

# Radon and Lung Cancer

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**CAREX**  
CANADA



National Collaborating Centre  
for Environmental Health

Centre de collaboration nationale  
en santé environnementale

**SFU**

# CAREX Canada – a brief overview

**CAREX**  
↑      ↑  
**CARCINOGEN**      **EXPOSURE**



Originally funded as a pilot project by WorkSafe BC in 2003

Fully funded by CPAC in 2008 (renewed 2012)

Multidisciplinary team - based at: SFU, UBC, UVIC

Expertise in: epidemiology, occupational hygiene, geographic information systems (GIS) and knowledge transfer & exchange.

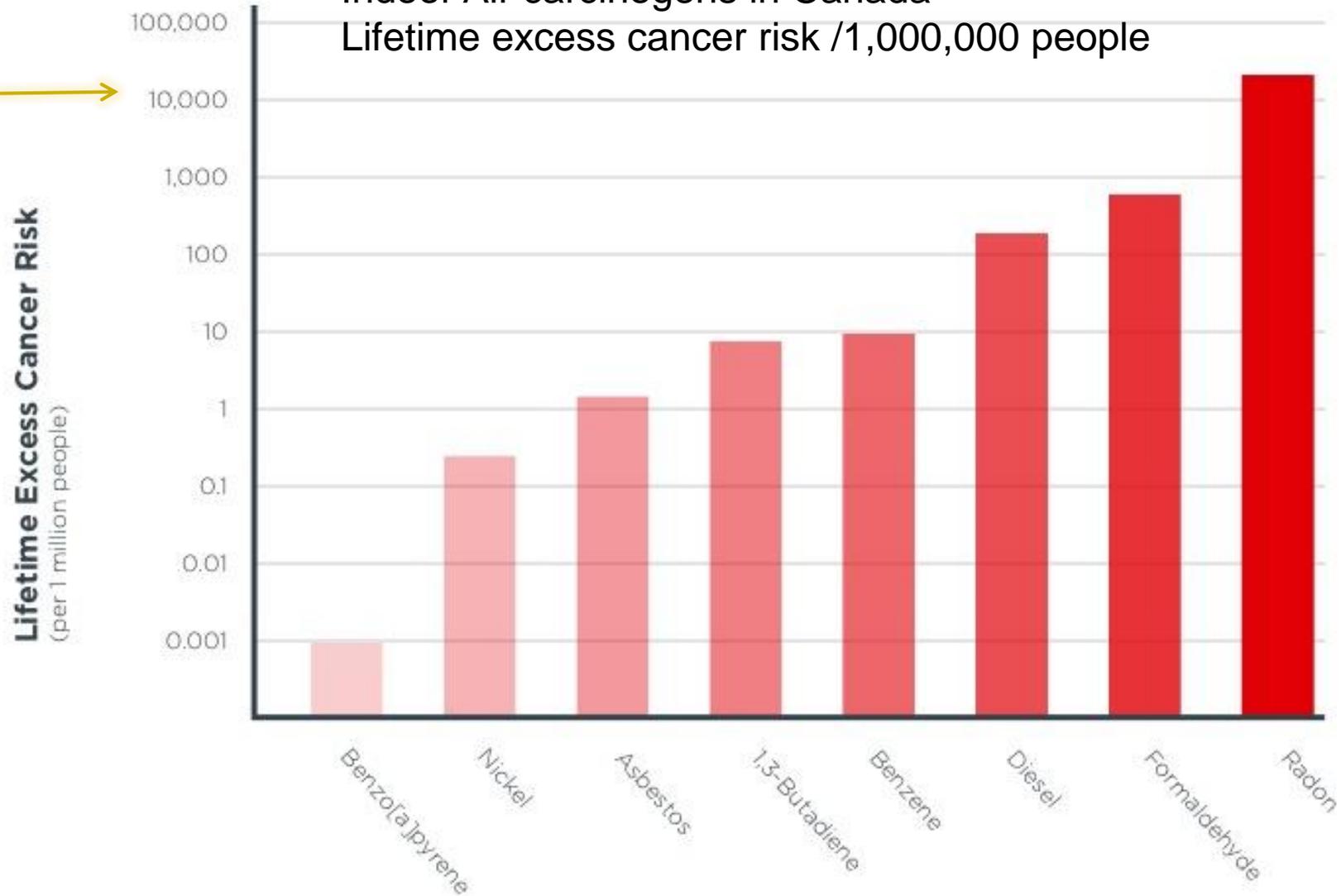
# CAREX Canada- Objectives

- ⦿ Determine which carcinogens are priorities for policy and prevention work in Canada
  - Environmental- community exposures
  - Occupational- workplace exposure
- ⦿ Environmental results: **Radon Gas**
  - most significant cancer causing exposure
- ⦿ Knowledge translation
  - Help establish networks of stakeholders across the country to reduce radon exposure



# Indoor Air carcinogens in Canada

Lifetime excess cancer risk /1,000,000 people



CAREX Canada risk estimates for indoor air carcinogens show that radon gas is the highest priority exposure in Canadian settings.

