

Health Adjusted Life Expectancy trends in Canada: preliminary results

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PROTECTING CANADIANS FROM ILLNESS



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Introduction

- Health-Adjusted Live Expectancy (HALE) can help to evaluate and track changes in mortality and morbidity over time;
- It can help to assess compression or expansion of morbidity;
- Results of a trend analysis can guide policy makers and program developers to design and implement policies and programs for areas where it is most needed;
- HALE at birth and HALE by income are key performance indicators for PHAC.



Objectives of the study

- Demonstrate the gradient in HALE across provinces and territories and by gender;
- Compare trends in the of number of years (LE-HALE) as well as in proportion of life $((LE-HALE)/LE)$ spent in poor health across jurisdictions;
- Analyse contribution of mortality and morbidity components in HALE difference over time.



Methods

- **HALE was calculated for 4 consecutive periods: 2000-2002, 2002-2004, 2004-2006 and 2006-2008;**
- Mortality data were from the Canadian Chronic Disease Surveillance System (CCDSS) collected by PHAC from all provinces and territories on annual basis;
- Morbidity data were from the Canadian Community Health Survey (CCHS) . Health Utilities Index Mark 3 (HUI) available for 4 cycles (2000-2001, 2003, 2005 and 2009-10) was used as a Measure of Health Related Quality of Life.



Methods

- **Chiang abridged life table**
 - » Hsieh method to close life table (last age group: 85+)
- **Sullivan method to compute HALE**
 - » Health Utilities Index Mark 3 (HUI) was used as a Measure of Health Related Quality of Life.
HUI weights quantify the proportion of full health for each year of life lived.
- **SAS 9.3 used for calculations**

Health Utilities Index Mark 3 (HUI)

- A multi-attribute health status classification system (a measure of health related quality of life).
- Attributes (each having 5 or 6 levels to which weights are assigned by an expert panel):
 - » Vision
 - » Hearing
 - » Speech
 - » Ambulation
 - » Dexterity
 - » Emotion
 - » Cognition
 - » Pain

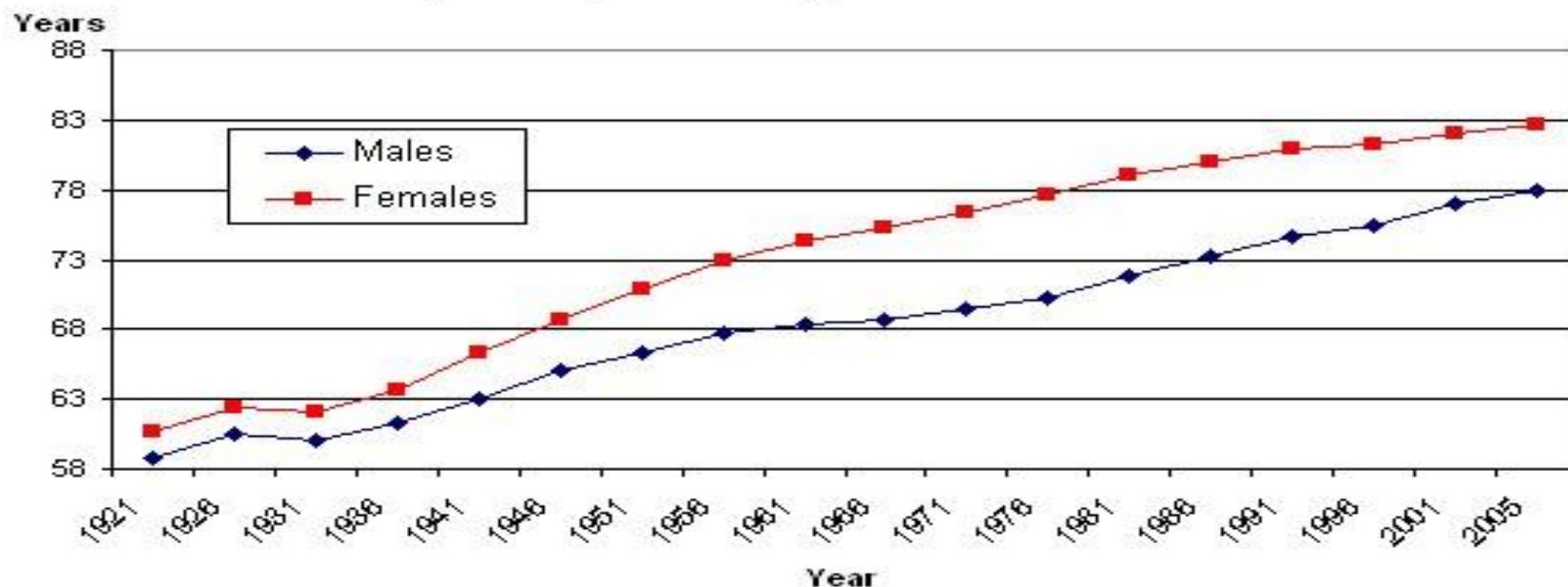
$$mHUI = 1.371 * \prod_{k=1}^8 b_k - 0.371$$

