

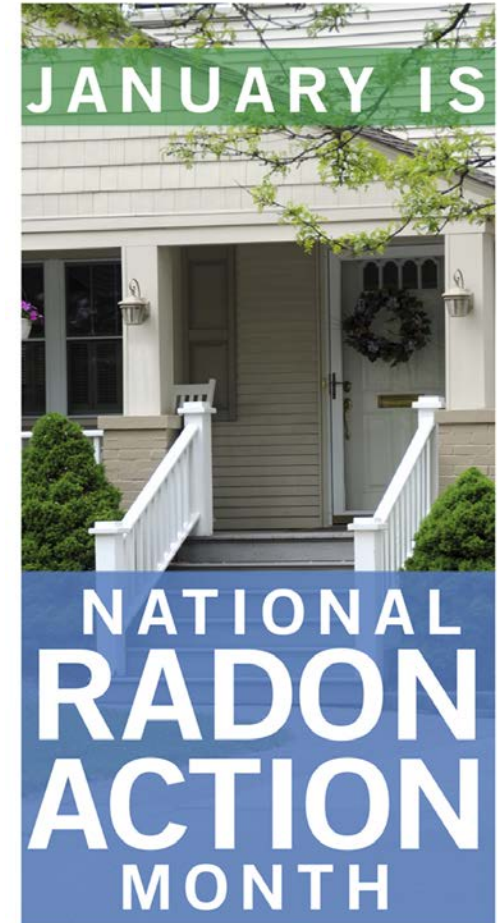
# Cancer in PA: Radon Awareness

## Welcome

Thank you for joining us.

The webinar will begin soon.

#PACancerTrends



[www.epa.gov/radon/nram](http://www.epa.gov/radon/nram)

# Pennsylvania Working Together

This webinar is a joint effort by



# Cancer in PA: Radon Awareness



**Jointly Sponsored by the:**

PA Chapter, American Academy of Pediatrics and the  
University of Pittsburgh  
School of Medicine, Center for Continuing  
Education in the Health Sciences

# Thank you

Thank you to the American Lung Association in Pennsylvania for hosting the webinar.



We appreciate your hard work and dedication.

# Moderator



Kevin M. Stewart, BSCHE



# Presenters

## Radon in Pennsylvania



**Robert K. Lewis**



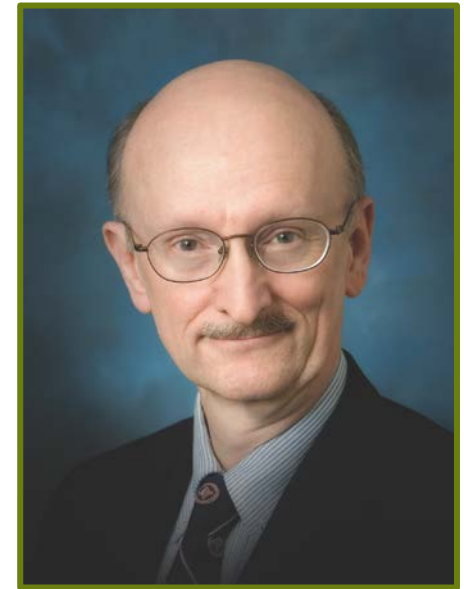
## Radon Health Concerns



**Troy Moritz, DO, FACOS**



## Radon Call to Action



**Alan S. Peterson, MD**



# Data Sources

- Healthy People 2020
- *The Burden Of Cancer In Pennsylvania* report
- US Environmental Protection Agency
- President's Cancer Panel Radon Report
- National Cancer Institute

# Radon in PA

Presenter:  
Robert K. Lewis



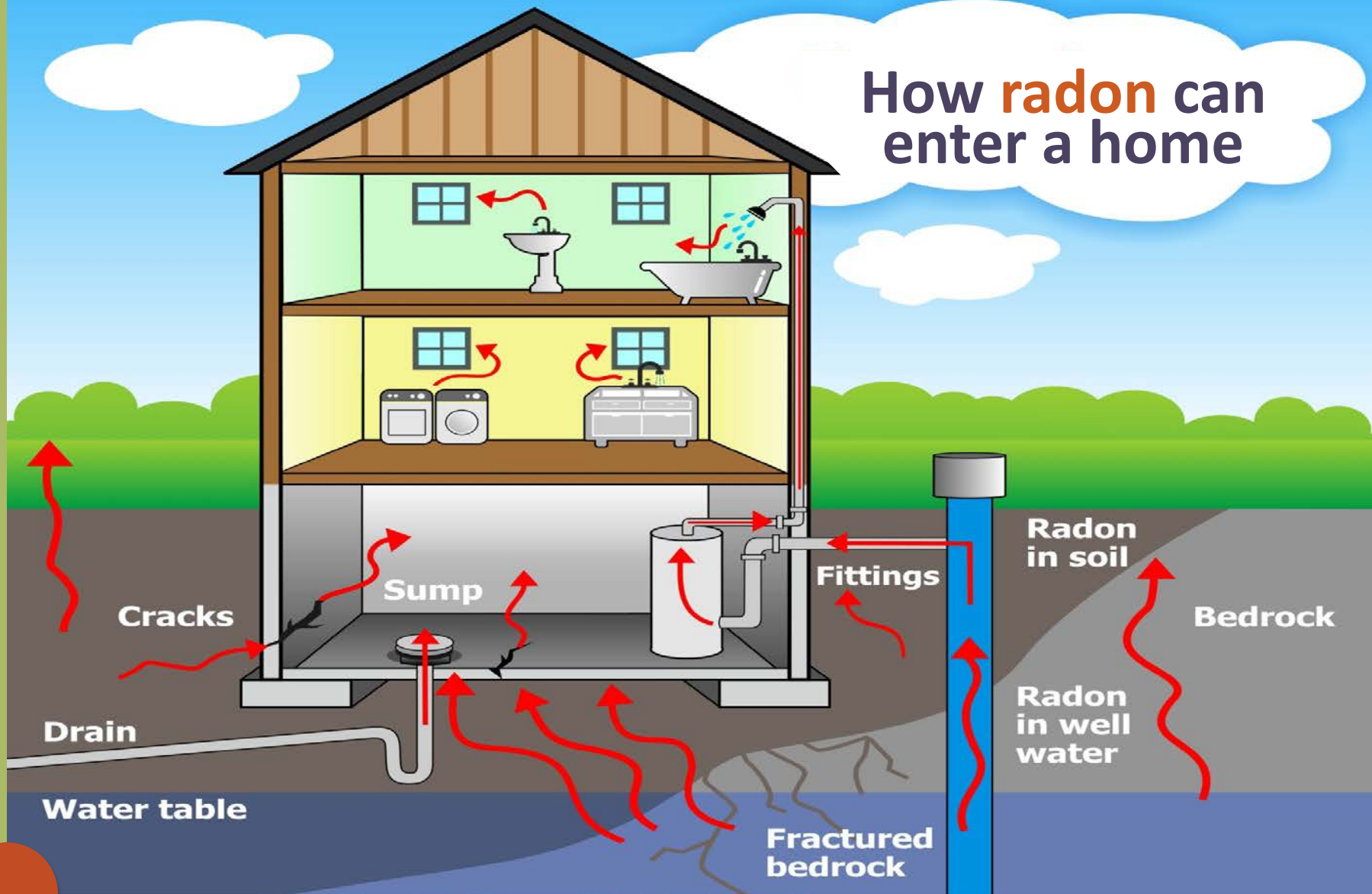


# Radon-222, Characteristics

- Naturally occurring
- Odorless, colorless, tasteless
- Gas
- Radioactive

# Radon

How **radon** can enter a home



# Radon Levels

4 pCi/L action level U.S

0.4 pCi/L Outdoor average U.S.

1.3 pCi/L Indoor average U.S.