# Radon gas and cancer

“Exposure to Radon gas is one of the most important causes of lung cancer world-wide”



**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans**  
Radon and its decay products are *carcinogenic to humans (Group 1)*.

In 2010, ICRP concluded that radon presents a greater risk than has been previously calculated in 1993

**ICRP**

INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

# Canadian Cancer Statistics 2015

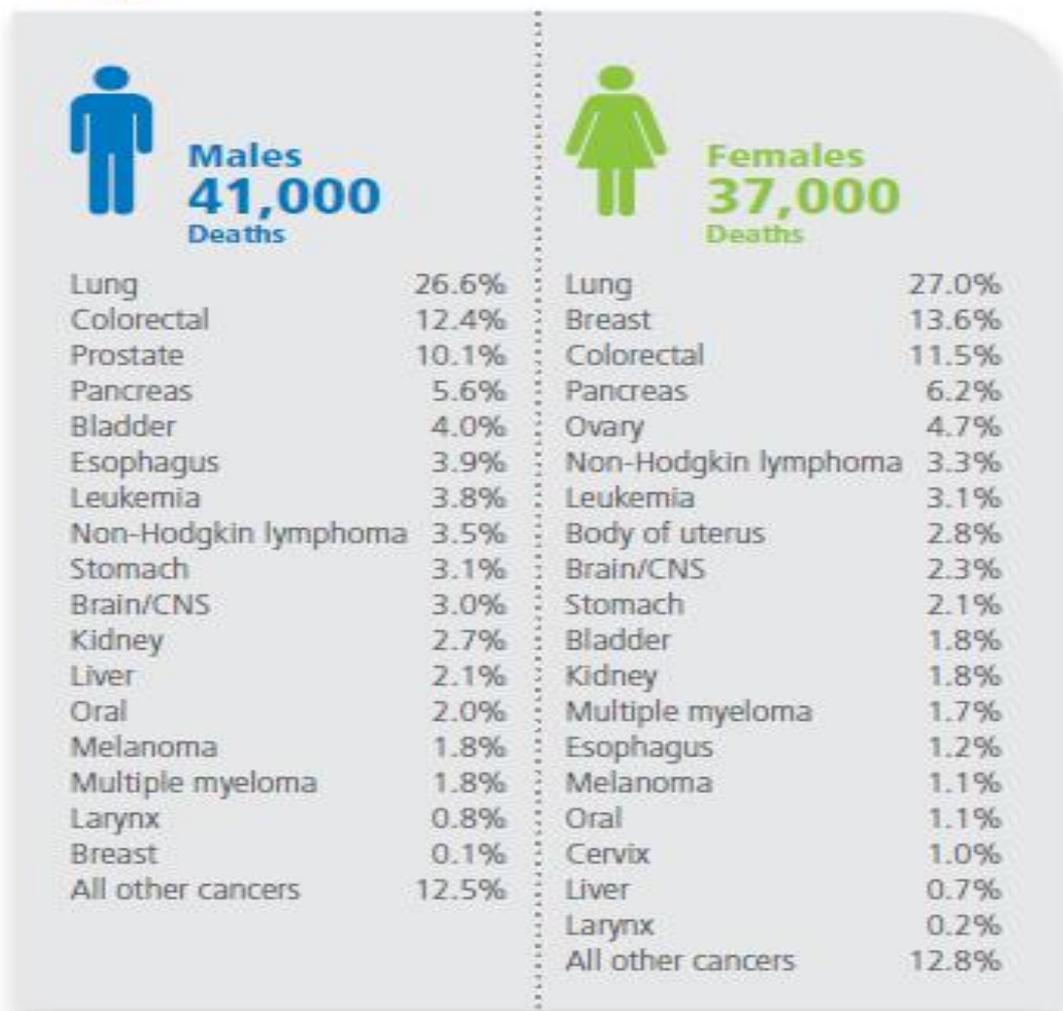
**FIGURE 3.1** Lifetime probability of dying from cancer, Canada, 2010



