

Mortality surveillance for the Inuit-inhabited areas of Canada

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Background

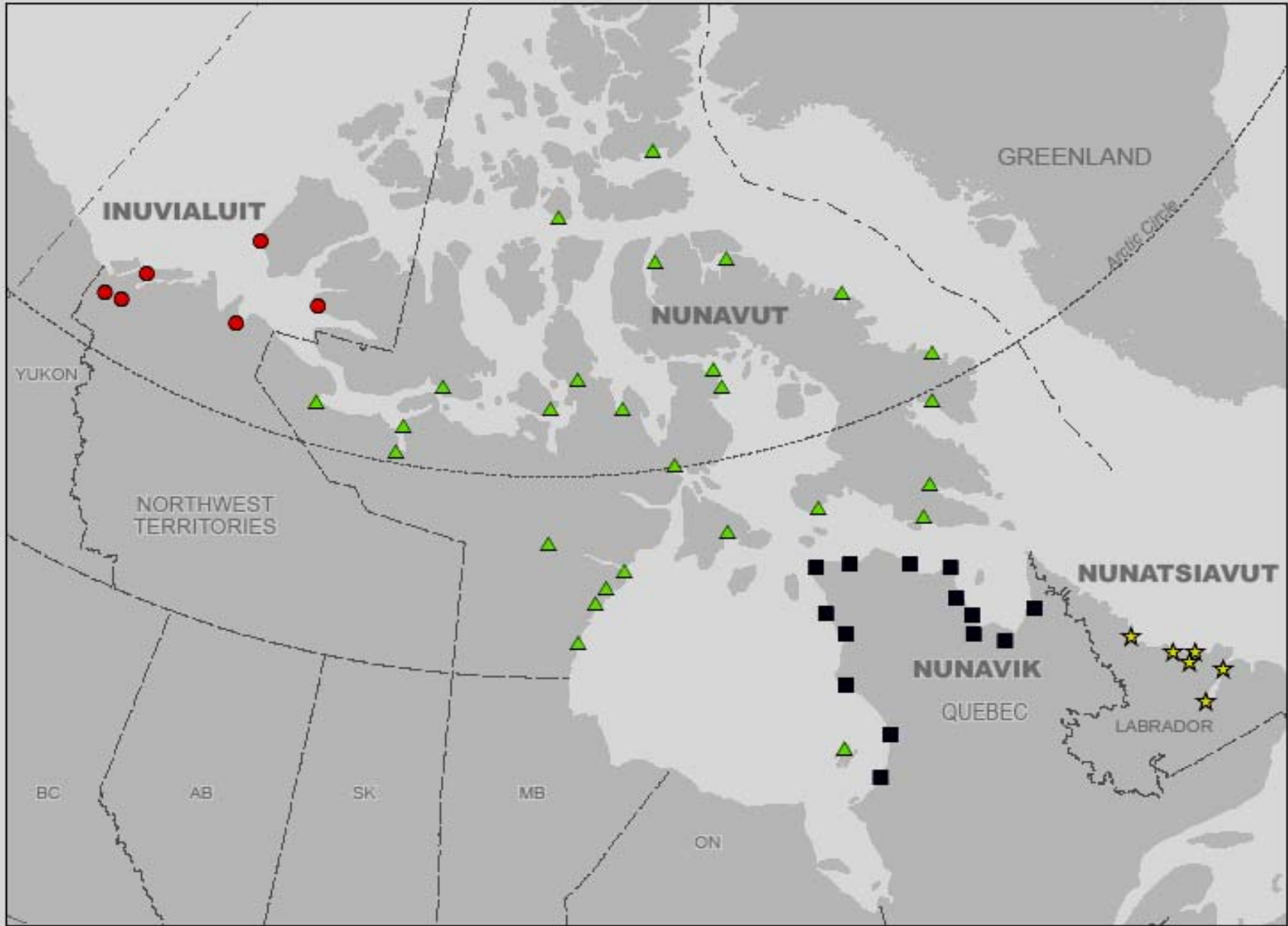
- 80% of Inuit people in Canada live in Nunavut (NU), Nunavik (QC), Inuvialuit (NT) and Nunatsiavut (NL)
- NU & NT request aboriginal status on vital statistics, but 20% of their deaths occur outside the territories (where such info not asked), and data not captured
- QC vital statistics only requests language (and if Inuit + English or Inuit+French, now recorded as “English+other”, or “French+other”)
- MB, SK, BC only ask about First Nations (NAI) status
- NL don't ask about aboriginal status on death registrations. BC, SK, MB don't ask about Inuit.

