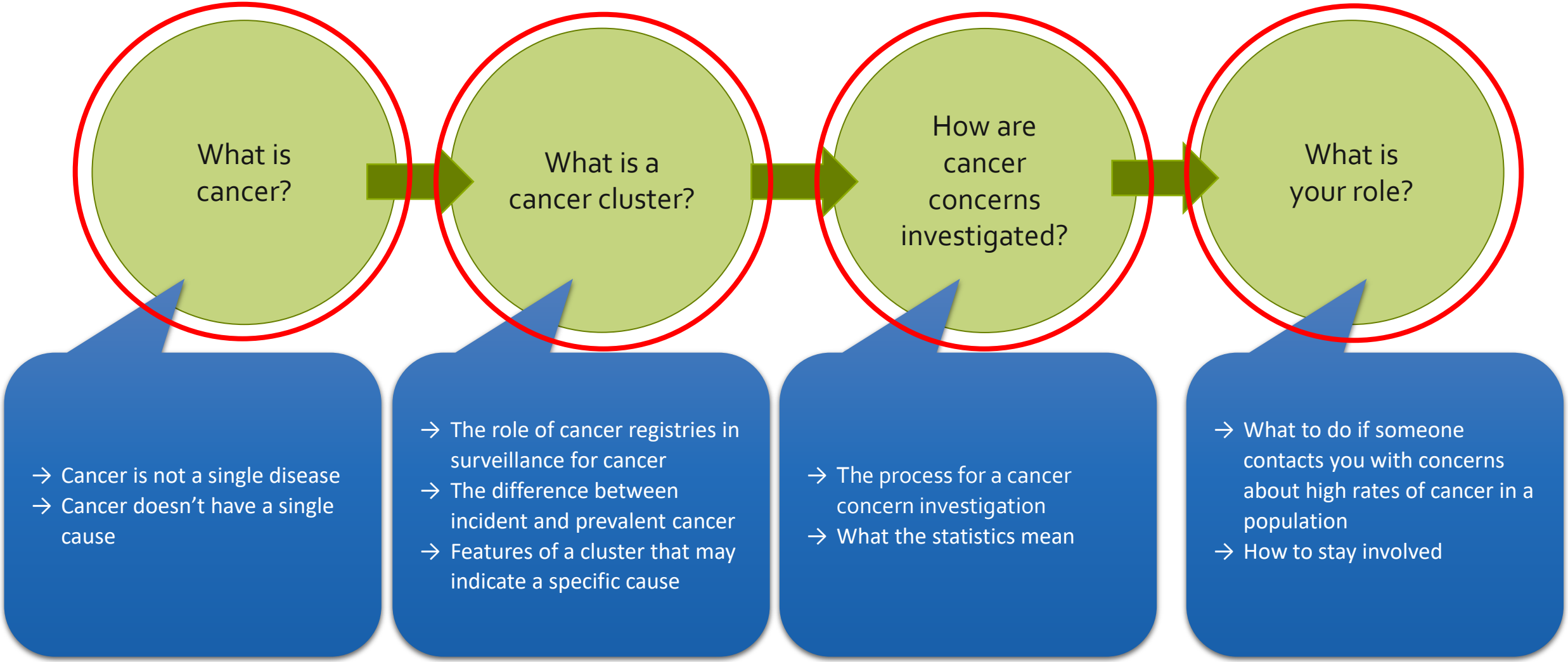
Cancer Concerns in the Community

NH Division of Public Health Services (DPHS)