7 pCi/L Basement average in PA

3.5 pCi/L First floor average in PA

**> 5,000 PA test results over 100 pCi/L**

# Pennsylvania is unique!

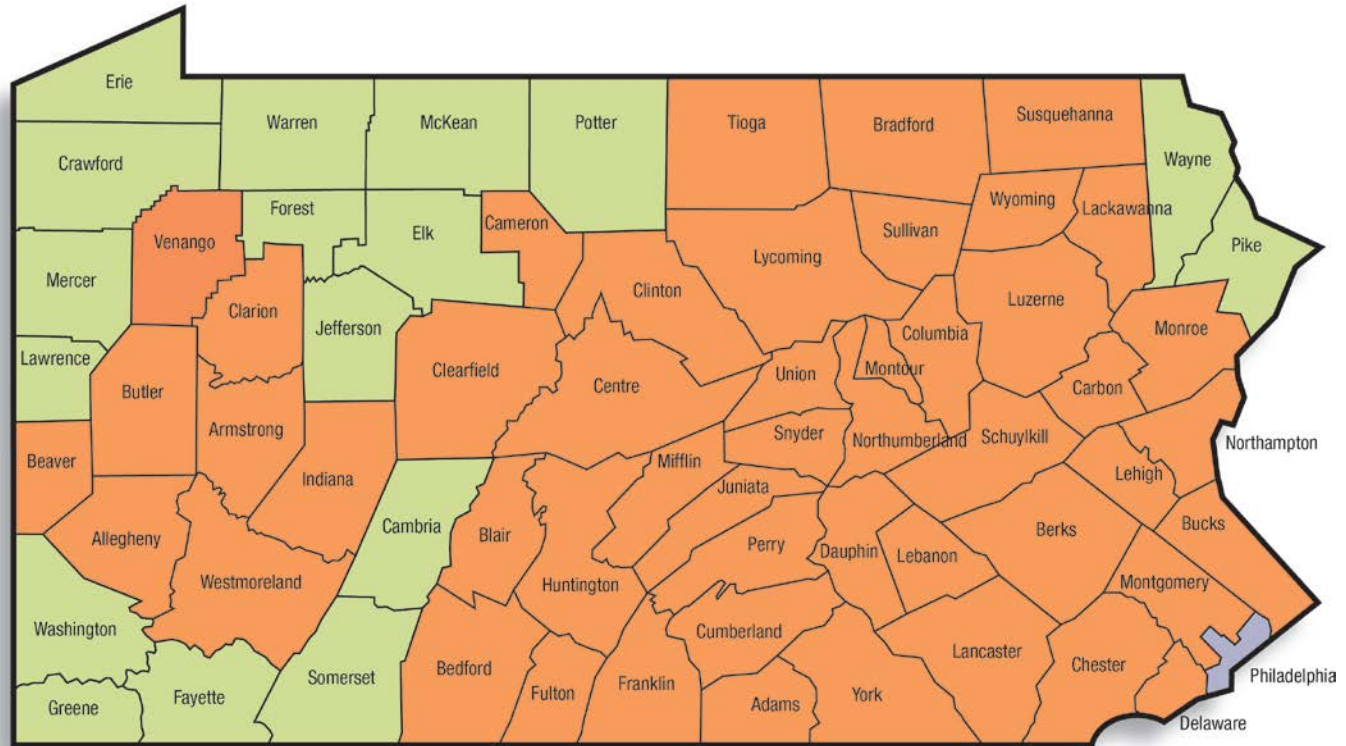
The geology and the soil contribute to PA having some of the highest radon levels in the country

Basements of PA homes average about twice the EPA action level of 4 pCi/L

In PA, approximately 40% of radon test results are greater than the EPA action level

# PA EPA Radon Maps

## Radon potential in Pennsylvania by zones



**Significantly higher**

**Zone 1** counties have a predicted average indoor radon screening level greater than 4 pCi/L (picocuries per liter)

**Not significantly different**

**Zone 2** counties have a predicted average indoor radon screening level between 2 and 4 pCi/L

**Significantly lower**

**Zone 3** counties have a predicted average indoor radon screening level less than 2 pCi/L

# Statewide Data

Radon Level (pCi/L)	Statewide Data
< 4 pCi/L	60.8 %
> 4 pCi/L	39 %
Sample Size	878,600



# Annual Radiation Dose

	U.S.	PA	Difference
Radon	228 mrem/yr.	988 mrem/yr.	760 mrem/yr.
Total Dose*	620 mrem/yr.	1,320 mrem/yr.	700 mrem/yr.

\*Radiation from other sources such as medical procedures, occupational exposure are included in total dose, along with radon.

# Life's Radon Sources

Homes



Schools



Work





# Radon Health Concerns

Presenter:

Troy Moritz, DO, FACOS



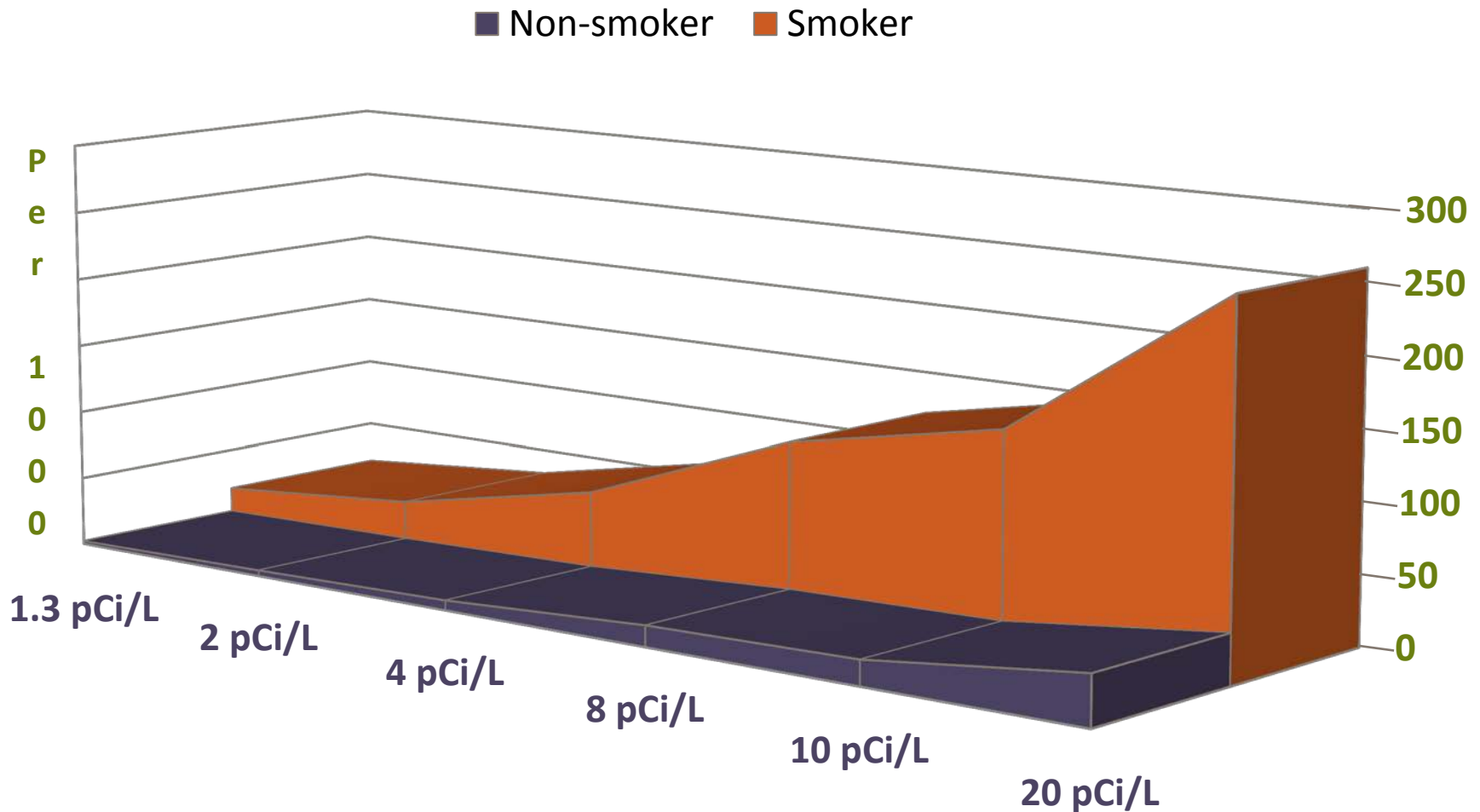
# EPA Risk Chart

If 1000 people are exposed over a lifetime\* the number that could get lung cancer is:

Radon Level	Non-smoker	Smoker
20 pCi/L	36	260
10 pCi/L	18	150
8 pCi/L	15	120
4 pCi/L	7	62
2 pCi/L	4	32
1.3 pCi/L	2	20

\* Assumes 70 years and 18 hours per day = lifetime

# Risk Graph



**Radon Exposure**

# Why Radon is important to Physicians

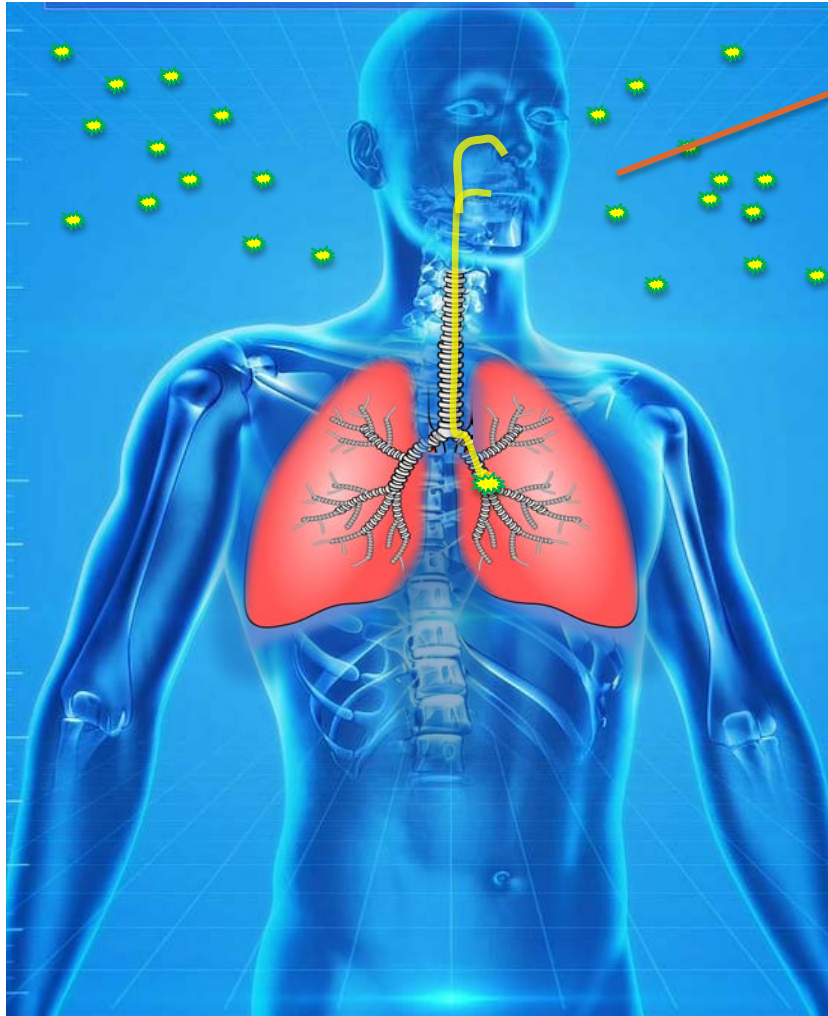
- 1) Not part of my medical school curriculum fifteen years ago
- 2) Need a better answer than “I’m not sure”, when patients stated “How did I get lung cancer.... I never smoked?”
- 3) Knowledge of radon’s impact on lung cancer essential to those that care for lung cancer patients.

# Radon Health Concerns

Class A carcinogen

Lung cancer only confirmed health effect

# How Radon Causes Lung Cancer



Inhalation of  
Radon Decay  
Products

Alpha  
Particle



Radiation Damage to DNA

# Cancer Facts

Most people know that smoking is the **#1** cause of lung cancer.

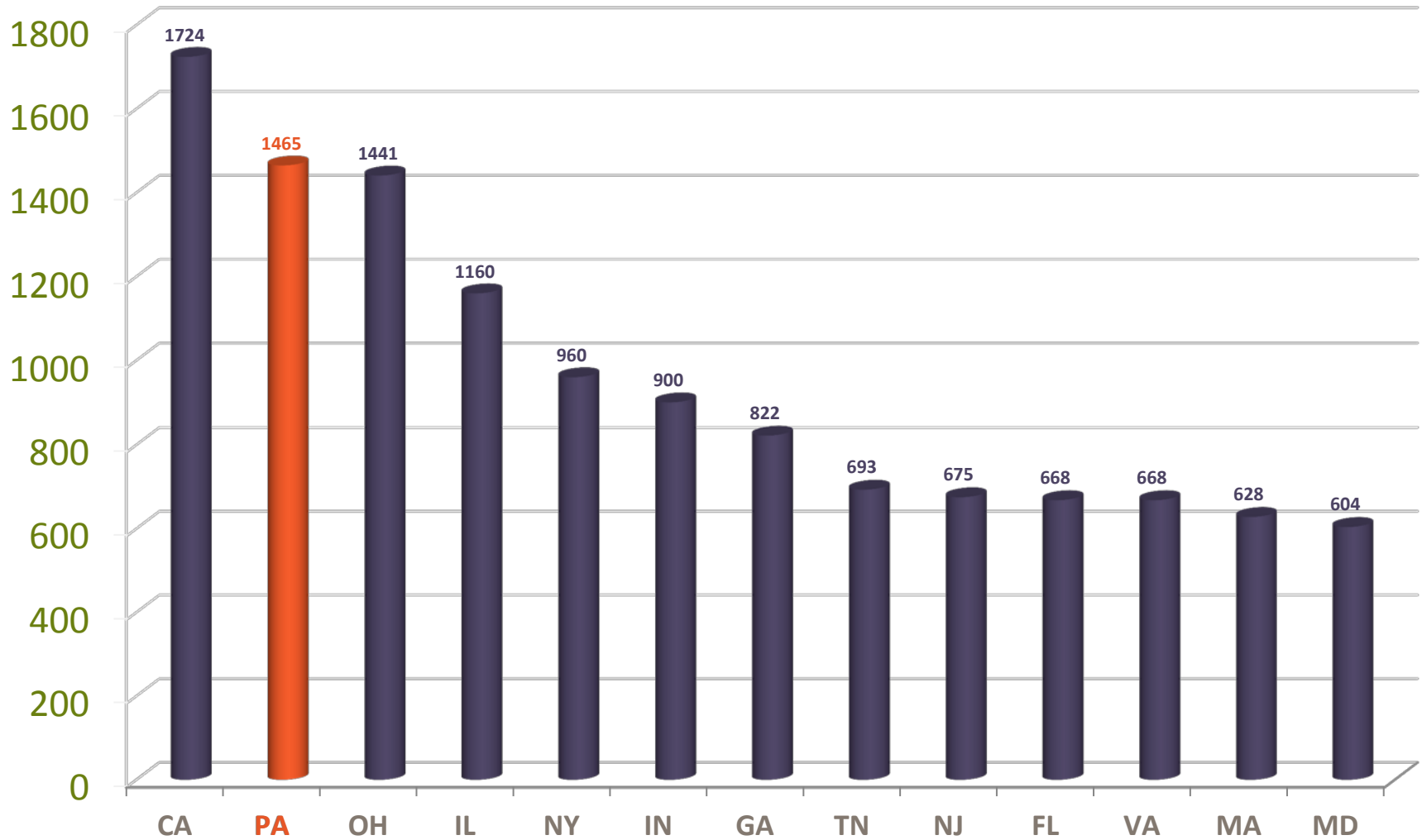
They don't know that radon is the **#2** leading cause of lung cancer