Problem and possible solution

- **So routine surveillance of Inuit mortality across Canada is not possible according to aboriginal status or identity**
- **However, most Inuit people live in isolated northern settlements which can be identified by geographic codes present on vital statistics registrations of all provinces and territories**
- **The geographic coding refers to the usual place of residence, regardless of where the event (death or birth) occurred**
- **Solution: base routine surveillance on data for all residents of those communities**

Inuit-inhabited areas as defined for this study

- **Census population $\geq 33\%$ Inuit identity**
- **54 communities (see Map):**
 - **6 in Northwest Territories (Inuvialuit region)**
 - **28 in Nunavut (entire territory)**
 - **14 in Quebec (Nunavik)**
 - **6 in Labrador (Nunatsiavut)**



Data and Methods

- 15 years of death registrations (1989-2003), analysed for three 5-year periods
 - 1989-1993, 1994-1998, 1999-2003
- Census populations for 1991, 1996, 2001 used to estimate the person-years at risk
- Life tables, ASMRs, PYLL*, excess PYLL*
- Causes of death coded to ICD-9, ICD-10

Results

- Population characteristics
- Life expectancy at birth
- Leading causes of death:
 - Age-standardized mortality rates (ASMR)
using Inuit-area population standard
- Potential years of life lost prior to age 75
(a measure of premature mortality)*

Inuit-inhabited areas

2001 population by aboriginal identity

- **Total** (54 communities) **45,615** **(100.0%)**
 - **Inuit identity** **36,450** **(79.9%)**
 - **Other aboriginal** **2,450** **(5.4%)**
 - **Non aboriginal** **6,720** **(14.7%)**
-
- **Total Inuit-identity population of Canada = 45,070**

Inuit-inhabited areas

2001 population by region

- **Total** **46,070** **(100.0%)**
- **Inuvialuit (NT)** **5,225** **(11.3%)**
- **Nunavut (NU)** **26,740** **(58.0%)**
- **Nunavik (QC)** **10,365** **(22.5%)**
- **Nunatsiavut (NL)** **3,740** **(8.1%)**

Deaths in the Inuit-inhabited areas

Years	PYAR	Deaths
• 1989-2003 (15)	643,275	3,474
• 1989-1993 (5)	197,700	1,053
• 1994-1998 (5)	215,225	1,133
• 1999-2003 (5)	230,350	1,288

Population characteristics

• Characteristic	Canada	Inuit areas	Inuit identity*
• % < 15 years	19.4	36.6	40.3
• % < high sch diploma	31.1	51.4	62.0
• % ≥ some university	25.8	12.2	3.2
• % unemployed	7.3	16.9	22.4
• Av household size	3.6	5.1	5.4
• Av inc per person (\$)	23K	15K	11K

