

## **FINAL REPORT**

### **A Profile of Social Isolation in Canada**

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## **EXECUTIVE SUMMARY**

### **A Profile of Social Isolation in Canada**

Social isolation is a complex concept comprised of multiple dimensions including physical, social, emotional, and psychological. It operates at the individual, community and societal level. Despite its complexity, or perhaps because of it, a greater understanding of social isolation is needed because of its inter-relationship with the social determinants of health.

Drawing on the National Population Health Survey, this research provides a cursory look at the characteristics of older Canadians who are more or less at risk of social isolation. While results are preliminary, and at times caution should be used in their interpretation, they begin to craft a profile of older Canadians experiencing social isolation and allow for the examination of the potential consequences of this social concern. Issues relevant to policy discussions and knowledge gaps are also identified to advance much needed work on this topic.

Social integration and the participation of older adults in society are often considered indicators of healthy aging and healthy communities. However, an increasing number of seniors may be at risk of being socially isolated. This can be precipitated by a number of factors such as increased likelihood of living alone in older age, multiple role loss through retirement or the death of a spouse, mobility problems, financial difficulties and/ or poor health. Such factors often intersect and overlap.

Differences in study design, sample and measures contribute to the challenges in understanding social isolation and its respective dimensions. Consequently definitive results of who are socially isolated, what are its contributing factors and its health-related outcomes continue to elude researchers. In addition, the potentially circular nature of the components of social isolation makes it difficult to discern whether certain variables are contributors or consequences of social isolation.

#### ***Research Findings***

This research set out to analyze Canadian data to identify the characteristics of the older population thought to place people at greater risk for being socially isolated. In recognition of the multi-dimensionality of social isolation we wanted to better understand the profile of individuals vulnerable in different dimensions and the way in which being vulnerable in one dimension of social isolation may place people at risk of being vulnerable in other dimensions.

Using the 2002-03 National Population Health Survey (NPHS) a sub-sample of 2179 persons aged 65 and older was extracted to explore the research questions. Using a number of social variables from the NPHS file, a composite index of risk factors to measure social vulnerability was constructed. This index is

an attempt to create a unified description of an individuals' social situation, which takes into account multiple, potentially interacting, social factors. We use the term 'level of social vulnerability' as the index does not necessarily measure social isolation in and of itself but is a composite of risk factors to measure vulnerability to be socially isolated.

*Research Question #1: What characteristics of the population are thought to place people at greater risk for being socially isolated?*

When controlling for the influence of other variables, age, education, rurality and co-morbidity are statistically significant predictors of levels of social vulnerability. More specifically, increasing age, less education, urban residence, and higher number of chronic illness are associated with higher level of social vulnerability.

*Research Question #2: Are there particular characteristics of individuals that place them at higher risk for vulnerability for specific dimensions of social isolation?*

Social isolation has many dimensions and the ways in which it is measured vary and are often dictated by available data. A factor analysis technique was used to assess the social vulnerability index and helped to develop the five dimensions: support for instrumental activities of daily living (IADLs), emotional support, engagement in physical leisure activities, mastery and sense of life control, and home living situation.

When items comprising the dimensions were considered, a greater proportion of older Canadians with little support from others for instrumental activities of daily living and psycho-social support are at increased risk of social isolation. Thus, it appears that having someone or a network of individuals to provide support is important in understanding those at greater risk of social vulnerability than perhaps other items such as participation in leisure-physical activities, control over one's life and living arrangements.

*Research Question #3: In what ways does being vulnerable in one dimension of social isolation place people at risk of being vulnerable in other dimensions?*

In assessing each social vulnerability dimension, we first examined the influence of seven individual characteristics, followed by analysis assessing the influence of the social vulnerability dimensions. Results suggest that the impact of individual characteristics varies even before considering the impact of other social vulnerability dimensions. For example, men and women are at risk of different dimensions of social vulnerability. Not surprising, women are more at risk for low support with IADL, reduced activity and living alone/without spouse, whereas men are more at risk for low emotional support. Older seniors, compared to younger seniors, are at greater risk for low IADL support, less frequent engagement in physical activity and increased likelihood of living

alone/without spouse. The decreased probability of engagement in physical activities as one ages poses an important question about cause and effect. Are older seniors less likely to participate because they have a chronic illness or does having a chronic illness restrict their ability to and frequency of participation?

Inter-relationships exist among the various dimensions that comprise the social vulnerability index reinforcing the notion that social isolation is a complex phenomenon. For example, with respect to the IADL and emotional support dimensions, respondents at risk for one are 15 times more likely to be at risk for the other dimension of social vulnerability.

*Research Question #4: Preliminary look at consequences of social isolation on health outcomes.*

Social isolation can have physically and emotionally damaging effects resulting in depression, poor nutrition, decreased immunity, anxiety, fatigue, and social stigma. Independently or collectively, these conditions are likely to impact on survival. To examine this relationship, older Canadians from the 1994 NPHS were grouped by level of vulnerability into deciles and then assessed in 2002 to determine the extent of survival (8 years later). Preliminary results presented in this report suggest that a higher proportion of older Canadians at greater risk of social vulnerability in 1994 were deceased in 2002 compared to those at lower risk of social vulnerability - even when controlled for age and sex. This preliminary finding points to the need for further analysis including economic modeling of the consequences of social isolation.

#### *Policy Issues for Consideration*

This preliminary analysis raises issues that government policy makers may want to take into account when considering the profile of older Canadians who might be socially isolated and the long term consequences of their social isolation.

#### *Social vulnerability / isolation versus community engagement*

- Social isolation and vulnerability are inter-related to the broader questions of community and participation and support by members of the community whether it is a geographical location, a cultural boundary or a temporal intersection of people. How then do we create these idealized caring communities? What is the role of government in facilitating support without replacing the undeniable importance of the volunteer hours and support provided by family and friends?

#### *Social isolation and importance of chronic home support services*

- Findings from this preliminary analysis suggest that older people, especially older women, are at risk for deficits in perceived support with

instrumental activities of living. Fundamental to a discussion of risk factors of social vulnerability is an examination of programmatic shifts in the delivery of home support services in many provinces in Canada. Are there outcomes of being unable to receive home support services as a consequence of policy shifts towards “Short term acute home care services” ? For example, a) the older person moves closer to a family member to receive the support they would have received in the community from home support services and moves away from a network of friends and neighbours with whom they connected; or b) the person can no longer engage in activities such as grocery shopping, or banking because of transportation and mobility issues. Home support no longer may offer these services. As a result their world shrinks, groceries are delivered, and banking is done by others and their risk for social isolation increased.

### *Social Isolation and the need to use a Rural and Cultural Lens in Policy Analysis*

- Although transportation and its relationship to participation and engagement was not addressed specifically in this research, we know that it is a critical facilitator for participation and may be more or less available depending on geographical location. Public transportation services tend to be limited to urban areas. Distances to services, social functions etc., in rural areas may also make use of taxis, if available, cost prohibitive.
- Social isolation may have different meanings and experiences in different cultures. Among recent immigrants to Canada, the elderly may endure greater barriers to participation and engagement because of language, cultural norms, distinct gender expectations and so on. Thus, the availability of supportive community groups to facilitate programs and culturally sensitive activities will be increasingly important.

### **Knowledge Gaps**

One challenge to research in the area of social isolation/social vulnerability is the limited consensus on definitions including the conceptual overlap of social isolation, social vulnerability, or social exclusion, on the negative side, and on the positive side, social integration, social engagement, and social capital. A comprehensive and validated index of social isolation needs to be developed. This research has put forth one approach however more research on “fine tuning” this approach and comparing its applicability using other data is necessary before it can be validated.

The complexity of the inter-relationships involved in social isolation and their consequences or outcomes is difficult to capture. Previous research does not provide definitive guidelines as to the specific component of the model. In the future, structural equation modelling may be helpful to delineate the inter-relationships that exist among the variables. Further research is needed to

advance our understanding of the relationship between social vulnerability and health outcomes.

### *Data Gaps*

Few surveys measuring social isolation are longitudinal in nature (England Longitudinal Study of Aging (ELSA), the NPHS and Aging in Manitoba (AIM) study being exceptions). However, one challenge with both the NPHS and the AIM is sufficient sample size to enable complex multivariate analysis. However, the AIM study has the advantage of complete health utilization data that can be used for outcomes other than mortality.

A second challenge is the consistency in variables used to measure social vulnerability/isolation. For example, in the NPHS a number of questions addressing social interaction (e.g., frequency of contact with family, friends, and neighbours) asked in the 1994 survey were dropped by the time of the 2002 survey.

There are additional data sources that may be useful to understanding social isolation but were beyond the scope of this research. The 2002 Canadian Community Health Survey on Mental Health and Well-Being and the 2003 General Social Survey on Social Engagement has a number of variables that could be used to explore social isolation. An additional area of research is to utilize these data files to further develop the index of social vulnerability and to understand the factors which contribute to placing Canadians at risk for social isolation.

Finally, researchers are working to develop the Canadian Longitudinal Study of Aging (CLSA). Hopefully, a comprehensive measure of social isolation will be available the data collected so we can further advance our understanding of the social isolation of older Canadians.