# Cancer Facts

And radon is the **#1** Cause of lung cancer in Non-smokers



# Annual Radon-Related Deaths Deaths



Source: EPA 09/2007

# Radon is a National Health Problem!

## **Recognized by:**

American Cancer Society

American Lung Association

American Medical Association

American Public Health Association

U. S. Environmental Protection Agency

U. S. Surgeon General

# 2008 President's Cancer Panel Radon Report

Cancer Type		Estimated U.S. Deaths/Year
1.	Lung	161,840
	<b>Lung – Radon-induced</b>	<b>21,000</b>
2.	Colon	49,960
3.	Breast	40,930
4.	Pancreatic	34,290
5.	Prostate	28,660
6.	Leukemia	21,710
7.	Non-Hodgkin Lymphoma	19,160
8.	Liver	18,410
9.	Ovarian	15,520

# Radon Health Facts

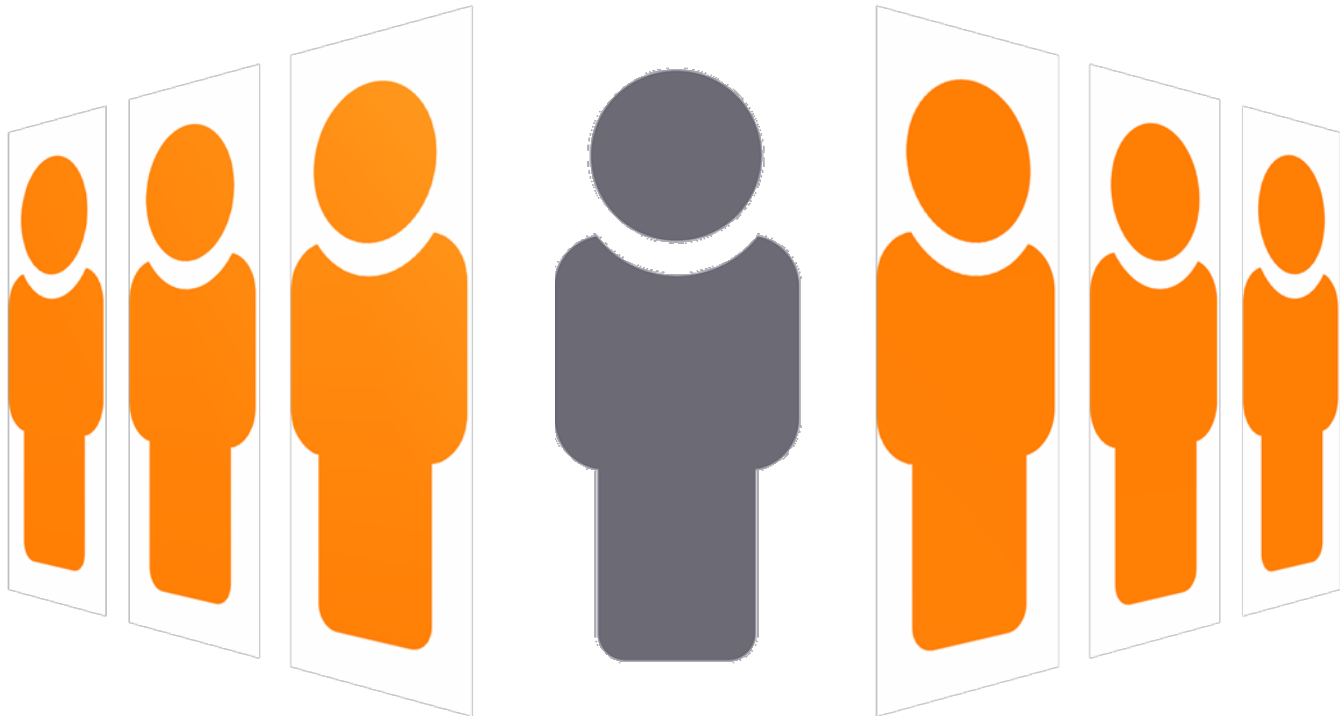
There is no confirmed “safe level” of radon exposure

Demonstrated lung cancer risks to underground miners occur at radon levels that clearly overlap with exposures frequently experienced in Pennsylvania

Pooled residential studies published in 2004 to 2006 confirm an  in **lung cancer risk** on the order of **10 percent at the 2.7 pCi/L level – not a safety standard**

# Radon-Related Deaths

The EPA has estimated that one in seven lung cancer deaths are radon-related



# 5 Year Cancer Survival Rate

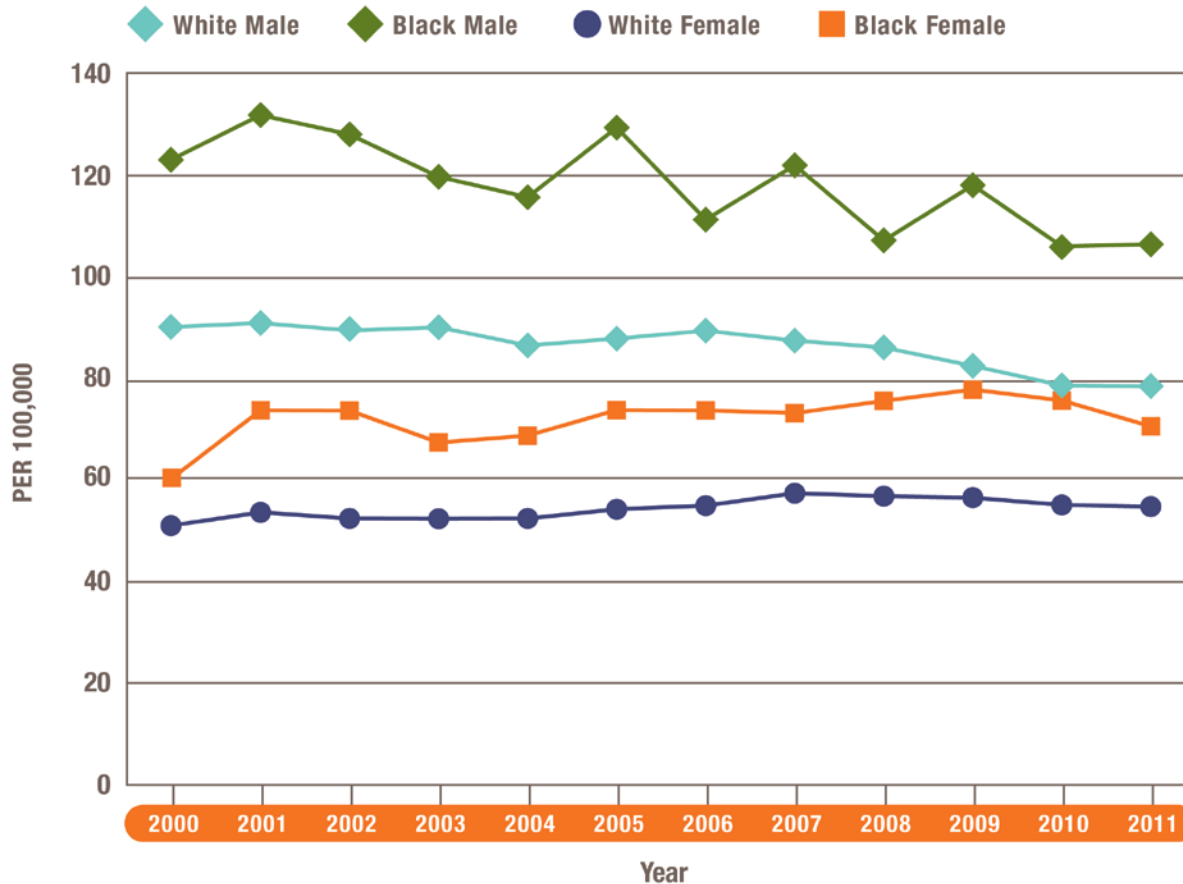
Type of Cancer	2005-2011
Breast	89.4%
Prostate	98.9%
Colon	64.6%
Lung	17.4%

More people die from Lung Cancer than Breast, Prostate and Colon combined. It is estimated that 25% of non-smoking women who contract lung cancer can be attributed to their exposure to radon.

