Cognitive-Impairment-Free Life Expectancy for Canadian Seniors

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Key Words

Aging • Life expectancy • Dementia • Cognition disorders • Canada • Male • Female

Abstract

Background/Aims: While cognitive impairment (CI) and dementia are among the most common morbid conditions in later life, life expectancies free from CI or dementia have been the object of much less investigation than life expectancy based on measures of physical functioning. **Methods:** We estimated sex-specific CI-free life expectancy in Canada for people aged 65 and older using data from a nationwide, multicenter Canadian study on the epidemiology of dementia. **Results:** The absolute number of years with CI remains virtually constant with increasing age. Whatever the current age, senior men can expect to live 2.5–3 years of their remaining life with some form of CI and about 1.5 years of those with dementia. For women, these figures rise to 3–4 years with CI, of which 2–2.5 years are spent with dementia. **Conclusion:** Surviving to an older age does not result in a longer average absolute period of CI. This period is associated with a significant reduction in quality of life, the use of home and institutional services, as well as psychological and physical distress for formal and informal caregivers. Results are compared to findings reported in other countries.

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Introduction

The aging of the population in industrialized countries raises concerns about the sustainability of current retirement schemes and health-care systems. Policy-makers and managers in social and health services need data that reflect not only the number of years people will expect to live in the retirement period, but also the proportion of their time spent with significant disabilities and diseases. Moreover, older people themselves are less concerned by the length of their remaining life than by the quality of it. In order to address this concern, indicators of healthy life expectancy have emerged. These health indicators take both morbidity and mortality into consideration. Healthy life expectancy is defined as the average number of years an individual is expected to live without any specific morbid condition, if current patterns of mortality and health continue to apply. Since the first computation by Sullivan [1], most countries have focused on the physical aspects of health and have concentrated on calculations of disability-free life expectancy.

However, growing numbers of older adults suffer from dementing illnesses in old age. According to the Canadian Study of Health and Aging (CSHA), 8% of Canadians aged 65 and older suffer from dementia [2]. The proportion rises to 35% among those over 85 years of age. In this age group, the prevalence further increases to 65% when all types of cognitive impairment (CI) are included [3]. Results of the incidence component of the CSHA further suggest that there are 60,150 new cases of dementia

in Canada each year [4]. These conditions significantly impact the quality of life of sufferers and their relatives, in addition to the disabilities they generate. It is thus interesting and is also important to consider life expectancy with and without CI. While CI and dementia are among the most common morbid conditions in later life, life expectancies free from CI or dementia have been the object of much less investigation than life expectancy based on measures of physical functioning. Data for dementia-free life expectancy have been published for only seven countries, namely the UK [5, 6], the Netherlands [7], France [8], Belgium [9], Australia [10], Japan [11], and the United States [12, 13]. Moreover, although CI is highly prevalent in old age and can also have an impact on quality of life, a health indicator such as CI-free life expectancy has never been reported to date.

Estimation of dementia-free or CI-free life expectancy is more complex than estimation of disability-free life expectancy, since it requires clinical evaluation. The CSHA, a nationwide, multicenter, population-based clinical survey designed to study CI and dementia, represents a good opportunity to get such figures. Since it focused on dementia, the CSHA was designed to get multiple sources of information about CI, thereby increasing the validity of such data. The sample composition also allows generating good and stable estimates from 65 to 90 years of age. The objective of this paper is to report CI-free and dementia-free life expectancy for older Canadians using CSHA data.

Materials and Methods

Source of the Data

The first phase of the CSHA [1, 14] aimed to estimate the prevalence of dementia in Canada. The design of the CSHA is described in detail elsewhere [15, 16]. In summary, this multicenter study sampled subjects from both the community and institutions on the basis of age-stratified (65–74, 75–84, and 85+ years) random samples in 36 urban and surrounding rural areas in the 10 Canadian provinces. An optimal allocation procedure was used to reduce variance estimates. This resulted in oversampling the older groups: the sampling fraction among the subjects 75–84 was twice that among those of 65–74, and the fraction among those 85 or more was 2.5 times that among those of 65–74. In all, 9,008 community residents and 1,255 residents of institutions were surveyed; they were all fluent in English or French. All CSHA centers received the approval of local research ethics committees; signed informed consent was obtained from all participants (or their proxies, where appropriate).

