

# TRIBAL EPIDEMIOLOGY CENTER ENVIRONMENTAL PUBLIC HEALTH TRACKING PROGRAM

SHELDWIN A. YAZZIE, PHD, MPH, MS  
EPIDEMIOLOGIST

---

TRIBAL EPHT SYMPOSIUM

28 SEPTEMBER 2018



# Presentation Overview

---

Tribal Environmental Tracking Program

Tribal Healthy Homes Pilot Project

- Indoor Radon Surveys
- Injury Prevention Risk Survey
- Chronic Conditions

Environmental Health Survey

- Questions
- Responses

Comments/Questions

# Tribal Environmental Tracking Program

---

## Tribal Epidemiology Centers

- Received pilot funds through Great Lakes Inter-Tribal Epidemiology Center (GLITEC)
- Conduct environmental health project



## Projects

- Environmental Health Survey
- Tribal Healthy Homes Project



# Tribal Healthy Homes Project

---



## Collaborative project

- Two communities
- Programs in each community
- AASTEC

## Community Meetings

- Discuss community priorities
- Formulate timeline

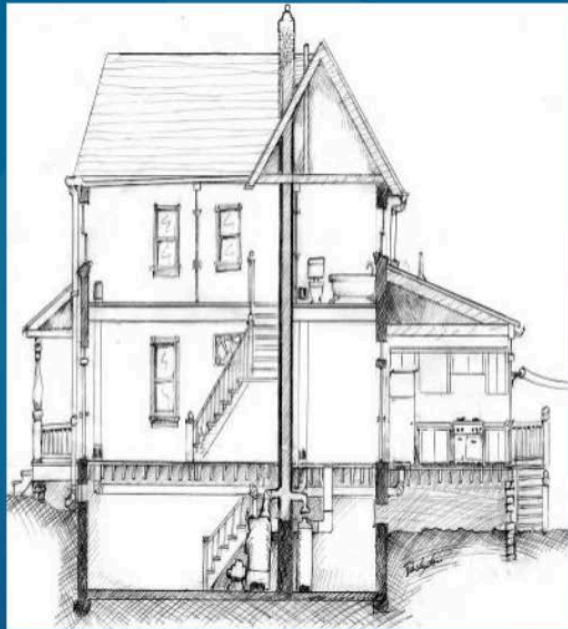
## Opportunities for partnerships

# Healthy Home Assessment

---

# Healthy Home Principles

## 7 Healthy Homes Principles



### Keep It:

1. Dry
2. Clean
3. Ventilated
4. Pest-Free
5. Safe
6. Contaminant-Free
7. Maintained

Figure: Healthy Home Principles

Source: U.S. Department of Housing & Urban Development (2018). Retrieved from [https://www.hud.gov/program\\_offices/healthy\\_homes/healthyhomes](https://www.hud.gov/program_offices/healthy_homes/healthyhomes)

# Home Indoor Radon Exposure

---

# EPA Radon Zone Regions

EPA developed map for illustrating varying predicted Radon (Rn) organized into 3 zone regions