### *Next Steps*

This research is an initial step in advancing our understanding of social isolation. Further indepth analysis is needed to comprehend the complexities and inter-relationships of social isolation. In addition, beyond the scope of this report, we need to investigate what affect, if any, interventions have on the social isolation of individuals. A review of policies and programs that may impact on social isolation is the focus of the second phase of this research.

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## **1.0 Introduction**

Social integration and the participation of older adults in society are frequently seen as indicators of both healthy aging and healthy communities. However, an increasing number of seniors may be at risk of being socially isolated. This can be precipitated by a number of factors such as increased likelihood of living alone in older age, multiple role loss through retirement or the death of a spouse, mobility problems, financial difficulties and/ or poor health. Social isolation affects multiple stakeholders, including the individual in terms of declining mental and physical health, inappropriate service utilization, premature institutionalization and perhaps death, as well as the community/society in terms of lack of social cohesion, inappropriate service usage and reduced benefit from their lack of participation in community activities.

While there appears to be considerable interest in social isolation and loneliness, the issue is complex and the research to date is meager and inconclusive. In particular, debate about the relationships among isolation, loneliness and health exists. Further, there is little information about the extent of the issue and a profile of Canadian seniors who are isolated. Given the social and economic costs of social isolation, attention is warranted. Drawing on the National Population Health Survey, this research provides a cursory look at the characteristics of older Canadians who are more or less at risk of social isolation. While results are preliminary, and at times caution should be used in their interpretation, they begin to craft a profile of older Canadians experiencing social isolation and allow for the examination of the potential consequences of this social concern. Issues relevant to policy discussions and knowledge gaps are also identified to advance much needed work on this topic.

## **2.0 What do we know about social isolation?**

### **2.1 What is it?**

Social isolation is multidimensional. It encompasses physical dimensions, mental health and psychological dimensions, and social dimensions (Delisle 1999, Delisle 2005). It can be more or less severe, and has a temporal dimension; that is, it could be permanent, periodic, or episodic if related to life cycles or life transition phases.

While empirically social isolation is measured and defined in numerous ways, essentially social isolation denotes a lack in quantity and quality of social contacts (Delisle, 1988). In other words, a situation of social isolation involves few social contacts and few social roles, as well as an absence of mutually rewarding relationships with other people. This situation can occur at any age, but it is generally accepted that in older age it is often a result of retirement and the loss of daily contacts related to work, from death of family members or friends, or through a change of residence that may be necessitated by declining

health coupled with the absence of regular caregivers. Related positive concepts of social isolation include aloneness and solitude which denote separation from others, but due to choice. Related negative concepts of social isolation include loneliness, estrangement and alienation, and feelings associated with separation that are unwelcome (Fioto, 2002).

While the concept of social isolation refers generally to individual situations, it should be noted that these situations are socially determined. Most older Canadians are integrated within their families and communities, but opportunities for interactions can be affected by such trends as changing family structures that reduce access to familial supports among those with no/few children and/or those who become divorced or separated, and changing access to social resources such as the dismantling of the welfare state and with it, provisions for those in need of supportive resources (Penning, 2005). Likewise, physical location may impede or prompt interaction; namely, living in a remote area, residential segregation in urban environment or the occupation of some places by groups permanently or at some periods (e.g., segregated housing, senior centers). Social isolation, therefore, occurs on three levels, at the individual level (micro), the community level (meso) and at the level of greater society (the macro level) (Delisle 1999, Delisle, 2005).

## 2.2 How is social isolation measured?

Social isolation as a concept is complex, presenting challenges with attempts to define and measure it. There are challenges associated with secondary data sources in terms of question availability, unit of analysis (e.g., individual or community) or cross sectional or longitudinal data, and differences in approach to understanding the concept – social isolation or its converse social integration, engagement or connectedness. Further, some research has focused specifically on a more subjective aspect of social isolation, namely loneliness.

The Bangor Longitudinal Study of Ageing (BLSA) conducted in rural Wales from 1979 to 1999 constructed measures of social isolation and loneliness to understand the extent and experience of social isolation over time among those 65 years of age and older (Wenger & Burholt, 2004). The indicators of social isolation used in this study were objective and included: living alone, absence of close relatives, no visits with other people, no contact with neighbours, no telephone calls, being alone for more than nine hours a day, living a far distance from the nearest neighbour, and never leaving the house. In the same study, indicators of loneliness were subjective and included: feeling lonely much of the time, not seeing enough of friends and relatives, not meeting enough people, no confidant, wishes for more friends, has no one of whom to ask favours, has no real friends living nearby, spent the previous Christmas alone and lonely.

A 1996 Aging in Manitoba study explored social isolation and loneliness as two outcomes to examine differences between older rural and urban Manitobans.

(Havens, Hall, Sylvestre & Jivan, 2004) Social isolation was measured using the Life Space index (Cumming, Henry & Newell, 1961 in Havens, Hall, Sylvestre & Jivan, 2004) a measure that is based on an estimate of social interactions with family, friends, neighbours, co-workers, and others in the community.

Stone (n.d.) used the 1994 Canadian National Population Health Survey to construct three dimensions of social isolation and identified risk factors for Canadians 12 years of age and older. The risk factors included: social participation (e.g., meeting and church attendance, organizational memberships), contact with significant others (e.g., family, friends, neighbours) and perceived social support (e.g., someone to confide in, help in times of need, support with advice, make them feel loved). These dimensions were combined to assess the extent to which Canadians 12 years of age or older were at risk of social isolation.

More recently, a UK study on social exclusion (Office of the Deputy Prime Minister, 2006) using 2002-3 data from the English Longitudinal Study of Ageing (ELSA) constructed seven dimensions of social exclusion. They included both individual and community level characteristics as follows: social relationships (contact with family and friends), culture and leisure activities (e.g., going to cinema or theatre), civic activities (e.g., group membership, voluntary work, voting), basic services (e.g. health services, shops), neighborhood characteristics (e.g., safety, friendliness), financial products (e.g., bank account, pension), and material goods (e.g., consumer durables, central heating).

As can be seen from this cursory review, differences in study design, sample and measures contribute to the challenges in understanding social isolation and its respective dimensions.

### 2.3 Who is socially isolated?

As evidenced previously, it is not surprising that reports of prevalence range from 10% - 90%, depending on the populations studied and the definitions used (Delisle, 1988; Duggan & Kivett, 1994; Forbes, 1996; Hall, Havens & Sylvestre, 2003). For example, in the UK study mentioned above, the risk of exclusion for all older people varies from 9% for services compared to 13% for neighborhood characteristics. Approximately 20% were found to experience exclusion on two or more of the seven dimensions examined (Office of Deputy Prime Minister, 2006).

Gender differences have not been fully explored in many studies with some suggesting women are at greater risk (Kivett, 1979) and others that men are at greater risk (Mullins & Elston, 1996; Mullins et al., 1996). A Manitoba study, for example, found that women were more likely to be widowed, live alone, and experience poorer health; however, female gender was not found to predict either social isolation or loneliness (Havens et al., 2004). Other sub-populations

of seniors may also be a risk, such as the geographically isolated, those living in poverty, and those who may be isolated because of cultural expectations and/or language.

#### 2.4 What factors/conditions contribute to social isolation?

Social isolation, defined as the separation of individuals or groups, results from the lack of or minimizing of social contact and/or communication. This separation may be from a combination of socio-economic/cultural factors which interact with individual characteristics and may be accomplished by physical separation, by social barriers and by psychological mechanisms. In the latter, there may be interaction but no real communication. For example, relations in pre-industrial society were guided by the logic of mutual assistance, where extended families were the norm and older family members were cared for as long as possible. With industrialization, however, young adults have tended to separate from their families, and extended families have become scarce. At the community level, social isolation will be less likely if mutual assistance is a principle in the community and if reciprocity is the norm. Personal social skills obviously also influence the experience of isolation. These are more developed for some people than others, and are determined partially by culture, social class and gender. (Hall, 2005, paraphrasing Delisle).

Research into social isolation has consistently found a link to various individual and social characteristics related to older age. Female gender, widowhood or divorce, culture, education, income, and health have all been found to influence the experience of social isolation (Adams, Kaufman & Dressler, 1989; DeJong-Gierveld and Van Tilburg, 1995; Holmen et al., 1992; Mullins & Elston, 1996). Other factors include changes in life events such as retirement and widowhood, nursing home placement, living alone, reduced participation in social activities and transportation problems (Hicks, 2000; Holmen et al., 1992; Ryan, 1998; Walker & Beauchene, 1991; Woodward & Queen, 1988).

Similarly, social structures, such as social networks and social support, are also considered contributing factors. Chappell and Badger (1989) concluded that social networks can affect one's psychological well being. The size of the social network presumably measures one's potential social supports, which is the actual interaction with others including the assistance that a person provides and/or receives from another. Social networks can therefore be viewed as the structure through which social support may be provided and that facilitates interaction. They are the ties that link people together in definable patterns, such as family relations, friends, colleagues, or acquaintances (McDowell & Newell, 1987).

While the research has shown all these risk factors to be associated with social isolation, it has been difficult to determine inter-relationships among them. One aspect that has received a lot of attention in relation to social isolation is that of

poor health. For example, does poor health lead to isolation, or does living in an isolated situation predispose one to poor health?

