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Public Health Ethics: A Case in Environmental Health

Webinar | November 29, 2016

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Presented by:



Centre de collaboration nationale
sur les politiques publiques et la santé

National Collaborating Centre
for Healthy Public Policy

*Institut national
de santé publique*
Québec 



National Collaborating Centre
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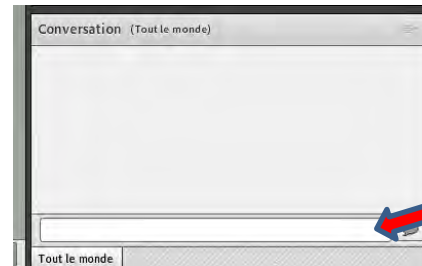
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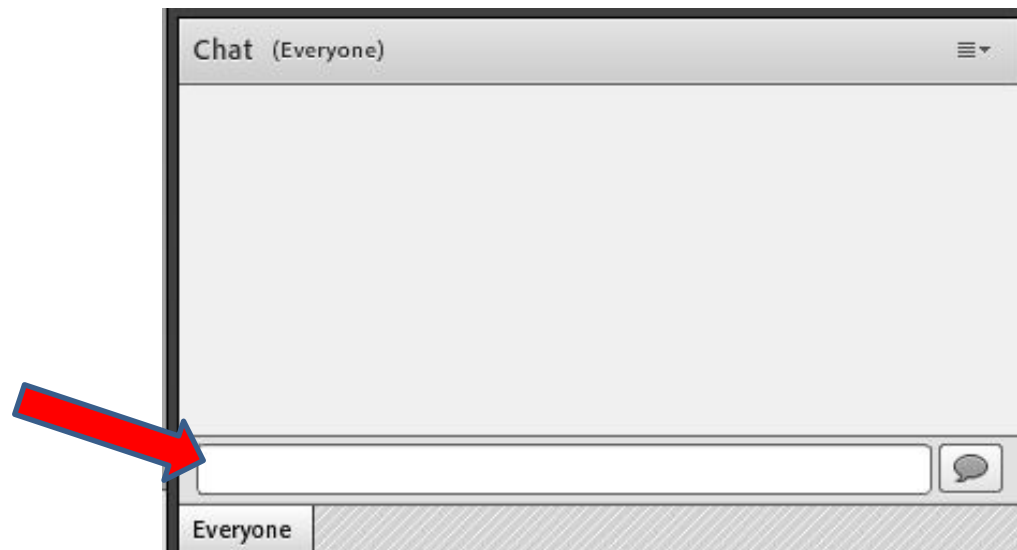
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Please note that we are recording this webinar, including the chat, and we will be posting this on the NCHPP's website.

Your presenters today



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Declaration of real or potential conflicts of interest

Presenters:

Anne-Marie Nicol, Olivier Bellefleur and
Michael Keeling



I have no real or potential conflict of interest
related to the material that is being
presented today.

The National Collaborating Centres for Public Health




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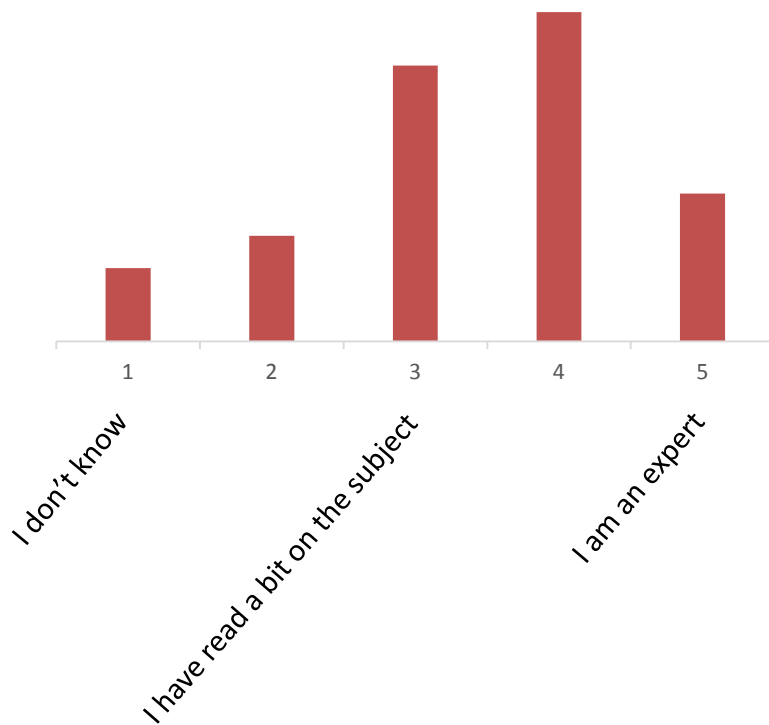
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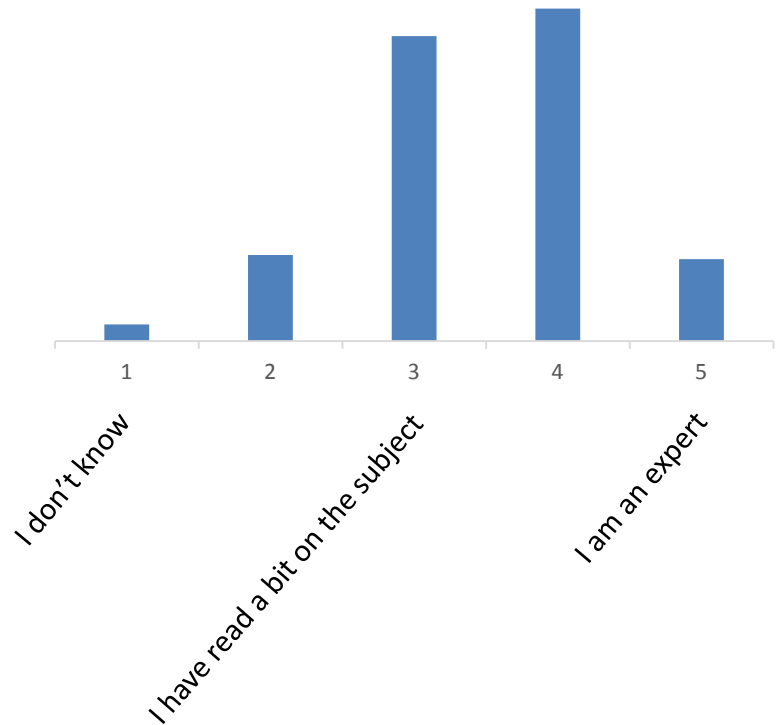
What you said...

- The results from our questionnaire, in brief:

Radon



Ethics

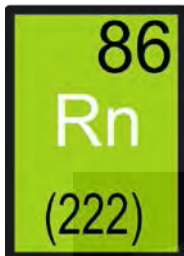


Our goals today:

- Present the main characteristics of radon, the risks it poses to health, methods of remediation and the regulatory structures that are in place,
- Suggest and then try out an approach to identifying ethical issues in public health,
- Provide you with additional resources on radon and on public health ethics.

Let's start with a problem...

The problem:



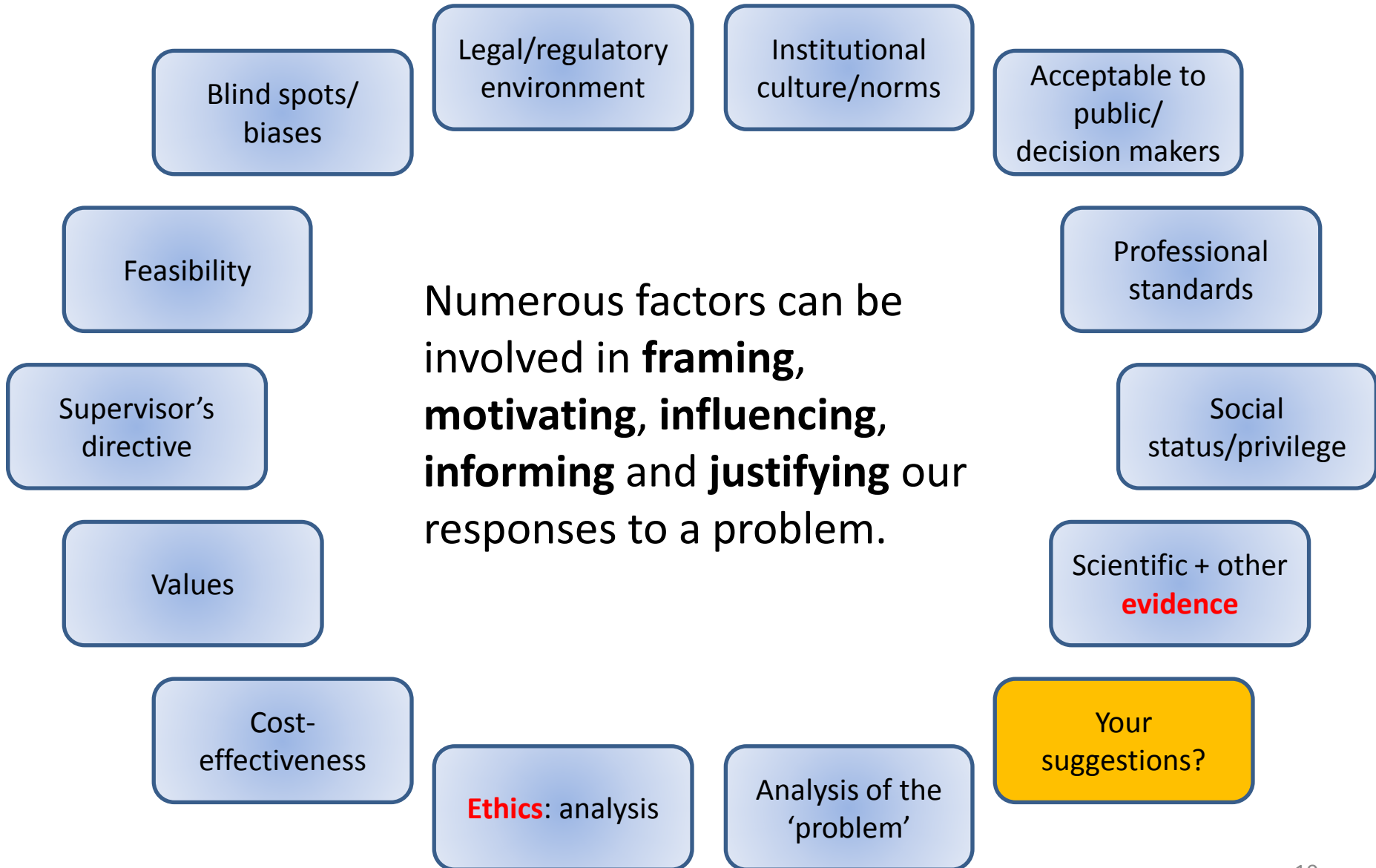
Radon is Canada's second leading cause of lung cancer, after smoking, and the leading cause among non-smokers. Despite this, the general public knows very little about radon, the risks it poses to health and protective measures that can be taken.

