

Environmental Health Surveillance Workshop:

Uses of surveillance: To follow the effects of development

Dr. James Irvine
Medical Health Officer

Ottawa, Feb 25 – 26, 2013



Uranium mining developments in northern Saskatchewan



Photo: Doug Chisholm

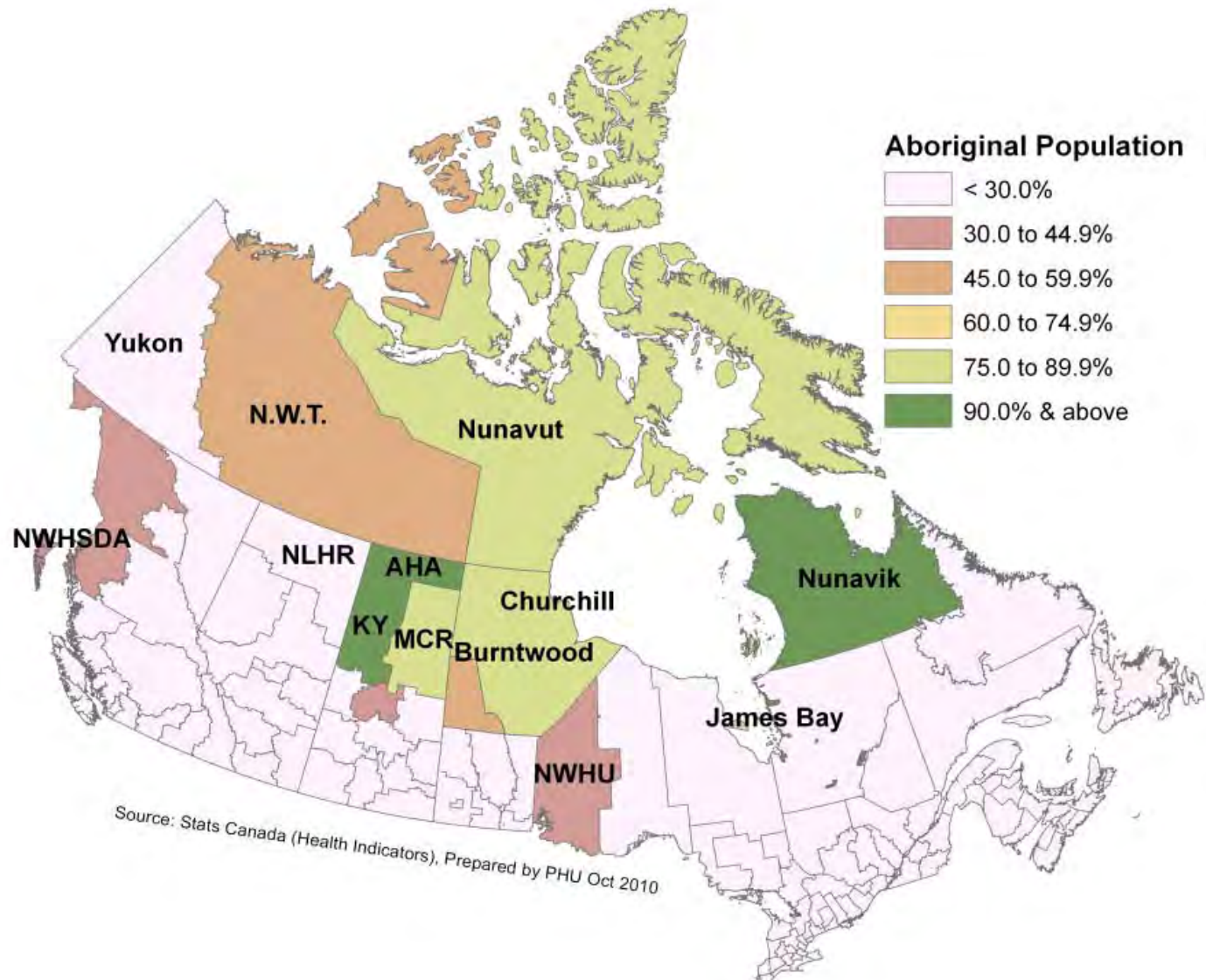


**2012 Northern
Sask Population:**

38,442

~ 70 communities

Population declaring Aboriginal identity, by Health Authority, 2006



Uranium mining developments in Saskatchewan



History

Mining since the 1950s



Legacy Sites:
abandoned/orphaned sites



Mine employees

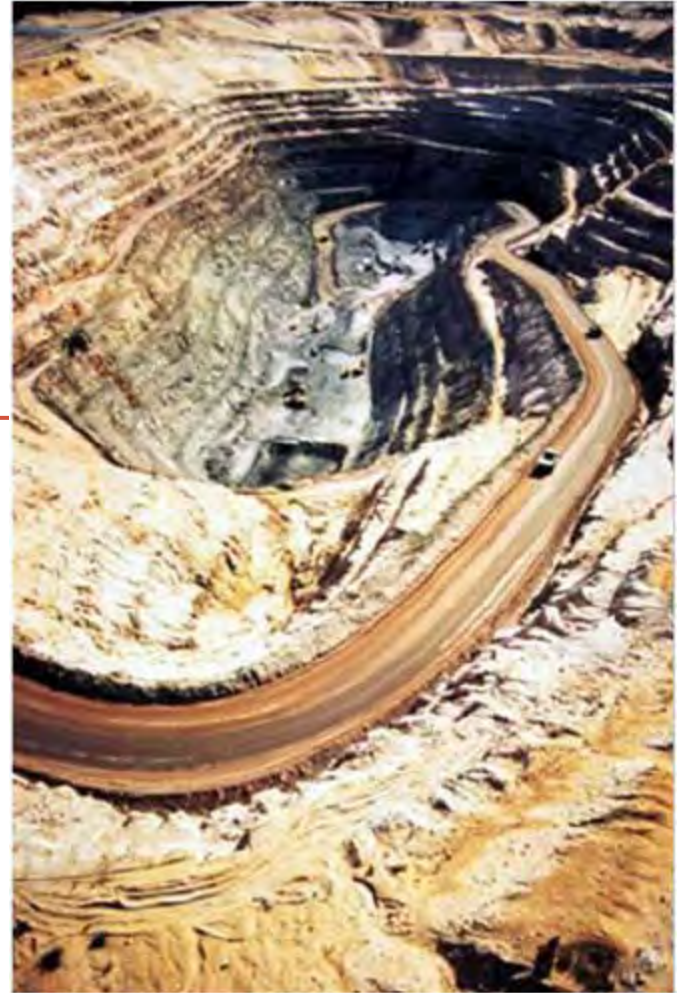
Historical: Mining Towns



Now: Fly in / Fly out



Underground and Open-Pit Mines Mills



Present day mines



Remote Technologies





3723 work at northern Saskatchewan uranium mines
(employees or long term contractors):
47.5% are 'residents of northern Saskatchewan (2011)



Environmental Health Surveillance



Walter Smith,
(with wife Lorrie and grandson)
Cameco Northern Affairs
La Ronge, SK

Partnerships for surveillance

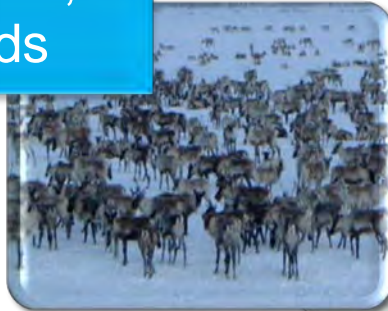
- Northern Mines Monitoring Secretariat:
 - Ministries of Environment (EA and EP Branch), Education, Energy & Resources, Government Relations (First Nations, Metis and Northern Affairs), Health, Labour Relations and Workplace Safety
 - Canadian Nuclear Safety Commission
- Environmental Quality Committees
- Environment Canada
- Health Canada
- Saskatchewan Watershed Authorities
- Universities
- Industry