**Analysis by:** Surveillance and Epidemiology Division, CCDP, Public Health Agency of Canada

**Data source:** Canadian Vital Statistics Death database at Statistics Canada

**FIGURE 3.2** Percent distribution of estimated cancer deaths, by sex, Canada, 2015



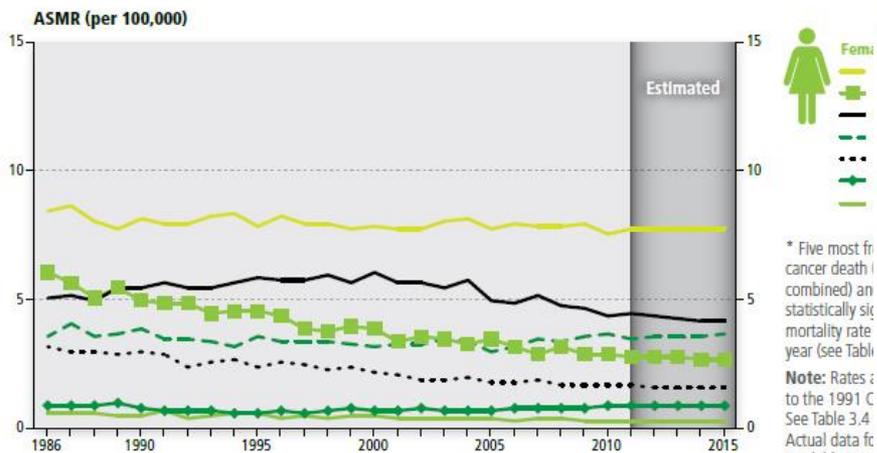
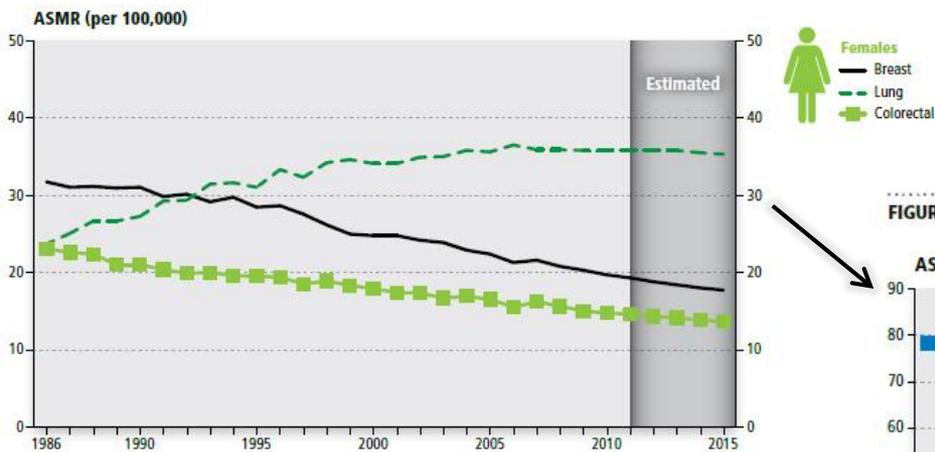
CNS=central nervous system

**Note:** The complete definition of the specific cancers listed here can be found in Table A10.

**Analysis by:** Surveillance and Epidemiology Division, CCDP, Public Health Agency of Canada

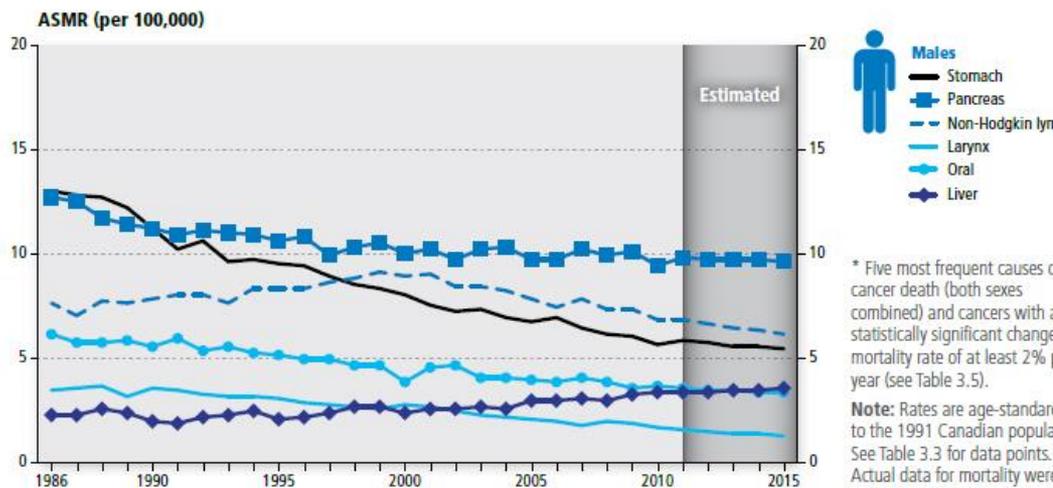
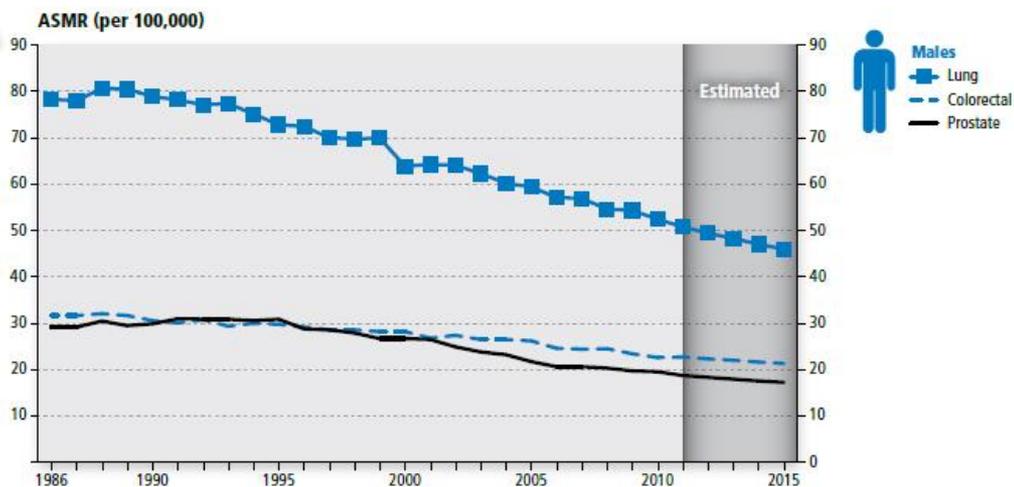
**Data source:** Canadian Vital Statistics Death database at Statistics Canada