Drawing from measures recently taken by the Government of Québec, imagine that your provincial government has sent a letter to all daycare owners and managers to inform them about the problem of radon and to ask them to undertake radon testing in their facilities. A follow up six months later reveals that very few daycares have done the testing.

'Radon' <http://commons.wikimedia.org/wiki/File%3ARadon.svg>
Photo credit: SA 2.5. Licence :
<http://creativecommons.org/licenses/by-sa/2.5>

'Radon Kit.' Photo credit: National Cancer Institute. Public domain:
<https://visualsonline.cancer.gov/details.cfm?imageid=2344>

What to *do*? How to *decide*?



These are just a few among many. All of these are important and call for critical attention.

...here is one response¹



Your public health unit has been asked to comment on a proposed law that, as a condition for obtaining or renewing operating licences, would require daycares to:

- Perform **radon tests**,
- **Post the results** such that they are visible from the exterior of the building, and
- Undertake, if necessary, **remedial work** within the time limits outlined by Health Canada.

The law would use a pictorial system of traffic lights to inform parents, workers and the public about the problem of radon. The green light indicates a site's tested levels were within the acceptable limit of 200 Bq/m³ established by Health Canada. The yellow light indicates a result between 200 and 600 Bq/m³ and the red light indicates levels exceeding 600 Bq/m³.

Several daycare owners and operators have approached you to express their concerns, such as the fact that the law could cause them to lose clients. They also fear having to eventually close their businesses, which could have major impacts for children and families, especially in lower-income neighbourhoods.

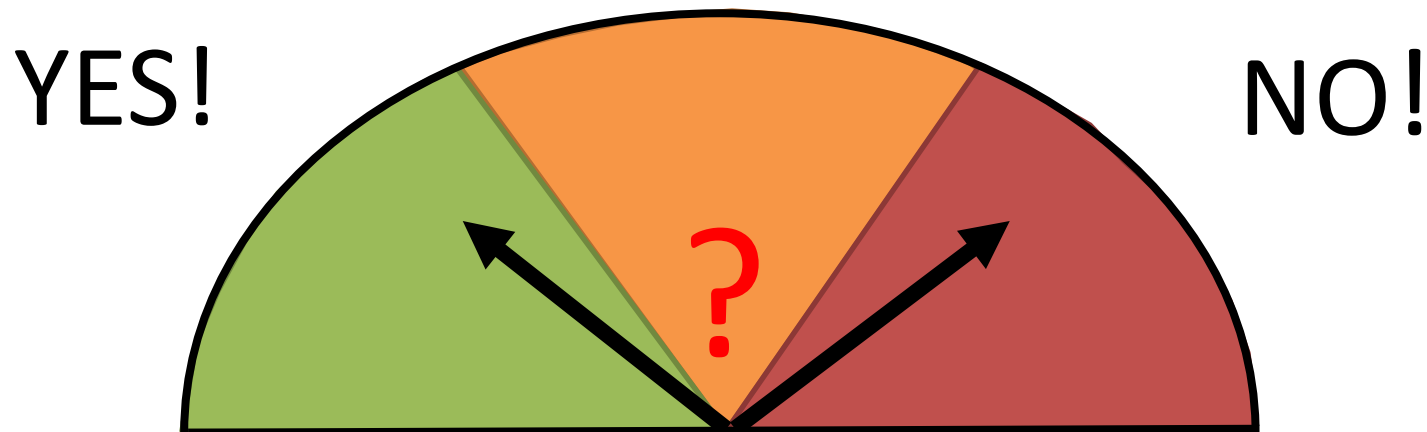
'Orange Traffic Light'
<https://www.flickr.com/photos/marioraffin/61391507/>

Photo credit: M. Raffin. Licence:
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¹Inspired by a law in the state of Illinois: http://www.idph.state.il.us/envhealth/factsheets/radon_daycare.htm

At first glance, should your public health unit support the proposed law?

Hmmm.
Maybe?



Radon 101

Radon is the second leading cause of lung cancer worldwide after smoking

-Leading cause in non-smokers

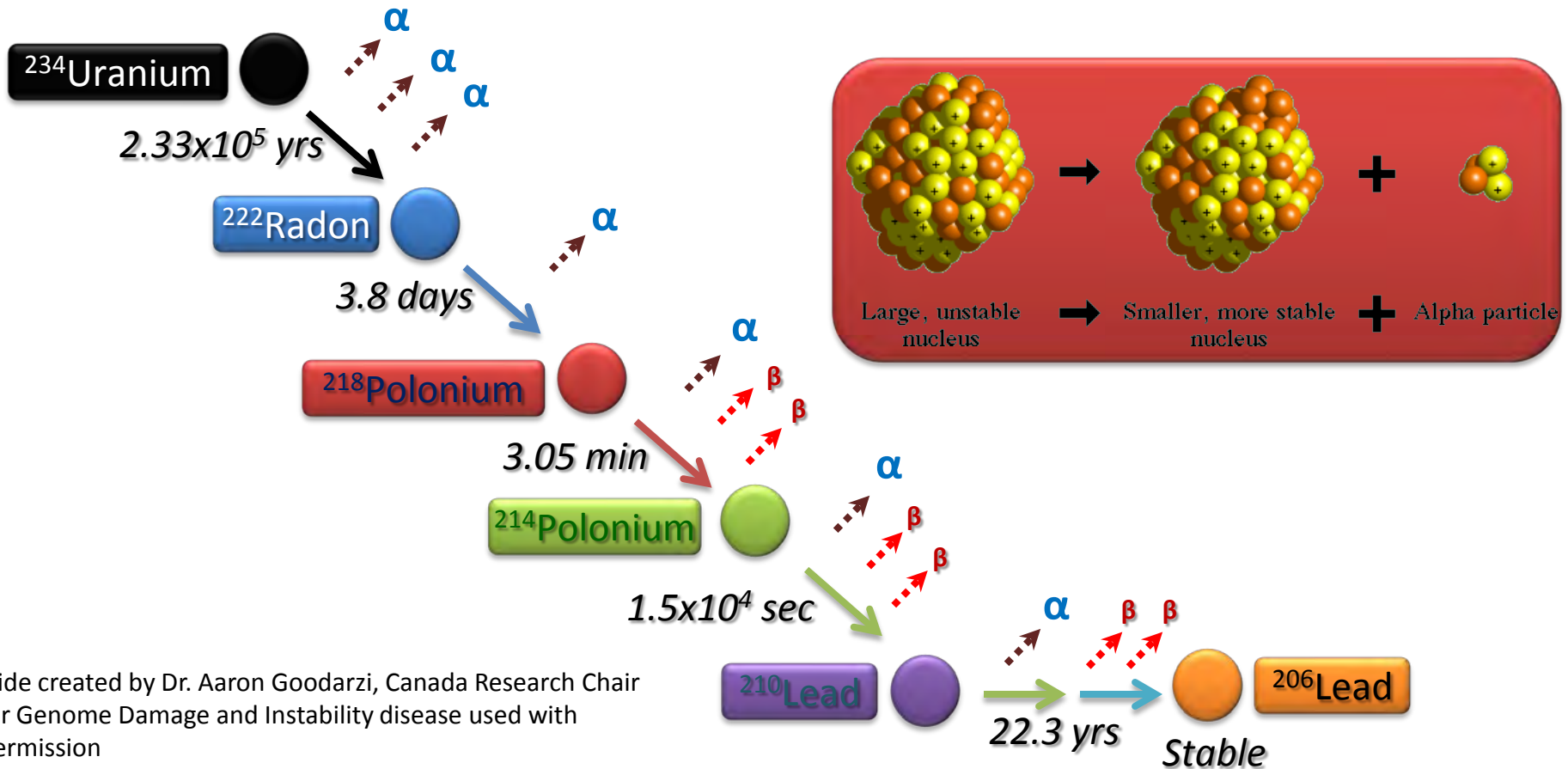


IARC Monographs on the Evaluation of Carcinogenic Risks to Humans
Radon and its decay products are *carcinogenic to humans (Group 1)*.

