



Novel Means of Radon Education from North Dakota

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Objectives

- Into to Radon & North Dakota
- Novel Interventions:
 - *Cell Phones*
 - *Lending library*
 - *Tobacco Quitline*

Take Home Message

What is Radon?

You need to test your house for radon.

• Radon comes from gas.

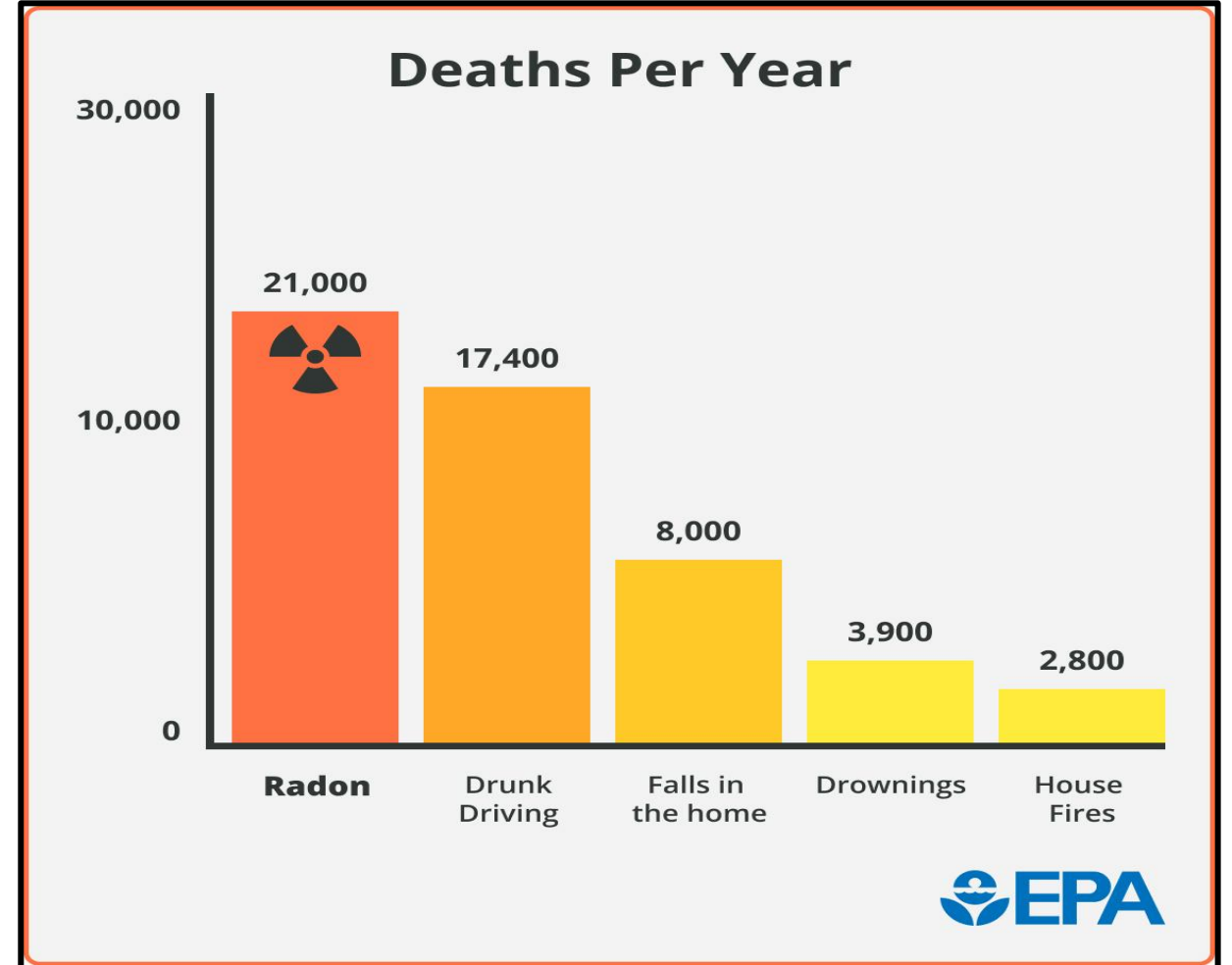
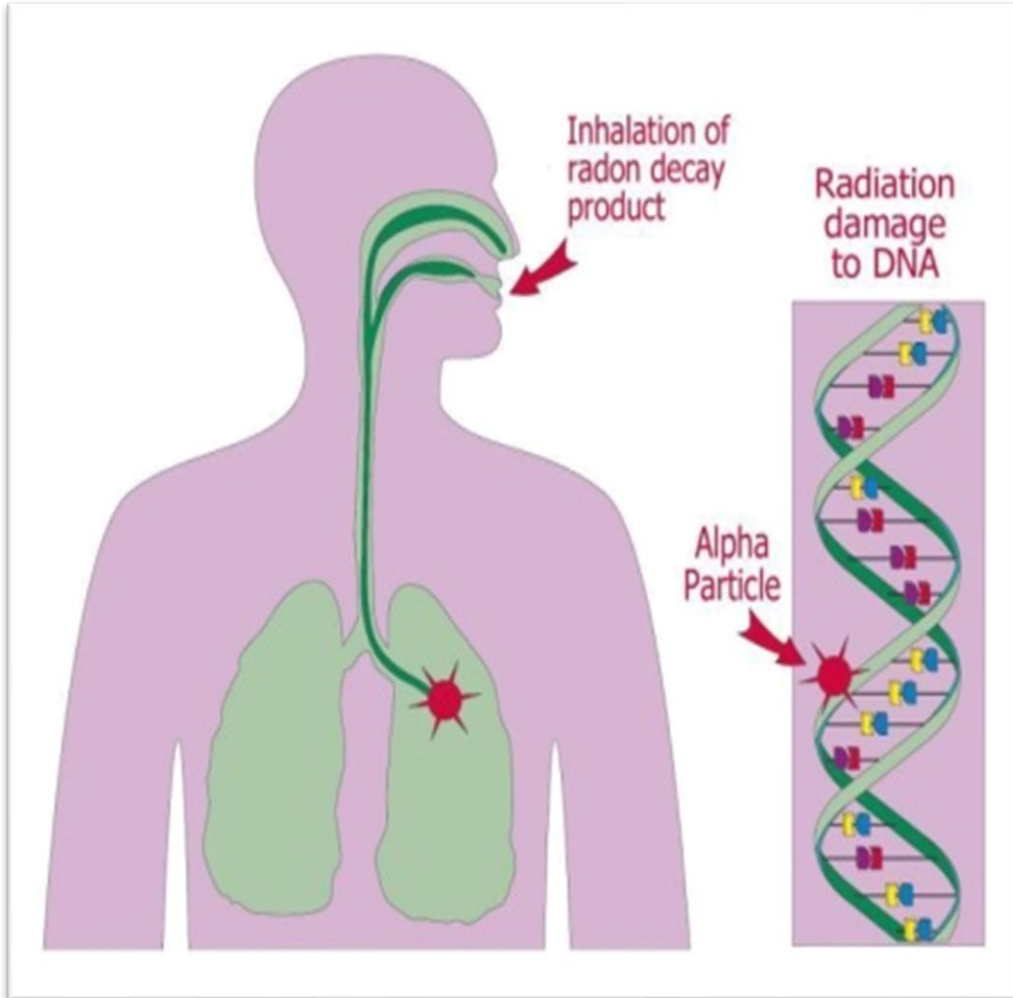
• Radon can kill you, your dog, and it can cause lung cancer.

