Sex Differential in Life Expectancy at Birth in Canada, 1921-2004: Provincial Variations

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Abstract

Since the beginning of the 20th century, mortality has substantially declined in most countries. However, this decline has been quite different between women and men. In Canada, sex differential in life expectancy at birth was about two years at the beginning of the century and reached more than seven years at the end of the 70's. Since then, the female advantage has been reducing meaning that the nation witnessed a reduction of this differential. Using a decomposition analysis of sex differences in life expectancy at birth, our results demonstrated that the main reason of this major change in the evolution of life expectancy at birth difference is reducing mortality among men aged 55 to 74 especially from ischemic heart disease. The situation is similar among Canadian provinces. However, their situation was quite heterogeneous at the beginning of the century but tends to converge nowadays. The reducing sex differential in life expectancy at birth is not unique to Canada and can be observed in most developed countries. The situation does not reflect a deterioration of women's health but an acceleration of men's health progress.

Key words: Demography, mortality, life expectancy at birth, causes of death, sexes, Canada, provinces.

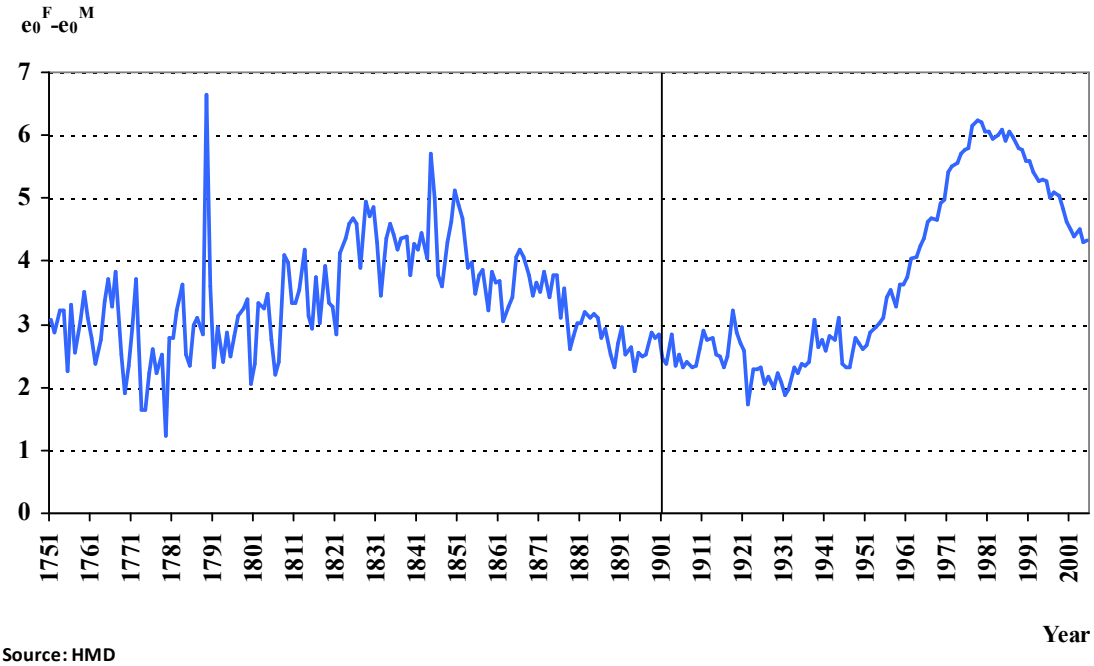
1. BACKGROUND

Since the beginning of the 20th century, mortality has substantially declined in most countries. However, the decline has been quite different between females and males creating a special pattern of sex mortality differential. It is well known that longevity advantage is a woman advantage. More than 300 years ago, in the 17th century, father of modern demography, John Graunt, had identified lower female death rates at almost all ages in London. Moreover, looking at Sweden data[1] (using the Human Mortality Database, HMD, www.mortality.org) available for the 18th century, the difference between female and male life expectancy at birth is about 2-3 years. This level is known as the biological difference between sexes when no external action is taken into account (Pressat, 1973).

[1] Sweden was chosen because of long history of data availability.

Indeed, this is the level observed in many high income countries at the beginning of the 20th century (Glei, 2005; United Nations, 1988). Figure 1 shows for Sweden, the evolution of the difference between female and male life expectancy at birth (e_0^F-e_0^M) from 1751 to 2006. At the turn of the 18th century, the difference was about three years and then fluctuates enormously throughout the following century; but, at the beginning of the 20th century, the gap was still about two years. What will be new here is the continuous growth of the absolute mortality difference between sexes. It reached 6.05 years in 1986 and, since then has been continuously decreasing and attained 4.21 years in 2006. This general pattern of the difference between female and male life expectancy at birth can be observed in most high income countries. Only the timing and the intensity of the phenomenon differ (Glei, 2005; Meslé, 2004; Lopez, 1983).

Figure 1: Female-Male Gap in Life Expectancy at Birth (e_0^F-e_0^M), Sweden, 1751-2006



Source: HMD

The determinants

The major reasons of the difference between female and male mortality are well documented and can be classified in two principal categories: internal and external. The first includes endogenous factors which are mostly biological/genetic. The second one refers to social, cultural, environmental, and behavioral factors (exogenous) according to each sex.

Other factors like socioeconomic status, benefits from the advancement in medicine, can also be taken into account when explaining the phenomenon.