Zone 1: Rn > 4 pCi/L

Zone 2: Rn 2-4 pCi/L

Zone 3: Rn < 2pCi/L

Average Rn levels

- Inside home 1.3 pCi/L
- Outside home 0.4 pCi/L

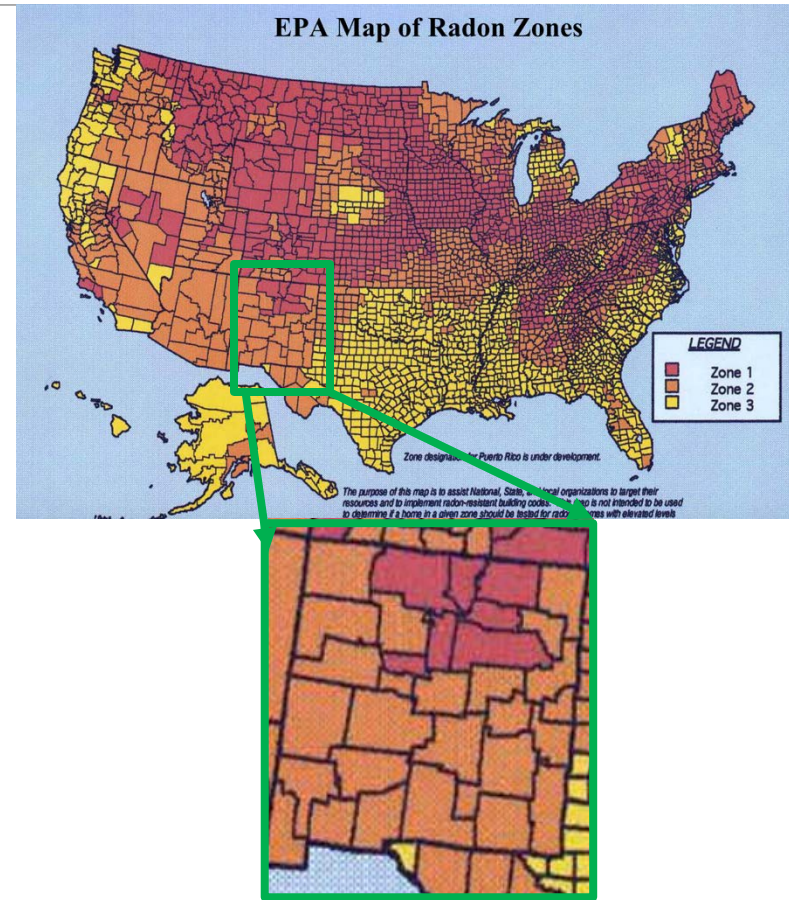


Figure: EPA Radon Zone Map

Source: Retrieved from <https://www.epa.gov/radon/epa-map-radon-zones>



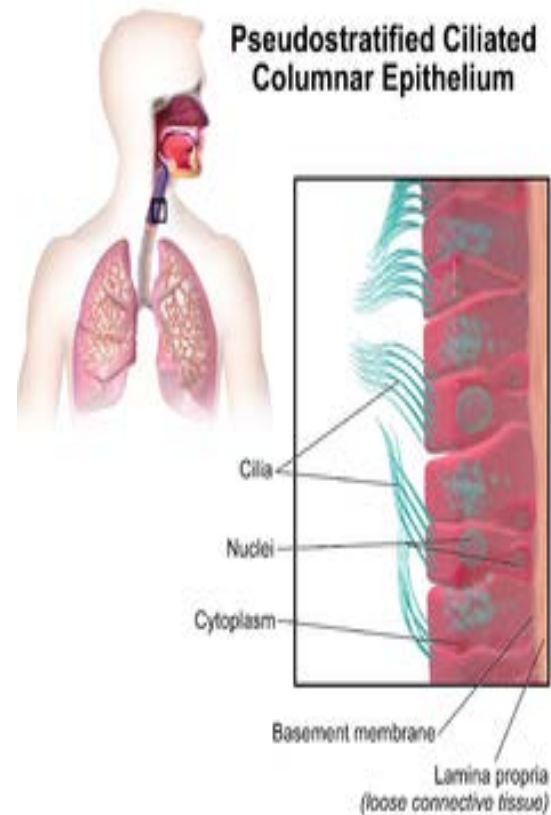
# Radon Exposure Is the Second Leading Cause of Lung Cancer

Lung Cancer (American Cancer Society, 2014)  
(USEPA, 2014)

- Leading cause is cigarette smoking
- Second leading cause is radon exposure

Uranium Epidemiologic studies

- Excess respiratory cancer deaths associated with cumulative exposure to radon progeny (WLM) among underground uranium miners (Archer et al., 1976)



# Home Fall Prevention

---

# Fall Prevention Checklist



**HOME FALL PREVENTION**  
**CHECKLIST FOR TRIBAL MEMBERS**

# Data Collection

---

# Data Collection

---

## Housing List

### Two Visits Per Home

- Written Consent
- Home characteristics
  - Developed
  - Type of home
  - Ventilation characteristics
- Indoor Radon Samples
- Geolocation
  - Latitude/Longitude
- Elevation (Feet)
- Temperature (°F) retrospective