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

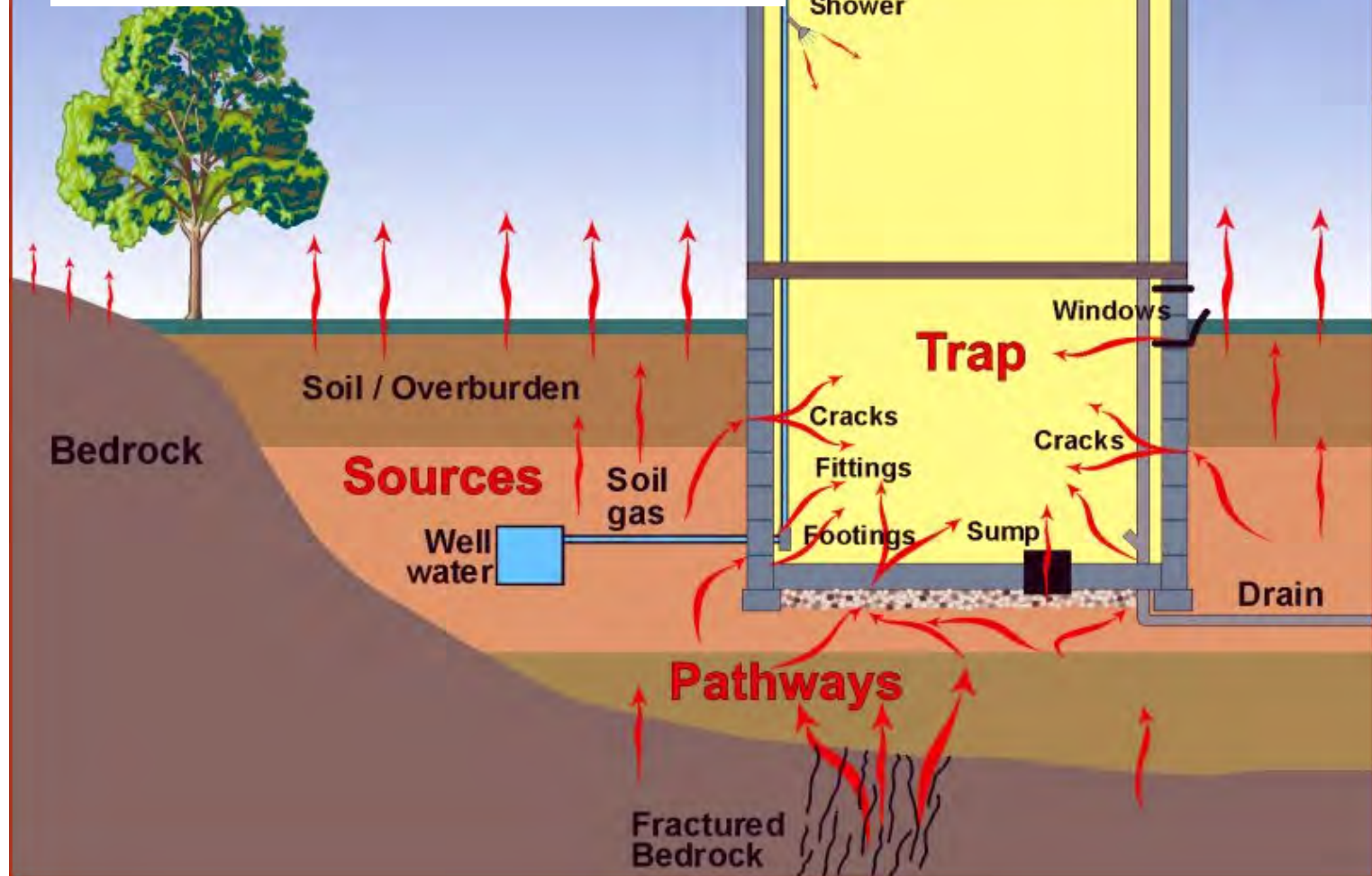
Decay chain of uranium -> radon

For every atom of Rn^{222} inhaled, **four a-particles** are emitted, three in the first week.



Slide created by Dr. Aaron Goodarzi, Canada Research Chair for Genome Damage and Instability disease used with permission

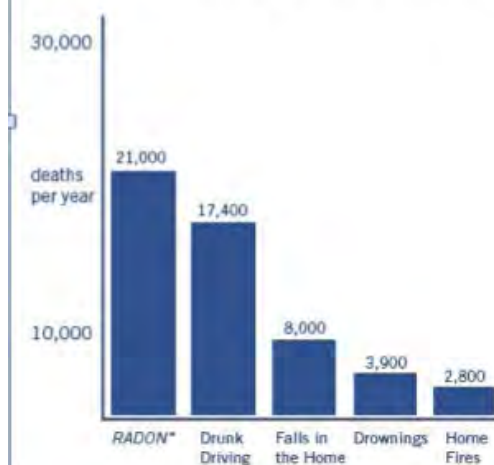
Radon is a soil gas and it is drawn into buildings through pressure differential between ground and home



Burden of Radon-related lung cancer

- Every year **3,300** Canadians die of **lung cancer** due to radon exposure (Health Canada)
- Public Health Ontario-> 2016
 - 1,080- 1,550 new cancer cases each year

Radon is estimated to cause thousands of lung cancer deaths in the U.S. each year.



US EPA- Radon

CCC Cancer Care Ontario Public Health Ontario Santé publique Ontario



Environmental Burden of Cancer in Ontario

Technical Supplement
August 2016

Radiation and DNA damage

In the lung and respiratory track, the alpha radiation “rips through” DNA bonds

This type of clustered damage is more difficult to repair properly than other forms of DNA damage

↑ DNA damage = ↑ error = ↑ genetic mutation = ↑ cancer

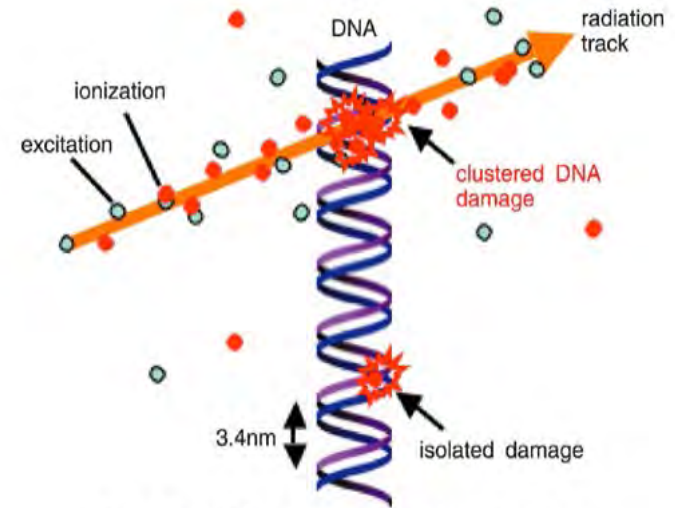
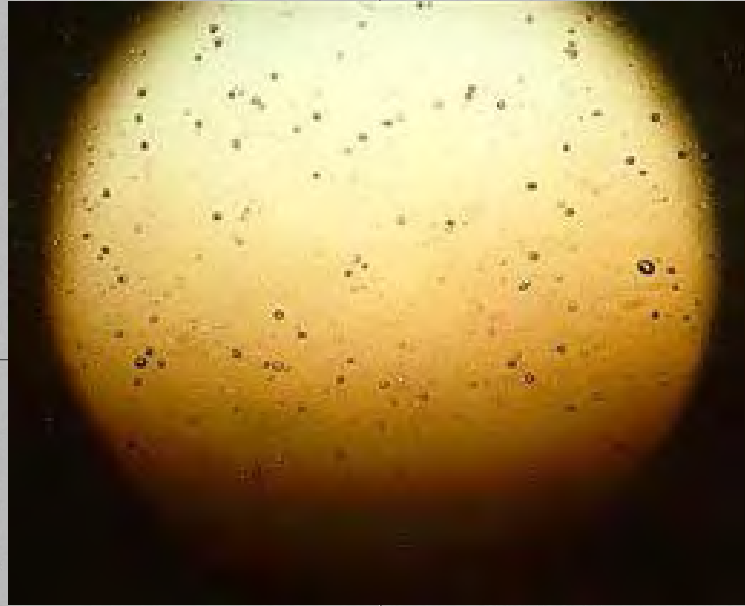


Fig.6-10 DNA damage by ionizing radiation



How Much Damage Does an Alpha Particle Really Do?



