

Occupational Lung Disease in New Mexico

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Objectives

At the end of this presentation, the attendee will have an understanding of

- The importance of Medical Surveillance
- lung diseases in miners
- Innovative home-grown solutions in New Mexico addressing miners' lung diseases

Who are we and what do we do?

What industry are you from?

William “Cotton” Jarrell, CMSP, MCMC Board of Trustee

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w Mexico

The American Miner

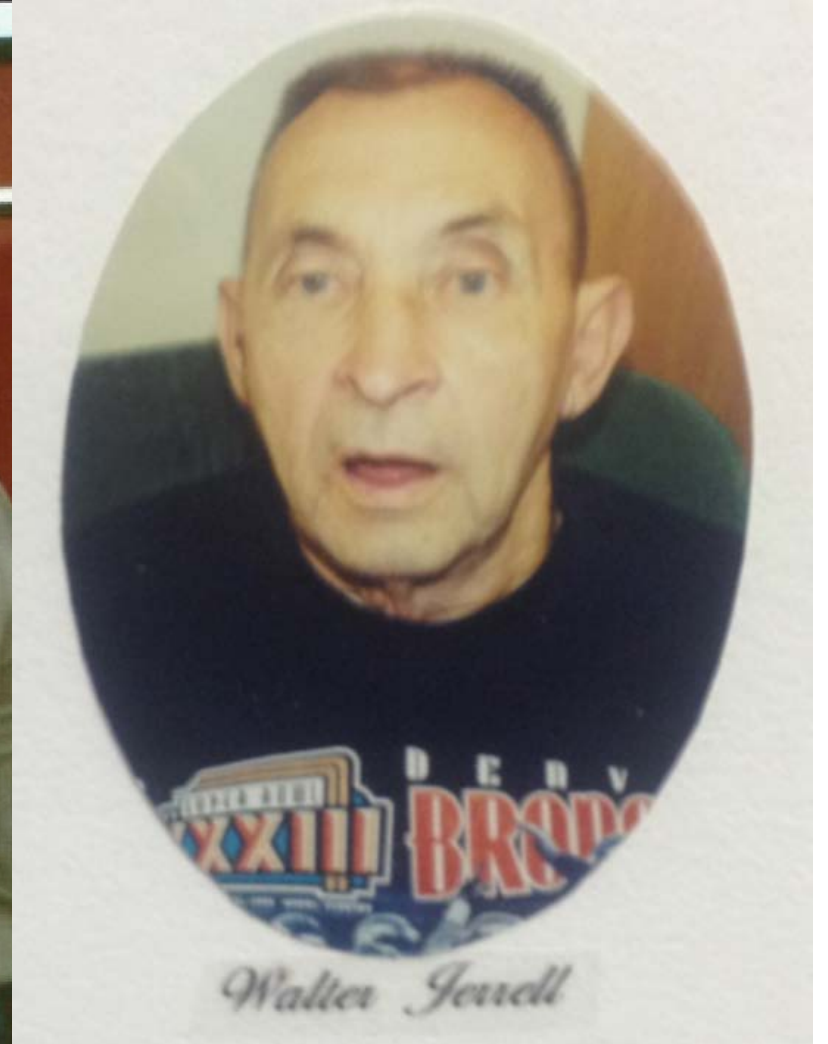
- Miners are a rare breed
- Hard headed/dedicated & loyal/uneducated
- Don't like Doctor offices or visiting doctors
- We often wait until it's too late/we don't want to know
- Likely to not take meds
- Most are early risers

The American Miner

- We work harder than anyone should have to work
- We play twice as hard as anyone should be allowed
- High divorce rate
- Very general/pranksters

Dad was Active in Coal, Uranium & Gypsum Mining 1964 - 1983

➤ Son of a Uranium



Very fond memories of the Uranium days

- Steady flow of people in our town
- Little West Virginia – French-Canadian miners
- Camaraderie
- Water holes
- Hopper for aluminum cans
- Learning to drive
- Support from mining companies

Memories I try to forget

- Ambulance
- **Period of five years**
- Strong active man to a man that could no longer fight the fight
- From days of laughter and joking to days of not being in pain being considered a good day.
- From a man that played tricks and pranked most everyone to a man that could no longer speak words
- To a man that took his last breath at Miners' Colfax Medical Center's long-term care facility

Fast forward 14 years

- Appointed by Governor Susana Martinez as a Board of Trustee for Miners' Colfax Medical Center
- Honored, proud and excited to give back
- Arrived early to see the miners in the long-term care facility
- Miners with 10 toes and 10 fingers
- Chester Fike –“I was always trained to avoid injuries and I should've paid more attention to the dust”

Truly understood what our miners were giving of themselves

- Our miners give their heart and soul to mining
- Safety Professional
- Safety Safety Safety 1st
- Bigger picture we needed to explore



Take Home Points: Slide 1

- Mining is usually generational
- Miners are hard headed and dedicated, but they sometimes need motivation
- Our Miners are giving their heart and soul

Fast forward a year

Dr. Akshay Sood – Division of Pulmonary, Critical Care and Sleep Medicine at the University of New Mexico

- Endowed Chair in Mining-Related Lung Disease at MCMC
- Medical Director of our Miners' Wellness Tele-ECHO Clinic

What is Pneumoconiosis?

Pneumoconiosis

A disease of the lungs caused by the habitual inhalation of irritants (as mineral or metallic particles) — also called miner's asthma or miner's consumption

Lung Health Cost of Mining: A Summary

Exposures

Silica

Asbestos

Mixed Dust

Isocyanates

Diesel exhaust

Radiation

Water sprays with biological contaminants

Diseases

COPD (emphysema and chronic bronchitis)

Pneumoconioses: Coal Workers' Pneumoconiosis, Silicosis, Progressive Massive Fibrosis, Pulmonary fibrosis, Asbestosis

