Historical Mining Exposures in Ontario

Victoria Arrandale PhD

Occupational Cancer Research Centre, Cancer Care Ontario
Dalla Lana School of Public Health, University of Toronto

Lung Cancer and Prevention in Mining Symposium
Sudbury, Ontario

July 11, 2017
Exposures in Mining

• Exposure to known and suspected lung carcinogens
  – Silica, diesel engine exhaust, radon, asbestos
• Exposure also contribute to respiratory diseases, including pneumoconiosis and COPD
• No provincial or industry-wide exposure surveillance system
OMED

- **Ontario Mining Exposure Database**
- Over 118,000 records
  - Mix of data from Ministry of Labour, Mines Accident Prevention Association of Ontario and companies
- Database of historical exposure measurements
- Useful for studying exposures related to cancer, and other long latency disease
Most Common OMED Exposures

Percentage of Exposure Records

Exposure Hazards

- Dust
- Silica & silicon compounds
- Radon & its decay products
- Arsenic & its compounds
- Sulphur & its compounds
- Copper & its compounds
- Carbon Monoxide
- Acids and acid mists
- Cadmium & its compounds
- Asbestos
- Oxides of Nitrogen
- Iron & its compounds
- Zinc & its compounds
- Nickel & its compounds
- All Other exposures
Preliminary Results – Respirable Dust in OMED

~8300 respirable dust measurements
~5400 for nickel, gold and uranium

V. Tran, MPH Practicum
Preliminary Results – Respirable Silica in Gold Mines

~7800 respirable silica measurements
~4200 for nickel, gold and uranium

~7800 respirable silica measurements

~4200 for nickel, gold and uranium

N. Blagrove-Hall, MPH Research Project
Medical Surveillance in Mining

• Historically underground hard rock miners in Ontario underwent annual medical evaluation to ensure they were free of silicosis (1920s – 1980s)
  – “Mining Master File”
  – Used for mining cohort studies, last updated in its entirety in 1983
  – Uranium miners cohort (subset of MMF) updated in 2015

• Valuable tool for studying health in the mining industry
  – Administrative health data limitations
Over half (54%) of miners mined more than one ore during their career.
OCRC Research

Ontario Mining Exposure Database
~118,000 exposure records

Ontario Mining Master File (MMF)
~90,000 miners (over 99% male)
Annualized job history, 1950s to 1980s

Ontario Mines Database
Detailed information on mine operations over time

Uranium Miners Cohort
~30,000 miners

Potential to assign exposure to cohort members for multiple exposures, preliminary work beginning with uranium miners cohort
Take-away Message

• Early OMED results: no obvious trend in dust and silica exposure from 1970s to 1990s

• Data for quantitative exposure assessment continues to be a challenge

• In mining, need to account for:
  – Exposures mixtures (concurrent exposures)
  – Exposure in multiple workplaces over time

• Goal is to use OMED and MMF together, to investigate cancer and other chronic diseases among Ontario miners
Thank you

victoria.arrandale@cancercare.on.ca