- You can't see radon
- You can't smell radon
- You can't taste radon
- You can't hear radon

• It comes from underground.



Radon & Lung Cancer



North Dakota



High uranium +
cold winters
High indoor radon

1/15 US homes high radon

*In North Dakota, 2/3
Mean ~ 222 Bq/m³ (6 pCi/L)*

People Don't Test for Radon. *Why?*

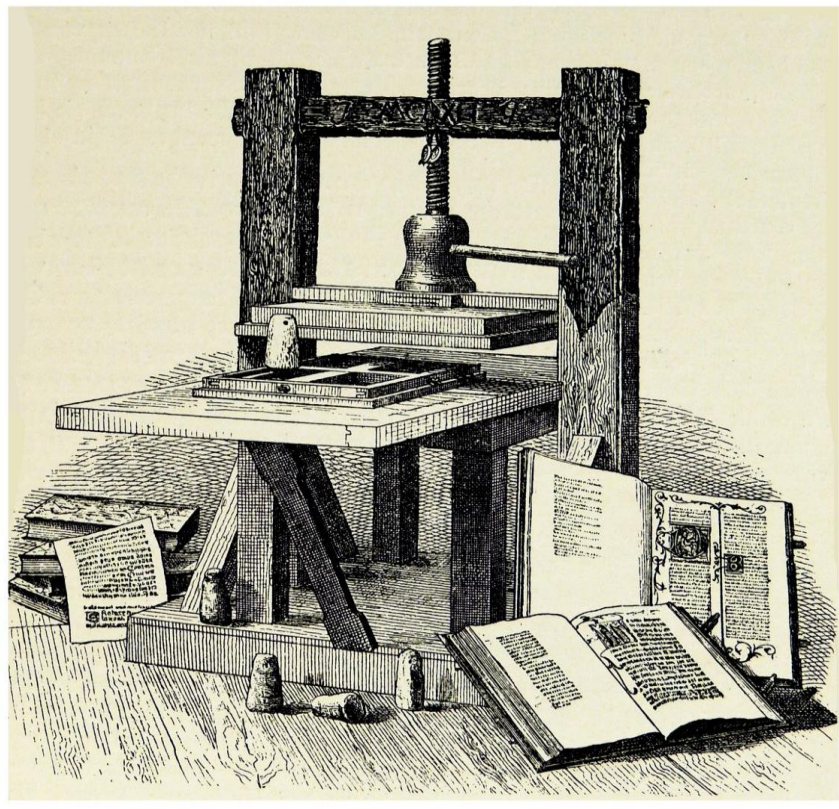
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- Lack of knowledge, clues, laws
- Testing has multiple steps
- *Hypothesis: Our radon communication is outdated*