Many researchers have documented a negative relationship between isolation and/or loneliness and health. Mullins and colleagues (1996), for example, found that a decline in physical mobility may impede one's ability to get out and about and therefore interact socially. Similarly, poor oral health or a decline in vision and hearing can affect the ability to communicate which can have an isolating effect. Recent research from the USA found that disease combined with disability in later life has a significant impact on social engagement, thereby influencing life satisfaction (Jang, Mortiner, Haley & Borenstein Graves, 2004). Keller-Cohen and associates (2004) have also reported that communication skills may be diminished with social isolation. It has also been suggested that a poor self-rating of health and low morale might exacerbate social isolation (Wenger, Davies, Shahtahmasebi & Scott, 1996). For those who become ill and are homebound, home care workers may provide the main social contact (Hall et al., 2003). Illness can also be especially limiting for caregivers, who are often spouses. When caregiving becomes a full-time activity, the spouse's opportunities for social contact also become severely restricted (Hall & Havens, 1999).

The direction of causality between social support and health is unknown; that is, the lack of a social support network may lead to ill health, but also, ill health may lead to disintegration of social support. Auslander and Litwin (1991) found that people who viewed their social networks as supportive showed a higher level of emotional and functional health, resulting in higher self-ratings of health. In another study, Foster and Stoller (1992) examined the impact of health and social support on mortality of people aged 65 or older. They found no evidence that a larger social network or help with instrumental activities increased the likelihood of survival.

## 2.5 What are the consequences of social isolation?

As discussed above, the complexity of social isolation results in difficulties in determining inter-relationships among various factors and also understanding their roles as contributors or consequences of social isolation. For example, the relationship between social engagement and health service use, either more or less use, is not conclusive: Fiota (2002) suggested that people who have a good social support system have assistance and encouragement and this underlies the reason why they are more apt to seek medical care and adhere to their therapies. Conversely, some researchers have found an increase in the use of health care services such as home care, and medication use has been associated with the perception of a restricted social environment (Bosworth & Schaie, 1997; Hall & Havens, 1999; Russell, Cutrona, & de la Mora, 1997; Wilkins & Beaudet, 2000). Penning (1995), however, found that isolated seniors with high levels of instrumental support from families tended to use fewer services, and it has been suggested that social support may exert an indirect

influence on health status and service use through need or perceived need (Kouzis & Easton, 1998).

Research has consistently demonstrated a strong association among isolation, loneliness and health, yet debate remains as to which is the cause and which the consequence (Ryan, 1998). Research suggests loneliness may result from less contact with others due to ill health (Jerrome, 1991; Mullins et al., 1996), while others feel that loneliness and limited social contact precede ill health (Cattell, 1988; Koedoot & Hommel, 1993; Ryan & Patterson, 1987; Wenger, 1984). Both the physical and emotional damaging effects of social isolation may contribute to depression, poor nutrition, decreased immunity, anxiety, fatigue, and social stigma. Collectively these factors may make it difficult for an individual to feel confident in establishing/maintaining contacts resulting in diminished social contacts, and may even contribute to premature institutionalization and death.

Numerous social factors have been individually associated with health. These include: socio-economic status, social inequalities, income, social status, control over life situation, social support, social networks, social engagements, social capital (individual vs group) and social cohesion. Each of these factors represents a distinct body of literature leading to fragmentation of research. As a consequence potentially complex interactions and relationships among the social factors are not taken into account. There is also the problem of definition: different authors define the terms differently such that what one authors considers as social support, another might term social network. Andrew argues (2005; 2006) that because there are not clear distinctions among the numerous social factors that contribute to overall social vulnerability, measures of social isolation should be conceptually unified, rather than compartmentalizing factors that potentially interact.

In conclusion, forthcoming research on social isolation should require 'methodological imagination' because of the holistic character of the phenomenon and the realization that the previously discussed factors and conditions often feed vicious cycles of negativity that present challenges for research.

While the aging process itself forces people to change relationships and roles (as in married people becoming single again due to death of the spouse, or workers becoming retired), the remaining question is why some older people are more likely to experience the negative consequences of isolation than others. Knowing the characteristics of these individuals and the circumstances of their communities would help to determine what might be done to help. Also, understanding an individual's ability to participate, the quality of their participation, as well as the community's ability to encourage participation can help to enhance individual capacities on the one hand and community capacities on the other.

### **3.0 Using the National Population Health Survey to explore social isolation**

This research explores characteristics of older Canadians who are more or less at risk of social isolation.

#### **3.1 Data source**

The 2002-03 National Population Health Survey (NPHS) was the primary data source for this research. The (NPHS) is a longitudinal study that began in 1994-95 and has interviewed Canadians every two years since that time to collect information related to the health of the Canadian population. The survey consists of 17,276 persons of all ages. It excludes populations residing on Native Reserves, Canadian Forces Bases, some remote areas in Quebec and Ontario, as well as residents of health care institutions with four or more beds who were expected to remain there longer than six months.

The NPHS was selected for our study because it includes a broad range of social and health variables, and is longitudinal, allowing for assessment of mortality and health outcomes. Variables relevant to this research include measures of social support and sense of coherence (e.g., finding life meaningful, manageable and comprehensive), demographic and social-economic variables (e.g., age, education, gender, marital status, number of chronic conditions and rural residence), self perception of health, a health status index and health-related outcomes of chronic conditions.

#### **3.2 Research questions**

1. What characteristics of the population are thought to place people at greater risk for being socially isolated?
2. Are there particular characteristics of individuals that place them at higher risk for vulnerability for specific dimensions of social isolation?
3. In what ways does being vulnerable in one dimension of social isolation place people at risk of being vulnerable in other dimensions?
4. What are the consequences of social isolation on health outcomes?

#### **3.3 Analysis**

In an effort to investigate social isolation and identify variables to specifically measure the concept, we began to more appropriately, we believe, use the term social vulnerability. This nuance in terminology is important as the index does not necessarily measure social isolation in and of itself but is a composite of risk factors that describes someone's vulnerability to be socially isolated. Hence in

the following section, we use the term “level of social vulnerability” as opposed to level of social isolation.

Using a number of variables from the NPHS file, an index to measure social vulnerability was constructed (see Appendix A).<sup>1</sup> This index is an attempt to create a unified description of an individuals’ social situation, which takes into account multiple, potentially interacting, social factors (Andrews 2005; 2006). It is similar to a previously described and validated index put forward by Mitniski et al. (2004) in their examination of frailty.

Numerous social variables were used in the construction of the social vulnerability index, including living arrangement, marital status, language, membership and frequency of participation in leisure and physical activities; number of close friends and relatives; extent of control over life’s issues; and perceived levels of social support. A social vulnerability score was computed for each individual. A maximum score was therefore 33, with all items having the same weight. The sample was divided into deciles to elucidate distinctions among degrees of social vulnerability (i.e. least to most). As well, to create clear groupings of social vulnerability and because small sample size of each decile affects the confidence intervals of the data, respondents were divided into thirds, denoting three levels of social vulnerability (i.e. low, moderate, high). In addition, a Principal Components Factor Analysis, varimax rotation, resulted in four factors emerging and accounting for more than half of the variance (53%)<sup>2</sup>. These dimensions of social vulnerability were identified as “perceived support” (20 items), “leisure-physical activities” (3 items), “autonomy and control” (7 items) and “living arrangements” (2 items). Because of the high number of items that loaded on the first dimension and the clear distinction among the items, these 20 items were subdivided into two distinct dimensions - “perceived instrumental support” (4 items) and “perceived emotional support” (16 items). This resulted in five dimensions comprising the social vulnerability index (see Appendix A).

Univariate, bivariate and multivariate analyses were employed to explore the social vulnerability index and its dimensions. For ease of presentation, a description of analysis precedes the results.

### 3.4 Description of the sample

The sample for this research was drawn from the most currently released survey, 2002-03. It involved 2179 persons aged 65 and older. The average age of this sub-sample was 75 years, 60% were female and almost half were married (see Table 1). One in five was classified as low income, and one in five lived in rural areas. Almost half had at least three chronic health conditions/illnesses.

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<sup>1</sup> Access to the NPHS data file for this research was made possible under the umbrella of a Data Access Agreement with the Atlantic Regional Data Centre (Andrew et al.).

<sup>2</sup> Three items did not load. They included: rural residence, language and educational attainment. Rural residence and educational attainment were subsequently treated as independent variables.