* Inuit-identity population of the Inuit-inhabited areas

Figure 1: Life expectancy by sex in the Inuit-inhabited areas of Canada

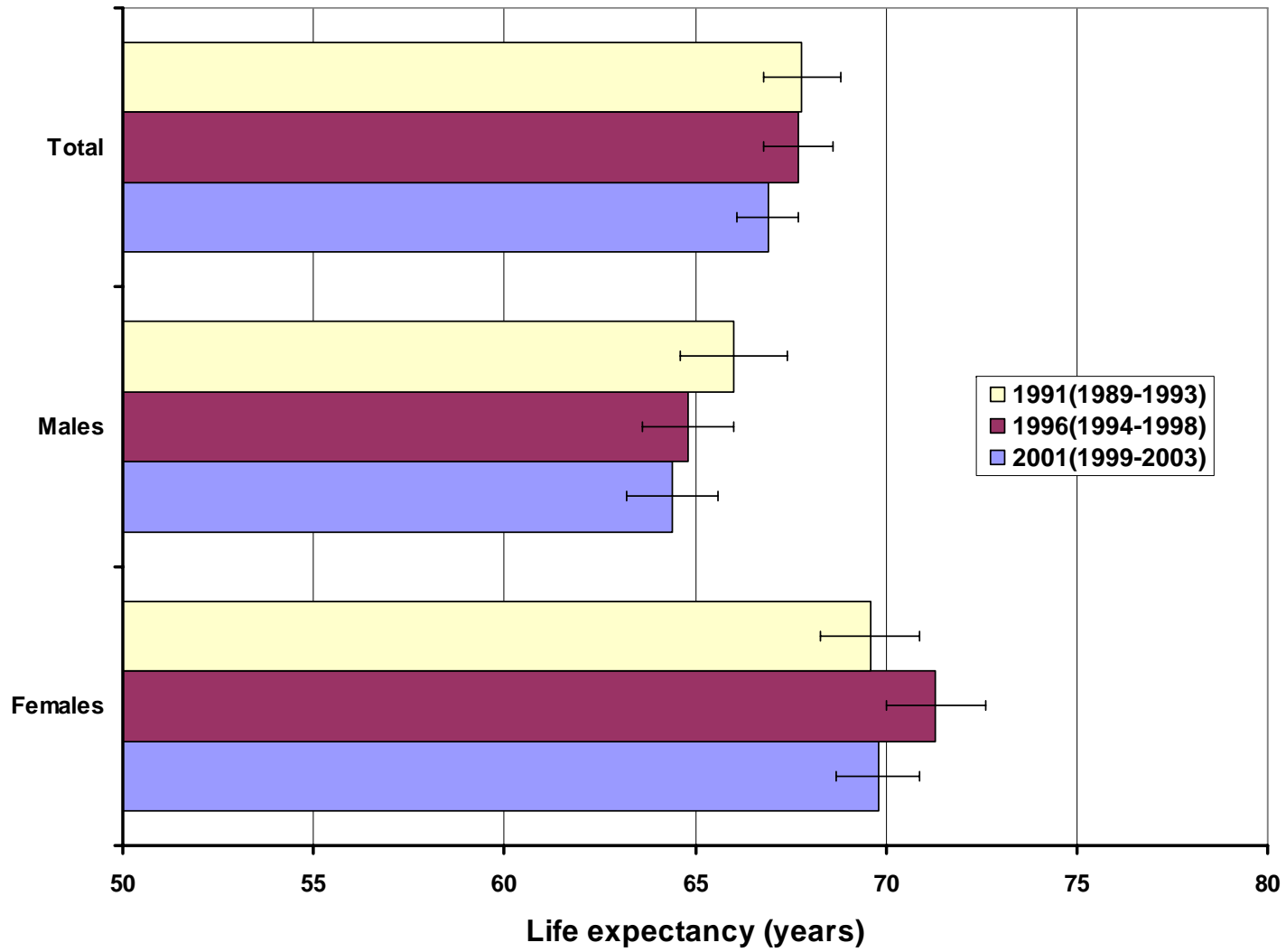
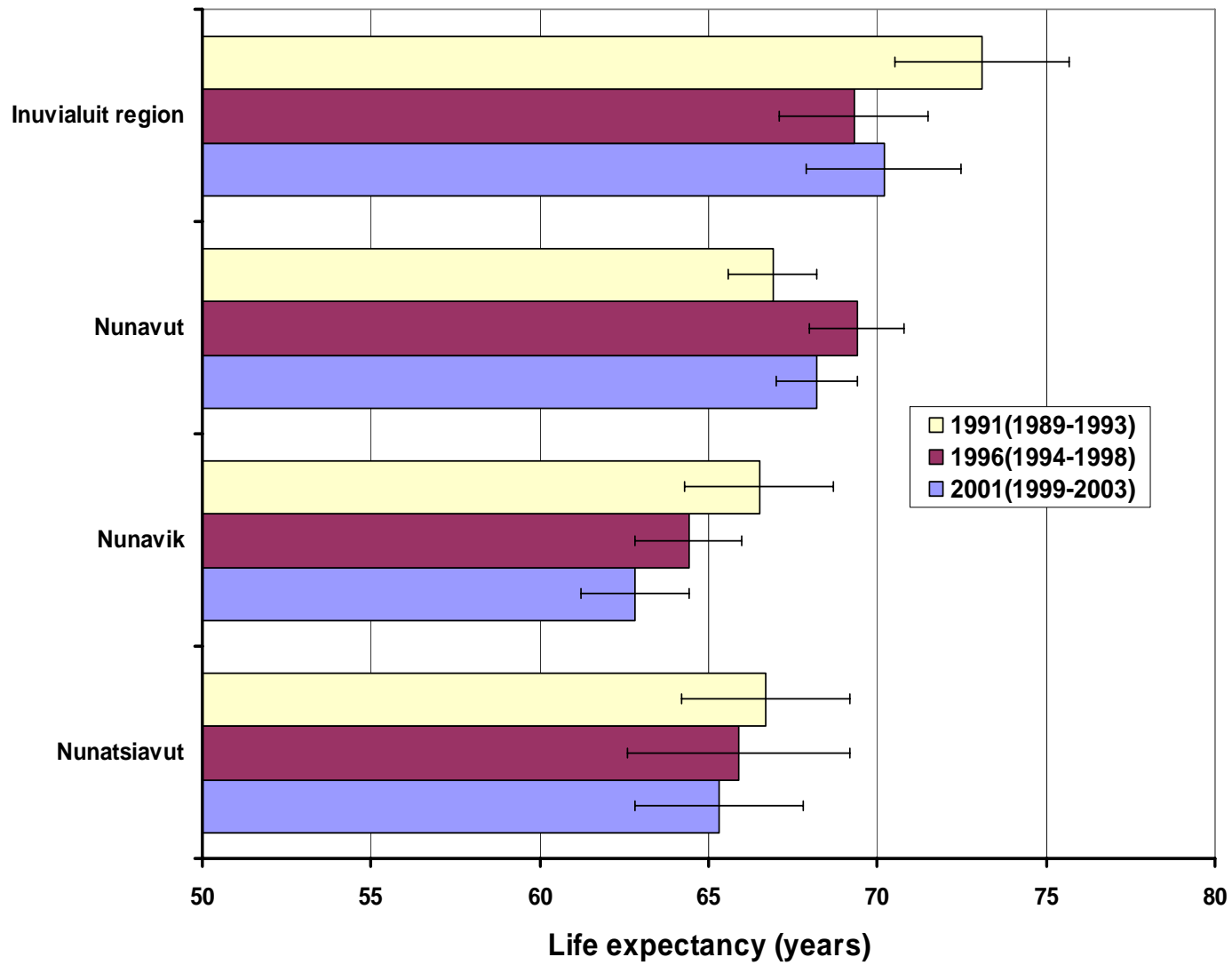


