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Thoughts from a user of results of Statistics Canada's LifePaths Microsimulation Model

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SEDAP Research Paper No. 290

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Abstract

 As for more than ten years, my name has been many time associated with Statistics Canada's LifePaths Microsimulation Model, I was asked to give my thoughts on it at the Seminar "On the Varieties of Computer Modeling: A Toolbox Approach to Analysis and Decision Making" organized by the Population Change and Lifecourse Strategic Knowledge Cluster in Gatineau (Québec) on September 28, 2011. After a narration of how I became user of results of LifePaths, I give a few examples that lead me to uncertainty because I am questioning my trust regarding methods and models used as well as data used.

Réflexions d'un utilisateur des résultats du modèle de microsimulation LifePaths de Statistique Canada

Résumé

 Comme depuis plus de dix ans, mon nom a souvent été associé au modèle de microsimulation LifePaths de Statistique Canada, on m'a demandé de faire part de mes réflexions sur ce modèle au séminaire intitulé « On the Varieties of Computer Modeling: A Toolbox Approach to Analysis and Decision Making" organisé par le Réseau stratégique de connaissances sur les Changements de population et les Parcours de vie à Gatineau (Québec) le 28 septembre 2011. Après avoir raconté comment j'étais devenu un utilisateur des résultats de LifePaths, j'ai donné quelques exemples qui me conduisent dans un état d'incertitude, étant donné que je remets en question ma confiance en ce qui a trait aux méthodes et aux modèles utilisés de même qu'aux données elles-mêmes.

Thoughts from a user of results of Statistics Canada's LifePaths Microsimulation Model

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 As for more than ten years, my name has been many time associated with Statistics Canada's LifePaths Microsimulation Model, I was asked to give my thoughts on it at the Seminar "On the Varieties of Computer Modeling: A Toolbox Approach to Analysis and Decision Making" organized by the Population Change and Lifecourse Strategic Knowledge Cluster in Gatineau (Québec) on September 28, 2011. The original title of my presentation was "Notes from a user of LifePaths".

I   A narration of how I became a user of results of LifePaths.

In the early 60's, while I was a graduate student at INED in Paris, during an exhibit of new books bought by the library, I looked at 1961 book by Orcutt et al. on microsimulation . My first reaction was that it was demographic science fiction and that it would not be in my surroundings during my active life… but it reaches me in retirement!

In the late 90's, I joined a research project on population ageing headed by Yves Carrière , then at Simon Fraser University as Principal Investigator (PI) with Janice Keefe from Mount Saint Vincent University and myself as Co-PIs.

To reach our research objectives on home care services, we realized that we would have to rely on population projections more sophisticated than the ones we were usually using. Microsimulation became a must.

Meanwhile, Yves Carrière having move to the Demography Division of Statistics Canada, we realized that instead of setting up a model of microsimulation by ourselves, we should ask access to Statistics Canada's LifePaths microsimulation model (Statistics Canada, 2011) which implied the involvement of the staff of the Socio-Economic Modelling Division of Statistics Canada and mainly of Geoff Rowe. The projections were produced by them but checked and analysed by people from the Demography Division. My role was then to analyse the results but, I was a

member of a team, not a lonesome driver, that have to analyse results over which he may not have a complete control (Carrière et al. , 2007).

In the mid 2000's, Janice and I had to become independent regarding LifePaths, as for many reasons Yves and Geoff became mentors and consultants on our project. But we had no competence in LifePaths and Modgen language. However, our graduate students Yann Décarie and Samuel Vézina took specialized training from Geoff Rowe under the sponsorship of the Policy Research Initiative (PRI).

Yann became the one who produce the population projections using LifePaths, at the beginning under the supervision of Geoff, but we had to trust the results he produces as Janice and I have no control except for consistency. Some would say: the "Black Box".

II A few examples that lead to uncertainty

My reaction to the publication of a recent article by Sanderson and Scherbov in Science will serve as an example. In their article untitled "Remeasuring Aging", published in September 2010, they present very challenging results for many developed countries, in general but especially for Canada (Sanderson and Scherbov, 2010). In a paper, co-signed with Yann Décarie and Alain Bélanger and presented at the International Microsimulation Conference in Stockholm in June 2011, we challenged the Science results with projections coming from LifePaths (Légaré, Décarie and Bélanger, under review).

