



# **Population Aging and Fiscal Sustainability – The Intersection of Retirement Income Adequacy and Health Care Costs Associated with Disability**

Michael C Wolfson (University of Ottawa, Canada) and Bonnie-Jeanne MacDonald (University  
of Ottawa, Canada)

Paper prepared for the 34<sup>th</sup> IARIW General Conference

Dresden, Germany, August 21-27, 2016

Session 6B: The Ageing Society

Time: Thursday, August 25, 2016 [Afternoon]

## Initial Draft – IARIW LifePaths Analysis

(n.b. we may be posting an updated version; please see <http://www.iariw.org/c2016dresden.php> for the latest draft)

# Population Aging and Fiscal Sustainability – The Intersection of Retirement Income Adequacy and Health Care Costs Associated with Disability

Michael Wolfson and Bonnie-Jeanne MacDonald<sup>1</sup>

**Preface** This paper presents initial results in a multi-year project recently funded by CIHR. It is very much a working draft, so that some important elements are still missing at this point.

**Introduction** Canada, like many countries, is facing population aging amid growing public concerns about the fiscal sustainability of publicly funded programs, especially pensions and health care. There are also continuing concerns about inter-generational fairness. One high profile example, in both the recent Ontario election and the current Federal election campaign, is a deep conflict over the future adequacy of retirement incomes. Much less prominent but equally important is the relationship between retirement incomes and the affordability of various forms of long term care (LTC) – both home care (medical and social services provided in one's home) and nursing homes (i.e. care in an institutional settings).

In Canada, LTC is not systematically covered under publicly funded health insurance. It therefore imposes significant burdens on informal care givers as well as out of pocket costs. With population aging, LTC needs and costs are likely to grow more rapidly than GDP. Depending on how these needs are met, there could be major implications for income inequality.

In this paper, we first describe the features of the major old age-sensitive publicly funded programs, those in health and social care, and retirement pensions. We then describe several promising reform options. These include expansion of publicly funded retirement pensions, along the lines of the current Canadian debates, and various options for financing growing needs for LTC. These options are assessed in terms of their adequacy in relation to projected needs, their fiscal impacts, and their effects on income inequality and intergenerational equity.

**Background** While there have been ongoing discussions of retirement income adequacy, culminating in June 2016 in an apparent federal-provincial-territorial agreement to expand the

---

<sup>1</sup> We would like to acknowledge the kind support of John Hirdes and his colleagues in supplying the Inter-RAI data. The original LifePaths model source-code and parameters have been provided by Statistics Canada and have been modified by the authors. The authors are solely responsible for all views expressed, including any errors and infelicities.

Canada (and Quebec) Pension Plans, the lead up to this major agreement has been devoid of discussion or analysis of the inter-relationships between retirement income adequacy and health care costs. There is widespread media interest, typically characterized by “demodoom” and “boomerangst”, that as the baby boom generation moves into its retirement years, the costs of both public pensions and publicly-provided health care will become unsustainable. However, there has been limited discussion of the potential impacts of growing out-of-pocket costs for the elderly, and their (in)ability to finance those LTC costs not covered by public programs.

In this analysis, we bring together a detailed microsimulation analysis of both of these topics, drawing on Statistics Canada’s LifePaths model. ... (LifePaths is described in Wolfson (2011, 2013) where the main public pension expansion options have also been described and simulated.)

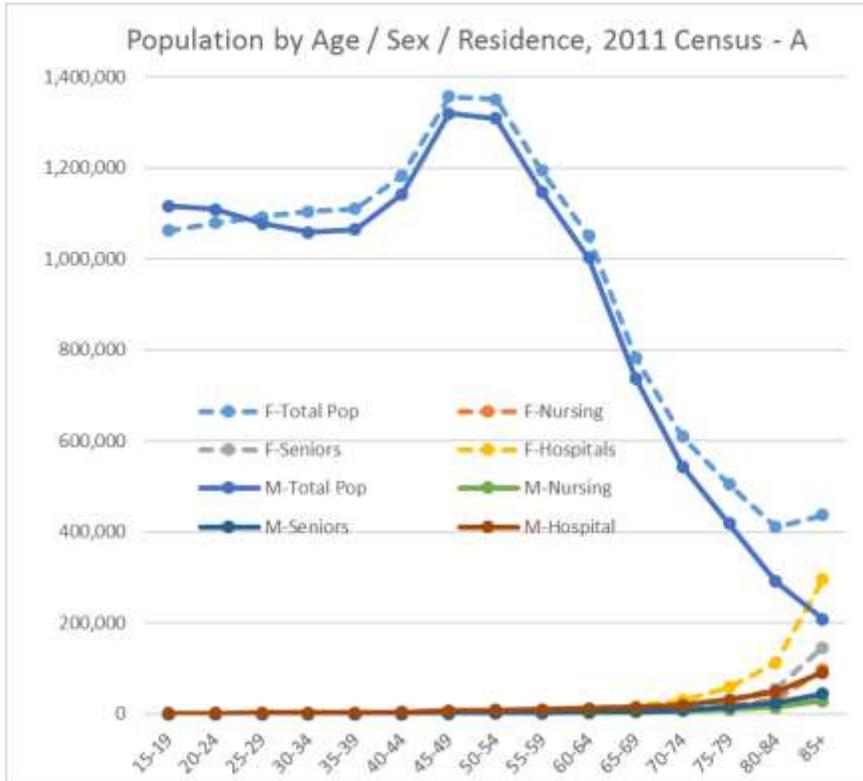
**Health Care** – Discussions of health care costs in connection with Canada’s aging population typically focus on the publicly funded portion, hospitals, doctors, and to some extent pharmaceuticals. For retirees, however, a major concern is out-of-pocket (OOP) costs, including various forms of long term care. While provinces in Canada do provide substantial amounts of institutionalized care (nursing homes) and fund a variety of home care services, repeated surveys show that a very substantial portion of long term care (LTC) is provided informally to elderly still living in their own homes by close relatives and friends, and by private providers paid for OOP.<sup>2</sup>