Small airways disease

Hypersensitivity Pneumonitis

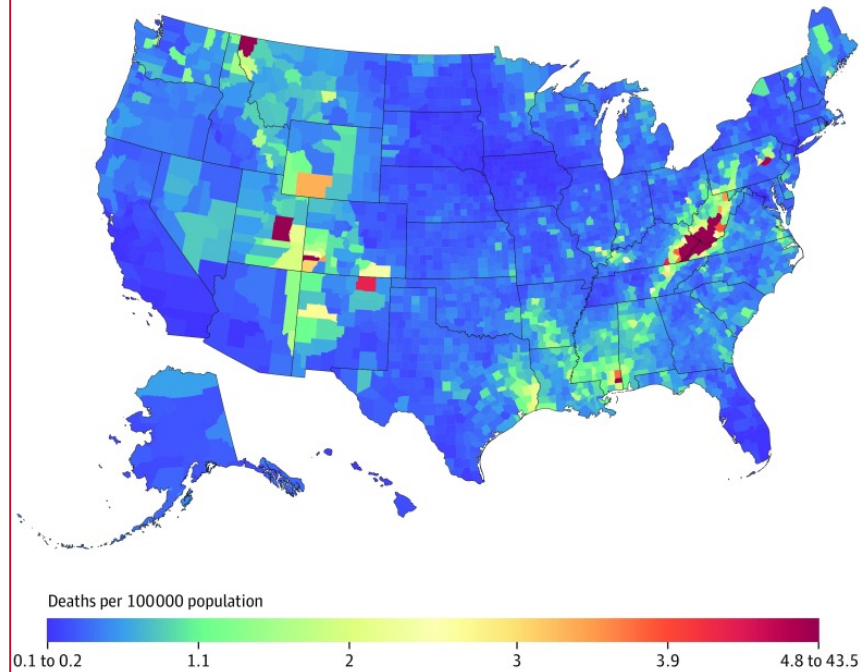
Asthma

Pleural thickening/effusions

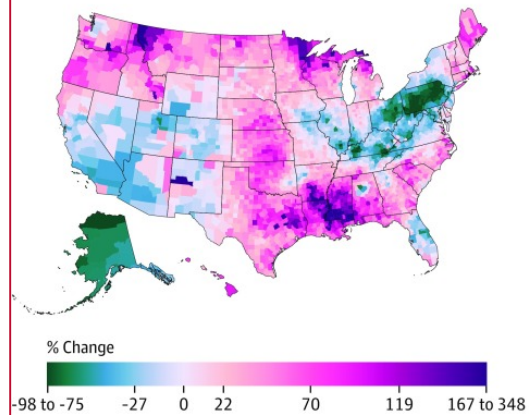
Lung cancer & Mesotheliomas

Pneumoconiosis

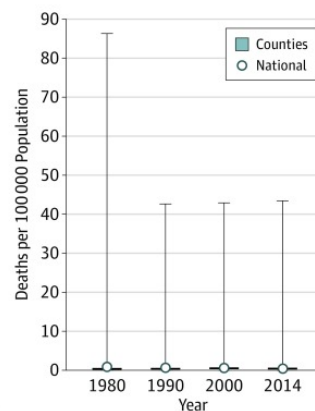
A Age-standardized mortality rate from pneumoconiosis, both sexes, 2014



B Percent change in age-standardized mortality rate from pneumoconiosis between 1980 and 2014, both sexes

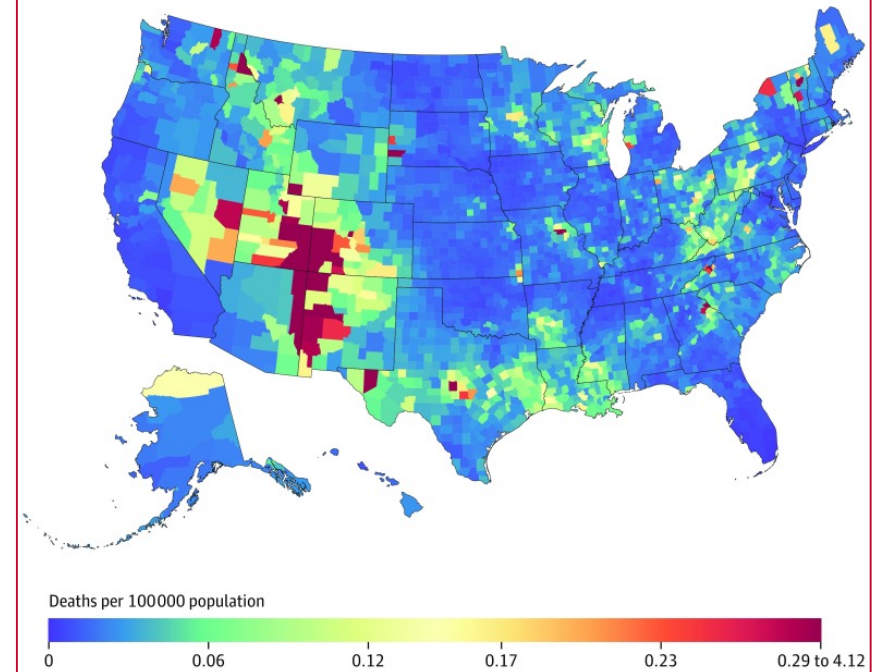


C Age-standardized mortality rate from pneumoconiosis over time

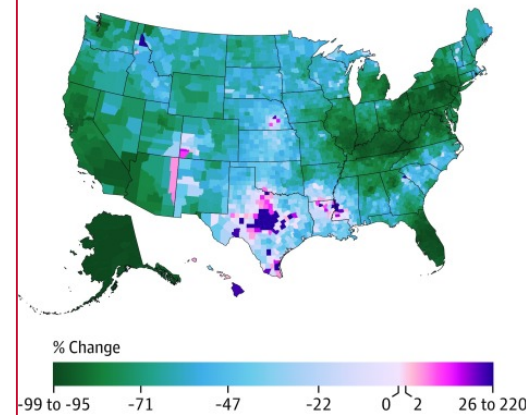


Silicosis

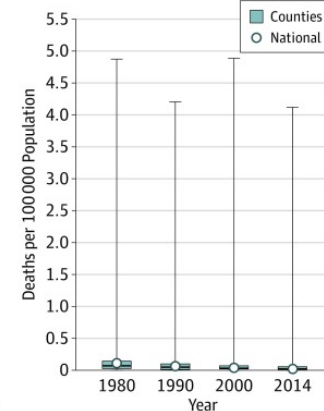
A Age-standardized mortality rate from silicosis, both sexes, 2014



B Percent change in age-standardized mortality rate from silicosis between 1980 and 2014, both sexes