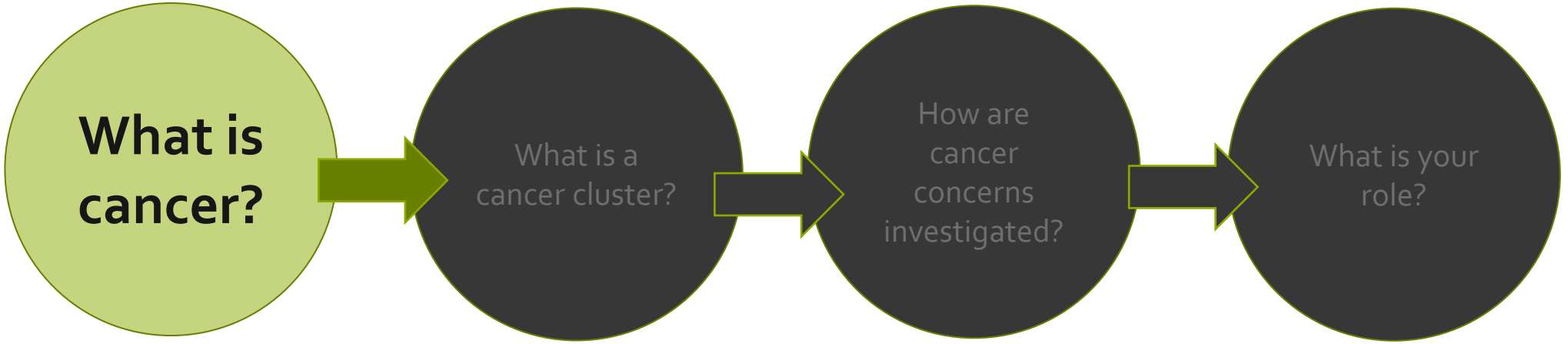
Whitney Hammond, MSW MPH

Learning Objectives

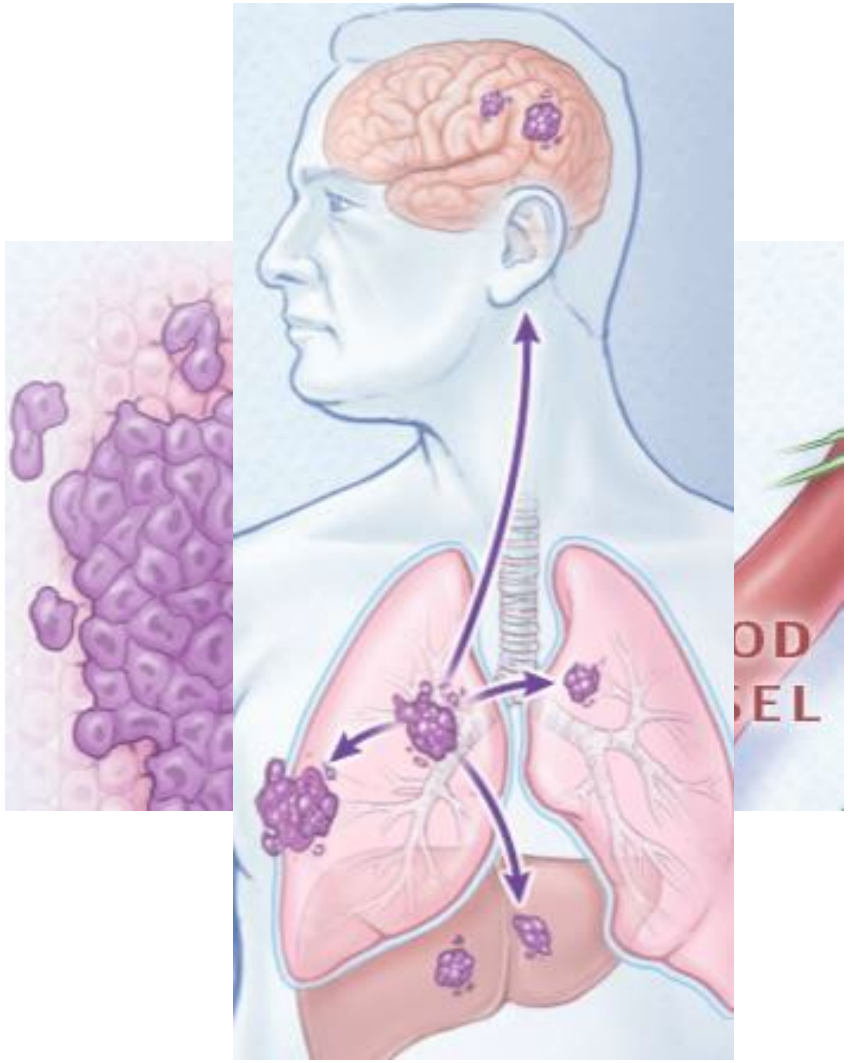
After the training, trainees should be able to explain in simple terms:



First let's consider



What is Cancer?



- A tumor - abnormal mass of cells in the body
- Malignant tumors can invade other tissues

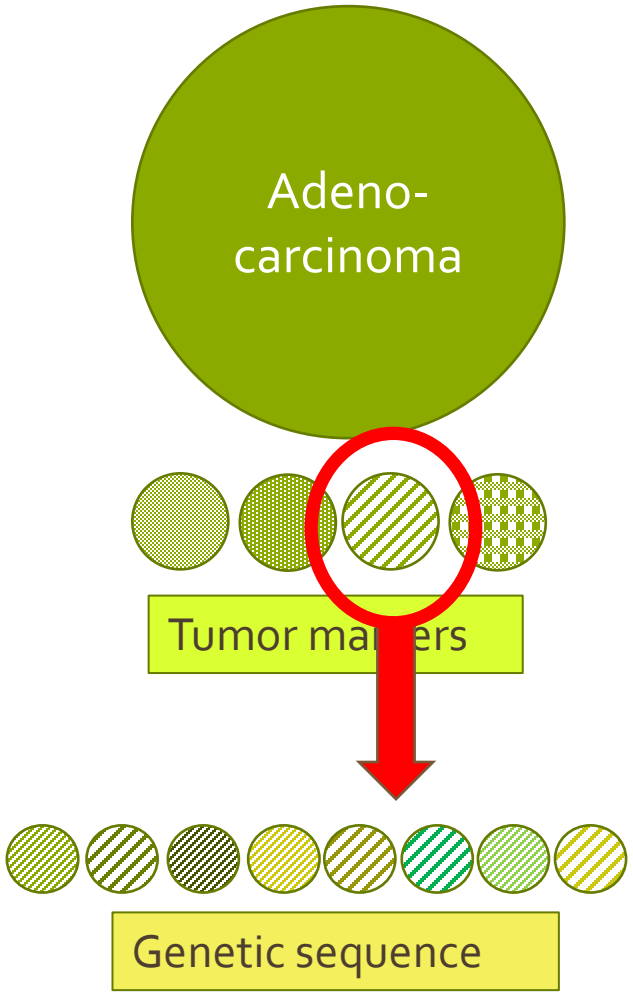
  … and spread to other parts of body
  e.g., lung, liver

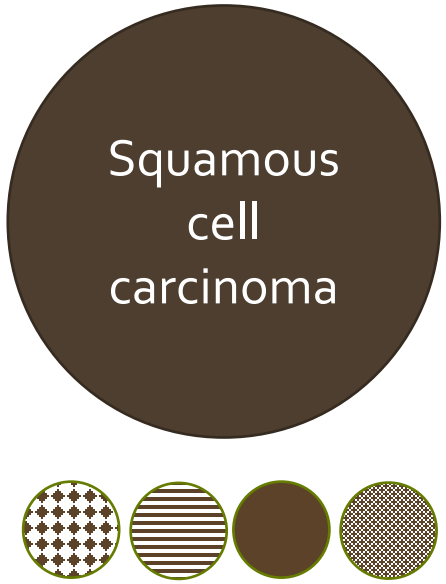
- **Malignant tumor - "cancer"**
- Because they spread and invade body tissues, malignant tumors can be fatal

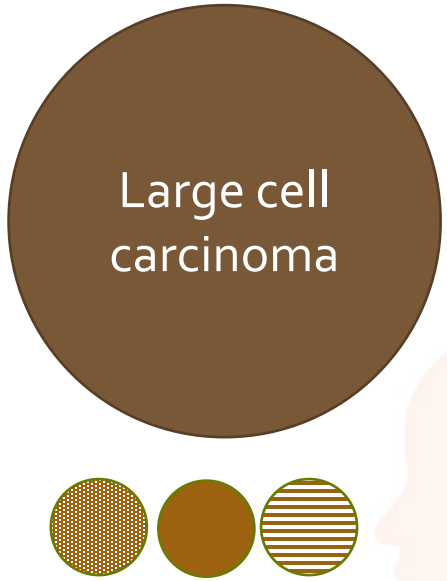
https://jamanetwork.com/journals/jamaoncology/fullarticle/2768634