**FIGURE 3.5** Age-standardized mortality rates (ASMR) for selected\* cancers, females, Canada, 1986–2015



**Analysis by:** Surveillance and Epidemiology Division, CCDP, Public Health Agency of Canada  
**Data source:** Canadian Vital Statistics Death database at Statistics Canada

**FIGURE 3.4** Age-standardized mortality rates (ASMR) for selected\* cancers, males, Canada, 1986–2015



**Analysis by:** Surveillance and Epidemiology Division, CCDP, Public Health Agency of Canada  
**Data source:** Canadian Vital Statistics Death database at Statistics Canada

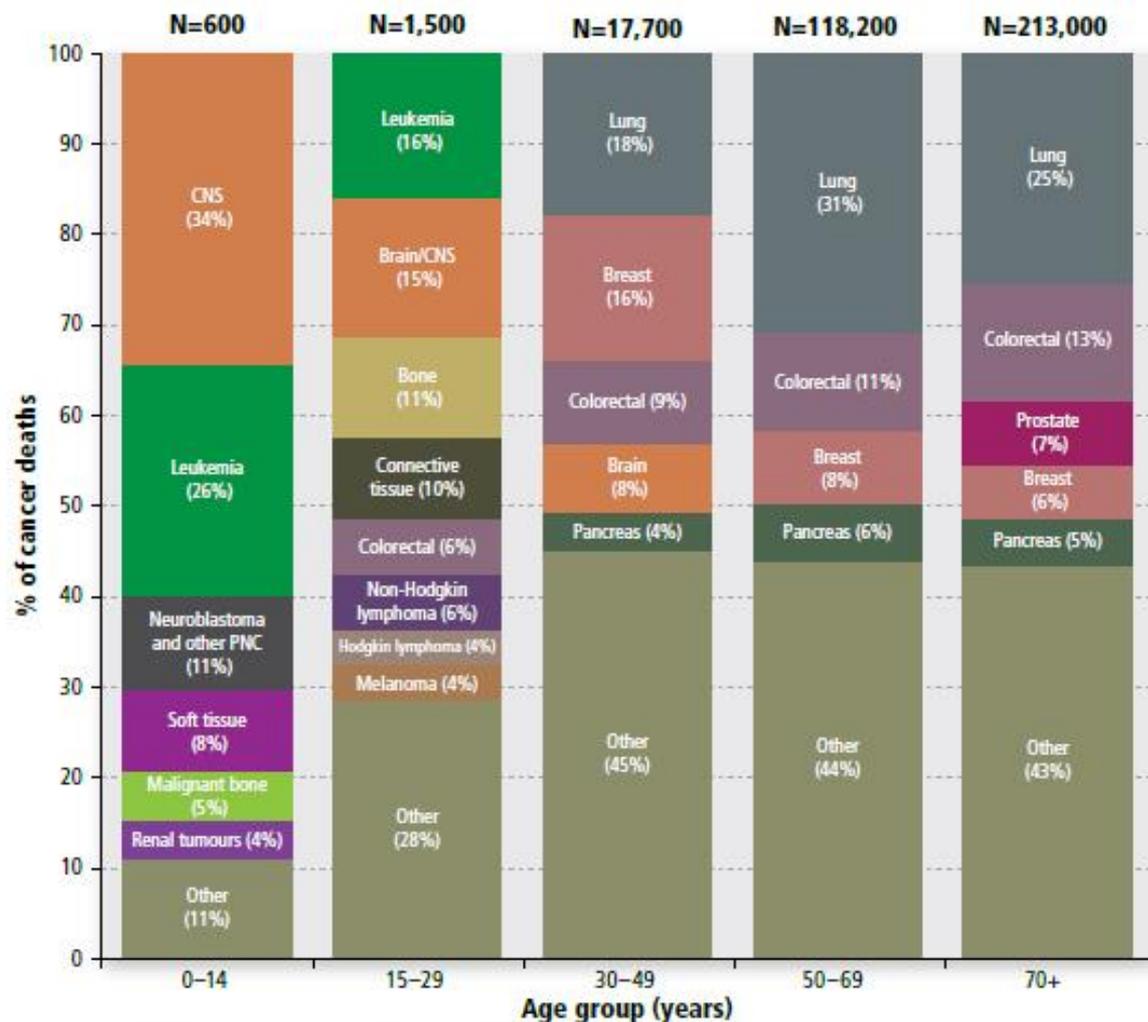
\* Five most frequent causes of cancer death (combined) and cancers with a statistically significant change in mortality rate year (see Table 3.4)