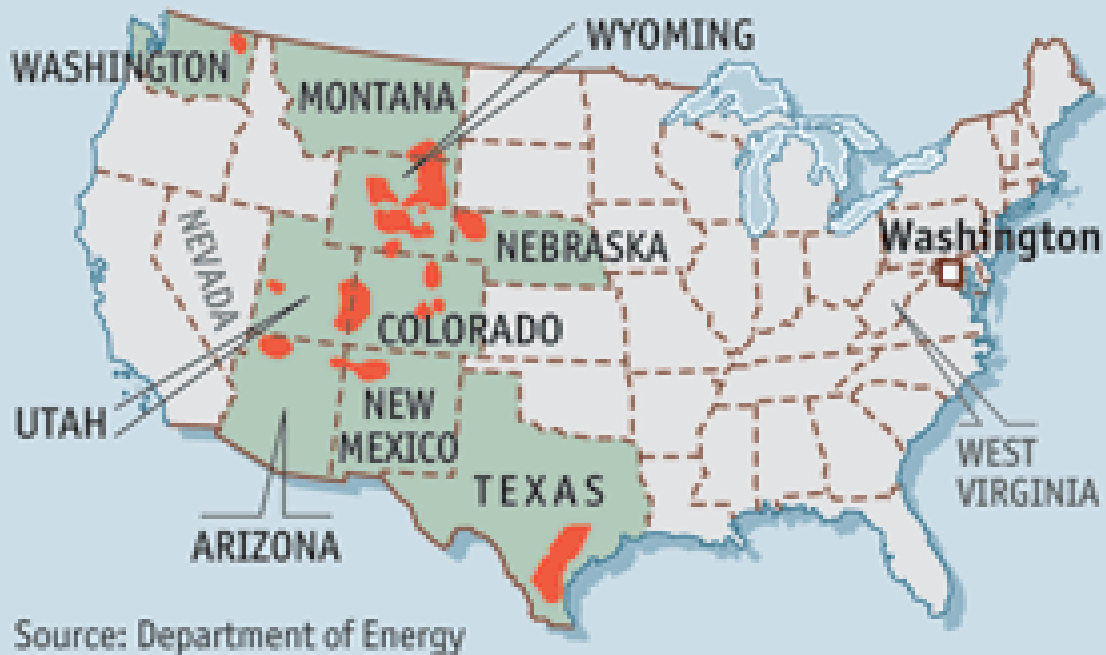


C Age-standardized mortality rate from silicosis over time

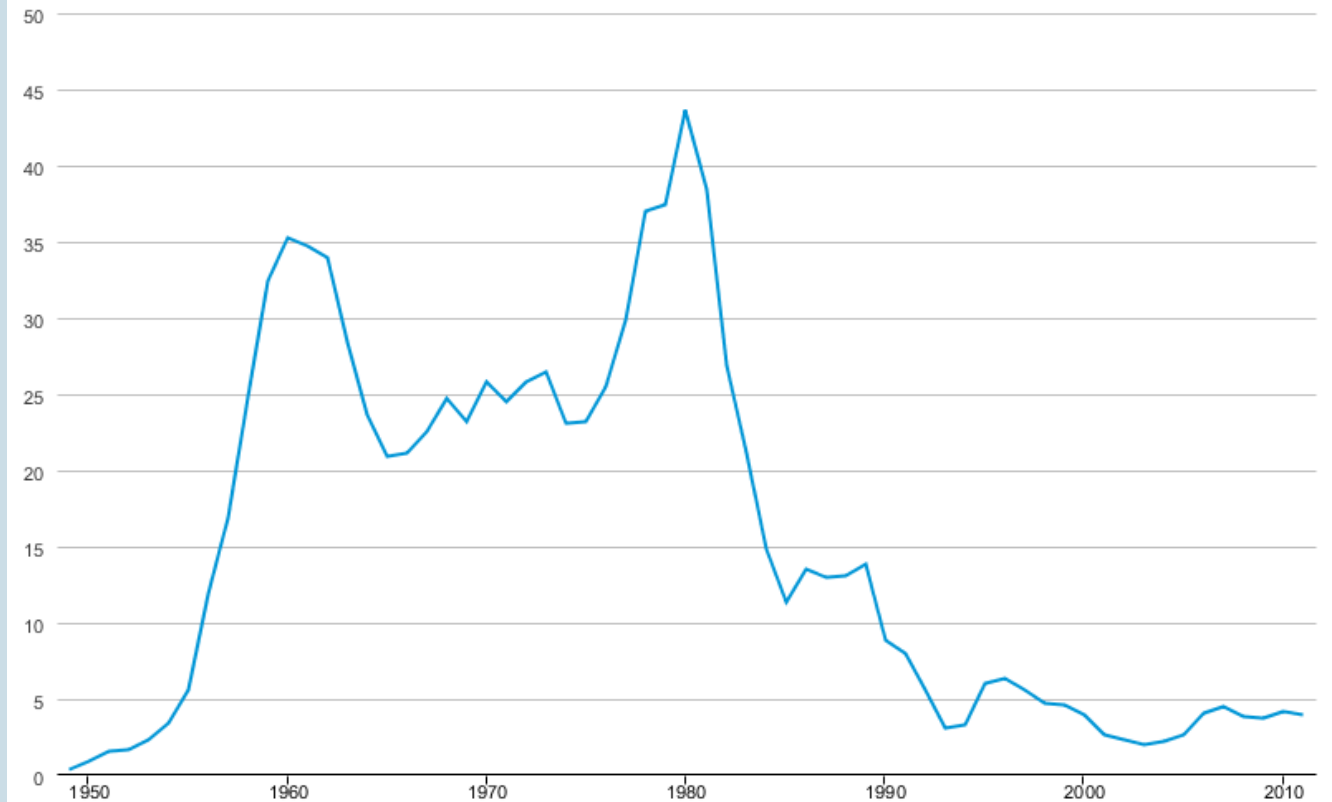


Uranium Workers' Pneumoconiosis: A Uniquely New Mexican Lung Disease

Uranium deposits



Million Pounds Uranium Oxide



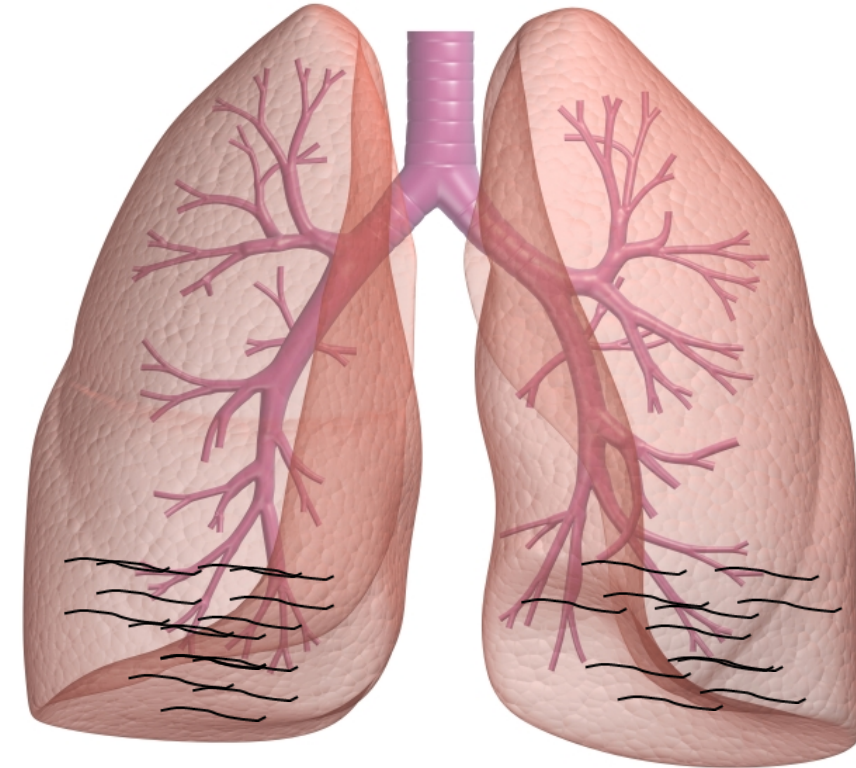
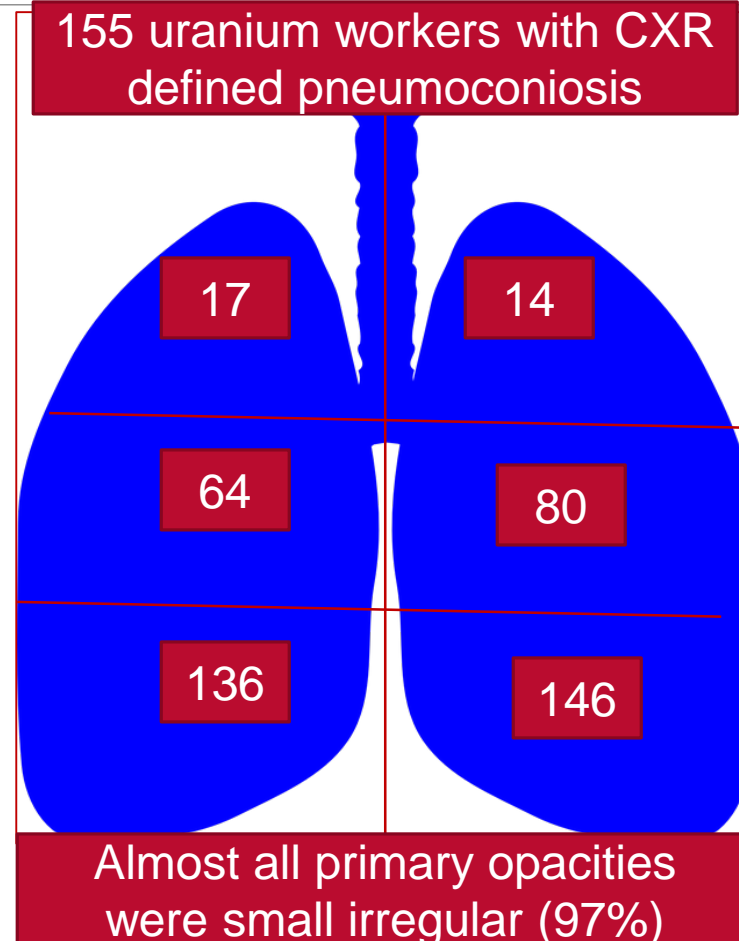
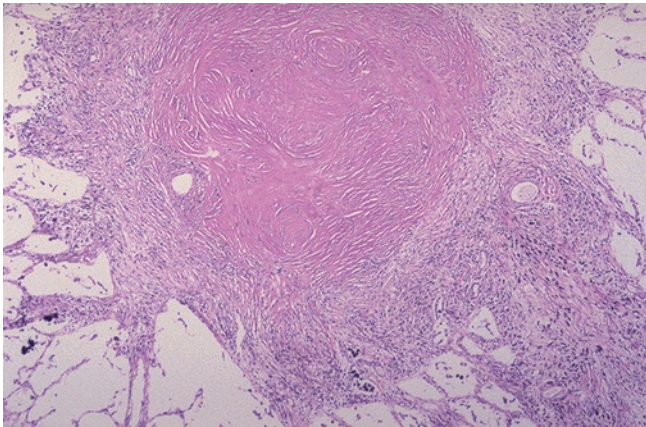
Source: U.S. Energy Information Administration

