

Mapping the Adequacy of Care and Support for the Elderly in Developed Countries

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for the Elderly in Developed Countries

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## Abstract

This research paper assesses the adequacy of the combination of elder care and support programs in six developed countries. The programs considered are social security (retirement income), health care and long-term care, and four family compositions are considered to make the assessment. The paper discusses the difficulties of defining adequacy.

The fuzzy set methodology of Ragin (2000) is used to label the level of adequacy of the combined programs. This is the first time this methodology has been applied to this problem. The paper contributes to research in the social sciences by combining quantitative and qualitative results. It finds that the combined programs are: often inadequate in England and the United States; not adequate or inadequate in Canada; and mainly adequate in France, Germany and Sweden. Three policy recommendations, which would increase the likelihood of benefit adequacy, are made.

## 1.0 Introduction

All developed countries have an array of programs involving government funding designed to provide care and support for the elderly, programs such as social security, health care and long-term care (LTC). Some countries' programs are more extensive than others. Often, the full range of required services is not provided by government programs but individuals and their families are expected to supply some of the care and support. Occasionally, the level of care and support provided is income- or means-tested. Can the complete array of programs in each country be compared and assessed and the results communicated easily and effectively?

The main objectives of this research are threefold:

1. To develop an international comparison based on an assessment of the adequacy of the array of care and support programs for the elderly, with reference to a number of developed countries
2. To develop a tool (referred to as a map) that would communicate the results easily and effectively
3. To contribute to research methods in the social sciences by developing a tool that combines quantitative and qualitative research results

This research undertakes to compare the combination of social security, health care and LTC for certain family compositions of elders in six developed countries. The comparison is to a defined adequacy standard. Such a comparison faces numerous problems, as described herein, such as what benefits to include, as of what date, the family compositions to be selected, and the income and service history of the individuals. Moreover, most international comparisons focus on a single benefit, such as retirement income or LTC. This research breaks new ground by examining a combination of services for the elderly. The methodology is based on fuzzy-set theory. In this regard, it is the first actuarial study to apply fuzzy-set analysis to this problem.

This paper proceeds in the following order. The second section introduces the methodology, discusses the subject of adequacy, defines how it is used in this report and outlines the limitations of this report. The third section presents the results of the comparison and discusses these results. The fourth section discusses areas for further research. The fifth section lists three policy recommendations and concludes. A note on terminology: When I refer to “state” programs I mean the programs available from all of a country’s governments.

## 2.0 Methodology

This paper uses a comparative approach to evaluate the aggregate impact of three main types of social protection in a selected group of developed countries, which are members of the Organisation for Economic Co-operation and Development (OECD). Each country might be considered a case and the research approach is qualitative comparative analysis, based on a small number of cases with rich complexity.

The types of social protection are social security (retirement income), health care and LTC. The focus for the evaluation is the elderly. To define elderly, a family composition model is used. Two model family compositions are defined:

1. A couple with both members between age 65 and 70, who have retired on a state pension in respect of the principal household member, which is based on a career of earning at the average national wage, with no other earnings and savings, and with annual drug expenses before application of any state program of \$2,000
2. A single female age 85 or older, who lives on her own with a state survivor’s pension based on the death of the principal household member who had earned a pension based on a career earning at the average national wage, with no other earnings and savings, and with annual drug expenses before application of any state program of \$1,200

The dollar amounts are in Canadian dollars and were converted to the comparable amount in each country’s currency, using exchange rates pertaining to 2011, the year of comparison.

For each of these two family compositions, consideration is given to the situation where no family member requires institutional LTC and to the situation where one family member requires institutional LTC. This results in four family compositions.

For the purpose of assessment, general living expenses associated with food, transportation, accommodation, entertainment and taxes are considered to be 53 percent of the average national wage for couples. This assumes rental accommodation. The figure was derived from a review of spending patterns associated with lower income earners (Statistics Canada 2010). To calculate the reduction in spending for single-person households, this percentage was divided by 1.4, a fairly common factor used in expenses research, resulting in general living

expenses being considered to be 38 percent of the average national wage for single-person households. These percentages were applied to all countries.

