

FRESH: Dual Home Screening for Lung Cancer Prevention

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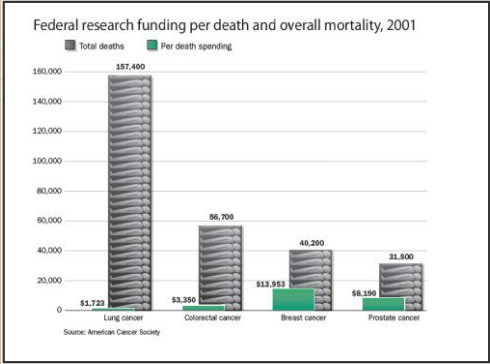
Disclosure

- The project described is supported by Award Number R01ES021502-01 (9/1/12-5/31/17) from the National Institute of Environmental Health Sciences. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Environmental Health Sciences or the National Institutes of Health.

In Memoriam...."I just did not know"



Lois, a never smoker, died from radon-induced lung cancer, September 2013



Age-adjusted Lung Cancer Incidence Rates 2006-2010 U.S. versus Kentucky*

Race	US Male ¹	KY Male ²	KY Appalachian Male ²	US Female ¹	KY Female ²	KY Appalachian Female ²
All Races	74.3	125.9	143.9	51.9	80.3	84.9
White	74.5	125.6	144.4	54.6	80.7	85.4
Black	95.8	144.2	135.5	52.2	82.9	71.8

*All rates per 100,000 population

¹Data Source: NCI/SEER <http://seer.cancer.gov/staffacts/html/lungb.html#incidence-mortality>

²Data Source: Kentucky Cancer Registry <http://www.cancer-rates.info/ky>

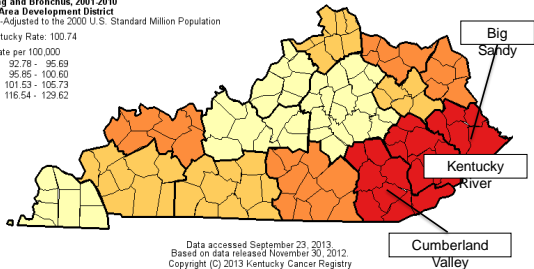
Lung Cancer Incidence by Area Development District

Age-Adjusted Invasive Cancer Incidence Rates in Kentucky
Lung and Bronchus, 2001-2010
By Area Development District
Age-Adjusted to the 2000 U.S. Standard Million Population

Kentucky Rate: 100.74

Rate per 100,000

- 92.78 - 95.69
- 96.65 - 100.60
- 101.53 - 105.73
- 116.54 - 129.62



Data accessed September 23, 2013
Based on data released November 30, 2012
Copyright (C) 2013 Kentucky Cancer Registry

Data Source: Kentucky Cancer Registry
<http://www.cancer-rates.info/ky>

Our Vision: Clean Air Free of Secondhand Smoke and Radon



"Trust me, background radiation—it's the new secondhand smoke."
James Gamble III, New York City



- Freedom from
- Radon Exposure and
- Smoking in the
- Home

Can Dual Home Screening Reduce Exposure?

Tobacco Smoke and Radon Cause Lung Cancer

- Smoking and secondhand smoke combined are the #1 cause of lung cancer.
- Radon is the 2nd leading cause of lung cancer.



Tobacco, Radon, & Lung Cancer

• Tobacco Smoke

- 85% lung cancer cases caused by tobacco smoke.
- 3,000 lung cancer deaths per year among nonsmokers from secondhand smoke



• Radon

- 20,000 lung cancer deaths per year from radon exposure (only 2,100-2,900 among never smokers)
- Of those exposed to at least 4 pCi/L of radon, the risk of developing lung cancer is estimated at 6/100 for smokers and 7/1,000 for nonsmokers.
- Most never smokers with lung cancer are women.