**Cakes have such a terrible habit of turning out bad
just when you especially want them to be good**

Lucy Maud Montgomery



Uranium Workers' Pneumoconiosis Does Not Resemble Classic Silicosis on Chest X-Ray



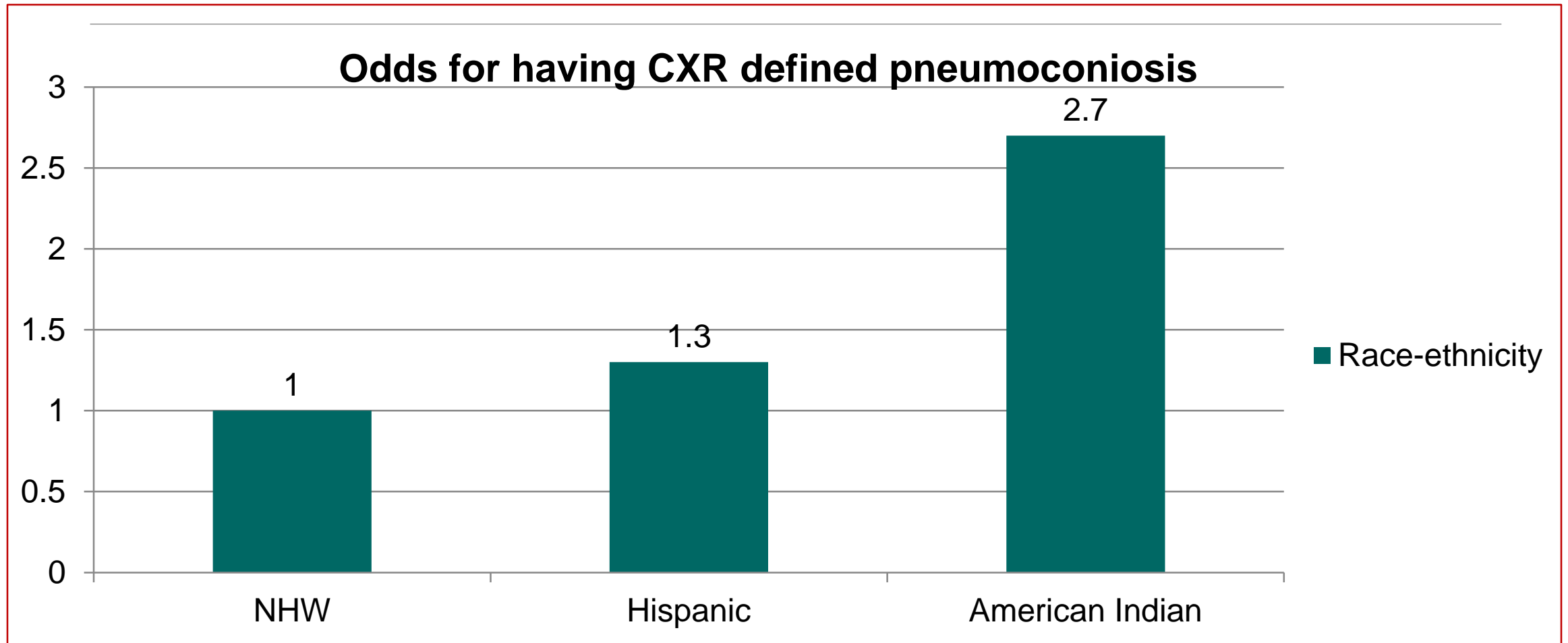
Secondary Pulmonary Fibrosis

Interstitial lung disease

Cardiovascular disease

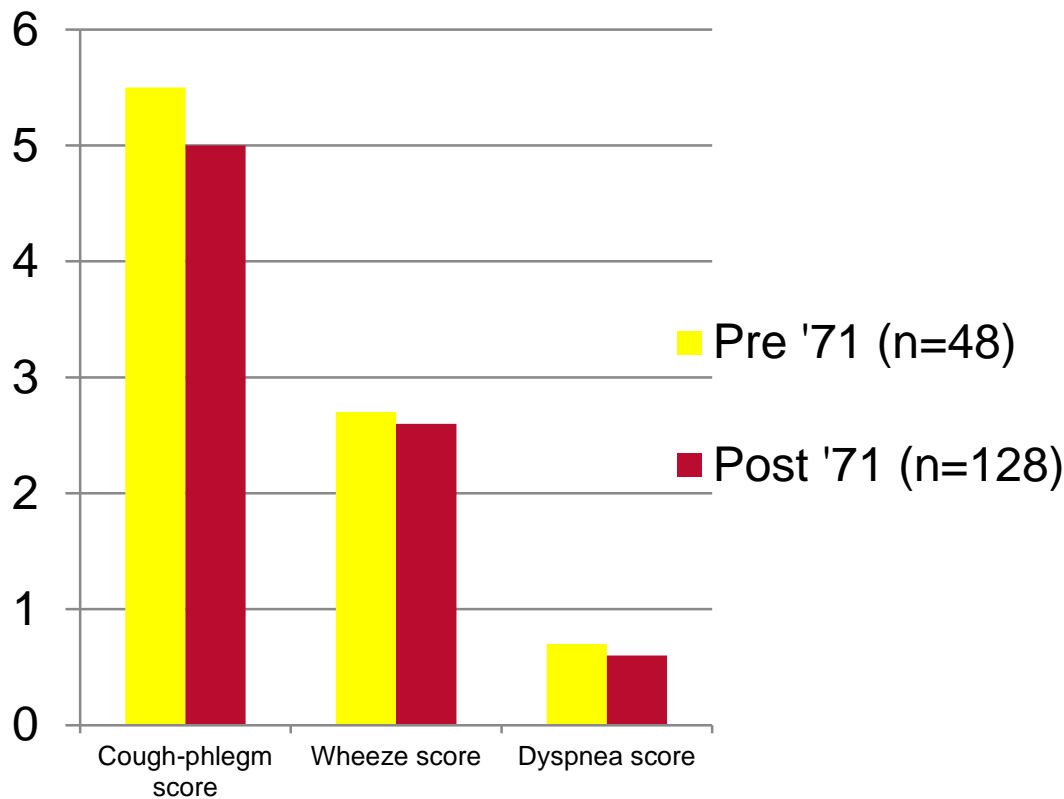
Characteristic	Pulmonary Fibrosis	Asbestosis	Uranium workers' pneumoconiosis
Characterization	Well characterized		Poorly characterized
Anatomy	Lower-lobe predominant disease		
Pleural disease	Absent	Present	Less common (10%)
Disease progression	Relatively fast	Slow	Slow
Pathology	Usual Interstitial Pneumonia picture		

