



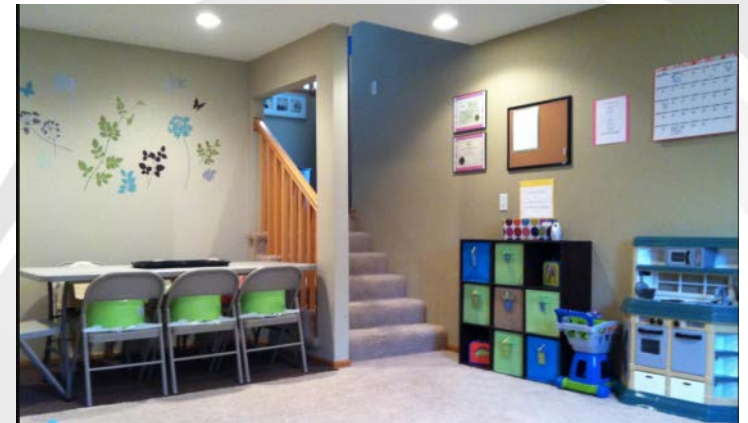
Radon and Child Care Facilities

Anne-Marie Nicol, PhD

Knowledge Translation Scientist, NCCEH

Greg Baytalan, BSc, CPHI(C)


Specialist Environmental Health Officer
Interior Health s



CIPHI Annual Education Conference 2017

Richmond BC, Nov. 8th, 2017

Overview of talk

- Review of radon exposure during childhood
 - Rational for testing
 - Interior Health Authority Child Care radon testing research
 - Policies to reduce childhood exposures
 - Ethical considerations
 - Conclusion
- 

Radon causes cancer

- IARC known human carcinogen- **Lung Cancer**

- Other cancers?



- Leukemia and lymphomas

- Studies of children and adults
- Studies designs mostly correlation or case-control
 - 2017 county level data supports relationship between leukemia and radon
- Large (140,000) US prospective study found association for radon and blood cancers for women only
 - Exposure measurement still a problem

- Stomach cancer

- Only correlation studies to date

Children and radon- does age matter?



Agency for Toxic Substances & Disease Registry

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Environmental Health and Medicine Education

- Due to lung shape and size differences, **children have higher estimated radiation doses than do adults**. Children also have breathing rates faster than those of adults.
- Risk of lung cancer in children resulting from exposure to radon may be almost twice as high as the risk to adults exposed to the same amount of radon.
- If children are also exposed to tobacco smoke, the risk of getting lung cancer increases at least 20 times. <https://www.atsdr.cdc.gov/csem/csem.asp?csem=8&po=7>

Conflicting statements: Health Canada and US EPA don't support the above statement

Reducing risk- Early Life exposure

Exposure assessment

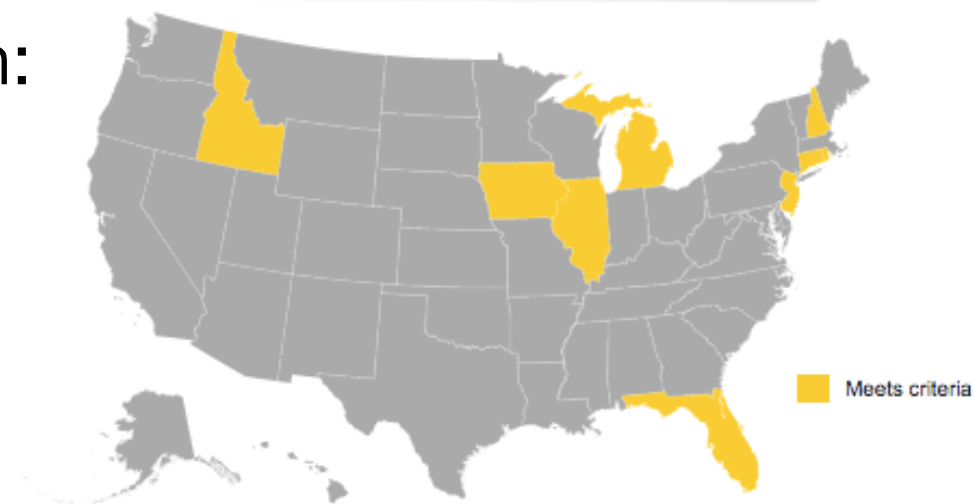
- Where do children spend time?
 - At home (most people spend ~90% of time indoors)
 - Childcare facilities
 - Majority of families use childcare (54%) for children less than 4
 - Hours in care: 60% use at least 30 hours or more per week
- Exposure pathways: Infants and toddlers
 - Greater exposure to floor regions: crawling, sleeping
 - Childcare centres often at ground or underground level
 - Churches, offices, homes



USA Radon testing in daycares

- Radon testing compulsory in:

- Connecticut
- Florida
- Iowa
- Illinois
- Idaho
- Michigan
- New Hampshire
- New Jersey
- Rhode Island



JURISDICTIONS FOUND: 9

CRITERIA SELECTED:

Does the state require radon testing? ☒ Yes

Does the state require radon testing in Radon Testing in day care centers?