Worker's health
& safety



Animals, fish,
plant foods



Family's socio-
economic conditions



Air, water, soil

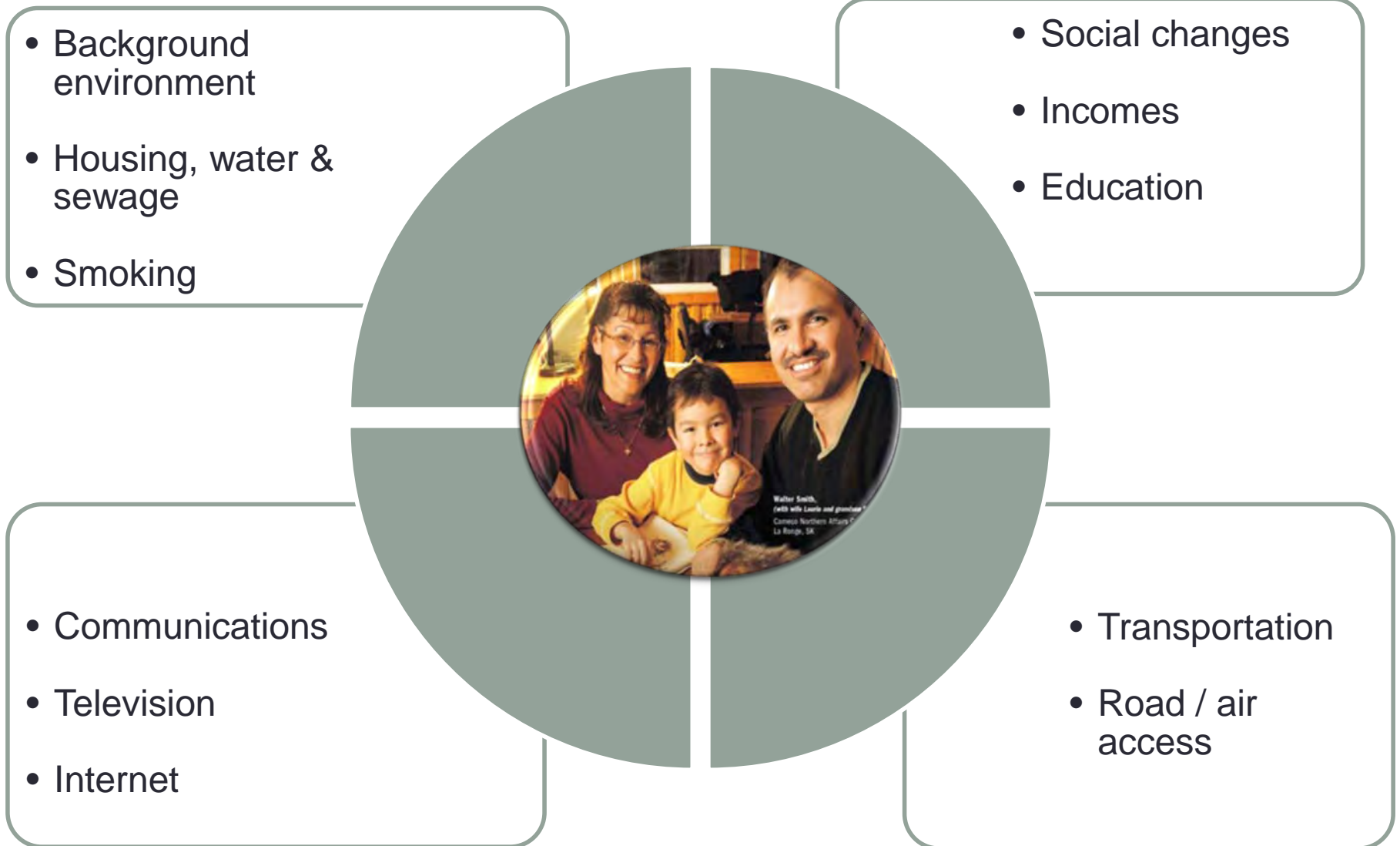


Community's socio-
cultural-economic factors



Monitoring community health

Many other factors affecting our communities



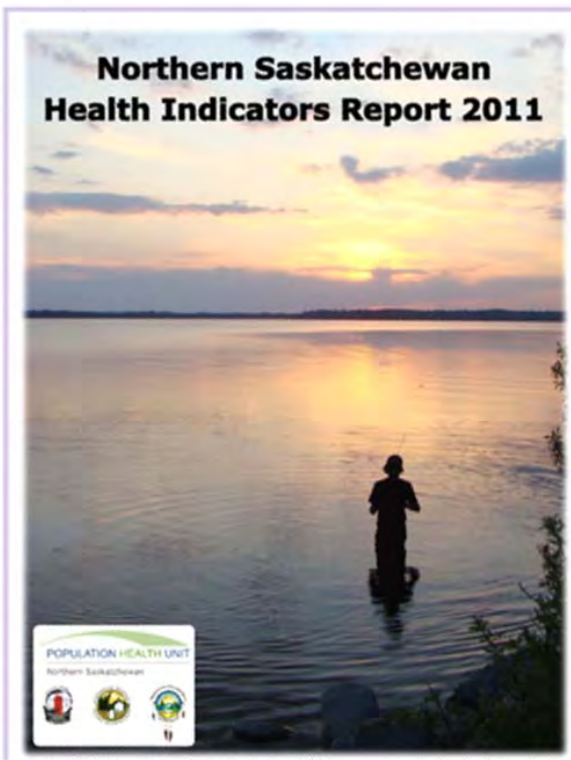
Joint Federal-Provincial Panel on Uranium Report 1993

- **“Implementation of a program to collect & analyze changes in indicators of community health for impacted communities, & formulation & implementation of remedial health strategies”**
- **Following Feasibility Study**
 - Health effects monitoring integration with overall health monitoring / needs assessment