Racial-ethnic differences in radiologic disease in uranium miners



Pre & Post 1971 (RECA era) uranium workers: an artificial construct

SIMILARLY HIGH SELF-REPORTED RESPIRATORY SYMPTOM BURDEN



SIMILARLY ABNORMAL CHEST X-RAY

Chest Radiologic pattern	Pre-RECA N=48	Post-RECA N=128	P value
Abnormal (Profusion score $\geq 1/0$)	76%	67%	0.46

Take Home Points: Slide 2

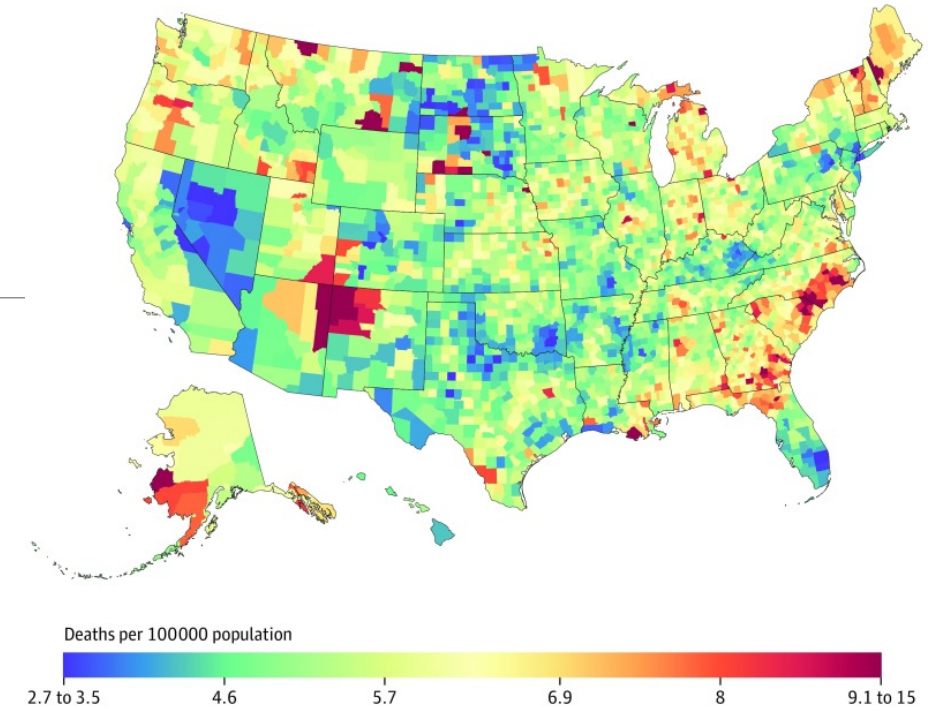
Mortality from interstitial/secondary lung disease is rising in NM, particularly in the Navajo Nation and the legacy of uranium mining may contribute to this rise

Pneumoconiosis can be present in all forms of mining

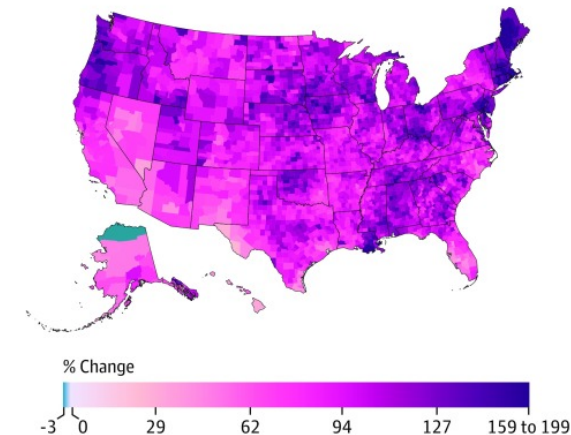
Some lung disease resemble others while some are unique

Lung disease does not discriminate, but some may be racially at risk

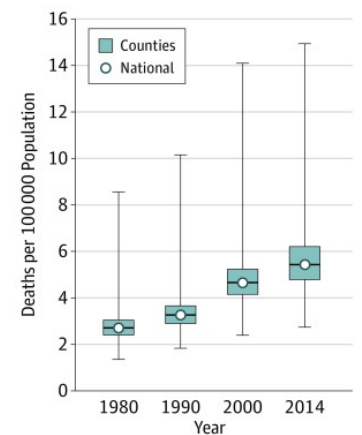
A Age-standardized mortality rate from interstitial lung disease and pulmonary sarcoidosis, both sexes, 2014