There is no standard terminology in the area of LTC or “continuing care”. In this discussion, we use LTC as the generic term covering both institutional care and home care. There is also a gray area of “assisted living” where individuals live in “seniors’ residences” which typically provide meals and some forms of care, and are fully private pay. But to complicate matters, publicly funded home care (certainly in Ontario) treats both seniors’ residences (like apartments but with common food services plus some private pay medical and other services) and homes (owner-occupied houses, owned condominiums, and rented apartments) as part of the “community”. As a result, those living anywhere but in a nursing home, whether it is “at home” or in a (private pay) seniors’ residence, are eligible for publicly funded home care services.

**Baseline Statistics** Statistics Canada considers seniors’ residences to be “collective dwellings”, as are nursing homes, hospitals, and prisons. Stat Can surveys on health and disability, however, exclude all collective dwellings, focusing only on the “household” population. This

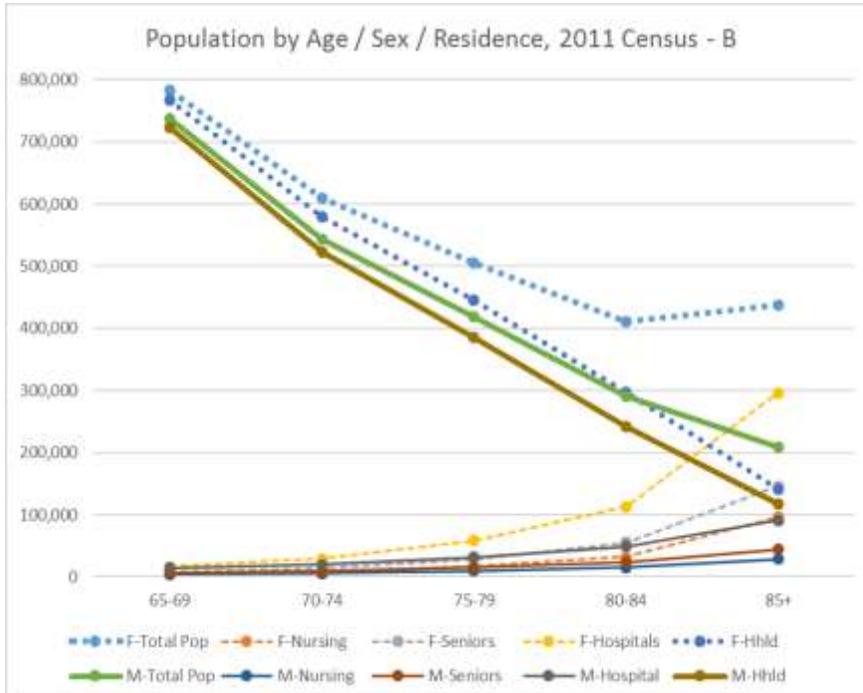
- 
1. The bulk of caregivers have historically been family and friends in most countries, but this is expected to decline owing to fewer children, greater mobility of family members, greater workforce participation of women, and changing expectations of care within families (among many, see: Gibson, 2007; Keefe et al., 2012; Pickhard, 2008; and Pickhard, 2011).

exclusion from the sampling frame complicates forming a complete picture of the population, especially the elderly, where our focus is on retirement income and health care needs. To assemble a complete picture of the prevalence of disability in Canada, and to provide the basis for sound projections into the future, it is necessary to integrate several sources of partial information.



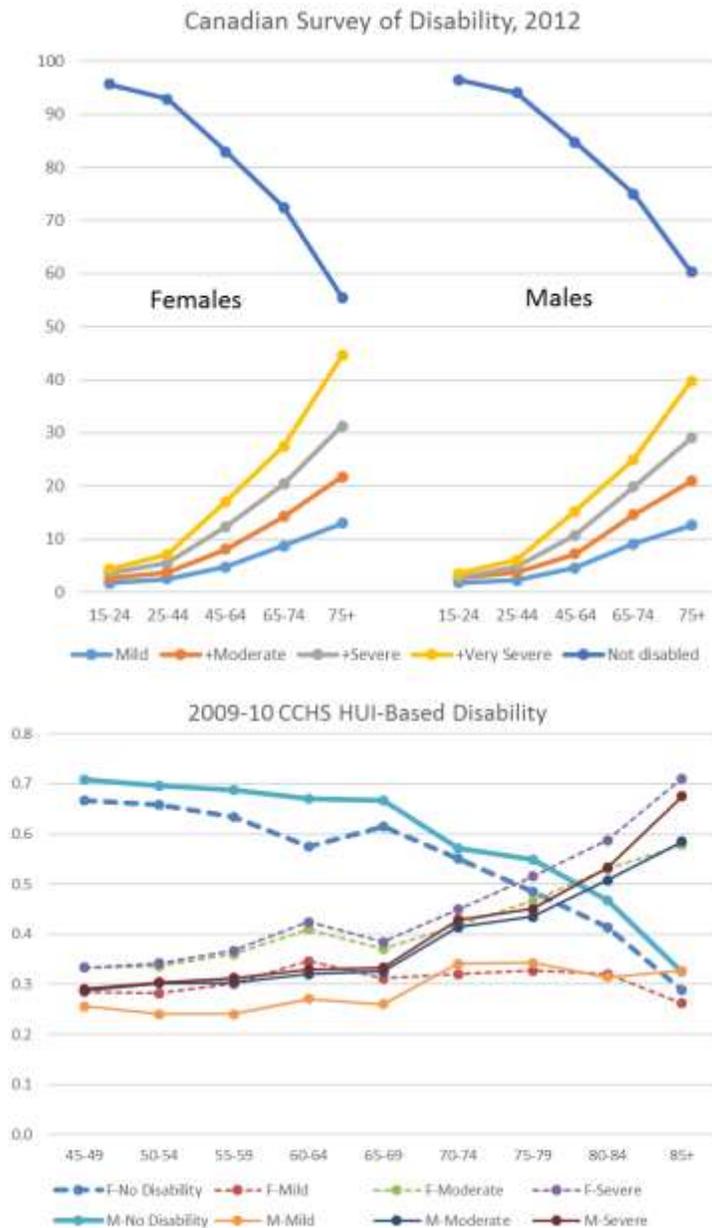
We start with the 2011 short form (mandatory) population census which (for the first time) did a fairly careful job of identifying individuals living in seniors' residences. Figures 1 A and B provide the basic results.