Plastic chip from radon test device
150 Bq/m³ of radon
3 months

Government of Canada / Gouvernement du Canada

Canada.ca | Services | Departments | Français

Statistics Canada

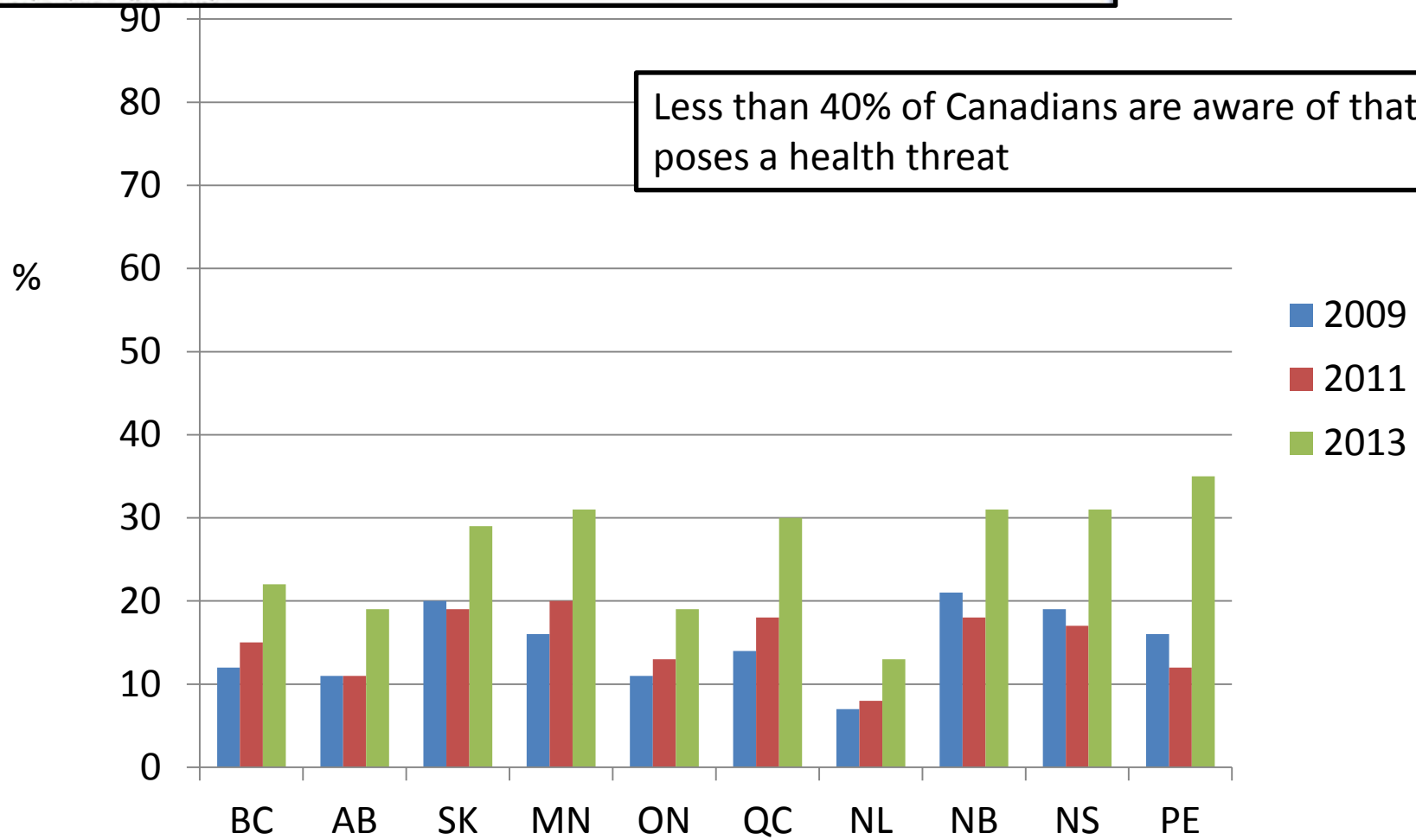
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Table 153-0098 1, 2

Households and the environment survey, knowledge of radon and testing, Canada, provinces and census metropolitan areas (CMA) every 2 years (percent)



Households* (%) that have tested for radon gas[†]

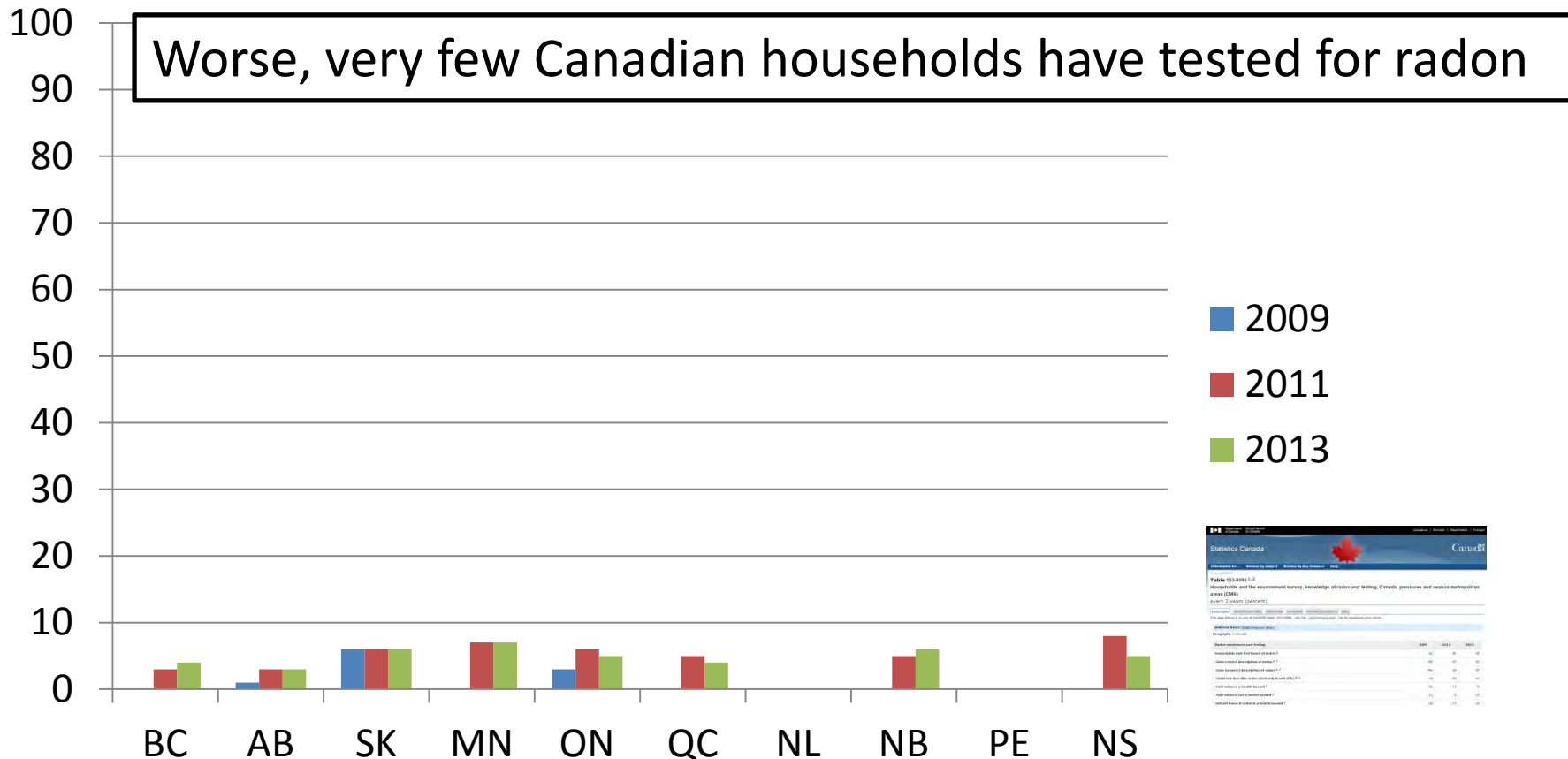


Table 13-2018 (1-2)
 Knowledge and the assessment survey, knowledge of radon and testing, Canada, provinces and census metropolitan areas (CMAs)
 2009 to 2013 (percent)

Knowledge of radon	2009	2011	2013
Knows radon is a gas	98	98	98
Knows radon is a natural gas	98	98	98
Knows radon is a radioactive gas	98	98	98
Knows radon is a colorless gas	98	98	98
Knows radon is a tasteless gas	98	98	98
Knows radon is a colorless and tasteless gas	98	98	98
Knows radon is a colorless and tasteless gas that is radioactive	98	98	98
Knows radon is a colorless and tasteless gas that is radioactive and can cause cancer	98	98	98
Knows radon is a colorless and tasteless gas that is radioactive and can cause cancer and is found in homes	98	98	98
Knows radon is a colorless and tasteless gas that is radioactive and can cause cancer and is found in homes and can be tested for	98	98	98
Knows radon is a colorless and tasteless gas that is radioactive and can cause cancer and is found in homes and can be tested for and is found in homes	98	98	98

*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

Are children more vulnerable?

- Research suggests that children are at greater risk from radiation *in general* than adults
- Beyond lung cancer:
 - Leukemia and other blood cancers main research focus for children
 - Some weak evidence for and some evidence against
 - Limited data set for both adults and children
- Question for childhood exposure: timing
 - In utero? first few years?
- Bottom line- reducing exposure during early years reduces overall lifetime burden

Current guidelines and impacts

- Canada 200 Bq/m^3
- USA $\sim 150 \text{ Bq/m}^3$
- WHO 100 Bq/m^3
- Linear relationship
 - No safe level
- PHO example (Peterson 2013)
 - **91** people saved at 200
 - **233** saved saved at 100