Radon and Lung Cancer

- Soil gas infiltration primary source of indoor radon exposure.
- Most radon-induced lung cancers are associated with low to moderate radon concentrations.
- When radon gas is inhaled, alpha particles are emitted by the radon decay products (Po and Pb), leading to significant DNA damage.
- Radon decay products create Pb-210, a semi-stable isotope of lead (half-life 22 yrs)

Synergistic Effects of Secondhand Smoke and Radon

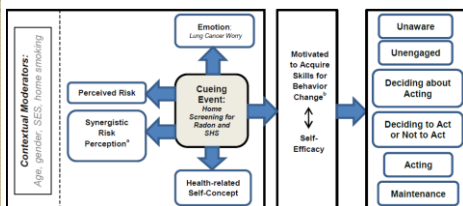
- Secondhand smoke particles linger in the air and are small enough to be inhaled directly into the lungs.
- Radon byproducts have a static charge and are attracted to secondhand smoke particles in the air.
- The combination of radon attached to secondhand smoke particles greatly increases the likelihood of lung cancer.

Purposes of the Study

- Test the effects of FRESH on:
 - (a) home exposure to SHS and radon and the likelihood of taking action among homeowners.
 - (b) Teachable Moment psychosocial factors
- Examine the differential effects of home smoking on taking action.
- Explore impact of FRESH on renters
- Identify factors associated with use of monetary incentive for radon mitigation (*simulated tax credit*)



Create a Teachable Moment!



Adapted from the Teachable Moment model (McBride et al., 2003)

FRESH: Dual Home Screening for Lung Cancer Prevention

- Pilot Funding from Markey Cancer Center; UK College of Nursing, UK Got Grants Program
- Brief, home screening and environmental feedback intervention (FRESH)
- 50 parents recruited in pediatrician's office and received free home radon and air nicotine kits.
- 2-month follow up survey
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute of General Medical Sciences (NIGMS)
- R01ES021502-02 (9/1/12-5/31/17)



Hahn, E.J., Rayens, M.K., Kerckmar, S.E., Adkins, S.M., Wright, A.P., Robertson, H.E., Rinker, G. (in press). Dual home screening and tailored environmental feedback to reduce radon and secondhand smoke: An exploratory study. *Journal of Environmental Health*.

Primary Pilot Findings

- Of the returned kits, 26% were > 4.0 pCi/L and 38% had nicotine > .1 µg/m³.
- Of those with high radon, more than half had contacted a mitigation specialist or planned contact.
- Of those with positive air nicotine, 75% had adopted smoke-free homes.
- Significant increase in perceived risk for lung cancer and synergistic risk perception after FRESH (regardless of home smoking).

Follow up Focus Group

- Reasons to test for radon and SHS:
 - Potential impact on their children
- Wanted very little information when their levels were low
- Thought telephonic intervention delivery not necessary
 - Use phone for reminders to complete testing and/or surveys.

Study Design



- RCT with stratified sampling to ensure equal proportion of those exposed to SHS in the home
- Recruit homeowners (n = 520) and renters (n = 46) at UK Family Medicine Clinic & Pharmacy
- Baseline electronic survey (\$10)
- Intervention
 - Free home test kits for radon and SHS
 - Environmental feedback intervention post-results (8-10 weeks post-enrollment)
- Follow up online surveys to assess behavior change (3-9-15 mos; \$20-\$30-\$40)
- 17-month home testing

Treatment Group (n = 260)

Control Group (n = 260)

- Free radon and SHS test kits and brochures at enrollment
- \$20 if return both test kits.
- If results high, brief problem solving via telephone.
- Tailored environmental feedback intervention via U.S. mail.
- Voucher to cover 30% of the radon mitigation cost up to \$600 (simulated tax credit).

- Brochures and coupon for free test kits
- If they request a test kit, they will simply receive the results by mail
- Referred to the health department for information on radon, mitigation, quitting smoking, and reducing SHS exposure.