Numerous studies have shown the role of biological factors regarding the sex mortality differential using animal data. Main results show that in the vast majority of animal species[2], the males have higher mortality rates than do the females (Kalben, 2002; Hamilton, 1948). Other major biologic factors in favor of women cited in the literature can be listed as follow: XX chromosome constitution, protection of progestins and estrogens, iron loss through menstruation, care of offspring, etc. Another key study supporting the biological hypotheses was performed by Madigan (1957) when he compared the mortality rates between Catholic Brothers and Sisters. He found that sex mortality differentials were similar to those observed in the general population and concluded that «*…not only are sociocultural pressures less important than biological factors in relation to the mortality differentials of the sexes, but are of comparatively small importance in this respect*. [3]». But an important limit of the study is that he did take into account the role of smoking which he mentioned, was a behavior observed among Brothers. Moreover, if the absolute difference between sexes increased through time, it is clearly not the result of accelerating biological differences.

This point raises the question of external factors in creating a mortality differential between sexes. Their actions can be seen through behavior according to each sex (risk taking, smoking and alcohol use, health care services use, etc.), environmental factors, socioeconomic status, sex roles (gender), labor force participation, diet, etc. However, it is evident that there can be an interaction between these factors and the biological one. A classic example is the risk taking behavior known as a man behavior and the possible role of testosterone or one of its hormonal metabolites (Kalben, 2002; Waldron, 1983). Another example is breast cancer which is predominately female but evidence showed that external factors such as diet can influence the occurrence of the disease (Kalben, 2002; Waldron, 1983).

Keeping this in mind, we propose a conceptual framework of sex mortality differential (Appendix 1). The combination of endogenous and exogenous determinants creates, through an improvement or a deterioration of health status, a sex mortality differential. This

[2] Most animal kingdom species are represented: nematodes, crustaceans, mollusks, insects, arachnids, reptiles, birds, fish and mammals.
[3] Madigan, 1957: 215

phenomenon can be measured using its a) direction, b) trends, c) variations by age, and d) variations by region (Stolnitz, 1956: 22). This is the global approach used in this study.

Study aim

Therefore, our aim is to document the evolution of sex differential in life expectancy at birth in Canada and its provinces. Data availability on a long time-period, lack of systematic studies on a long time-period distinguishing provinces and well-documented provincial diversity raised our interest in starting this study. From this point of view, we address three major questions concerning Canada and the provinces: 1) How have female-male life expectancy at birth difference evolved in Canada and its provinces? 2) What age groups and causes of death are responsible for the changing pattern of the phenomenon? 3) Is there a regional pattern in the evolution of the sex differential in mortality?

2. DATA AND METHODS

Data

Main variables used in this study are life expectancy at birth by sex and death rates by age and sex. Both are from the Canadian Human Mortality Database[4] (CHMD, 2007). One of the numerous advantage of the CHMD is to provide uniform death rates and life tables for Canada, provinces and territories and therefore to allow a reliable comparison through time and between geographic areas. In fact, data are available from 1921 to 2005[5].

Another important variable used is cause of death by age and sex for Canada and Quebec. Data for Canada are from Statistics Canada[6] (1979 to 1983 and 2000 to 2004 for all provinces) and Quebec's one from the Institut national de Santé publique du Québec[7] (1981 to 1983). Unfortunately, because of confidentiality reasons and delays, we did not receive causes of death data for other provinces. Data cover the ninth and tenth revision of the International Classification of Diseases (ICD 9 and ICD 10). According to the recommendations of Paquette and al. (2006), we did not proceed to any data aggregation between the revisions. Appendix 2 shows causes of death codes used for each revision. For the purposes of this analysis causes of death are grouped into eleven (11) major categories: **C1, Infectious and parasitic diseases; C2, Malignant neoplasm of trachea, bronchus and lung; C3, Malignant neoplasm of female breast; C4, Malignant neoplasm of prostate; C5, Other malignant**

[4] 'Satellite' of the Human Mortality Database, www.bdlc.umontreal.ca
[5] When this study was conducted, data were available till 2004.
[6] www.statcan.ca
[7] INSPQ, www.inspq.qc.ca

neoplasm; C6, Ischemic Heart disease; C7, Cerebrovascular disease; C8, Other circulatory disease; C9, Suicide; C10, External causes of injury (except suicide); C11, All other causes (residual).

Methods

After showing the evolution of the absolute difference between female and male life expectancy at birth **(e_0^F-e_0^M)**, we calculate the annual life expectancy gain for each sex, using a five-year moving average to smooth out annual fluctuations. Then, we also calculate sex ratios of mortality rates: ${}_nm_x^M$ / ${}_nm_x^F$, where ${}_nm_x$ represents death rate for male (M) and female (F) aged x to $x+n$ for a selected time interval. With sex ratios, we can evaluate the excess mortality of one sex compare to the other one. When sex ratio is higher than one, there is a male excess mortality. Inversely, if ratio is lower than one, excess mortality is female. This indicator is presented using a Lexis surface, a tool that allows to studying the process in three dimensions simultaneously: year of age, calendar time and sex ratio of mortality.

In the second part, we proceed to a decomposition analysis to see the contribution of age groups (0; 1-14; 15-34; 35-54; 55-74; 75-89 and 90+[8]) in the change of the life expectancy difference between two periods: 1921-1924 to 1975-1979, representing the period during which the difference increased and 1975-79 to 2000-2004, representing the period during which the difference reduced. We also made a decomposition analysis to see the contribution of 5-year age groups and cause specific death rate in the narrowing sex mortality differential from 1979-1983 to 2000-2004 for Canada and 1981-1983 to 2000-2004 for Quebec. These intervals cover the change in the differential from the approximate point at which it has reached a maximum to the recent period at which data are presented. Decomposition method used is Arriaga's discrete approach where the absolute difference is the sum of age and cause specific contribution in an age group.