The reasonability of this approach was tested by updating figures reported by Bajtelsmit, Rappaport and Foster (2013) with respect to the Elder Economic Security Standard Index Household Types 2010, a U.S. study. The percentage of average national wage for elder couples who rented was 53 percent. The percentage for single-person households was 39 percent. Hence the research approach was considered reasonable for its purposes.

It is likely that if households find their income is insufficient to purchase the desired basket of goods, they will substitute less expensive items or do without certain items. This aspect of behavior is not considered in this research.

By using information about actual spending patterns, this research follows a “bottom-up” approach. Often, researchers use a “top-down” approach assuming that a particular replacement ratio, such as 70 percent, will be appropriate to cover expenses. A common observation is that expenses in retirement should lessen because

- the work-related expenses, such as for special clothing and transportation, cease
- seniors have more leisure time and can cook their own meals
- there are special discounts available due to age, in respect of bank fees, transit, etc.

Interestingly, Lafrance and LaRochelle-Cote (2011) use a synthetic cohort approach and conclude that “households in their early 70s consumed 95 percent of the level measured for the same cohort in its late 40s.” This is a challenge for top-down researchers.

A difficulty in comparing different schemes of social protection is that the schemes continue to change over time and take a long time to mature. Individuals may earn some benefits under one set of scheme rules and other benefits under another set of scheme rules. For purposes of comparison, it is assumed that the scheme in effect in 2011 had been in effect for long enough to be mature for the family compositions considered. Moreover, it is assumed that the benefits received by the family compositions have been determined by the rates in effect in 2011.

This research is considered secondary. The principal source of information regarding the three types of social protection is the OECD website, but this information has been supplemented from other sources, as identified in the paper.

Spicker (1993) categorizes social security benefits as

- social insurance,
- means-tested,
- contributory,
- universal or

- discretionary.

On this categorization, means-tested benefits are considered social assistance. Social assistance benefits are not considered in this analysis. For the purpose of this research, social assistance benefits are considered to be an indicator that the three main types of social protection being studied are inadequate, i.e., result in needs that must be supplemented by another source.

An assessment of adequacy is made for each of the four model family compositions, which are abbreviated as couple not requiring LTC (C.N.), couple with one member requiring LTC (C.Y.), single female not requiring LTC (S.N.) and single female requiring LTC (S.Y.). For this purpose, the technique of fuzzy sets (Ragin 2000) is used. Each of the four family compositions was assigned a raw fuzzy-set score and label as shown in table 1. The score depends on the extent to which the state pension (S.P.) is sufficient to cover total expenses (T.E.). Total expenses are comprised of general living expenses (GLE), and drug and care expenses.

**Table 1.** Method of scoring the adequacy for each family composition

<b>Comparison</b>	<b>Score</b>	<b>Label</b>
S.P. < 50% GLE	0	Completely inadequate
50% GLE ≤ S.P. < 100% GLE	0.33	Somewhat inadequate
100% GLE ≤ S.P. < T.E.	0.67	Somewhat adequate
100% T.E. ≤ S.P.	1	Completely adequate

Since the objective is to make an evaluation of adequacy at the country level, the individual assessments of adequacy for the four family compositions are averaged to obtain a single overall score. This overall score could range between 0, completely out of the set of adequate social protection, to 1, completely adequate social protection; however, many other scores between 0 and 1 are possible, which indicate that social protection is somewhat but not fully adequate. For the purpose of referring to these scores, the following language will be used.

**Table 2.** Method of summarizing country's scores and label

<b>Overall score</b>	<b>At least 1 raw score of 1</b>	<b>Label</b>
0	No	Completely inadequate
.20 > score > 0	No	Mainly inadequate
.40 > score > .20	No	Often inadequate
.40 > score > .20	Yes	More inadequate than not
.60 > score > .40	No or Yes	Not adequate or inadequate
.80 > score > .60	No	More adequate than not
.80 > score > .60	Yes	Often adequate
1 > score > .80	Yes or No	Mainly adequate
1	Yes	Completely adequate

### 2.1 How is adequacy defined?

Adequacy is a concept that does not have a unique definition in practice. It may vary by country or within a country. What is deemed adequate in Canada will be considered more than adequate in India, and the adequate in the south central part of Canada might be woefully inadequate in the far north of Canada. It may vary by individual. The adequate for a child may not be adequate for an adult. It may vary by family composition. The adequate for a couple may be less than what is adequate for two independently living adults.