Table 1 – Description of sample

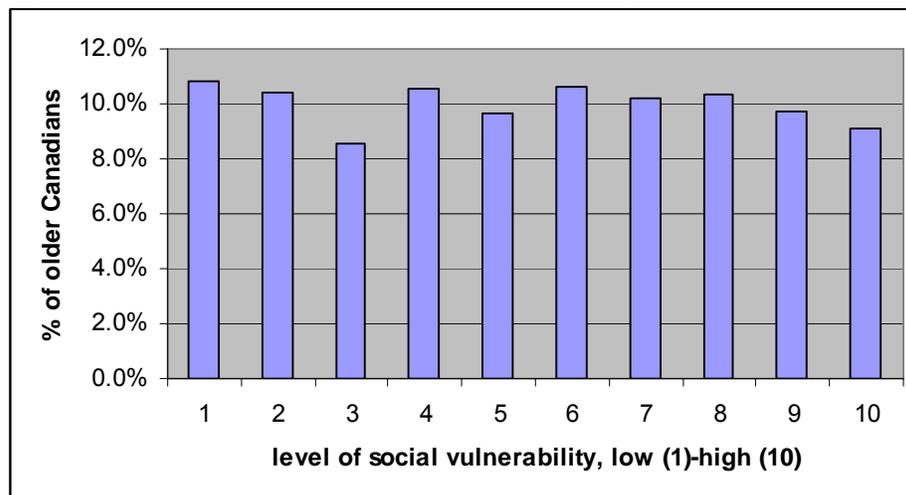
Variables	2002 sample	Confidence interval
Mean Age	74.70 years	74.3-75.1
Less than secondary education	42.6%	39.9-45.4
Female	59.5%	56.8-62.1
Post secondary education	24.5%	22.0-26.9
Married	45.2%	42.5-47.8
Low income	19.8%	17.6-22.2
3 or more chronic conditions	46.5%	42.3-51.9
Rural	19.3%	17.5-21.3

Although most of the analyses presented in this report utilize the 2002-03 NPHS, the analysis assessing the affect of social vulnerability on mortality uses an earlier version of the NPHS. Specifically, a sub-sample of Canadians 65 years of age and older was identified in the 1994-95 NPHS survey and were subsequently followed to their participation, or not, in the 2002-03 survey in order to determine rate of survival.

### 3.5 Assessing social vulnerability and evidence of risk factors

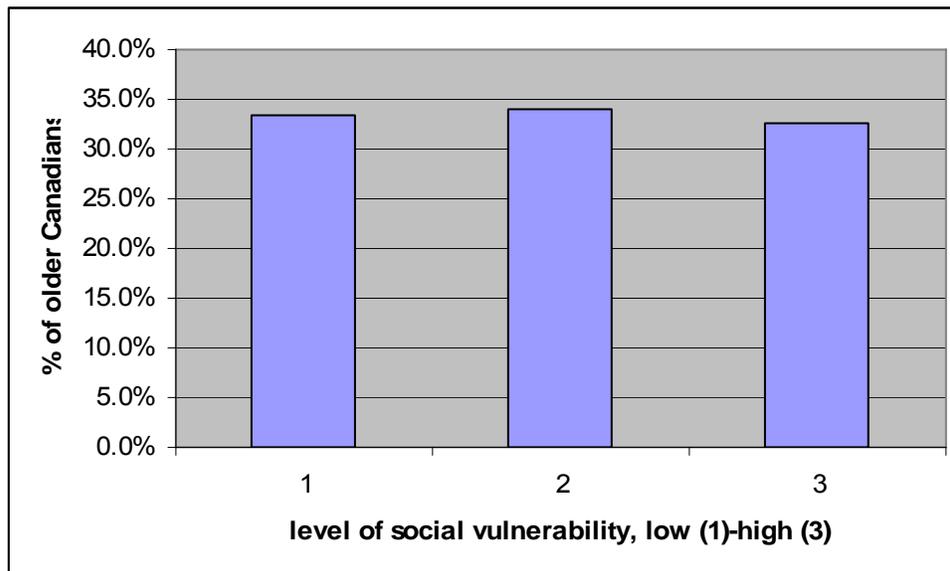
The variables in the social vulnerability index were scored to indicate an overall measure of social vulnerability for each respondent (Min 0, Max 33). For the purpose of presentation we divided the scores into deciles and weighted them to the overall population to eliminate any sampling response bias in the data. These ten groups are presented in Figure 1 with column 1 representing the least vulnerable group and column 10 representing the 10% of the population who scored highest on the social vulnerability index and could therefore be considered by be the most vulnerable group (see Figure 1, column 10).

Figure 1 – Level of social vulnerability among Canadian seniors, deciles (low to high)



Next we regrouped the index denote three levels of social vulnerability – low, moderate, and high.<sup>3</sup> These three categories were used instead of deciles in the subsequent multivariate analyses because a larger sample size in each of the groups is needed when controlling for the complex relationships (see Figure 2).

Figure 2 – Level of social vulnerability among Canadian seniors, thirds



**Research Question #1:** *What characteristics of the population are thought to place people at greater risk for being socially isolated?*

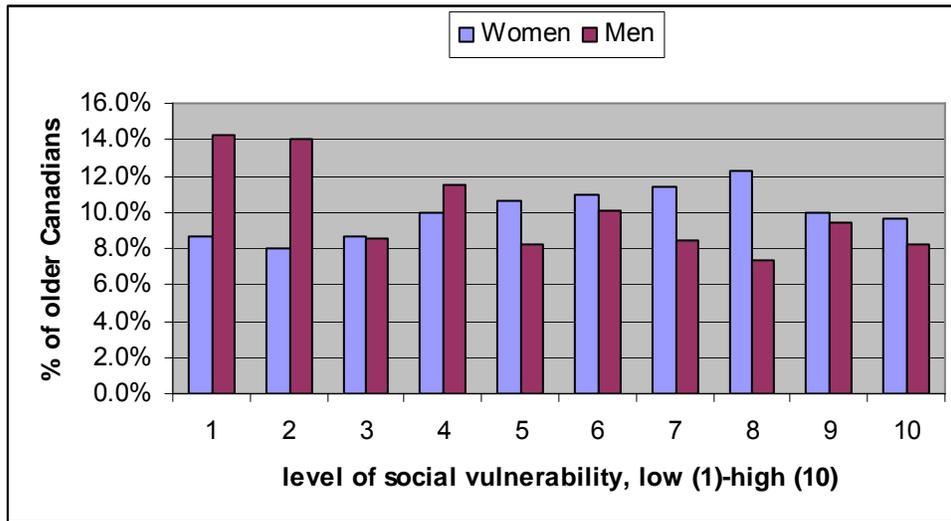
Individual characteristics are often thought to place people at greater risk for being socially isolated. Therefore, cross tabulations of level of vulnerability by specific individual characteristics (i.e., sex, age, education, geographic location, health status) help to build a preliminary profile of the risk factors for social isolation.

First, when examining level of vulnerability by sex we see that women and men have different experiences of social vulnerability ( $p < .01$ ) (see Figure 3). Men are more prevalent in the lower deciles, whereas almost twice as many women as men comprise the 8<sup>th</sup> decile. Few differences in the proportion of women and men exist in the highest deciles, 9 and 10.

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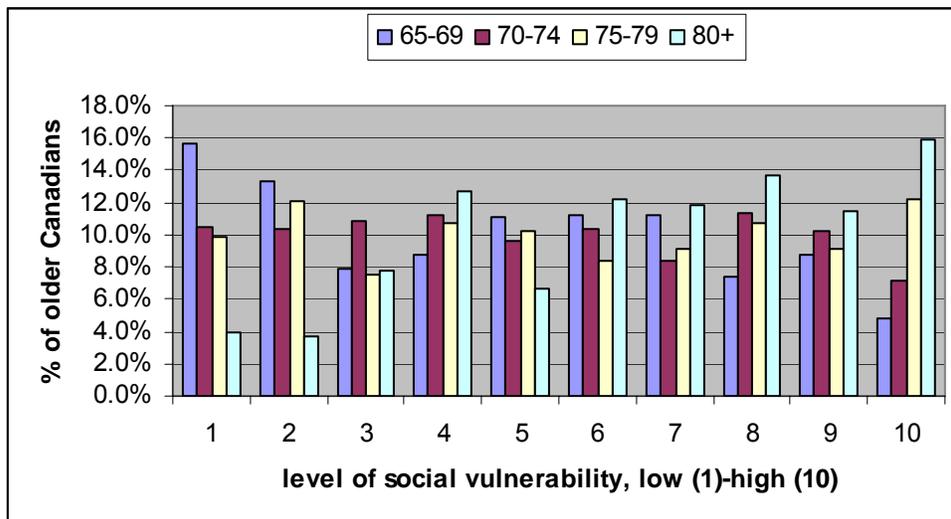
<sup>3</sup> While the sample was divided into thirds, they are not exactly even because the groups were divided using unweighted data and because the index is not exactly continuous.

Figure 3 – Level of social vulnerability by sex, deciles (low to high)



Likewise, age is an important contributor to understanding social vulnerability. Figure 4 demonstrates that as older Canadians age they become at greater risk of higher levels of social vulnerability ( $p < .0001$ ). For example, only 4% of the oldest seniors (80+) are found in the lowest decile compared to almost 20% in the highest decile.