Communication Methods

Printing Press

1436



iPhone

2007



Radon Communication: New Method

Kim et al. *BMC Public Health* (2020) 20:547
<https://doi.org/10.1186/s12889-020-08677-7>

BMC Public Health

RESEARCH ARTICLE

Open Access

Communicating radon risk via a smartphone app: a pilot intervention study



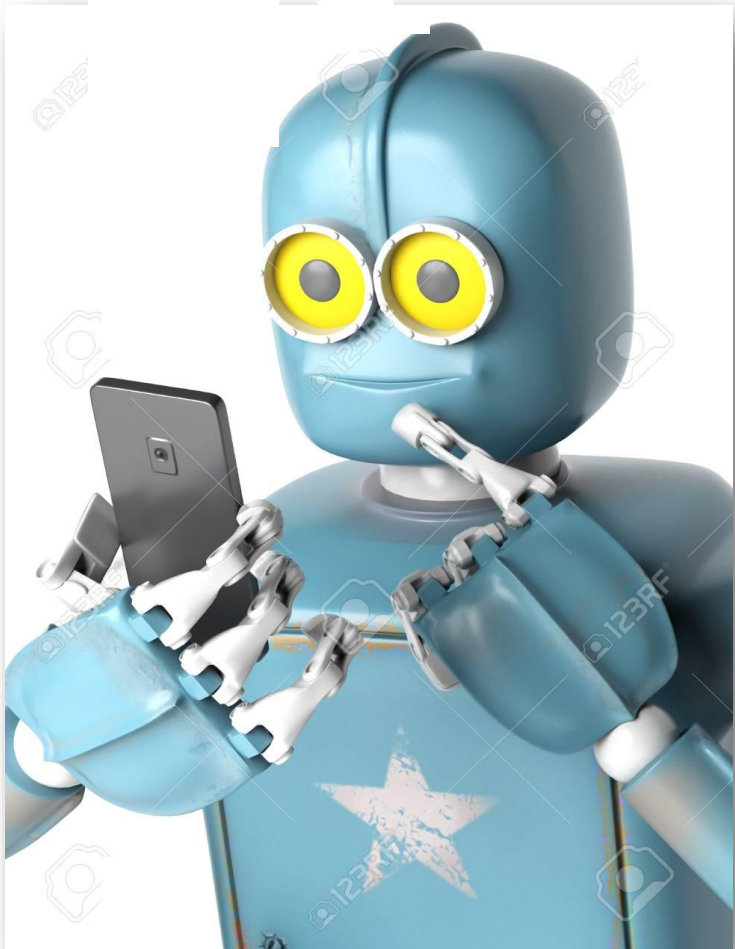
Soojung Kim¹, Michael S. Brewster² and Gary G. Schwartz^{3*}

Population: 97 students mid-Western university.

Methods: We built a radon app & participants downloaded it to their phones.

Outcomes: Radon knowledge, attitudes, & behavior before and after exposure to the app. Bar-coded radon tests showed who ordered and used a test.

Results: Smartphones are a promising method to stimulate radon test requests.



Radon App vs. Brochures: Randomized Controlled Trial



- Participants randomized to **app** or **brochure**
- Radon info differed in format (**phone** vs. **print**)
- Outcomes:
 - Radon knowledge and behavior before & after app or brochure
 - Number of radon test requests

Clinical Trials Summary



- App superior to Brochures in:

- ✓ Radon knowledge
- ✓ Self-efficacy
- ✓ Requests for radon tests

Test utilization low in both groups. So,

How do we increase test use?

Radon Detectors



Charcoal Single Use

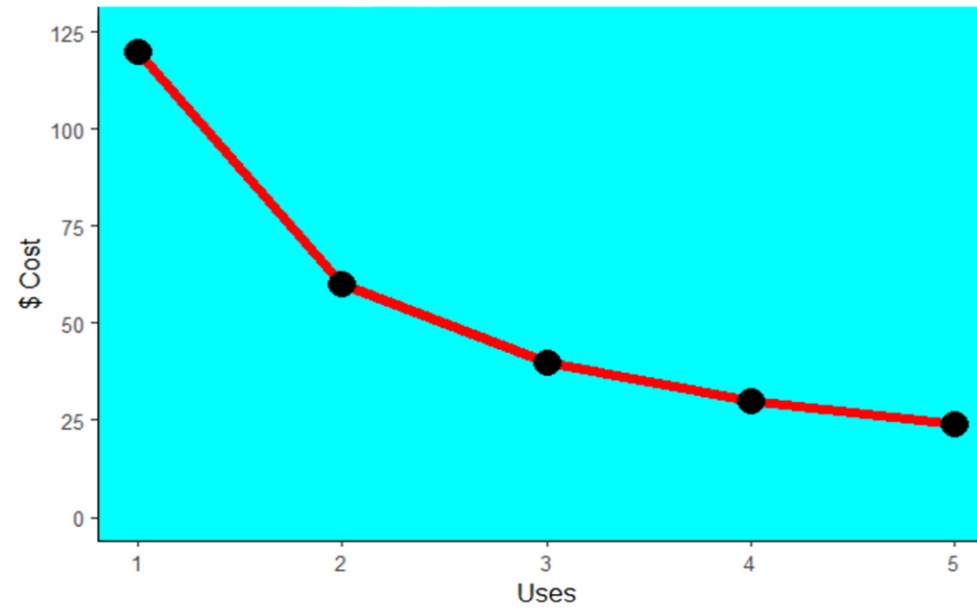
- Cost: \$10
- Use rate: 20%
- *Cost/Use = \$50*

