

# **OCCUPATIONAL LUNG/ CARDIOVASCULAR DISEASE RISKS IN NAVAJO COAL MINERS**

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*Workshop*

# Disclosures

- Principal Investigator: Black Lung Clinics Program (*Health Resources and Services Administration*)
- Co-investigator: Clarifying Distribution, Trends, and Determinants of Adverse Health in United States Miners: Exploration and Integration of Existing Data Systems and Clinical Materials (*Alpha Foundation for the Improvement of Mine Safety and Health*)

# Overview

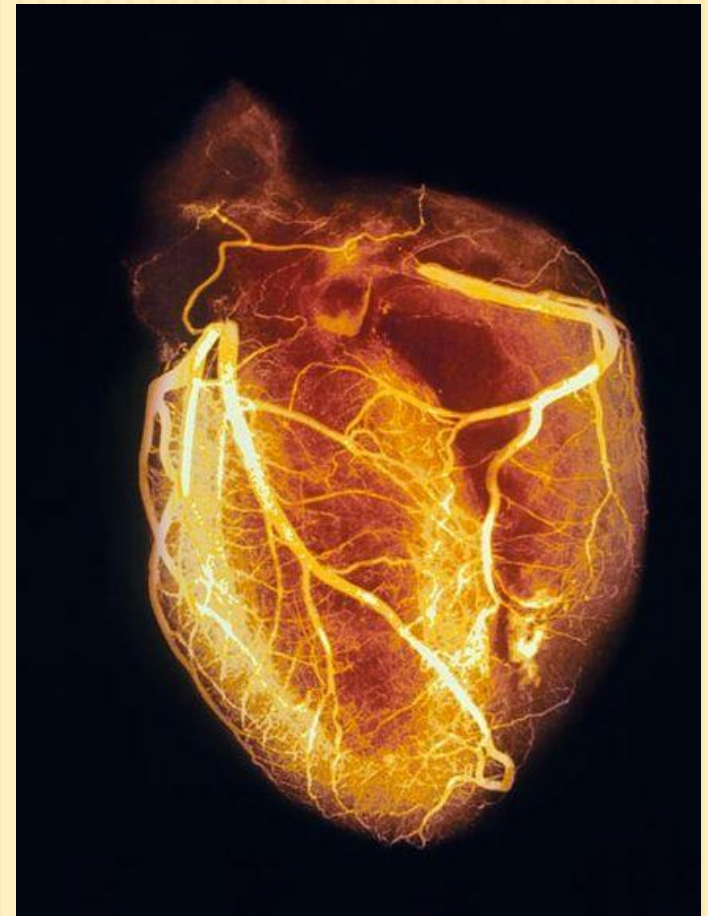
- Review personal and mining-related occupational risk factors for cardiovascular disease
- Review spectrum of lung diseases from exposure to coal mine dust
- Share data on rates of cardiovascular and work-related lung disease in Navajo coal miners participating in the Miners Clinic
- Discuss implications for care and prevention

# Cardiovascular disease (CVD)

- **Leading cause of death** in the US.
- **> 81 million Americans** have CVD, at an estimated cost of \$503 billion in 2010.
- **Multiple CVD risk factors** (personal and occupational).
- Estimated proportion of CVD associated with work-related factors ranges from **15 – 35%**.


# Personal risk factors for CVD

- ❑ Smoking
- ❑ High lipids/cholesterol
- ❑ Physical inactivity
- ❑ Diet/alcohol
- ❑ Hypertension
- ❑ Obesity
- ❑ Diabetes mellitus
- ❑ Family history of heart disease



# Mining-related occupational risk factors for CVD

- Noise
- Particulates (PM 2.5)
- Stress (high demand/low control; shift work; long hours)
- Vibration
- Temperature extremes
- Carbon monoxide
- Some chemicals and metals (lead, solvents, carbon disulfide, nitrates)