Participants living in the community were first screened for CI through home interviews during which the Modified Mini-Mental State Examination (3MS) [17, 18] was administered. Sub-

jects screening positive (3MS <78/100) or unable to complete the screening test, a random sample drawn from those screening negative, and all institutionalized subjects were referred for a complete clinical and neuropsychological examination.

The examination, designed to confirm the presence or absence of CI, included independent assessments by a nurse, physician, and neuropsychologist. The nurse collected medical information, interviewed a knowledgeable informant about the cognitive and medical status of the participant, and re-administered the 3MS. The physician, selected for his/her expertise in dementia, followed a semistructured general medical and neurological examination [19]. The neuropsychological examination included 12 standardized tests that assessed memory, abstract thinking, judgment, and other areas of cognitive functioning often associated with dementia [20].

Using all available information from their examination and the nurse's, the physician and the neuropsychologist independently formed preliminary diagnoses. They classified participants as either demented, cognitively impaired but not demented (CIND), or cognitively normal. Both diagnoses were compared at a case conference in order to establish a consensus diagnosis. Dementia was diagnosed using the DSM-III-R criteria [21].

In the absence of a clinical examination, if the subject had previously screened negative, he/she was presumed cognitively normal for the purposes of the present analysis. Missing values for cognitive status were assigned to subjects that screened positive but refused the clinical examination.

Subsequent phases of the CSHA were undertaken but will not be described here, since this paper only makes use of data from the first phase. Between phases, contact was maintained with the participants and dates of death were collected when relevant. This enabled us to determine the number of days each subject was alive during the first year following the interview. These figures are necessary to compute total life expectancy (TLE). Missing dates of death were imputed [22].

Statistical Methods

Sample weights were calculated to correct for the oversampling of the very old, and for the fact that equal samples were drawn in each study region despite their different population sizes.

Weighted CSHA data were used to estimate the TLE for males and females by single years of age from 65 to 89, then 90 and over [23]. Next, they were used to estimate the proportion of people in each age and sex group with CIND or dementia. These prevalence rates were then combined with the TLE data using the method described by Sullivan [1]. This leads to a partitioning of TLE into the number of years that may be assumed to be spent with or free from a given cognitive disorder at any age.

Results

Response rates were 72.1% and 81.7% for the community and institutional samples, respectively [2]. The age and sex distribution of the total sample is given in table 1, showing that, even with oversampling in the oldest age groups, after the age of 90, the sample sizes reduce considerably. Overall, 58% of the respondents were women.

Table 2 exhibits the prevalence of CI with and/or without dementia, for each sex and age group. The prevalence shows a comparable rise in both sexes. Considering all types of CI, the prevalence increases exponentially with age. On average, each older age group has a prevalence 1.6–2 times the next younger group. It shifts from 4% for the 65–69 age group, to 45% in the 85–89 age group, for both men and women. However, for people aged 90 or over, CI is more prevalent for women, the proportion of people affected being 63% and 74% for men and women, respectively.

Table 3 and figure 1 present, both numerically and graphically, TLEs free of and with each type of CI. As

Table 1. Age and sex distribution of the subjects

Age years	Number of subjects		
	men	women	all
65–69	1,058 (15.58)	1,227 (18.32)	2,285 (33.90)
70–74	819 (11.29)	1,080 (14.59)	1,899 (25.88)
75–79	1,072 (8.23)	1,592 (11.55)	2,664 (19.78)
80–84	550 (4.14)	1,030 (7.37)	1,580 (11.51)
85–89	393 (2.12)	952 (4.48)	1,345 (6.60)
90+	116 (0.61)	374 (1.73)	490 (2.34)
Total	4,008 (41.96)	6,255 (58.04)	10,263 (100)

Figures in parentheses are weighted percentages.