Source: National Cancer Institute, 2012

# Lung Cancer Incidence 2000-2011

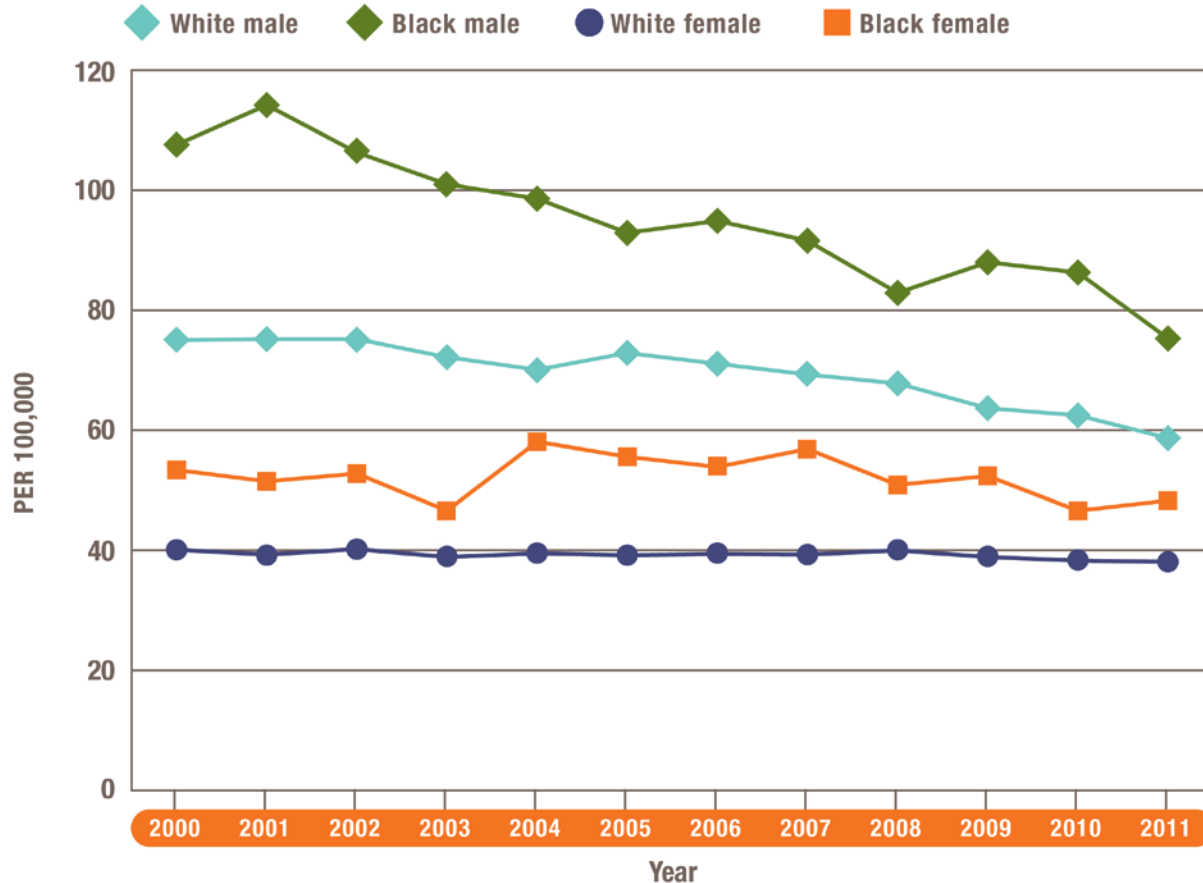
Lung and bronchus cancers, age-adjusted incidence rates by sex and race, Pennsylvania residents, 2000 -2011



NOTES: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. Incidence rates based on invasive cancers. Rates based on less than 10 events are considered statistically unreliable and are not displayed. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.

# Lung Cancer Mortality 2000-2011

Lung and bronchus cancer deaths, age-adjusted rates by sex and race, Pennsylvania residents 2000-2011



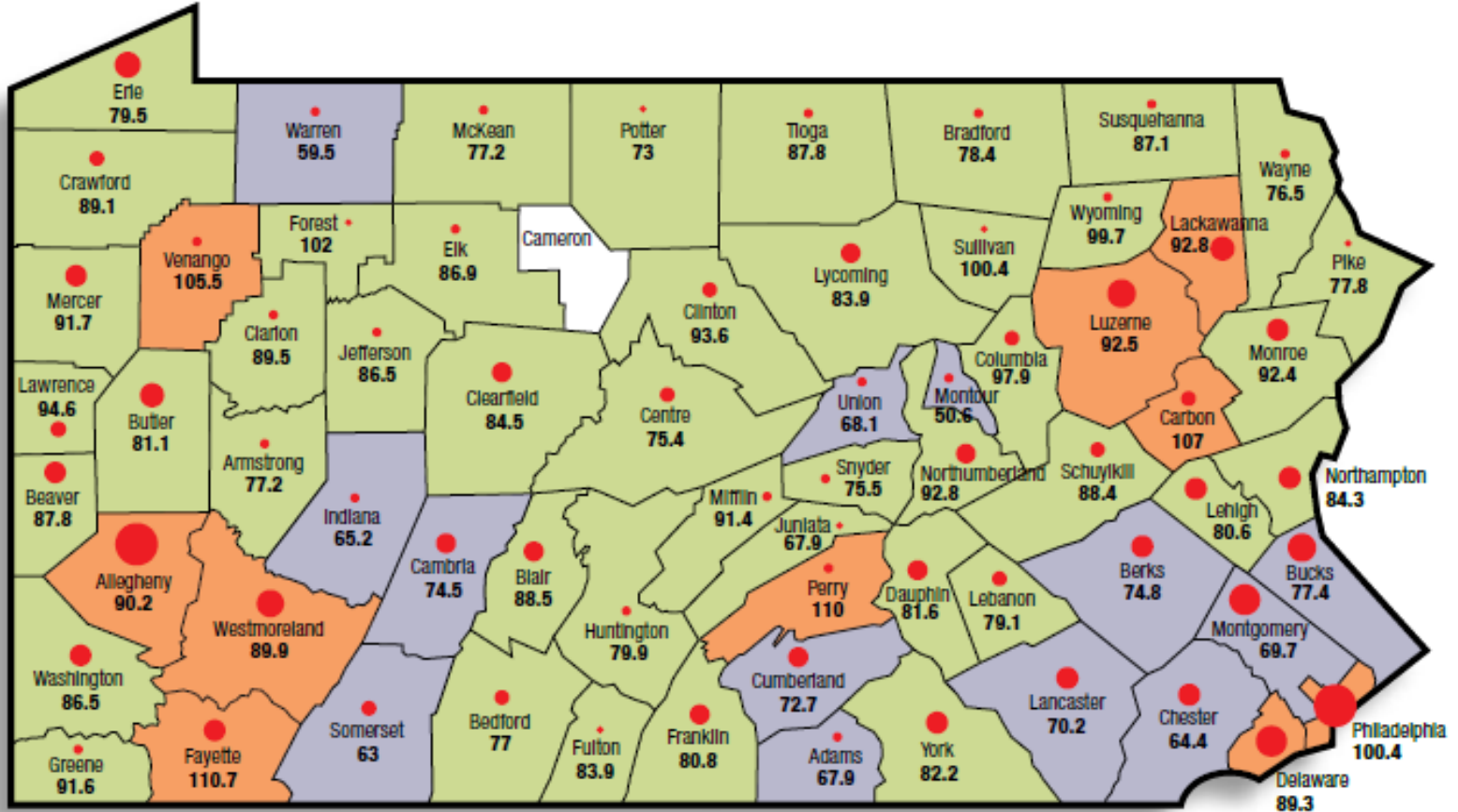
NOTES: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 10 events are considered statistically unreliable and are not displayed. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute's SEER program.