3. DESCRIPTIVE RESULTS

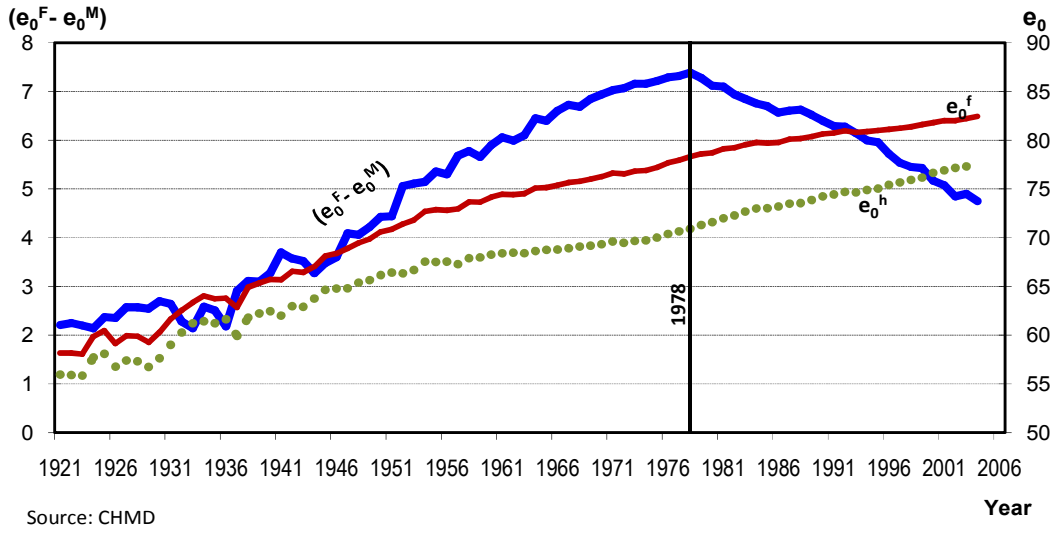
Canada

In Canada, sex differential in life expectancy at birth was about two years at the beginning of the 20th century and reached more than seven years at the end of the 70's. In fact, in 1921, life expectancy difference between women and men was 2.21 years in favour of women and by 1978, women were enjoying an additional 7.39 years, a historical never-reached level.

[8] Decomposition analysis was made for 5-year age groups.

Since then, the female advantage has been reducing and the difference had narrowed to 4.75 years in 2004 (Figure 2).

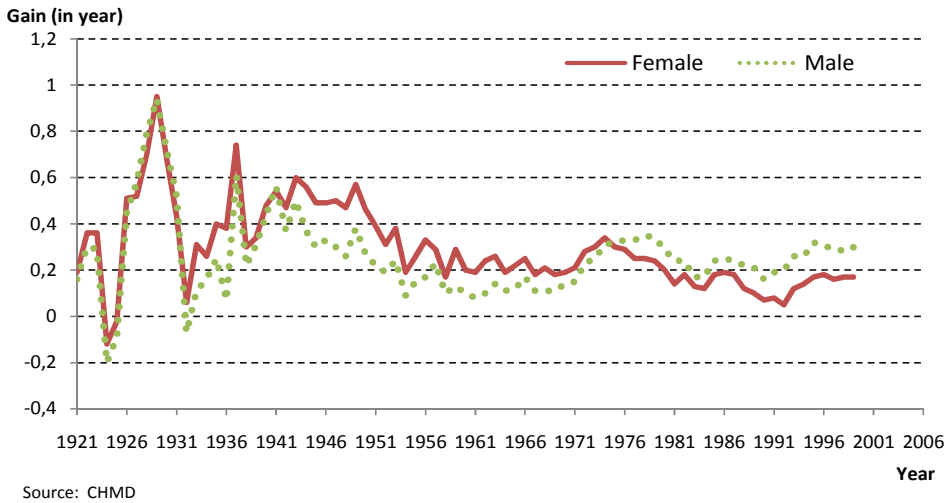
Figure 2: Life Expectancy at Birth (e_0) and Gap Between Sexes (e_0^F-e_0^M), Canada, 1921-2004



Source: CHMD

Looking at the annual gain of life expectancy for each sex, it appears that until the beginning of the 70's, women gained more years than men but the situation has reversed since then. Men's life expectancy at birth is then growing every year faster than women's. However, this situation doesn't lead to a reduction of men's excess mortality at all ages.