**Note:** Rates are age-standardized to the 1991 Canadian population. Actual data for mortality were available to 2010. The range of scales differs widely between figures. The complete definition of the specific cancers listed here can be found in Table 3.3

\* Five most frequent causes of cancer death (both sexes combined) and cancers with a statistically significant change in mortality rate of at least 2% per year (see Table 3.5).

**Note:** Rates are age-standardized to the 1991 Canadian population. Actual data for mortality were available to 2010. The range of scales differs widely between figures. The complete definition of the specific cancers listed here can be found in Table 3.3

**FIGURE 4.2** Distribution of cancer deaths for selected cancers by age group, Canada, 2006–2010



N is the total number of deaths over 5 years (2006–2010) for each age group; CNS=Central nervous system; PNC=Peripheral nervous cell tumours.

**Note:** Childhood cancers (ages 0–14) are classified according to ICC3-3.<sup>(6)</sup> and the data are shown for 2005–2009. The complete definition of the specific cancers listed here can be found in Table A10.

**Analysts by:** Surveillance and Epidemiology Division, CCDP, Public Health Agency of Canada

**Data source:** Canadian Vital Statistics Death database at Statistics Canada

What to do?

Strategies for reducing risks

# Education and priority setting

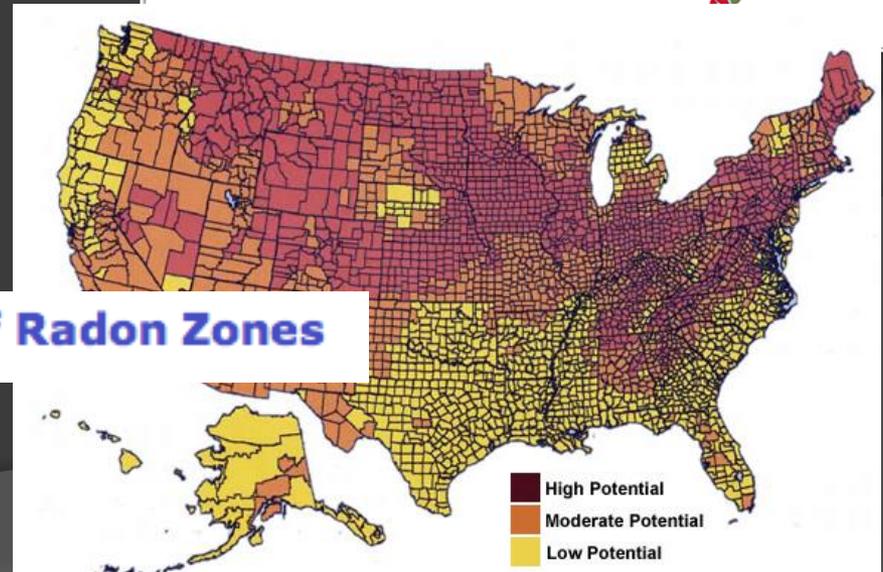
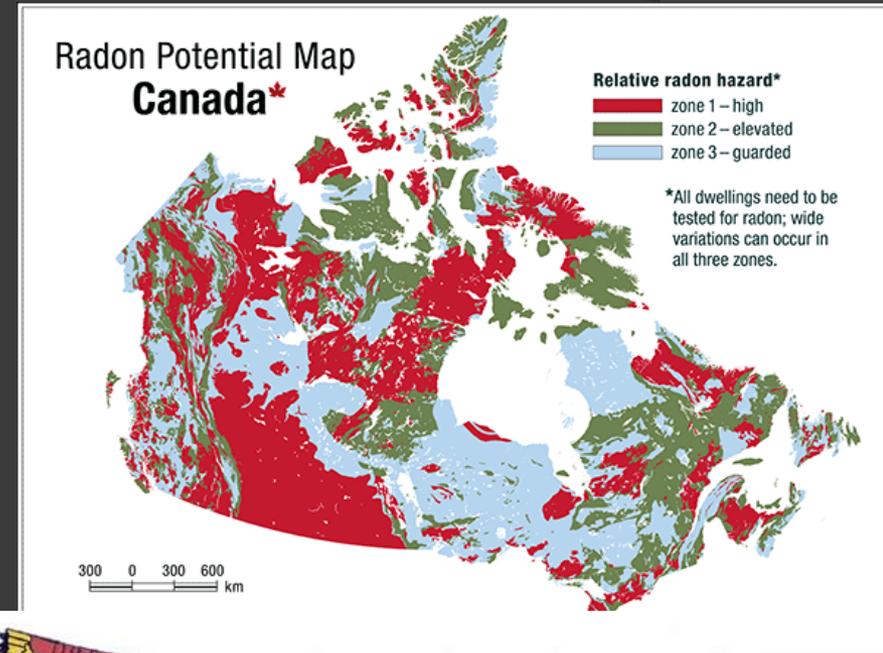
## Radon exists across the country