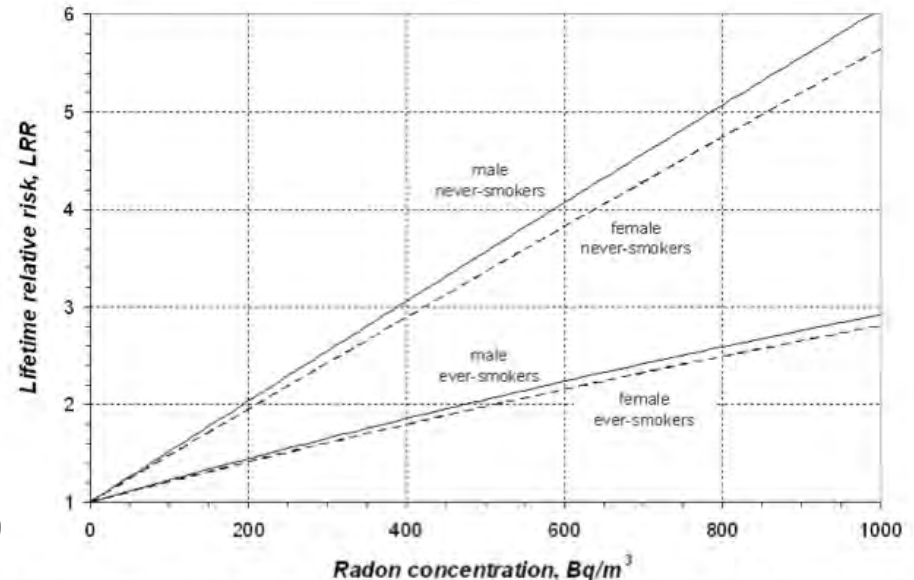


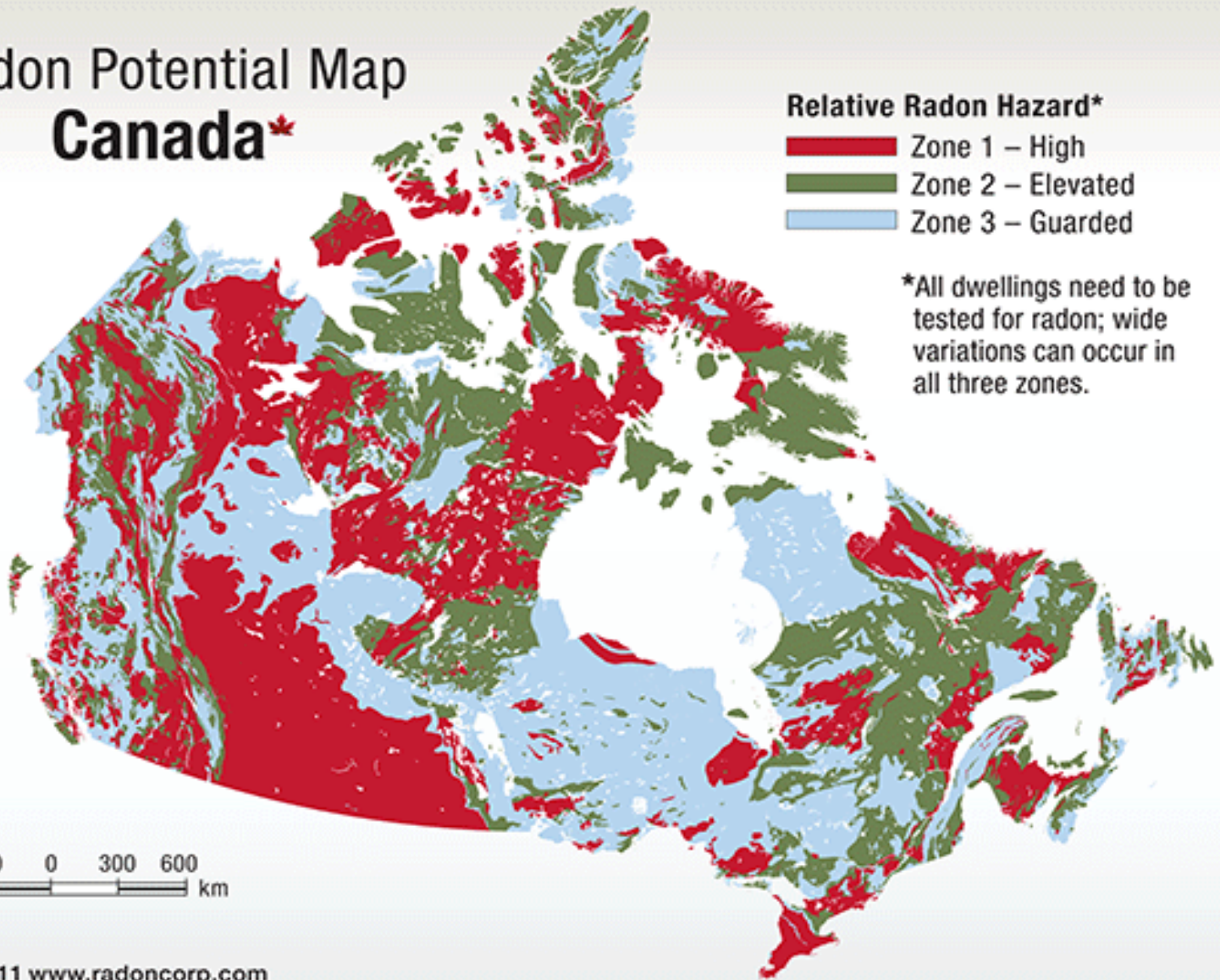
Figure 1. Lifetime relative risks (LRRs) of lung cancer for Canadian males (solid lines) and for Canadian females (broken lines) based on the EPA model and a submultiplicative interaction between smoking and exposure to radon progeny

Radon Potential Map Canada*

Relative Radon Hazard*

- Zone 1 – High
- Zone 2 – Elevated
- Zone 3 – Guarded

*All dwellings need to be tested for radon; wide variations can occur in all three zones.



© 2011 www.radoncorp.com

What prevention strategies exist?

- **Existing homes:**

- Colourless, odourless gas
- Testing recommended in areas where people spend >4 hours
 - Workplaces, homes, schools, institutions
- Requires testing, remediation and retesting
- Various remediation options
 - Active radon removal systems- sub slab depressurization
 - Sealing floors and cracks
 - Temporary measures: moving bedrooms and play rooms upstairs while waiting, increasing ventilation

- **New homes:**

- Changes in Building codes to build radon out

Radon Testing: 91 days or more

- **Electret Ion Chamber**



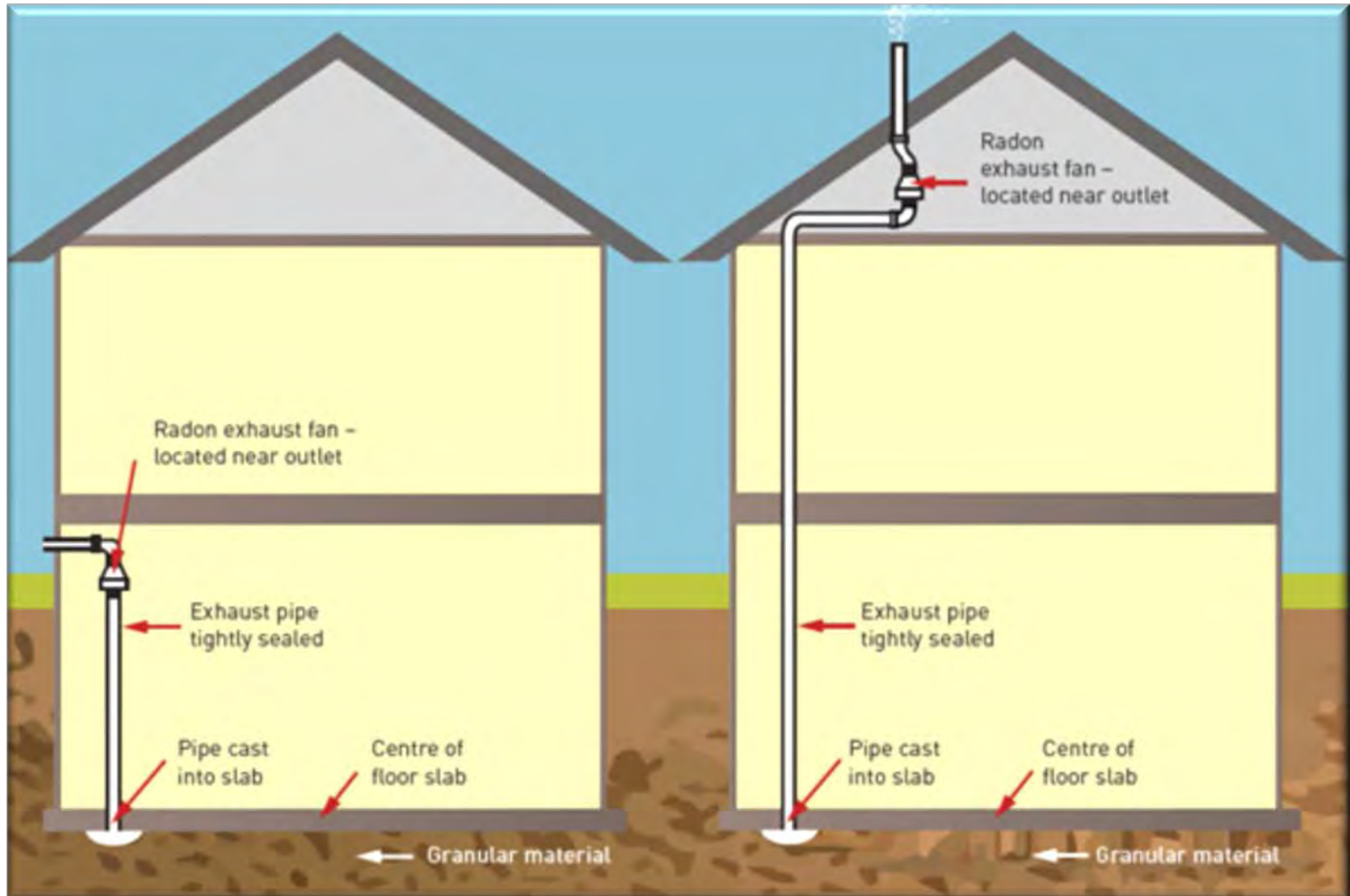
- **Alpha Track Detector (ATD)**



- **Continuous Radon Monitor (CRM)**



Sub-Slab Depressurization





02/15/2015 11:01PM

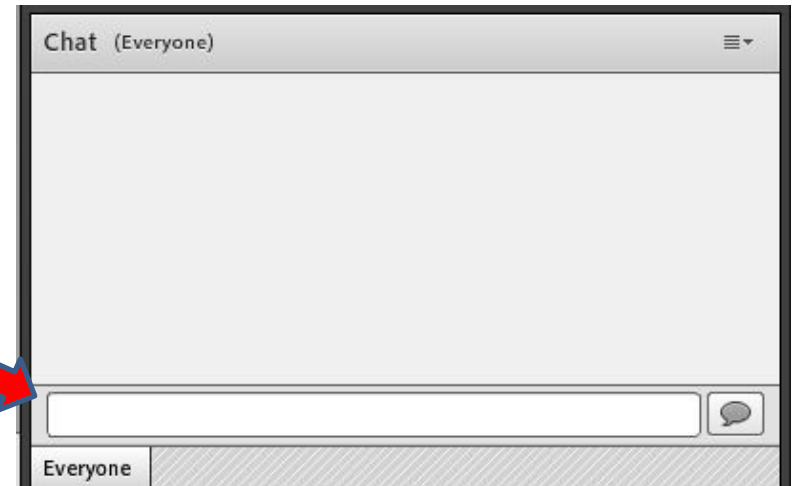




Regulatory initiatives

- Health Canada radon recommendations guideline only-not law, **no legal requirements to test**
 - New building code doesn't require *testing*
- Reducing exposure during early life effective at reducing lifetime risk
 - Quebec only province that has mandatory school testing
 - Daycare testing not yet required as part of licensing
- Others
 - Provincial government in Ontario reviewing changes to rental tenancy to incorporate radon testing
 - Real estate transactions/home inspection opportunities
 - New home owners warranty- Ontario only

Questions? Comments?