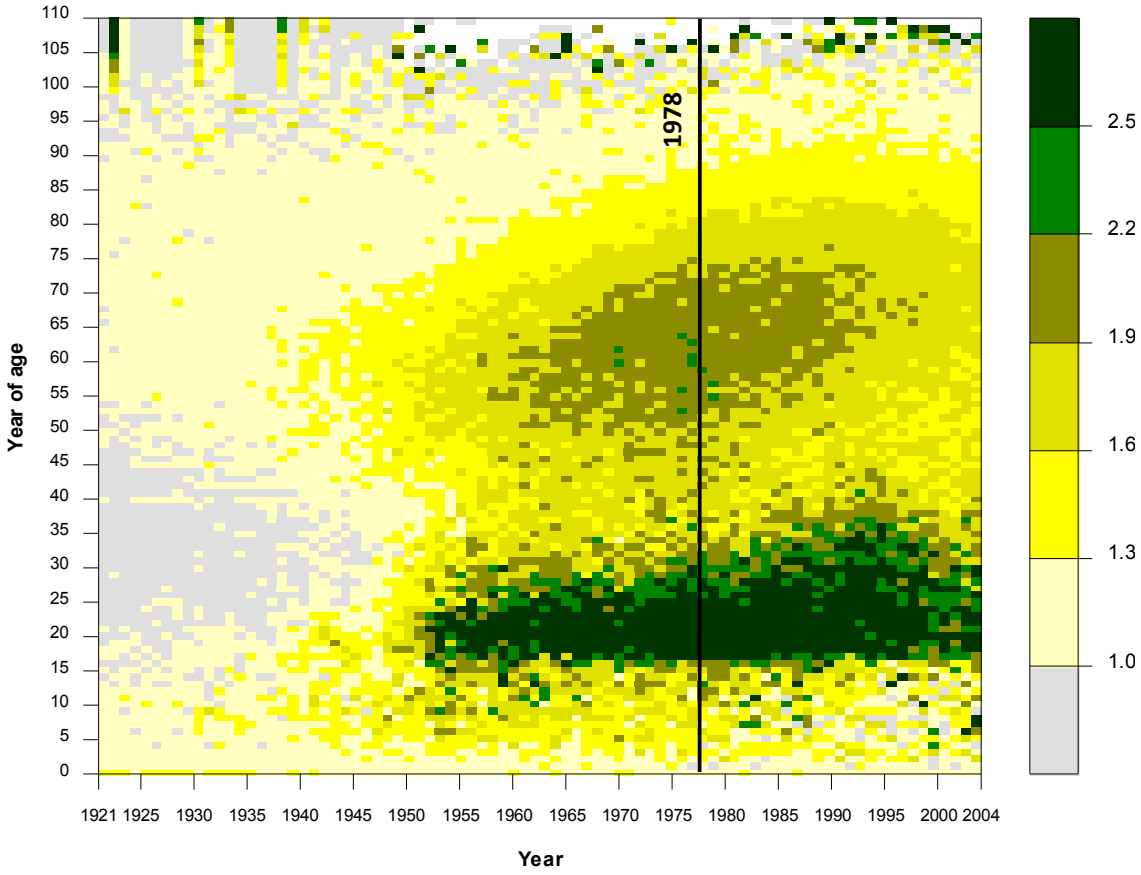
Figure 3: Annual Gain in Life Expectancy by Sex (5-year moving average), Canada, 1921-2004



Source: CHMD

In fact, sex ratios of mortality rates shows that, when looking at age groups, except maternal mortality at the beginning of the century, male excess mortality is obvious everywhere especially among young adults (between age 15 to 30, where there is highest excess male mortality) and adults (from age 45 to 75, where the ratios are still high but lower than the previous). The excess male mortality profile is then characterised by two major peaks, one higher than the other (see Lexis surface, Figure 1). We therefore address the question of the weight of those age groups: do the age groups with higher ratio contribute more than the other in the sex mortality differential?

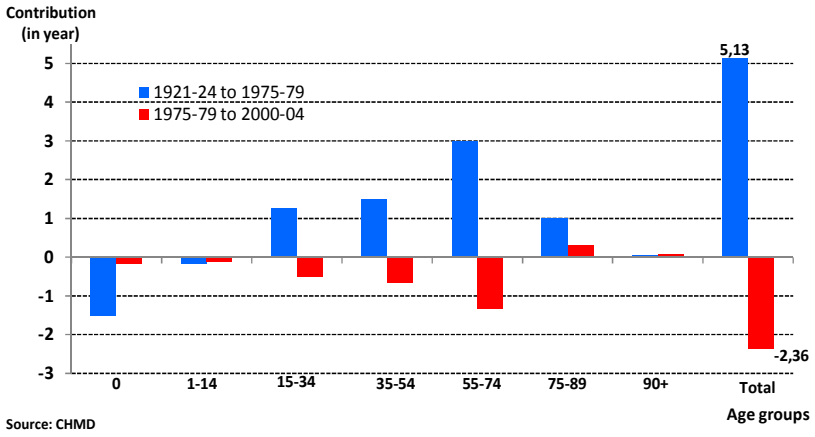
Figure 4: Sex Ratios of Mortality Rates by Year of Age and Calendar Time, Canada, 1921-2004



To answer this question, we used the decomposition analysis to see the contribution of age groups in the changing sex differential in mortality (across sequential periods). Figure 5 shows that during the first period where the difference increased by 5.13 years, age groups above 14 contributed to create this difference. The most important contributor is age group 55-74. Inversely, mortality differences between sexes reduced among persons aged 0-14. This might be seen as an effect of the reduction of mortality due to infectious and parasitic diseases.

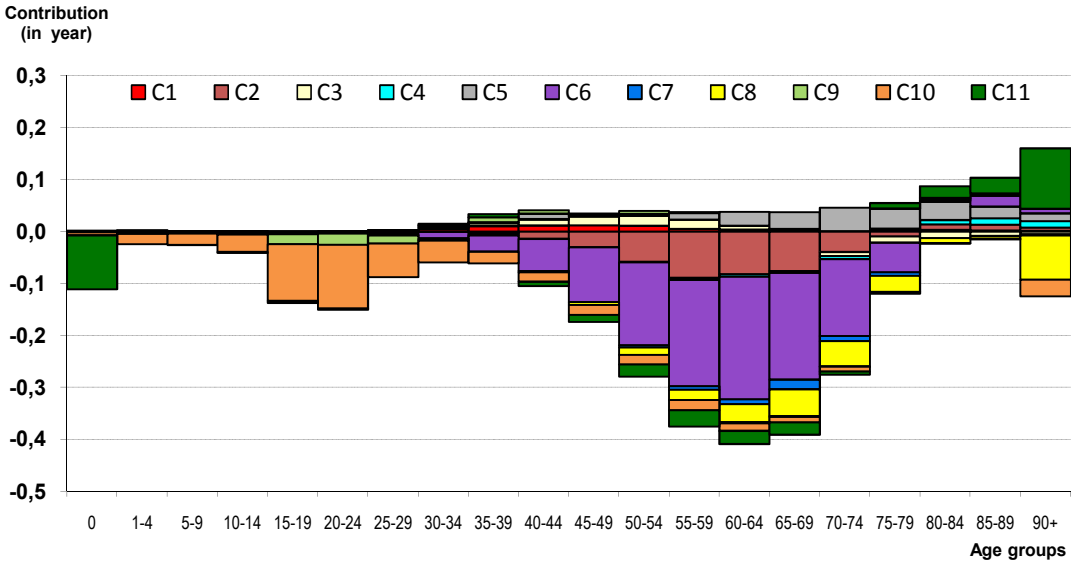
During the second period, mortality narrowed by 2.36 years. Here, all age groups below 75 contributed to reduce the mortality gap between men and women. The most important contributor is also age group 55-74. The contribution of old persons is still to widening the difference between sexes. Then it appears that the age groups where sex ratios are the highest are not those which contribute the most in mortality difference between sexes; the change is due to age groups where mortality is already high.