Figure 1A shows all age groups from 15 on, while Figure 1B focuses on the 65+ age groups. The baby boom demographic bulge is clearly evident in Figure 1A. In the overall picture, the population living in nursing homes, seniors' residences, and hospitals is negligible until ages 75+. [Note that the total population ("Total Pop") and the nursing home population are actual counts, while the curves for those living in seniors' residences ("Seniors") and in hospitals are cumulative.]



(QQQ fix formatting of legends) Figure 1B adds a curve for the household population. The gap between the total population and the

household population represents those in “collective dwellings” who are not covered by Stat Can’s various health and disability surveys. This is clearly an important population segment for those age 75-79 and 80-84, and is more than half the population age 85+.



A further challenge is that “disability” is not well-defined. Several definitions have been used in various Stat Can surveys. Definitions based on eligibility for various kinds of publicly provided LTC also vary. In order to give an indication of this variation, we present data from three sources: the 2012 Canada Survey of Disability, the 2009-10 Canadian Community Health Survey (focusing on the McMaster Health Utility Index), and the Inter-RAI administrative data for home care utilization in Ontario.

Figure 2 shows basic disability prevalence data from the 2012 Canadian Survey of Disability by age group and sex (CANSIM Table 115-0001). The top curve is the proportion (%) of the population considered non-disabled, while the bottom four curves show the cumulative proportions of the population in increasingly severe levels of disability.

Recall that these curves cover only the “household” population in terms of Figures 1A and 1B above, which were drawn from the 2011 census.

Figure 3 shows disability prevalences by age and sex from the 2009-10 Canadian Community Health Survey (CCHS) on Healthy Aging, using a custom definition based on four components of the McMaster Health Utilities Index (HUI).<sup>3</sup>

<sup>3</sup> Specifically, the definition used is based on four functional health domains from the McMaster Health Utilities Index (HUI) – mobility, dexterity, cognition, and pain:

As in Figure 2 from the CSD, the top curves (male and female) indicate no disability, while the bottom three pairs of curves show the cumulative prevalences of mild, moderate and severe disability. Again, these data pertain only to the household population, and exclude all those in nursing homes, seniors' residences and hospitals.

Note that individuals residing in "hospitals" at the time of the census include "alternative level of care" (ALC) patients who are typically awaiting placement in a nursing home, or the availability of home care to enable a safe discharge, hence should be considered part of the LTC population. For example, in March 2015, 14.1% of all inpatient hospital beds were occupied by ALC patients. ([www.oha.com/CurrentIssues/Issues/Documents/ALC%20Report%20-%20April%202015.pdf](http://www.oha.com/CurrentIssues/Issues/Documents/ALC%20Report%20-%20April%202015.pdf)) (QQQ more fine-grained data on ALC beds by age and sex coming)

Note also that the CCHS data cover the population age 45+ in 5-year age groups to 85+, while those for the CSD start at age 15, use wider age groups, and only go up to age 75+.

Generally, the CSD and the CCHS HUI data looks somewhat similar, with accelerating prevalence of disability at all levels. The CSD data show, however, a much sharper increase from ages 45-64 to ages 65-74 than do the CCHS data. Nevertheless, the definitions of disability in these two surveys need not accord with the criteria used to determine eligibility for nursing homes or government-funded home care services, as shown in Table 5 below.

Given these data, especially those from the 2011 census on residents of collective dwellings and from the CCHS on HUI-based disability, scenarios have been constructed for the current distributions of residence (nursing homes, seniors' residences, hospital ALCs, and households), and then within each of these dwelling categories, the distribution of levels of disability – all by 5-year age groups and sex, both currently and as projected.

**Disability Prevalence and LTC Needs** Importantly, disability, even with breakdowns by severity, need not correspond closely to LTC needs. For this question, home care data from the Ontario inter-RAI have been used. As shown in Tables 4 and 5 below, even mildly disabled individuals are receiving home care, while fewer than 100% of severely disabled individuals do.

- 
- Mild disability: Mobility problem but does not need any help; Dexterity problem but does not need any help from someone else (may or may not use special equipment); Somewhat forgetful and slight difficulty in thinking; Moderate and/or severe pain prevents performing some or few tasks.
  - Moderate disability: Requires wheel chair or mechanical support to walk; Dexterity problem and needs help to perform some tasks; Very forgetful and a lot of difficulty in thinking; Severe pain prevents performing most tasks.
  - Severe disability: Can not walk or needs help from others to walk; Dexterity problem and needs help for most or all tasks; Unable to remember or think.

Further, other Stat Can surveys provide data on the receipt of informal care. This source of care is substantial for many Canadians, and indicates considerable unmet need for LTC. (QQQ tables to come)

As a result, the initial focus of this analysis is projections of disability by severity, and then secondly on a set of probabilities of “need” for LTC – whether currently provided formally by government programs, purchased by incurring OOP costs, received informally from relatives and friends, or unmet.