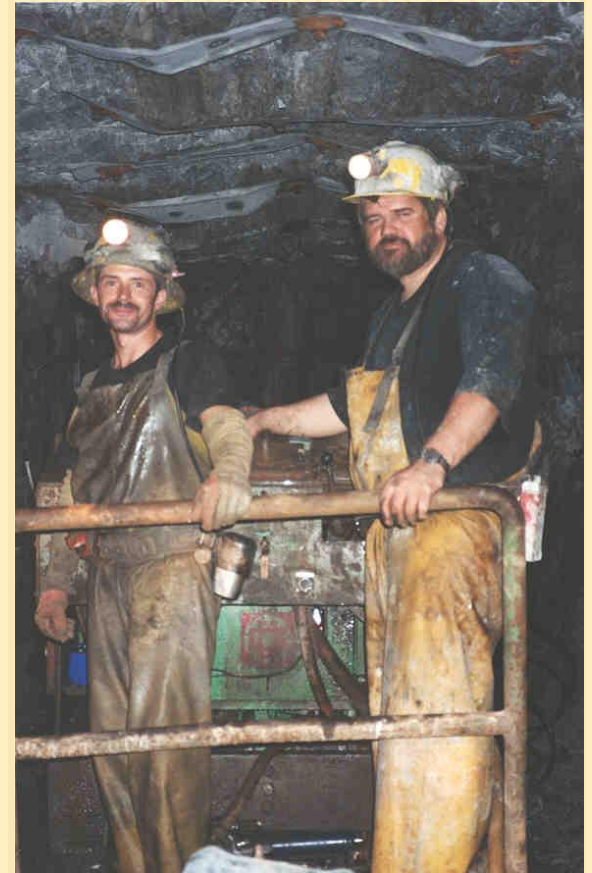


Workplace factors contribute to obesity, smoking, alcohol use, and lack of exercise as well as to work-family stress and conflict.

# Morbidity & disability among workers $\geq 18$ years in the Mining sector, 1997-2007

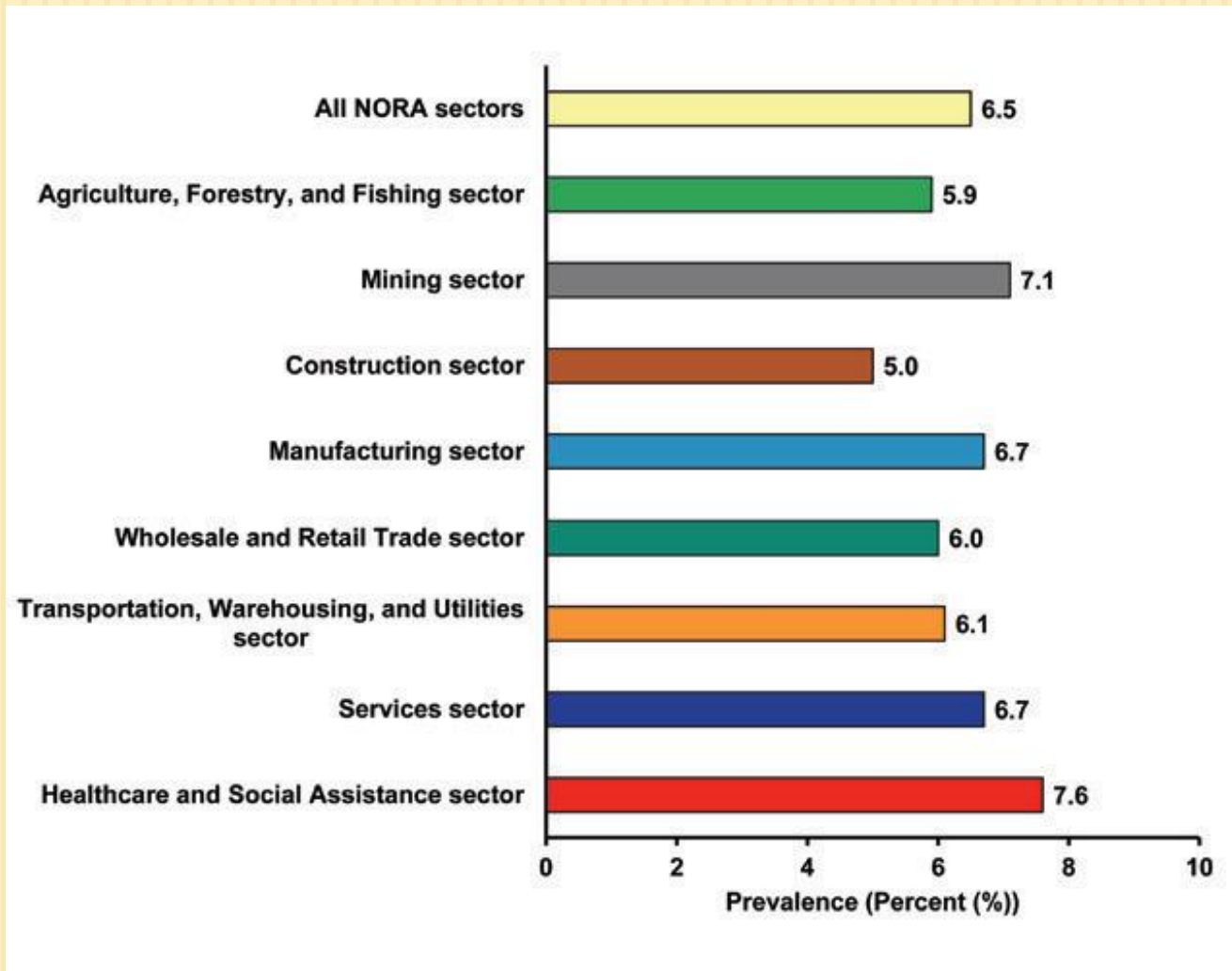
- Blue collar workers less likely to have health insurance, health screening, health prevention information;
- More likely to be obese, less likely to exercise, more likely to report risky behaviors (smoking, drinking).