b_k -single attribute utility score



Results and discussion: LE

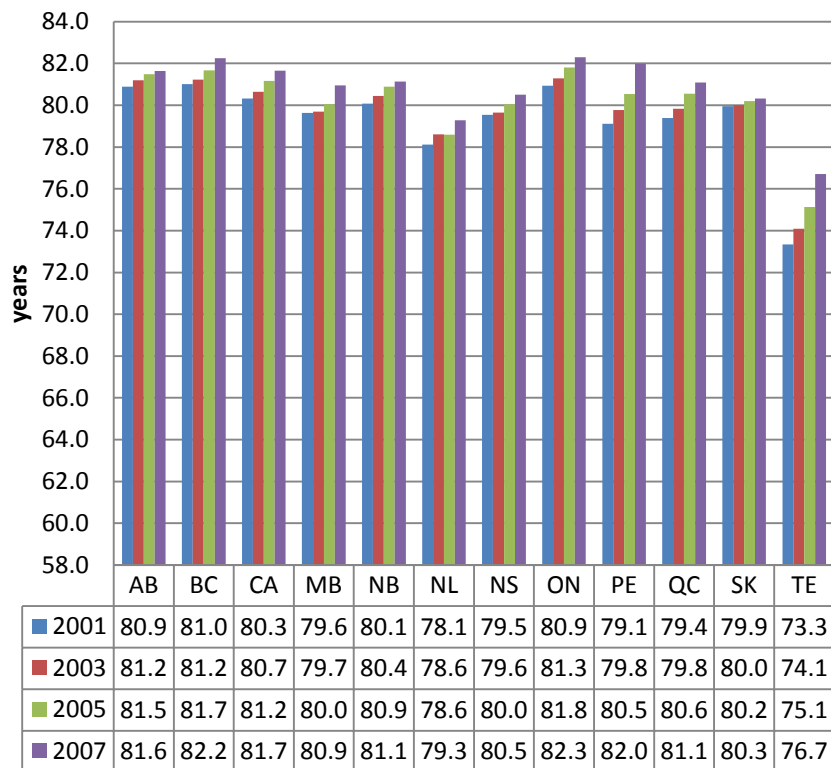
Life expectancy at birth, by sex, Canada, 1956 to 2005



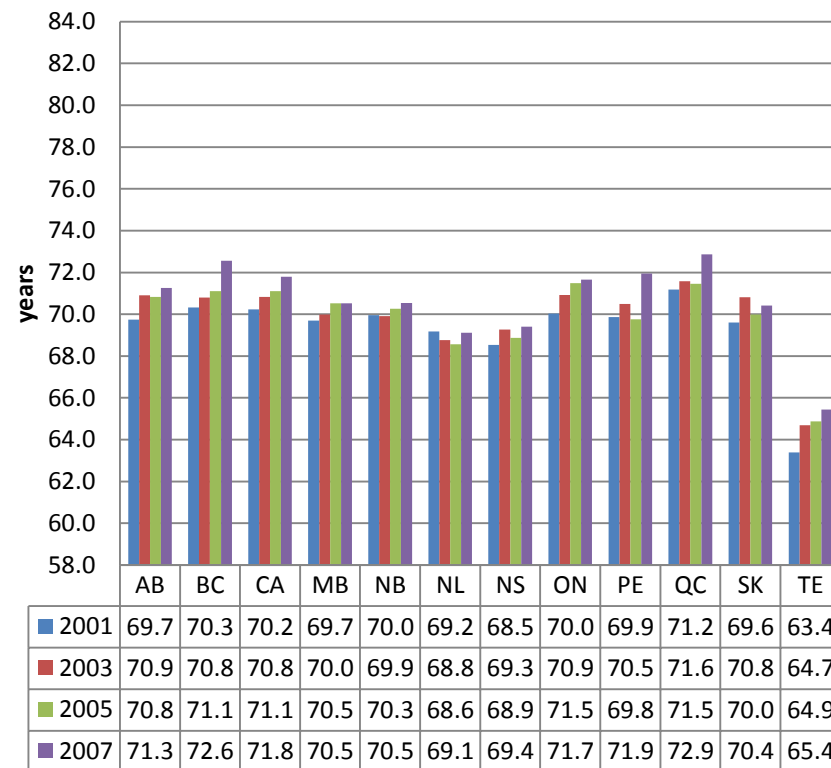
Source: 1921 to 1981: Nagnur D. *Longevity and Historical Life Tables, 1921 to 1981 (Abridged)*, Statistics Canada, Catalogue 98-506, 1986;
1986: Duchesne D, Nault F, Gilmour H, Wilkins R. *Vital Statistics Compendium 1996*, Statistics Canada, Catalogue 84-214, 1999;
1991 to 2005: CANSIM Table 102-0511, *Life expectancy, abridged life table, at birth and at age 65, by sex, Canada, provinces and territories, annual*.

Results and discussion: LE, HALE

LE trend for Canada and by province and territories, both genders combined, 2001-2007

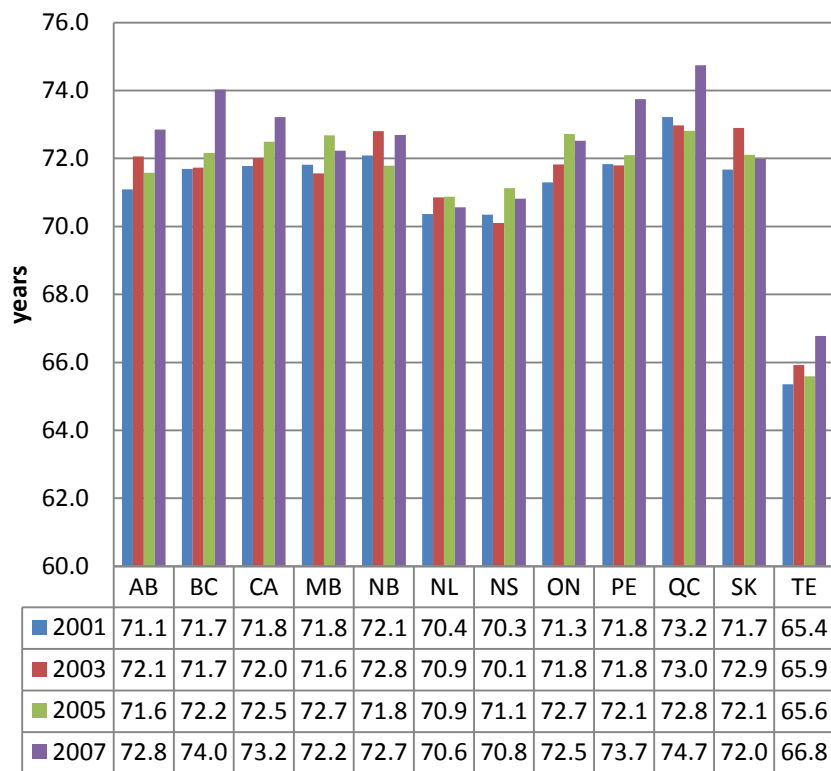


HALE trend for Canada and by province and territories, both genders combined, 2001-2007