☒ Yes

LawAtlas Project, Temple University, as of Dec 2016

Daycare testing in the Canadian context

- BC Interior Health Authority most engaged
 - Received funding from Health Canada to initiate
 - Most comprehensive testing program to date
- Test kit program started 2013
 - 2010 introductory letter suggesting testing- no uptake
 - Radon detector/letter from Senior MHO encouraging Operators take advantage of free test kits
 - Repeat/reminder letters mailed out
- Mailed out 853 kits
 - 46% of facilities responded and have results

Radon levels known to be elevated in homes in Interior Health Region



Highest home to date:
Slocan Valley (Rental)

Basement 37,000 Bq/m³

Main Floor 7,800 Bq/m³

Post Mitigation by IRPS Ltd.

Basement 29 Bq/m³

Main Floor 22 Bq/m³

Methods: Child Care deployment kit

Packages for facilities included:

- Basic radon info
- Step-by-step instructions
- Random duplicates & spikes
- 91-days minimum,
- Seal, return in postage-paid envelope,
- BC Lung building envelope survey
- Contact number for questions

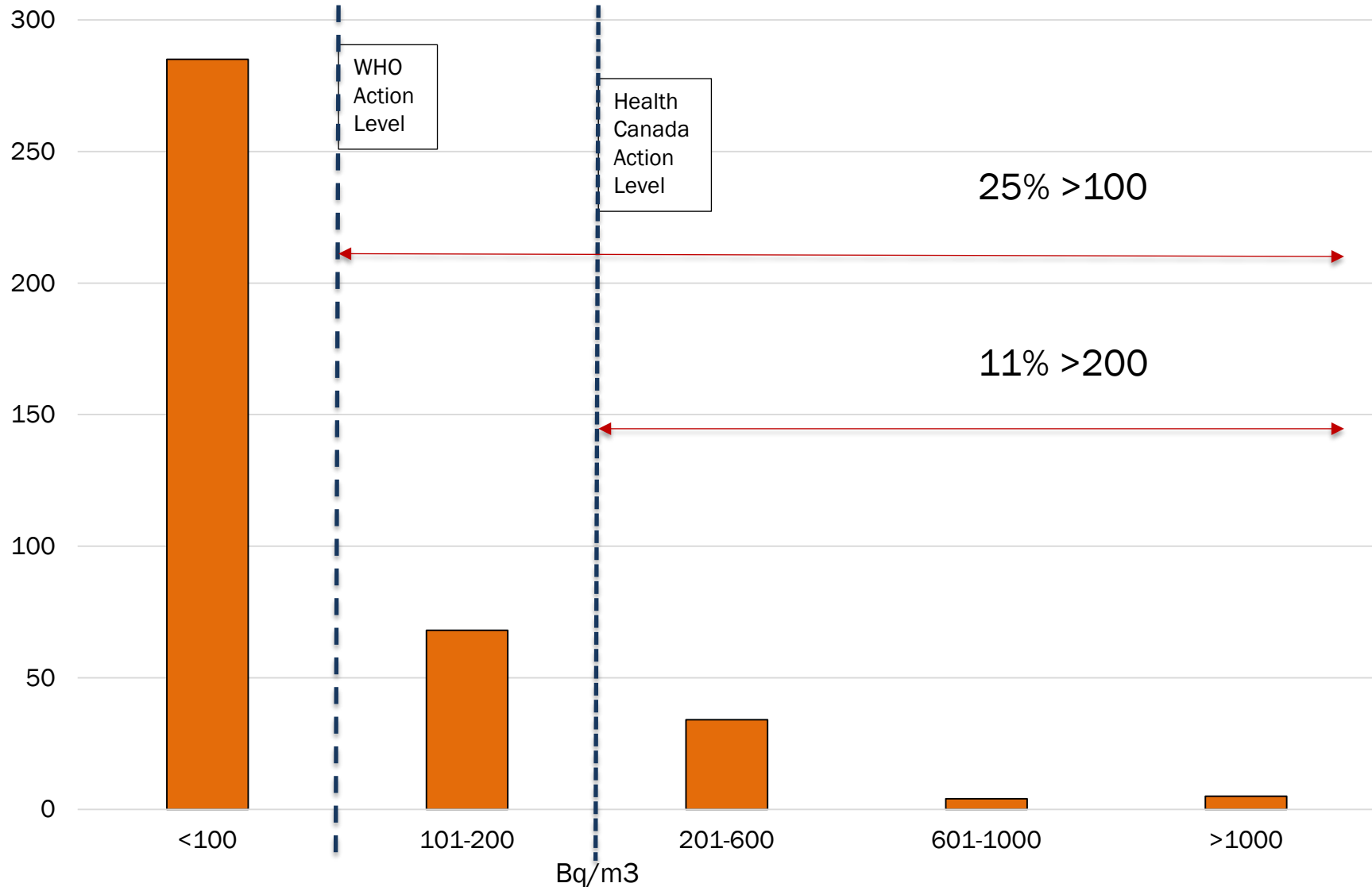


Quality Assurance

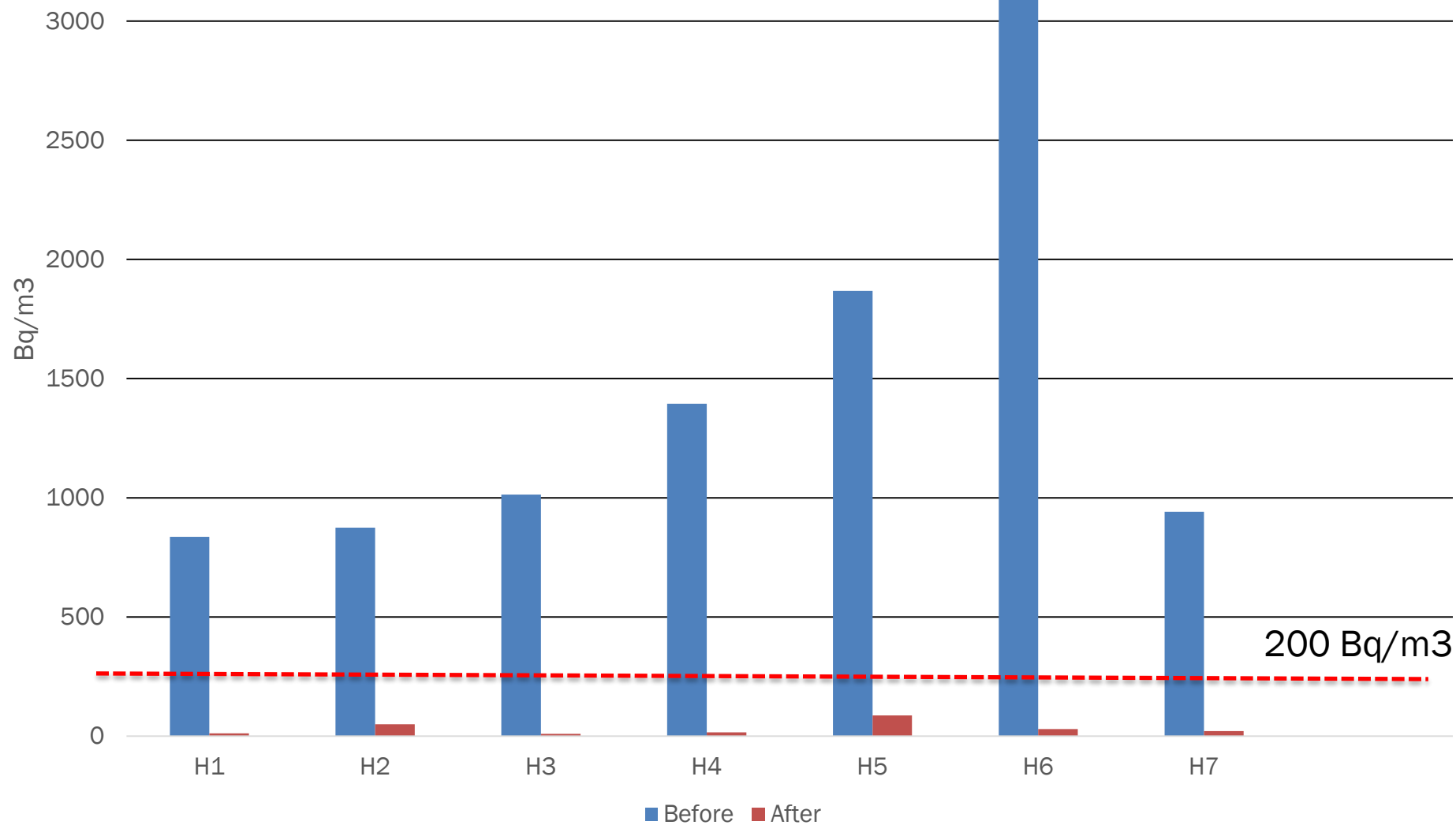
Tests returned to the health unit



Results of Childcare radon testing categorized by radon level



IHA Childcare Facilities Pre- and Post-Mitigation



Results Letter mailed to facilities

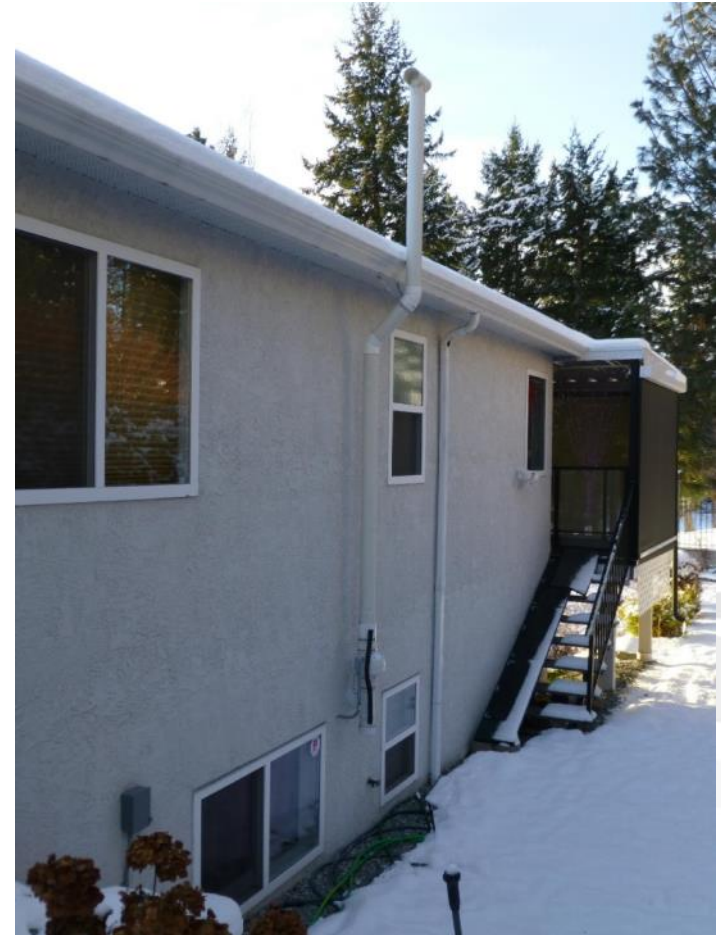
- Numerical results, Where the test was done