Sanderson and Scherbov had suggested very wisely to measure population ageing by taking into account disability by age instead of only the age structure of the population. The index suggested – the Adult Disability Dependency Ratio (ADDR)- is the proportion of people aged 20 years old and over with a disability related to those of the same age group without disability. Their results, up to 2050, show for all countries very small increment in their index, concluding that ageing in the first half of the XXI Century shall not be an issue. Our calculations, using LifePaths model, show completely different results (Slide 1). The population projections by age and sex show almost no difference when we compare the standard Old Age Dependency Ratios from many sources (Slide 2), implying that the issue is at the level of the disabled people projections.

The Adult Disability Dependency Ratios (ADDR)

$$ADDR = \frac{number\ of\ adults\ at\ least\ 20\ years\ old\ with\ disabilities}{number\ of\ adults\ at\ least\ 20\ years\ old\ without\ any\ disabilities}$$

Table 2 - Projection of the Adult Disability Dependency Ratio (ADDR) for Canada according to different sources

Years	Science article	LifePaths projections
Circa 2006	0,09	0,09
Circa 2051	0,11	0,16

Sources : Science - sept 2010, vol. 329, no.5997 (2005-2010, 2045-2050); LifePaths - current study (2006, 2051)

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The Old Age Dependency Ratios (OADR)

$$OADR = \frac{Population\ 65\ years\ old\ and\ over}{Population\ of\ working\ ages\ 20-64}$$

Table 1 - Projection of the Old Age Dependency Ratio (OADR) for Canada according to different sources

Years	Science article	OECD projections	LifePaths projections
Circa 2006	0,22	0,22	0,22
Circa 2051	0,47	0,48	0,48

Sources : Science - sept. 2010, vol. 329, no.5997 (2005-2010, 2045-2050); Society at a Glance 2011 - OECD Social Indicators (www.oecd.org/els/social/indicators/SAG) (2008, 2050); LifePaths - current study (2006, 2051)

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Canadian policy makers have to be very cautious with the results for Canada coming from the Science paper. We have used the LifePaths module on Disability to project the number of Canadian disabled elderly up to 2051. They should trust us, but again I have no control but consistency per se and with OECD Lafortune study with results for Canada (Lafortune et al., 2007)

Within our program of research and for reasons of consistency with previous projects, we have used another method than the LifePaths module on disability to project the number of Canadian disabled elderly. While LifePaths has by essence a longitudinal approach using the information contained in various surveys, we have also calculated regression parameters calculated from CCHS 2000/2001 data and applied them to the LifePaths projections not integrating the Disability Module. The comparisons of results show differences, with important implication for policy makers, both at the beginning of the projections in 2001 (Slide 3) but mainly in year 2031 when the LifePaths projections doubled the number of disabled elderly projected by the other

method (Slide 4).The method using regressions show different results: the projected trend is however the same as with LifePaths, always on the upward whatever the disability status (Slide 5). The OECD study has already made aware the Canadian policy makers of the sharp increase in the number of elderly Canadians with a severe disability in the near future, but announcing that it will be more around 600 000 people in 2031 instead of 300 000 (Slide 6) has a lot of important consequences for old age programs. .

Slide 3

Population 65 years and over in bad health (moderate and severe disability), by age group, Canada, 2001

Age group	Regression method	LifePaths method (Stockholm)	Difference
65-74 years	247 272	360 492	113 220
75-84 years	244 771	346 977	102 206
85 and over	138 719	176 607	37 888
Total	630 762	884 076	253 314

Sources : Statistics Canada, National Population Health Survey, 1994-2000
Canadian Community Health Survey, 2000-2001

Population 65 years and over in bad health (moderate and severe disability), by age group, Canada, 2031

Age group	Regression method	LifePaths method (Stockholm)	Difference
65-74 years	507 470	918 838	411 368
75-84 years	515 964	932 691	416 727
85 and over	344 343	528 127	183 784
Total	1 367 777	2 379 656	1 011 879

Sources : Statistics Canada, National Population Health Survey, 1994-2000
              Canadian Community Health Survey, 2000-2001

Slide 5

Population 65 and over by level of disability (mild, moderate and severe), Canada, 2001-2031

Sources : Statistics Canada, National Population Health Survey, 1994-2000
Canadian Community Health Survey, 2000-2001

Slide 6

Population 65 years and over in severe disability, by age group, Canada, 2031

Age group	Regression method	LifePaths method	Difference
65-69 years	53 492	85 339	31 847
70-74 years	61 541	110 991	49 449
75-79 years	62 247	124 240	61 994
80 years and over	149 394	299 057	149 663
Total	326 674	619 627	292 953

Sources : Statistics Canada, National Population Health Survey, 1994-2000
Canadian Community Health Survey, 2000-2001