VS

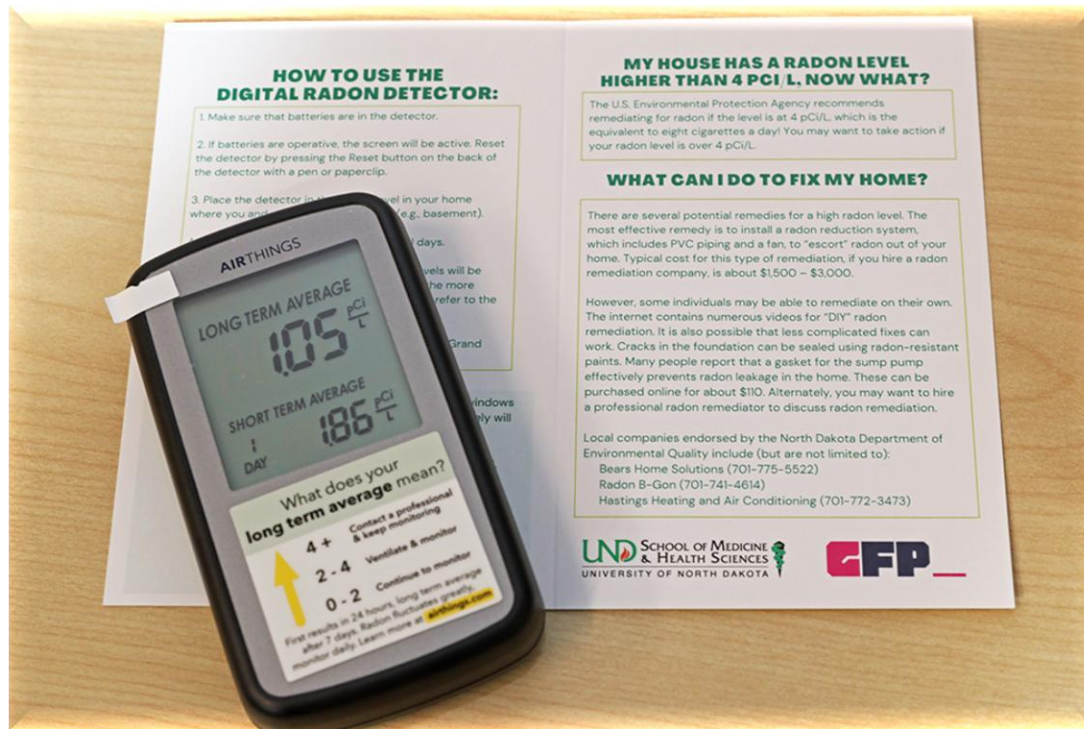


Digital Multiple Use

- Cost: \$120
- Use rate: 500%+
- *Cost/Use = \$120/N uses*



#1 Library Item: Radon Detectors



- We donated 40 digital radon testers to Grand Forks Public Library. Borrow like a book.
- **The** most borrowed library item!
- We replicated this in the Fargo and Bismark Public Libraries, serving a population of 250,000 at a cost of \$15K

Goal: Reduce Lung Cancer Deaths

1 in 4 smokers exposed to 20 pCi/L radon will get lung cancer



Smoking, combined with exposure to high levels of radon,
increases your lung cancer risk by 10x