It also requires a determination of some minimum standard and the determination of such a standard will require many judgments. For example, should the minimum standard be a measure of poverty, i.e., the minimum level of food and accommodation to subsist? Or should adequacy include more, such as access to health care when sick, education of children from some minimum age to some other age, freedom from domination by others, protection from criminal acts or wrongful persecution? If the minimum standard is a measure of poverty, should it be an absolute measure or a relative measure?

Individuals will answer such questions differently. Countries will answer such questions differently. The answers may depend on the country's resources and on its political structure, e.g., representative democracy or authoritarian rule. It may also depend on the country's dominant philosophy or religion. Are all individuals considered to have a right to an adequate living or does one's caste or class at birth influence what might be considered adequate?

This paper does not attempt to answer such questions, although this author certainly holds opinions regarding the appropriateness of various answers. Rather it defines a particular context and within that context provides an indication of whether adequacy is achieved. The primary purposes of this research are threefold:

1. To measure adequacy within the context
2. To make observations on how adequacy could be achieved within the context
3. To develop methods for communicating research regarding adequacy by combining quantitative and qualitative information

A secondary objective of this paper is to prepare a basis for the assessment of the sustainability of the programs that constitute the context. This research is described in a separate paper (Andrews 2013).

This language is very abstract, so let me be specific. The context is formed by six developed countries:

- Canada
- England (generally the United Kingdom except for LTC)
- France
- Germany
- Sweden
- the United States

These countries are some of the world's richest, as measured by gross domestic product (GDP). They also have developed social programs, which have been designed to provide assistance to those with specific needs. All of these countries have aging populations, although the aging is occurring at different rates across countries. Although similar in those respects, these countries differ in terms of their philosophy toward the objectives of the programs and the proper balance between individual responsibility and effort and the intervention of the state.

Furthermore, the context in this research is limited to the consideration of seniors, taken to be those 65 or older. Moreover, the adequacy of one's position as a senior may be influenced by one's present state, e.g., married, partner deceased, healthy or institutionalized, and by one's past, e.g., income history, the fulfillment of eligibility criteria for participation in social programs or savings. For the purpose of this research, I consider two family compositions:

- Married couple both age 65 to 70
- Surviving female spouse age 85

For each of these two compositions, I consider two health states:

- Living in private rental accommodation
- Female spouse in institutional care

Finally, I assume the male spouse had a full career of work and earned the average wage in each year and the female spouse did not work.

Defined in this way, the context is quite narrow, but I have selected this context for several reasons. First, I am interested in assessing the adequacy of state pension, health and social care provision. By examining a couple where one member has earned the average wage in each year for a full career, one would expect to find a healthy couple near state pension age, i.e., age 65 to 70, that was above the poverty line, which may not be the minimum standard for adequacy but is likely to be accepted as a lower bound for adequacy. This first consideration is an income history for a healthy couple.

Second, what may be adequate at retirement for a healthy couple may not remain adequate as the couple's state changes, i.e., as the couple ages, when one of the couple dies or if health deteriorates requiring institutionalized care. On a model where individuals work for a period of time, say 40 years, and then do not work, it is important to measure adequacy throughout the period of nonwork. By examining different states, I provide a glimpse of adequacy throughout the period.

Third, I have tried to choose a sufficiently high income history where there may be valid reason to argue such individuals in a developed country could expect to have at least an adequate living. In other words, I have not selected a situation that may be at the edge of where adequacy begins, but one sufficiently above where adequacy could be expected to begin.

To provide an indicator of how strong this assumption is, the following table from the OECD shows the replacement level of income from state plans at various wage levels, for the countries considered and for the average of 34 OECD countries.