Table 2. Distribution of cognitive impairment by age and sex

Age, years	Cognitive impairment, weighted %					
	CIND		Dementia		CIND or dementia	
	men	women	men	women	men	women
65–69	3.50	2.00	0.68	1.33	4.19	3.33
70–74	4.40	3.20	2.93	2.81	7.33	6.01
75–79	8.46	7.80	6.79	6.79	15.25	14.59
80–84	12.88	12.26	13.43	16.56	26.31	28.82
85–89	22.46	17.12	23.05	22.93	45.51	46.39
90+	17.25	19.47	45.79	54.83	63.04	74.31

Table 3. Total life expectancy and life expectancy free from and with cognitive impairment, by age and sex

Age years	Life expectancy, years					Dementia free/total %	Cognitive impairment free/total, %
	total	dementia free	cognitive impairment free	with CIND	with dementia		
Men							
65	16.36	15.12	13.76	1.33	1.24	92.42	84.11
70	12.47	11.16	9.90	1.26	1.31	89.49	79.39
75	9.83	8.37	7.08	1.30	1.46	85.15	72.02
80	7.36	5.80	4.54	1.26	1.56	78.80	61.68
85	5.60	3.91	2.71	1.20	1.69	69.82	48.39
90	3.48	1.89	1.29	0.60	1.59	54.31	37.07
Women							
65	19.10	16.92	15.46	1.46	2.18	88.59	80.94
70	15.27	13.00	11.54	1.46	2.27	85.13	75.57
75	11.82	9.43	7.97	1.46	2.39	79.78	67.43
80	8.92	6.37	5.02	1.36	2.55	71.41	56.28
85	6.33	3.86	2.73	1.14	2.47	60.98	43.13
90	3.91	1.76	1.01	0.76	2.15	45.01	25.83

Fig. 1. TLE by age and sex, with amount of time spent with CI. Figures are weighted to be representative of the 1991 population of seniors in Canada. CI = Cognitive impairment; CIND = cognitive impairment not dementia; TLE = total life expectancy.

can be expected, TLE declines with age. However, the absolute number of years with CI varies little. For men, the expected number of years with either form of CI (CIND or dementia) is between 2.5 and 3 years at all ages. The average Canadian man can also expect to live around 1.5 years with dementia. Similarly, for women, life expectancy with some form of CI is roughly 3–4 years, while life expectancy with dementia ranges from 2 to 2.5 years, these figures being relatively constant across ages.

Discussion

The calculation of total and CI-free life expectancy in a Canadian population using prevalence data from the CSHA shows that, at age 65, men have a life expectancy of 16.4 years, of which 13.8 will be without CI. Women of the same age have a life expectancy of 19.1 years, of which 15.5 years will be without CI.

While TLE and CI-free life expectancy decrease with age, we found that the absolute number of years with CI

remains relatively constant with increasing age. As they get older, the proportion of life expectancy spent with CI increases such that, after 85 years of age, more than half of the remaining years are expected to be lived with CI. Fortunately, the number of expected years with dementia is rather small: around 1.5 years for men and less than 2.5 years for women. Since life expectancy represents an average, some people will never have dementia while others will. For the latter, Wolfson et al. [24], using CSHA data, estimated that the median duration of survival after the onset of dementia is 3.2 and 3.4 years for men and women, respectively.

Three alternative life table models can be used to calculate impairment-free life expectancy: the prevalence-rate model introduced by Sullivan [1], the double-decrement model [25], and the multistate life table model [26]. In this analysis, we estimate life expectancy without CI using the prevalence-rate model.

The prevalence-rate and the double-decrement models have been criticized by some authors saying an inherent assumption behind them is that CI is an irreversible absorbing state, thus leading to the underestimation of impairment-free life expectancy. This has led people to claim that the ideal model for estimating impairment-free life expectancy is the multistate life table model, because it is based on a Markov chain taking into consideration the transitions from the unimpaired state to the impaired state and back to the unimpaired state. This limitation is less important in the case of dementia, which is generally irreversible, except for a very small proportion (<1%) of cases that can be cured by treatment [27]. Moreover, one must realize that Sullivan's model implicitly recognizes recovery from impairment, even though it does not model it [28]. Indeed, intermittent mental-health periods contribute to a lower measured average prevalence of CI.

The choice of the model also depends on data availability. Sullivan's model requires only cross-sectional data, while the double-decrement and the multistate life table models demand longitudinal data. In the CSHA, longitudinal data were available, but the second and third waves of the study took place, respectively, 5 and 10 years after the first assessment. Therefore, the use of the multistate life table model would have required us to make two major unrealistic assumptions:

- (1) Only one transition can occur within the 5-year interval. This, of course, results in many unobserved transitions.