Tobacco Quitlines

NDQuits

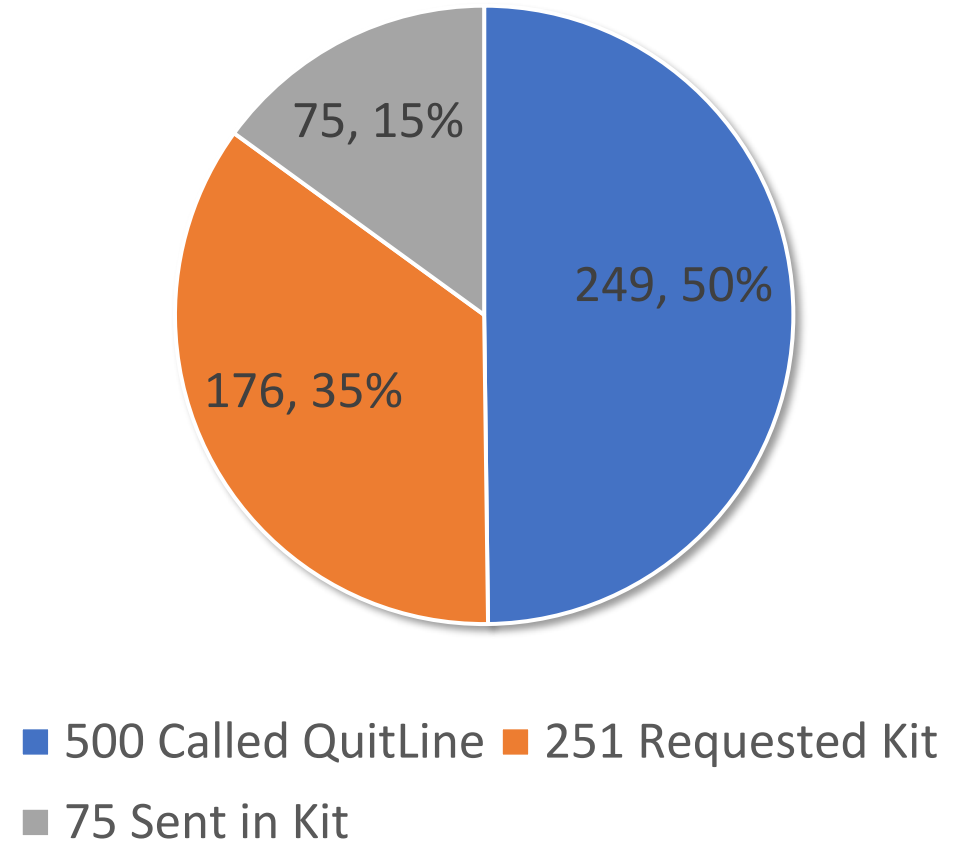
1-800-QUIT-NOW (1-800-784-8669)

hhs.nd.gov/ndquits

- Telephone-based services help smokers quit
- In many countries and all US states
- Free services:
 - Counseling; Rx drugs, etc.
 - ***Why not radon tests?***

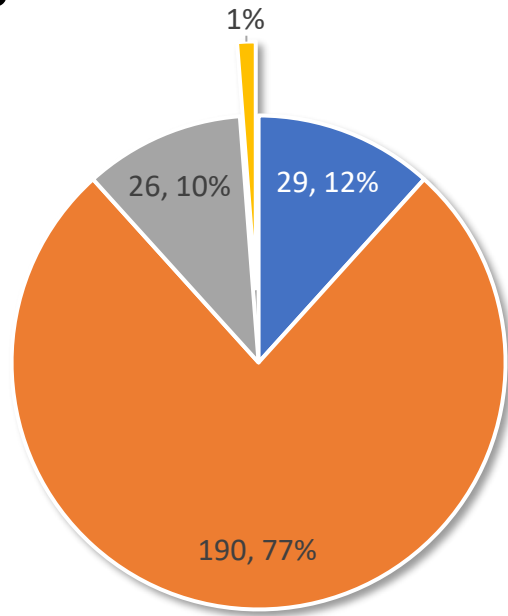
North Dakota Tobacco Quitline

- Callers offered free radon tests 2/2021- 2/2023
- Measured demographics and the return of the tests for the first 500 callers