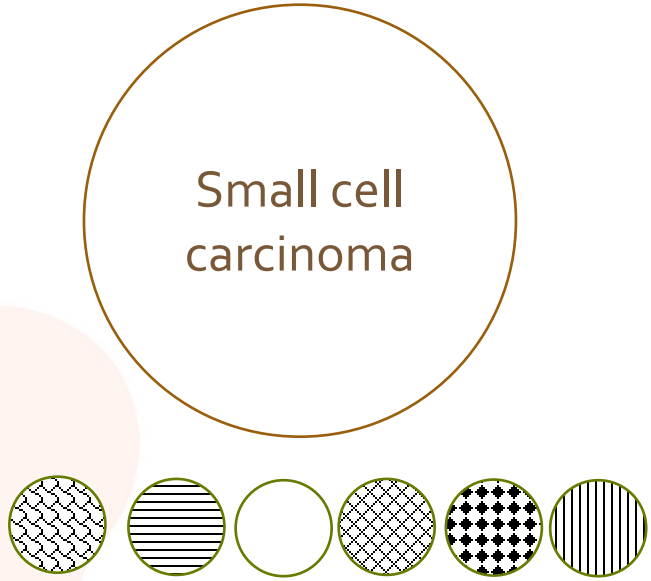
Cancer is not a single disease

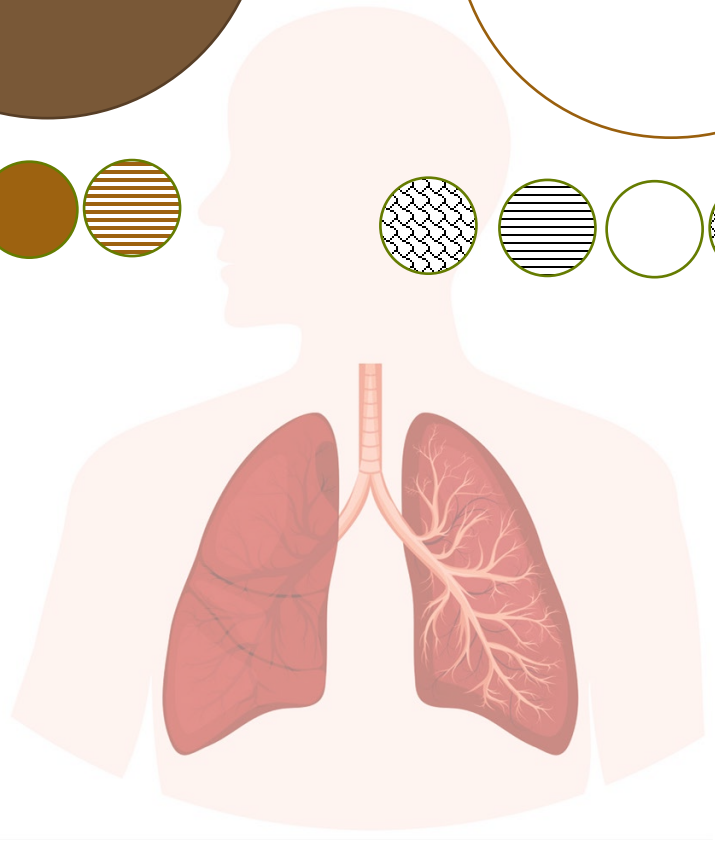
Example: lung cancer



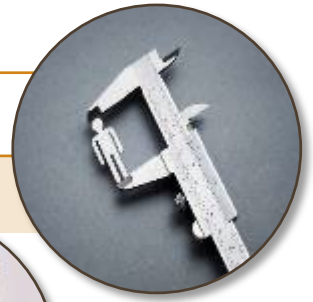






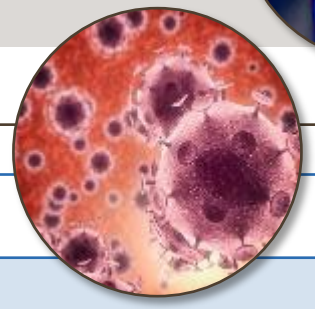


Examples of things that increase the risk of cancer



Modifiable personal risk factors

- Smoking
- Obesity
- Diet
- Alcohol



Personal risk factors that can't be changed

- Age
- Sex
- Genetics
- Immune suppression

Radiation

- Medical imaging
- Radon

Environmental carcinogens

- Aflatoxins
- Arsenic
- Asbestos
- Coal Tar and Coal-Tar Pitch
- Nickel Compounds
- PFAS
- Radon
- Trichloroethylene
- Vinyl Chloride
- Wood Dust

https://monographs.iarc.who.int/agents-classified-by-the-iarc/

Hospitals

Pathology labs

Physician offices

Oncology & radiation clinics

Death certificates

Veterans Administration

VA | U.S. Department of Veterans Affairs

Other states

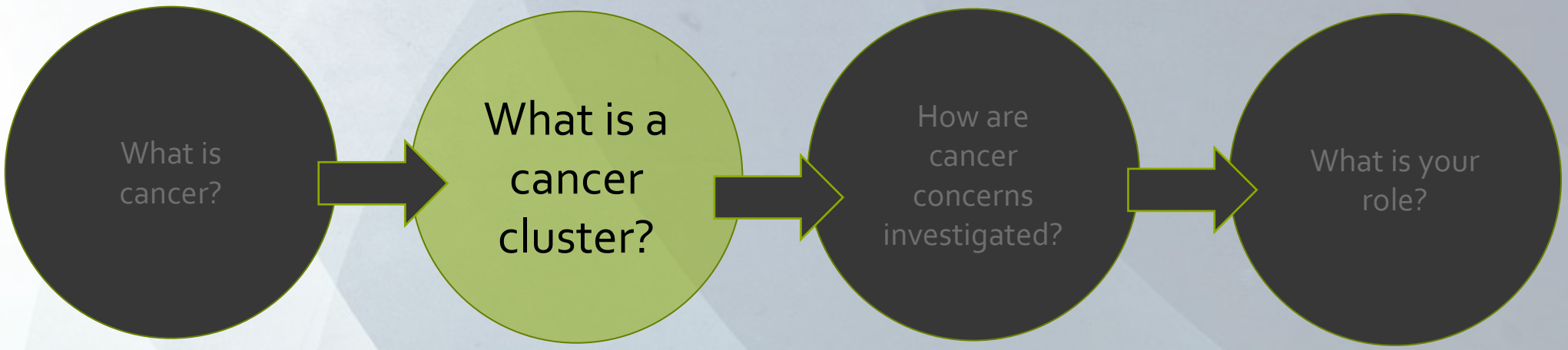
NH State Cancer Registry

NH DIVISION OF Public Health Services
Department of Health and Human Services

Information comes from medical records

Collects:	✓ Cancers in NH residents
	✓ Address at diagnosis
	✓ Usual/longest occupation/industry
Doesn't collect:	X Previous addresses
	X Cancers diagnosed after leaving NH
	X Risk factor information
	X Specific exposures to chemicals

What is a cancer cluster?



