RADON KNOWLEDGE AND TESTING AMONG PUEBLO COMMUNITIES IN NORTHERN NEW MEXICO

22 MARCH 2021
NIEHS-EPA ENVIRONMENTAL HEALTH DISPARITIES RESEARCH WEBINAR SERIES

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Acknowledgements

Funding Sources
This work was supported by the Centers for Disease Control and Prevention Environmental Health Tracking Service Agreement (No. 200-2016-M-92315) to the Great Lakes Inter-Tribal Council, Inc.

This work was supported by the Indian Health Service Epidemiology Program for AI/AN and Urban Indian Communities to the Great Lakes Inter-Tribal Council, Inc. (No. U1B1IHS0001-21-02) and (No. U1B1IHS0001-22-02).

This work was supported by the Centers for Disease Control and Prevention Cooperative Agreement to the Albuquerque Area Indian Health Board, Inc. Grant No. 6 NU38OT000268-02-01.

This work was supported by National Institutes of Health grants 1P50ES026102 and P50MD015706 to the University of New Mexico Health Sciences Center

Mentorship
- Tribal Community Leadership
- Albuquerque Area Southwest Tribal Epidemiology Center
- UNM Native Environmental Health Equity Research
Presentation Overview

Community Engaged Practices to address tribal environmental health issues
- Preparing Through Community Environmental Health Surveys and workshops
- Addressing Tribal Environmental Health Concerns
  - Assessing Home Indoor Radon Exposure Assessment
  - Designing Tribal/Community Sampling Framework
  - Applying Tribal-led Methodological Approach for Data Collection
- Impacts of Tribal Healthy Homes Projects
- Designing Culturally Tailored Education Materials
- Expanding and Developing Future Tribal EPHT Activities

Community 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
A Healthy Home For Every Family

7 Healthy Homes Principles

Figure: Healthy Home Principles

Tribal Environmental Public Health Tracking Workshop - Audience Poll

“My house is healthy because..”

Please type your answer in the chat box.
Based on survey, workshop feedback and conversations with community leadership

Focused Tribal Environmental Health Tracking Program on three key areas

1. Indoor radon exposure
2. Fall and injury prevention
3. Resident health

Radon in the Southwest US

Map developed to illustrate predicted Radon (Rn) organized into 3 zone regions

Zone 1: \( Rn > 4 \text{ pCi/L} \)
Zone 2: \( Rn 2-4 \text{ pCi/L} \)
Zone 3: \( Rn < 2 \text{ pCi/L} \)

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

Naturally occurring
Radioactive noble (inert) gas formed from the decay of uranium, radium and other radioactive elements in the Earth’s crust
- Tasteless, odorless and water soluble
Radon decays quickly – half-life of ~4 days
- Emits alpha particle during decay
When inhaled the alpha particle decay can cause damage to our lungs
- Second leading cause of lung cancer – behind cigarette smoking
Concentration in air
- Radon pCi/L (1pCi/L=37 Bq/m³)

Predictors of radon exposure

Home type
Pressure difference
Soil characteristics
Groundwater
- Movement/displaces radon
- Absorbs radon
Weather
Radon Survey

Measurement Devices
- Short-term: 3-7 days
- Long-term: 91 days to 1 year

Testing Areas in Home
- Living room
- Bedroom
- Lowest level-basement

Radon Kit Information
- Date set up
- Date pick up

Units: picocuries per liter (pCi/L)

Home Maintenance & Repair

Smoke Alarm Detectors
- Any in the house?
- When were they installed?
- Location?
- Missing/non-working?

Condition
- Interior/Exterior walls
- Floors, Windows, Roof

Mold Issues
- Major
- Minor
Home Occupants – Chronic Conditions

- Occupants with Sensory Impairments
  - Eye sensory impairments?
  - Hearing impairments?

- Any occupants with asthma?
  - Adults
  - Children
  - Use of oxygen tanks?

- Anyone with mobility issues?
- Anyone with transportation issues?

Home – Fall/Injury Risk Factors

- Outside Home
  - Any objects blocking pathway to door?
  - Is pathway to door visible at night?

- Floor Safety
  - Are there any throw rugs on the floor?
  - Are there cords or cables on the floor?

- Are there any stairs/steps at the home?
Community Sampling Design – Conversations with working group members

- **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

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Data Collection & Training

- **Community working groups**
- **Data Dictionary** – loaded on Trimble device
- **Training**
  - Home assessments
  - Radon exposure and assessment
  - Fall injury prevention
  - Hardware/Software Training
  - Geographic Information System (GIS)
- **Field experience (Pilot testing)**
- **Two Visits Per Home**
  - Home characteristics
  - Geolocation
Accomplishments – An Example

Held 7 community meetings to design and implement the project

Trained 12 community members to set, pickup and ship Rn test kits

Community team members have:

- Placed short-term Rn test kits in 32 homes
  - Majority of kits placed in bedroom or living room
  - Testing duration ranged between 3.25 and 6.25 days
  - All quality control kits reported non-detectable Rn concentrations
- Placed long-term Rn test kits in 32 homes

Two community discussion groups (including Tribal leadership)

- Discuss radon knowledge and awareness
- Inform design of a radon knowledge and awareness survey
Impacts of these projects

Short term
• Strengthened tribal capacity for conducting radon testing
• Updated indoor radon concentration levels (pCi/L)
• Update home characteristics and clinical services information

Long term
• Advanced training in utilizing geographical information system (GIS) software and hardware
• Integrating environmental health data with existing GIS will improve community capacity for addressing EH issues
• One community successfully applied injury prevention data to receive funds for home safety mitigation.
• Another community applied COVID-19 Response funds to mitigate homes identified with elevated radon levels for safe quarantine.

Tribal Specific Radon Brochure
Working To Expand Tribal EPHT Activities

Benefits
- Household assessments
- Radon assessments
- Geospatial map of communities
- Community Education/Outreach

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

Comments/Questions?

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