# Male lung cancer incidence, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates

U.S. Rate—(2007–2011) **69.6**

Pa. Rate—(2007–2011) **83.8**



Significantly higher    
  Not significantly different    
  Significantly lower    
  Significance not determined—less than 20 observed cases

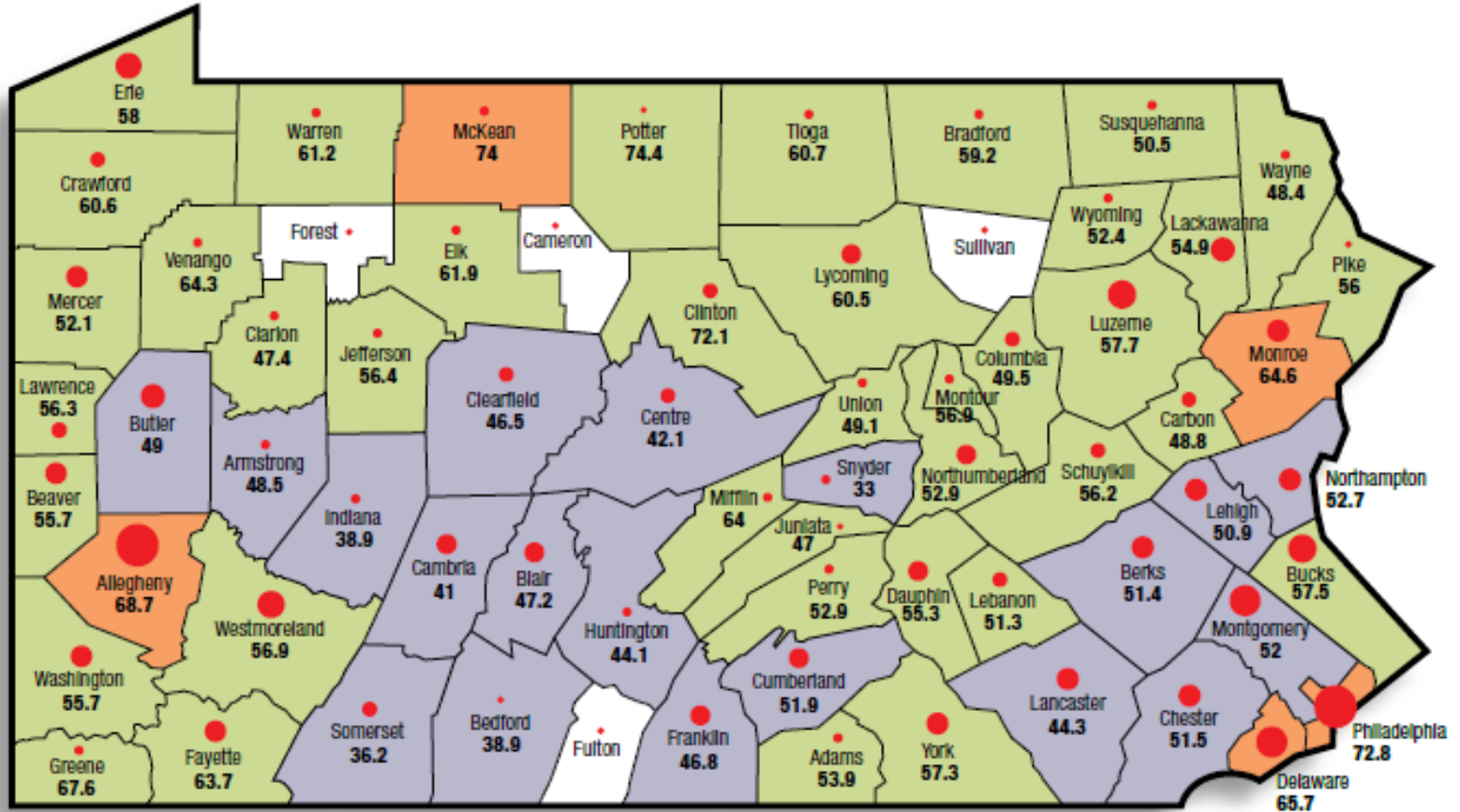
The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

Note: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 20 events are considered statistically unreliable.

# Female lung cancer incidence, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates

U.S. Rate—(2007–2011) **51.0**

Pa. Rate—(2007–2011) **57.3**



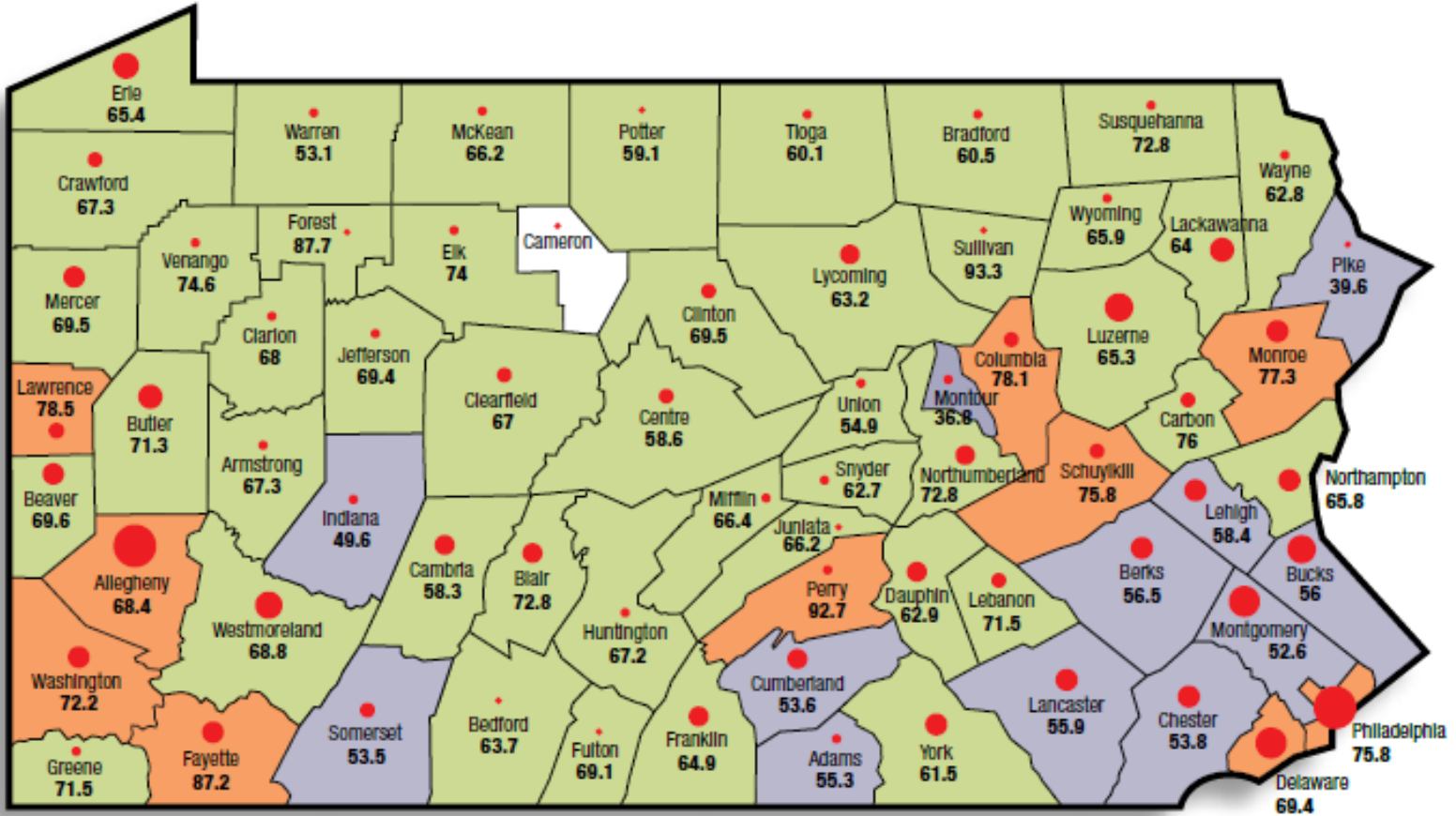
Significantly higher
  Not significantly different
  Significantly lower
  Significance not determined – less than 20 observed cases

The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.  
 Note: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 20 events are considered statistically unreliable.