Trends in Health Status

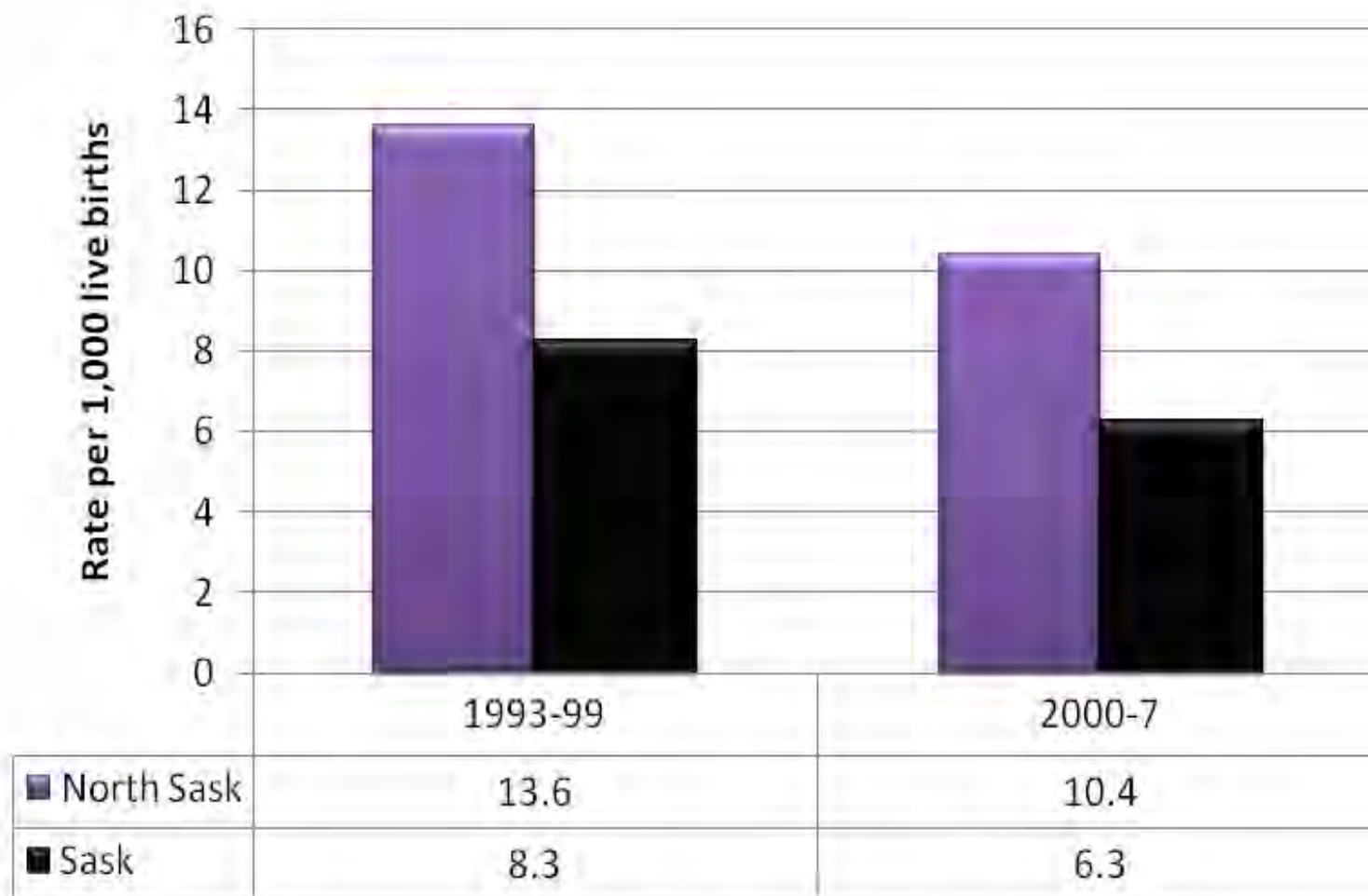
1998, 2004, 2011

- Improvements in infant health
- Improvements in infectious disease
- Some infectious diseases still prevalent or emerging
- Continuing high rates of traumatic deaths
- Increasing influence of chronic disease (e.g. diabetes, heart disease)
- High levels of tobacco misuse