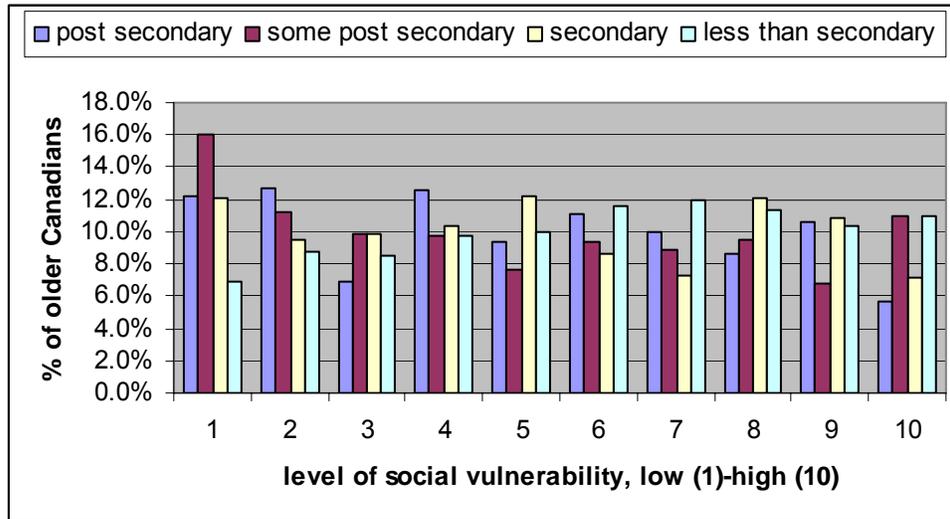
Figure 4 – Level of social vulnerability by age, deciles (low to high)



While sex and age are related to older Canadians' experience of social vulnerability, Figure 5 shows that there is no association between lower levels of education and levels of social vulnerability ( $p = .16$ ). While it appears that a

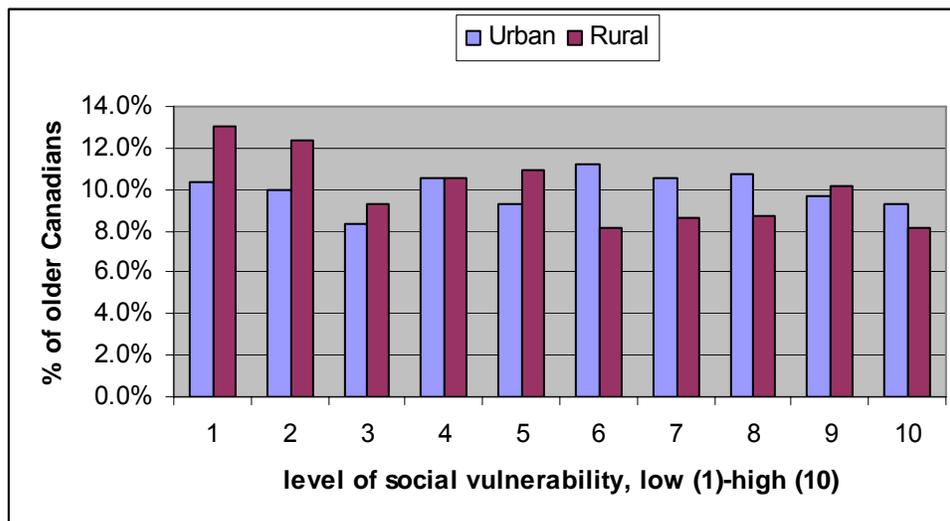
greater proportion of older Canadians with lower levels of education are in the 1<sup>st</sup> decile (low) compared to those with higher levels of education, this pattern does not emerge as expected across the deciles.

Figure 5 – Level of social vulnerability by education, deciles (low to high)



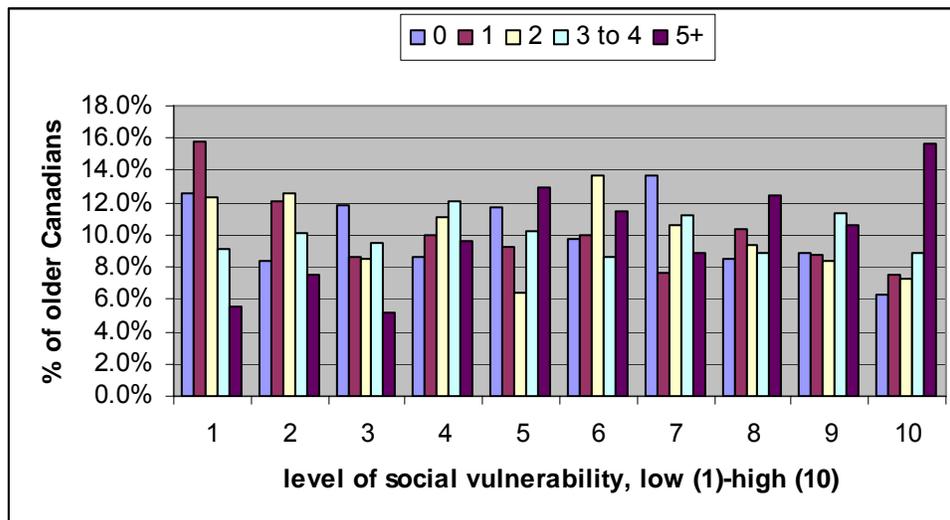
Similarly, geographic location does not play a role in understanding social vulnerability ( $p=.67$ ). Here the trends were less distinct across the levels of social vulnerability for urban dwelling older Canadians, compared to rural older Canadians (see Figure 6).

Figure 6 – Level of social vulnerability by geographic location, deciles (low to high)



Finally, number of chronic health illnesses does not play a role in understanding social vulnerability ( $p=.14$ ). While it appears that a smaller proportion of older Canadians with few chronic illness are in the 1<sup>st</sup> decile (low) and a higher proportion of older Canadians with a higher number of chronic illness are in the 10<sup>th</sup> decile (high), this pattern is not statistically significant across the deciles.

Figure 7 – Level of social vulnerability by co-morbidity, deciles (low to high)



In summary, at the bivariate level female gender and older age are important characteristics in distinguishing levels of social vulnerability in the Canadian senior population.

Next, the results from a linear regression analysis are presented. This analysis controls for each of the above characteristics thereby identifying only those characteristics that are significant risk factors for social isolation. Table 2 demonstrates that all but sex are statistically significant independent predictors of level of social vulnerability. This suggests that previous differences by sex are representing inter-relationships with other characteristics such as age, level of education and so on.

Table 2 – Level of social vulnerability, controlling for individual characteristics

	Coefficient	P value
Age	.1201	.000
Male sex	- .4049	.196
Level of education	1.2003	.001
Rural residence	- .6769	.046
Co-morbidity	.312	.000

Increasing age, less education, urban residence, and higher number of chronic illness are associated with higher level of social vulnerability. In other words, when controlling for all of the other individual characteristics in the model, social vulnerability increases incrementally ( $p < 0.001$ ) for every year of increased age, for each decrease in educational level (between the four categories of education) ( $p < 0.001$ ), and with each additional chronic illness ( $p < 0.001$ ). Additionally, rural dwellers are less socially vulnerable than urban dwellers ( $p = 0.05$ ).

Research Question #2: *Are there particular characteristics of individuals that place them at higher risk for vulnerability for specific dimensions of social isolation?*

As the literature suggests, social isolation is a multi-dimensional concept, and the ways in which it is measured vary and are often dictated by available data sources. This research has developed a unique multi-dimensional measure of social vulnerability based on 33 items. Five dimensions have been constructed: perceived support for instrumental activities of daily living (IADL), perceived emotional support, sense of autonomy-control over life issues, participation in leisure-physical activities, and living arrangements. While these dimensions collectively speak to social vulnerability, the question remains as to what extent, individually, they contribute to our measure of vulnerability. Also, are there key variables that are related to one dimension more than another? To explore these questions, we first examined the associations between individual characteristics and each dimension of the index (see Table 3)<sup>4</sup>. Following this, when possible, individual items comprising the dimensions are examined in terms of level of social vulnerability (see Figures 8 through 12).<sup>5</sup> Finally, we employed regression analysis techniques to examine the influence of individual characteristics and the various dimensions in understanding what more or less explains the various dimensions of the social vulnerability (see Figure 12).

When examining the relationships between individual characteristics and individual dimensions of social vulnerability, it appears that no pattern exists (see Table 3). For example, sex is related to social vulnerability dimensions of IADL support, leisure-physical activities and living arrangements; age is related to IADL and emotional support, leisure-physical activities' dimensions, and rural is related to dimensions measuring perceived support and living arrangements, and number of chronic conditions is related to sense of control over life issues and engagement in leisure-physical activities.

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<sup>4</sup> Depending on the variable, these associations were measured using chi-square, t-test and correlational analysis.

<sup>5</sup> Not all dimensions of SV or all items contained in the SV index are represented here due to insufficient cell size and respondent confidentiality being at risk.

Table 3 – Significance of associations between individual characteristics and social vulnerability dimensions (√ denotes statistically significant relationship)<sup>6</sup>

	Perceived IADL support	Perceived emotional support	Autonomy-control	Leisure-physical activities	Living arrangements
Sex	√	X	X	√	√
Age	√	√	X	√	Not available due to cell size
Rural	√	√	X	X	√
Co-morbidity	X	X	√	√	X

In particular, the men were more likely to report engagement in leisure-physical activities, lower IADL vulnerability and better living arrangements' scores resulting in decreased vulnerability on these three dimensions. The older seniors in our sub-sample reported higher deficit scores on IADL and emotion support and leisure-physical activities resulting in increased vulnerability on these dimensions. Rural dwelling seniors had lower deficit scores for perceived support (IADL and emotional) and better living arrangement scores resulting in less vulnerability on these three dimensions. Finally, those individuals with more chronic conditions were more vulnerable in terms of engagement in leisure-physical activities and control over their life situation.