[NIOSH, 2012]

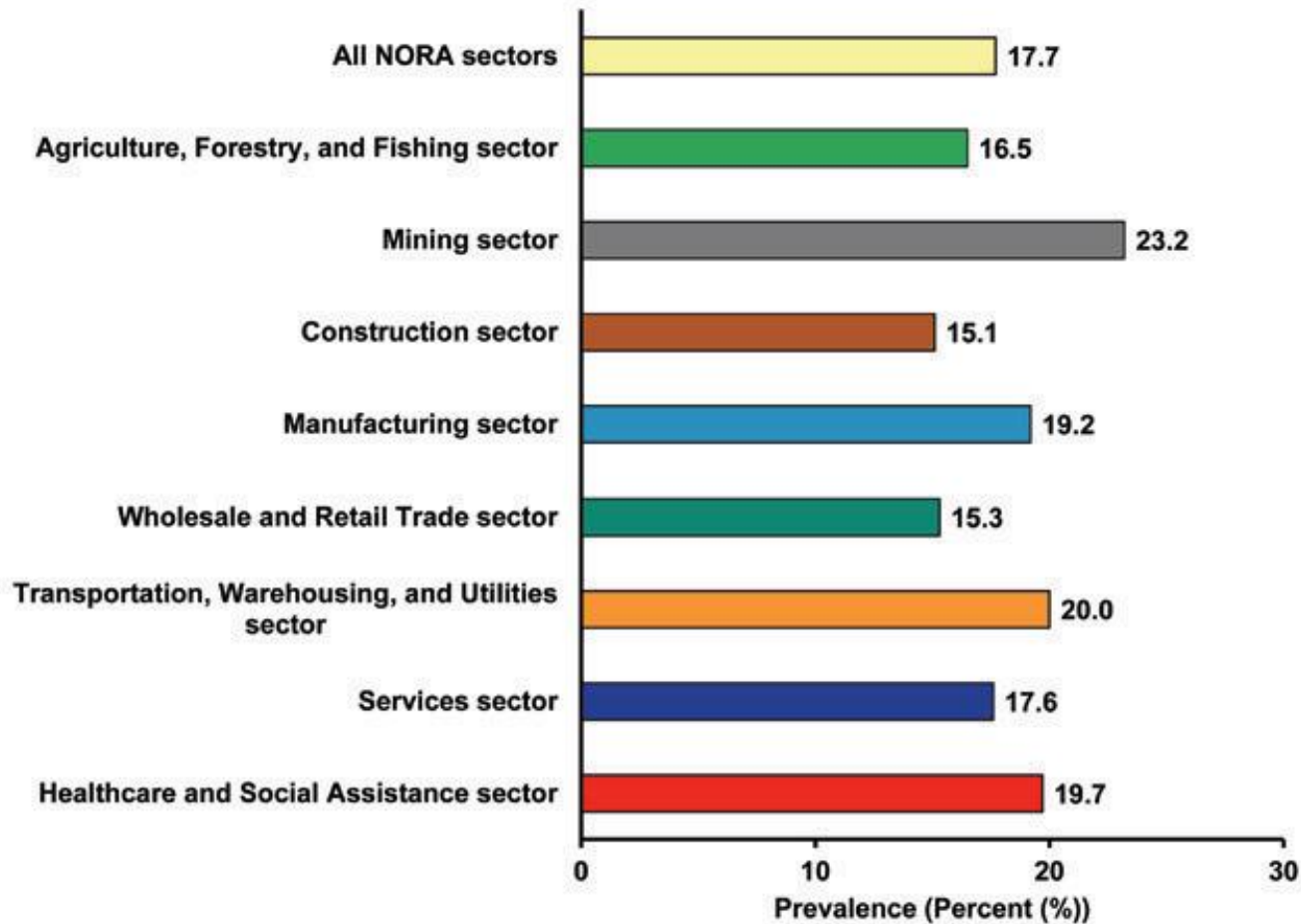




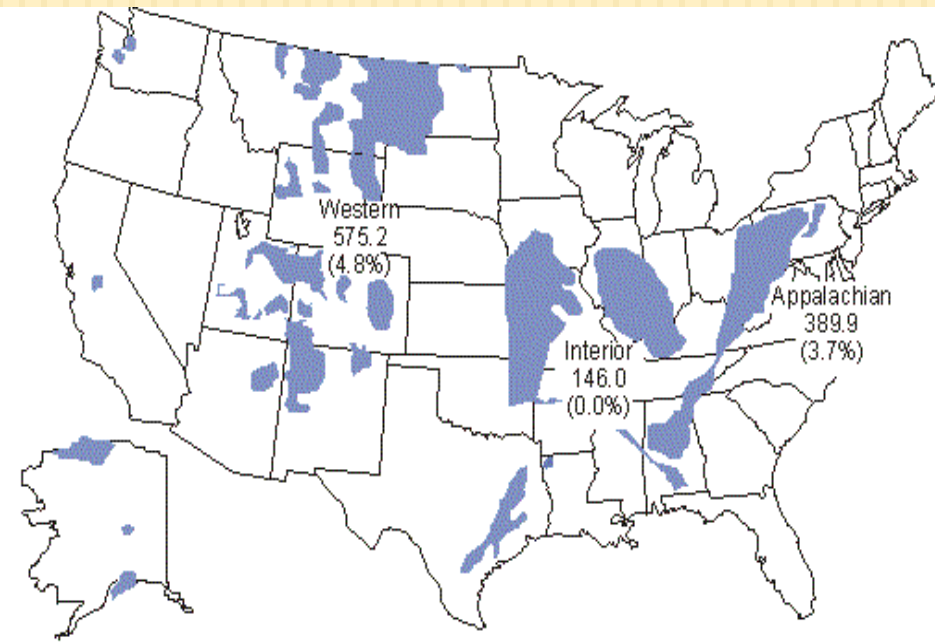
# Heart disease prevalence is high in the mining sector.



# High prevalence of hypertension is in the mining sector (23.2%).




# Coal miners are at risk for work-related lung disease.



**Lung** diseases from exposure to coal mine dust:

- ❑ Black lung (CWP)
- ❑ Silicosis
- ❑ Emphysema
- ❑ Industrial bronchitis
- ❑ Diffuse interstitial fibrosis

# Miners Clinic Navajo coal miners 5 year medical screening program in Page, AZ



We've got our reasons why miners should be screened for lung conditions. Maybe you've got your own.

You'd do anything for your family — and taking care of yourself is one of the most important things you can do. Miners are at risk for many lung conditions. Early diagnosis and treatment make a difference, even if you are not having breathing problems right now.


**Get a FREE annual screening.**  
The Miners Clinic of Colorado at National Jewish Medical and Research Center in collaboration with Page Hospital, is offering free, in-depth screenings for mining-related illnesses.

**Miners Lung Screening Program For Retired and Active Miners**  
Page Hospital, 501 North Navajo Drive  
October 19 & 20

Call **1.877.BLK.LUNG** for more information or to schedule a confidential screening. Space is limited; call for an appointment.