Figure: House Cartoon  
Source: Google Images



Figure: Trimble TDC 100 Device  
Source: Trimble website

# Training

---



## Knowledge

- Home assessments
- Radon exposure and assessment
- Fall injury prevention

## Trimble training

## Field experience

## GIS training

# Sampling

---

## Buildings

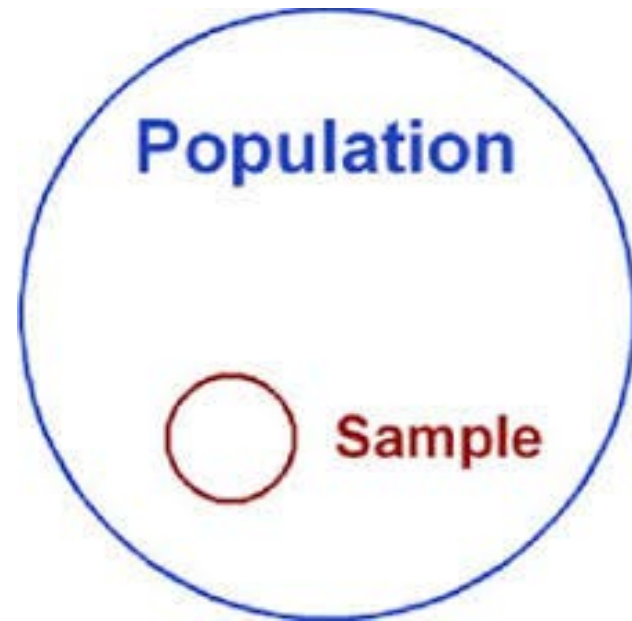
- Residential
- Public

## Community 1

- Smaller
- Goal- sample
  - All residential
  - All public buildings

## Community 2

- Larger
- Goal-sample
  - Over half of residential
  - All public buildings



# Impacts of Project

---

## Short term

- Strengthen tribal capacity
- Spatial map of each community
- Updated indoor radon concentration levels (pCi/L)

## Long term

- Advanced training in utilizing geographical information system (GIS) software and hardware
- Spatial map will assist in prioritizing funds in each community
- Spatial map could assist in prioritizing resources in cases of emergencies (i.e., flood, fire)



# Next Steps

---

## Benefits

- Community Education
- Community Outreach
- Data used for overall welfare of community
- Household assessments
- Radon assessments
- Geospatial map of communities

## Expand beyond pilot

- Reach out to more tribal communities
- Explore additional environmental health concerns



NEXT  
STEP

# Tribal Specific Radon Brochure

# RADON TESTING



A GUIDE FOR TRIBAL COMMUNITIES

KEEPING OUR HOMES  
AND COMMUNITY SAFE:  
ONE TEST AT A TIME

## HOW DO I TEST MY HOME FOR RADON?

- Testing is the only way to know your home's radon levels.
- Testing for radon is easy and inexpensive.
- You should first do a "short-term" test.
- These kits should remain in place for 3-7 days depending on the device.
- When testing, follow "closed house" conditions by keeping windows and outside doors closed as much as possible during the test except for normal exit and entry.



## WHAT DO THE RESULTS MEAN?

- If the initial test is at or above 4.0 pCi/L, follow up with 2nd test.
  - 4.0 to 8.0 pCi/L: Long-term test (90 days to 1 year) under normal lived-in conditions.
  - Above 8.0 pCi/L: An immediate short-term test (48 hours)
- If your radon level is 4.0 picocuries per liter (pCi/L) or higher, take action to reduce your risk from radon.



# Environmental Health Survey

---

## Environmental Concerns

- Air Pollution
- Water quality
- Radon Exposure
- Climate Change

Link between personal health and the environment

Available information on health issues in communities



# Environmental Health Survey

---

Q1. What do you feel are the top three environmental concerns in your community? (Please select up to 3 choices)

- Waste Management (sewage/sewer systems, landfills, illegal dumping)
- Stray Dogs
- Climate Change
- Poor Quality Drinking Water
- Air Pollution
- Natural Disasters
- Water Pollution
- Infectious Disease Outbreaks
- Radon
- Radiation Exposure (waste piles; proximity to nuclear facilities)

# Environmental Health Survey

---

Q2. Do you feel there is a link between your personal health and the environment?

- Yes
- No
- Don't Know/Not Sure

Q3. In your opinion, how much of a priority is environmental health to your tribal leadership?

- High Priority
- Medium Priority
- Low Priority

# Environmental Health Survey

---

Q4. How much information do you currently have on environmental health issues?

- A lot of information
- Some information
- Little or no information

Q5. What is the name of your Tribe?