Figure 5: Change in the contribution of age groups to the change in female-male gap in life expectancy at birth, Canada, 1921-24 to 1975-1975 (P_1) and 1975-1979 to 2000-2004 (P_2)



We also proceed to a decomposition analysis using age groups and causes of death to see what causes are implicated in the reduction of the longevity gap. Between 1979-1983 and 2000-2004, the difference decreased by 2.26 in Canada. Among the eleven chosen causes of death, seven contributed to reduce the sex gap in longevity (from highest to lowest contribution): ischemic heart disease (53 percent), external causes of injury (except suicide), malignant neoplasm of trachea, bronchus and lung, other circulatory disease, cerebrovascular diseases and other causes of death (residual) (2 percent). The four other causes still contribute to widen this difference in favour of women and count for 16 percent of the total change (Figure 6 and Table 1).

Figure 6: Change in the contribution of eleven causes of death components to the change in female-male gap in life expectancy at birth, Canada, 1979-1983 to 2000-2004 (-2.26 years)



Source: CHMD; Statistics Canada (Causes of death)

Table 1: Change in the contribution of eleven causes of death components to the change in female-male gap in life expectancy at birth, Canada, 1979-1983 to 2000-2004

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	Total
In year	0.07	***-0.38***	0.04	0.02	0.23	***-1.19***	***-0.05***	***-0.31***	***-0.04***	***-0.59***	***-0.05***	**-2.26**
%[9]	3	***-17***	2	1	10	***-53***	***-2***	***-14***	***-2***	***-26***	***-2***	**-100**

C1, Infectious and parasitic diseases; C2, Malignant neoplasm of trachea, bronchus and lung; C3, Malignant neoplasm of female breast; C4, Malignant neoplasm of prostate; C5, Other malignant neoplasm; C6, Ischemic Heart disease; C7, Cerebrovascular disease; C8, Other circulatory disease; C9, Suicide; C10, External causes of injury (except suicide); C11, All other causes (residual).

Provinces

Looking at the Canadian provinces, the general evolution of life expectancy at birth difference between sexes is the same. But the reached level and the moment the change has occurred are quite heterogeneous. For example, the first province where an effective change has been observed is British-Columbia in 1975 and the latest is Newfoundland Labrador in 1982. According to our observations, there is no evidence of a clear relationship between life expectancy level, the size of the difference and the time at which it started to narrow (See Appendix 3 for detailed data on provinces). Meslé (2004) came to the same conclusion when looking at the phenomenon in many high income countries.

[9] Percentages are presented to help in the interpretation of relative importance of specific cause of death because it is possible for one cause of death to contribute negatively when the other contribute more.

Table 2 shows the recent decrease of the life expectancy differential between sexes in Canada, Western provinces, Ontario and Quebec[10]. In almost all provinces the mortality gap between sexes decreased, from 0,010 year (Alberta) to 0,184 year (in Quebec). Exception here is Saskatchewan where, unlike other provinces, the gap between sexes increased recently by 0,048 year meaning that men are doing less mortality gains. The situation is documented and consistent data show that there is a slowdown in infant mortality rate decline, and an outbreak of mortality due to accidents and violence and prostate cancer (Prud'homme, 2007).

Table 2: Recent decrease of female-male gap in life expectancy at birth, Canada, 2000-04

	Provinces	Difference in 2000 ($e_0F - e_0M$) (1)	Difference in 2004 ($e_0F - e_0M$) (2)	Total reduction in year (3) =(1)-(2)	Average annual reduction[1]
Western provinces	Colombie-Britannique	4,74	4,39	0,35	**0,070**
	Alberta	4,80	4,75	0,05	**0,010**
	Saskatchewan	5,21	5,45	-0,24	**-0,048**
	Manitoba	5,61	5,00	0,61	**0,122**
Ontario et Québec	Ontario	4,78	4,45	0,33	**0,066**
	Québec	5,99	5,07	0,92	**0,184**
Canada		5,17	4,75	0,42	**0,084**

[1] Total reduction in year divided by 4.

As for Canada, in all provinces, almost all age groups contribute to reduce the sex gap (exception here is age 75+) and everywhere age group 55-74 is the major contributor to this change. Appendix 4 shows age groups contribution to the change in the sex longevity gap for sequential period. Because of lack of data, we proceed to a decomposition analysis using age groups and causes of death only for the province of Quebec. The results show that among the eleven causes of death, seven contribute to reduce the difference: ischemic heart diseases, external causes of injury (except suicide), malignant neoplasm of trachea, bronchus and lung, other circulatory disease, other causes of death (residual), cerebrovascular diseases and prostate cancer.