Current Canadian strategies require *awareness of radon fo all stakeholders:*

- Public Health
- Provincial Governments
- Health Researchers
- Local government
- Housing professionals
- The public

Building Codes, testing programs and remediation require:

- training
- education
- expertise



# Major problem- Radon? hmmm



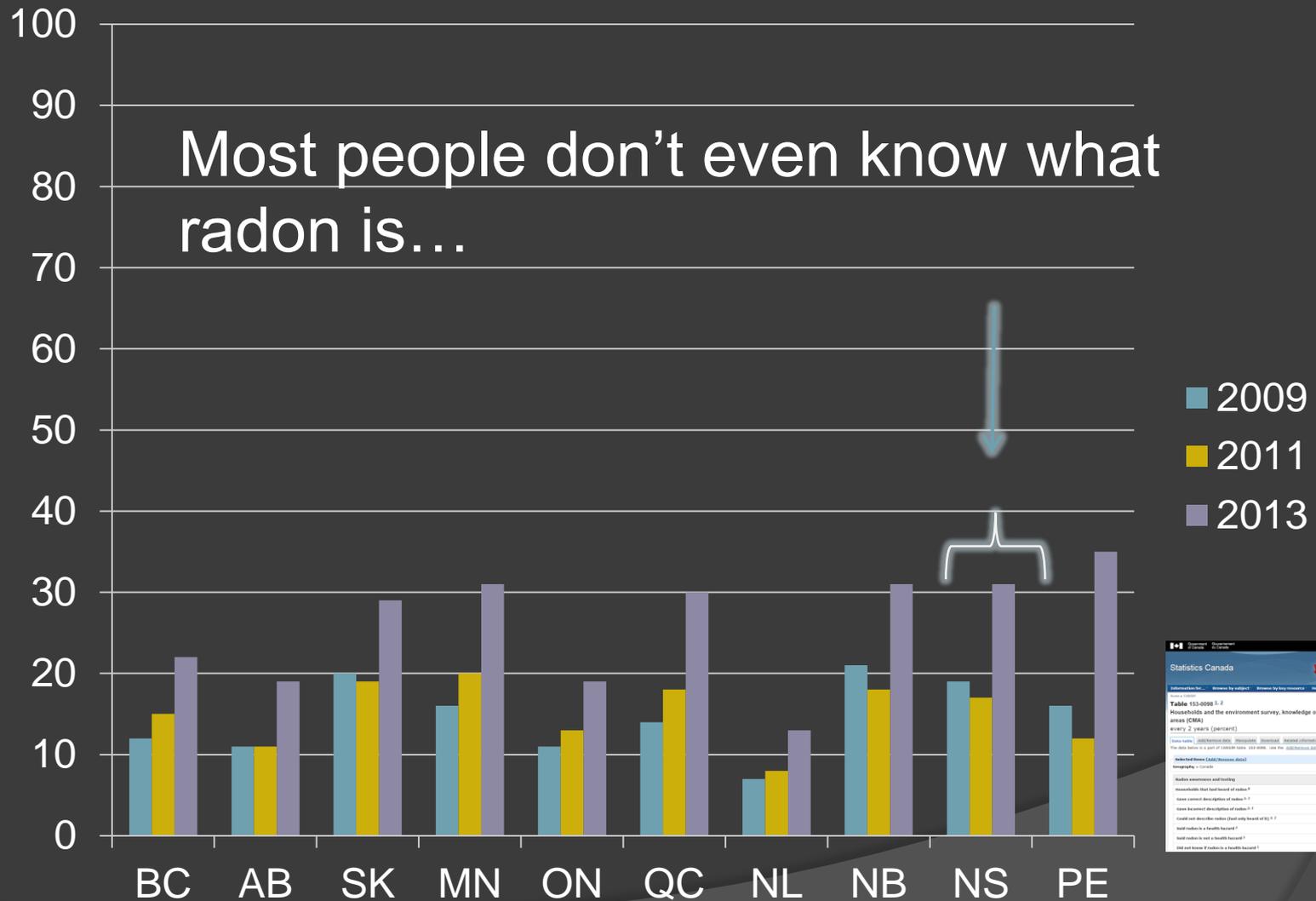
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# Statistics Canada: Households able to correctly describe radon gas (%)