Definition of a Cancer Cluster

The occurrence of a greater than expected number of cases of a particular cancer –

- in a group of people

- in a geographic area

- in a period of time

How are community concerns about cancer identified?

Typically,

- People notice many friends, family, neighbors, or co-workers are diagnosed with cancer
- Healthcare providers think they are seeing more cancer
- People are concerned about an environmental issue in their neighborhood

"There's a lot of cancer in my town"

Incidence – number of new diagnoses each year

- Incidence increases when the population ages
- And when other cancer risk factors increase e.g., obesity, smoking,
- New screening programs can increase incidence temporarily
- Environmental carcinogen exposures

Prevalence – the number of people alive with cancer

- Prevalence increases when people with cancer live longer
  - Treatments improve
  - Screening programs identify more cancers early
- Prevalence also increases when incidence increases

Changes in these factors
confuse a cluster evaluat

That's why we focus on inc
(people newly diagnosed
prevalence (cancer surviv

What does the NH Division of Public Health Services do?

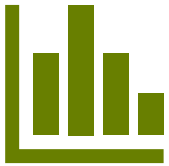
- Follow Centers for Disease Control & Prevention (CDC) protocol

Phase 1. Collect preliminary information about number and types of cancer, common exposures etc. Is further action needed?

Phase 2. Use NH Cancer Registry data to evaluate pattern

Phase 3. Determine feasibility of further study

Phase 4. Conduct epidemiologic study



Investigations often don't need to progress through all Phases

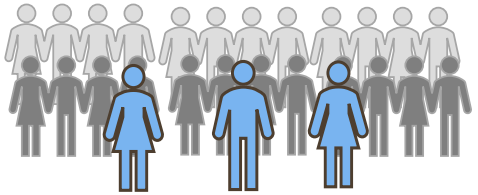
https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6208a1.htm

Phase 1. Important considerations:

Collect information to determine if the cluster is unusual, such as -

- A large number of cases of a similar type of cancer, rather than several different types

- Unusual distribution of cases in specific groups e.g., age, sex, e.g. male breast cancer