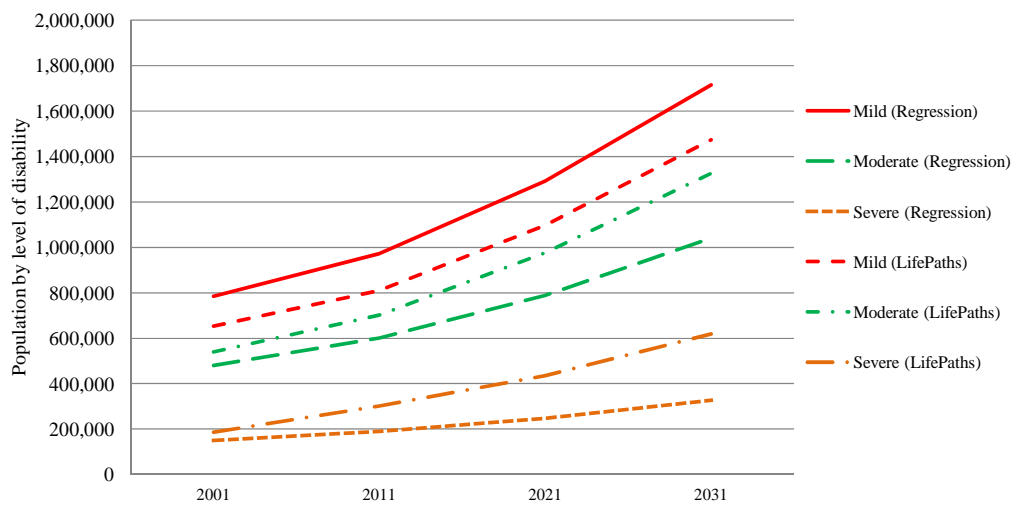But beyond the methods to make the projections, we should also question the methods to collect the information.

For example, when in our research project, we have attempted to use more recent surveys than the 2000/2001, the Canadian Communities Health Survey (CCHS) 2003 and the CCHS 2005, preliminary descriptive analyses of these more recent surveys revealed a decrease in the proportion of 85+ within the 65+ population compared to the level observed in the CCHS 1996/1997 as well as a decrease in the population of 65+ compared to the results of the CCHS 2000/2001. Those results do not fit with current demographic observations. This would be due to some issues encountered along the way regarding comparability problems and weighting issues of the 85+ age group (Lefrançois et al., under review, note 1, page 6). In the same research project, we have also attempted to use more recent survey information than the General Social

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Survey (GSS) 2002, data from the GSS 2007 being then available, in order to estimate the number of elderly who need assistance. Questions asked were quite similar in both surveys:

GSS 2007

During the past 12 months, did %you/he/she% receive assistance with: meal preparation, meal clean-up, house cleaning, laundry or sewing? (CAR_Q132)

GSS 2002

In the past 12 months, has any organization or anyone OTHER THAN YOU DONE ANY PART OF YOUR meal preparation and clean-up, house cleaning or laundry and sewing? (CR_IH_Q100)

When we compare the results, we observe that it is hard to establish where is the right information or if there is any trend (Slide 7)   due to the fact that filters within the questionnaires do not permit to follow equivalent people (Légaré et al., 2011, p. 25). It is unconceivable that the number of elderly needing assistance for these specific tacks would vary from 1.7 millions to less than 300 00 over a period of five years. How can specialists of home care services trust such information?

Slide 7

GSS 2007: During the past 12 months, did %you/he/she% receive assistance with:meal preparation, meal clean-up, house cleaning, laundry or sewing?(CAR_Q132)

	Frequency	Weighted
Yes	546	298 040
No	764	359 662
Not asked	6 978	3 496 096
Not stated	0	0
Don't know	1	598
Total	8 289	4 154 396

Source: GSS 2007

GSS 2002: In the past 12 months, has any organization or anyone OTHER THAN YOU DONE ANY PART OF YOUR meal preparation and clean-up, house cleaning or laundry and sewing? (CR_IH_Q100)

	Frequency	Weighted
Yes	5 689	1 681 967
No	6 932	1 985 264
Don't know	67	21 519
Total	12 688	3 688 750

Source: GSS 2002

Policy makers should help researchers in their query for more consistency in data collection, especially for elderly, as the Canadian population will face in the very near future important issues related to an ageing population.

Finally,

How can I trust the methods and models used?

How can I trust the data used?

I feel working, while standing on moving sands,

....with UNCERTAINTY!

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