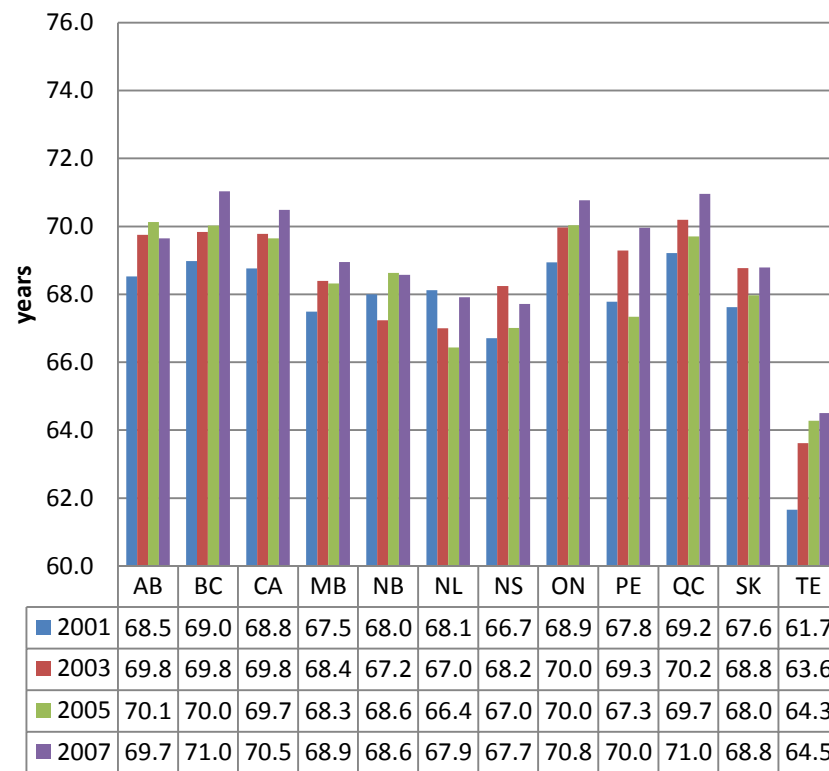


Results and discussion: HALE

HALE trend for Canada and by province and territories, Females, 2001-2007

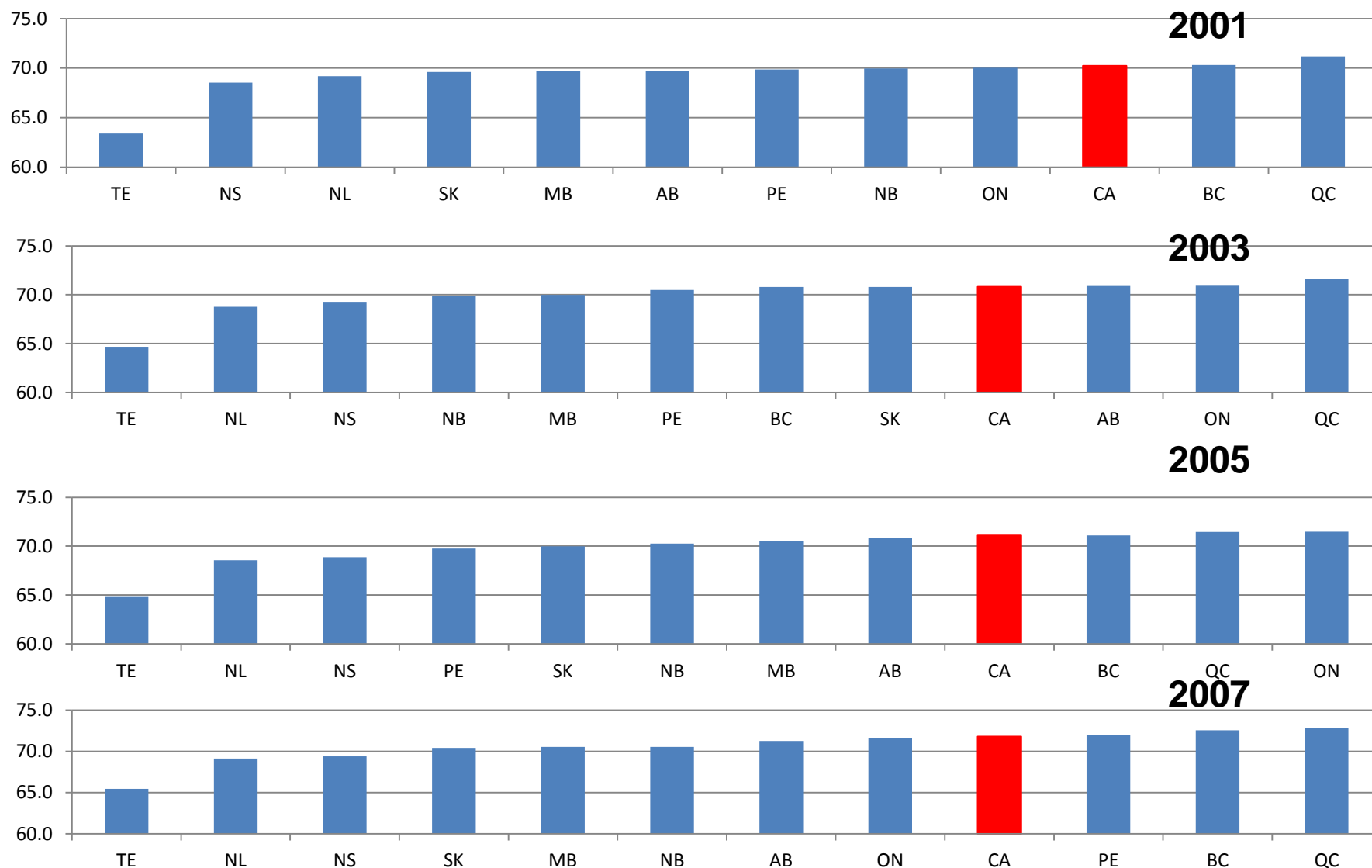


