

Radon-Related Health Issues in Oregon

Kolby Childers, Earth and Physical Sciences Department, Western Oregon University,
Monmouth, OR, 97361 email: kchilders13@wou.edu



Abstract

Radon is a natural radioactive gas that forms from the breakdown of uranium in soils, rocks, water, and is released into the air. Radon gas is not visible, and one cannot smell or taste it. Geology is the most important fact in controlling the source and distribution of radon as it is able to enter homes and gets into the air that we breathe. Although Radon exposure is unavoidable, steps have been made to reduce the risk including radon mapping and affordable test kits.

Introduction

Radon is able to enter home and buildings and may be contained in water. Although Radon is a natural gas, the problem that arises is that its bad to the human health and can cause lung cancer. There is uncertainty about all the health risks when being exposed to radon, but it is the second leading cause of lung cancer and affects the health of humans if not properly handled and contained. Radon causes over 21,000 lung cancer deaths and approximately 13% of all lung cancer deaths, and is increased for those who smoke.

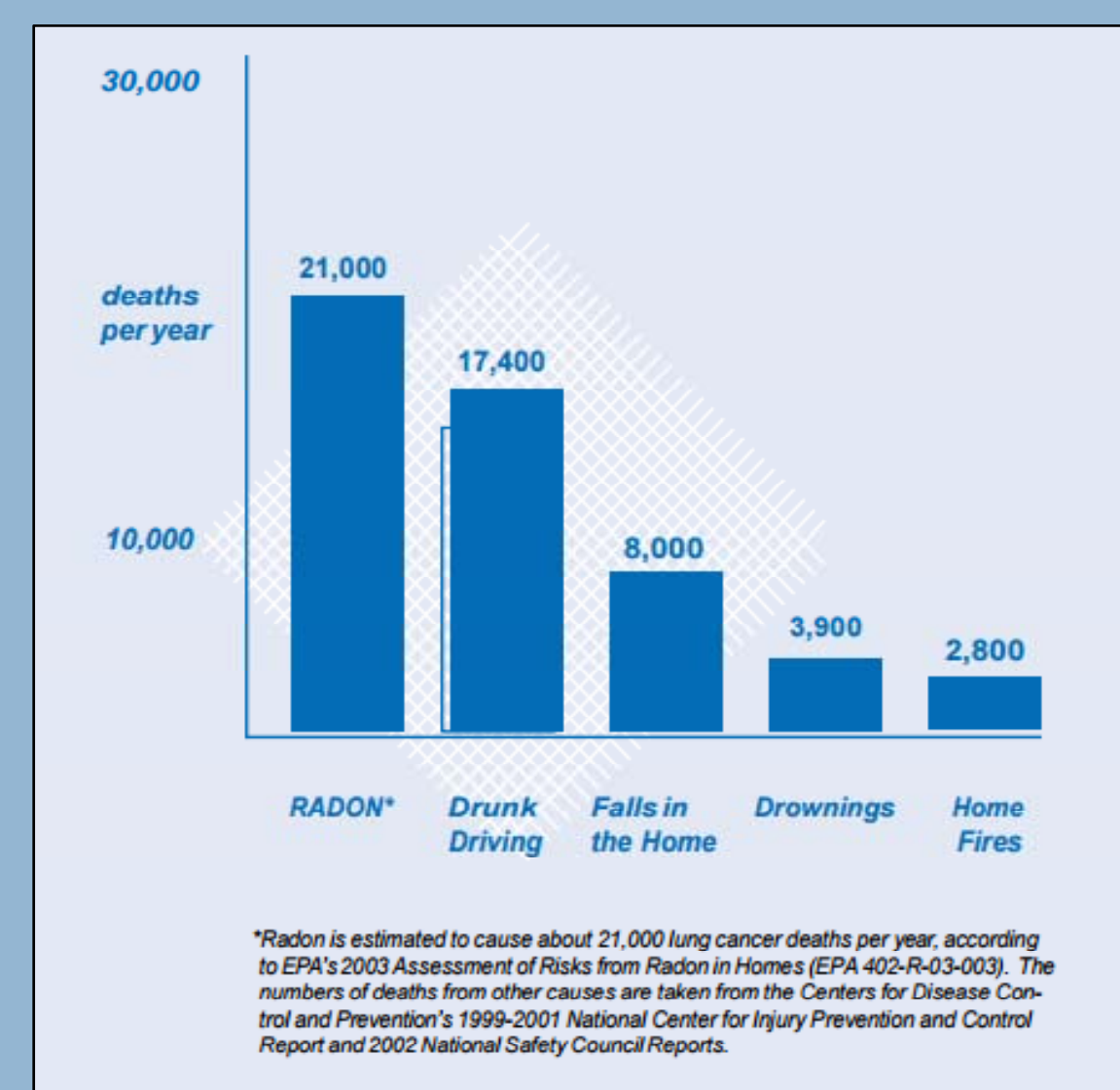


Figure 1. Radon annual deaths comparison.

Project Overview

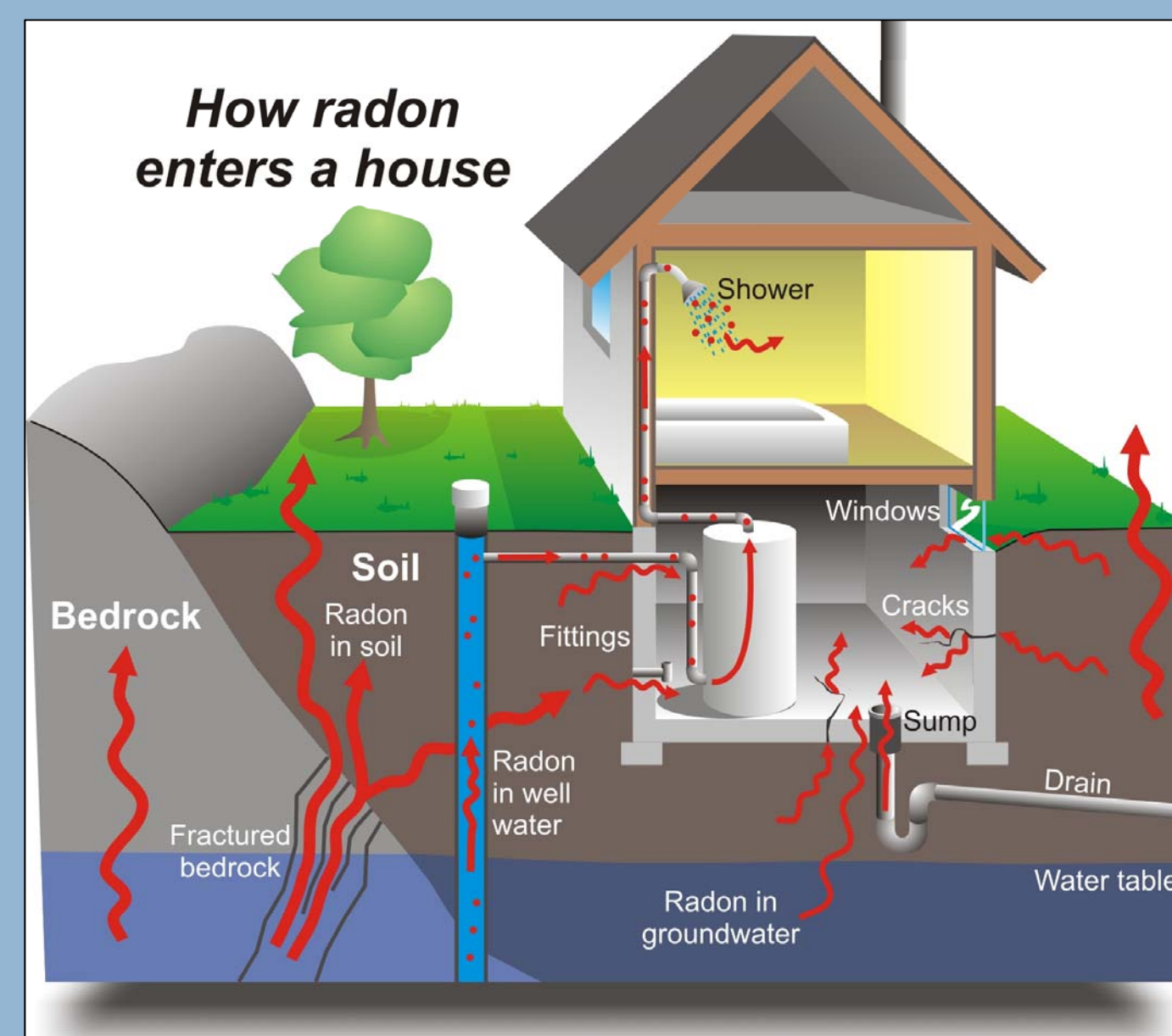


Figure 2. Diagrammatic sketch showing the pathways for radon accumulation in homes.