Table 3 shows a comparison of the contributions of cause components to the change in longevity gap in Canada and Quebec from 1979-1983 to 2000-2004 and 1981-1983 to 2000-2004 respectively. Even if the general pattern is the same, same causes of death do not

[10] Because of variations due to small population size, eastern provinces are not presented.

always produce the same effects on sex differences in life expectancy especially when looking at the case of suicide and malignant neoplasm of prostate. Between the peak period of the differential and the latest point of observation, mortality due to prostate cancer, unlike the situation in Canada, decreased in Quebec. On the contrary, in Canada, there has been some convergence in the sex gap mortality due to suicide which not the case of Quebec (note that total contributions in year are low).

Table 3: Contribution of causes of death components to the change in the sex mortality gap, Canada and Quebec

Canada[1] 1979-83/2000-04	Quebec 1981-83/2000-04
Contribution to the reducing sex gap (from highest to lowest)	
C6, Ischemic Heart disease (-1,19)	**C6,** Ischemic Heart disease (-1,17)
C10, External causes of injury (except suicide) (-0,59)	**C10**, External causes of injury (except suicide) (-0,53)
C2, malignant neoplasm of trachea, bronchus and lung (-0,38)	**C2,** malignant neoplasm of trachea, bronchus and lung (-0,38)
C8, Other circulatory disease (-0,31)	**C8,** Other circulatory disease (-0,35)
C7, Cerebrovascular disease (-0,05)	**C11** All other causes (residual) (-0,09)
C11, All other causes (residual) (-0,05)	**C7,** Cerebrovascular disease (-0,08)
C9, suicide (-0,04)	**C4, Malignant neoplasm of prostate (-0,01)**
Contribution to increasing sex gap (from highest to lowest)	
C5, Other malignant neoplasm (0,23)	**C5,** Other malignant neoplasm (0,22)
C1, Infectious and parasitic diseases (0,07)	**C1,** Infectious and parasitic diseases (0,07)
C3, Malignant neoplasm of female breast (0,04)	**C9, suicide (0,03)**
C4, Malignant neoplasm of prostate (0,02)	**C3,** Malignant neoplasm of female breast (0,02)
Total reduction : -2,26 years	**Total reduction : -2,25 years**

[1]Includes Quebec

CONCLUSION

The reducing sex differential in life expectancy at birth analysed in this paper is not specific to Canada and can be observed in its provinces and in most high income countries. Our results show that the phenomenon does not reflect a deterioration of women's health but evidently an acceleration of men's health progress (annual life expectancy gains in year). In other word, as women already experience relatively low mortality level, before they can add more years to their life expectancy, they need to make significantly higher gains than that necessary for men. According to our observations, there is no evidence of a clear relationship between life expectancy level, the size of the difference and the time at which it started to narrow.

When looking at the contribution of age groups in the narrowing sex differential in mortality, our results showed that almost all age groups contribute to reduce the differences between sexes but the main reason for the change in the evolution of life

expectancy at birth difference is reducing difference among ages 55 to 74. Then it appears age groups where sex mortality ratios are the highest are not those which contribute the most; the change is due to age groups where mortality is already high. It's clear that same causes of death do not always produce the same effects on sex differences in life expectancy even if the general pattern is the same. Within provinces, the general pattern is similar to what is observed for Canada and British Columbia appears to be a precursor in the changing pattern.

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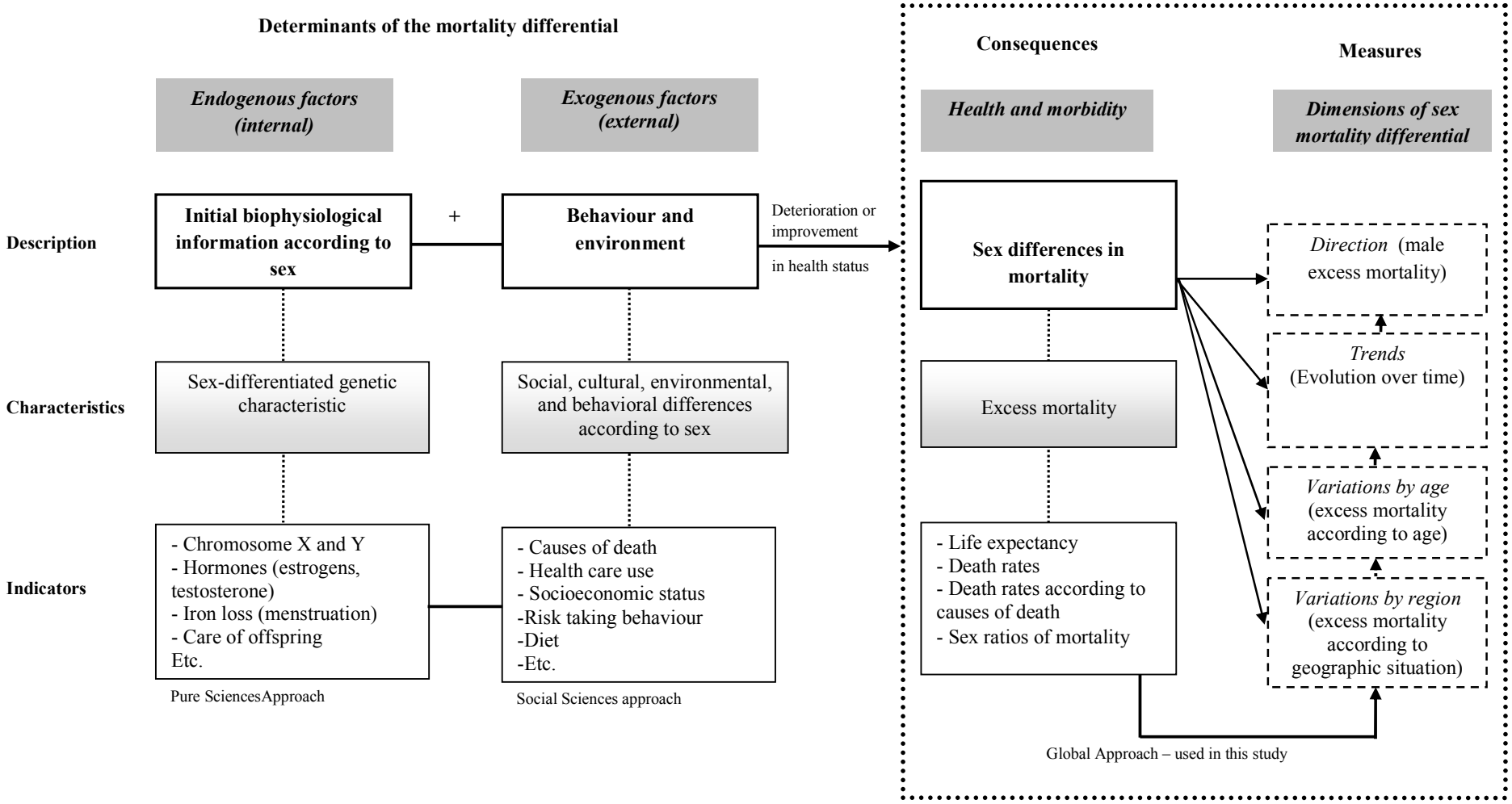
Appendix 1: Elements for a conceptual framework of mortality gap between sexes