HALE trend for Canada and by province and territories, Males, 2001-2007

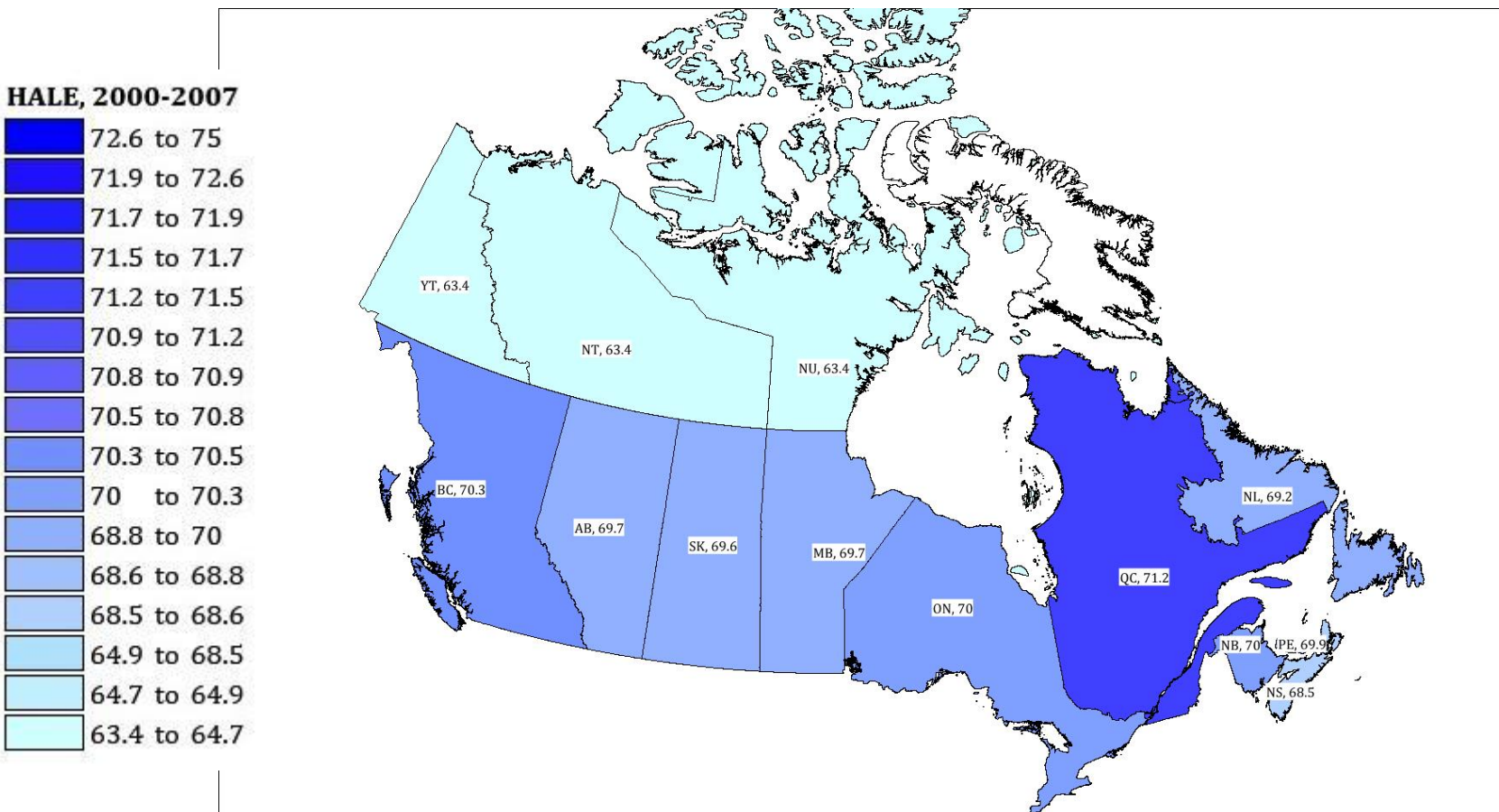


REVES 2014, Edinburgh, UK, May 28-30