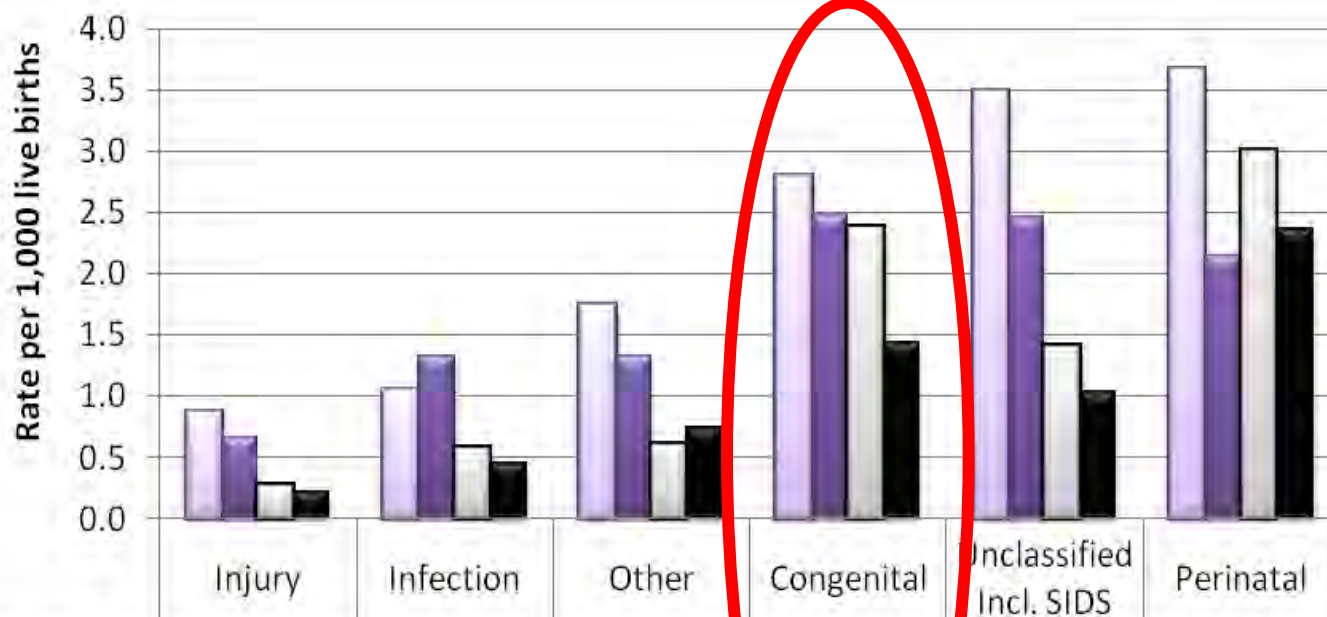
Infant mortality rate,

8-yr averages, NorthSask and Saskatchewan, 1993-2007



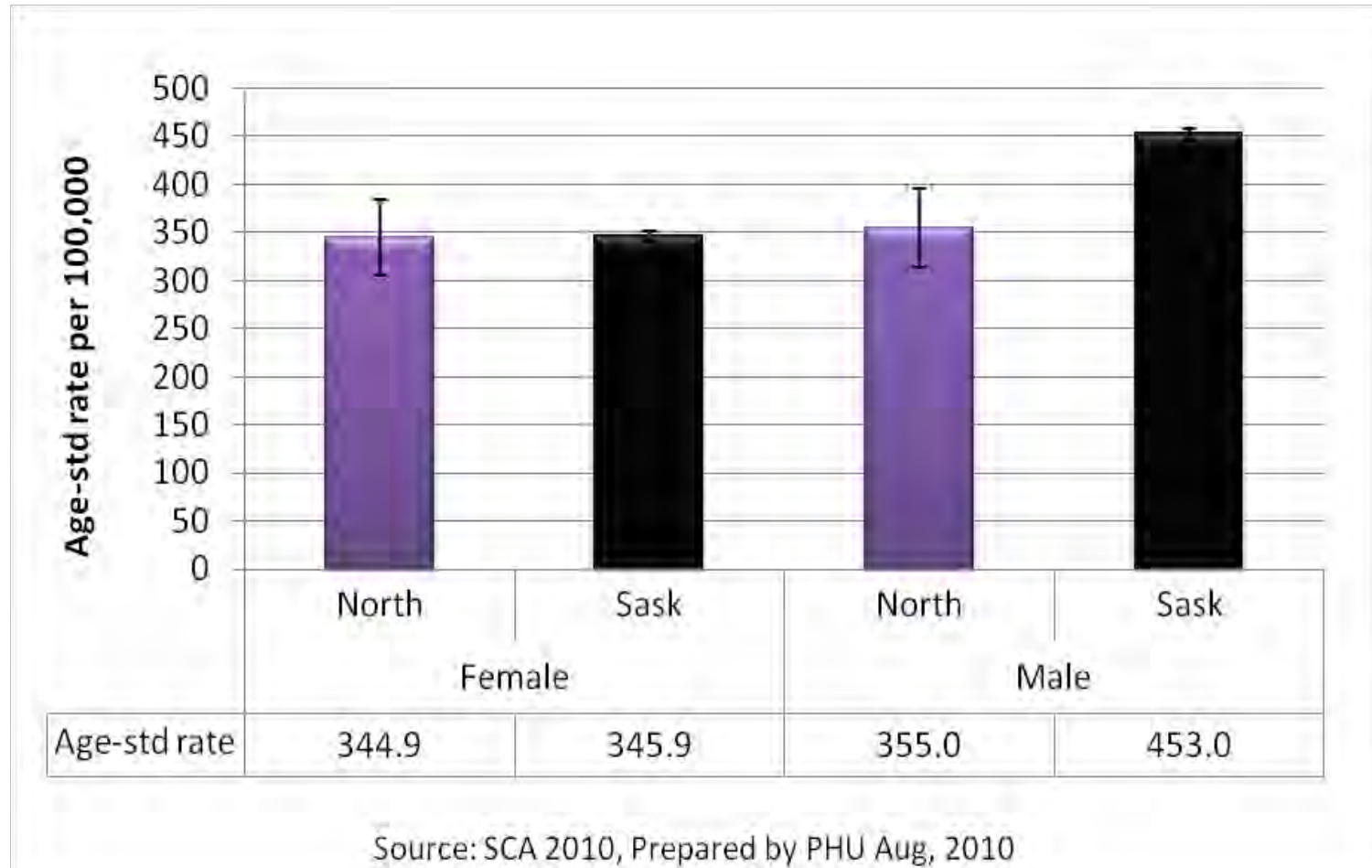
Causes of Infant Death

in Northern Saskatchewan and Saskatchewan by year groups
(rate per 1000 live births)



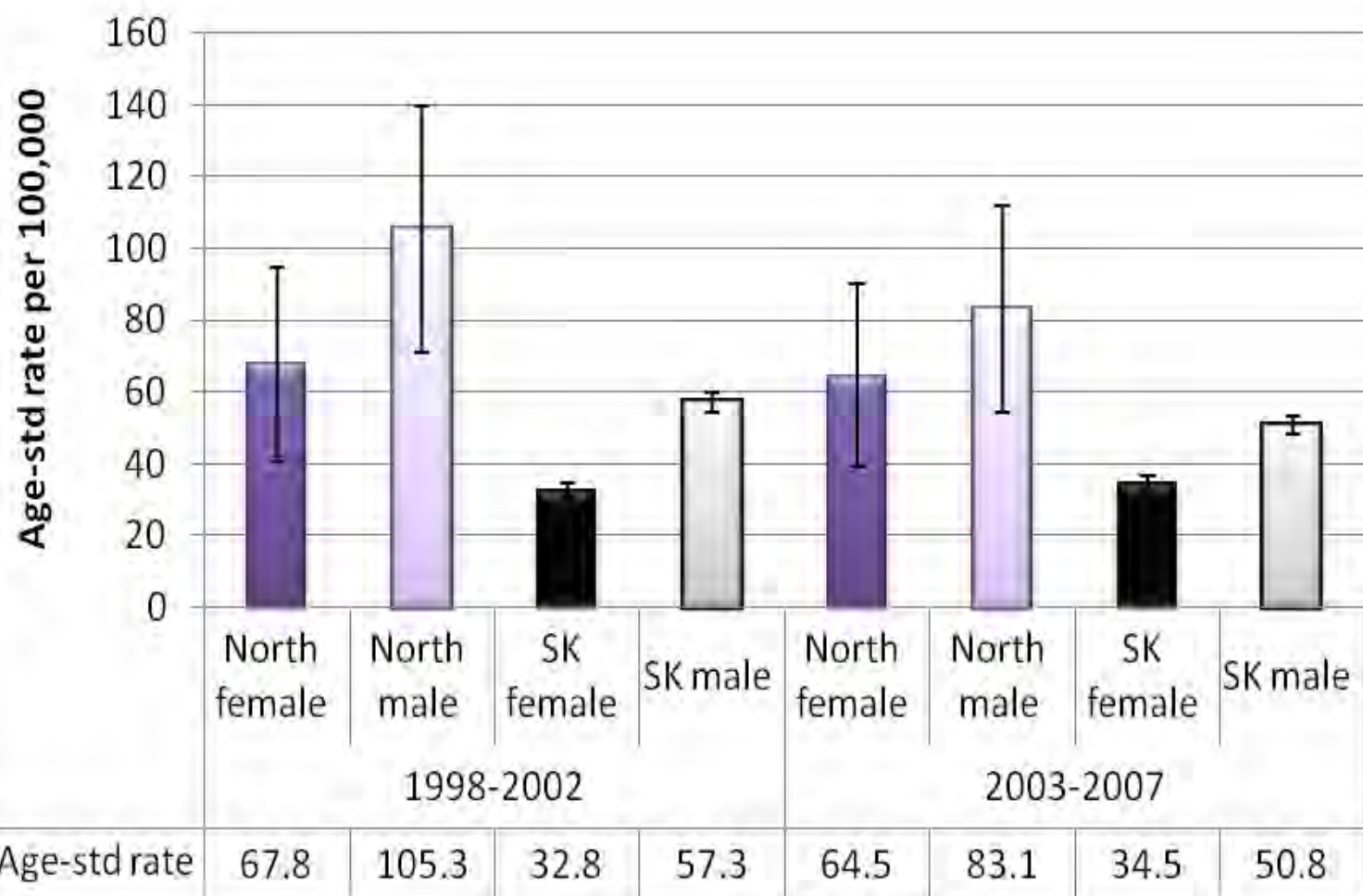
Source: SaskHealth, Prepared by PHU Nov 2009 * suppressed as cell < 5

Age-adjusted Cancer Incidence rate, 10-yr average, total invasive cancers, by sex, 1998-2007



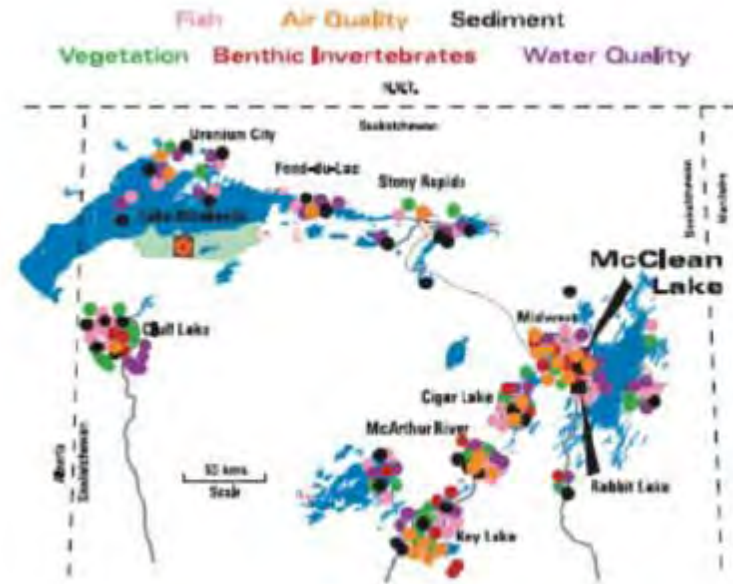
Trends in mortality rates for lung cancer

by sex North Sask and Saskatchewan,
5-yr average age-std rates, 1998-2007



Source: SCA 2010, Prepared by PHU Aug, 2010

Environmental monitoring: air, water, & sediment around mines and near communities



