



World Class. Face to Face.

Scientific Advisory Committee Meeting
July 28, 2010 Richland, WA

Collaborative Mesothelioma Study

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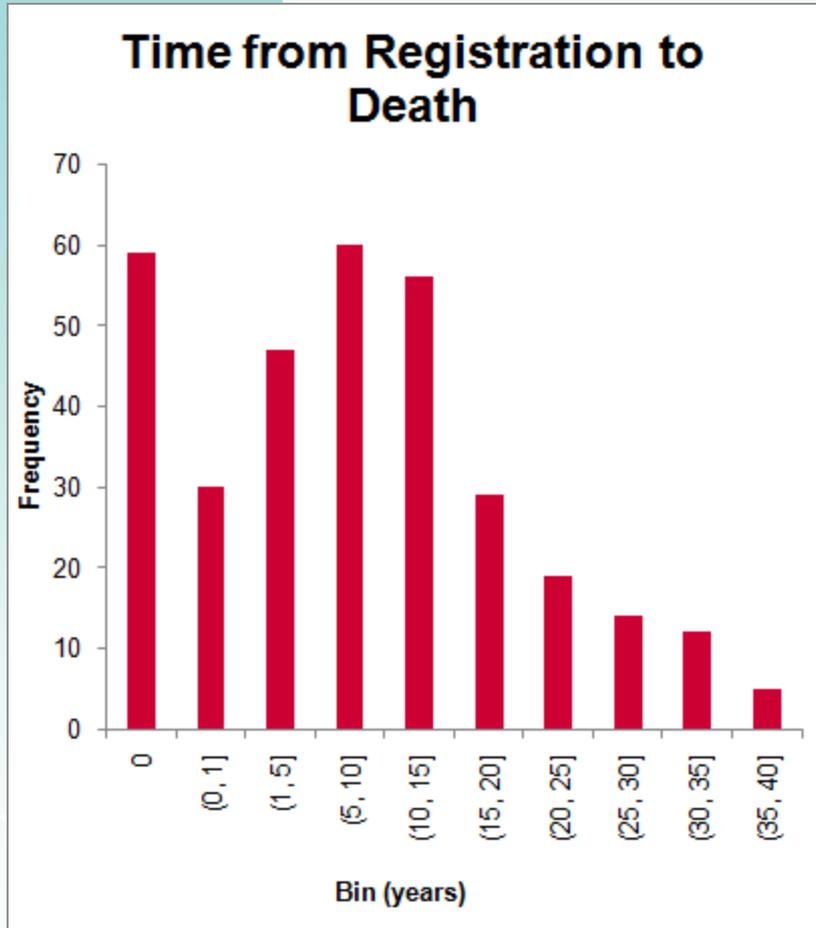
*“Learning from Plutonium and Uranium
Workers”*

Overview

- **8 mesothelioma deaths out of 332 registrants (2.4%)**
- **Compiled data:**
 - **Admin**
 - **Asbestos Exposure**
 - **Smoking**
 - **Alpha Dose**



Admin Data



- **Worksite**
- **Autopsy Type**
(37 WB, 290 RO, 5 SP)
- **Birth and Death dates**
(age)
- **Registered Date**
- **Gender**
- **Race**

Asbestos: Data Sources

- **Self Reported “work with or exposure to”:**
 - Asbestos
 - Beryllium
- **“At Risk” Occupations:**
 - *Teschke et al.*
 - *Peto et al.* (study of mesothelioma incidence in UK population, based upon 5+ y in occupation)
- **Autopsy Report**
- **Absence of Information**
 - No indication of exposure
 - No information



Asbestos: High and Medium Risk Occupations

HIGH risk:

- Sheet Metal Workers
- Riveters
- Coach/vehicle body builders
- Laggers
- Boiler attendants
- Shipwrights
- Shipbuilding
- Working on board a ship
- Carpenters
- Electricians
- Plumbers
- Painters
- Roofers
- Other Construction

MEDIUM risk:

- Metal working production
- Toolmakers
- Maintenance fitters
- Railway worker
- Chemist or industrial scientist
- Surveyor or inspector
- Metal machining & instrument makers
- Electrical & electronic trades
- Welding
- Steel erecting & fixing
- Assemblers
- Miner (excludes coal)
- Research chemists



Asbestos: Low Risk Occupations

LOW risk:

Motor mechanic

Draughtsman

Engineers and technologists (nec)

Stores and warehousemen

Armed forces (nec)

Drivers

Road transport workers

Coal mine laborers

Railway station staff

Cabinet makers (wood)

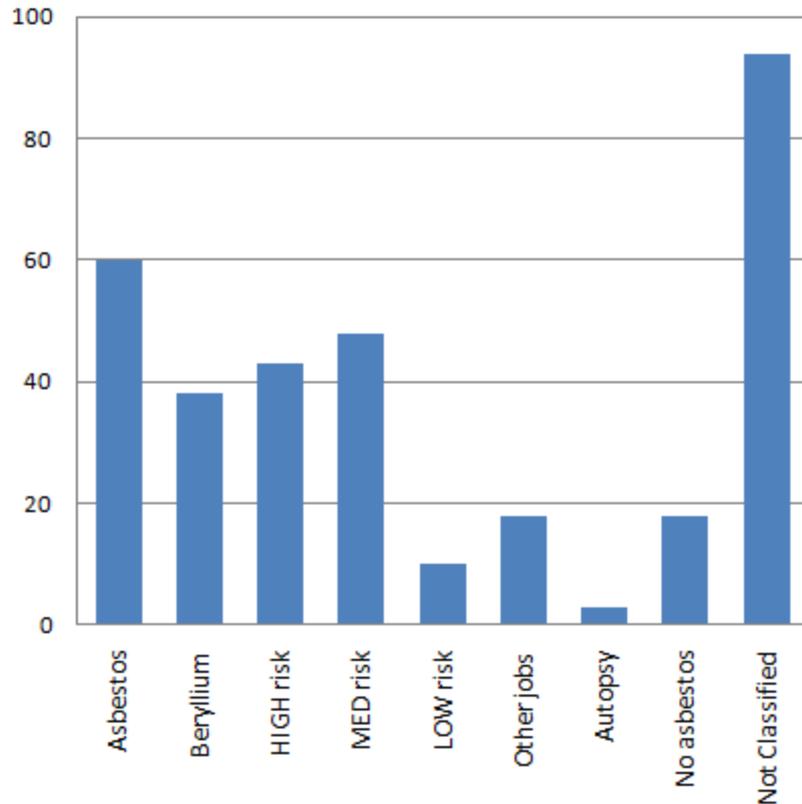
Die casters

Occupational hygienists/safety officers

Rubber process operatives

Asbestos: Summary

of Cases in each Classification Category

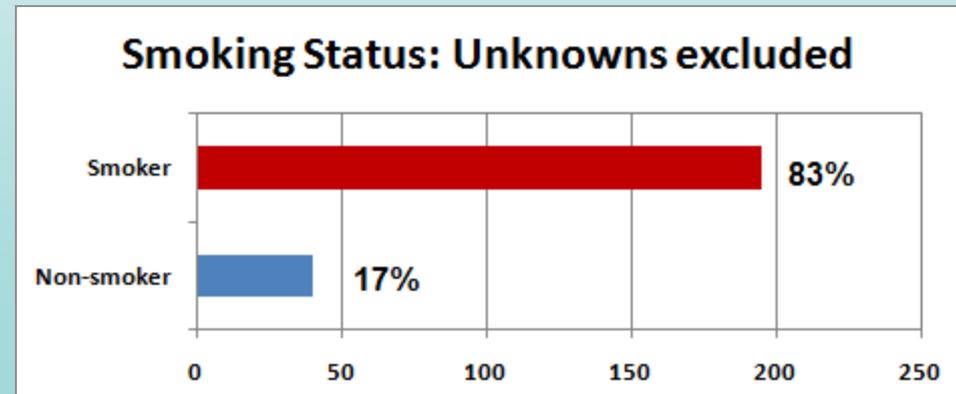
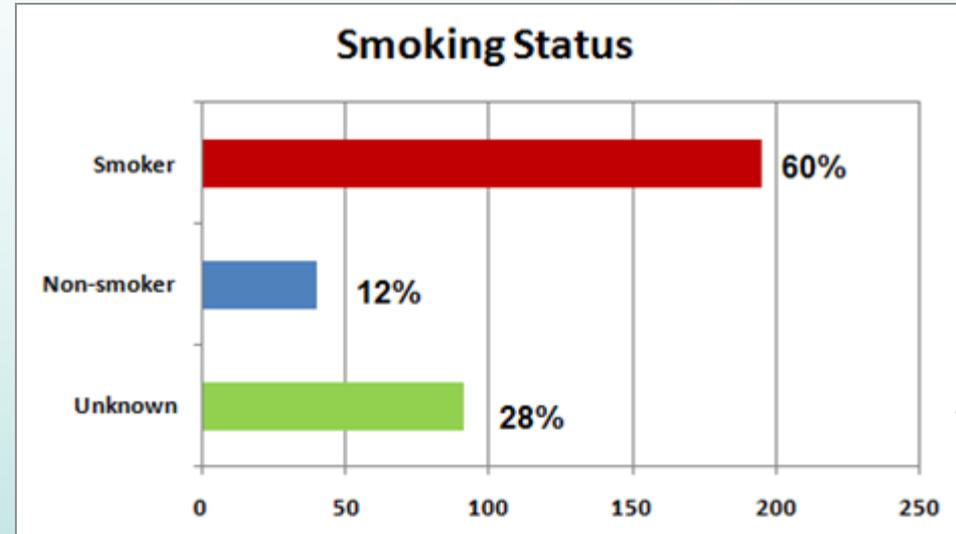


Category		Percent
Asbestos	Y	18%
Beryllium	Y	11%
HIGH risk	Y	13%
MEDIUM risk	Y	14%
LOW risk	N	3%
Other jobs	Y	5%
Autopsy report	Y	1%
No indication of exposure	N	5%
Not classified	?	28%

Category	Count	Percent
Elevated risk	210	63%
Low risk	28	8%
Not classified	94	28%

Smoking History

- **Data Collected**
 - **Smoker? (Y/N)**
 - **Type**
 - Cigarettes
 - Cigars
 - Pipes
 - **Dates**
 - From/To
 - **Number of Years**
 - **Packs per Day**



Radiation Doses (Lung)

- **Cumulative External Dose**
 - **Collected by Naz Fallahian**
 - **Maximum: 183 rem (criticality)**
 - **Minimum: no recorded dose**
 - **Average: 17 rem**
- **Terminal Alpha Dose Rate (TDR) in the Lung**
 - **Absorbed Dose Rate (mGy/y)**
 - **Calculated from radiochemistry results**
 - **Lung activities measured in 295 of 332 registrants**
 - **Alpha + Alpha Recoil**



Terminal Alpha Dose Rate (Lung)