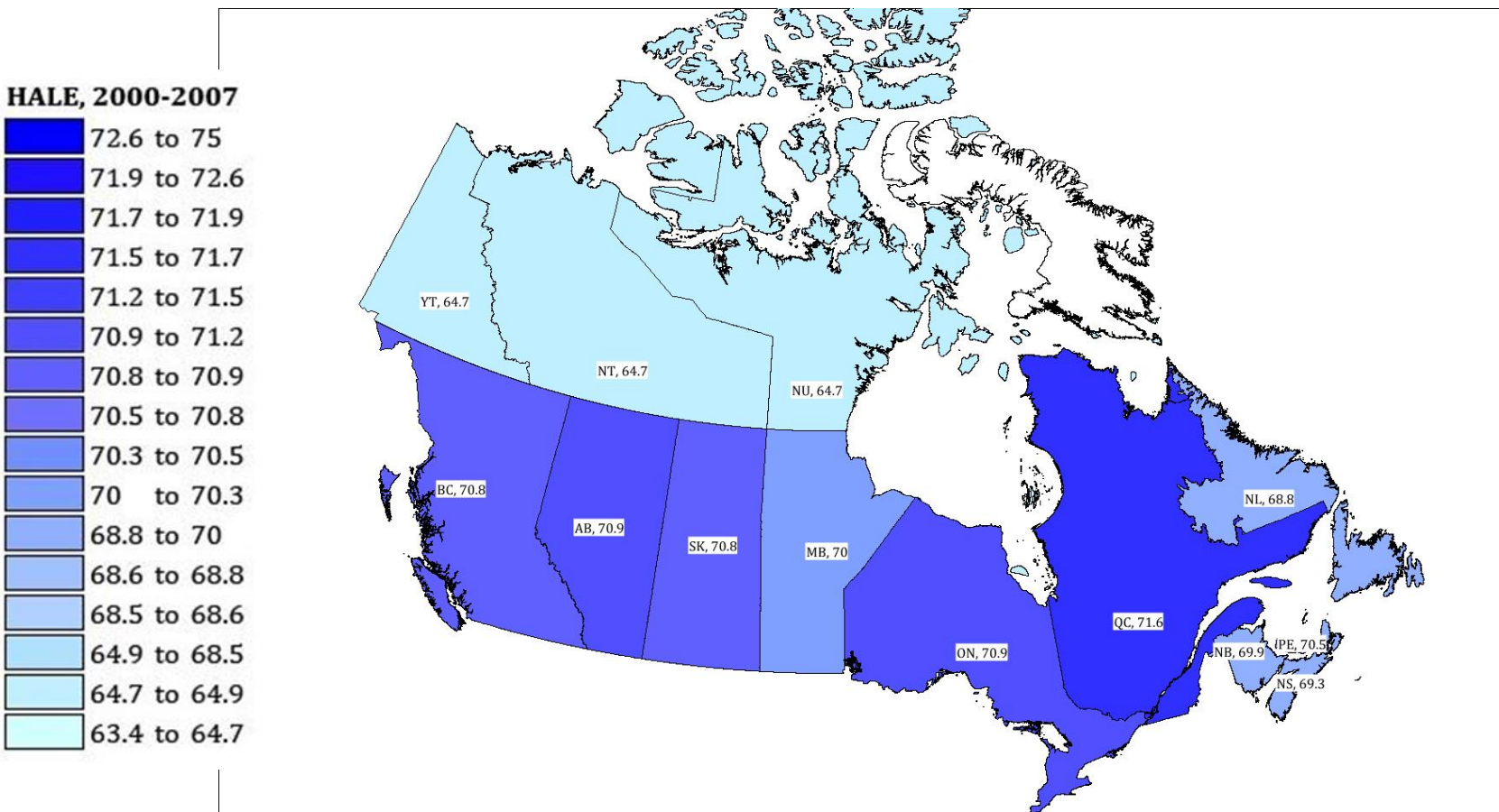
HALE, years



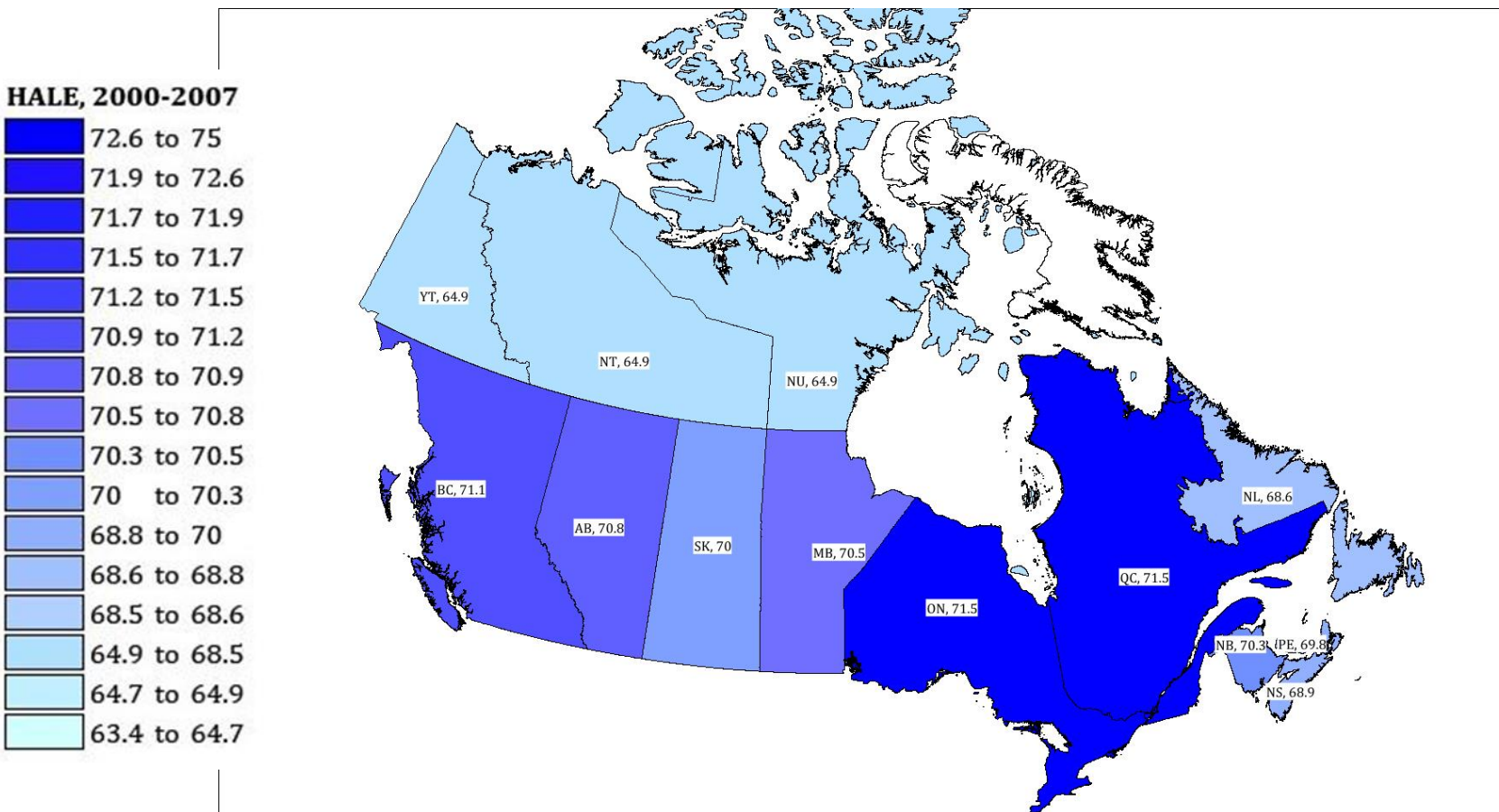
HALE for Canadian provinces and territories, both genders combined, 2001



