DETERMINANTS OF RADON TESTING IN MINNESOTA

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INTRODUCTION

- Radon is a colorless, odorless, radioactive gas[1].
- It's the second leading cause of lung cancer in the U.S. only trailing smoking[2].
- Radon accounts for approximately 21,000 deaths annually[1].
- Minnesota's average radon levels are more than 3 times the national average[2].
- The study aimed to identify if psychological factors, specifically radon knowledge and worry, could predict the successful completion of a home radon test[3]

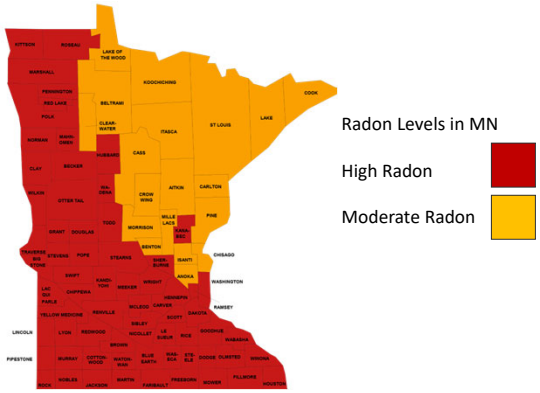

Figure 1. Map of MN radon levels[4].

METHODOLOGY

- The study analyzed a sample of 581 Minnesota adults from the 10,000 Families Study (10KFS) who opted into radon testing.
- Participants self-reported their levels of radon worry and knowledge via Likert scale questionnaires before receiving a short-term AirChek radon test kit.
- The outcome, successful testing, was defined as returning the kit to the lab and receiving a valid radon reading.
- Multivariable logistic regression was used to determine the association between psychological factors and testing success, adjusting for demographics age, gender, race, income, education, children in the home, and smoking status

PSYCHOLOGICAL MEASURES

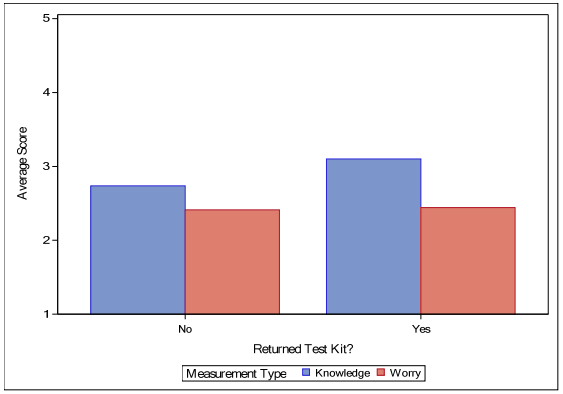

Figure 2. Average radon worry and knowledge levels by testing completion status.

RESULTS

- Among participants who opted in to radon testing, 75.6% (439/581) successfully returned their kits.
- Higher radon knowledge was significantly associated with successful testing in the crude model (OR 1.40, 95% CI: 1.17, 1.69), though this effect decreased when adjusting for education (OR 1.17, 95% CI: 0.98, 1.47).
- Radon worry was not a significant predictor of kit return in either the crude model OR=1.02 (95% CI: 0.87, 1.21) or the adjusted model OR=0.99 (95% CI: 0.83, 1.18).
- Significant independent predictors of successful testing included being an older age (AOR 1.02) and having children living in the home (AOR 1.8).

RADON LEVELS FROM KITS

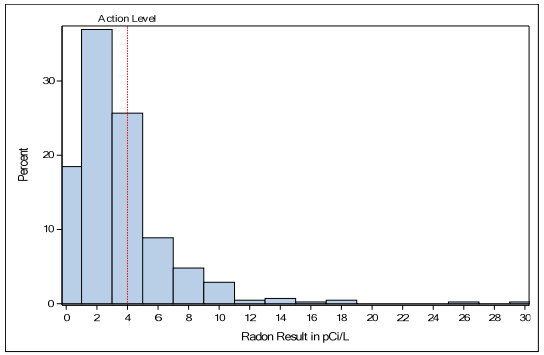

Figure 3. Histogram of radon results

CONCLUSIONS

- The association between knowledge and testing shifted when adding education. Public health campaigns should focus on increasing specific radon knowledge in underserved communities rather than general awareness.
- The study's lack of diversity (91% white and 77.8% female) limits its generalizability to the broader, more diverse Minnesota population.
- Targeted outreach remains essential for high-risk subgroups.

Home radon test kit.

REFERENCES

1.Radon and Cancer - NCI. December 6, 2011. Accessed March 17, 2026. https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/radon/radon-fact-sheet

2. Radon in Minnesota - MN Public Health Data Access portal. MN Data. Accessed February 10, 2026. https://data.web.health.state.mn.us/radon

3. Stanifer SR, Rayens MK, Wiggins A, Hahn EJ. Social Determinants of Health, Environmental Exposures, and Home Radon Testing. *West J Nurs Res*. 2022;44(7):636-642. doi:10.1177/01939459211009561.

4. https://www.radonmn.com/results.php

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