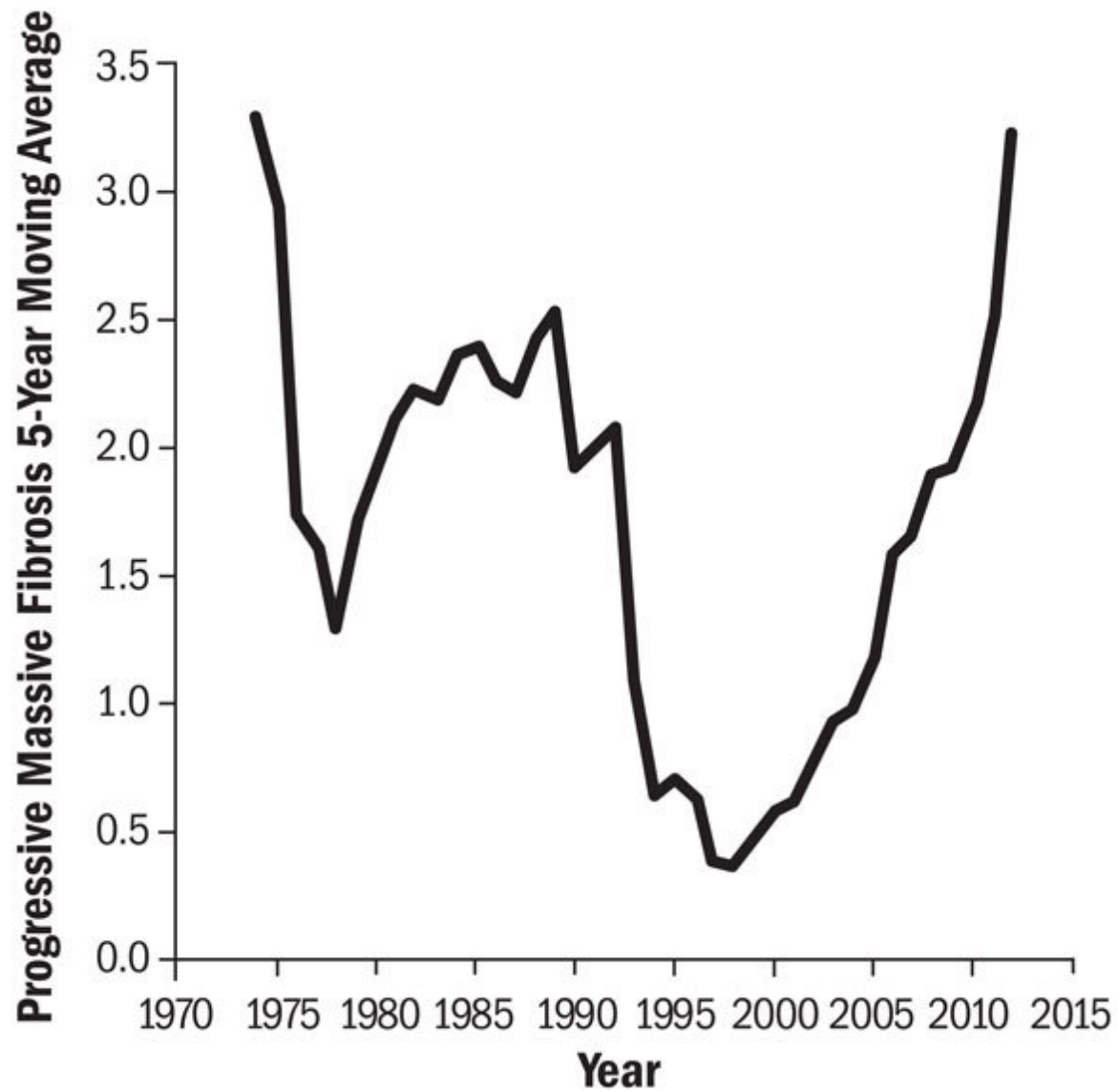


B Percent change in age-standardized mortality rate from interstitial lung disease and pulmonary sarcoidosis between 1980 and 2014, both sexes



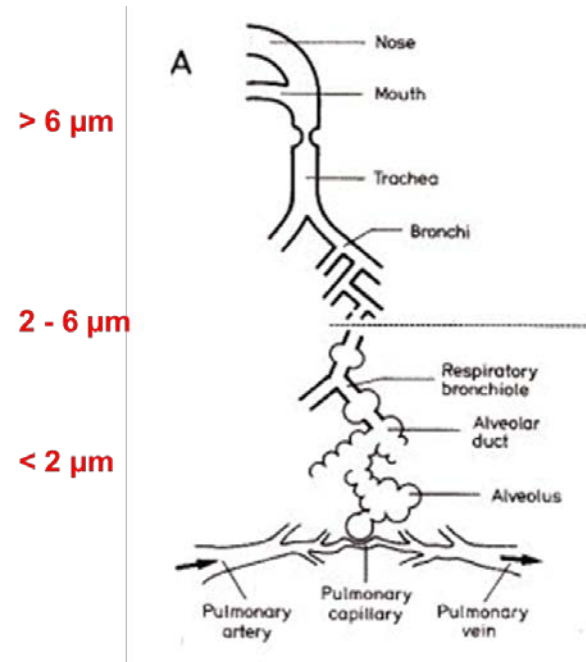
C Age-standardized mortality rate from interstitial lung disease and pulmonary sarcoidosis over time





Why the Increase in Lung Disease?

- Mine dusts today are much finer than before and contain high levels of quartz (and possibly silicates)
- New or modified mining practices
- Greater health-seeking behavior



Take Home Points: Slide 3

- There has been a re-emergence of Lung Disease including the more deadly Progressive Massive Fibrosis, in an era where mine compliance to dust regulations is at an all time high



Specific Management Issues for Miners

- 1) Worker Education
- 2) Surveillance of workers



What Limits Miners' Access to Medical Care?

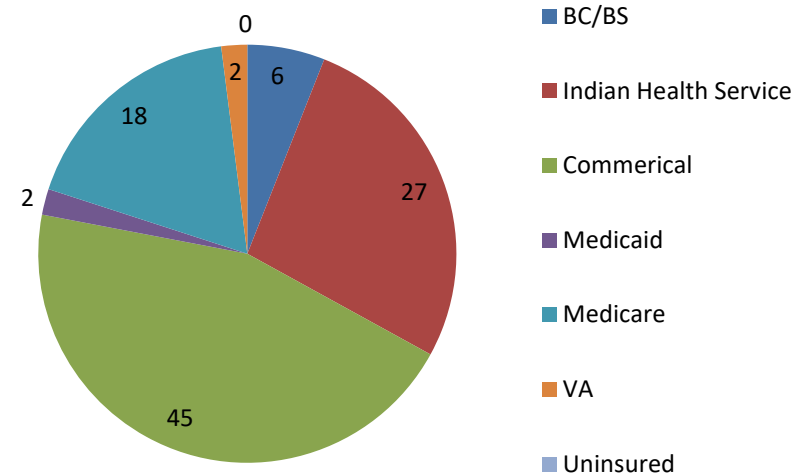
➤ Contrary to popular perception, almost all miners in NM are insured