**NATIONAL JEWISH**  
Medical and Research Center  
Global Leader in Lung, Allergic and Immune Diseases

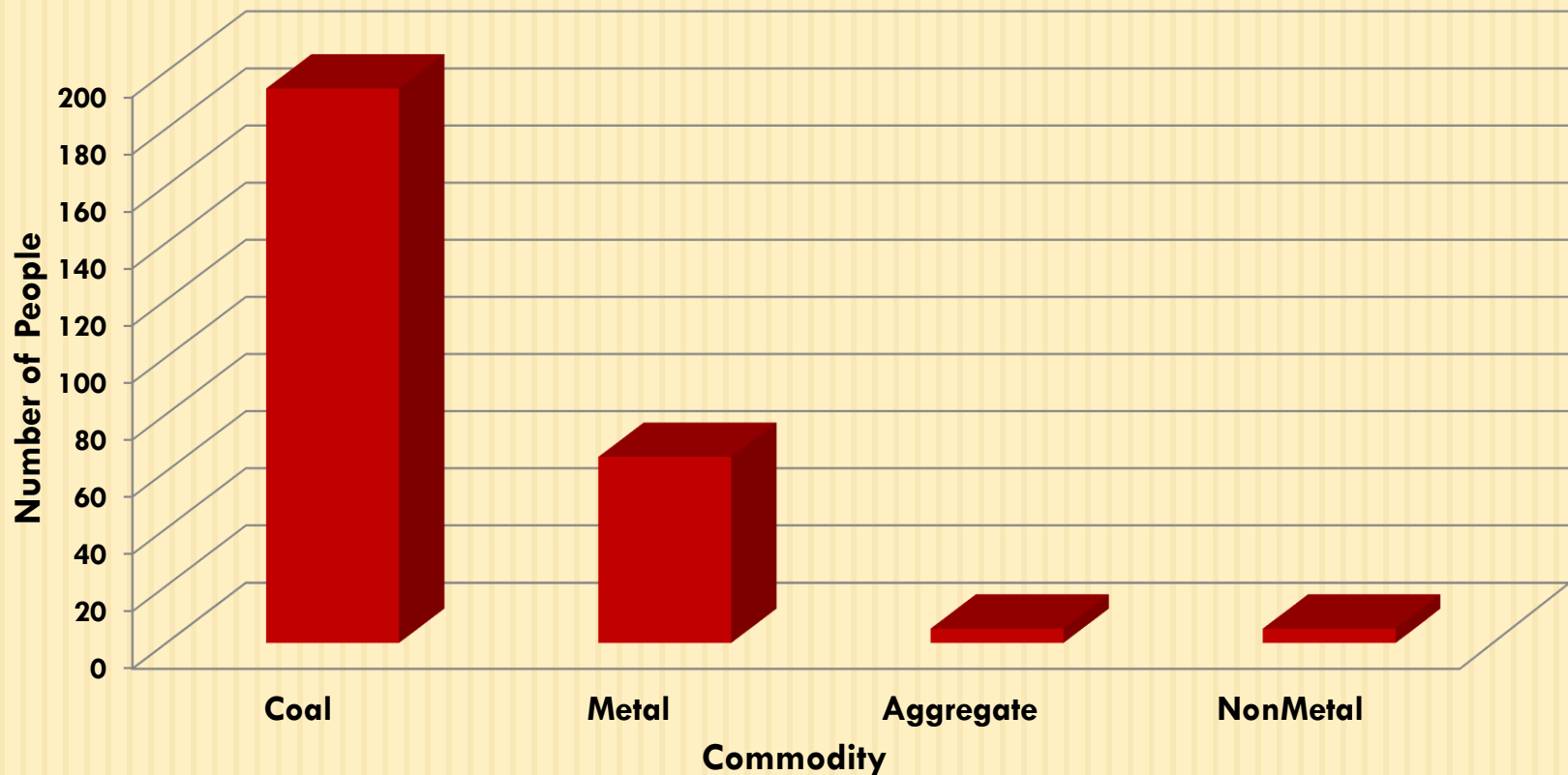
#1 respiratory hospital in the country.  
Since 1998. *U.S. News & World Report*



What do we know about rates of cardiovascular and lung disease in participating Navajo coal miners?