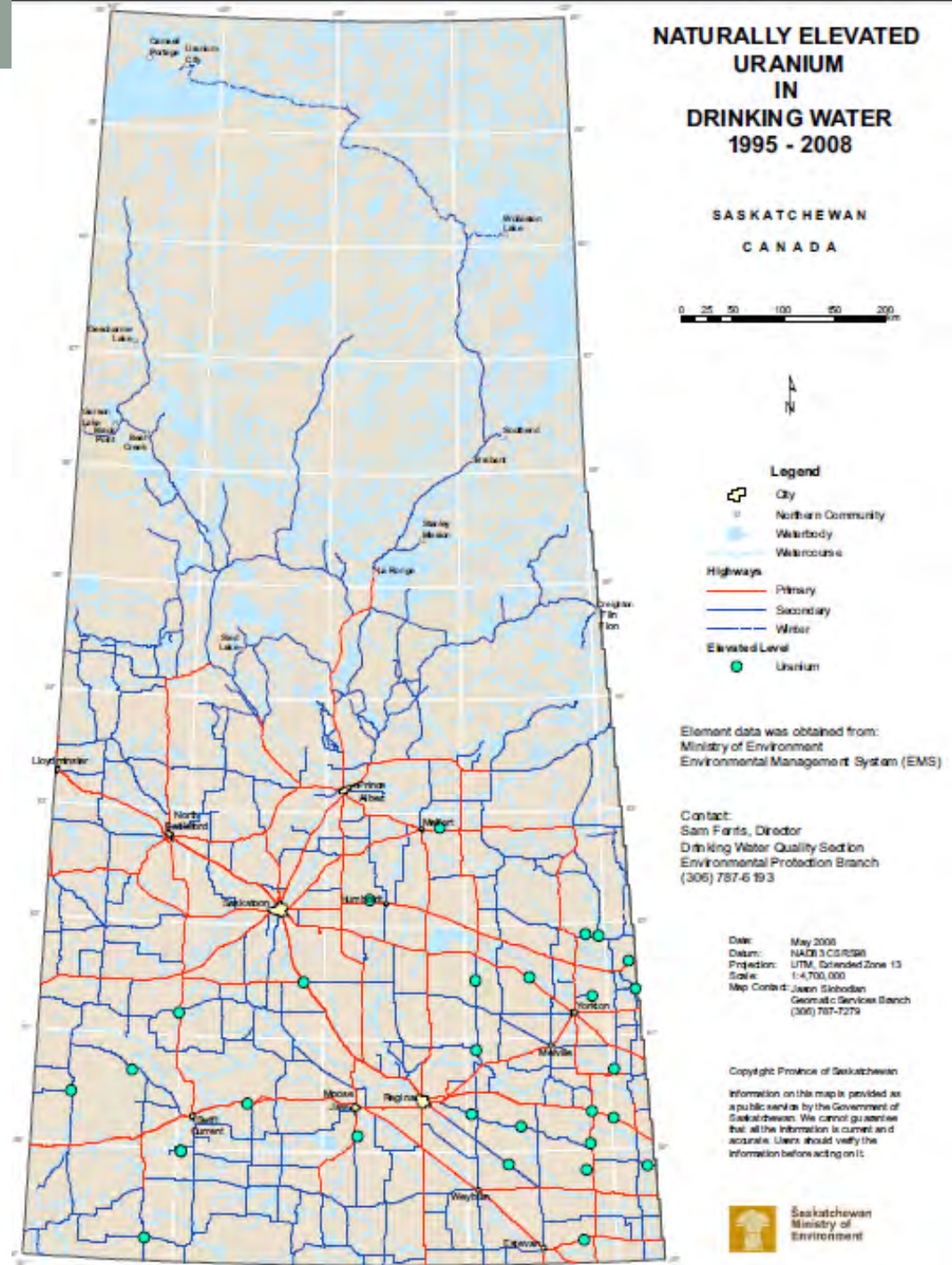
Environmental monitoring locations.

Ministry of Environment's Boreal Watershed Initiative
The Eastern Athabasca Regional Monitoring Program (EARMP) – earmp.ca

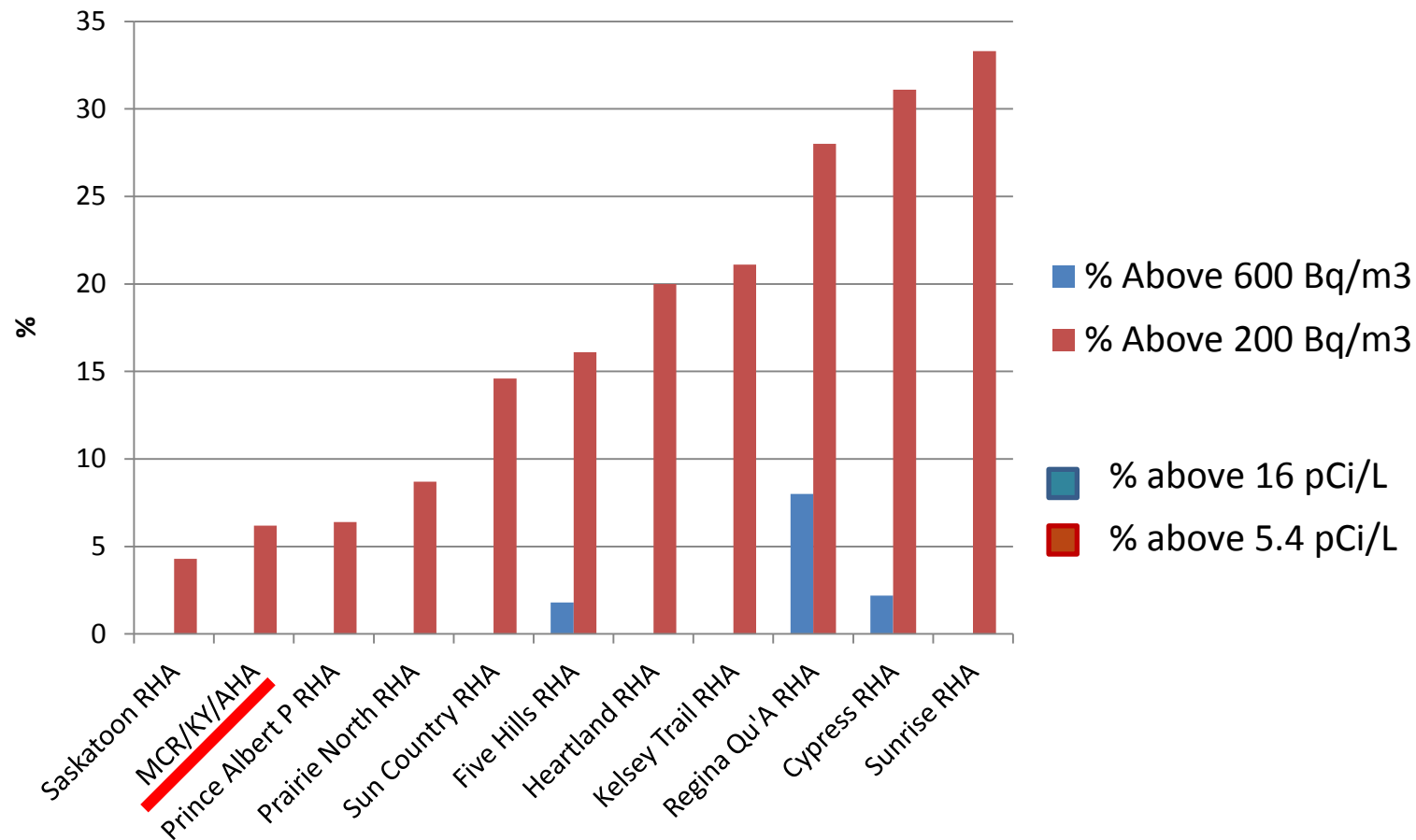
Human Exposures

Community drinking water

Uranium:
Maximum Acceptable Concentration
of 0.02 milligrams/litre (mg/L).