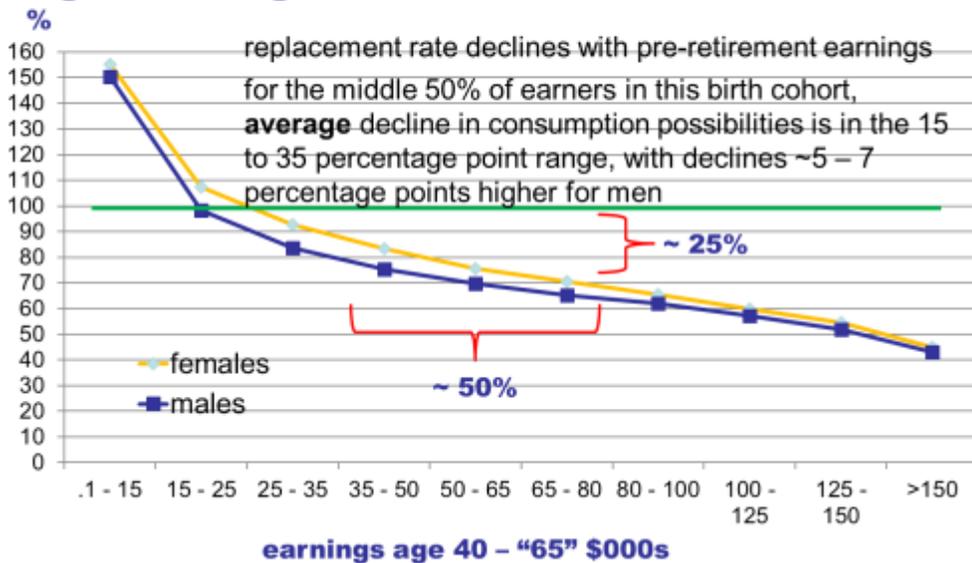
### **Retirement Income Projections**

Wolfson (2011) ( <http://irpp.org/wp-content/uploads/2014/05/Wolfson-No17.pdf>) developed the basic analysis of projected retirement income adequacy. The key result, shown in Figure 4, was that about one-half of the “baby boom” birth cohorts could expect a drop of at least 25 percentage points in their **net** replacement rates (RRs). The “net RR” is the ratio of post-retirement “consumable income” to pre-retirement consumable income. In turn, consumable income is defined as money income (wages and salaries, investment income, cash transfers from programs like public pensions) + dis-saving (e.g. from annuities purchased with tax-assisted retirement income saving plans, workplace pension plans, and sale of an owned home) + imputed rental income on owner-occupied housing – saving (e.g. contributions to workplace pension plans and the capital portion of mortgage payments) – income taxes.

As will be seen below, pre-retirement consumable income can be averages over various periods, ranging from the full potential working life (age 18 to 64) to the last five years before withdrawing from paid work. Post retirement, given the variety of pension indexing and survivor benefit provisions, there can be substantial differences by age, so ages 70, 80, and 85 will be examined. Also, household size typically varies considerably over these many years, so an adult equivalence scale has been applied (that underlying Statistics Canada’s Low Income Measure = LIM, which is almost the same as the widely used OECD scale).

Figure 4 -- ...

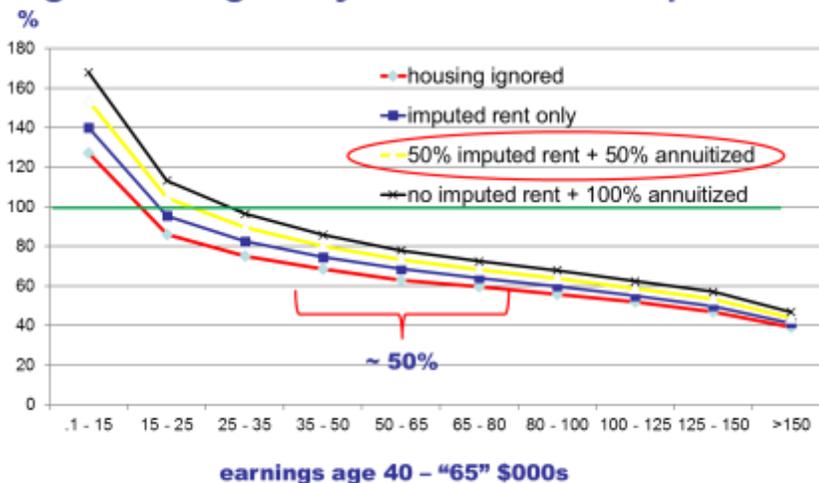
## Average Net Replacement Rates by Prime Age Earnings – Main Result (1960-65 cohort)



These results are quite sensitive to key assumptions. For example, Figure 5 shows how the net RRs vary according to whether and the extent to which equity in owner-occupied housing is used to supplement post-retirement incomes.

Figure 5 -- ...

## Average Net Replacement Rates by Prime Age Earnings – by Home Ownership



Clearly, the specific assumption one makes regarding home equity has a substantial effect on the magnitude of the issue of retirement income adequacy.

Similarly, Figures 6a for men age 70, and 6b for women age 80, show the import of assumptions on the range of pre-retirement net incomes (whether over the entire 18 to 64 age range = “updated career” or only the best (usually the last) 5 years), and how they are indexed (i.e. to price inflation = “CPI” or to average per capita wage growth = “AW”). Again, these assumptions have a major effect. And there is no one right answer. The scenario using age 18-64 is what was passed by Parliament in 1965 and is embodied in the CPP. The last 5 years is common in large DB pension plans. The CPP uses wage indexing for this denominator while many workplace plans use no indexing at all, not even for price inflation.