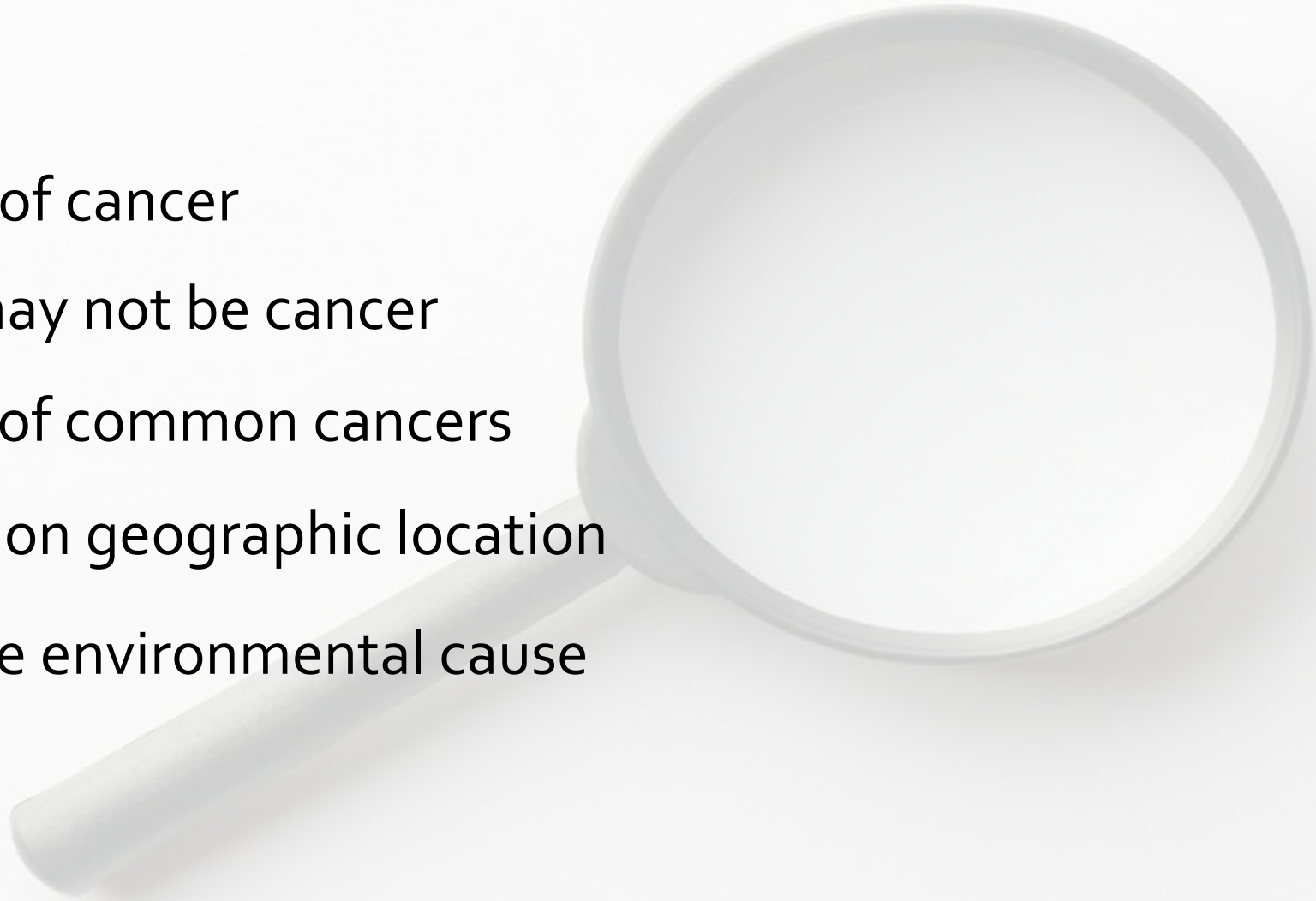


- Geographic clustering or common exposure to an environmental concern

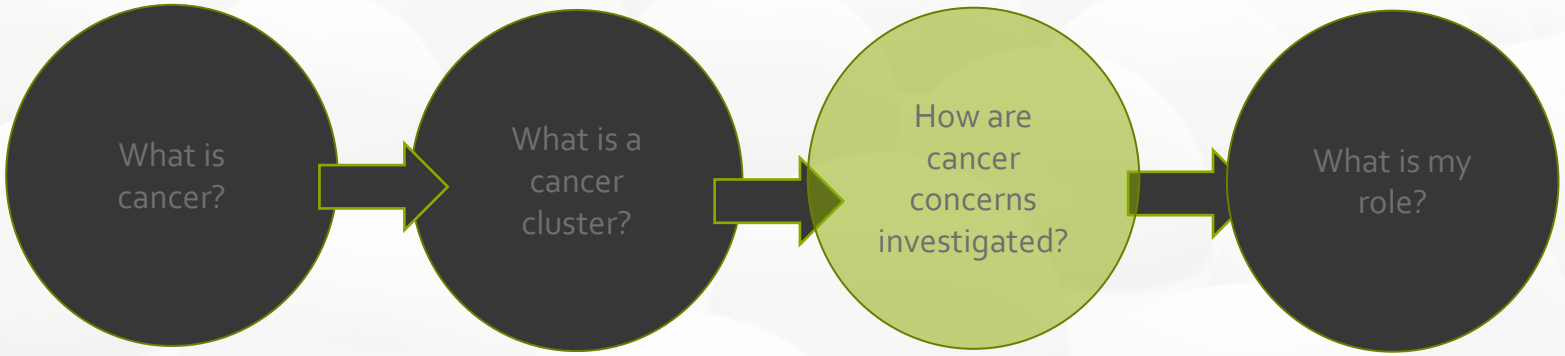
MMWR 2013, 62(RR08);1-14. Investigating Suspected Cancer Clusters and Responding to Community Concerns: Guidelines from CDC and the Council of State and Territorial Epidemiologists https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6208a1.htm?s_cid=rr6208a1_w

Many investigations do not proceed beyond Phase 1 – why?

- Different types of cancer
- Diseases that may not be cancer
- Small numbers of common cancers
- Lack of a common geographic location
- Lack of plausible environmental cause



Phase 2. How can we tell if there is an unusual pattern, or just random variation?



Often, things in nature (and elsewhere) are distributed randomly.

But this arrangement definitely doesn’t look like it happened by chance

Sometimes we see what appear to be patterns, but we’re not sure.

How do we tell if a pattern…

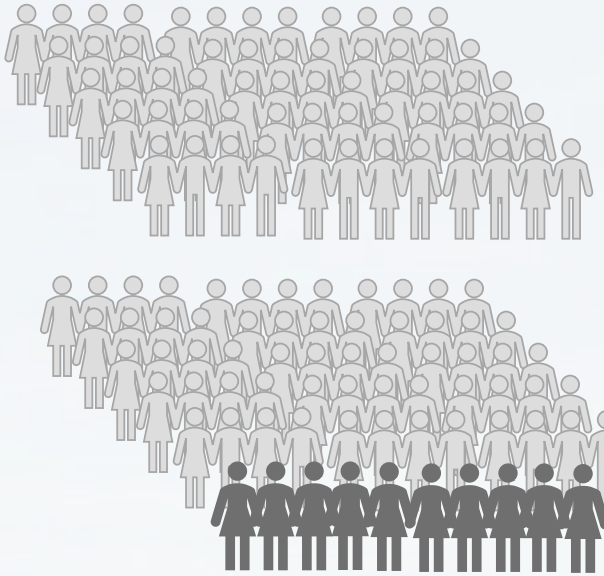
…is really a pattern?

…or just random chance?

Analysis

1. Verify the cancer cases for specific years using NH State Cancer Registry

2. How many cases did we expect to see in Town X (based on rates seen in the rest of NH, and taking age into account (e.g., N=50)



3. How many cases were observed in Town X (e.g., N=60)?

4. Calculate the Standardized Incidence Ratio (SIR) = observed/expected

   60/50 = 1.20 (If there's no excess, SIR = 1.00)

5. Calculate a 95% confidence interval to account for error in the estimate

SIR – key points

1

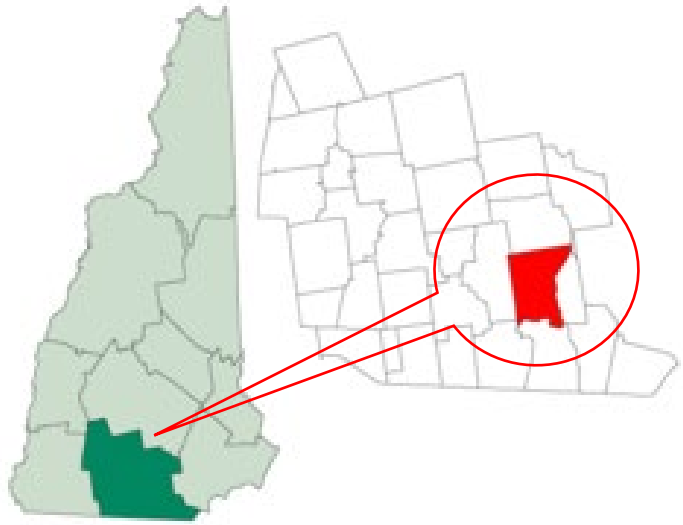
- A raised SIR (>1) in a town indicates excess risk (e.g., 1.20) compared to the rest of New Hampshire (or the chosen "control" population)

- SIR of 1.20 means the town as 20% more cancer than expected

For Example

Kidney Cancer in Merrimack 2009-18

SIR = 1.42 (95% confidence interval 1.10 – 1.81)



42% higher rate in Merrimack than the rest of New Hampshire

The confidence interval excludes 1.0 so we can be reasonably confident in our finding of an excess of kidney cancer

SIR – key points

A statistically significant elevated SIR

- Is a signal that the excess of cancer cases may need investigation
- Does not necessarily implicate a specific cause – we know that cancer is affected by many factors

Many investigations do not proceed beyond the SIR analysis of Phase 2 – why?

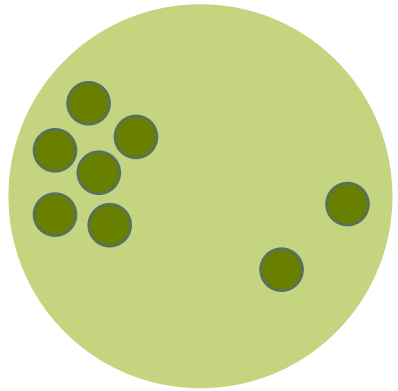
- Number and distribution of cancer cases is within expected range

  Examples:

  - Fewer cancers than expected (SIR <1.0)
  - Cancer numbers are the same as expected (SIR = 1.0)
  - There are more cancers than expected (SIR>1.0), but the confidence interval includes 1.0
    - E.g. SIR (95% confidence interval) = 1.1 (0.9 – 1.4)

What if the analysis shows an excess of cancers?