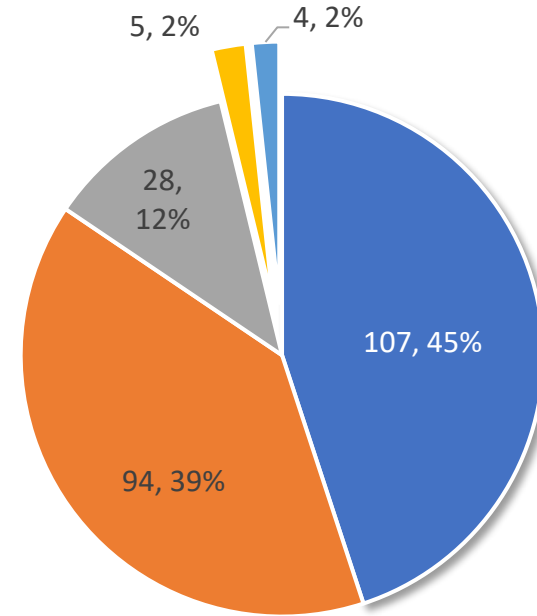
Smoking History

Age Started Smoking



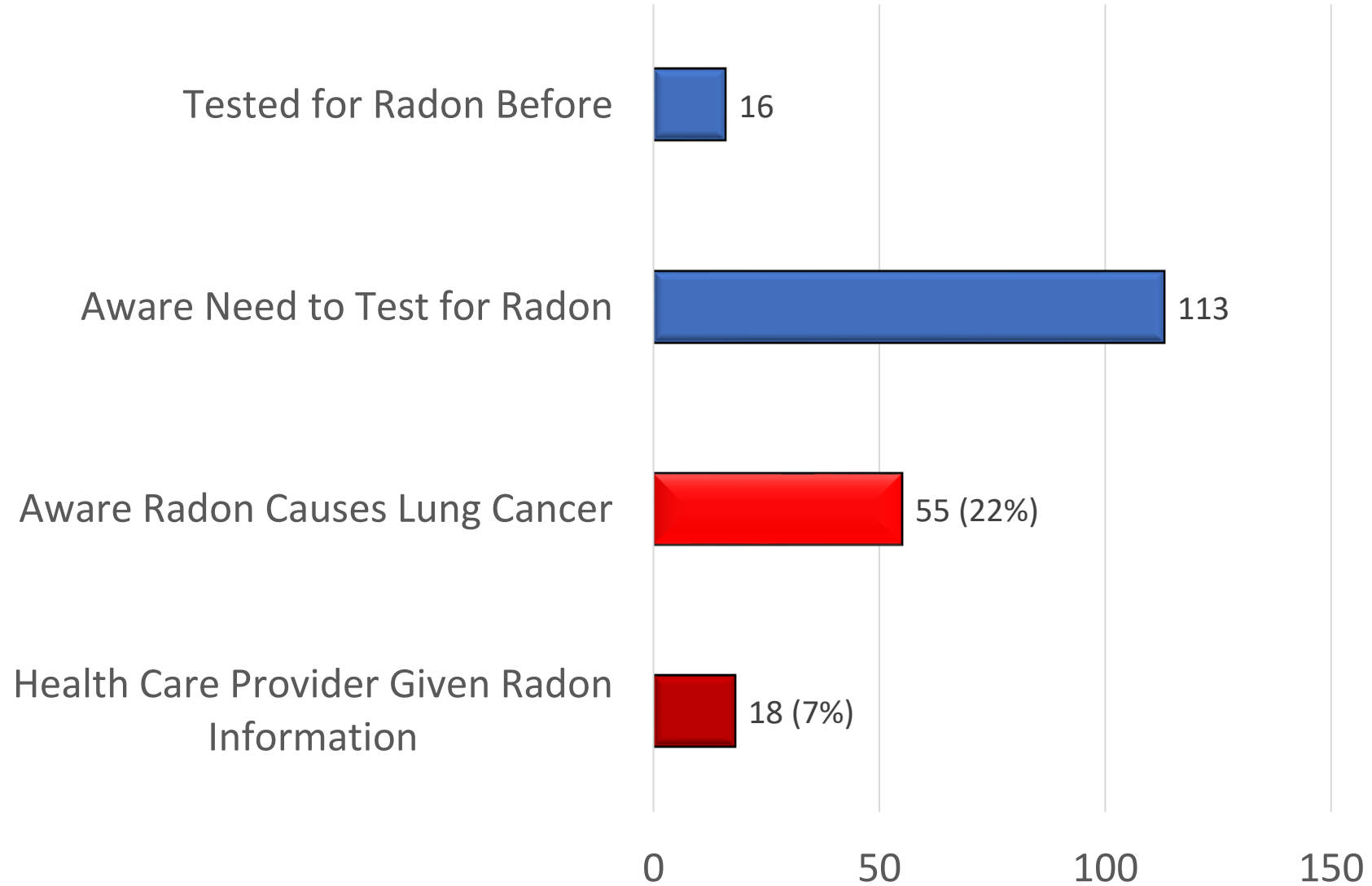
■ 5-12 ■ 13-20 ■ 21-40 ■ 41-62

Packs per Day