- (2) A constant distribution of risk within the interval. By using a 5-year interval in which the risk of mortality is not constant but increases, we undoubtedly would have

introduced a degree of underestimation in our life-expectancy calculations [29].

Finally, using an incidence method requires the cognitive status of subjects lost to follow-up (dead or refusing follow-up examination) to be determined, which is undeniably very difficult.

Weighting the strengths and weaknesses of each model, we believe that Sullivan's method was our best choice. Besides, Mathers and Robine [30] used simulation exercises to show that prevalence and incidence methods of computing impairment-free life expectancy result in very similar conclusions, except under unusual circumstances of very rapid change. Indeed, Sullivan's model gives an estimate of the expected years of life with and without impairment, assuming prevalence and mortality rates are constant over time.

We did not use Canadian life tables and estimated TLE directly from CSHA data. This did not have a major impact on the results, since our findings are comparable to those of Hill et al. [31], who reported dementia-free life expectancy at age 65 combining prevalence rates derived from the CSHA to TLE derived from Canadian life tables.

While age- and sex-specific dementia-free life-expectancy estimates have been published for a few countries, our study is the first to look at CI-free life expectancy. For many people, CIND can be considered an intermediate state between 'no CI' and dementia. Indeed, approximately 50% of the persons with CIND progress to dementia within 5 years [32, 33], a rate of progression to dementia that is consistent across CIND subtypes [33]. Although two studies [5, 6] use the term CI, their diagnosis of CI is based on a screening test for dementia. Their estimates are thus closer to life expectancy free from dementia than free from CI.

Other strengths of our study include a detailed neuropsychological and medical assessment to establish the presence or absence of CI, and oversampling of the old, which results in stable estimates for this age group. The data presented here can be generalized to the total elderly Canadian population, since estimates are derived from a nationally representative population-based survey, including community-dwelling and institutionalized persons. Studies in which estimates are calculated only among people living in the community provide underestimates, because of the rapid increase with age in the proportion institutionalized and the fact that institutionalized subjects have higher rates of CI.

Subjects screened positive who refused the clinical examination (ignored in the analysis) could have generated

an underestimation of the prevalence rates. The use of a screening test (the 3MS) could also generate false negatives (presumed cognitively normal in the present analysis), which could have contributed to the underestimation of the true prevalence rates of dementia and CIND. This is especially true for CIND, since the screening 3MS cut-off score was selected to be optimally sensitive for dementia but was less sensitive to CIND [2]. Of the 494 persons scoring above the cut-off point that underwent clinical examinations, 7 had dementia and 89 were diagnosed as having CIND. These few false negatives for dementia could not have had a major impact on our estimates of life expectancy with or without dementia. However, applying a percentage of false negatives of the same magnitude for CIND in the whole sample, our estimates of years with CIND would have increased by 1–2 years.

Since our study is the only one reporting CI-free life expectancy, we cannot compare our estimates with any others. Our comparisons must be restricted to dementia-free life expectancy for which estimates have been published for a few countries [5–13]. In 1998, Jagger et al. [34] tried to compare published and unpublished European estimates and reported differences in inclusion criteria, sampling, and diagnosis instruments. We face the same limitations in our comparisons. Given the methodological differences between studies conducted in different countries, it is difficult to ascertain to what extent the similarities and dissimilarities in estimates reflect real resemblances or differences. A study from the USA [13] and the two UK studies [5, 6] diagnosed dementia with a screening test with imperfect sensitivity; the other USA study [12] was not population based; the Japanese [11] study excluded institutionalized and hospitalized subjects; and the American, Japanese, Dutch, and French studies [7, 8, 11, 13] excluded cases of mild dementia, all leading to underestimates of dementia-free life expectancy. In addition, our estimates are based on prevalence, while those of others are based on incidence [6, 11, 12]. Our figures for life expectancy with dementia are very similar to those obtained in the Belgian study [9], the only one that is methodologically comparable to ours.