Figure 2: Life expectancy by region in the Inuit-inhabited areas of Canada



Life expectancy comparisons

• Group	T	M	F
• Inuit areas 2001	67	64	70
• Canada 1946	67	65	69
• Egypt 2001	67	65	68
• Guatemala 2001	66	64	69
• Greenland 2001	66	63	69
• First Nations 2001	73	70	76
• Canada 2001	79	77	82

Leading causes of death in Inuit areas ASMR (RR vs Can), by sex, 1989-2003

• Chapter/Cause	Males	Females
• External	258 (5.2)	86 (5.1)
– Suicide	131 (7.9)	31 (7.3)
• Neoplasms/Tumours	115 (1.6)	104 (1.9)
– Lung cancer	51 (2.3)	43 (3.7)
• Circulatory	100 (1.2)	65 (1.7)
– Ischemic heart disease	34 (0.7)	13 (0.7)
– Stroke	20 (1.9)	18 (2.1)
• Respiratory	53 (3.2)	69 (7.4)
– COPD (Bron, Emp, Asth)	36 (3.3)	45 (10.3)
• Perinatal/Congenital	31 (2.3)	25 (2.3)

Leading causes of death in Inuit areas ASMR, RR (vs Can), males, 1989-2003

• Chapter/Cause	ASMR	RR (95% CI)
• External	258	5.2 (4.9, 5.6)
– Suicide	131	7.9 (7.2, 8.7)
• Neoplasms/Tumours	115	1.6 (1.4, 1.7)
– Lung cancer	51	2.3 (2.0, 2.7)
• Circulatory	100	1.2 (1.5, 1.9)
– Ischemic heart disease	34	0.7 (0.6, 0.9)
– Stroke	20	1.9 (1.5, 2.3)
• Respiratory	53	3.2 (2.8, 3.7)
– COPD (Bron, Emp, Asth)	36	3.3 (2.7, 4.0)
• Perinatal/Congenital	31	2.3 (1.9, 3.2)