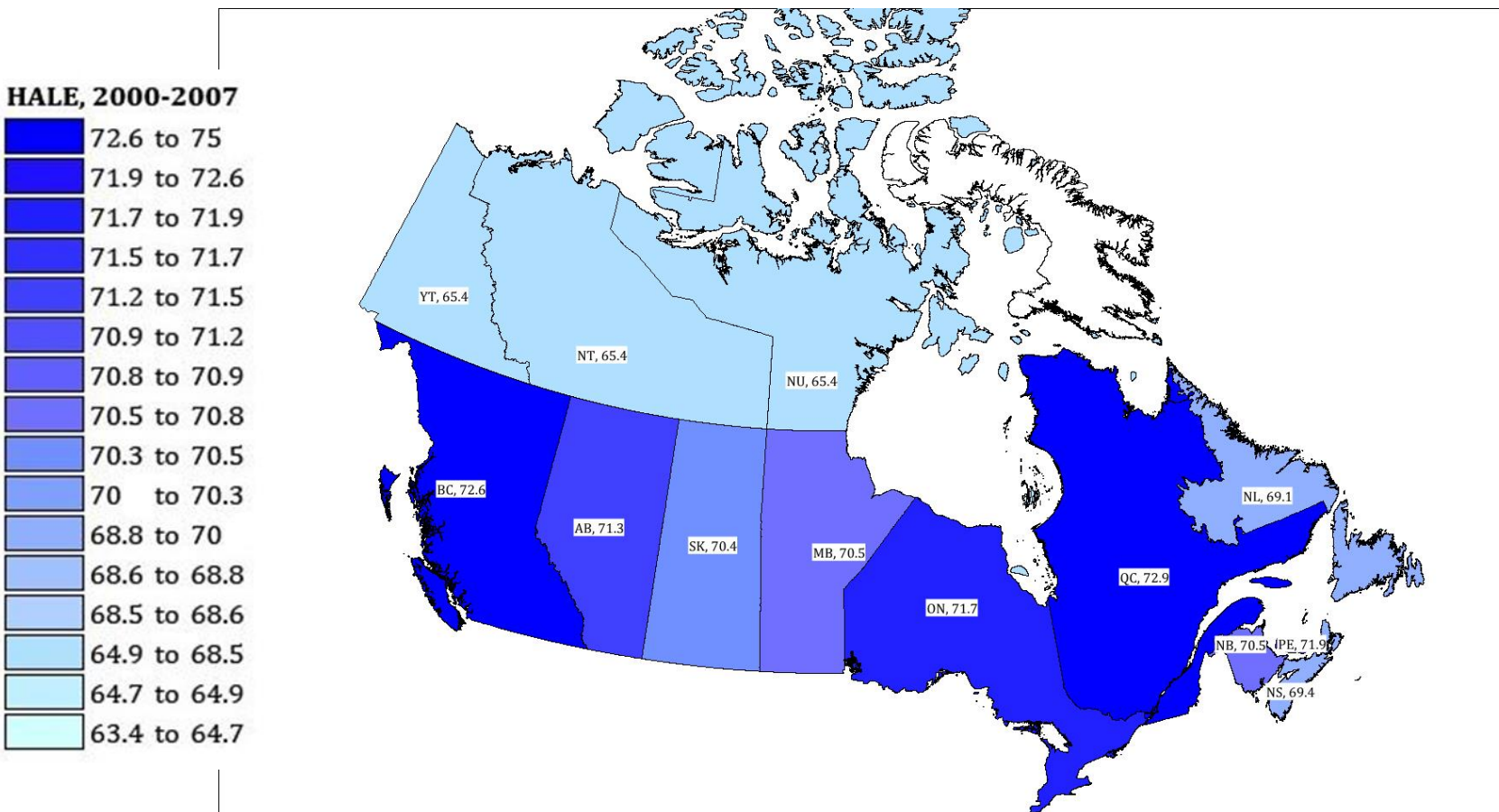
HALE for Canadian provinces and territories, both genders combined, 2003