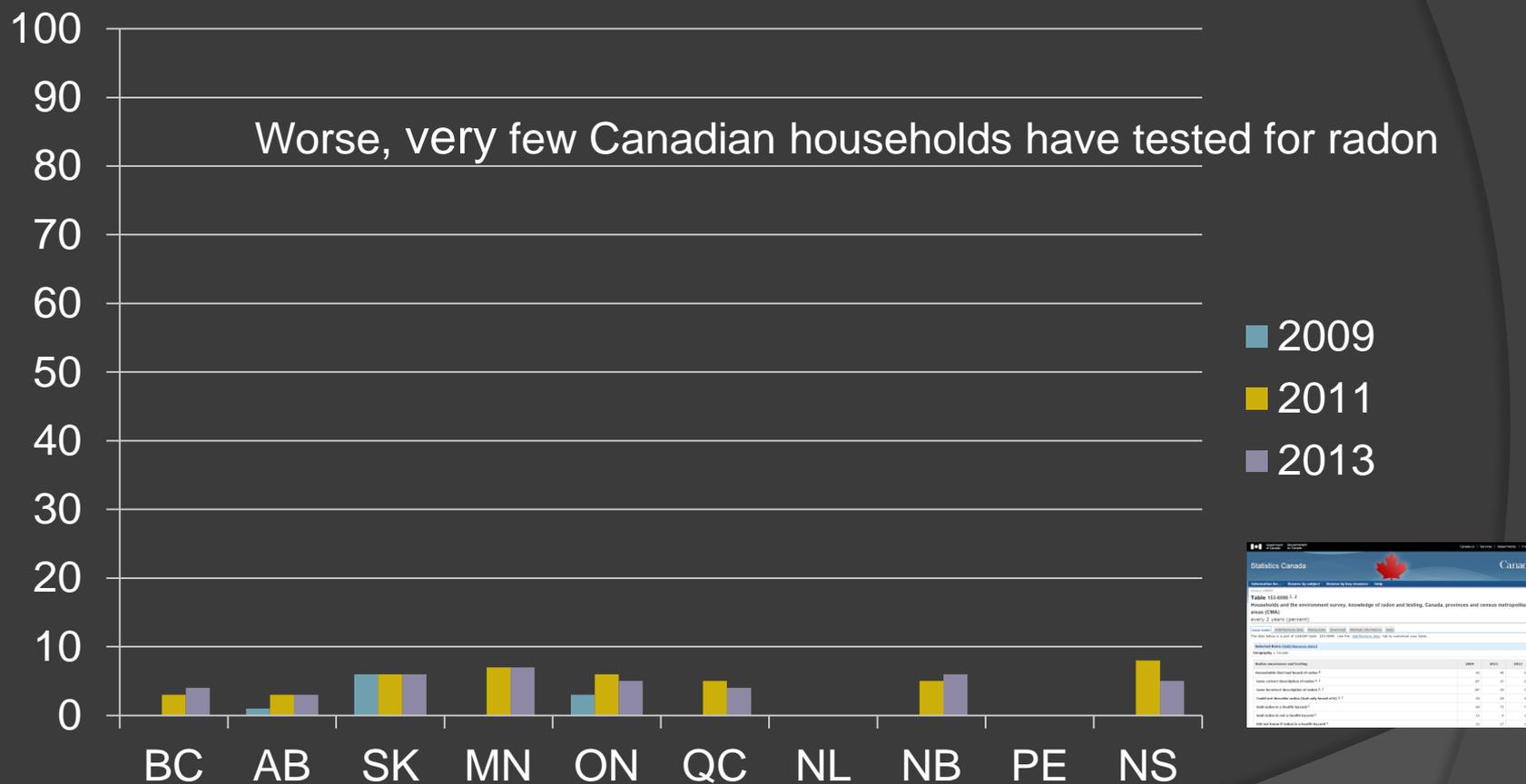


Statistics Canada

Table 13-0099 1-3  
Households and the environment survey, knowledge of radon and testing, Canada, provinces and census metropolitan areas (CMA) every 2 years (percent)

Knowledge question and testing	2009	2011	2013
Households that had heard of radon?	63	69	80
Have correct description of radon? *	27	37	50
Have incorrect description of radon? *	64	54	41
Know radon can describe the radon (that only heard of it) *	24	24	30
Had radon in a health house? *	16	13	16
Had radon in a health house? *	11	7	10
Had radon in a health house? *	25	27	33

# Households\* (%) that have tested for radon gas†



\*As a percentage of all households that did not live in an apartment and had heard of radon