% of radon levels above guideline values in Saskatchewan homes by health area 2009/10



Radionuclides and Trace Metals in Northern Saskatchewan Country Foods



Health Phys. 2005;88(5):423
EHP. 1999;107(7):527

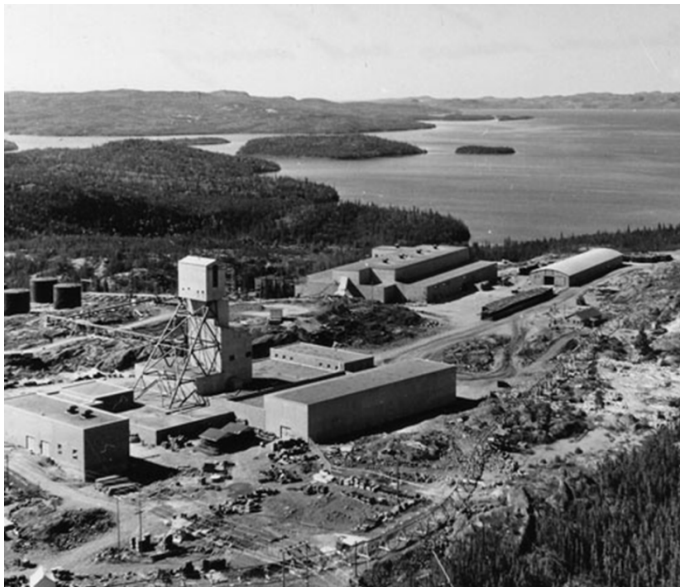
Country food consumption surveys

- Hatchet Lake First Nation
 - 1998-1999
 - Site specific dietary information
 - Comprehensive, summer and winter
 - By age, gender
 - By food, body part, cooking process
- Uranium City
 - 2010-2012

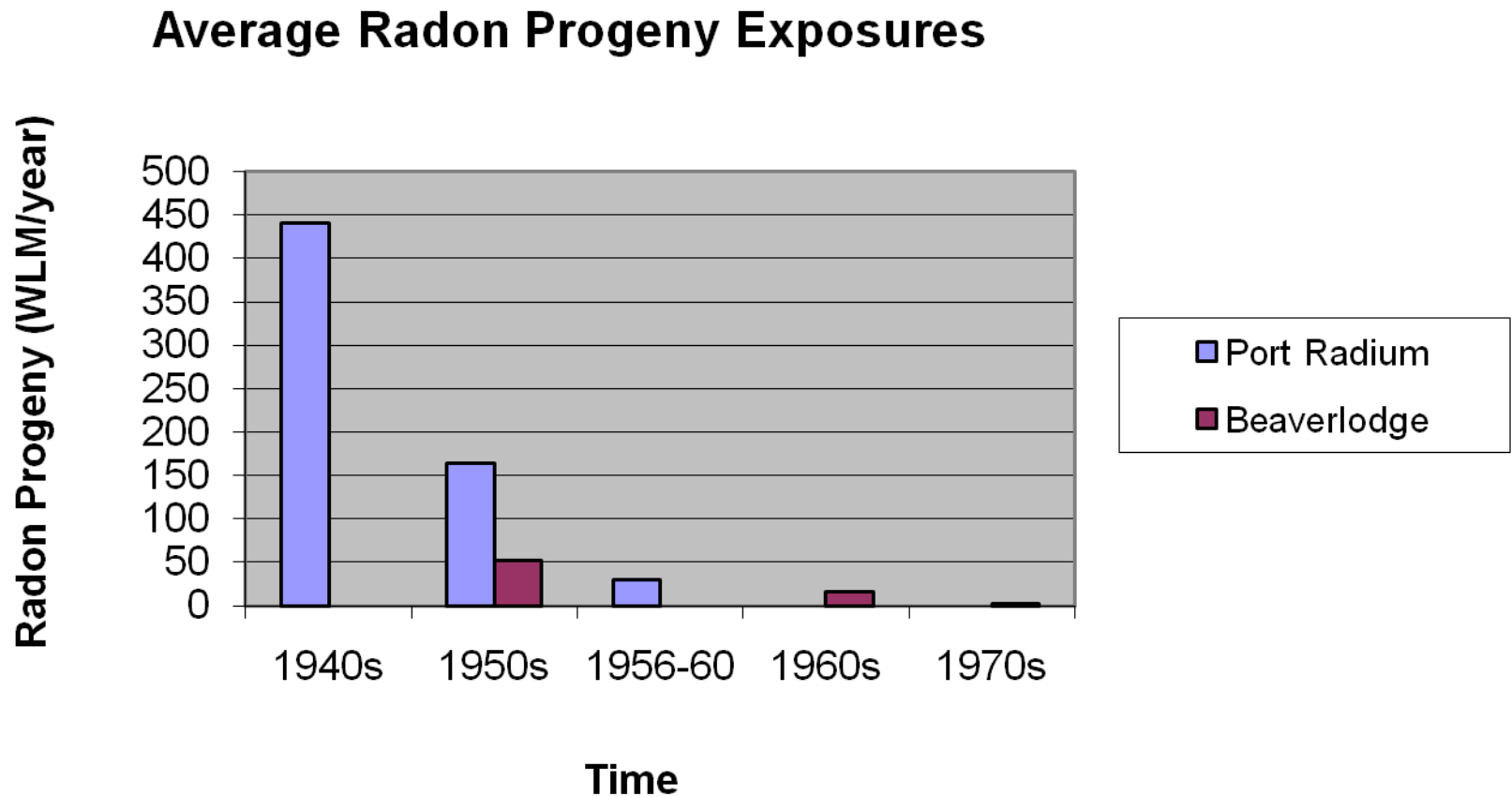
Mine Workers:

Uranium Mine Workers Epidemiologic Study

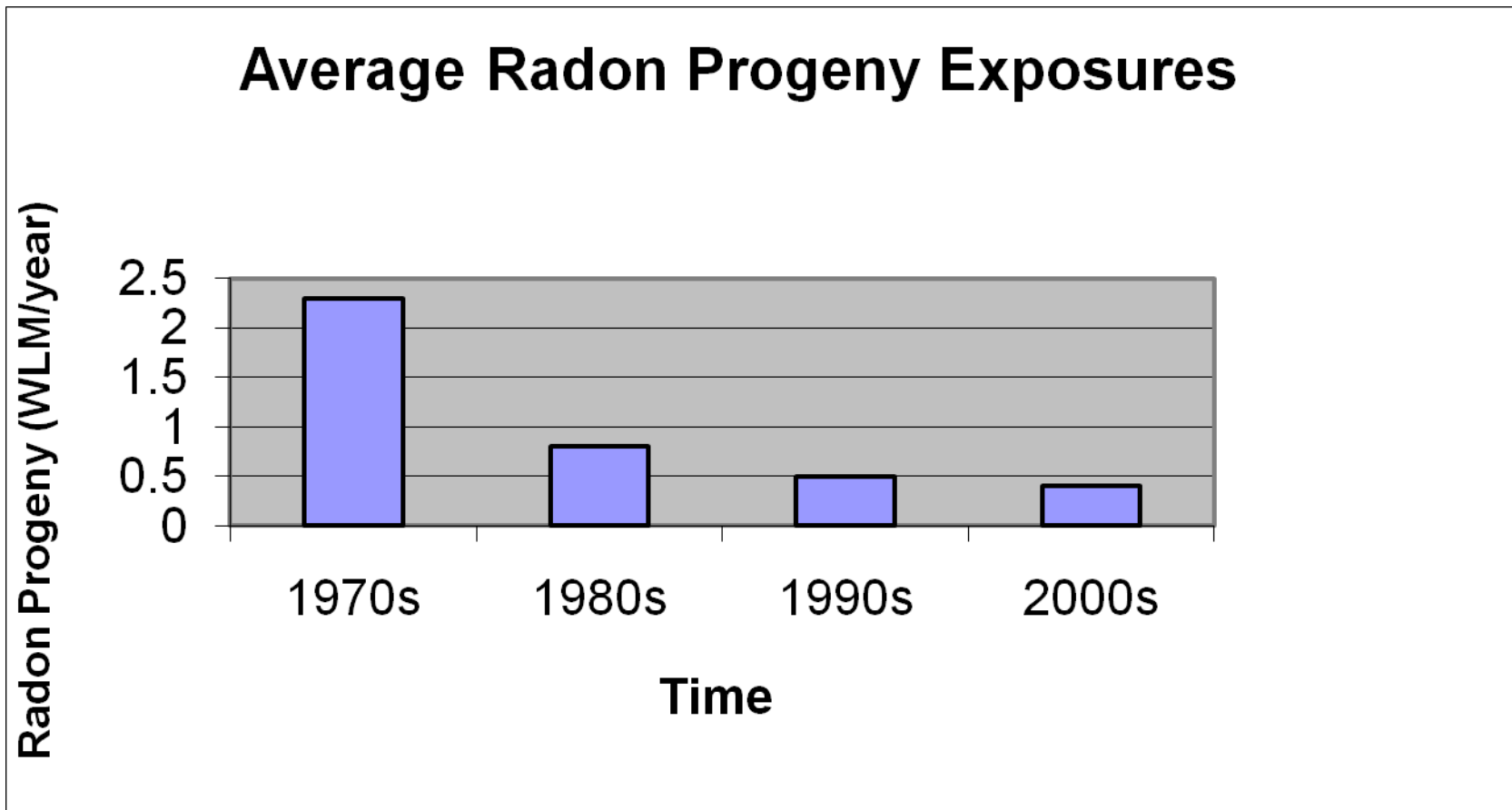
- Old Mines
 - Eldorado (1932 to 1982)
- Modern mines
 - 1982 to 2030