 - Impetus to remediate if necessary
- Describe guidelines
 - Health Canada (200 Bq/m³)
 - WHO (100 Bq/m³)
 - ALARA concept
- HC mitigation guidance timelines
 - 200-600
 - >600 Bq/m³



Results letter- continued

- Provided links to resources
 - Mike Holmes mitigation website
 - Health Canada general/ C-NRPP- find a professional remediation
 - Interior Health
- Encouraged retesting after 5 years
 - Or renovations
- Copy of results letter sent to building or agency owners to raise awareness and promote testing
 - School Districts,
 - First Nations Band,
 - Corporate Owner, NGO, etc.

Remediation methods: Sub-Slab Depressurization



Proven mitigation method
Catch radon & dump
outside
Low wattage fan

Sub-Slab Depressurization continued



Works well in many building envelope situations



New testing requirements for IH child care centres

- May 2017 newsletter informing at child care facilities that radon testing required
- Requirement of licensing
 - Using *Community Care and Assisted Living Act*
- New and existing care facilities must test
- Licensing Officers in the field now asking operators about testing
- On-going dialogue about testing and mitigation


Ethical considerations

- Access- does testing for radon decrease access to quality care?
 - Not necessarily- there is a practical solution
- Affordability- will testing for radon make childcare more expensive?
 - Reality- radon isn't that expensive test for
