

# Radon and Children

*The time to act is NOW!*



Radon is a naturally occurring radioactive gas and the **second leading cause** of lung cancer.<sup>1</sup>

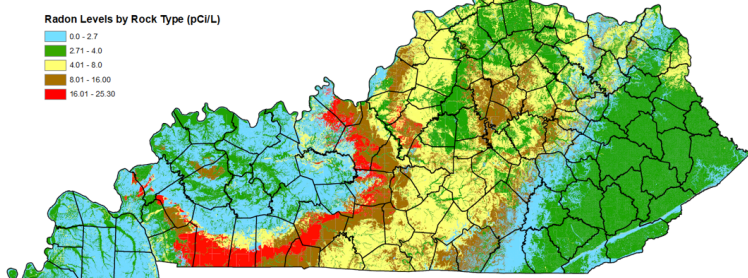
## WHY ARE CHILDREN AT RISK?

- Children have smaller lungs and they breathe faster than adults. Thus, children may get a higher dose of radiation from radon exposure. In addition, children have Immature organs that may be more sensitive to radiation and more susceptible to cell mutations, potentially leading to long-term health consequences.<sup>2</sup>
- Children who are exposed to radon in the home have demonstrated higher levels of inflammatory biomarkers in their blood, specifically C-reactive protein (CRP) and interleukin-1B (L-1B). Chronically elevated CRP and IL-1B may have long-term consequences on the health of children including major depressive disorders, neurodegenerative disease, asthma, and COPD.<sup>3</sup>
- Children have a longer life expectancy than adults, allowing more time for radiation-induced effects. In other words, children exposed to radon have a greater likelihood of developing radon-induced health issues over their lifetime. The longer a person is exposed to high levels of radon, the greater the risk of developing lung cancer later in life.<sup>2, 4</sup>
- Radon-induced lung cancer is impacted by:
  - age
  - duration of exposure
  - concentration of radon
  - exposure to tobacco smoke<sup>2, 5</sup>
- **Now is the time to act! Children rely on adults to protect them. You can lower the risk of lung cancer developing in the children you care for as they grow into adulthood.**

## IS RADON A PROBLEM IN KENTUCKY?

Yes! An estimated 1,033 radon-induced lung cancers are diagnosed every year in Kentucky.<sup>6</sup>

### Radon Potential



Radon potential is based on geologic formations. For detailed county information visit: <http://www.uky.edu/breathe/radon/radon-data-county>. EPA suggested radon action level is 4.0 pCi/L or greater; World Health Organization suggested radon action level is 2.7 pCi/L.

## WHERE ARE CHILDREN AT RISK?

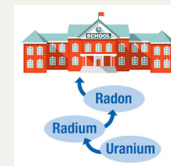
- Homes, daycares, and schools present the greatest risk of radon exposure for children as they spend a substantial portion of their day in these locations.
- Radon may be present inside any building regardless of the geographic area.<sup>7</sup>
- **All homes and buildings should be tested for radon and fixed when radon is greater than or equal to 4.0 pCi/L.**<sup>7, 8</sup>



# Radon testing is easy and can save lives!

Get a **FREE** radon test kit from the KY State Radon Program

<https://www.chfs.ky.gov/agencies/dph/dphps/emb/Pages/radon.aspx>



## How can healthcare providers ACT to protect children from radon?

- **Test** your own home and tell others to test.
- **Ask** caregivers if the home has been tested for radon during the child's health history.
- **Advise** caregivers to test home for radon and fix if radon is at or above 4.0 pCi/L.
- **Advise** children to abstain from all tobacco use including vapes.
- **Assess** for second hand smoke exposure in the home. If present, advise on creating a smoke- and radon-free home.
- **Assist** caregiver in obtaining a FREE radon test kit.
  - <https://www.chfs.ky.gov/agencies/dph/dphps/emb/Pages/radon.aspx>
- **Advise** caregiver to contact a certified radon mitigation professional if high levels of home radon are found.
  - <https://nrpp.info/pro-search/>
- **Educate** policymakers on the need for radon control policies which protect children.