# Male lung cancer deaths, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates

U.S. Rate—(2006–2010) **63.5**

Pa. Rate—(2006–2010) **64.7**



Significantly higher
  Not significantly different
  Significantly lower
  Significance not determined—less than 20 observed deaths

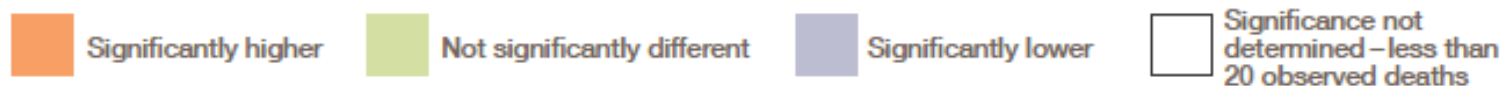
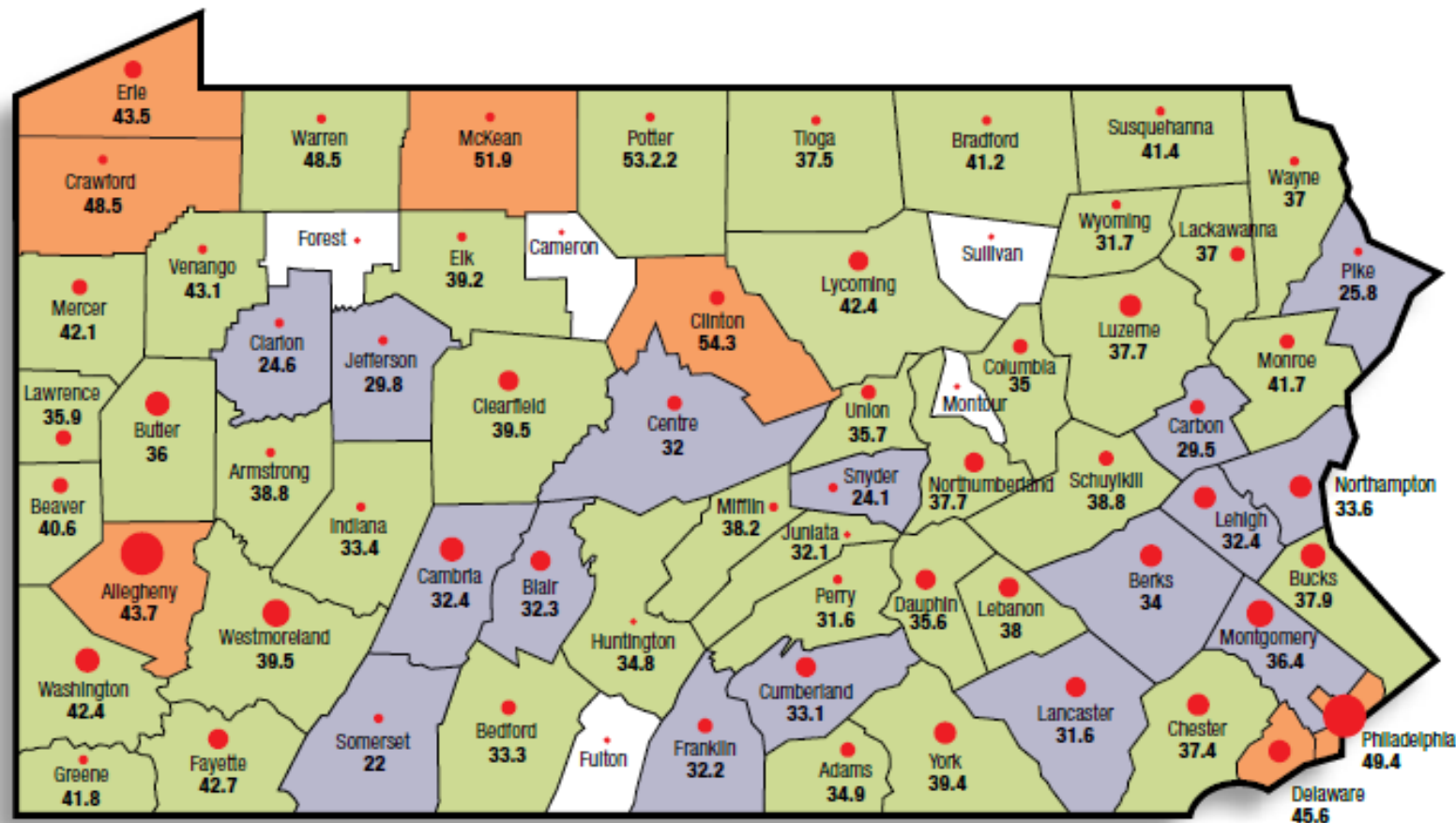
The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of deaths.

Note: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 20 events are considered statistically unreliable.

# Female lung cancer deaths, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates

U.S. Rate—(2006–2010) **39.2**

Pa. Rate—(2007–2011) **39.1**



The symbol, ●, represents the number of invasive cancers. A larger circle indicates a larger amount of deaths.

Note: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 20 events are considered statistically unreliable.

# Burden and Challenges of Lung Cancer

- 75% of all lung cancers are diagnosed at late stage
- Lung cancer counts for 26% of all cancer deaths in PA

# Preventing Lung Cancer

## Don't smoke

- Smoking, cigar smoking, secondhand smoke exposure increase cancer risk

## Get your home tested for radon

- Second leading cause of lung cancer

## Protect from workplace exposures

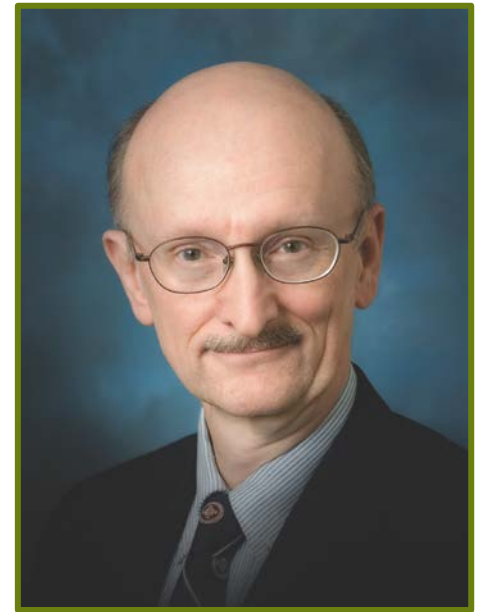
- Asbestos, radioactive ores, inhaled chemicals or minerals, diesel exhaust

# Radon Call to Action

Presenter:

Alan Peterson, MD

Lancaster General Health 



# Let's Make a Difference

**Lung cancer is a very preventable cancer.  
Stop smoking and test for radon.**

We must invest time, energy, and money  
NOW to prevent lung cancer!

In addition to saving lives, the return on  
investment in preventing costly healthcare  
burden is compelling.



# Call to Action

**“Have you tested your  
home for radon?”**

Physicians and Healthcare Professionals-

Start the discussion

Ask the question

Include it with the tobacco question

**Help prevent Lung Cancer!**

# The Goal

## Add radon to your EHR system



**Tobacco Status**

Currently Uses       Has Quit       Never used

What type(s)?