 - Often child care operators are not building owners
- Equity- should some children have safer environments than others?
 - Unlicensed childcare would still pose an issue

Natural justice?- Radon maybe naturally occurring, but the way we build isn't...



Policy level

- Requirements for testing in daycares
 - general state laws (USA)
 - public health (Yukon)
 - regional Health Authority licensing requirements
 - Policies need to include
 - Prescriptive methods for
 - Testing
 - Remediation if necessary
 - RETESTING- small changes over time can alter levels
 - Policies need champions
- 

In summary

- Children maybe more vulnerable to radon than adults
 - Still no consensus but biologically plausible
- Reducing exposure **early** means less **lifetime exposure**
 - Good idea for cancer prevention
- Implied “safety” of child care centres
- Requiring testing is not onerous
 - Solution is effective and straightforward
- Leadership is key- testing initiatives require policy advocates- maybe its YOU!

THANK YOU!

For more information, please visit the **NCCEH Radon Topic Page**, or reach out!

www.ncceh.ca || www.ccnse.ca

Anne-Marie.Nicol@bccdc.ca

Greg.Baytalan@interiorhealth.ca

<https://www.interiorhealth.ca/YourEnvironment/RadonGas/Pages/default.aspx>

*Production of this document has been made possible through a financial contribution from the **Public Health Agency of Canada**.*



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