Radon is a natural but hazardous gas that results from the decay of uranium and found in almost all soils. Geology is the most important fact in controlling the source and distribution of radon. Radon hazard mapping has been used to decrease the risk and map potentially more dangerous areas as radon is able to enter homes and buildings and may be contained in water. There is uncertainty about all the health risks when being exposed to radon, but can cause lung cancer and affects the health of humans if not properly handled and contained.

Results

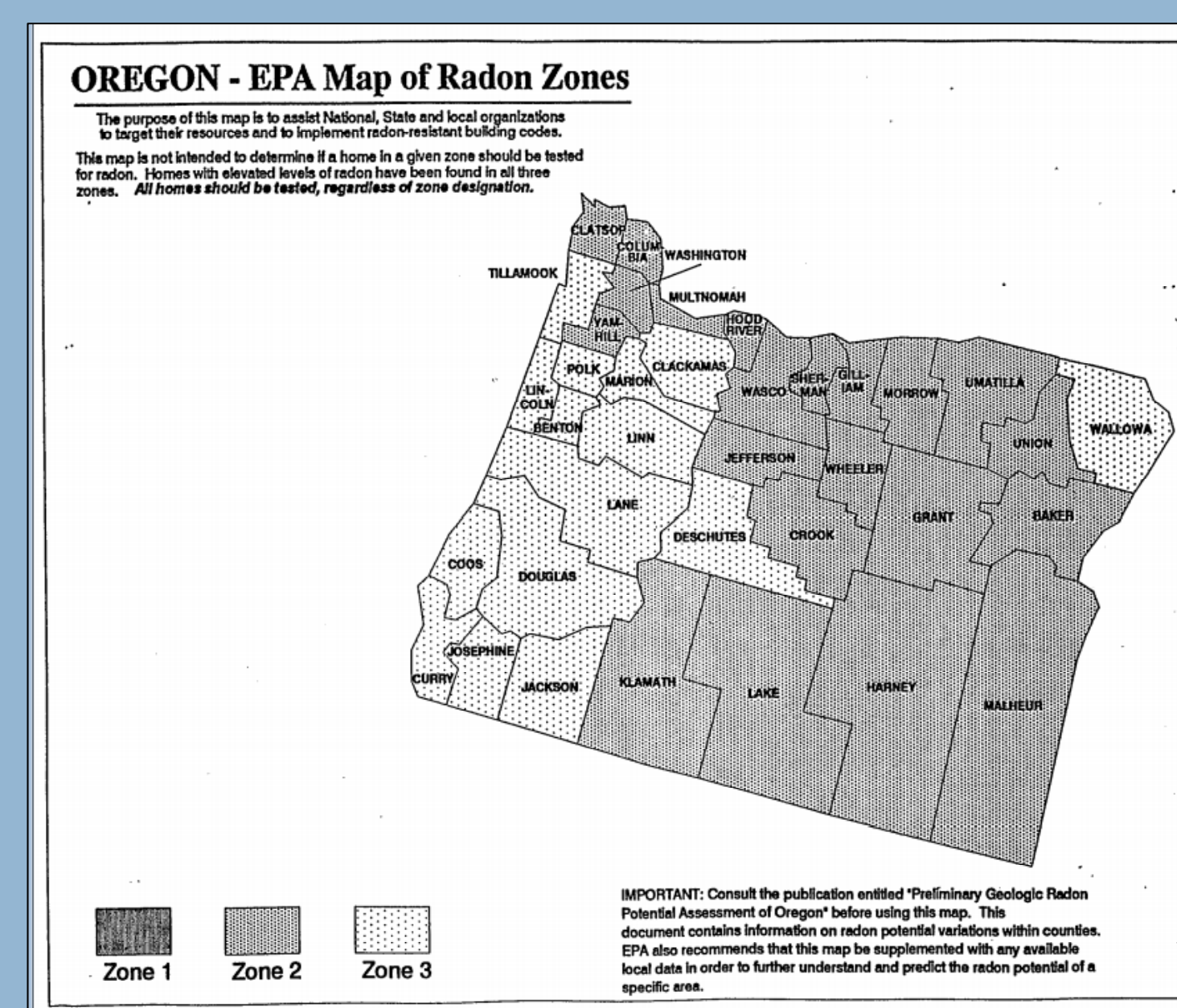
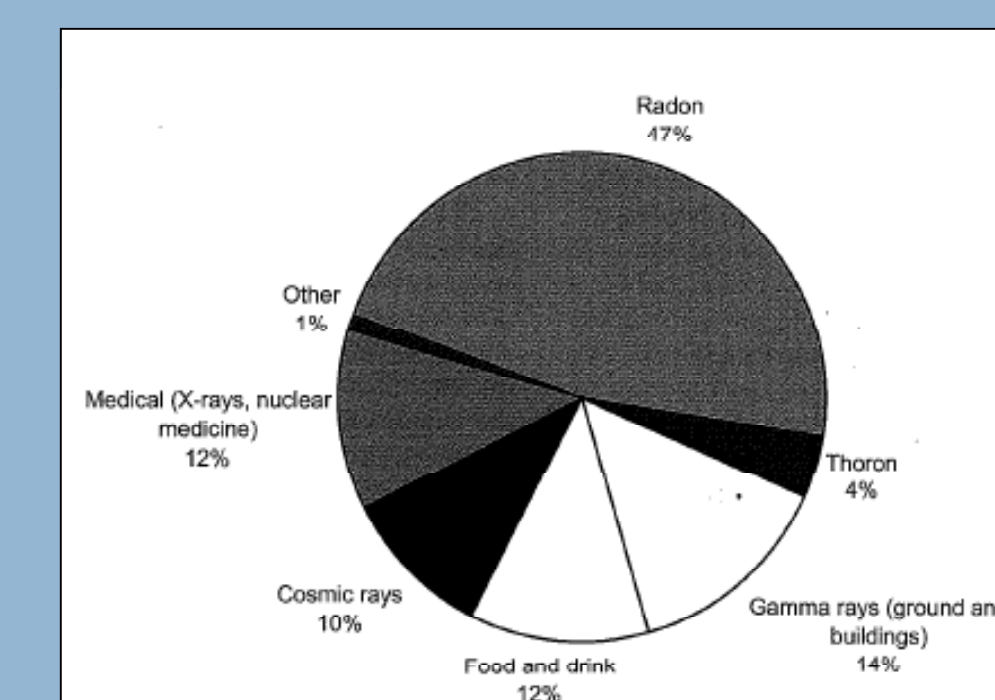