Renter Sub-study (n = 46)

- Expand intervention to query concerns about communicating with their landlord and persuading them to take action
 - Added information on smoke-free rental and public housing and radon mitigation in multi-unit housing to share with landlords
- Simulated tax credit voucher for radon mitigation to landlord.
- Post-study interview using qualitative methods to assess feasibility and acceptability, and to explore the impact and potential challenges of FRESH (\$20)

Radon Test Kit




Secondhand Smoke Test Kit

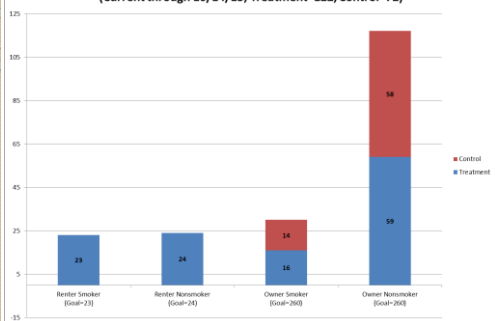


Dual Home Screening

Environmental Feedback Intervention

- Tailored based on one of four conditions
 - high radon/high SHS (radon = ≥ 4 pCi/L; SHS = ≥ 0.1 $\mu\text{g}/\text{m}^3$)
 - high radon/low SHS
 - low radon/high SHS
 - low radon/low SHS
- Brief problem solving via phone 
 - Readiness stage assessment, stage-tailored queries to enhance self-efficacy, motivation, & behavior change
 - Follow-up queries using 5Rs Relevance, Risks, Rewards, Roadblocks, Repetition
 - Stage-tailored goals and actions to reduce risk
- Mailed packet with results and educational materials

FRESH Recruitment Totals by Study Group and Treatment Type
(Current through 10/14/13; Treatment=122, Control=72)



Sample Characteristics (n = 170; 1/13-9/13)

- 66% Female
- 79% Caucasian; 12% African American; 4% Hispanic or Latino; 4% Asian
- Mean Age: 51 Years

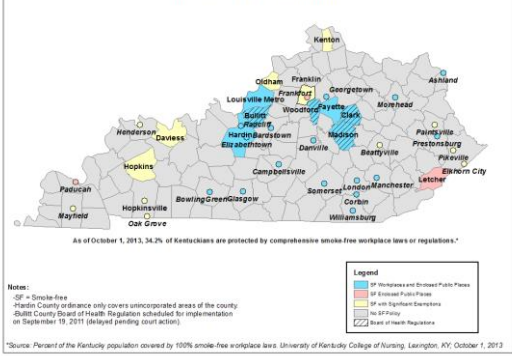


What Can You Do?

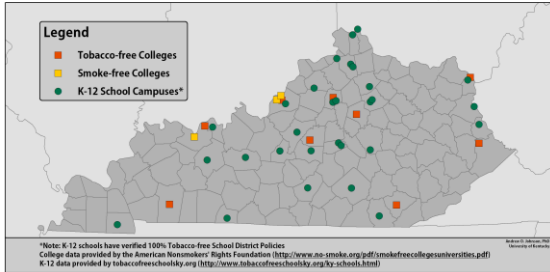
- **Promote Tobacco Treatment**
 - 1-800-QUIT-NOW
- **Promote Smoke-free Homes & Public Housing**
 - At least 30 ft. away from entryways, doors, windows.
- **Promote Tobacco-free Campuses**
 - All products, all the time, everywhere
- **Promote Lung Cancer Awareness Month**
- **Support Local and State Smoke-free Policies**
- **Promote Home Radon Testing**
- **Support Radon Policy Change**



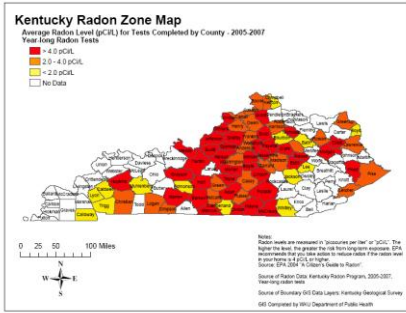
Strength of Smoke-free Laws and Regulations in Kentucky Communities



Smoke- and Tobacco-free School Campuses in Kentucky, 8/5/2013



Exposure to Radon in Kentucky



Clean Indoor Air Partnership

- **Our Mission**
To reduce tobacco use and exposure to secondhand smoke and radon through research, community engagement, and policy surveillance and development in treatment and prevention.



- www.ciapy.uky.edu
- Find *kysmokefree* on twitter and facebook  

Questions?

- For more information, contact us:
 - www.radon.uky.edu
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 - 859-257-2358