- Uninsured rate of general population in NM = 20%

➤ >50% of miners in NM report not having a PCP

Limitation to access is *geographical, not financial*

Payor Source for Miners in NM

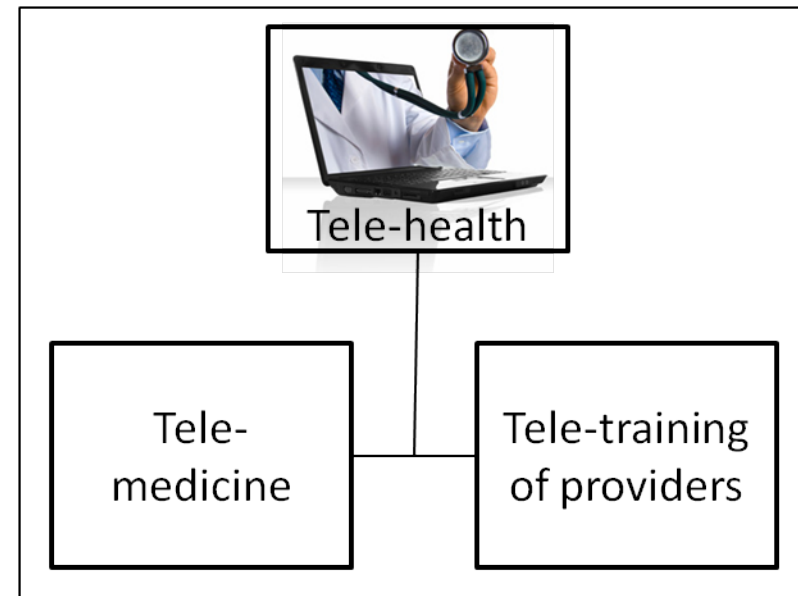


Ways to Improve Geographical Access

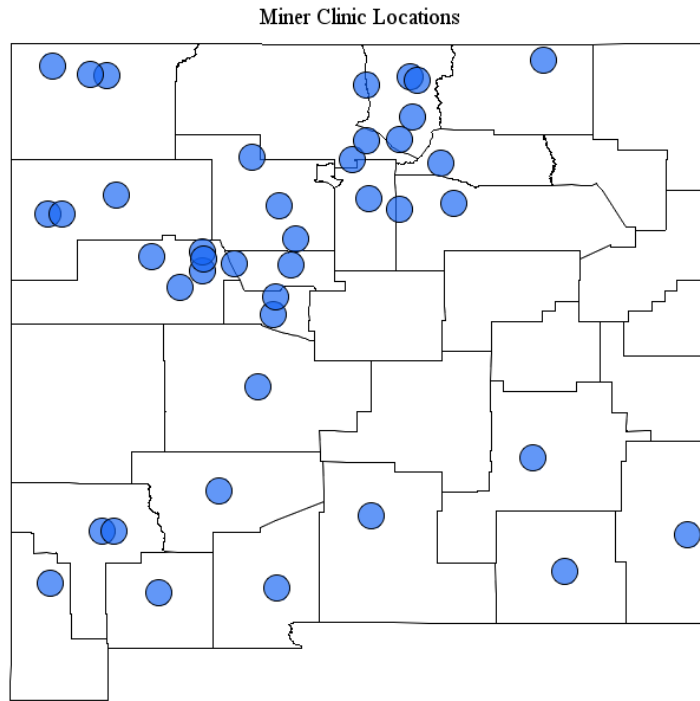
Take your clinic to the miner



Use technology to reach miner & provider



NM Mobile Screening Clinics

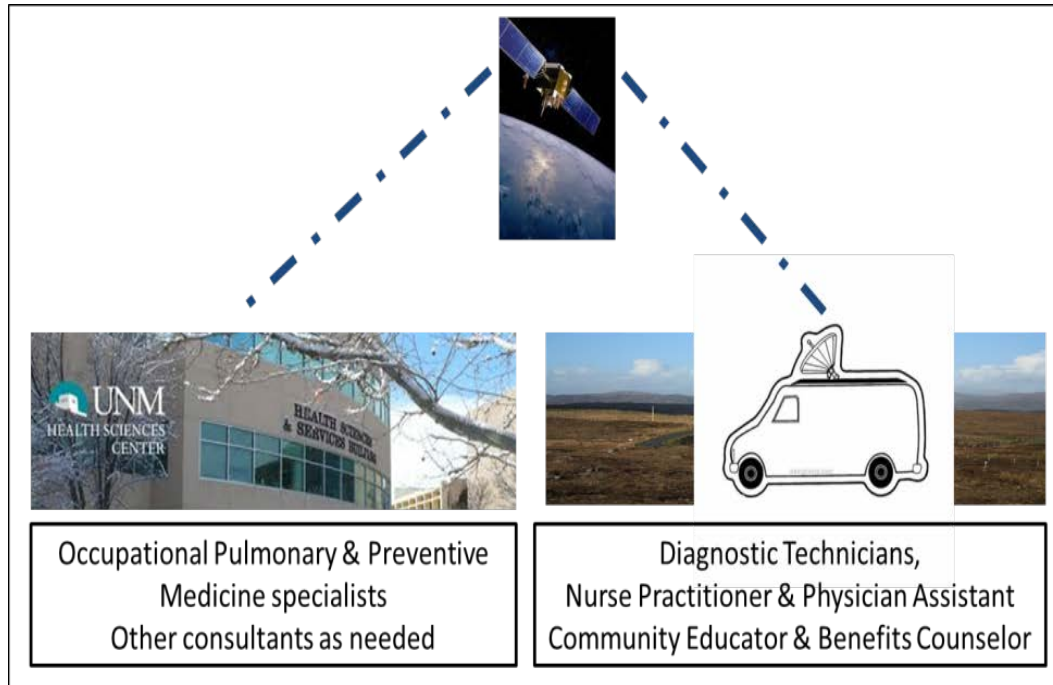


20 sites in NM since 1989

Miners are assessed for respiratory, hearing, metabolic, and musculoskeletal disorders



Addition of Specialist Telemedicine Expertise to Mobile Clinic



Advanced digital communication system for tele-medicine, using ground control satellite.

Videoconferencing using ZOOM® technology

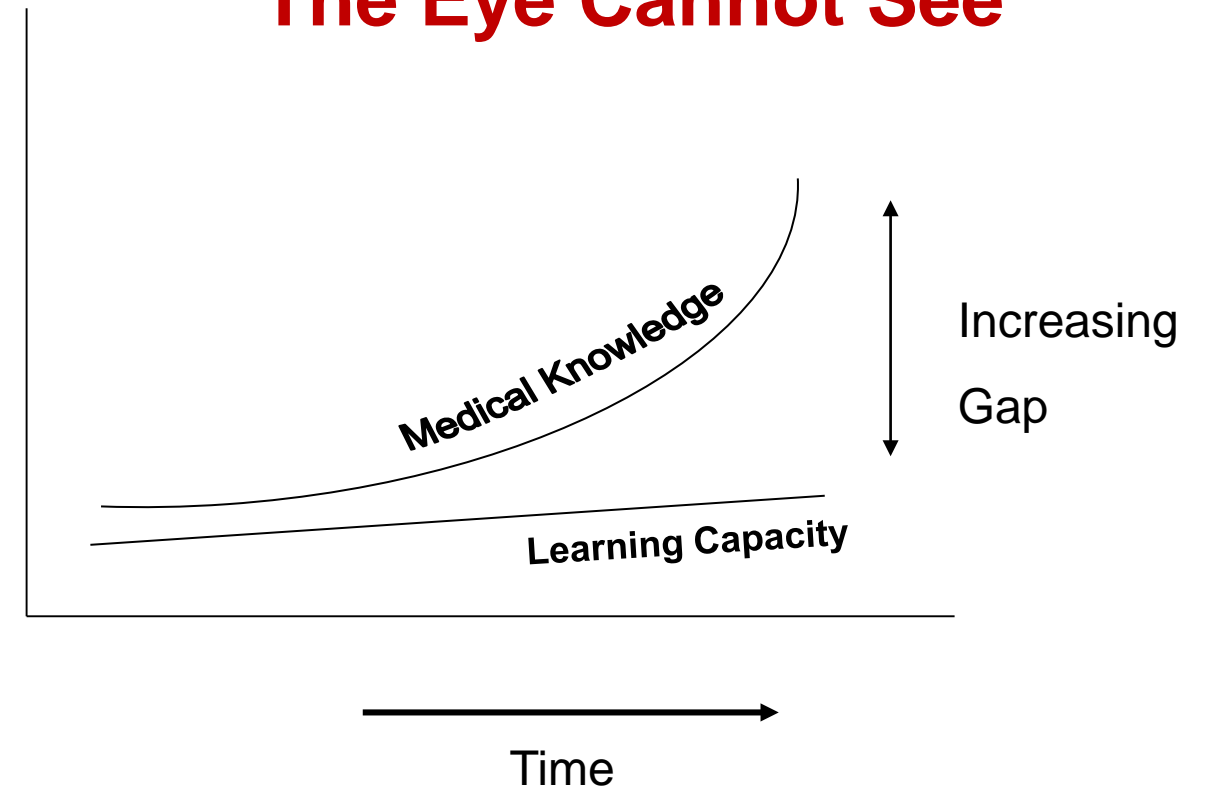
Technology demonstration successful in NM & WY and planned in UT

What Else Limits Miners' Access to Medical Care?