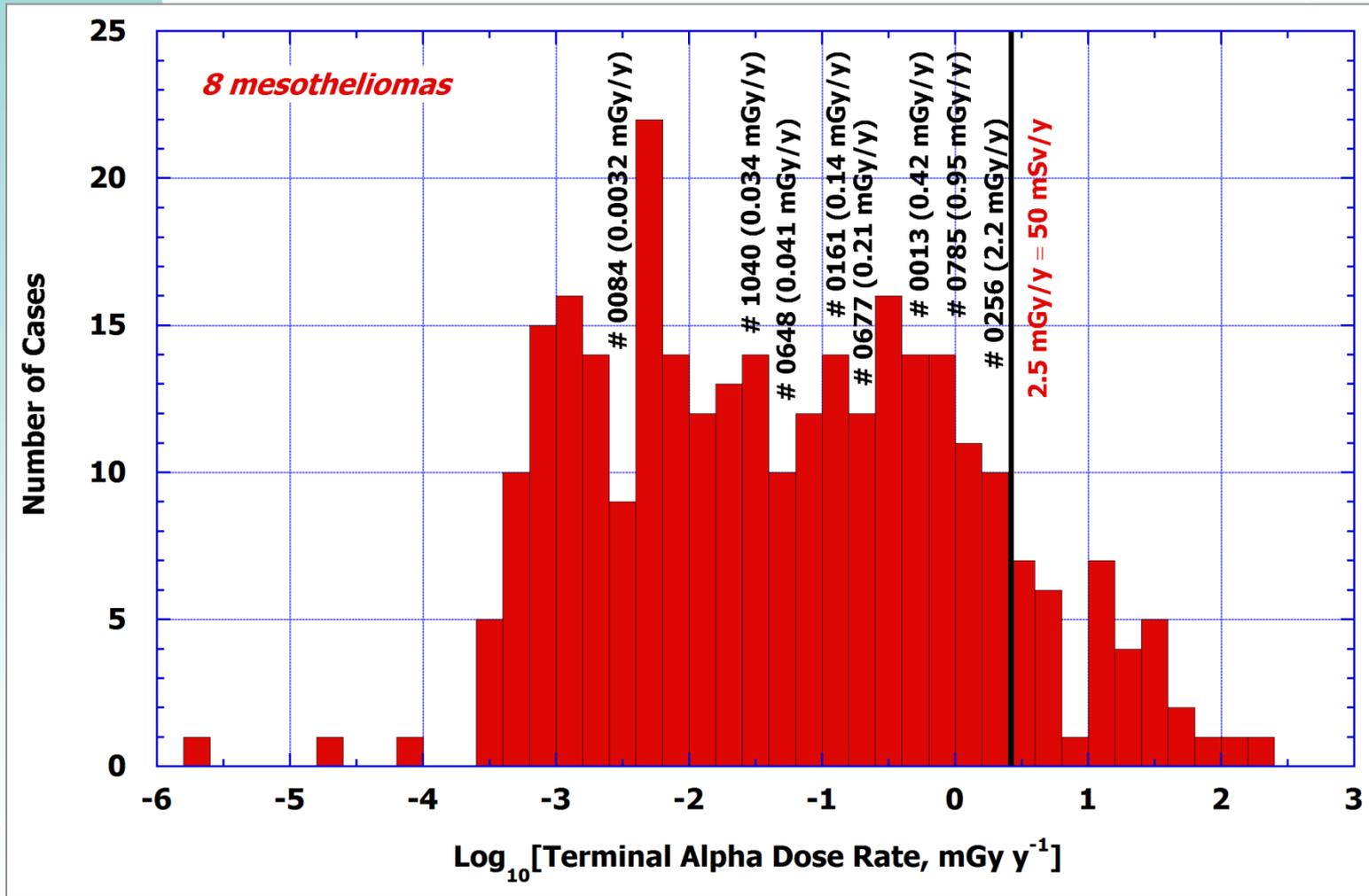
- The TDR (mGy/y) was calculated from radiochemistry results (Bq/kg)

Primary Intake	Typical Analyses
²⁴¹ Am	²⁴¹ Am
Pu	²⁴¹ Am; Pu-total or ²³⁸ Pu, ²³⁹ Pu, ²⁴⁰ Pu
U	U-total or ²³⁴ U, ²³⁵ U, ²³⁸ U
Th	²²⁸ Th, ²³⁰ Th, ²³² Th

- Calculated absorbed dose rate from:
 - Lung activity concentration (Bq/kg)
 - Transformation energy (MeV)
 - Yield
 - Absorbed fraction (=1 if S = T)
 - Conversion factors



Terminal Alpha Dose Rate



Terminal Alpha Dose Rate