Leading causes of death in Inuit areas ASMR, RR (vs Can), females, 1989-2003

• Chapter/Cause	ASMR	RR (95% CI)
• External	86	5.1 (4.5, 5.8)
– Suicide	31	7.3 (6.0, 8.9)
• Neoplasms/Tumours	104	1.9 (1.7, 2.1)
– Lung cancer	43	3.7 (3.2, 4.4)
• Circulatory	65	1.7 (1.5, 1.9)
– Ischemic heart disease	13	0.7 (0.5, 0.9)
– Stroke	18	2.1 (1.6, 2.7)
• Respiratory	69	7.4 (6.5, 8.4)
– COPD (Bron, Emp, Asth)	45	10.3 (8.7, 12.2)
• Perinatal/Congenital	25	2.3 (1.7, 3.2)

Other mortality-based indicators

- Premature deaths (<75 years)
- Excess premature deaths
- Potential years of life lost (<75 years)
- Excess potential years of life lost

Excess=Observed-Expected (based on rates for Canada by age, sex and cause)

Limitations

- **Areas \neq Inuit people (includes 20% non-Inuit)**
- **20% of Inuit population of Canada excluded**
- **Most results apply to entire population of each area (including FN and non-aboriginal), not just to the Inuit sub-population**
- **Census population not corrected for undercount (minor impact)**

Strengths

- **Availability of data: past, present, future**
- **Aboriginal identification of specific individuals not required**
- **Robust to type of geographic coding available (postal codes, municipal codes, etc.)**
- **80% of Inuit population of Canada included**
- **Methods applicable to other administrative datasets: births, stillbirths, hospitalizations, etc.**
- **Many services and programs also apply to entire areas defined in similar ways**

Work ahead

- **Additional analyses by causes of death and age groups (other causes, PYLL, excess PYLL)**
- **Apply these area-based methods to other administrative data: births, stillbirths, cancer, hospitalisation, etc.**
- **In parallel, pursue individual-level and record linkage-based methods**

Conclusions

- **This geographic-based method is easy to apply, and relatively easy to explain**
- **It helps to fill gaps, but doesn't replace the need for health surveillance using measures of aboriginal status at the individual level (such as through record linkage-based follow-up from registries and/or censuses which indicate the aboriginal status of individuals)**

Contact information

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Thank you

Background

- **Three groups of aboriginal peoples in Canada:**
 - **Inuit** 45,000 (0.2%)
 - **First Nations (N Am Ind)** 600,000 (2.0%)
 - **Métis (mixed ab/non-ab)** 300,000 (1.0%)
 - **Total aboriginal (self-ident)** 945,000 (3.2%)
- **Indian Registry excludes non-status Indians**
- **No registry for Métis**
- **Living conditions often difficult**
- **SES & health status often much below average**

Data—using 33% cut-point

• Area*	Pop	Deaths	Con	Cov
• Total	30007145	219538	3.2	100.0
• Inuit	43545	248	85.8	82.9
• First Nat	398190	2673	74.3	49.6
• Métis	56290	370	54.9	10.4
• <33%	29509120	216247	2.0	62.4
• * by predominate aboriginal group				

Life expectancy* at birth, 2001 (using 33% cut-off)

• Area*	T	M	F
• Total	79.3 (.03)	76.7 (.04)	81.9 (.04)
• Inuit	66.2 (.95)	63.1 (1.42)	69.6 (1.23)
• First Nat	72.6 (.30)	69.0 (.40)	76.8 (.43)
• Métis	75.9 (.73)	72.4 (1.04)	79.9 (1.00)
• <33%	79.5 (.03)	76.8 (.04)	82.0 (.04)

• * Standard errors within parentheses

• * By predominate aboriginal group, if any

Figure 3: Life expectancy for the total and Inuit-identity population of the Inuit-inhabited areas of Canada in 2001