Q6. Additional Comments: Please provide any additional environmental concerns in your community.

# References

---

- Abandoned Uranium Mines on the Navajo Nation. US EPA. Available at: <http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/8ed3f74d2f55b845882573f400787a8e>. Accessed February 1, 2014.
- Aeroradiometric Map Background Information. USGS. Available at: <http://pubs.usgs.gov/of/1999/ofr-99-0016/mapinfo.html> Accessed February 28, 2014.
- Archer VE, Gillam JD, Wagoner JK. Respiratory disease mortality among uranium miners. *Ann N Y Acad Sci.* 1976;271:280-293.
- Brugge D, Goble R. The history of uranium mining and the Navajo people. *Am J Public Health.* 2002;92(9):1410-1419.
- CERCLA Overview. USEPA. Available at: <http://www.epa.gov/superfund/policy/cercla.htm>. Accessed February 08, 2014.
- Community Uranium Exposure Journey To Healing Program. 2014.
- Darby S, Hill D, Doll R. Radon: a likely carcinogen at all exposures. *Ann Oncol.* 2001;12(10):1341-1351.
- Early PJ, Sodee DB. Principles and practice of nuclear medicine: Mosby; 1995.
- Eichstaedt PH. If You Poison Us: Uranium and Native Americans. Santa Fe: Red Crane Books; 1994.
- Gilliland FD, Hunt WC, Pardilla M, Key CR. Uranium mining and lung cancer among Navajo men in New Mexico and Arizona, 1969 to1993. *Journal of Occupational and Environmental Medicine.* 2000;42(3):278-283
- GIS Dictionary: Kriging. esri. Available at: <http://support.esri.com/en/knowledgebase/GISDictionary/term/kriging>. Accessed March 11, 2014.
- Hauri DD, Huss A, Zimmermann F, Kuehni CE, Roosli M. Prediction of residential radon exposure of the whole Swiss population: comparison of model-based predictions with measurement-based predictions. *Indoor Air.* 23(5):406-416.

# References

---

Health Risks. *USEPA*. Available at: <http://www.epa.gov/radon/healthrisks.html>. Accessed March 12, 2014.

Inoue, L. (2011). *Linear Regression*. Biostat 511. Seattle, WA.

Navajo Population Profile Based on Census 2010. Window Rock, AZ: Navajo Division of Health/Navajo Department of Behavioral Services/Navajo Epidemiology Center; 2013.

Radiation Doses in Perspective. *US EPA*. Available at: <http://www.epa.gov/radiation/understand/perspective.html>. Accessed March 09, 2014.

Radon. *American Cancer Society*. Available at: <http://www.cancer.org/cancer/cancercauses/othercarcinogens/pollution/radon>. Accessed March 08, 2014.

Radon Gas and Lung Cancer. *American Cancer Society*. Available at: <http://www.cancer.org/cancer/news/radon-gas-and-lung-cancer>. Accessed March 08, 2014.

Samet JM, Kutvirt DM, Waxweiler RJ, Key CR. Uranium mining and lung cancer in Navajo men. *N Engl J Med*. 1984;310(23):1481-1484.

Schmid K, Kuwert T, Drexler H. Radon in indoor spaces: an underestimated risk factor for lung cancer in environmental medicine. *Dtsch Arztebl Int*.107(11):181-186.

Seixas, N. (Oct. 16, 2012). *Occupational Exposure Assessment in Epidemiology*. ENVH 551. Seattle, WA.

Toxicological Profile For Uranium ATSDR. Available at: <http://www.atsdr.cdc.gov/toxprofiles/tp150.pdf>. Accessed October 20, 2013.

Travis E. *Medical Radiobiology*. 2nd ed. Chicago: Year Book Medical Publishers; 1989.

Turner MC, Krewski D, Chen Y, Pope CA, 3rd, Gapstur S, Thun MJ. Radon and lung cancer in the American Cancer Society cohort. *Cancer Epidemiol Biomarkers Prev*.20(3):438-448.

Who Can Fix My Home? *US EPA*. Available at: <http://www.epa.gov/radon/fixyourhome.html>. Accessed March 12, 2014.

Why is radon the public health risk that it is? *US EPA*. Available at: <http://www.epa.gov/radon/aboutus.html>. Accessed March 11, 2014.