# Most of our Navajo patients are surface coal miners.

**Commodity Distribution For Navajo (N=231)**



# Surface coal mining



# Characteristics of 231 Navajo miners

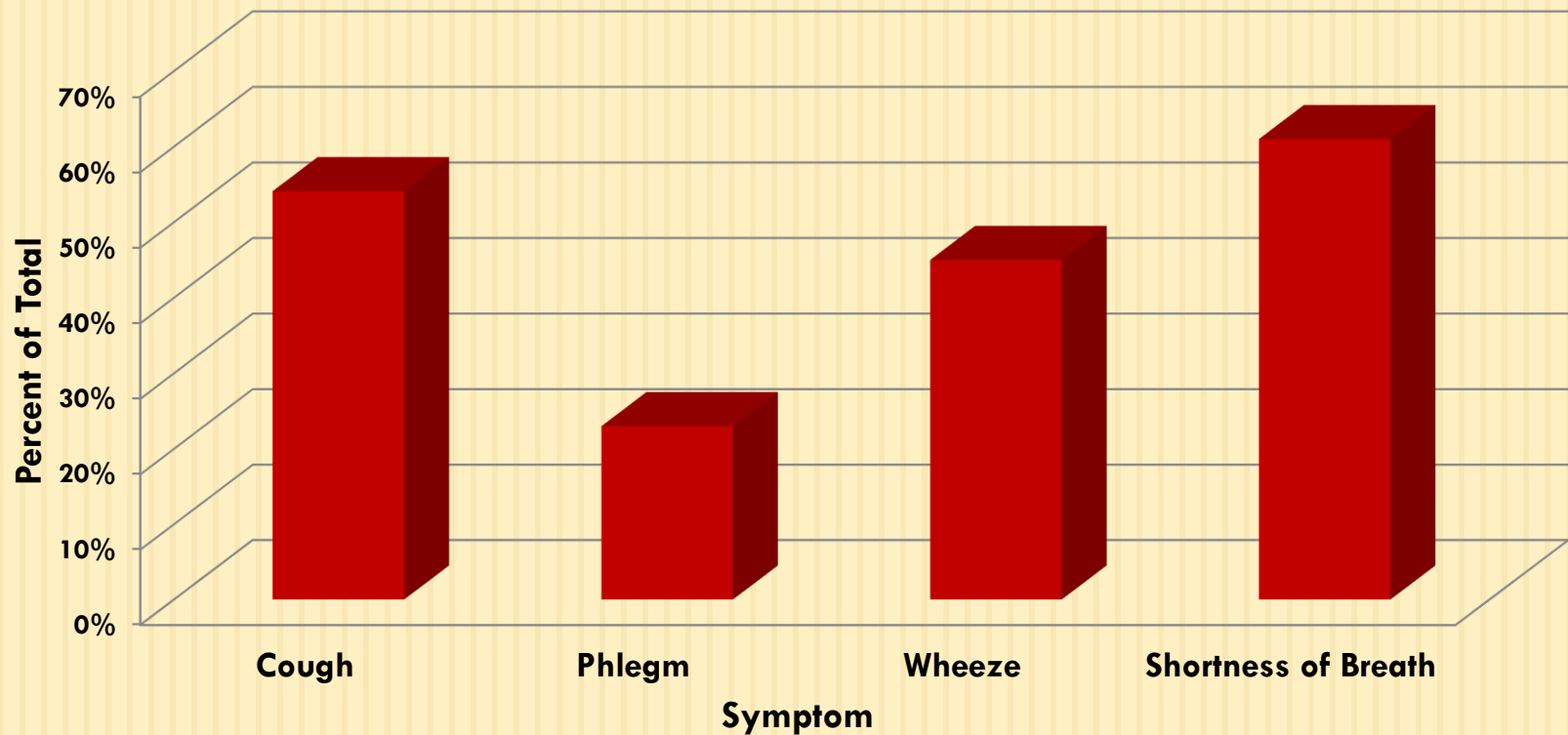
- **Average age: 61.3 (10.3) years**
- **93% men**
- **Ever smoker: 12.6%** (compared to 48% in MCC patients total)
- **Average years worked as a miner: 20.8 yrs (13.4)**