Figure 3. Zone 1- average outdoor levels greater than 4pCi/L. Zone 2- between 2 pCi/L and 4pCi/L. Zone 3- Less than 2 pCi/L.

- 1 out of every 15 homes in the U.S. have estimated to have elevated radon levels.
- Safe levels for radon are said to be below 4.0 pCi/L, anything above can pose a risk to health
- Radon levels may vary. Average outdoor level 0.4 pCi/L, Average indoor level 1.3 pCi/L

Nuclide	Principal mode of decay	Half-life
²³⁸ U	α	4.5 × 10 ⁹ years
²³⁴ Th	β	24.1 days
²³⁴ Pa	β	1.2 minutes
²³⁴ U	α	2.5 × 10 ⁵ years
²³⁴ Th	α	7.5 × 10 ⁴ years
²³⁰ Th	α	1,602 years
²²⁶ Ra	α	3.8 days
²²² Rn	α	3.1 minutes
²¹⁸ Po	α	26.8 minutes
²¹⁸ At	α	1.5 seconds
²¹⁴ Bi	α	19.9 minutes
²¹⁴ Po	α	1.6 × 10 ⁻⁴ seconds
²¹⁴ Pb	β	1.3 minutes
²¹⁴ Bi	β	22.6 years
²¹⁰ Pb	β	5.0 days
²¹⁰ Bi	α	138.4 days
²¹⁰ Po	α	4.2 minutes
²¹⁰ Tl	β	Stable
²¹⁰ Pb	Stable	Stable



Discussion

The most common approach to mitigating radon is referred to a sub-slab depressurization where radon air is drawn up through a pipe using a fan and vents the radon outside. Cracks and holes in the foundation of homes are sealed to make this more effective and prevent radon from entering homes again.