† Survey notes to use data with caution, z

# Why aren't people testing?

- ⦿ Lack of regulatory requirements means change left to the realm of personal action
  - People need to be aware and be **motivated**
    - **Denial, invisible nature of gas all disincentives**
    - Few studies have found strategies that increase testing
- ⦿ Test kits still aren't readily available in all parts of the country
- ⦿ People fear the downstream costs of remediation

# Reducing lung cancer risk from radon gas

## ◎ More leadership:

- Legitimate the risk posed by radon- more than just one agency
  - Multiple levels of government and public health
  - Building trades, researchers, real estate
  - Building radon out to save future lives

## ◎ Provide financial incentives and support

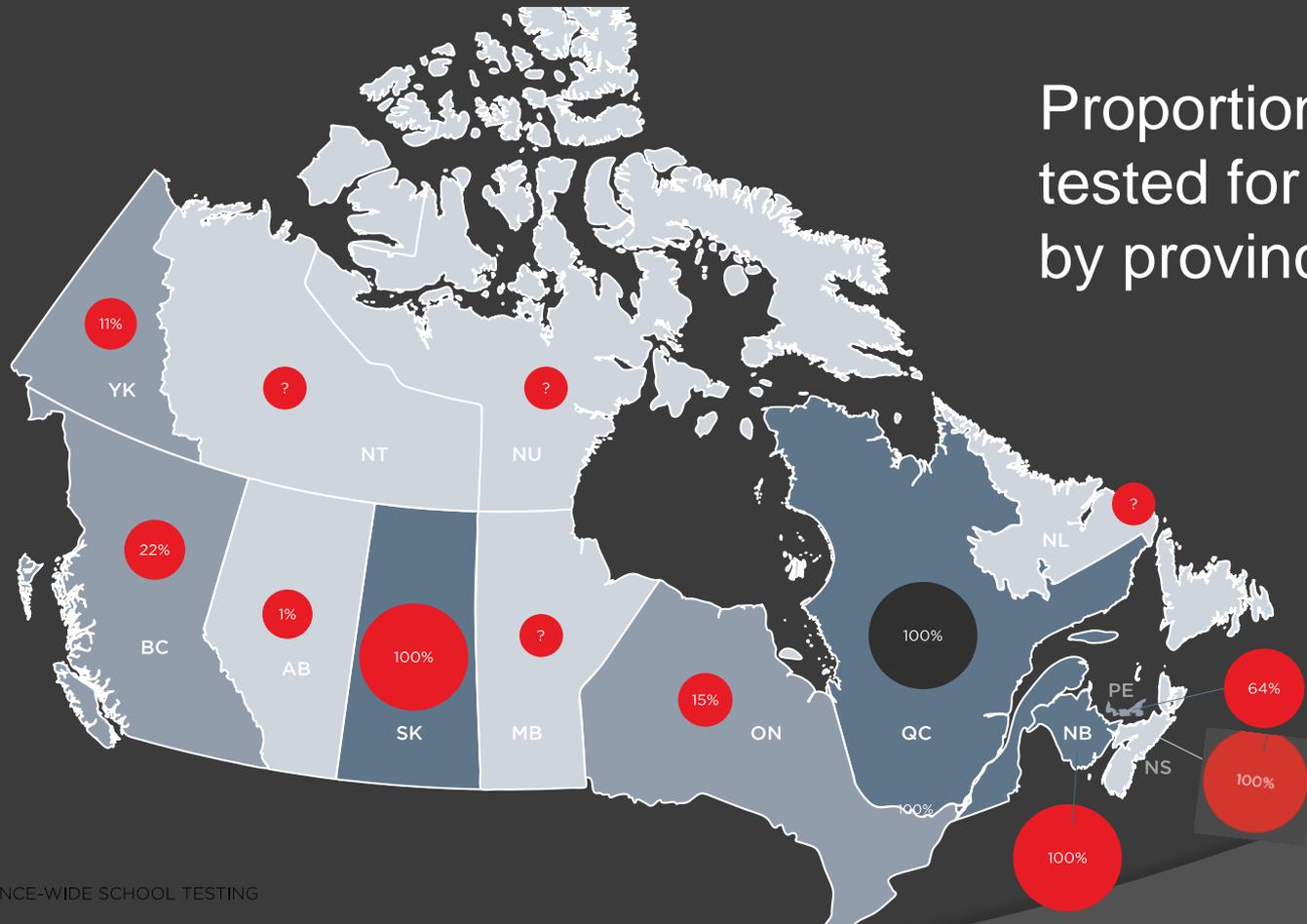
- Many options from other countries and some provinces
  - Tax credits, renovation incentives, etc.

## ◎ Workplace exposure can also be significant

- More testing and remediation requirements for workplaces

# CAREX radon focus: early life exposures

Proportion of schools tested for radon, by province



PROVINCE-WIDE SCHOOL TESTING



THANK YOU  
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