**Table 3.** Replacement rate of state pensions

Country	Median	Individual earnings multiple of mean		
		0.5	1.0	1.5
Canada	48.5	76.6	44.4	29.6
France	49.1	55.9	49.1	41.3
Germany	42.0	42.0	42.0	42.0
Sweden	53.8	68.3	53.8	68.7
U.K.	37.0	53.8	31.9	22.6
U.S.	42.3	51.7	39.4	35.3
OECD34	60.6	72.1	57.3	52.0

Source: OECD 2011

Fourth, I am assuming the state should organize its programs so that a couple with such an income history should be able to have an adequate living. I know this is a statement of political philosophy that some may find contentious and others may find despicable, but that is what I believe and what I shall measure.

Fifth, this approach requires minimal assumptions with respect to rates of return on investments, which are required for Sweden and Germany, and with respect to savings rates, which are required for Germany.

## **2.2 Limitations**

Many limitations in performing comparative secondary research on national systems have been identified, such as inconsistent and different definitions across countries, practice being different from policy, family models only capturing limited information and too much complexity to be captured by any case. For further elaboration and other considerations see, for example, Desrosieres 1996; Eardley 1996; Evans 1996; Glover 1996; Schunk 1996; Simonin 1996; and Spicker 1996. This research is exposed to such limitations. Moreover, as noted by Ragin (1991), there are limitations on the generalizability of concepts or observations drawn from case-oriented research.

Different countries have designed their systems to provide different levels of social protection, in line with the country's culture, social philosophy and beliefs in the objectives of state-financed welfare systems. For example, social security systems in Scandinavian countries tend to be designed to deliver more generous benefits than the social security systems of England, the United States and Canada. Esping-Andersen (1990) has written the classic text on this subject and categorizes the systems by design philosophy. Nonetheless, the designers of the social security systems in each country might maintain the system is adequate for the purpose for which it was designed. However, for the purpose of this comparative research, a common definition of adequacy has been selected. The level established may be considered adequate by the country but fail the test of adequacy as defined in this research.

Moreover, only state-provided or state-mandated benefits and programs are considered. It is acknowledged that certain countries expect the individual will save for future contingencies and to ensure benefits are adequate. It is intended that the fuzzy-set methodology, where countries are assessed on adequacy with respect to membership in a set, will mitigate to some extent these limitations.

The selection of the family compositions based on a one-earner male-head-of-household model could be criticized as being old fashioned and not representative of the modern work force, which has high female participation rates, single-parent structures and marriages that end in divorce. That is valid. However, for currently retired individuals, the one-earner male-head-of-household model is much more prevalent than it is among today's work force.

## **3.0 Results**

The following table summarizes the calculations for the four family compositions for each country, showing the raw score as specified in table 1, the overall score and the applicable label, as specified in table 2.

**Table 4.** Summary of results and assignment of label

Identifier	Canada	England	France	Germany	Sweden	U.S.
C.N.	0.33	0.33	1.0	1.0	1.0	0.33
C.Y.	0.67	0.33	0.67	1.0	1.0	0.33
S.N.	0.33	0.33	1.0	0.33	0.33	0.33
S.Y.	0.67	0.33	0.67	1.0	1.0	0.33
Index score	0.5	0.33	0.84	0.84	0.84	0.33
Label	Not adequate or inadequate	Often inadequate	Mainly adequate	Mainly adequate	Mainly adequate	Often inadequate

All countries’ programs provide pension income that is at least equal to 50 percent of general living expenses. Both England and the United States have programs considered to be often inadequate. This is not necessarily surprising as the attitude underlying these countries’ programs is that the individual has a responsibility to save and the state programs are only designed to provide a minimal level of support.

Although Canada has a similar attitude underlying its programs, it has two components that increase the level of support and result in a label of not adequate or inadequate. Canada provides a demogrant to all individuals age 65 or older, regardless of work history, provided they apply for it. This is important in the family compositions considered in this research because this program would provide an income to the spouse who has not worked. There is also a special program for those requiring institutional care that provides more expense assistance than if the care was received outside an institution. This could influence the decisions of those requiring care.

No country’s programs provide completely adequate coverage for a surviving spouse with no former employment earnings; however, the adequacy of coverage differs by country depending on whether the individual requires institutionalized care. Germany and Sweden generally provide adequate income or insurance; however, the reduction in income for a survivor’s benefit is greater than the reduction in expenses suggested by the research. (See the result for S.N.) France provides an adequate level of income, except when someone requires institutional care. Such individuals are required to pay a relatively high amount, compared to their income, resulting in less than fully adequate support. (See the results for C.Y. and S.Y.)