In this analysis, we focus on the middle assumption, “Prime” which uses as the pre-retirement denominator for the net replacement rate (RR) ratio consumable income (i.e. after tax and after savings) over the 40 to 65 age range.

Figure 6a -- ...

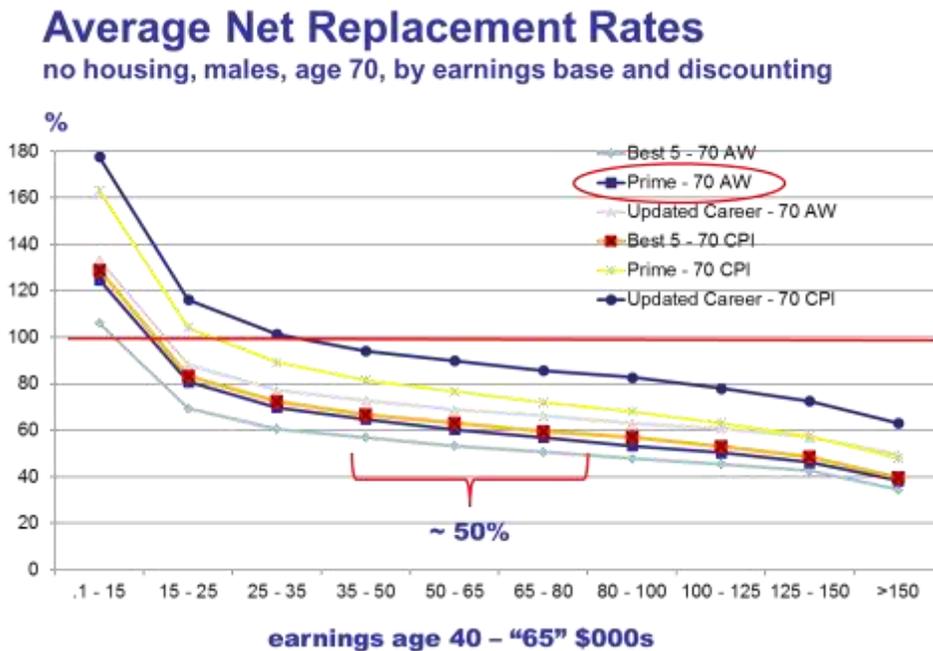
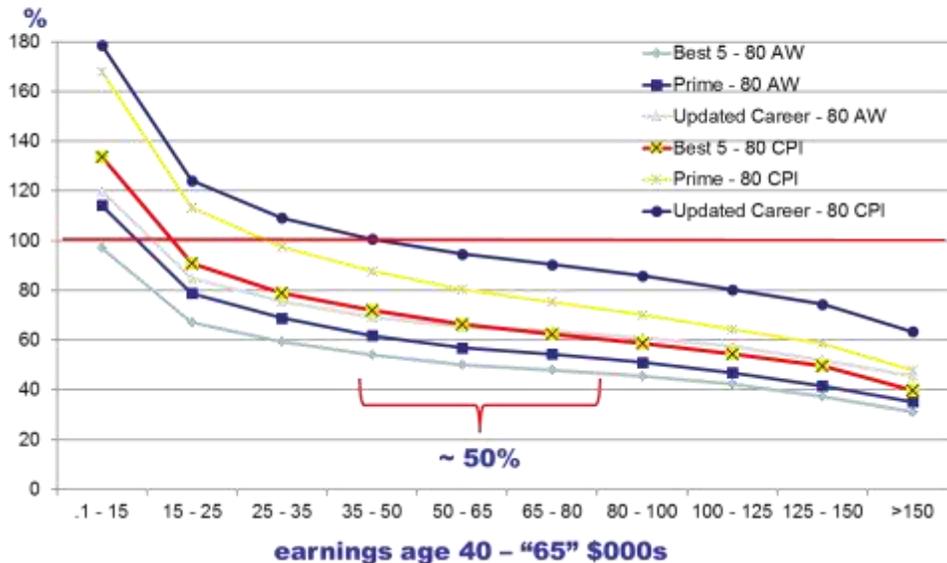


Figure 6b -- ...

## Average Net Replacement Rates

no housing, females, age 80, by earnings base and discounting



It is also important to note, when comparing Figures 6 a and b, that the age and sex of the individual have major import. Due to the generally limited indexing of retirement pensions in pay, and often weak survivor benefits, women at age 80 are projected to face significantly lower net RRs than men at age 70.

These key assumptions play a critical role in the results; there is no “right” answer:

- Home equity drawdown in retirement assumption: Figure 5 shows how the net RRs vary according to whether and the extent to which equity in owner-occupied housing is used to supplement post-retirement incomes;
- Choice of ages for the replacement rate denominator: the entire age 18 to 65 range, the last or best five years, or something in between;
- Choice of age for the replacement rate numerator;
- Choice of indexing factor (e.g. inflation rate or average per capita wage growth rate) for the replacement rate numerator;
- Choice of birth cohort; and
- Which pre-retirement earnings group – e.g. everyone or only those with “middle” incomes (say the middle 50% with average annual earnings between \$35,000 and \$80,000)

In line with the sensitivity results just shown for retirement income adequacy assessments, it is important to appreciate that the analysis (to be) presented here (n.b. not all scenarios have been produced as yet), looking at the inter-relationships between retirement incomes and the two main components of long term care (bed-days of institutional care, and hours of home care) will similarly involve a number of key assumptions for which there are no right answers. Instead, the “results” will be a series of estimates with surrounding discussion to indicate the policy judgments involved.