Appendix 2: Causes of death codes according to ICD 9 and ICD 10

Appendix 2A: Codes used for Canada, ICD 9 and 10

Causes de décès	Codes	
	ICD 9 (1979-1999)	**ICD10 (2000-2004)**
C1. Infectious and parasitic diseases	001-139	A00-B99
C2. Malignant neoplasm of trachea, bronchus and lung	162	C33-C34
C3. Malignant neoplasm of female breast	174	C50
C4. Malignant neoplasm of prostate	185	C61
C5. Other malignant neoplasm	(140-239) except 162, 174, 185	(C00-D48) except C33-34, C50, C61
C6. Ischemic Heart disease	410-414, 429.2	I20-I25
C7. Cerebrovascular disease	430-438, except 435	I60-I69
C8. Other circulatory disease	390-459 except : 410-414, 429.2 ; 430-438 except 435	I00-I99 except I20-I25 et I60-69
C9. Suicide and self-inflicted injury	E950-E959	X60-X84 et Y87.0
C10. External causes of injury (except suicide)	E800-E999 except (E950-E959)	V01-Y98 except X60-X84 et Y87.0
C11. All other causes (residual).	All deaths except above	All deaths except above
Total	**All deaths**	**All deaths**

Source : Paquette et al., 2006

Appendix 2B: Codes used for Quebec, ICD 9 and 10

Causes de décès	Codes	
	ICD 9 (1981-83 et 1997-99)	**ICD10 (2000-2004)**
C1. Infectious and parasitic diseases	001-139	A00-B99
C2. Malignant neoplasm of trachea, bronchus and lung	162	C33-C34
C3. Malignant neoplasm of female breast	174	C50
C4. Malignant neoplasm of prostate	185	C61
C5. Other malignant neoplasm	(140-239) except 162, 174, 185	(C00-D48) except C33-34, C50, C61
C6. Ischemic Heart disease	410-414	I20-I25
C7. Cerebrovascular disease	430-438	I60-I69
C8. Other circulatory disease	390-459 except : 410-414, 430-438	I00-I99 except I20-I25 et I60-69
C9. Suicide and self-inflicted injury	E950-E959	X60-X84 et Y87.0
C10. External causes of injury (except suicide)	E800-E999 except (E950-E959)	V01-Y98 except X60-X84 et Y87.0
C11. All other causes (residual).	All deaths except above	All deaths except above
Total	**All deaths**	**All deaths**

Source : Paquette et al., 2006

Appendix 3: Life expectancy at birth differential between sexes, few data, Canada and provinces

Geographie	Provinces	Year of evident decrease	e_0F[1] (1)	e_0M[1] (2)	Difference (3) = (1)-(2)	Difference in 2004 (4)	Total reduction in year (5) = (3)-(4)	Mean reduction in year[6]
Western provinces	British Columbia	**1975**	77.83	70.37	**7.46**	*4.39*	***3.07***	**0.102**
	Alberta	**1977**	78.62	71.67	**6.95**	*4.75*	***2.20***	**0.079**
	Saskatchewan	**1977**	78.88	71.51	**7.37**	*5.45*	***1.92***	**0.069**
	Manitoba	**1978**	78.89	71.17	**7.72**	*5.00*	***2.72***[3]	**0.101**
Ontario et Quebec	Ontario	**1979**	78.73	71.73	**7.00**	*4.45*	***2.55***	**0.098**
	Quebec	**1980**	78.14	70.70	**7.44**	*5.07*	***2.37***[4]	**0.095**
Eastern provinces	Prince Edward Island	**1978**	80.51	71.31	**9.20**	*4.83*	***4.37***	**0.162**
	New Brunswick	**1978**	78.16	70.10	**8.06**	*5.19*	***2.87***	**0.106**
	Nova Scotia	**1979**	78.33	70.49	**7.84**	*5.13*	***2.71***	**0.104**
	Newfoundland and Labrador	**1982**	78.7	71.91	**6.79**	*5.53*	***1.26***[5]	**0.055**
Canada		**1979**	78.59	71.31	**7.28**	*4.75*	***2.53***	**0.097**

[1] Female and male life expectancy at birth, year of evident decrease.
[3] Standard deviation western provinces : 0,52
[4] Standard deviation, Ontario et Quebec : 0,13
[5] Standard deviation western provinces: 1,27

Appendix 4: : Change in the contribution of age groups (year and percentage) to the change in female-male gap in life expectancy at birth, Canada, 1921-24 to 1975-1975 (P_1) and 1975-1979 to 2000-2004 (P_2)