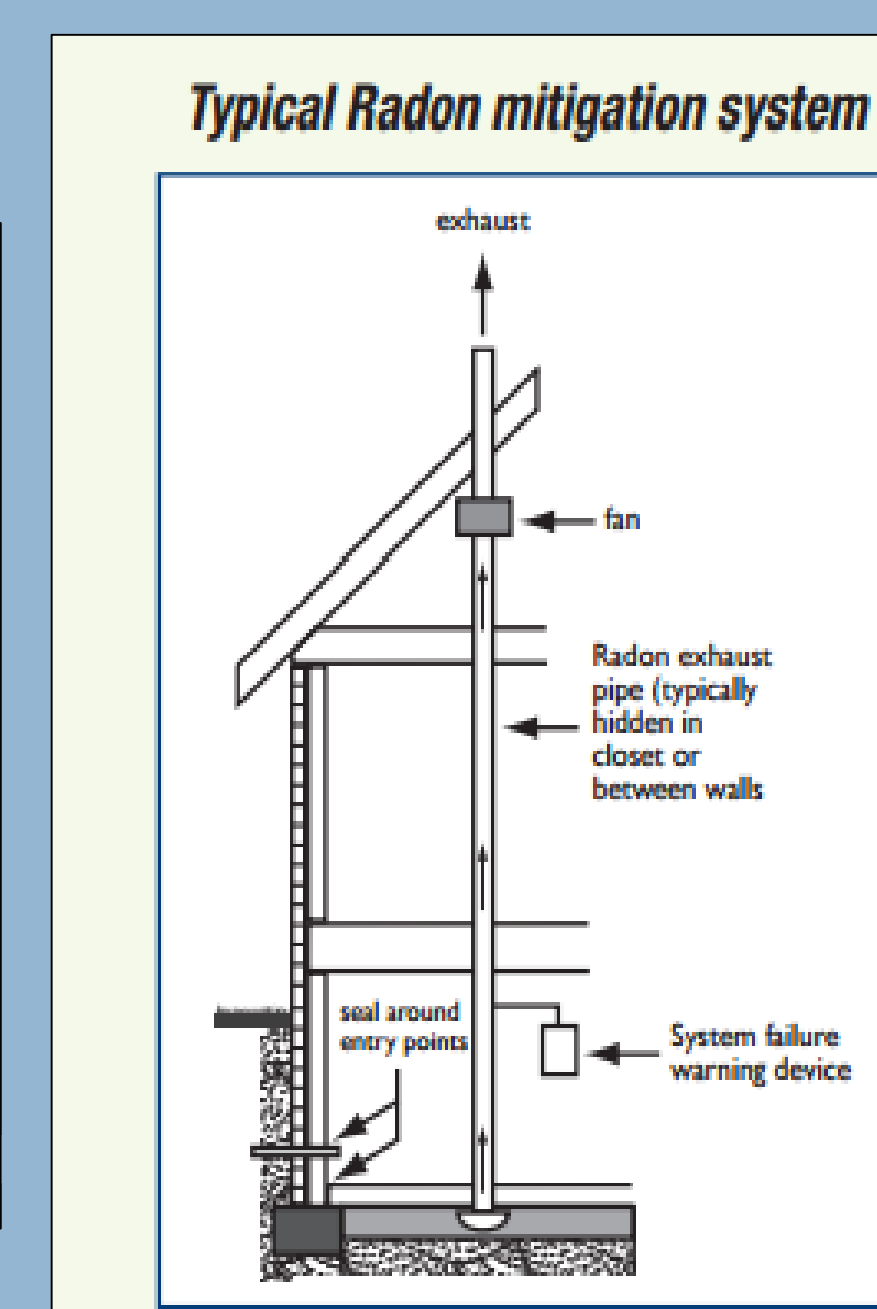


Figure 4. Radon mitigation procedures.

Conclusion

Radon is a natural but hazardous gas that results from the decay of uranium and found in almost all soils. Radon hazard mapping has been used to decrease the risk and map potentially more dangerous areas. There is uncertainty about all the health risks when being exposed to radon, but can cause lung cancer and affects the health of humans if not properly handled and contained.

References

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