**Projecting Disability Prevalence** A major unknown is the future evolution of disability. While there is every reason to expect that the longstanding trend toward increasing life expectancy (about 2 years per decade over the past half century) will continue, there is major uncertainty about the trend of disability in Canada, let alone future prospects. The debate in the academic literature typically makes reference to James Fries (QQQ ref) notions of expansion or compression of morbidity. We plan on exploring scenarios of both types: one where age-specific patterns of disability do not change over time, resulting in more years spent living with disability, hence expansion of morbidity, and another where age-specific rates decline at a sufficient pace that, even with increasing life expectancy, the proportions of individuals’ lifetimes spent with disability decline, hence compression of morbidity in Fries’ parlance.

As an initial effort, in the analysis presented below, we consider only one of these two scenarios, constant age-specific disability patterns = expansion of morbidity.

To this end, we build on the LifePaths module that simulates and projects disability defined in four levels: none, mild, moderate, and severe, as in Figure 3 above for the CCHS (see footnote 1). These transition dynamics were estimated from the longitudinal National Population Health Survey (NPHS; Wolfson and Rowe, 2008; etc.)

The distribution of disability shown in Figure 3 pertains, however, only to the household population. To produce estimates for the entire population, we have combined these data with the census data in Figures 1a and 1b.

For those in “assisted living” seniors’ residences, we have drawn on the Inter-RAI data for home care utilization in Ontario<sup>4</sup>. These data have been used to classify home care recipients by the level of severity of their disability, as shown in Table 1.

Table 1 – Estimated Population Distribution of Disability Rates by Age Group, Sex, and Level of Disability of Home Care Recipients for those living in Seniors’ Residences in Ontario, 2013 (%)

		none	mild	moderate	severe
65-69	Female	6	16	29	50
70-74	Female	4	18	26	52
75-79	Female	3	13	27	57
80-84	Female	2	13	25	60
85+	Female	1	10	20	69
65-69	Male	6	13	31	50
70-74	Male	5	12	27	56
75-79	Male	6	11	28	54
80-84	Male	2	11	26	61
85+	Male	2	9	23	66

<sup>4</sup> Kindly provided by John Hirdes and his colleagues.

(from Michael\_PSW q.xlsx)

As is evident in Table 1, and more generally, the conditions most strongly correlated with home care use or residing in a nursing home include incontinence and a mild form of cognitive impairment referred to as “wandering”, neither of which is included in the NPHS (CIHI ref QQQ). As a result, a key set of assumptions is the probabilities, at each of the three levels of disability produced by the LifePaths simulations, of needing either home care or living in a nursing home. For home care services, we have used the distribution shown in Table 1; for nursing homes, we have simply assumed that all nursing home residents are “severely” disabled. (In future, we anticipate being able to access the Inter-RAI data for the Ontario nursing home population in order to have a more accurate distribution.) We have also ignored the very small proportion of the population living in nursing homes under age 65.

The result of combining these data for the overall Canadian population is shown in Table 2.

Table 2 – Estimated Overall Population Distribution of Disability Rates by Age Group, Sex, and Level of Disability, 2011 (%)

		none	mild	moderate	severe
65-69	Female	66.3	28.2	4.8	0.7
70-74	Female	65.1	27.5	5.3	2.1
75-79	Female	61.9	28.4	5.6	4.1
80-84	Female	54.9	29.9	5.5	9.7
85+	Female	50.7	20.7	4.1	24.5
65-69	Male	70.5	25.4	3.2	1.0
70-74	Male	68.9	23.6	6.0	1.4
75-79	Male	67.3	23.2	6.1	3.4
80-84	Male	64.2	24.8	4.6	6.3
85+	Male	58.9	20.4	5.3	15.4

(from Michael\_PSW q.xlsx)

The LifePaths disability transition dynamics are represented by multivariate conditional probabilities of moving from one disability state to another, including both declines and improvements. These transitions have been calibrated to reproduce fairly well the prevalence distribution shown in Table 2.

In the results that follow, we have assumed that these age/sex-specific disability severity distributions remain constant. Implicitly, therefore, with an assumed increase in life expectancy, we are positing an “expansion of morbidity” in Fries’ (198X) sense – in other words, that the proportions of Canadians’ lives lived with some level of disability is increasing over time.

In addition to assigning to each individual in a LifePaths simulation a level of disability, we also need to assign a residence – either their own home (the “household” population in Stat Can’s

terms = owner-occupied house or condominium or rented apartment), a private-pay assisted living seniors' residence, or a nursing home. The first column of Table 3 shows the proportions of the total population living in nursing homes.

We assume that once an individual has entered a nursing home, they never return to the household population, and that no one under age 65 lives in a nursing home. Further, we are assuming that the only members of the household population that enter nursing homes are already severely disabled. The last column therefore shows the proportion of the household (in this case also including those in seniors' residences) population who are severely disabled and who enter a nursing home.

Table 3 – Population (%) Living in Nursing Homes and Fraction (%) of Severely Disabled Household Population Entering Nursing Homes by Age Group and Sex (2011)  
QQQ col labels

		pct of total population	pct of severely disabled
65-69	Female	0.6	88.8
70-74	Female	0.8	38.2
75-79	Female	1.9	47.0
80-84	Female	4.7	48.3
85+	Female	14.1	57.8
65-69	Male	0.6	60.2
70-74	Male	0.5	38.5
75-79	Male	1.3	37.7
80-84	Male	2.8	43.9
85+	Male	8.6	56.0

(from Michael\_PSW q.xlsx)

Similarly, Table 4 shows the proportions living in Seniors' residences (1<sup>st</sup> column). In this case, we assume that only individuals with some disability choose to live in a seniors' residences (2<sup>nd</sup> column). Finally, we assume, as for nursing homes, that once someone has moved from the household population to a seniors' residence, they never move back (although s/he can move to a nursing home once severely disabled), and that no one under age 65 lives in a seniors' residence. (These assumptions will be assessed when further more detailed data are obtained.) The last column of Table 4 therefore shows the incremental proportions of individuals moving from the disabled household population to a seniors' residence.