Next we select a sub-sample of individuals with deficits (e.g., few people in their network, less engagement in activity, little control) and compared individual items comprising the various dimensions by the three levels of social vulnerability, low, moderate and high (see Figures 8 through 12). The patterns demonstrated in Figure 8 and 9, illustrating perceived support, are different than the patterns for the leisure-physical activity dimension and the autonomy-control dimension.

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<sup>6</sup> For example, for sex the √ symbolizing significance means that the score on IADL support was higher for men than women.

Figure 8 – Individual items by level of social vulnerability, Perceived IADL support dimension

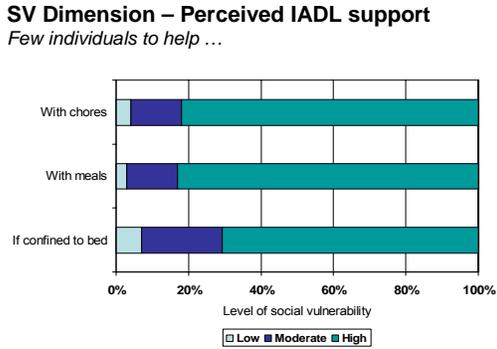


Figure 10 – Individual items by level of social vulnerability, Autonomy-control over life's issues dimension

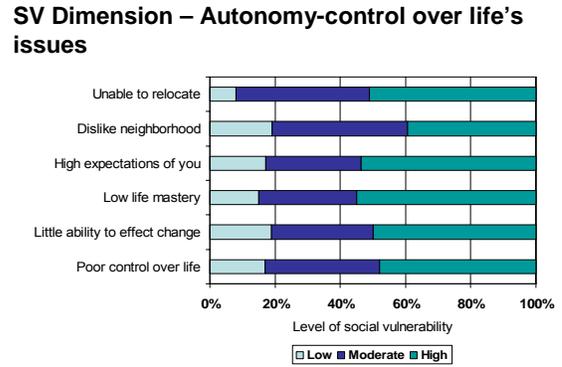


Figure 9 – Individual items by level of social vulnerability, Perceived emotional support dimension

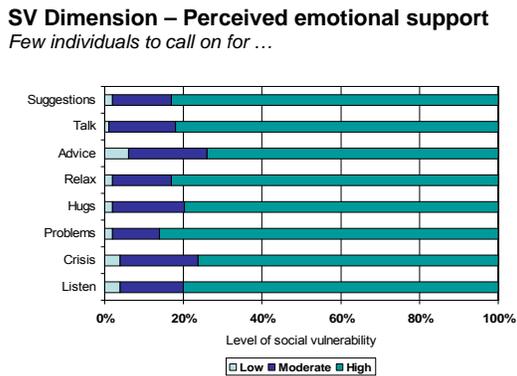


Figure 11 – Individual items by level of social vulnerability, Participation in leisure-physical activities dimension

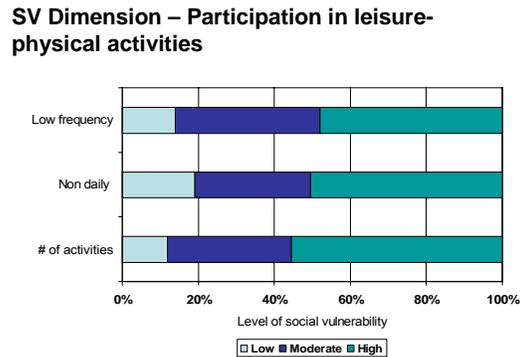
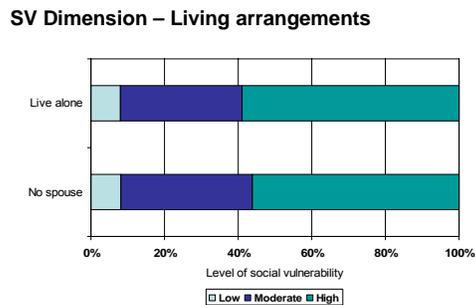


Figure 12 - Individual items by level of social vulnerability, Living arrangements



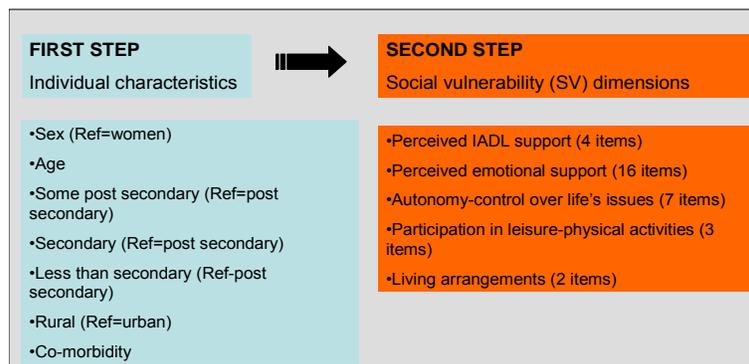
To summarize, a greater proportion of older Canadians with little support from others for instrumental activities of daily living and psycho-social support are at increased risk of social isolation. Thus, it appears that having someone or a network of individuals to provide support is important in understanding those at greater risk of social vulnerability than perhaps other items such as participation in leisure-physical activities, control over one’s life and living arrangements.

**Research Question #3:** *In what ways does being vulnerable in one dimension of social isolation place people at risk of being vulnerable in other dimensions?*

Finally, we examined the likelihood of one specific dimension of social vulnerability or some individual characteristic accounting for any other specific dimension of vulnerability. For example, are those with low perceived support for instrumental activities of daily living more or less likely to be men, be older, have higher levels of education or live in rural communities and also experience problems with emotional support?

Using logistic regression, where each dimension of social vulnerability is divided into two groups – low risk and high risk<sup>7</sup>, we first examined a set of individual characteristics by each of the five dimensions of our social vulnerability index, followed by the other four social vulnerability dimensions (see Figure 13). The first step takes into account the individual characteristics of older Canadians and the second step considers the impact of each of the social vulnerability dimensions. This analysis was undertaken to assess the respective impact of individual characteristics compared to the dimensions of social vulnerability to further our understanding of what characteristics place older Canadians at risk of social isolation.

Figure 13 – Model for logistic regression



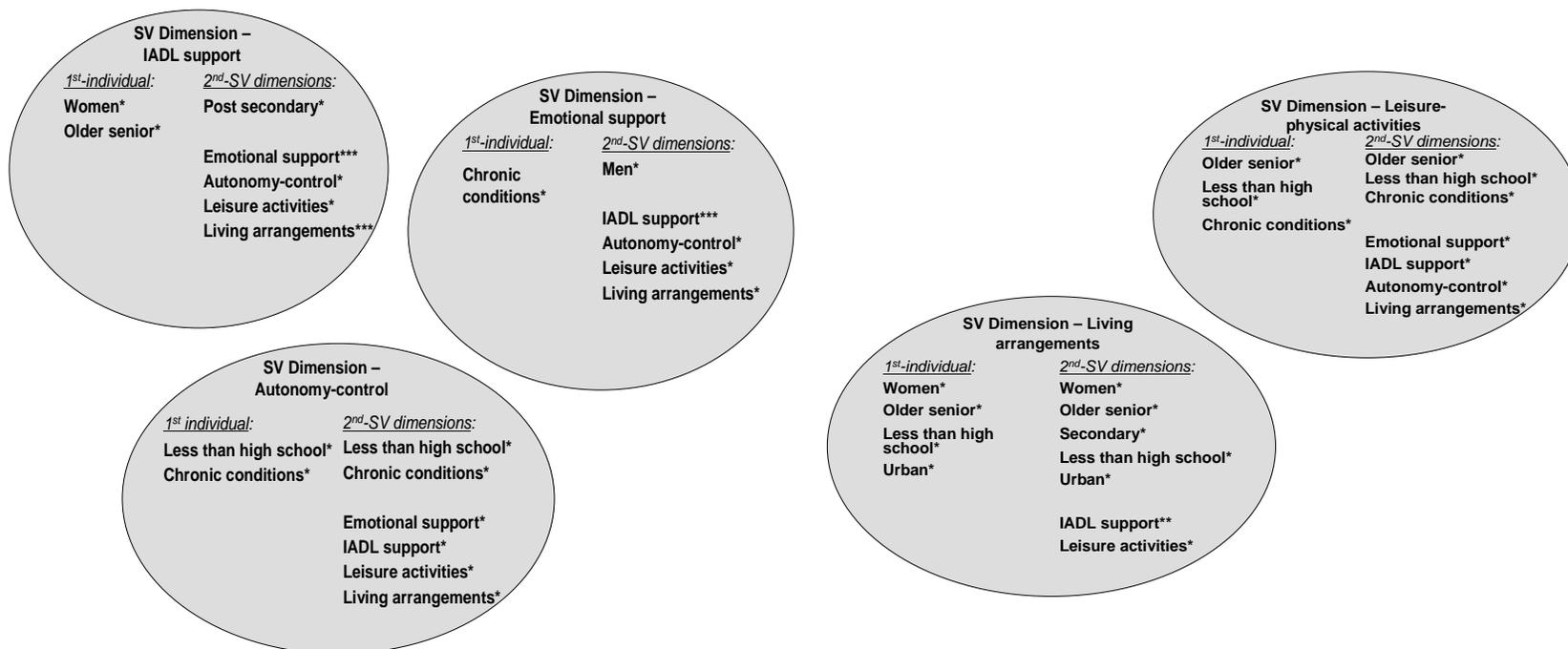
<sup>7</sup> This division was based on approximately 25% of sample with « worst » scores and 25% of sample with « best » scores.