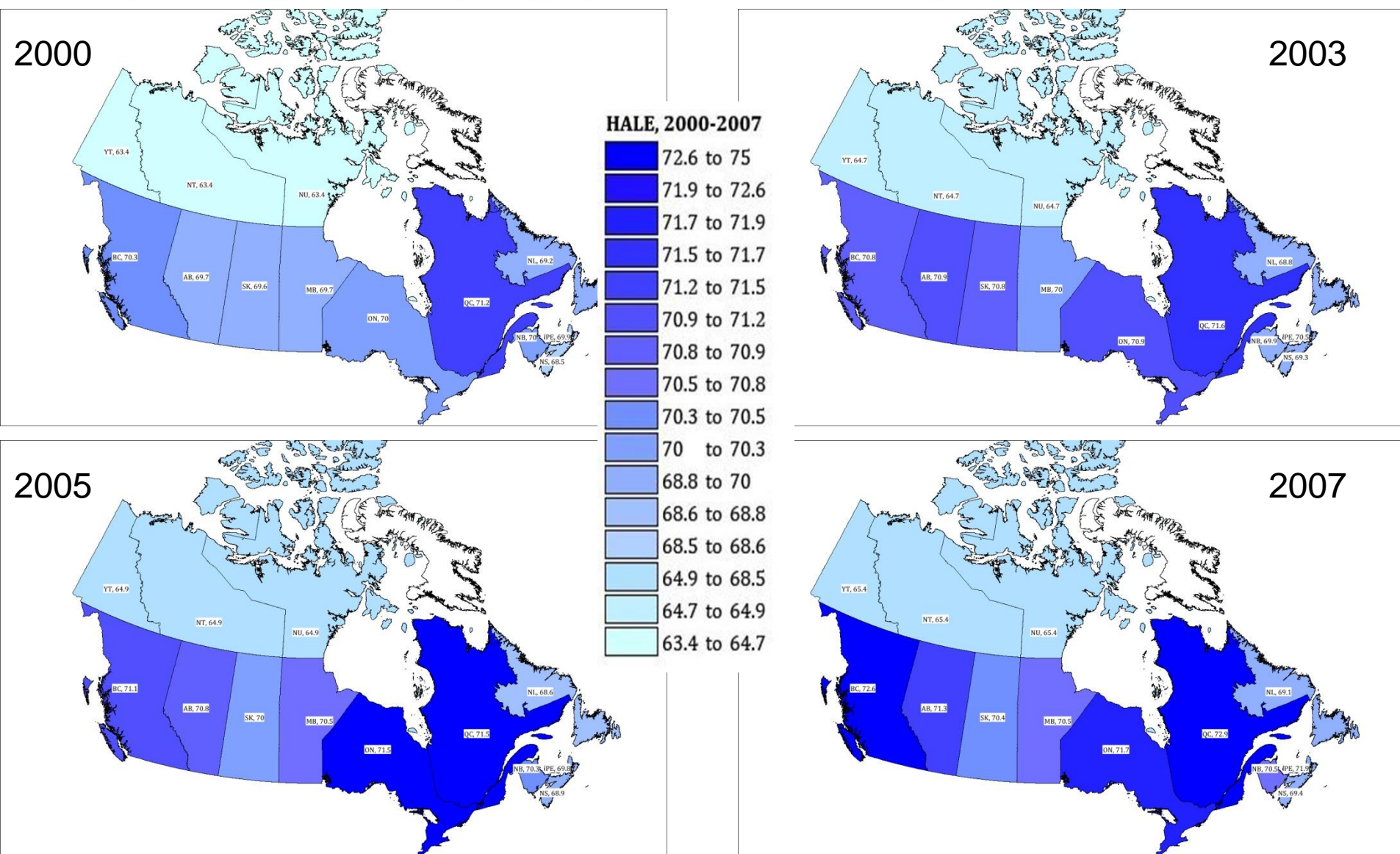


HALE for Canadian provinces and territories, both genders combined, 2005



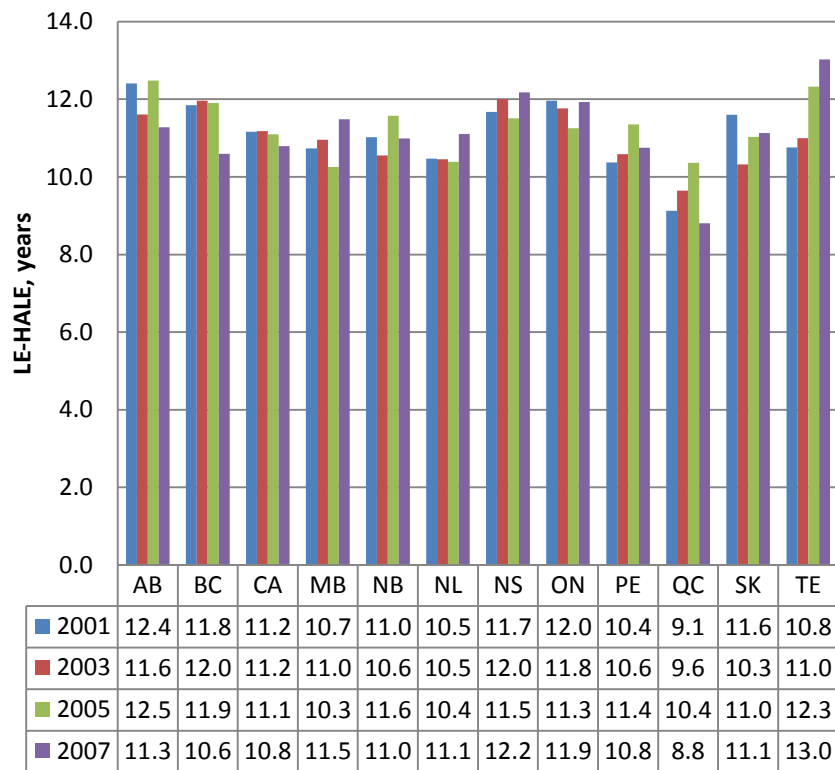
HALE for Canadian provinces and territories, both genders combined, 2007