Although we believe they underestimated the absolute figures, we see that others have also found that expected average length of life with dementia is constant across ages for men. Studies are less unanimous when it comes to women, with the three studies led by Catherine Sauvaget showing a decrease in life expectancy with dementia as age increases [6, 11, 12].

Our study, as well as most of the others, reports life expectancies for the 1990s. Have these figures changed

now? A slight change can be expected when it comes to absolute values. Indeed, the most recent (2001) Canadian estimates for TLE at age 65 are 17.1 and 20.6 years for men and women, respectively [35]. Still, when it comes to estimating CI-free life expectancy, large nationwide studies of the elderly population with adequate diagnosis of CI are needed. To our knowledge, no such study has been undertaken since the CSHA in Canada, and subsequent phases of the CSHA are not population based. The estimates reported in this paper are thus our best ones. Moreover, while absolute values for life expectancies have slightly changed, the observed trends over age are most likely still current. In a study comparing life expectancy estimates for the 1970s and the 1980s in the USA, Sauvaget et al. [12] showed that while absolute values changed slightly over a decade, the estimates decreasing or being constant with age in the 1970s still followed the same pattern in the 1980s. We can thus hypothesize that the curves presented in figure 1 have slightly upwards shifted while maintaining their shape. Of course, only a new study could confirm this hypothesis.

Conclusion

In conclusion, this study is the first to show that Canadian men over 65 can expect to spend 2.5–3 years with some form of CI. Women can expect to live 3–4 years with these conditions. This period is associated with a significant reduction in quality of life and the use of home and institutional services. Moreover, it generates psychological and physical distress for formal and informal caregivers. With the expected aging of the population, this will have significant impacts on the health-care system.