#### 4.0 Areas for further research

The definition of adequacy is difficult. It is affected by many decisions; first and foremost, by how the responsibility for adequacy is allocated between the individual, the family and the broader society, including the state. In countries such as Sweden and Germany where the programs are considered adequate, the society bears a large responsibility for ensuring that the program-context leads to high probabilities of adequate benefits being delivered. In Sweden, this

occurs primarily through state-provided programs, whereas in Germany it occurs through the combination of state programs and mandated private insurance. In other countries, such as England and the United States, the individual is considered to be primarily responsible for ensuring the coverage in place is adequate. For example, some learned commentators in the United States would argue that government-provided programs should not be universal and comprehensive but should be directed primarily toward the more needy and play a supplementary role (Steurlé 2013). It is not the purpose of a government-enabled context to deliver adequate benefits.

It would be useful to be able to include private savings and employer-provided benefits that are not mandated (and other support provided by families, as described below). The inclusion of such benefits might affect the assessment of adequacy.

Historically, the family has been expected to bear the responsibility for LTC provision. In the LTC programs of many developed countries, most of the expense of LTC provision outside an institution is the responsibility of the individual or family. Many countries are experiencing below-replacement levels of fertility, resulting in smaller family sizes. Moreover, the average age of (extended) families is rising. As individuals age, they become more likely to experience dementia or Alzheimer's disease, which can make caring issues even more challenging. All of these factors jeopardize the ability of families to deliver LTC in accordance with historical expectations. Such changes have implications for the adequacy of any country's programs.

Moreover, this research examines one-earner couples. Different views are possible on what should be adequate for a one-earner couple. Different countries have different attitudes regarding the extent to which married women are expected to participate in the organized labor market. It would be logical to expect different allocations of responsibility for ensuring adequacy, depending on the extent that married women are expected to earn income. It is quite possible that the outcomes of this assessment would be different if two-earner households and single-person–single-earner households were considered. Canada addresses this issue by having a demogrant to which every citizen who has attained age 65 may apply for and receive, regardless of whether the individual ever participated in the organized labor market. Sweden has a similar approach by defining a minimum pension to which all residents are entitled. Germany seems to have treated the issue by defining a sufficiently high state pension to provide adequate income for a couple if the primary earner has a full work history.

Furthermore, the attitudes held regarding responsibility for adequacy seem to vary by benefit type. All countries studied have well-established state pension plans, although the level of benefit provided by the state plans varies by country. Although the United States has a well-established Medicare program, its coverage is not as extensive and broad as that delivered in the other countries studied. Finally, LTC seems to be a relatively recent consideration for most countries, something to be considered after retirement income and health care have been addressed.

Sweden and Germany have more fully addressed LTC than the other countries studied. France and Canada set limits on the amounts institutionalized individuals can be charged. However, such limits may be sufficiently high that individuals will require a source of income or adequate savings if they are to pay the costs themselves. It is for this reason that both Canada and France are judged to be partially adequate when one individual is institutionalized, but they reach this categorization from different directions.

In Canada, income is deemed inadequate to meet general expenses, until some of those expenses become labeled as care expenses, in which case income is adequate to meet other general expenses. In France, income is more than adequate to meet general expenses, but insufficient to meet all the additional burden of care expenses.

Although England has proposed legislation that will provide greater limits on the amount individuals will be expected to pay for care, to be effective in 2017, those limits are still quite high. The United States has means-tested assistance for the very needy and is reforming health care and LTC provision, but the individual or the family can still face significant LTC costs, if deemed able to afford to pay.

This paper has been prepared for the Living to 100 Symposium. Living to 100 is a distinct possibility for readers of this paper. How to design adequate programs to make provision from a common retirement age, such as age 65, to an age of 100 or older, is very challenging. Even if we accept that individuals should be expected to save for their care and support needs when they are elderly, the range of possible states that must be provided for is significant, e.g., long life, long life with physical disability, mental disability, and frail or disabled spouse. Moreover, with increasing age, the probability of entering these states increases.