Next:

An ethical dimension in decision making

Why should we take an interest in public health (PH) ethics?

Because to act with professionalism, one must know:

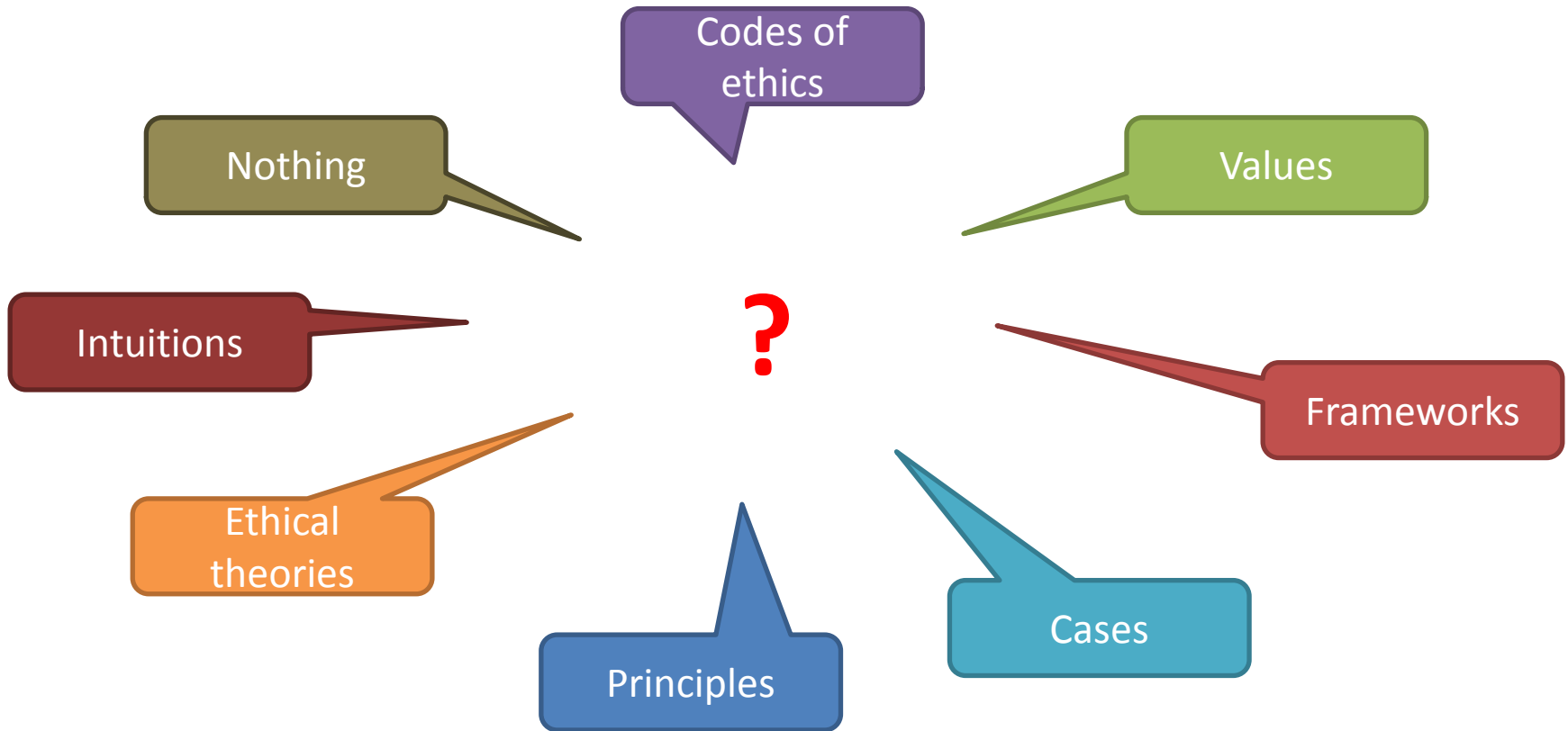
- The health effects of radon exposure
- The best means for prevention or remediation
- Guidelines and best practices
- The regulatory environment, etc.

But we also need to:

- Pay attention to the direct and indirect **effects** that our decisions have on communities, groups, individuals and ourselves.
- Recognize the **values** that are being promoted and those that are being diminished.
- Be able to **deliberate** about options, **make decisions**, and **justify** them.

Ethics can help you to do these!

What can we use to help us think about ethical issues in public health?



There are also different levels to consider...

Macro

At the level of public policy or population health

(e.g., provincial regulation on radon)

Meso

At the level of organizations or groups

(e.g., how can public health support daycare operators?)

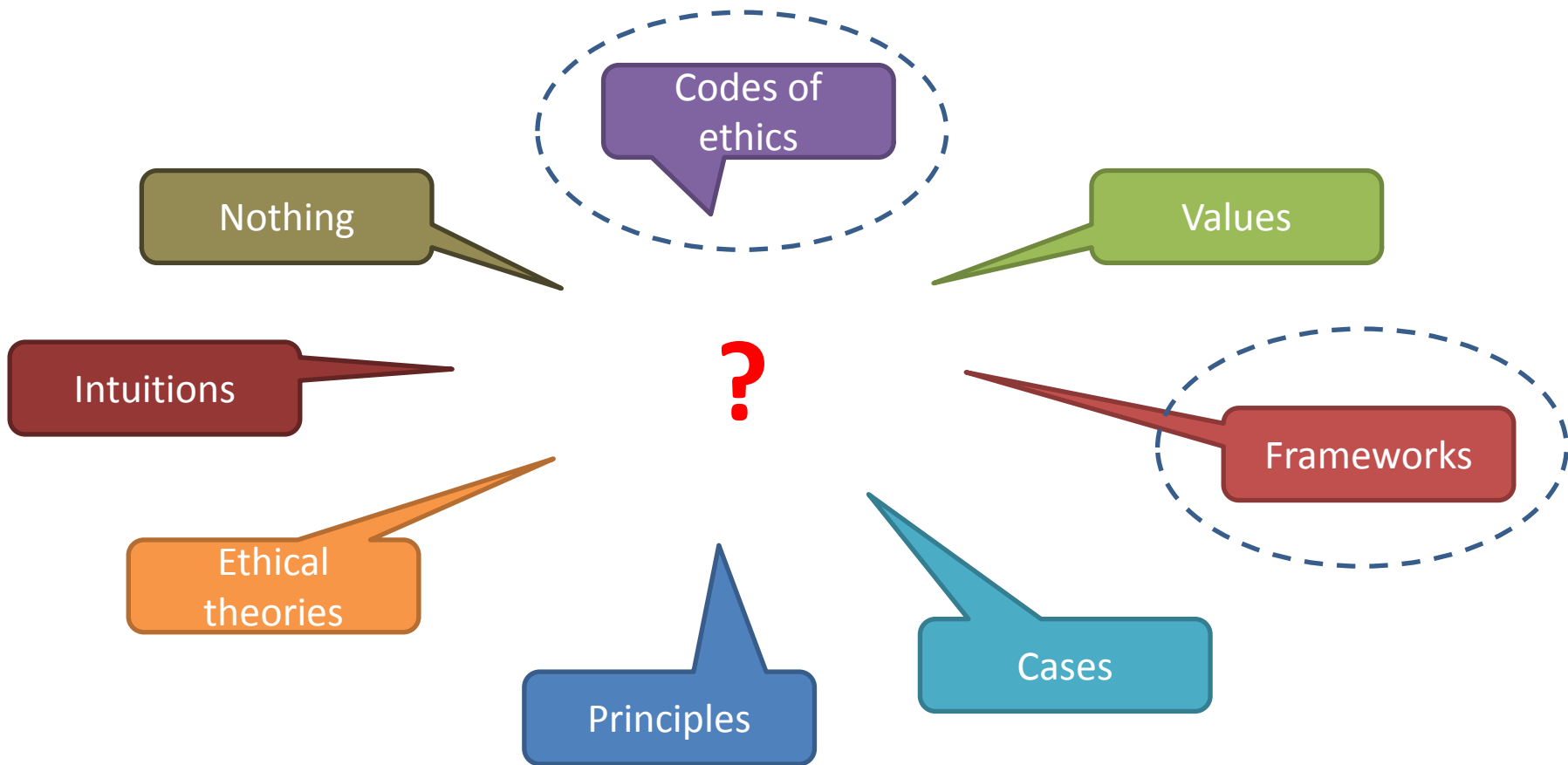
Micro

Between one or a few individuals

(e.g., how to help a low-income parent in moral distress when the daycare posts a sign indicating high radon levels?)

Each perspective reveals different ethical issues - every level is important

What can we use to help us think about ethical issues in public health?



