Inuit Pulmonary Health

Gonzalo G. Alvarez MD, MPH, FRCPC
Assistant Professor of Medicine
University of Ottawa at The Ottawa Hospital
Division of Respirology and Infectious Diseases
Ottawa Hospital Research Institute
Conceptual framework

- To understand Inuit pulmonary health problems
- A historical and geographical context must first be understood
- Followed by a present day description of Inuit determinants of health
- Followed by an examination of pulmonary health issues
Inuit Geography & History

Course 101
Aboriginal Canadians

- Three groups with distinct language and cultures
  - 1) First Nations
  - 2) Métis
  - 3) Inuit
Inuit means “the people”
Inuk means one person
Inuktitut is the Inuit language
Eskimo term considered pejorative

Noatak Family circa 1930s
Inuit are the indigenous people of the artic regions of Canada, Russia, Alaska and Greenland.
- **3000-2000 BC**
  Siberian hunters cross the Bering Sea and spread across the North American Arctic

- **1000 BC**
  Thule (whale hunters) continue to spread east across Canada

- **980 BC**
  Norseman Eric the Red sails to Greenland possible “first contact”
1576 Martin Frobisher (England) arrives in Baffin Island looking for the North West Passage, takes 3 Inuit back to England

1820 Hudson’s Bay Company (Trading Post)

1890 First commercial whaling ships enter Eastern Canadian arctic
1920 RCMP arrives in the arctic

1930-40 Canadian gov assigns disc numbers to Inuit as official ID

1941 Inuit counted as part of the Canadian census for the first time

1945 Canadian gov starts annual screening of Inuit for TB and forces evacuation of infected Inuit to southern sanitaria
1950 Canadian Inuit first able to vote in federal elections

1953 Canadian gov “encourages Inuit to settle in permanent communities, forced relocation of Inuit families to the high arctic creating Grise Fjord and Resolute

1956 Approx 10% of Canadian Inuit are confined to TB sanitaria in southern Canada for treatment
1960 Canadian Inuit population concentrated into permanent villages

1976 first Nunavut land claim presented to Canadian gov

1993 Nunavut Land claims agreement signed

1999 Nunavut Territory established officially as a new political jurisdiction in Canada
Inuit Nunangat (Inuit Homeland) is compromised of 4 regions

Nunavut means OUR LAND

Capital of Nunavut is Iqaluit
50,000 Canadian Inuit

Youngest population in Canada, 56% are under the age of 25

Inuktituk strongest aboriginal language in Canada 7/10 Inuit can carry a conversation
Inuit Health Disparities
The life expectancy gap between those in Inuit communities and all Canadians is about 13 years and is not closing.
When compared to Canada as a whole, the infant mortality rate was 3.3 times higher over 1994-1998 and 2.8 times higher over 1999-2003.
Inuit social determinants of health
Social determinants of health

- Generally to blame for the poor state of everyone’s health but more so in Aboriginal peoples health*

- “The context of people’s lives determines their health, and so blaming individuals for having poor health or crediting them for good health is inappropriate”†

- Individuals are unlikely able to control many of the determinants of health

*King et al 2009 Lancet, †WHO 2010
Inuit specific social determinants of health

- Acculturation
- Productivity (harvesting country food)
- Income distribution
- Housing
- Education
- Social safety nets
- Environment
- Addictions
- Health care services
- Food security and Nutrition

Inuit Tapiriit Kanatami 2008
Inuit acculturation

- Cultural modifications resulting from contact with a different culture
- Second half of the 20th century
- Establishment of large urban communities
Inuit acculturation

- Transition from traditional fishing and hunting subsistence to southern imported food
- Steep increase in tobacco consumption
- Steep increase in sedentary lifestyle
Food security is when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life (WHO 1996)

Prevalence of Food Insecurity in Canada

Inuit diet, Arctic Char, Caribou, Walrus, and Seal

Low Income, high cost of food (3X)
Income

The median income for Inuit adults is much lower than that for all Canadians: Inuit, $13,699 compared to $22,120. (Inuit also have a much higher cost of living.)