- This doesn't necessarily mean there's a single, external cause or hazard
- Or that the cause can be identified in a detailed study
- Scientists evaluate the feasibility of conducting a more detailed investigation e.g., a case control study, analysis of environmental or biological specimens
- Epidemiologic studies are expensive, resource intensive, and may not give clear answers



What can cause cancer?

Cancer is caused by many different factors, often in combination
Example: lung cancer

Investigating a cancer cluster: your role

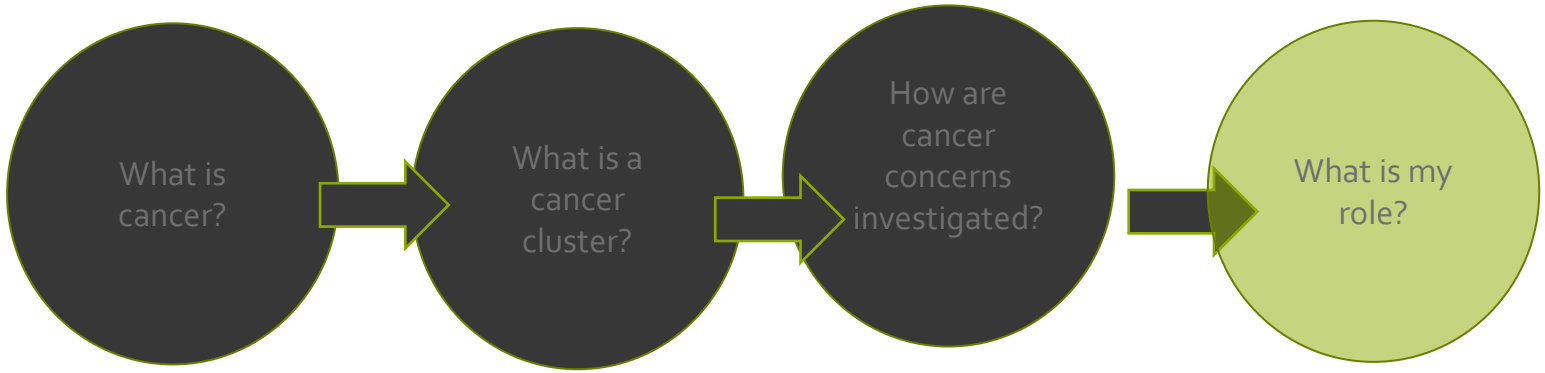
A community member calls you about an excess of cancer in their town. ***What do you do?***

Listen, empathize and take information

1. Take name and contact information for the person you are talking to
2. Record information about the cluster (do **not** take names of cancer patients)
   - How many cases?
   - What types of cancer do those people have?
   - What ages are the cancer patients?
   - Do they have anything in common?
3. Are there specific concerns about possible causes or environmental exposures?
4. Would they like you to report the information to the State Health Department or do they prefer to do so?

Contact New Hampshire Department of Health & Human Services

DHHSCCRT@dhhs.nh.gov



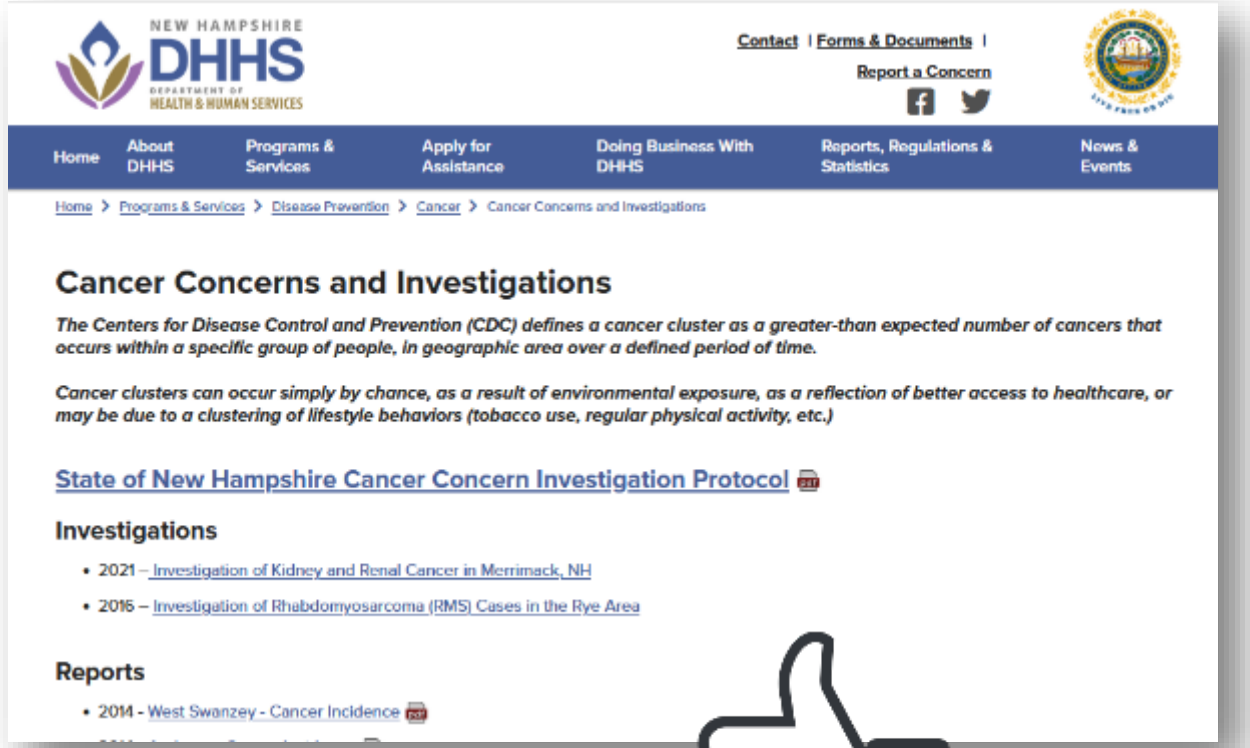
How to stay involved

NH DIVISION OF Public Health Services
Department of Health and Human Services

1. The most updated information on cancer concerns is listed on the NH DHHS website:

   https://www.dhhs.nh.gov/programs-services/disease-prevention/cancer/cancer-concerns-and-investigations