# Respiratory symptoms are common.

**Symptoms Reported by Navajo  
(N=231)**



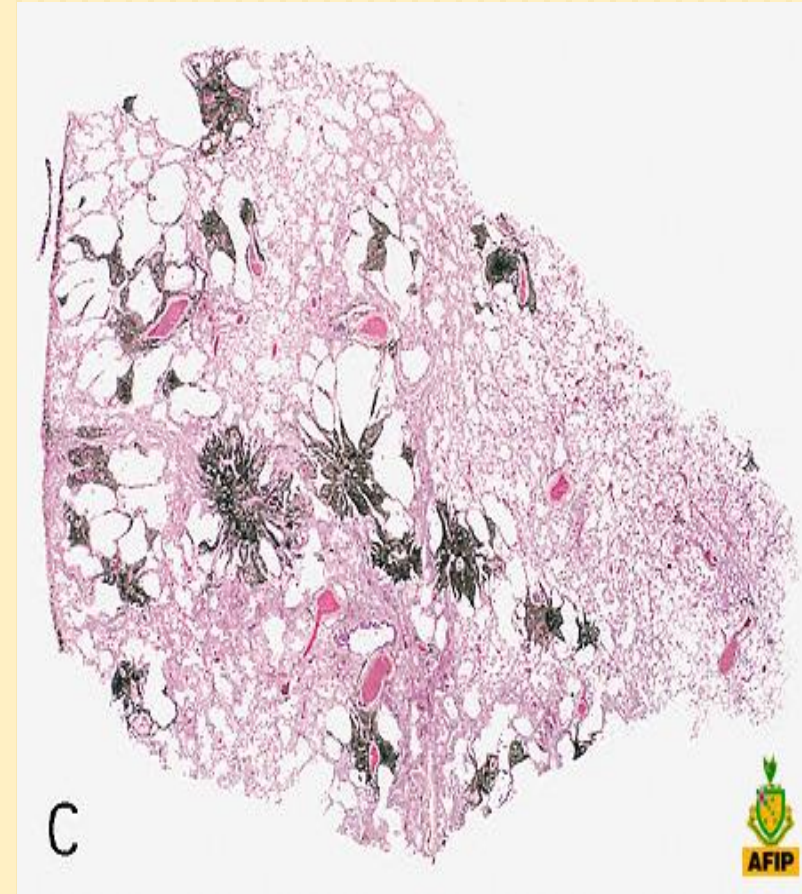
# Pneumoconiosis in 231 Navajo coal miners

- Abnormal chest x-ray profusion score on B reading: **24 (10%)**
  - 1/0=10
  - 1/1=9
  - 1/2=5
- Benefits counseling and assistance with DOL Black Lung claims



# Emphysema in 4-9% of participating Navajo coal miners

- COPD (LLN): **8 (4%)**
  - 7 never smokers
- COPD (GOLD): **17 (8.6%)**
  - 12 never smokers



# Hypertension in coal miners

## High blood pressure

- **38%** in Navajo coal miners
- **43%** in other coal miners

## Consequences of untreated hypertension

- 4 times as likely to die of **stroke**
- 3 times as likely to die of **heart disease**
- Chronic **kidney** disease

# High rates of treatable and preventable CV diseases risk factors in Navajo coal miners.

1. Obesity (BMI>30): 41%
2. Obstructive sleep apnea symptoms: 17%
  1. Poor concentration/inattention
  2. Errors and accidents (2-3x MVA rates)
3. High blood pressure: 38%
4. Current smoking: 7%

# Strategies used in the Miners Clinic to manage medical conditions identified.

- Immediate **face-to-face discussion** and counseling with the patient by the clinic MD
- Urgent finds and recommendations – **immediate written results** for patient to give to provider
- Written **health education materials** provided at the clinic visit
- **Calls to local providers** from MCC MDs to discuss referral and management of more immediate problems
- **Results letters** to patients, with copy to provider if available and with patient's written permission
- **Follow up phone calls** from case manager
- **Tracking** of calls and results in the BLCR database

# Implications and future directions

- Assure that miners with lung and heart disease get **medical and preventive care and follow up** (work with local MDs, pulmonary rehab, vaccinations, medications, supplemental oxygen)
- Assure that miners with work-related lung disease get the Black Lung **benefits** they deserve
- Support efforts to **limit coal mine dust exposure**



# Miners Clinic team/Acknowledgements

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# Questions?