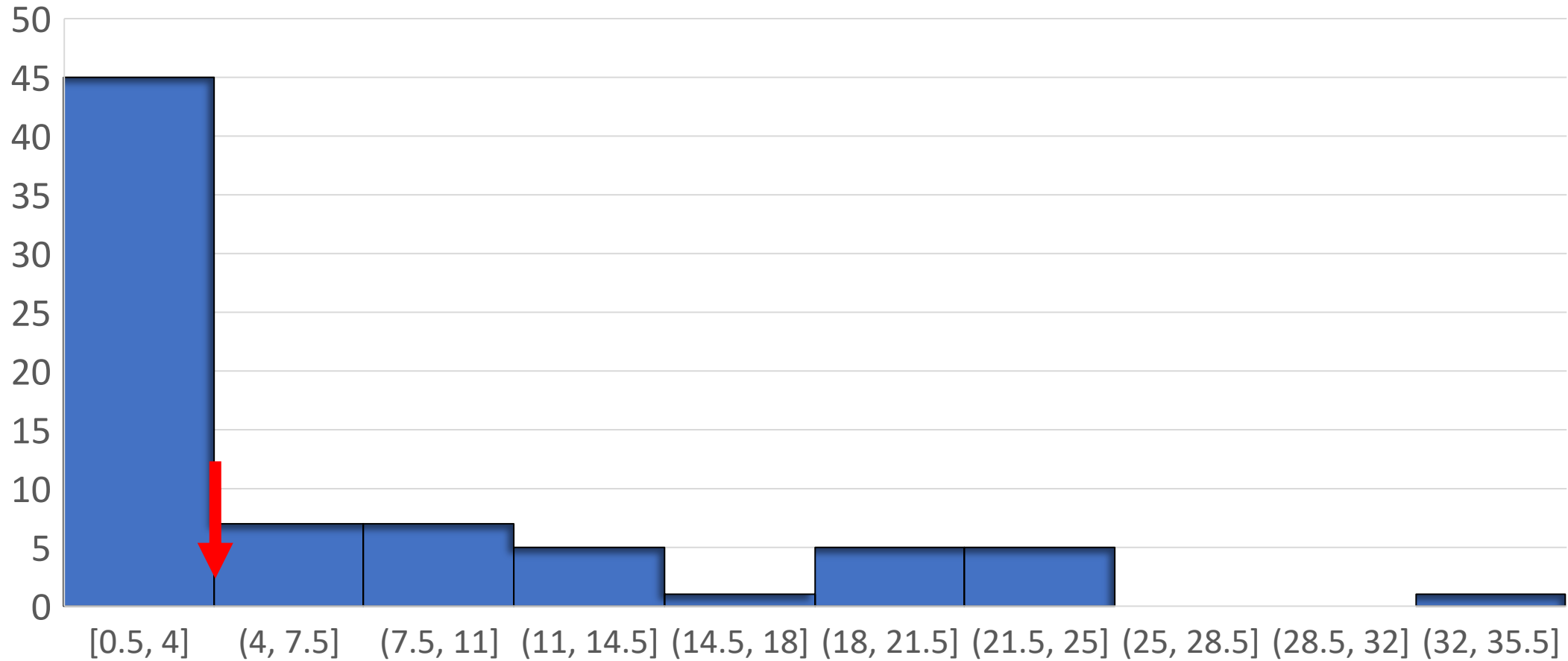


■ 1 ■ 2 ■ 3 ■ 4 ■ 5

Radon Knowledge

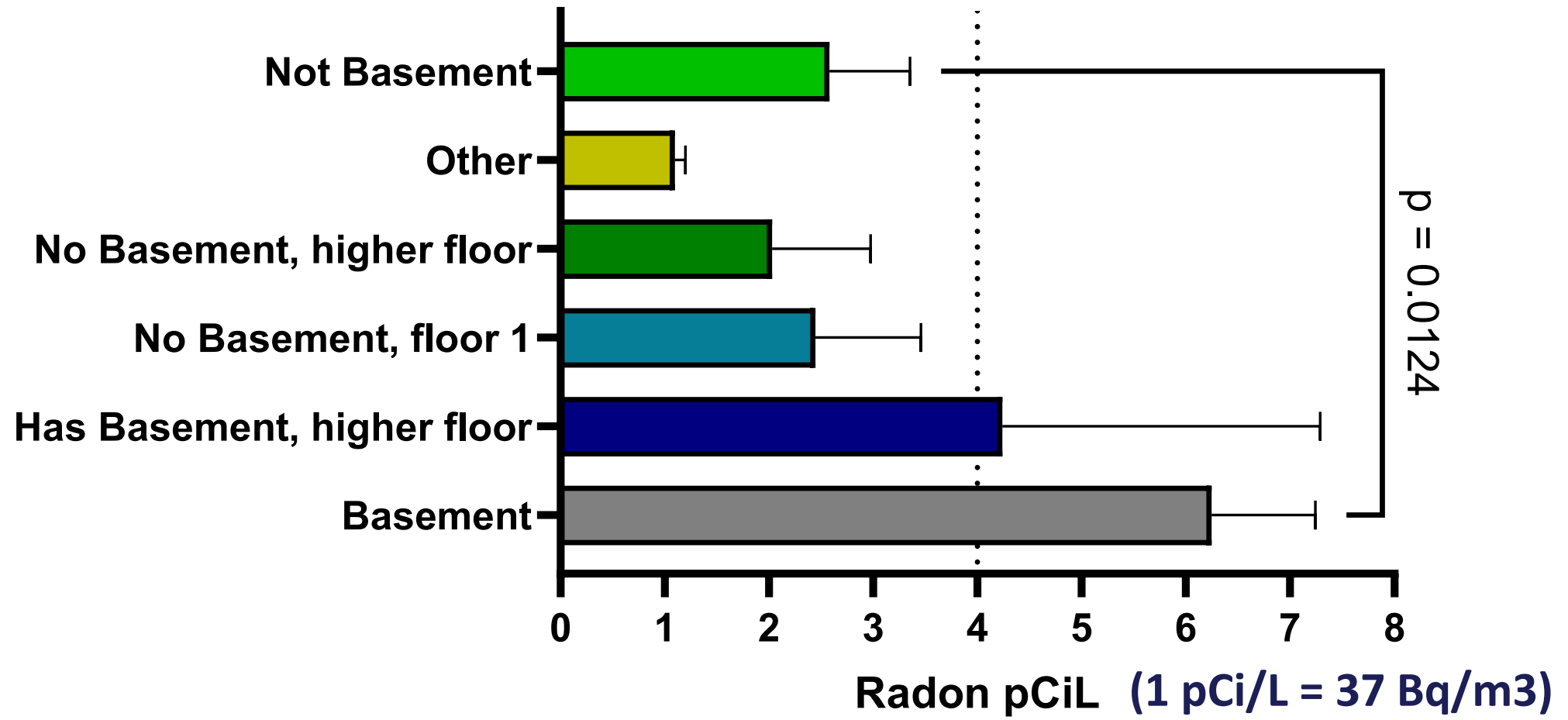


Radon Levels, pCi/L



Mean radon 181 Bq/m³ (4.9 pCi/L).
> 50% > 148 bq/m³ (4.0 pCi/L)