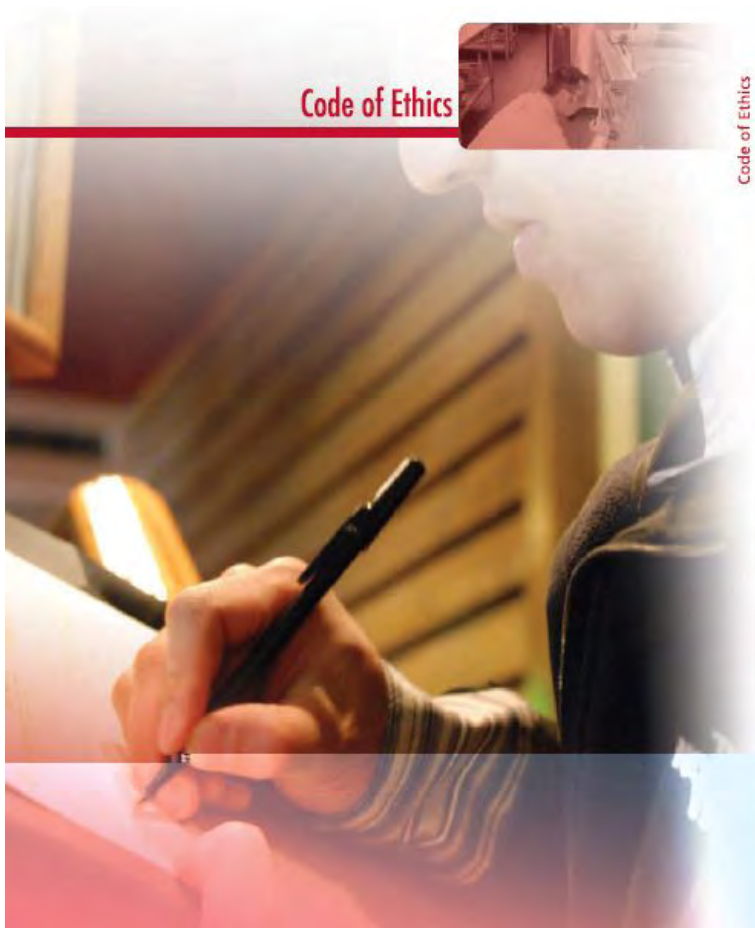
Professionalism at the Canadian Institute of Public Health Inspectors (CIPHI)

- Code of Ethics
- Standards of Practice
- Discipline-specific competencies
- Professional development model

<http://www.ciphi.ca/info-centre/continuing-professional-competencies-cpc-program/>

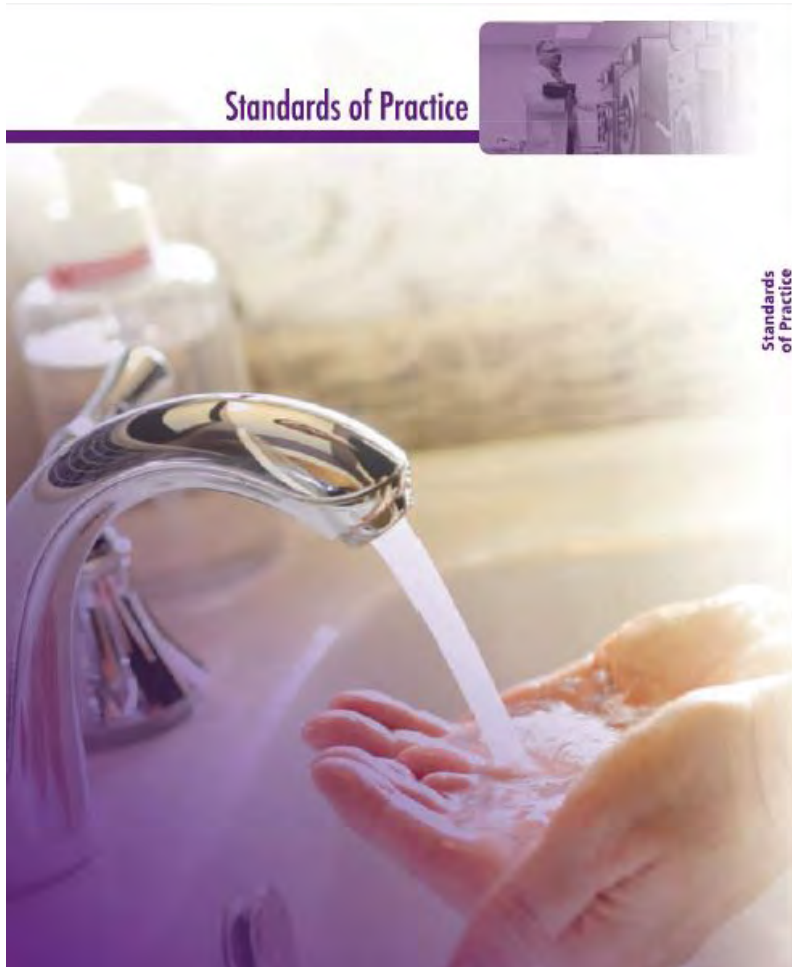
Code of Ethics

6 PRINCIPLES



- Promoting Justice
- Being Accountable
- Maintaining Privacy and Confidentiality
- Promoting Evidence-Informed Decision making
- Promoting Health, Well-Being & Collaboration
- Competent Practice

Standards of Practice



3.3 Ethical Standard

Environmental public health professionals demonstrate the ethical standard by: (7 indicators, including...)

“Identifying ethical issues and communicating them to their employers, colleagues, and members of their teams”

Ethics frameworks for public health

- A framework is a guide that can help professionals to adopt an ethical perspective – no prior expertise in ethics is required.
- Alas, it will only *help* to guide you – the work is still up to you (especially the critical thinking) and so are the decisions.
- Many frameworks exist (see the resources at the end of this presentation).

Let's discuss our case with the help of the framework by Nancy Kass

Case:

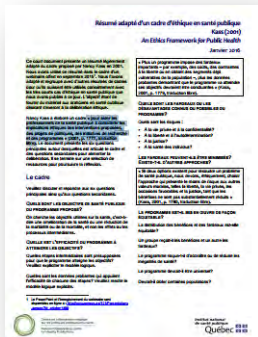


This daycare: tested

In order to obtain or renew a daycare licence, it would be necessary:

- To undertake **radon testing**;
- To **post the results** such that they will be visible from outside the building; and
- In the case of elevated radon levels, to undertake **remedial work** within the time limits outlined by Health Canada.

The framework:



Its goal:

“to help public health professionals consider the ethics implications of proposed interventions, policy proposals, research initiatives, and programs” (2001, p. 1777).

Kass, N. E. (2001). **An ethics framework for public health.** *American Journal of Public Health*, 91(11), 1776–1782. Available at:

<http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.91.11.1776>

Our adapted summary is available at:

http://www.nccph.ca/docs/2016_eth_frame_kass_En.pdf

Its structure:

6 questions

Kass (1)

1. What are the public health goals of the proposed program?

The ultimate health goal(s)

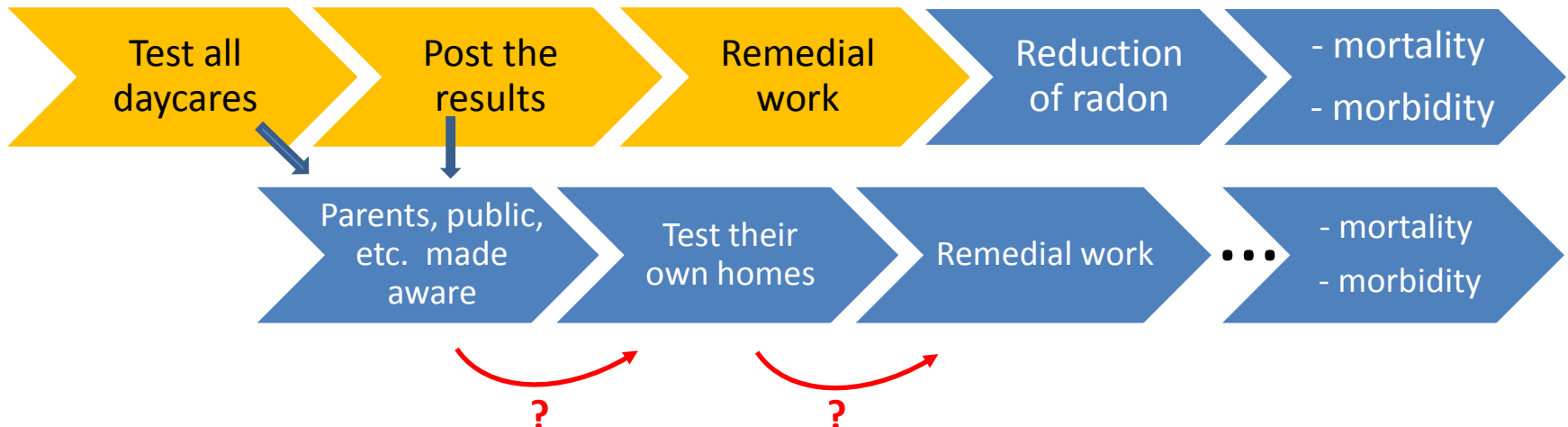
Reduce morbidity and mortality caused by radon.

Kass (2)

1. What are the public health goals of the proposed program?

2. How effective is the program in achieving its stated goals?

The “greater the burdens posed by a program” (liberty, costs, etc.) the stronger the evidence should be



- Few people who are aware of radon test their homes (approx. 6%)
- Few people do the remedial work to reduce radon levels:
 - About 12% of those whose homes test between 150 and 800 Bq/m³
 - About 32% of those whose homes test at over 800 Bq/m³

(NCCEH, 2008; Dessau *et al.*, 2004).

Kass (3)

1. What are the public health goals of the proposed program?
2. How effective is the program in achieving its stated goals?