Figure 14 presents the results of the logistic regression analyses for each social vulnerability dimension whereby seven individual characteristics were entered on the first step in each model, followed by a second block containing the social vulnerability dimensions (see also data tables in Appendix B). Results suggest that the impact of individual characteristics varies even before considering the impact of other social vulnerability dimensions. For example, men and women are at risk of different dimensions of social vulnerability. The figure indicates that women are at greater risk for low IADL support and to live alone or without a spouse while men are at greater risk for low perceived emotional support. The longer life expectancy of women and their greater likelihood of outliving their spouse help to understand these relationships as in later life women are more likely to live alone and to have a smaller network of perceived support to assist with instrumental activities of daily living. Men, on the other hand, are at greater risk of lower levels of emotional support, as over the life course many men have had fewer confidants compared to women.

Older seniors, compared to younger seniors, are at risk of vulnerability in the dimensions measuring perceived IADL support, engagement in physical activity and living arrangements. These findings are understandable given the increase of chronic illness, the greater likelihood of being widowed and of living alone as one ages. The decreased probability of engagement in physical activities as one ages pose an important question about cause and effect; specifically, are older seniors less likely to participate because they have a chronic illness or does having a chronic illness restrict their ability to and frequency of participation?

Further, only geographic location is a significant predictor of living arrangements meaning that persons in urban areas are more likely to be widowed and/or live alone. Moreover, reinforcing the notion that social isolation is a complex phenomenon, inter-relationships exist among the various dimensions comprising the social vulnerability index. In all analyses with the exception of the "living arrangements" dimension, each of the other four dimensions of social vulnerability makes a significant contribution in understanding the specific social vulnerability dimension being examined. With respect to the IADL and Emotion support dimensions, for example, respondents at risk for one dimension are 15 times more likely to be risk for the other dimension of social vulnerability.

Figure 14 – Relative importance of characteristics in understanding social vulnerability dimensions



**NOTE:**  
 \* denotes odds ratio is at least 1–4 times more likely than reference group  
 \*\* denotes odds ratio is 5–14 times more likely than reference group  
 \*\*\* denotes odds ratio is more than 15 times more likely than reference group

## Summary

The preceding section reaffirms the complexity of social isolation and the likelihood that several social factors are inter-related in explaining this issue. Our research has constructed a social vulnerability index comprised of 33 variables, subsequently grouped into five dimensions. At the bivariate level, sex and age emerge as important considerations in distinguishing levels of social vulnerability. However, when controlling for other individual characteristics (e.g., residence, education, co-morbidity, age), all but sex are statistically significant. This suggests that previous differences by sex are representing inter-relationships with these other characteristics.

When examining the associations between individual characteristics and individual social vulnerability dimensions, no consistent patterns emerged across the dimensions. Men were more likely to have lower vulnerability scores on the dimensions of leisure-physical activities, IADL support and living arrangements'. With increasing age, those in our sub-sample were more likely to show increased vulnerability on IADL and emotion support and leisure-physical activities dimensions. Rural dwelling older Canadians showed lower deficit scores for perceived support (IADL and emotional) and better living arrangement scores resulting in less vulnerability on these three dimensions. Finally, individuals with more chronic conditions appeared to be more vulnerable in terms of engagement in physical-leisure activities and control over their life situation.

Logistic regression analysis was employed to further explore these associations in an attempt to understand in what ways being vulnerable on one dimension of social isolation places older people at risk of being vulnerable on other dimensions. Men and women, older and younger seniors, those in rural and urban communities were found to be at risk of different dimensions of social vulnerability. Moreover, inter-relationships were seen among the various dimensions comprising the index, reinforcing the notion that social isolation is a complex phenomenon.

Next, we examined the consequences of social vulnerability on survival rates.

Research Question #4: *Preliminary look at consequences of social isolation on health outcomes.*

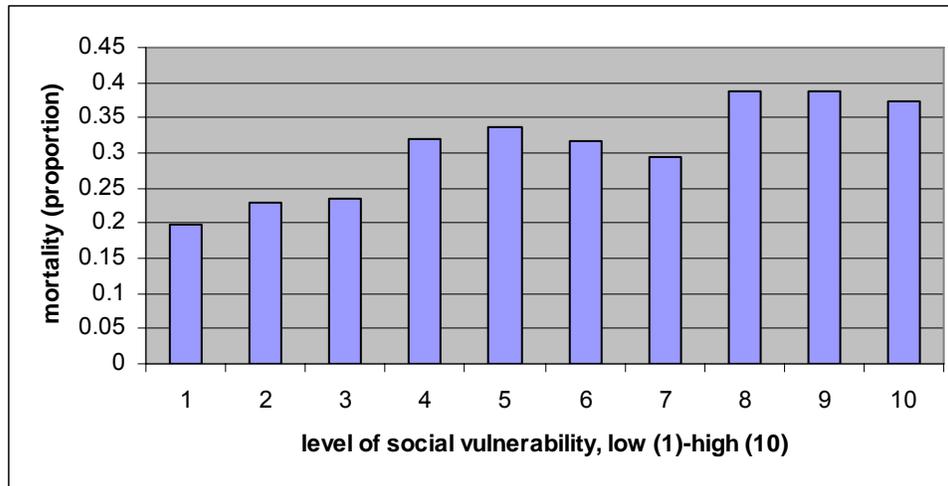
To examine this relationship, older Canadians from the 1994 NPHS were grouped by level of vulnerability into deciles and then assessed in 2002 to determine survival 8 years later. Results indicated that a higher proportion of older Canadians at greater as opposed to lower risk of social vulnerability in 1994 were deceased by 2002.<sup>8</sup> While other significant factors of mortality such as age

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<sup>8</sup> Note: for this analysis, a slightly different measure of social vulnerability was constructed due to the inconsistency of questions between the 1994 and 2002 files.

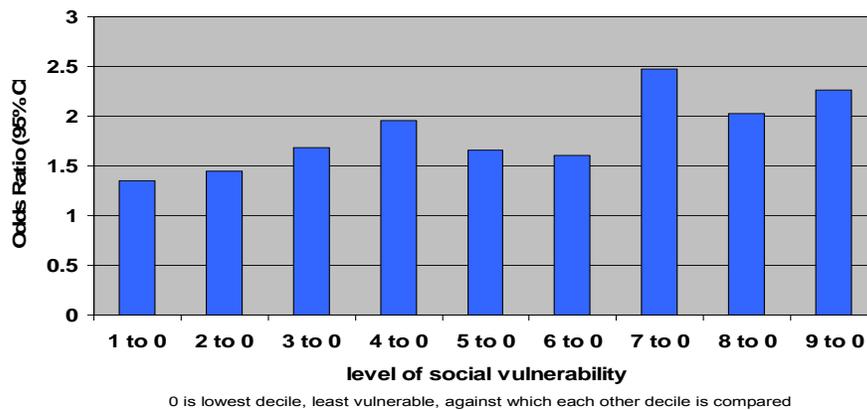
and health are not considered here, this finding suggests that social isolation may be a risk factor for mortality.

Figure 15 – Mortality by decile of social vulnerability, deciles (low to high)



When controlling for factors that are related to mortality the relationship between level of vulnerability and likelihood of death is supported. Figure 16 demonstrates an older person in the highest levels of social vulnerability was 2-2.5 more times likely to be deceased within the 8 years. While these results are preliminary they support the notion that social isolation is an important risk factor for mortality. This preliminary finding points to the need for further analysis including economic modeling of the consequences of social isolation.

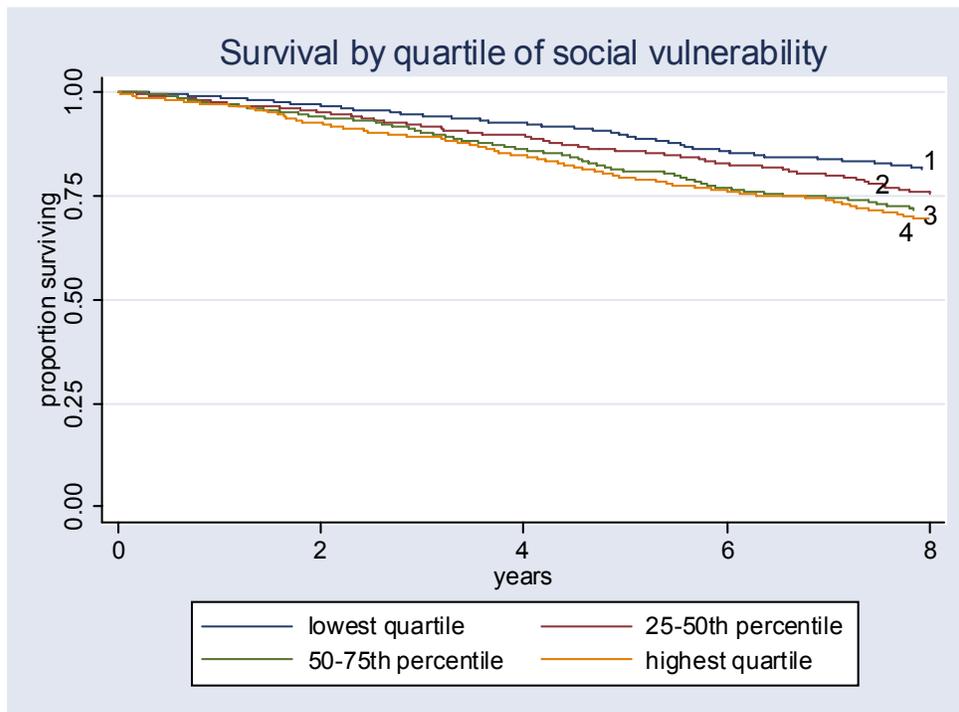
Figure 16 – Mortality by decile of social vulnerability controlling for age, sex, frailty<sup>9</sup>



<sup>9</sup> Frailty is measured by a composite index, validated by Mitniski et al., 2004.