Education

46% of Inuit do not have a high school diploma as compared to 15% of the general Canadian population.
Health Care Access

Contact with a medical doctor in the past 12 months, Inuit and total Canadian population by age group, 2005/2006

Sources: Statistics Canada, Aboriginal Peoples Survey, 2006 and Canadian Community Health Survey, 2005
Figure 12  Physicians per 100,000 Population, 2006

Source: National Physicians Database, CIHI.
Inuit and respiratory disease
Tuberculosis in Nunavut
Canadian Tuberculosis Incidence Rates by Province/Territory, 2008

- ≤ 4.8 (national rate)
- 4.9--9
- 10--29
- > 30

Map showing the distribution of tuberculosis incidence rates across different provinces and territories in Canada.
<table>
<thead>
<tr>
<th>Reporting province or territory</th>
<th>Abbreviation</th>
<th>Incidence rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nunavut</td>
<td>Nvt.</td>
<td>99.2</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>N.W.T.</td>
<td>34.5</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>Sask.</td>
<td>10.6</td>
</tr>
<tr>
<td>Yukon</td>
<td>Y.T.</td>
<td>9.2</td>
</tr>
<tr>
<td>Manitoba</td>
<td>Man.</td>
<td>8.6</td>
</tr>
<tr>
<td>British Columbia</td>
<td>B.C.</td>
<td>6.4</td>
</tr>
<tr>
<td>Ontario</td>
<td>Ont.</td>
<td>5.1</td>
</tr>
<tr>
<td>Alberta</td>
<td>Alta.</td>
<td>3.2</td>
</tr>
<tr>
<td>Quebec</td>
<td>Que.</td>
<td>3.0</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>N.L.</td>
<td>1.4</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>N.S.</td>
<td>0.7</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>N.B.</td>
<td>0.7</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>P.E.I.</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>CANADA</strong></td>
<td></td>
<td><strong>4.7</strong></td>
</tr>
</tbody>
</table>
Inuit TB cases (533) by province/territory, Canada, 1997-2008

<table>
<thead>
<tr>
<th>Year</th>
<th>AB</th>
<th>BC</th>
<th>NB</th>
<th>NL</th>
<th>NT</th>
<th>NU</th>
<th>ON</th>
<th>QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>1998</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1999</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>15</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>47</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>2001</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>39</td>
<td>0</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>27</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>44</td>
<td>1</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>48</td>
<td>0</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>31</td>
<td>1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>58</td>
<td>3</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>27</td>
<td>53</td>
<td>346</td>
<td>6</td>
<td>92</td>
</tr>
</tbody>
</table>
Proportion of Inuit TB cases by age and sex
Canada, 1997-2008

Proportion of Inuit TB cases by age and sex
Canada, 1997-2008

Proportion

Female
Male

Age group

Proportion

00-01 01-04 05-14 15-24 25-34 35-44 45-54 55-64 65-74 75+

Public Health Agency of Canada
What group specific TB rates must do to reach an overall Canadian rate of 3.6/100,000 by 2015

Assumption: Foreign-born and Canadian-born non-Aboriginal rates continue their previous trend.

Source: CTBRS

Courtesy of Dr. E. Ellis “Stopping TB in Canada, what will it take?”
Lung Cancer among the Inuit
Inuit and Lung Cancer

- Increased significantly over the past 50 years
- Most common malignancy in Inuit
- Lung Ca about 20% of all cancers in Inuit
- Highest rates reported in the world
The Canadian Inuit have had a steep increase in new cases of lung cancer.
The Canadian Inuit have the highest incidence rate of lung cancer in the world.

Figure 8. Regional variation in cancer incidence among Inuit men, 1989–2003.

ASIR = Age standardized incidence rate
Figure 9. Regional variation in cancer incidence among Inuit women, 1989–2003.

ASIR = Age standardized incidence rate
<table>
<thead>
<tr>
<th>Location</th>
<th>Age-standardised incidence†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Salivary glands</td>
<td>3.9</td>
</tr>
<tr>
<td>Mouth</td>
<td>3</td>
</tr>
<tr>
<td>Nasopharynx</td>
<td>10.3</td>
</tr>
<tr>
<td>Other pharynx</td>
<td>6.6</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>21.9</td>
</tr>
<tr>
<td>Stomach</td>
<td>22.1</td>
</tr>
<tr>
<td>Colon</td>
<td>18.2</td>
</tr>
<tr>
<td>Rectum</td>
<td>9.7</td>
</tr>
<tr>
<td>Liver</td>
<td>8.0</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>3.3</td>
</tr>
<tr>
<td>Pancreas</td>
<td>11.4</td>
</tr>
<tr>
<td>Larynx</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Lung</strong></td>
<td><strong>80.4</strong></td>
</tr>
</tbody>
</table>