Table 4 – Population for Seniors' Residences (percentages, see previous paragraph for column descriptions)

65-69	Female	0.4	1.1	1.1
70-74	Female	1.0	2.8	1.7
75-79	Female	2.5	6.8	5.1
80-84	Female	6.4	15.1	10.1
85+	Female	17.1	44.3	34.2
65-69	Male	0.3	0.9	0.9
70-74	Male	0.6	1.9	0.9
75-79	Male	1.3	4.3	3.4
80-84	Male	3.4	10.2	6.8
85+	Male	9.8	29.5	22.6

(from Michael\_PSW q.xlsx)

**LTC Resource Use** The data in Tables 1 to 4 above, in combination with the disability dynamics previously estimated from the NPHS and already incorporated into LifePaths, first provide the basis for projections of disability by level of severity (none, mild, moderate, and severe). Then, conditional on age group, sex, and disability level, these data further provide the basis for projecting residence in seniors' residences and nursing homes. (Recall that Alternative Level of Care = ALC beds in hospitals should also be considered a form of LTC; data on this population are pending.)

The next step in the analysis is to produce estimates of the consumption of these two main kinds of LTC services, home care and nursing home, in physical units – hours per year and bed-days per year respectively. The nursing home consumption is based simply on the fraction of a year the individual is living in a nursing home. However, home care is more complex because even within an age/sex/disability level category, there is a distribution of home care hours consumed.

We have derived estimates of these more fine-grained distributions from the same Inter-RAI data as used above, for Ontario. (n.b. these estimates are very much a first pass; they will be refined using more detailed data.) For simplicity, we have assumed that 25% of each age/sex/disability level category uses zero home care, 50% uses the mean amount, and the last 25% uses the 75<sup>th</sup> percentile amount. Table 5 shows the means and 75<sup>th</sup> percentiles as used.

Table 5 – Home Care Services Utilization Distributions by Age Group, Sex, Disability Level and Residence (Weekly Hours)

age group	disability level	Middle 50%				Top 25%			
		seniors females	home females	seniors males	home males	seniors females	home females	seniors males	home males
		65-70	severe	5.1	4.9	4.9	5.8	6.8	6.7
	moderate	2.3	2.9	2.3	3.2	3.3	3.1	3.3	4.1
	mild	2.0	2.1	2.1	1.8	2.4	2.4	1.8	2.2
70-75	severe	5.9	5.5	6.1	6.1	5.2	7.0	7.0	8.8
	moderate	3.9	2.9	4.6	2.8	4.5	3.1	4.0	3.4
	mild	1.7	1.9	2.2	1.6	2.8	2.3	2.9	2.0
75-80	severe	6.7	5.8	9.0	6.7	6.8	7.0	6.7	9.0
	moderate	2.8	2.8	3.5	2.9	3.8	3.1	3.8	3.3
	mild	2.3	1.8	5.7	1.8	3.5	2.1	1.8	2.0
80-85	severe	7.2	6.2	6.5	6.3	7.0	7.1	6.6	8.4
	moderate	3.9	3.0	3.9	3.3	3.6	3.3	3.9	3.7
	mild	1.9	2.0	2.3	1.8	3.0	2.1	3.2	2.0
85+	severe	8.1	6.9	7.8	7.1	7.0	7.1	6.6	8.4
	moderate	3.6	3.2	2.9	3.3	3.6	3.3	3.9	3.7
	mild	2.0	2.2	1.4	1.8	3.0	2.1	3.2	2.0

(from Michael\_PSW q.xlsx)

Source: authors' calculations based on...QQQ)

Finally, we assign provisional unit costs to these services of \$300 per bed-day for nursing homes and \$30 per hour for home care.

### Initial Simulation Results

As shown in Figures 4 to 6, the key indicator of retirement income adequacy is the net replacement rate (RR), especially for those with middle range incomes. In these graphs, those with pre-retirement (gross) earnings between about \$35,000 and \$80,000 comprise the middle 50% of this distribution. And as shown, there is a significant proportion of baby boomer who can expect to experience a significant drop in their consumable income after retirement.

However, these net RR results take no account of the possibility that individuals will face major out-of-pocket (OOP) costs for home care and assisted living in seniors' residences. Moreover, the needs for such care are highly skewed. As shown in Table 2, severe disability is quite rare until ages 80+, and only becomes substantial at ages 85+.

But as shown in Figure 6b for women at age 80, net RRs decline with age, so the financial resources available to cover the increasing likelihood of needing some sort of LTC decrease just as these needs are accelerating.

The projected LifePaths results above focused only on financial flows. As a first effort to assess the relationship between LTC needs and net RRs, we have augmented the LifePaths model in

order to compute not only net RRs as in the previous studies (Wolfson, 2011, 2013; CDHowe etc.) but also a new “net RR after LTC” – a net replacement rate after also subtracting individuals’ costs for home care and nursing home services.

In this case, we ignore the fact that substantial portions of both kinds of service are publicly funded. For example, in Ontario, residents pay about \$2,200 per month for staying in a nursing home, while at \$300 per day, we are assuming the monthly cost is on the order of \$9,000.

Table 6 – Net RR Distributions by Age Group and Sex, Before and After Subtracting LTC Costs at Age 70 and at Age 85, 1955-1960 Birth Cohort

Net RR	M-before LTC 70	M-after LTC 70	F-before LTC 70	F-after LTC 70	Net RR	M-before LTC 85	M-after LTC 85	F-before LTC 85	F-after LTC 85
<.5	8.6	11.4	10.5	17.4	<.5	26.5	34.7	25.0	44.1
.5 - .8	51.4	48.6	47.7	44.2	.5 - .8	57.1	59.2	51.5	38.2
.8 - 1.0	27.1	27.1	19.8	17.4	.8 - 1.0	16.3	6.1	14.7	13.2
>1.0	12.9	12.9	22.1	20.9	>1.0	0.0	0.0	8.8	4.4

Table 6 shows the results for the 1955-1960 birth cohort. As noted in connection with Figures 6a and b above, older individuals (at age 85 on the right in Table 6) generally have lower net RRs than those at younger ages post retirement (age 70 on the left of Table 6).