2. Provide your contact information to DHHSCCRT@dhhs.nh.gov and ask to:
   - Receive any updates on the investigation
   - Be included on invitations to any community meetings



3. Also be sure to subscribe to our social media channels:

https://www.facebook.com/NHPubHealth

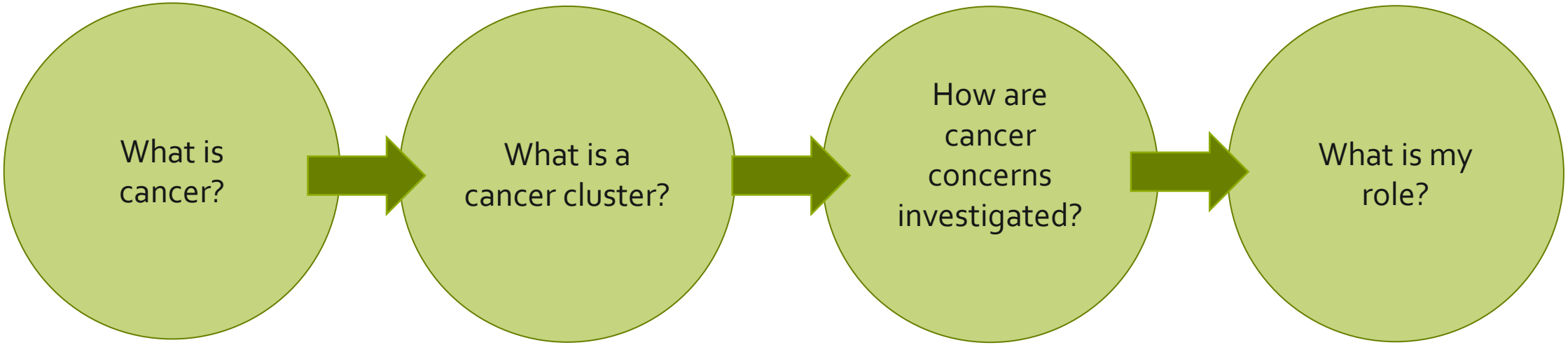
YouTube https://www.youtube.com/user/NHPublicHealth

Questions?

NH DIVISION OF Public Health Services
Department of Health and Human Services

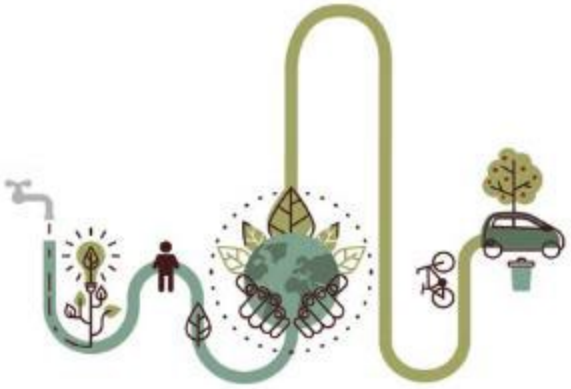
For questions about the Cancer Programs at NH DPHS, contact

DHHSCCRT@dhhs.nh.gov



APPLETREE

Agency for Toxic Substances and Disease Registry's **P**artnership to **P**romote **L**ocal **E**fforts **T**o **R**educe **E**nvironmental **E**xposures



Understanding Environmental Contamination and Risk

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NH DIVISION OF Public Health Services
Department of Health and Human Services

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Dartmouth Cancer Center

Dartmouth Health

Dartmouth GEISEL SCHOOL OF MEDICINE

What is contamination?

A substance that…

- does not belong
- is present at levels in the environment that might cause adverse health effects
- can be chemical, microbial or radiological

As landfill space dwindles in Massachusetts, New Hampshire has become the state's dumping ground

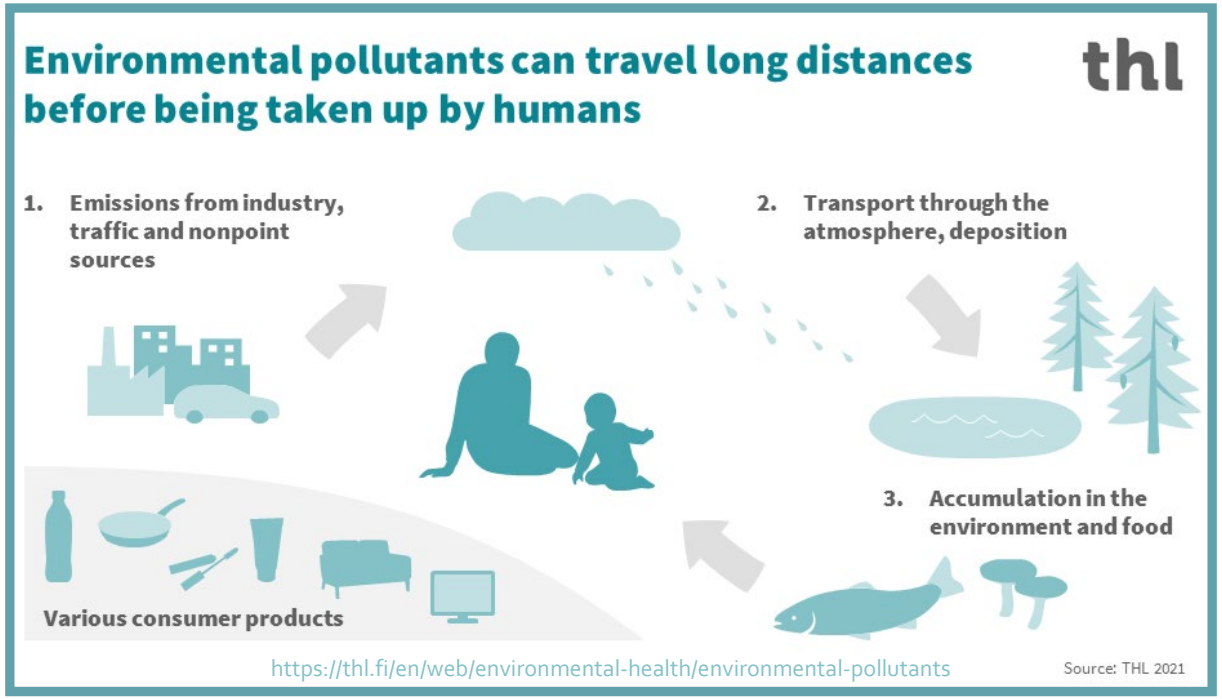
By David Abel Globe Staff, Updated July 19, 2021, 5:10 p.m.