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References

- 1 Sullivan DF: A single index of mortality and morbidity. *HSMHA Health Rep* 1971;86:347-354.
- 2 CSHA Working Group: Canadian Study of Health and Aging: study methods and prevalence of dementia. *Can Med Assoc J* 1994;150:899-913.
- 3 Graham JE, Rockwood K, Beattie BL, Eastwood R, Gauthier S, Tuokko H, McDowell I: Prevalence and severity of cognitive impairment with and without dementia in an elderly population. *Lancet* 1997;349:1793-1796.
- 4 CSHA Working Group: The incidence of dementia in Canada. *Neurology* 2000;55:66-73.
- 5 Brayne C, Matthews FE, McGee MA, Jagger C: Health and ill-health in the older population in England and Wales. The Medical Research Council Cognitive Function and Ageing Study (MRC CFAS). *Age Ageing* 2001;30:53-62.
- 6 Sauvaet C, Jagger C, Arthur AJ: Active and cognitive impairment-free life expectancies: results from the Melton Mowbray 75+ health checks. *Age Ageing* 2001;30:509-515.
- 7 Perenboom RJM, Boshuizen HC, Breteler MM, Ott A, van de Water HPA: Dementia-free life expectancy (DemFLE) in The Netherlands. *Soc Sci Med* 1996;43:1703-1707.
- 8 Ritchie K, Robine JM, Letenneur L, Dartigues JF: Dementia-free life expectancy in France. *Am J Public Health* 1994;84:232-236.
- 9 Roelands M, van Oyen H, Baro F: Dementia-free life expectancy in Belgium. *Eur J Public Health* 1994;4:33-37.
- 10 Ritchie K, Mathers C, Jorm A: Dementia-free life expectancy in Australia. *Aust J Public Health* 1994;18:149-152.
- 11 Sauvaet C, Tsuji I, Minami Y, Fukao A, Hisamichi S, Asano H, Sato M: Dementia-free life expectancy among elderly Japanese. *Gerontology* 1997;43:168-175.
- 12 Sauvaet C, Tsuji I, Haan MN, Hisamichi S: Trends in dementia-free life expectancy among elderly members of a large health maintenance organization. *Int J Epidemiol* 1999;28:1110-1118.
- 13 Suthers K, Kim JK, Crimmins E: Life expectancy with cognitive impairment in the older population of the United States. *J Gerontol Soc Sci* 2003;58B:S179-S186.
- 14 McDowell I, Hill G, Lindsay J: An overview of the Canadian Study of Health and Aging. *Int Psychogeriatr* 2001;13(suppl 1):7-18.
- 15 McDowell I, Aylesworth R, Stewart M, Hill G, Lindsay J: Study sampling in the Canadian Study of Health and Aging. *Int Psychogeriatr* 2001;13(suppl 1):19-28.
- 16 McDowell I, Stewart M, Kristjansson B, Sykes E, Hill G, Lindsay J: Data collected in the Canadian Study of Health and Aging. *Int Psychogeriatr* 2001;13(suppl 1):29-39.
- 17 Hébert R, Bravo G, Girouard D: Validation de l'adaptation française du Modified Mini-Mental State (3MS). *Rev Geriatr* 1992;17:443-450.
- 18 Teng EL, Chui HC: The Modified Mini-Mental State (3MS) examination. *J Clin Psychiatry* 1987;48:314-318.
- 19 Graham JE, Rockwood K, Beattie BL, McDowell I, Eastwood R, Gauthier S: Standardization of the diagnosis of dementia in the Canadian Study of Health and Aging. *Neuroepidemiology* 1996;15:246-256.
- 20 Tuokko H, Kristjansson B, Miller JA: The neuropsychological detection of dementia: an overview of the neuropsychological component of the Canadian Study of Health and Aging. *J Clin Exp Neuropsychol* 1995;17:352-373.
- 21 American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, ed 3, revised. Washington, American Psychiatric Association, 1987.
- 22 Dubois M-F, Hébert R: Imputation of missing dates of death or institutionalization for time-to-event analyses in the Canadian Study of Health and Aging. *Int Psychogeriatr* 2001;13(suppl 1):91-97.
- 23 Mausner JS, Bahn AK: Epidemiology: An Introduction Text. Philadelphia, Saunders, 1974, pp 206-210.
- 24 Wolfson C, Wolfson DB, Asgharian M, M'Land CE, Østbye T, Rockwood K, Hogan DB: Clinical Progression of Dementia Study Group: A reevaluation of the duration of survival after the onset of dementia. *N Engl J Med* 2001;344:1111-1116.
- 25 Katz S, Branch LG, Branson MH, Papsidero JA, Beck JC, Greer DS: Active life expectancy. *N Engl J Med* 1983;309:1218-1224.
- 26 Rogers A, Rogers RG, Branch LG: A multi-state analysis of active life expectancy. *Public Health Rep* 1989;104:222-226.
- 27 Clarfield AM: The decreasing prevalence of reversible dementias: an updated meta-analysis. *Arch Intern Med* 2003;163:2219-2229.
- 28 Rogers A, Rogers RG, Bélanger A: Longer life but worse health? Measurement and dynamics. *Gerontologist* 1990;30:640-649.
- 29 Rogers RG, Rogers A, Bélanger A: Active life among the elderly in the United States: multistate life-table estimates and population projections. *Milbank Q* 1989;67:370-411.
- 30 Mathers CD, Robine JM: How good is Sullivan's method for monitoring changes in population health expectancies. *J Epidemiol Community Health* 1997;51:80-86.
- 31 Hill GB, Forbes WF, Lindsay J, McDowell I: Life expectancy and dementia in Canada: The Canadian Study of Health and Aging. *Chronic Dis Can* 1997;18:166-167.
- 32 Tuokko H, Frerichs R: Cognitive impairment with no dementia (CIND): longitudinal studies, the findings, and the issues. *Clin Neuropsychol* 2000;14:504-525.
- 33 Tuokko H, Frerichs R, Graham J, Rockwood K, Kristjansson B, Fisk J, Bergman H, Kozma A, McDowell I: Five-year follow-up of cognitive impairment with no dementia. *Arch Neurol* 2003;60:577-582.
- 34 Jagger C, Ritchie K, Bronnum-Hansen H, Deeg D, Gispert R, Grimley Evans J, Hibbett M, Lawlor B, the Medical Research Council Cognitive Function and Ageing Study Group, Perenboom R, Polge C, van Oyen H: Mental health expectancy - the European perspective: a synopsis of results presented at the Conference of the European Network for the Calculation of Health Expectancies (Euro-REVES). *Acta Psychiatr Scand* 1998;98:85-91.
- 35 http://www.statcan.ca/english/freepub/82-401-XIE/2002000/tables/html/dt005_en.htm (web site accessed February 10, 2006).