The first row of Table 6 shows the proportions of this cohort who are projected to experience very serious declines in their living standards, where their post-retirement consumable income at either age 70 or at age 85 is less than half their corresponding average pre-retirement (ages 40 to 65) consumable income. For those age 70, the proportion with a net RR below 0.5 increases somewhat – from 8.6 to 11.4 percent for men, and from 10.5 to 17.4 percent for women. But these increases are much larger at age 85 (right portion of the table) – from 26.5 to 34.7 percent for men, and almost doubling from 25.0 to 44.1 percent for women.

One likely explanation for the substantially larger impacts of LTC needs resulting in severe declines in post-retirement living standards relates to women’s greater life expectancy. Men at age 85 are more likely to have a surviving spouse who can provide informal care at home, thus reducing the need to move into a nursing home, or reducing the number of hours of home care needed.

(QQQ subsequent versions of Table 6 will show nursing home and home care service costs separately.)

### Policy Implications

Overall, the proportions of the elderly population needing some form of LTC are substantial, though nowhere near a majority. And it is very difficult if not impossible for an individual to predict if and when disability will set in, how quickly it will progress, what forms it will take, and

therefore what the consequential needs for LTC will be – for individuals it is substantially a game of chance, like roulette. However, for society, using the kinds of actuarial and statistical methods embodied in the LifePaths model used here, the general scope of LTC needs can be projected. Thus, LTC is clearly the kind of need where social insurance, but likely not individual insurance, can play a major role. Our assessment of precisely what kinds of roles are feasible, and their comparative pro's and con's, will depend on forthcoming more detailed analysis.

## Next Steps

It must be emphasized that the results presented here are very much an initial set. considerable further work is planned, funded by a new CIHR grant. Among other things, the next steps in this analysis include:

- assessing “unmet needs” for LTC based on Stat Can surveys such as the Canadian Community Health Survey (CCHS), General Social Survey (GSS) and the Participation and Activity Limitations Survey (PALS), as well as comparisons with “met needs”;
- estimating the proportions of met needs that are publicly funded, privately funded, and provided in kind as informal care by close relatives and significant others;
- constructing more refined scenarios for projecting disability, based on assuming either compression or expansion of morbidity;
- assessing retirement income adequacy not only in relation to the status quo public pension system, but also in relation to various reform options, including the recent federal-provincial-territorial agreement to expand the Canada Pension Plan; and
- developing and exploring various options for funding LTC, including expansion of general revenue funding, some sort of “social health insurance” as in Continental Europe, and some form of “managed competition” as is being adopted in the Netherlands.

## Selected References

[L Corscadden, S Allin, M Wolfson and M Grignon](#) (2014), “Publicly Financed Healthcare and Income Inequality in Canada”, *Healthcare Quarterly*, Vol 17, No 2, April.  
(<http://www.longwoods.com/content/23886#abtauth>)

Not So Modest Options for Expanding the CPP/QPP, IRPP Study, May 2013, IRPP, Montreal,  
<http://www.irpp.org/assets/research/faces-of-aging/not-so-modest-reforms/Wolfson-No41.pdf>

Projecting the Adequacy of Canada’s Retirement Income System, IRPP Study, April 2011, IRPP, Montreal, [http://www.irpp.org/pubs/IRPPstudy/IRPP\\_Study\\_no17.pdf](http://www.irpp.org/pubs/IRPPstudy/IRPP_Study_no17.pdf)

Michael Wolfson, Geoff Rowe (2007), Aging and Inter-Generational Fairness: A Canadian Analysis, in Peter J. Lambert (ed.) *Equity Research on Economic Inequality*. (Emerald Group Publishing Limited) Volume 15, pp.197-231.

Michael C. Wolfson (2007), Population Ageing and Health — Empirical Needs for Effective Foresight, in Ann Harding (ed.) *Modelling Our Future: Population Ageing, Health and*

*Aged Care International Symposia in Economic Theory and Econometrics* (Emerald Group Publishing Limited), Volume 16, pp.41-56

“Disability and Informal Support: Prospects for Canada” (MC Wolfson, Geoff Rowe), S.B.Cohen and J.M Lepkowski (Eds), Eighth Conference on Health Survey Research Methods, National Center for Health Statistics, Hyattsville, MD, 2004

GIBSON, M.J., and HOUSER, A. (2007) Valuing the Invaluable: A New Look at the Economic Value of Family Caregiving. Issue Brief (Public Policy Institute (American Association of Retired Persons)), no. IB82, 1–12.

KEEFE, J., L'EGARÉ, J., CHARBONNEAU, P. and 1271 DE'CARIE, Y. (2012) Intergenerational support to older Canadians by their adult children: Implications for the future. In *The Family, the Market or the State? Intergenerational Support Under Pressure in Ageing Societies*. International Studies in Population, Vol. 10 (ed. G. De Santis), pp. 141–158. Berlin: Springer Publisher. ISBN 97-94-007-4338.

PICKARD, L. (2008) Informal care for older people provided by their adult children: Projections of supply and demand to 2041 in England, Report to the Strategy Unit (Cabinet Office) and the Department of Health, Discussion Paper 2515, London.

PICKARD, L. (2011) The supply of informal care in Europe, ENEPRI Research Report No. 94, CEPS, Brussels.