Estimated need for physicians in occupational medicine = 4600-6700

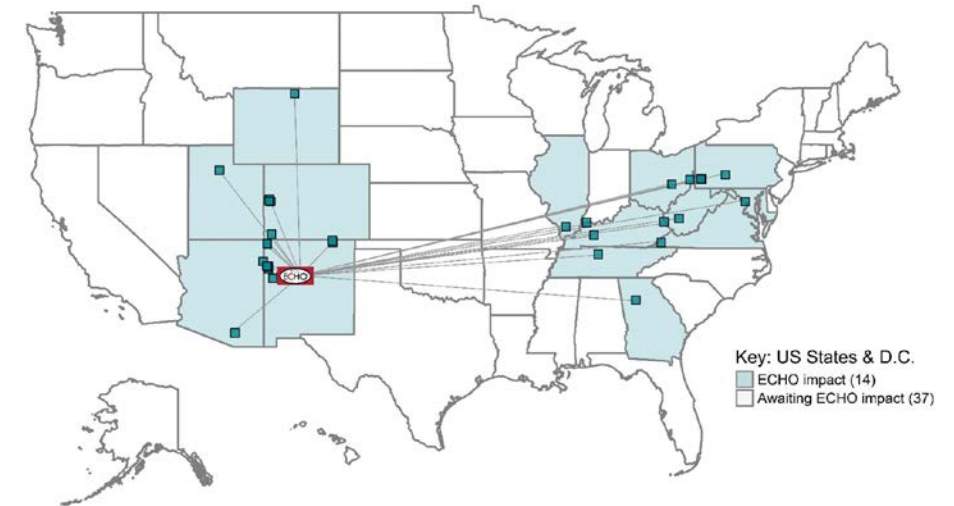
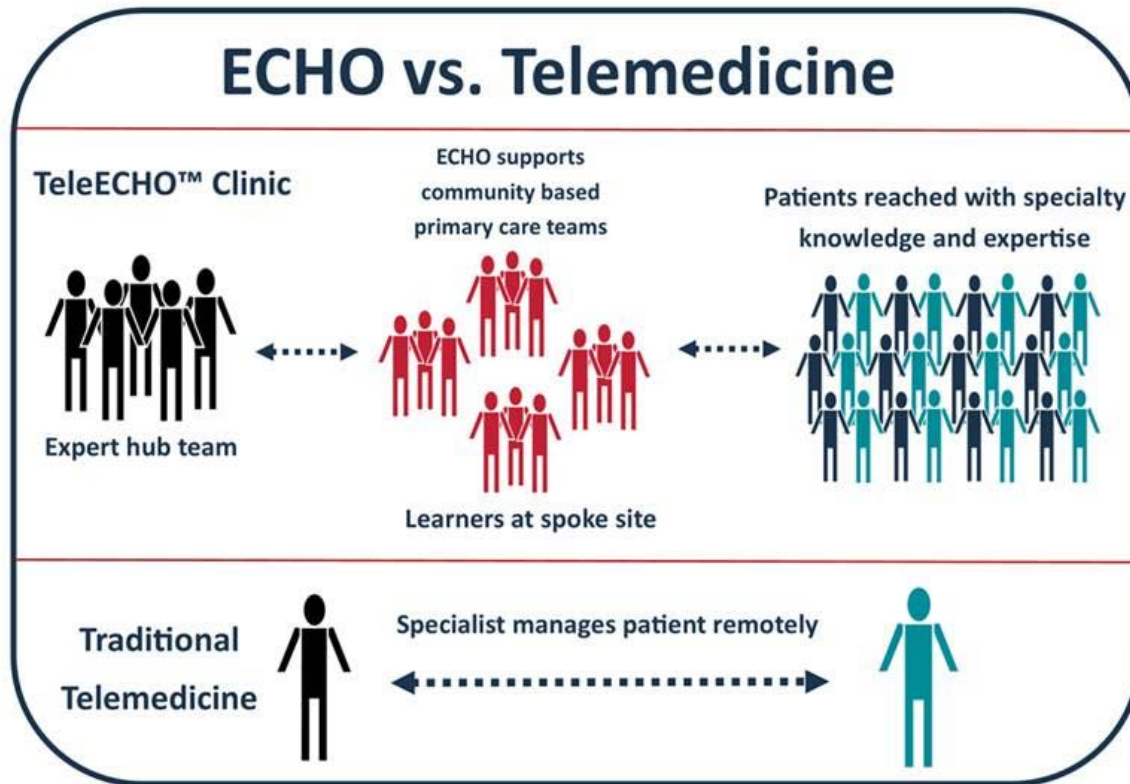
Estimated supply = 1200-1500

What The Mind Does Not Know The Eye Cannot See



Project ECHO: Miners' Wellness TeleECHO Clinic

Second & Fourth Wednesday 12 noon MT Please give me a business card if you would like to join in



Take Home Points: Slide 4

- Re-emergence of dust-related lung diseases & limited access to medical care in miners constitutes a problem
- Every problem has a creative solution
 - Donna Karan
- Information technology must play a central role in the redesign of the health care system
 - 2001 IOM Committee on Quality Health Care in America

My learnings over the past 4 years

- Medical Surveillance – Chest X-Ray
 - Early signs
- Spirometry Test
 - Lungs air capacity and your ability to expel air
- Reduced lung capacity
 - Reduced mobility
 - Increased abdominal obesity
 - Increased Diabetes
 - Less oxygenated blood to the brain
 - Increase in Dementia and Alzheimer's

Lung disease affects communities, our country and generations

Learnings from research

Native Americans

Hispanic Americans

African Americans

Non-Hispanic Americans

My advice to you

- If you smoke
 - STOP NOW!
- Exercise as much as you can
- Take deep breaths
- Eat healthier
- Talk to somebody
 - Educate our young miners
 - Ask for help

Summary

Mining is potentially hazardous but the lung health cost of mining can be reduced by primary, secondary, and tertiary prevention

Prevention is better than cure!

Acknowledgements

Lovelace Smokers' Cohort

- Y. Tesfaigzi
- H. Petersen
- P. Meek

Project ECHO

- S. Arora
- S. Kalishman
- R. Rochelle
- S. Murillo

Mining Dust in the US Cohort

- O. Myers
- L. Cook
- N. Assad
- X. W. Shore
- C. Pollard

Final Take Home Point

- December 1, 2001
- November 1, 2009
- 1 finger to see 11/01/2009
- 2 fingers to touch your great granddaughter
- 1 hand to hold your great granddaughter

The most important thing to come out of a mine...

...is the miner!

GOLD RUSH
EXPEDITIONS

<https://www.cdc.gov/nora/councils/resp/FacesCOPD.html>

[NORA homepage](#)

[NORA Respiratory Health Council page](#)



Questions