Protesters against the proposed Granite State Landfill gathered outside of White Mountains Regional High School in Whitefield, N.H. JIM DAVIS/GLOBE STAFF

Contamination in your community may present a public health risk and/or be a source of significant public concern

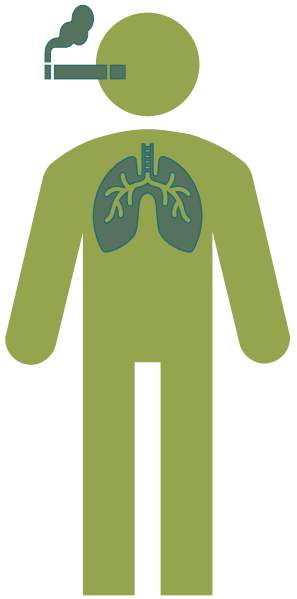
Contamination can occur naturally or as a result of human activity

What is Environmental Health?



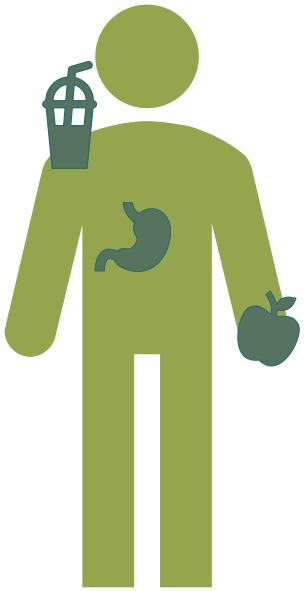
Environmental health refers to the relationship between the environment (natural or built or social environment) and the health of people and their communities. This includes the air we breathe, the water we drink and the land and soil on which we live and recreate.

Routes of Exposure



Inhalation

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



Ingestion

(food, water)

Dermal (skin/eye) Contact

(direct contact bathing/swimming/recreating)

Inhalation + Ingestion + Dermal Contact = Total Exposure

Environmental Contamination and Risk to Health

High

Medium

Low

High Risk

- Higher levels of exposure or exposure to vulnerable populations (e.g., pregnant women, children) can lead to adverse health effects.
- When too much contamination is present, there is **risk to public health.**

Low Risk

- **Healthy** people can often tolerate low levels of exposure to contamination without health consequences

Risk Definition:

"(Exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility"

- Oxford English Dictionary

The degree to which contamination leads to poorer health is influenced by:

- Contaminant type
- Individual sensitivity
- Type of health effect

Naturally-Occurring Contamination

Naturally occurring contamination comes from **substances found in the environment** that are **not human made.**

Examples you might hear about from residents:

- Arsenic in private wells
- Radon in homes
- Air pollution from wildfire smoke
- Harmful algae blooms

Wildfires

Algae Blooms

Human-made Contamination

Contamination generated by human activity that is not naturally occurring

Characteristics:

- Caused by improper handling of chemicals or waste
- May be unidentified in some situations
- High perception of risk

Causes of Contamination:

- Former spills sites
- Industrial operations
- Mismanaged landfills
- Gas stations
- Superfund sites

Check-In: Human-made vs. Natural Contamination

Examples of Risk Identification and Reduction

Potential Questions	Purpose / Health Risk	Risk Reduction Steps
Has your home been tested for radon?	Radon is a leading cause of lung cancer and is prevalent in New Hampshire	Test for radon, install mitigation system if found
Does your home water come from a well?	Well water should be tested regularly for contaminants, such as arsenic	Test water, filter water, run tap for 60 seconds to flush out sitting water
Has your home been tested for lead?	Exposure to lead can cause neurological and brain damage	Test home for lead, prevent lead paint from chipping

Risk Communication

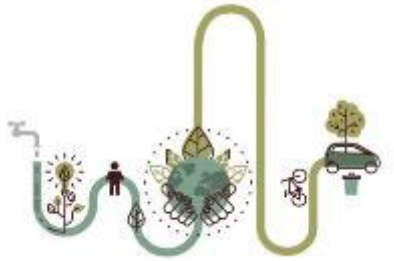
Why do we need it?

Risk communication is a critical tool that regulators and public health agencies use to help communities make decisions to reduce their exposure to harmful chemicals or situations that could harm people.

Effective Risk Communication

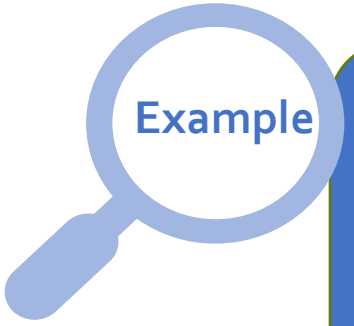
to Communicate Risk effectively you need to understand communities' perception of risk

Summary of Relevant Risk Perception Factors



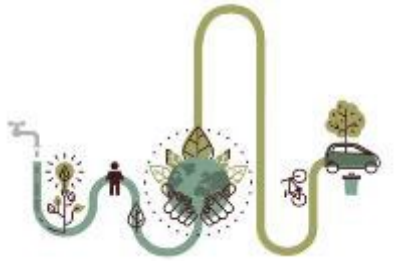
Underestimate Risk	Overestimate Risk
Natural contamination	**Human made contamination**
Non dreaded diseases (e.g., heart disease)	Dreaded diseases (e.g., cancer)
Known	Unknown
Controllable by the individual	Out of individual control
Widely occurring contaminants	Rare contaminants
Little media attention	Large presence in media

Adapted from https://nepis.epa.gov/Exe/ZyPDF.cgi/60000IOS.PDF?Dockey=60000IOS.PDF



Arsenic is a known to cause cancer and has a high potential risk. BUT, since it is naturally occurring, can't be detected (seen, tasted or smelled), does not immediately make you sick, and is controllable by the individual (in their well water)… it has a low perceived risk.

Steps for Productive Risk Communication



Listen Actively

Repeat and reshare the community stories

Ask clarifying questions in order to make the right personal connections

Recommend simple, achievable steps to give communities tools to reduce exposure

Develop three key messages:

Explain what is known and unknown

Share contacts, resources, and next steps for community

"Who can I contact with questions?

Robert Thistle, Ph.D.
Principal Investigator
NHDES Environmental Health Program
Robert.Thistle@des.nh.gov

Questions?