*Table 2: Age-standardised incidence rates (world standard) per 100,000 for selected cancers in Greenland between 1988 and 1997*

†Directly age-standardised by use of world standard population.
Figure 4  Lung Cancer Mortality

Figure 3: Incidence of traditional (eg, nasopharynx, salivary gland, and oesophageal) and lifestyle-associated (eg, lung, colon, rectum, and female breast) cancers in Greenland in 1950–74, 1973–87, and 1988–97.
June 23, 2006

Nunavut out-smokes rest of Canada
Figure 2-2  Trend in the prevalence of daily smokers, 15+ years, Canada, 1985-2006.

### Smoking status, Inuit adults aged 15 and over by sex and age group, Nunavut

<table>
<thead>
<tr>
<th>Age and sex</th>
<th>Total</th>
<th>%</th>
<th>Daily smokers</th>
<th>Occasional smokers</th>
<th>Non-smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>count</td>
<td>%</td>
<td>% from to</td>
<td>% from to</td>
<td>% from to</td>
</tr>
<tr>
<td>Total age groups</td>
<td>15,490</td>
<td>100</td>
<td>64</td>
<td>62.2 - 66.5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.5 - 9.0</td>
<td>27</td>
</tr>
<tr>
<td>Male</td>
<td>7,810</td>
<td>100</td>
<td>62</td>
<td>58.4 - 64.8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.2 - 9.5</td>
<td>30</td>
</tr>
<tr>
<td>Female</td>
<td>7,680</td>
<td>100</td>
<td>67</td>
<td>64.2 - 70.0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.0 - 9.8</td>
<td>25</td>
</tr>
</tbody>
</table>

**Prevalence of daily smokers > 15 years old in Canada was 14% in 2006**
Daily smokers among Inuit and total Canadian population aged 15 and over, 2005/2006

<table>
<thead>
<tr>
<th>age group</th>
<th>Inuit</th>
<th>Total Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total 15 and over</td>
<td>58</td>
<td>17</td>
</tr>
<tr>
<td>15 to 19</td>
<td>56</td>
<td>10</td>
</tr>
<tr>
<td>20 to 24</td>
<td>63</td>
<td>20</td>
</tr>
<tr>
<td>25 to 34</td>
<td>67</td>
<td>20</td>
</tr>
<tr>
<td>35 to 44</td>
<td>64</td>
<td>21</td>
</tr>
<tr>
<td>45 to 54</td>
<td>52</td>
<td>21</td>
</tr>
<tr>
<td>55 and over</td>
<td>38</td>
<td>12</td>
</tr>
</tbody>
</table>

Sources: Statistics Canada, Aboriginal Peoples Survey, 2006 and Canadian Community Health Survey, 2005

There was some variation in the daily smoking figures by region. Inuit adults living outside Inuit Nunaat were the least likely to smoke daily (40%) while Inuit in Nunavik were the most likely (73%). Differences between the remaining three Inuit regions were not statistically significant from each other (chart 4.5).
Nunavut Ottawa
Respirology Program
Current clinical program

- Dr. Peter McLeod established Iqaluit respirology clinic in 2000
- Transferred to me in 2005 after he retired
- 1 full week of clinics each year
- Assisted by 1 senior U of O pulmonary fellow each year
All respirology cases flow through my resp and TB clinics in Ottawa.
Current program of research

- QSPI N program at Qikiqtani General Hospital
- Spirometry program at Qikiqtani General Hospital
- Research interests centered around prevention & public health including TB prevention, smoking cessation, spirometric testing for COPD and asthma
Research challenges

- Historical context of research in marginalized populations always a challenge
- Research versus financial assistance/policies/programs
- Navigating among all the players
Future

- Continue to serve the people of Nunavut in regards to pulmonary health
- Exchange ideas between Nunavut and KwaZulu Natal SA with parallel problems
- CIHR and Lung Health Network grants submitted
Nakummek