Although I have argued for the need for social insurance to help address some of these needs (Andrews 2011), is it likely that countries could organize their programs to provide adequate care and support in every situation? A one-size-fits-all program adequate for the neediest would be extremely expensive and unnecessary for many. A targeted, means-tested approach makes better use of funds but requires significant administration and can be degrading for recipients.

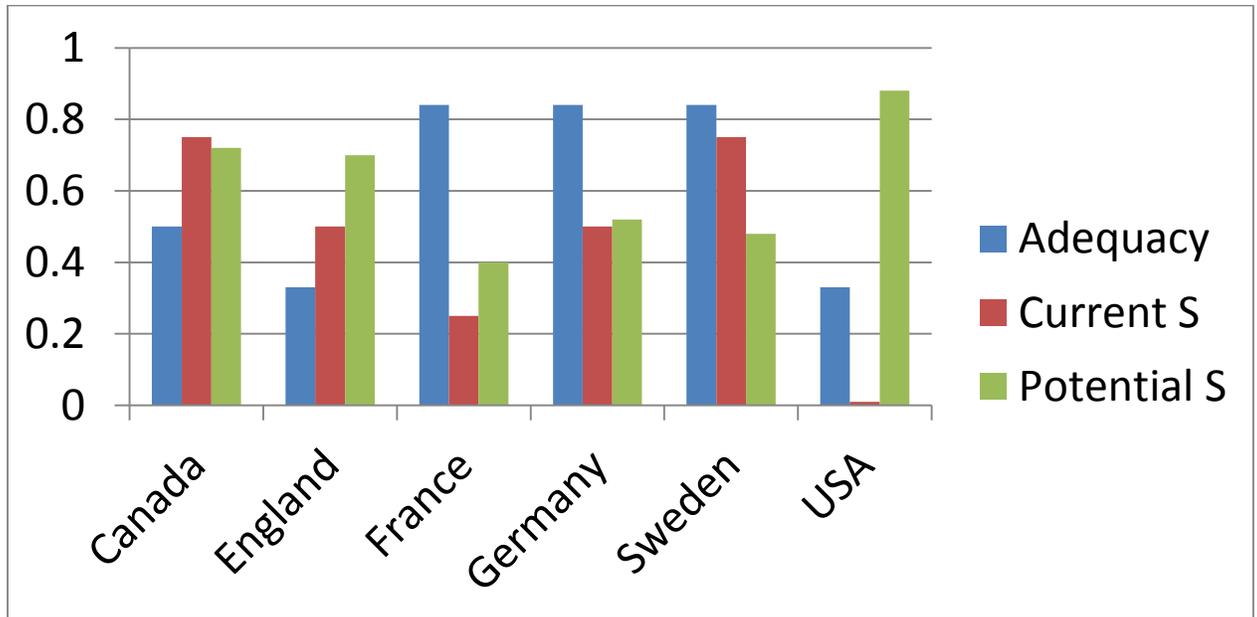
These subject areas provide a rich context for further research and policy debate.

#### **4.1 Combining adequacy and sustainability**

All policies have direct costs and opportunity costs. Each country must decide how much cost to accept and how those costs are to be borne. This paper merely assesses the countries' combined retirement income, health care and LTC programs for seniors on a specific measure of adequacy. For meaningful consideration of policy alternatives, at a minimum, cost must be considered along with adequacy.

In related research (Andrews 2013), I consider the sustainability of the care and support programs for the elderly for these six countries. Two measures of sustainability are constructed: one with respect to current contribution levels and cost structures and whether they are likely to be sustainable, and one with respect to a country’s position to be able to make changes to sustain programs in the future, referred to as potential sustainability. The following chart shows the combined findings of this research on adequacy and that research on sustainability.

**Chart 1.** Sustainability and adequacy



The chart shows that England and the United States have programs that are often inadequate; however, the situation with respect to sustainability differs. In England, the programs are possibly sustainable, whereas in the United States, they are unsustainable. Both countries have strong potential for sustainability. The potential for sustainability is very strong in the United States because of its relatively low levels of taxation, its relatively low public pension commitment and its more moderate rate of aging. But there is strong resistance to tax increases in the United States, so whether this potential can be realized is debatable. Sweden provides a contrast to these two countries. Its programs are mainly adequate and its programs are currently likely sustainable. Yet its potential sustainability is less than both of England and the United States. An immediate reaction might be to scoff at Sweden because of its welfare state—that such a situation could not be implemented elsewhere. But the evidence suggests the Swedish welfare state is changing—to improve productivity and to incorporate private companies in the delivery of public services (*The Economist* 2013).