Cigarettes     Pipe     Cigars     Smokeless

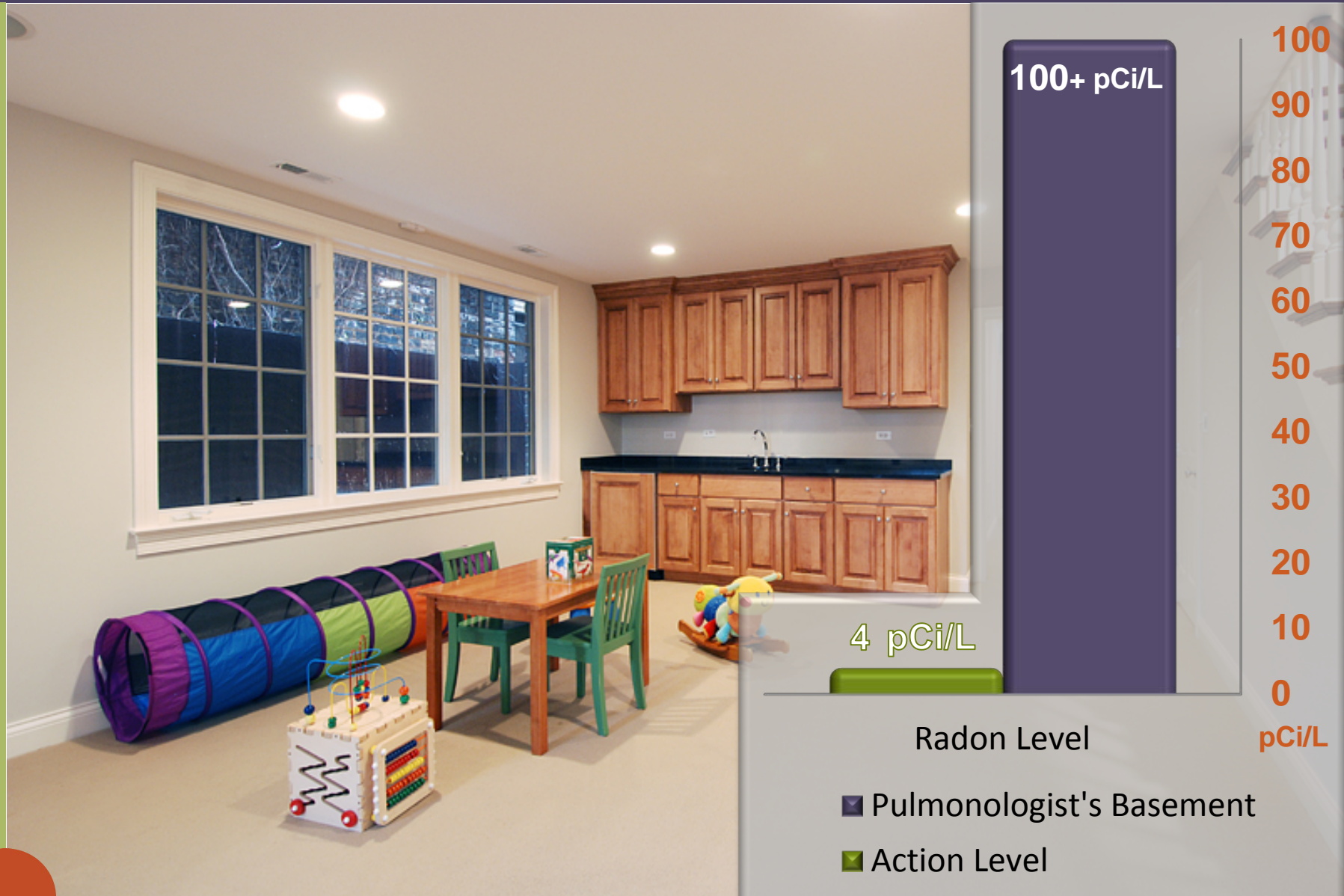
How many years?

Amount/Packs per day:

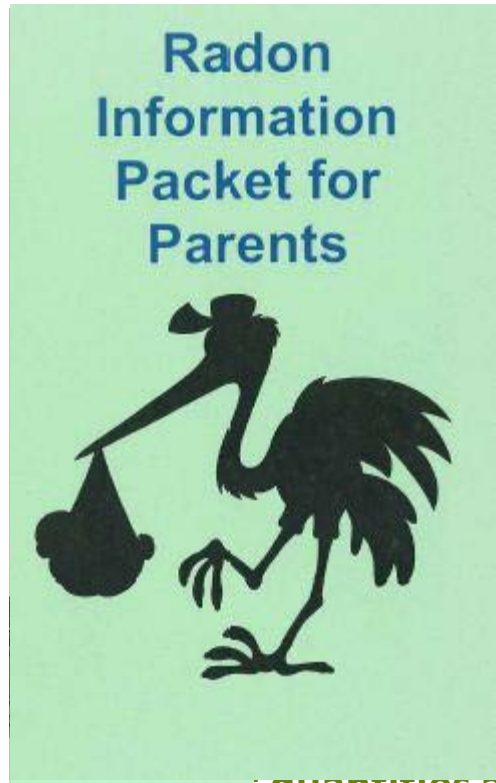
**Radon**

Have you had your home tested for radon?     Yes     No

# Radon can be present in any home



# Radon Program



*Radon Test Kit Program*

ed charcoal Radon test kit  
and the results will be sent  
e parents of newborn infants  
and is administered by  
reau of Radiation Protection.  
ion, tape closed, and mail.

o you live: \_\_\_\_\_  
Child's Birth: \_\_\_\_\_  
was Born at: \_\_\_\_\_  
ospital located in: \_\_\_\_\_  
ion \_\_\_\_\_  
Serial No. \_\_\_\_\_

Are the hospitals and birthing centers participating in the newborn Program?  
For information,  
Call 717-783-3594

test kit quantities are limited \*

# Radon Handouts



**Trifold document available  
for distribution at your office.**

**Call to order:  
1-800-23RADON**

**Download Radon Resources document from  
Handouts section for a web link to this resource**

# Radon Handouts

One page information sheet available for distribution at your office.

## Health Effects of Radon

**Call to order: 1-800-23RADON**

**Download Radon Resources document from Handouts section for a web link to this resource**

High radon levels can be fixed

**Contact DEP 1-800-23RADON**

# Radon Health Effects Resources

## Annals of the ICRP

Radiological Protection against Radon Exposure

Lung Cancer Risk for Indoor Exposures to Radon Daughters

Lung Cancer Risk from Radon and Progeny, and Statement on Radon

## BEIR VI – Health Effects of Exposure to Radon

## EPA Assessment of Risks from Radon in Homes

## NCRP Report No. 160

Ionizing Radiation Exposure of the Population of the United States

## UNSCEAR Volume II: 2006 Effects of ionizing Radiation Annex E

Sources-to-Effects Assessment for Radon in Homes and Workplaces

## WHO Handbook on Indoor Radon

**Download Radon Resources document from  
Handouts section for web links to these resources**



For additional CEUs and radon information:

[www.siumed.edu/cpd](http://www.siumed.edu/cpd)

Click on Online Courses

Module	Cost	CEU
Module #1	\$20	1 CEU
Module #2	\$20	1 CEU
Module #3	\$15	.75 CEU
Module #4	\$5	.25 CEU
Module #5	\$15	.75 CEU

Southern Illinois University School of Medicine

# DEP/BRP Radon Division

- Radon remains a serious issue
- Everyone should test
- Some areas are worse than others
- Our work is not finished

# More State Cancer Data

PA Bureau of Health Statistics and Registries

<http://www.statistics.health.pa.gov>

Listing of publications on PA cancer statistics

<http://www.statistics.health.pa.gov/HealthStatistics/CancerStatistics/Pages/default.aspx#.Vo1WbmQo6Uk>

EpiQMS

<http://www.statistics.health.pa.gov/StatisticalResources/EpiQMS/Pages/Default.aspx>

# Questions & Answers

**Thank you for attending  
today's webinar.**

Please take a moment and complete  
the survey as you exit.

**The survey is required for any  
who wants to receive CMEs.**