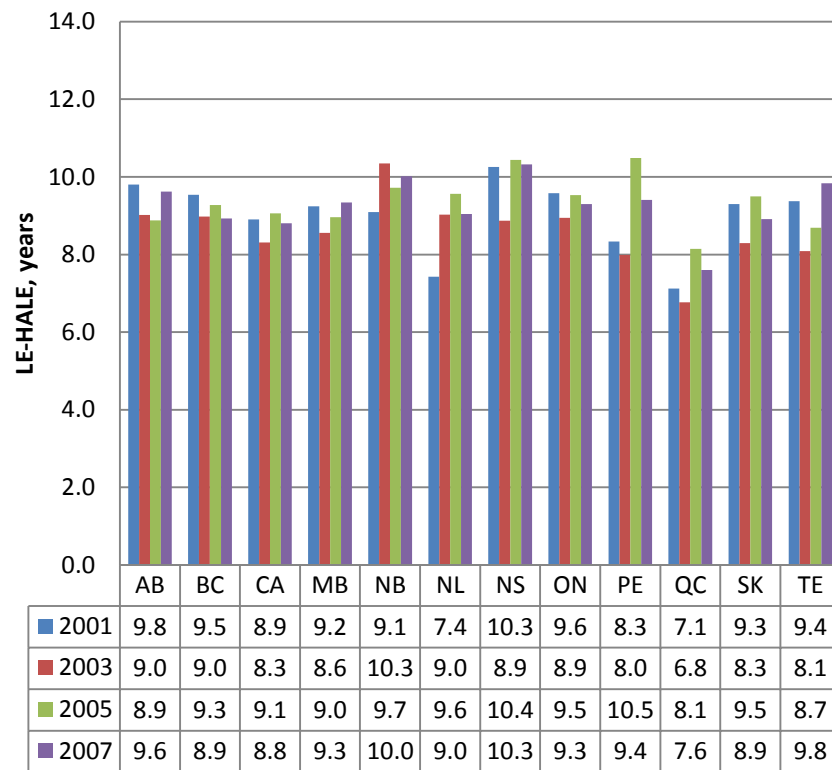


Results and discussion: LE-HALE

LE-HALE trend for Canada and by province and territories, Females, 2001-2007

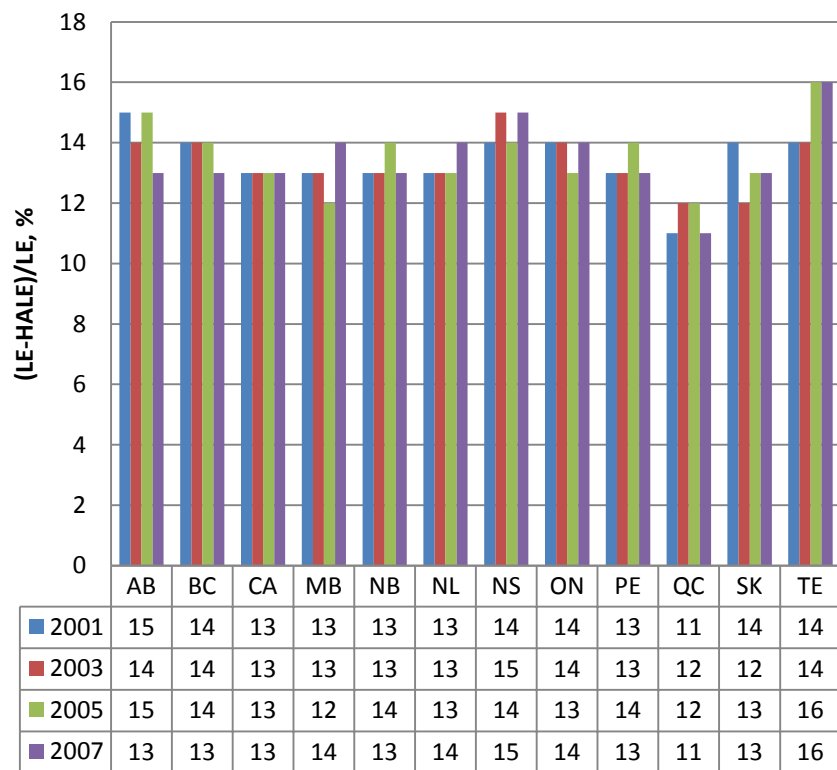


LE-HALE trend for Canada and by province and territories, Males, 2001-2007

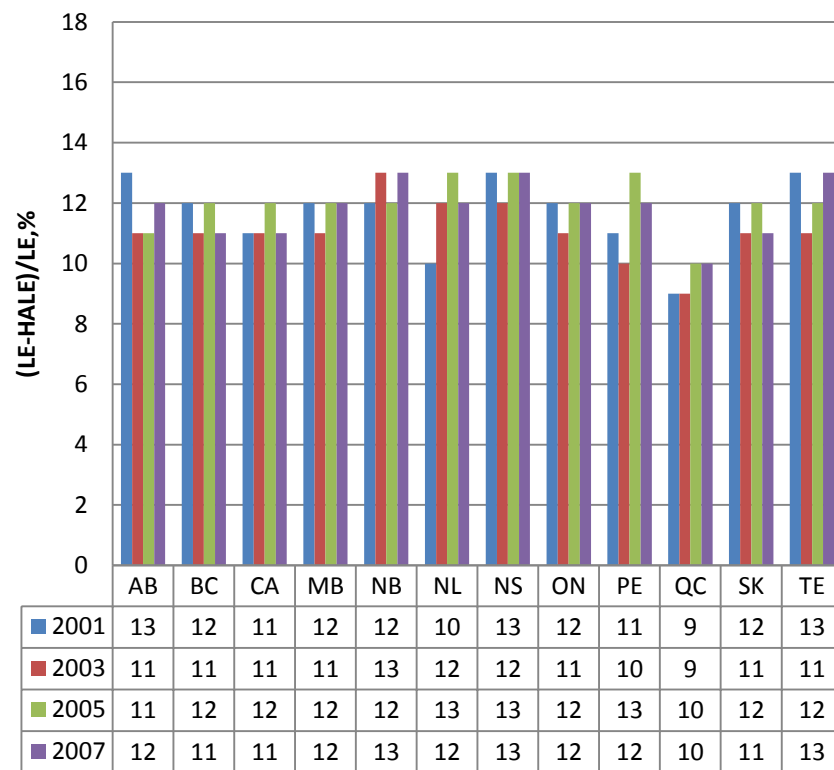


Results and discussion: (LE-HALE)/LE)

(LE-HALE)/LE trend for Canada and by province and territories, Females, 2001-2007



(LE-HALE)/LE trend for Canada and by province and territories, Males, 2001-2007



HALE difference decomposition: CANADA

Age	Base Year	Compare Year	LE, years gained	HALE, years gained	HRQL contribution	Mortality contribution
At birth	2001	2003	0.33	0.61	0.37	0.23
At birth	2001	2005	0.84	0.88	0.29	0.59
At birth	2001	2007	1.33	1.57	0.62	0.95
At 20	2001	2003	0.32	0.70	0.47	0.24
At 20	2001	2005	0.85	0.98	0.39	0.59
At 20	2001	2007	1.31	1.60	0.67	0.94
At 40	2001	2003	0.31	0.70	0.47	0.23
At 40	2001	2005	0.83	1.07	0.49	0.58
At 40	2001	2007	1.26	1.52	0.62	0.93
At 60	2001	2003	0.28	0.60	0.37	0.22
At 60	2001	2005	0.77	0.94	0.39	0.55
At 60	2001	2007	1.17	1.43	0.57	0.87
At 80	2001	2003	0.15	0.39	0.18	0.12
At 80	2001	2005	0.44	0.44	0.11	0.33
At 80	2001	2007	0.67	0.90	0.29	0.52

Conclusions

- HALE increased by 1.6 years in Canada for the study period;
- NB,MB,AB,QC,ON,TE and BC demonstrated a significant annual increase in HALE;
- Statistically significant annual decrease in (LE-HALE)/LE was observed for BC (both genders combined) and for females of all of CA;
- (LE-HALE)/LE increased in NL (both genders combined) and for females in TE;
- A similar pattern was observed for the number of years spent in poor health (LE-HALE)
- Decrease in mortality plays a greater role in HALE increase over time than the increase in the quality of life.

Next steps

- Decompose HALE difference between a base year 2001 and subsequent years by gender and by Canadian jurisdictions in order to identify main drivers of increase or decrease in HALE;
- Summarize findings for a publication;



THANK YOU!

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