3. What are the known or potential burdens of the program?

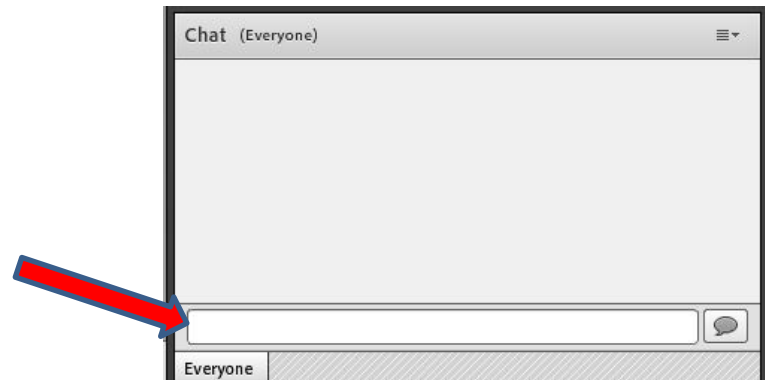
What are the risks

to privacy and confidentiality?

to liberty and self determination?

to justice?

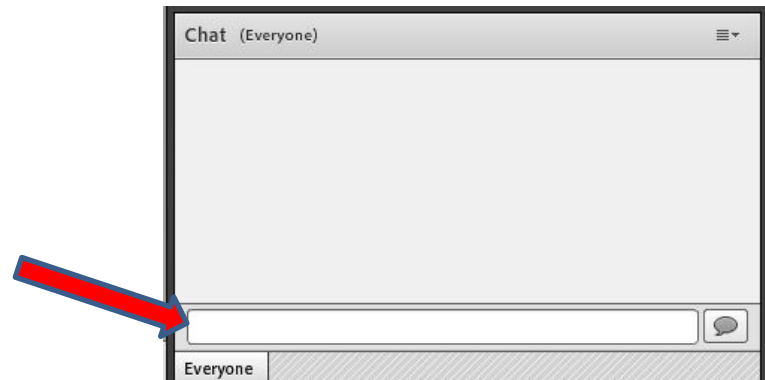
to individuals' health?



Kass (4)

1. What are the public health goals of the proposed program?
2. How effective is the program in achieving its stated goals?
3. What are the known or potential burdens of the program?
- 4. Can burdens be minimized? Are there alternative approaches?**

“[W]e are required, ethically, to choose the approach that poses fewer risks to other moral claims, such as liberty, privacy, opportunity, and justice, assuming benefits are not significantly reduced” (p. 1780).



Kass (5)

1. What are the public health goals of the proposed program?
2. How effective is the program in achieving its stated goals?
3. What are the known or potential burdens of the program?
4. Can burdens be minimized? Are there alternative approaches?

5. Is the program implemented fairly?

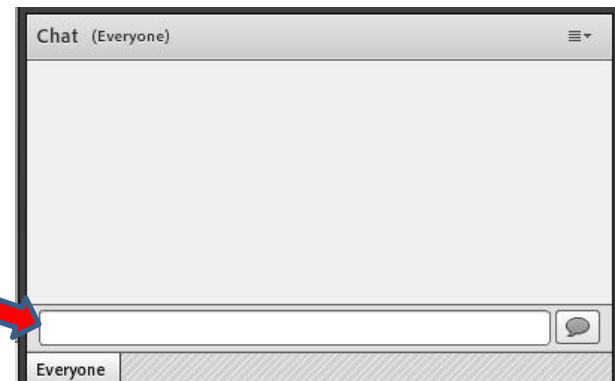
Is there a fair distribution of benefits and burdens?

Will the program increase or decrease inequalities?

Should the program be universal?

Should it target certain populations?

Is there a risk of stigmatizing certain groups?



Kass (6)

1. What are the public health goals of the proposed program?
2. How effective is the program in achieving its stated goals?
3. What are the known or potential burdens of the program?
4. Can burdens be minimized? Are there alternative approaches?
5. Is the program implemented fairly?

6. How can the benefits and burdens of a program be fairly balanced?

“[T]he greater the burden imposed by a program, the greater must be expected public health benefit”.

the more that “burdens are imposed on one group to protect the health of another...the greater must be the expected benefit”

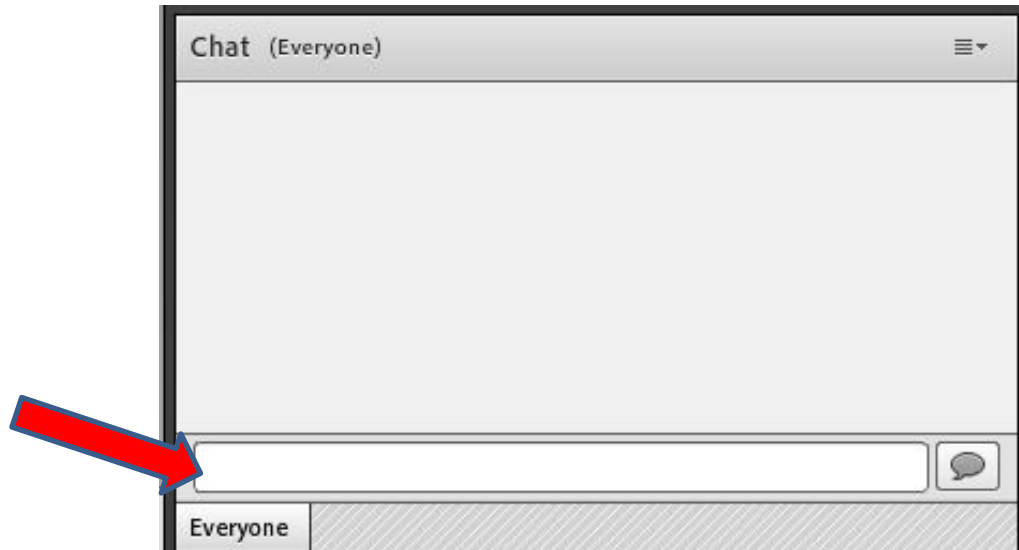
Balancing these calls for a democratic, equitable process.

Now, do you think that your public health unit should support the proposed law?

Hmmm.
Maybe?



Questions and discussion



Links to a selection of NCCEH resources on radon

- NCCEH. (2016). **Radon Resources**
<http://www.ncceh.ca/environmental-health-in-canada/health-agency-projects/radon>
- NCCEH. (2008). **Effective Interventions to Reduce Indoor Radon Levels.**
<http://www.ncceh.ca/documents/evidence-review/effective-interventions-reduce-indoor-radon-levels>
- NCCEH. (2008). **Radon Testing and Remediation Programs: What Works?**
<http://www.ncceh.ca/documents/evidence-review/radon-testing-and-remediation-programs-what-works>
- NCCEH. (2009). **Residential Indoor Radon Testing.**
<http://www.ncceh.ca/documents/evidence-review/residential-indoor-radon-testing>



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Other resources on radon

- Canadian national radon proficiency program. **C-NRPP and CARST have developed some resources to help when it comes to testing child care centres.** <http://c-nrpp.ca/professionals/testing-child-care-centres/>
- Canadian national radon proficiency program. <http://c-nrpp.ca/>
- **Health Canada. (2012). Cross-Canada Survey of Radon Concentrations in Homes - Final Report** <http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/survey-sondage-eng.php>
- Dunn, B. & Cooper, K. (2014). **Radon in Indoor Air: A Review of Policy and Law in Canada.** *Canadian Environmental Law Association.* http://www.cela.ca/sites/cela.ca/files/Radon-Report-with-Appendices_0.pdf
- Environmental Law Institute. (2016). **Database Of State Indoor Air Quality Laws Database Excerpt: Radon Laws.** https://www.eli.org/sites/default/files/docs/2016_radon_database.pdf
- Gagnon, F., Poulin, P., Leclerc, J.-M., Dessau, J.-C., Abab, A., Arsenault, P., El-Turaby, F., Lachance-Paquette, G. & Vézina, F.-A. (2016). **Implementation of a radon measurement protocol and its communication plan by child care centre managers in Québec.** *Canadian Journal of Public Health*, 107(3), p. 319-325. <http://journal.cpha.ca/index.php/cjph/article/view/5339>
- Institut national de santé publique du Québec. (2006). **Radon in Québec: Evaluation of the Health Risk and Critical Analysis of Intervention Strategies** <https://www.inspq.qc.ca/pdf/publications/476-RadonInQuebec-Feuillet.pdf>

Some NCCHPP resources on public health ethics

NCCHPP. (2016). **A Repertoire of Ethics Frameworks for Public Health.**

http://www.ncchpp.ca/708/Repertoire_of_Frameworks.ccnpps

NCCHPP. (2016). **A Collection of Adapted Summaries of Public Health Ethics Frameworks and Very Short Case Studies.** http://www.ncchpp.ca/127/publications.ccnpps?id_article=1525

NCCHPP. (2016). **Utilitarianism in Public Health.**

http://www.ncchpp.ca/127/Publications.ccnpps?id_article=1527

NCCHPP. (2016). **'Principlism' and Frameworks in Public Health Ethics.**

http://www.ncchpp.ca/127/Publications.ccnpps?id_article=1517

NCCHPP. (2016). **How Can I Choose a Public Health Ethics Framework that Is Suited to My Practical Needs?** (PowerPoint presentation).

http://www.ncchpp.ca/128/presentations.ccnpps?id_article=1553

MacDonald, M. (2015). **Introduction to Public Health Ethics 3: Frameworks for Public Health Ethics.**

http://www.ncchpp.ca/127/Publications.ccnpps?id_article=1426



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Thank you for joining us

This subject interests you?

Visit NCCEH's (www.ncceh.ca) and NCCHPP's (www.ncchpp.ca) websites for more resources

Or, write to us:

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