This research on sustainability suggests that among the countries with a substantial welfare state (Sweden, Germany and France), Sweden is not the concern, but France is. Both its

current and potential sustainability is considered likely unsustainable. Germany's programs, on both a current and potential assessment, are considered possibly sustainable. This should be a major concern for the European project, for which Germany is considered the linchpin, with France by its side. How will these countries react nationally if their programs prove unsustainable? What will their reaction to Europe be? What will Europe's reaction to them be?

Canada is in a different space in the sustainability-adequacy grid. Its programs are not adequate or inadequate and are assessed as likely sustainable on both current and potential measures. Its retirement program philosophy is to provide considerable room for individual saving and employer-provided pension plans. There is a growing divide in pension plan coverage between public sector workers, with coverage, and private sector workers without access to defined benefit pension plans. If individual savings plays the role contemplated by the philosophy, then the status quo may continue. However, if individual savings are inadequate, there will be pressure to improve the adequacy of the coverage. This could prove challenging for governments if some workers have adequate coverage and others do not. There will not be a one-size-fits-all solution. The positive aspect is Canada's position with respect to sustainability gives it flexibility to adapt.

## **5.0 Conclusion and policy recommendations**

The narrowness of the definition of adequacy, the limited scope of this research and the limitations of this methodological approach have been described. Despite these limitations, there are three policy recommendations I will make.

First, there will be reasons other than laziness why individuals reach state retirement age with little or no income from the state, if the state pension is based solely on the individual's employment earnings and earnings' history. A demogrant, such as provided by Canada, is one way this situation may be addressed. The demogrant can be taxed back if total income exceeds some threshold. This is not to suggest that Canada's approach is the only one or even that Canada has found the right level for the demogrant. It is a continuing source of policy blindness in Canada that income provision for the elderly focuses on pension reform based on employment earnings rather than increasing the level of the demogrant, which would have far wider reach.

Second, LTC provision and its associated cost is just beginning to receive the attention it will require. Given increasing longevity, aging populations, smaller families, and changing social attitudes toward the family and its obligations to provide care, to name but a few drivers, LTC will be an increasingly important area for public policy debate in the coming decades. The characteristics of the risk associated with requiring LTC makes insurance an appropriate solution. Some of the policy debate points include:

- All individuals may require LTC at some future time
- Yet not all individuals will require LTC

- It is difficult to determine in advance which individuals will require LTC and the extent of care required
- The cost of LTC can be significant

For a variety of reasons, private LTC insurance has had limited take-up. Elsewhere, I have argued that LTC insurance should be provided as social insurance (Andrews 2011). However, I accept that the approach of mandated private insurance, as used in Germany, can produce appropriate results. The policy recommendation is that some form of comprehensive universal LTC insurance needs to be in place to ensure the elderly are adequately protected.

Third, the research with respect to expenses suggests that a couple only incurs about 1.4 times the expenses incurred by a single individual. Many state pension plans calculate the survivor's pension at 55 percent, such as Germany and Sweden, or 60 percent, such as Canada, of the primary pension. The research on expenses suggests this is too big a reduction. If the primary pension were just adequate, then a survivor benefit of 70 percent of the primary pension would be required to be adequate.

This research has made several contributions to the study of the adequacy of care and support systems for the elderly in developed countries.

1. It has considered the combined effect of social security, health care and LTC in assessing adequacy.
2. It has employed the fuzzy-set methodology to this issue, resulting in a combination of a quantitative and qualitative assessment.
3. In combination with the sustainability research, it has shown how different countries face different challenges, i.e., the United States has current issues regarding adequacy and sustainability, Sweden's programs are mainly adequate and likely sustainable, and France's programs although mainly adequate are likely unsustainable.

In all these ways, this research sets the stage for further investigation, which may lead to social policy development.

## **6.0 Acknowledgements**

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