## How can daycares and schools ACT to protect children from radon?

- **Educate** employees, caregivers, and decision makers on radon.
- **Advise** caregivers to test their home for radon and fix if levels are at or above 4.0 pCi/L.
- **Teach** students about radon during science classes.
- **Secure** administrator support and test daycares and schools for radon.
- **Contact** a certified radon mitigation professional if high levels of radon are found.
  - <https://nrpp.info/pro-search/>
- **Notify** employees and caregivers of radon results in writing and post results in the building.
- **Use** radon resistant new construction techniques to reduce exposure to radon when building new daycares or schools.
- **Advocate** for laws requiring radon testing and mitigation in daycares and schools.

### Check Out These Resources!

- **FREE CME/CNE** Introduction to Radon: Continuing Education Course: <https://www.cecentral.com/radon>
- U.S. Environmental Protection Agency. Radon. <https://www.epa.gov/radon>
- U.S. Department of Health and Human Services. Radon and Cancer. <https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/radon/radon-fact-sheet>
- American Lung Association. Radon Testing. <https://www.lung.org/clean-air/at-home/indoor-air-pollutants/radon>
- Centers for Disease Control and Prevention. Protect Yourself and Your Family from Radon. <https://www.cdc.gov/radon/index.html>
- U.S. Department of Health and Human Services. A Citizen's Guide to Radon: The Guide to Protecting Yourself and Your Family from Radon. [https://www.epa.gov/sites/default/files/2016-12/documents/2016\\_a\\_citizens\\_guide\\_to\\_radon.pdf](https://www.epa.gov/sites/default/files/2016-12/documents/2016_a_citizens_guide_to_radon.pdf)
- Conference of Radiation Control Program Directors, Inc. Reducing the Risk from Radon: Information and Interventions Guide for Health Care Providers. 2020. <http://www.radonleaders.org/sites/default/files/2020-11/HCPProvGuide%20Update%209-17-20.pdf>
- US Environmental Protection Agency. Radon in Schools. <https://www.epa.gov/radon/radon-schools>
- U.S. Environmental Protection Agency. Managing Radon in Schools. <https://www.epa.gov/iaq-schools/managing-radon-schools>
- BREATHE. Radon Data by County and Statewide. University of Kentucky College of Nursing. <https://breathe.uky.edu/radon/radon-data-county-and-statewide>
- **Breath of Hope Kentucky.** <https://www.bohky.org/>

### References

1. American Cancer Society. Cancer Facts & Figures 2023. Atlanta: American Cancer Society; 2023.
2. US Department of Health and Human Services. Toxicological Profile for Radon. Atlanta: Agency for Toxic Substances Disease Registry. 2012.
3. Taylor BK, Smith OV, Miller GE. Chronic Home Radon Exposure Is Associated with Higher Inflammatory Biomarker Concentrations in Children and Adolescents. *Int J Environ Res Public Health*. 2022 Dec 23;20(1):246. doi: 10.3390/ijerph20010246. PMID: 36612568; PMCID: PMC9819293.
4. National Research Council Committee on the Biological Effects of Ionizing Radiations (1990). *Health Effects of Exposure to Low Levels of Ionizing Radiations*. Washington, DC National Academies Press.
5. National Research Council Committee on Health Risks of Exposure to Radon (1999). *Health effects of exposure to radon: BEIR VI*. Washington, DC: National Academies Press.
6. American Association of Radon Scientists and Technologists. Kentucky The AARST Radon Report Card: Risk and Response. 2023. Retrieved from <https://aarst.org/Report-Cards/KY-Report-Card.html>
7. US Environmental Protection Agency. A Citizen's Guide to Radon. 2016. Retrieved from [https://www.epa.gov/sites/default/files/2016-12/documents/2016\\_a\\_citizens\\_guide\\_to\\_radon.pdf](https://www.epa.gov/sites/default/files/2016-12/documents/2016_a_citizens_guide_to_radon.pdf)
8. United States Department of Health and Human Services, Office of the Surgeon General. (2005, January 13). Surgeon General releases national health advisory on radon [Press Release]. Retrieved from [http://www.adph.org/radon/assets/surgeon\\_general\\_radon.pdf](http://www.adph.org/radon/assets/surgeon_general_radon.pdf)