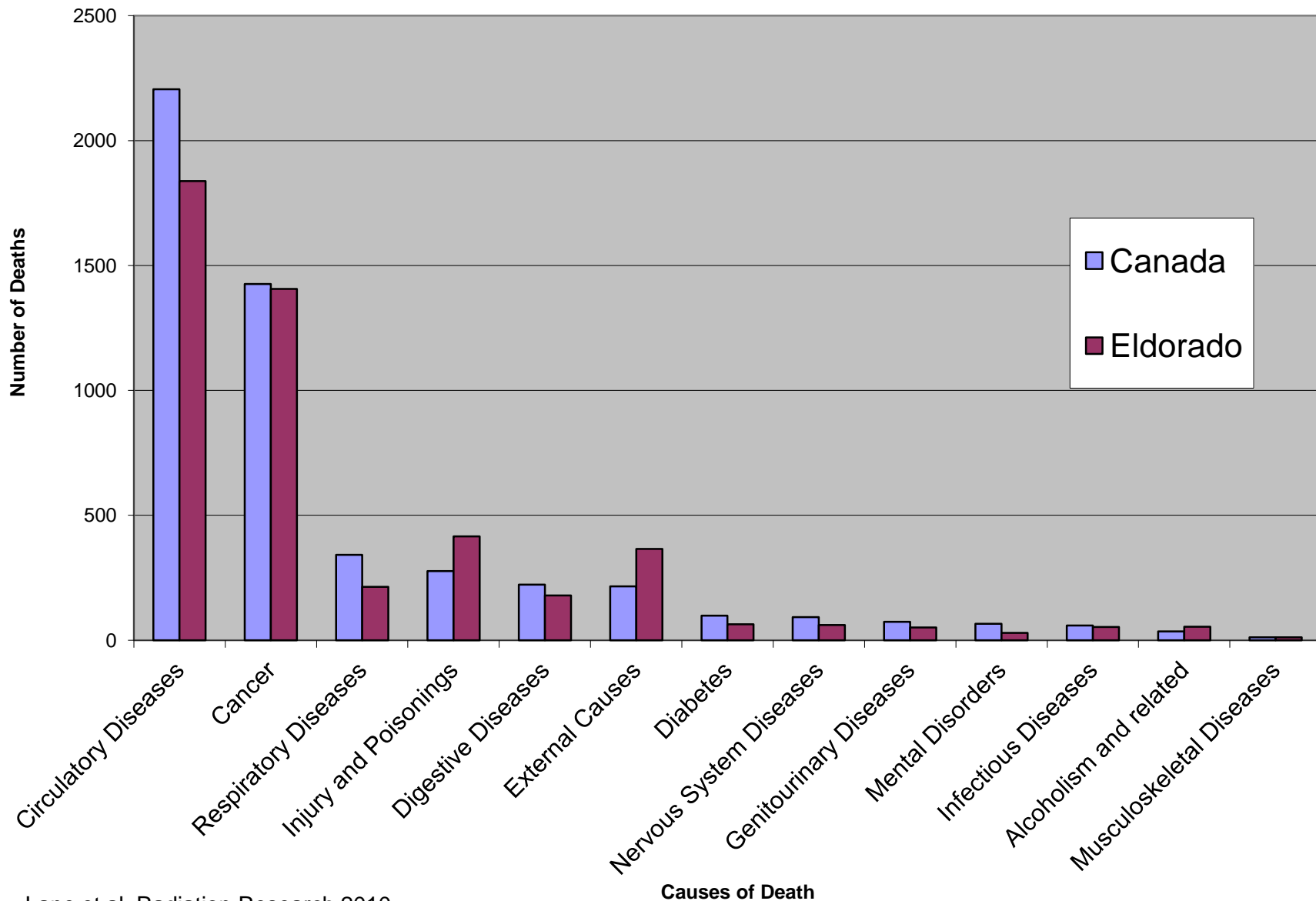
Past Radon Exposures



Modern Radon Exposures



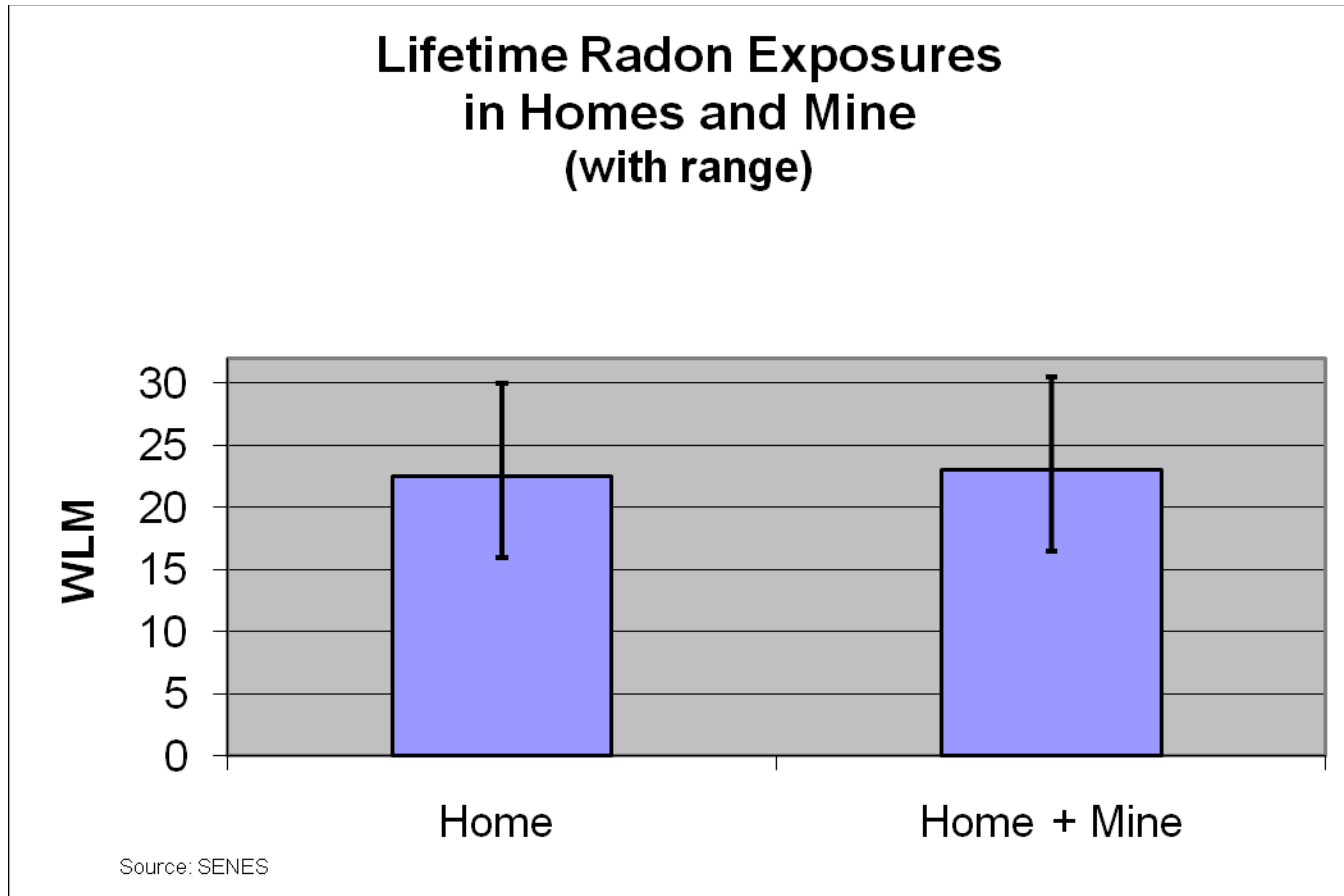
Expected vs Observed Deaths for all Males (1950-1999) for all Causes



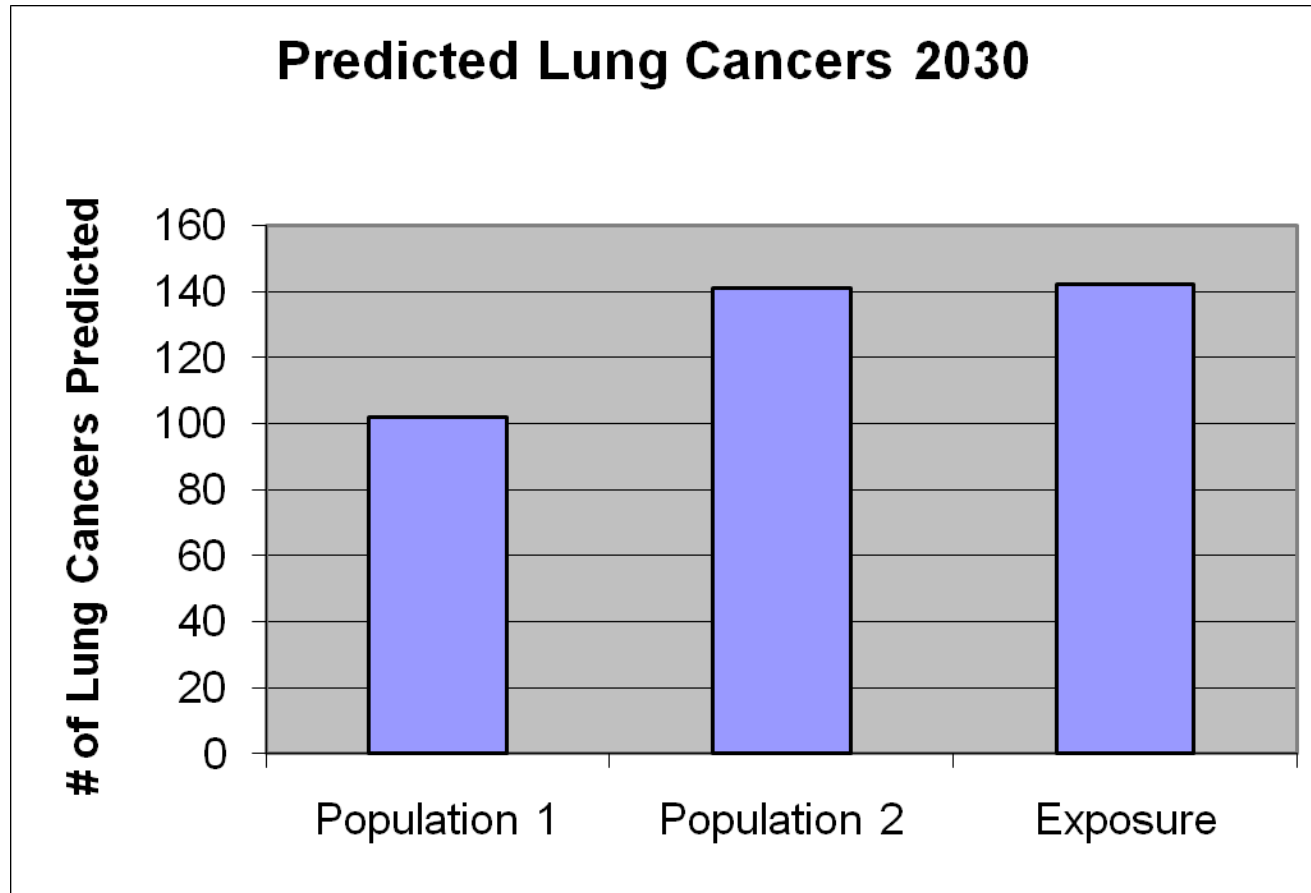
Present Day Mines



Saskatchewan Uranium Miners Cohort Feasibility Study (1975-2030)



Saskatchewan Uranium Miners Cohort Feasibility Study (1975-2030)



Population 1: Average Canadian smoking rate

Population 2: Average mine worker's smoking rate (early 2000s)

Social Health: Community Vitality Monitoring Partnership



Community Vitality Monitoring Project Goals:

- “....provide insight into community vitality such that stakeholders can use that knowledge to improve and maintain the quality of life in Northern Saskatchewan”
- “Provide information related to uranium mining impacts on community vitality that is useful to northern communities.”

Projects:

- Migration Survey
- Healthy Food Costing
- Northern Youth Initiatives
- 7 in / 7 out work schedule impact on individual, family & community
- Athabasca Education
- Career Counseling Initiatives in Schools
- Northern Recognition
- *Socio-economic impact of uranium mining*

Assessment of Impacts of Work Schedule

- Household level
- Relationships
- Children
- Traditional activities
- Community / volunteerism



Socio-economic impact of uranium mining

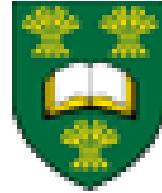
- Northern labour force changes over time
- Northern education levels & industry contributions
- Northern employment #s and rates – industry contribution
- Northern incomes over time and industry contributions
- Northern business opportunities related to uranium industry
- Workers health
- Industry's engagement with northern communities
- Community well-being index
- Uranium industry contributions to vitality of northern communities.

Community Involvement

- Northern Environmental Quality Committees, and Athabasca Working Group
 - Northern Health Boards
 - Community consultations
-



Input into the what, where, how, when for surveillance and how best to disseminate results



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