Radon Level by Location

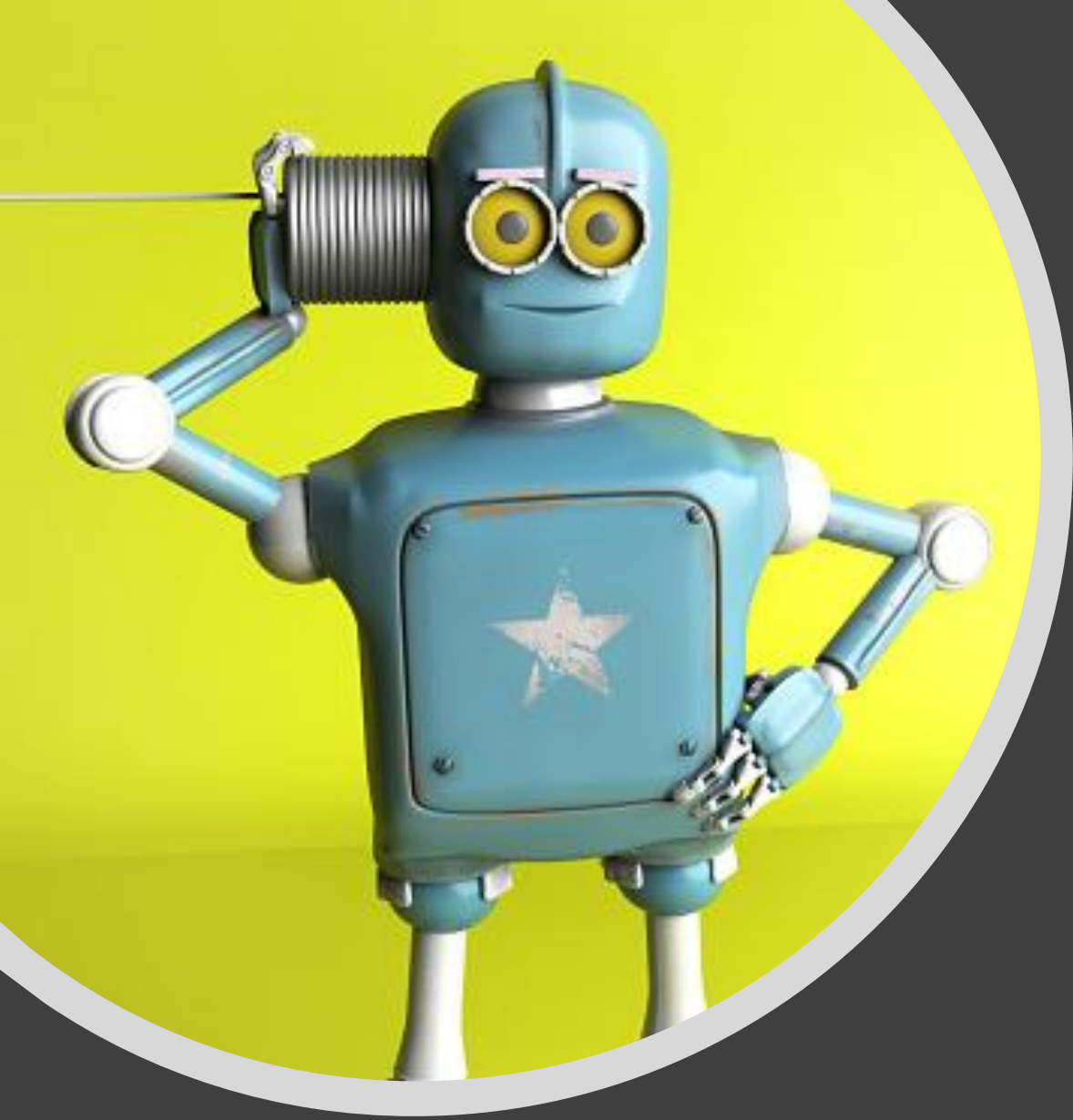


Of the first 500 callers to the ND Quitline:



- Radon knowledge low: **22% knew radon causes cancer**
- **50% chose a free radon test**
- **30% used it**
- *50% of tests > 148 Bq/m³ (4.0 pCi/L)*

Free radon tests are a valuable addition to Quitlines, esp in states where radon &/or smoking is high



Take Home Message

- Radon is a poorly known hazard
- We made testing *immediate* and *accessible* via cell phones, lending libraries, and free tests to smokers
- These approaches can be adopted easily by other states

Acknowledgements



Radon Outreach and Research

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[Radon Outreach And Research \(ROAR\) | University of North Dakota](#)