	Western provinces								Ontario et Quebec				Eastern provinces							
	BC		*AB*		*SK*		*MB*		*ON*		*QC*		*NFL*[1]		*PEI*		*NB*		*NS*	
GA	P_1	P_2	P_1	P_2	P_1	P_2	P_1	P_2	P_1	P_2	P_1	P2	P_1	P_2	P_1	P_2	P_1	P_2	P_1	P_2
0	-1,18 *(-45)*[2]	**-0,23** ***(-9)***	-1,19 *(-23)*	**-0,10** ***(-5)***	-1,19 *(-19)*	**0,06** ***(4)***	-0,87 *(-14)*	**-0,15** ***(-7)***	-1,34 *(-28)*	**-0,15** ***(-6)***	-2,04 *(-40)*	**-0,16** ***(-8)***	-0,45 *(-13)*	**-0,12** ***(-9)***	-0,41 *(-5)*	**-0,02** ***(0)***	-1,26 *(-20)*	**-0,24** ***(-10)***	-1,33 *(-24)*	**-0,11** ***(-4)***
1-14	-0,35 *(-13)*	**-0,11** ***(-4)***	-0,25 *(-5)*	**-0,10** ***(-5)***	0,07 *(1)*	**-0,09** ***(-5)***	-0,06 *(-1)*	**-0,16** ***(-8)***	-0,18 *(-4)*	**-0,08** ***(-3)***	-0,20 *(-4)*	**-0,15** ***(-7)***	-0,23 *(-7)*	**-0,13** ***(-10)***	-0,09 *(-1)*	**-0,08** ***(-2)***	-0,004 *(0)*	**-0,15** ***(-6)***	-0,23 *(-4)*	**-0,09** ***(-3)***
15-34	0,30 *(11)*	**-0,60** ***(-23)***	1,46 *(28)*	**-0,55** ***(-25)***	1,87 *(30)*	**-0,63** ***(-38)***	1,41 *(23)*	**-0,44** ***(-21)***	0,78 *(16)*	**-0,43** ***(-17)***	1,59 *(31)*	**-0,49** ***(-24)***	0,63 *(18)*	**-0,15** ***(-12)***	1,82 *(22)*	**-0,75** ***(-23)***	1,70 *(27)*	**-0,64** ***(-27)***	1,55 *(28)*	**-0,84** ***(-30)***
35-54	0,48 *(18)*	**-0,34** ***(-13)***	1,40 *(27)*	**-0,51** ***(-23)***	1,70 *(28)*	**-0,50** ***(-30)***	1,50 *(25)*	**-0,58** ***(-28)***	1,41 *(29)*	**-0,63** ***(-24)***	1,72 *(33)*	**-0,87** ***(-42)***	0,75 *(22)*	**-0,59** ***(-47)***	2,21 *(26)*	**-1,30** ***(-40)***	2,08 *(33)*	**-0,94** ***(-40)***	1,64 *(30)*	**-0,75** ***(-27)***
55-74	2,11 *(81)*	**-1,35** ***(-52)***	2,66 *(51)*	**-1,19** ***(-54)***	2,76 *(45)*	**-0,97** ***(-58)***	2,96 *(49)*	**-1,08** ***(-52)***	2,99 *(62)*	**-1,52** ***(-59)***	3,23 *(63)*	**-1,19** ***(-57)***	2,00 *(58)*	**-0,89** ***(-70)***	3,82 *(46)*	**-1,44** ***(-44)***	2,96 *(47)*	**-0,93** ***(-40)***	3,04 *(56)*	**-1,32** ***(-47)***
75-89	1,22 *(47)*	**-0,01** ***(0)***	1,13 *(22)*	**0,15** ***(7)***	0,92 *(15)*	**0,40** ***(24)***	1,05 *(17)*	**0,26** ***(13)***	1,12 *(23)*	**0,16** ***(6)***	0,84 *(16)*	**0,69** ***(33)***	0,72 *(21)*	**0,54** ***(43)***	0,95 *(11)*	**0,29** ***(9)***	0,83 *(13)*	**0,52** ***(22)***	0,78 *(14)*	**0,22** ***(8)***
90+	0,04 *(2)*	**0,06** ***(2)***	0,05 *(1)*	**0,09** ***(4)***	0,03 *(1)*	**0,05** ***(3)***	0,06 *(1)*	**0,06** ***(3)***	0,06 *(1)*	**0,07** ***(3)***	0,02 *(0)*	**0,09** ***(4)***	0,02 *(1)*	**0,07** ***(5)***	0,07 *(1)*	**0,04** ***(1)***	0,06 *(1)*	**0,05** ***(2)***	0,02 *(0)*	**0,08** ***(3)***
Total[3]	2,61 *(100)*	**-2,58** ***(-100)***	5,26 *(100)*	**-2,21** ***(-100)***	6,16 *(100)*	**-1,67** ***(-100)***	6,04 *(100)*	**-2,09** ***(-100)***	4,84 *(100)*	**-2,57** ***(-100)***	5,15 *(100)*	**-2,08** ***(-100)***	3,44 *(100)*	**-1,27** ***(-100)***	8,37 *(100)*	**-3,24** ***(-100)***	6,36 *(100)*	**-2,35** ***(-100)***	5,46 *(100)*	**-2,81** ***(-100)***

P1 : Period 1 : 1921-24 to 1975-79 ; P2 : Period 2: 1975-79 to 2000-04

[1] Data cover period 1950-54 to 1975-79

[2] (X) presents part in the total change (%). They are presented to help in the interpretation of relative importance of specific cause of death because it is possible for one cause of death to contribute negatively when the other contribute more.