A Cox regression adjusting for age, sex, and frailty shows that the association with mortality remains statistically significant (HR 1.12, 95% CI: 1.05-1.20,  $p < 0.001$ ). This means that an individual's risk of mortality increases by approximately 12% for each jump to a higher quartile of social vulnerability (i.e. the chances of mortality on category 4 are 12% higher than on category 3, which in turn is 12% higher than on category 2, etc.

Figure 17 – Survival by quartile of social vulnerability



## 4.0 Issues for Consideration and Next Steps

This preliminary analysis raises issues for consideration by policy makers as well as areas where future direction is needed to fill existing knowledge and data gaps. This section provides a cursory discussion of these issues, presents the gaps and suggested approaches to addressing them and outlines the next steps for the research process.

### 4.1 Potential policy issues for consideration

In Canada, like in all Western countries, the portion of the population over aged 65 is growing at a faster pace than was the case with previous generations. The result will be a novel experience, with 20% of the population being retired from the paid work force. In our increasingly individualized culture, it is essential to understand the consequences of becoming isolated from a network of support. This preliminary profile of social vulnerability in Canada has highlighted some characteristics of the more isolated in our society. Following are some thoughts on issues that government policy makers may want to take into account when considering the profile of older people who might be socially isolated and the long term consequences their social isolation.

#### 4.1.1 *Social vulnerability / isolation versus community engagement*

- Social isolation and vulnerability are inter-related to the broader questions of community and participation and support by members of the community whether it is a geographical location, a cultural boundary or a temporal intersection of people. How then do we create these idealized caring communities? What is the role of government in facilitating support without over-riding the undeniable importance of the volunteer hours and support provided by family and friends?
- What role did federal government programs such as the original New Horizons program have on the social engagement of seniors? For example, did small programs of this type reduce social isolation, and, in the future, are Baby Boomers likely to continue to relate with and to the seniors' social clubs of the New Horizon program?

#### 4.1.2 *Social isolation and importance of chronic home support services*

- In the preliminary research results the inter-relationship among the individual characteristics of chronic illness, geographic location, education age and sex and risk for social isolation was measured. Increasing age, less education, urban residence, and higher number of chronic illness are associated with higher level of social vulnerability. While the cause and effect of these variables cannot be determined, our preliminary analysis supports the notion that social isolation can be better understood by

profiling individuals who are at risk for higher levels of vulnerability to be socially isolated.

- Findings from this preliminary analysis suggest that both women and older people are at risk for perceived support with instrumental activities of living. Fundamental to a discussion of risk factors of social vulnerability is an examination of programmatic shifts in the delivery of home support services in many provinces in Canada. Does having publicly-funded home support for persons who need assistance reduce social isolation? While this question is beyond the scope of this report, we many want to consider the preventative/maintenance function of home care services that enabled persons in need to remain in their community. There may be a series of outcomes of being unable to receive home support services as a consequence of public policy shifts towards “Short term acute home care services”. These outcomes could include: 1) the older person moves closer to a family member to receive the support they would have received in the community from home support services and moves away from a network of friends and neighbours with whom they connected; or 2) the person can no longer engage in activities such as grocery shopping, or banking because of transportation and mobility issues. Home support no longer may offer these services. As a result their world shrinks, groceries are delivered, and banking is done by others and their risk for social isolation increased.

#### *4.1.4 Social Isolation and the need to use a Rural and Cultural Lens in Policy Analysis*

- Although transportation and its relationship to participation and engagement was not addressed specifically in this research, we know that it is a critical facilitator for participation and may be more or less available depending on geographical location, the time of day and eligibility criteria. Participation becomes more difficult because of deficits in vision; for example, night vision problems affect ability to drive and participate in evening events. Public transportation services tend to be limited to urban areas. Distances to services, social functions etc., in rural areas may also make use of taxis, if available, cost prohibitive.
- Social isolation may have different meanings and experiences in different cultures. Among recent immigrant to Canada, the elderly may endure greater barriers to participation and engagement because of language, cultural norms, distinct gender expectations and so on. As a result, consideration needs to be given to supportive community groups to develop and facilitate programs and activities that are culturally sensitive and inclusive.

## Knowledge gaps

There are three main challenges in the existing knowledge on social isolation - inconsistencies in definitions; failure to address the complexity of the inter-relationships among the variables in the analysis; and limited understanding on whether intervention makes a difference in social isolation.

- There is no consensus in the literature of how best to measure social isolation, which components are antecedents and which are outcomes.
- Numerous social factors have been individually associated with health representing a distinct body of literature leading to fragmentation of research. As a consequence potentially complex interactions and relationships among the social factors are not taken into account.
- Moreover, there is a yet another definitional complication as authors define the terms differently such that what one author considers as social support, another might term social network. Similarly, the conceptual overlap of social isolation, social vulnerability, or social exclusion, on the negative side, and on the positive side, social integration, social engagement, and social capital is rarely distinguished in the research results.
- A comprehensive and validated index of social isolation needs to be developed. This paper has given one just definition, however more research on “fine tuning” this definition and comparing its applicability using other data is necessary before it can be validated.
- Preliminary data presented here suggest that even when controlling for age and sex and frailty, socially vulnerable people have a lower probability of survival. A much greater understanding of this relationship is needed yet this level of complex analysis was beyond the scope of this study.
- The complexity of the inter-relationships involved in social isolation and their eventual outcomes is difficult to capture. Previous research does not provide definitive guidelines as to this model. In the future, a structural equation model may be helpful to delineate the inter-relationships that exist among the variables in order to measure them against the outcome.
- Another complexity in our understanding of social isolation is the various ways in which people may perceive isolation versus participation in different contexts. In a very simplistic example, some cultures, be they micro or macro, may “require” extensive extended family participation while others may find this unacceptable. Similarly, some surveys focus on perceptions of isolation and others on observational behaviours. We suggest both are important. For instance one person with a particular set

of behavioural characteristics (number of activities) might 'feel' socially isolated while another does not.

- From the previous research as well as the data presented here we are unable to determine what affect, if any, interventions make on the social isolation of individuals.

#### 4.3 Data gaps

- As mentioned previously in knowledge gaps, a similar challenge in analyzing data is accessing data that represents a widely accepted definition of social isolation. Consistency among the variables used to measure social vulnerability/isolation is dependent on what is available in each dataset. An important caveat to this study is that the 33 items included in this construction of social vulnerability were those that were available from the National Population Health Survey in 2002. Other studies may have used more or less items based on the available data.
- Few surveys measuring social isolation are longitudinal in nature (England Longitudinal Study of Aging (ELSA), the NPHS and Aging in Manitoba (AIM) study being exceptions). The NPHS was chosen as the survey to examine risk for social isolation for a number of reasons. Most importantly is its ability to measure vulnerability to be socially isolated and its effect over time. As a longitudinal survey, it was possible to measure the effect of vulnerability over an eight year period on survival rates. However, one challenge with both the NPHS and the AIM is sufficient sample size to enable complex multivariate analysis. One advantage of the AIM study is having complete health utilization data attached to the survey that can be used to examine impact on health outcomes other than mortality.
- Among longitudinal surveys there is also the risk that changes in the wording of the questions over time may alter the meaning of the responses and the comparability of the variables. For example in the 1994 National Population Health Survey a measure of the frequency of contact with each group was asked: Parents/in-laws, Grandparents, Daughters/in law, Sons/in law, Siblings, Other relatives, Close friends, and Neighbours. In the 2002 NPHS survey these questions were replaced with one question about network size generally.
- There are additional data sources that may be useful to understanding social isolation but were beyond the scope of this research. The 2002 Canadian Community Health Survey (CCHS) has a special module on social vulnerability and the 2003 General Social Survey on Social Engagement has a number of variables that could be measured to explore social vulnerability. In addition, greater sample size will advance opportunities for multivariate analysis. For example, the 2003 GSS

sampled twice as many seniors (N=4486) as the 2002 NPHS. An additional area of research is to utilize these data files to develop further the index of social vulnerability and to understand the factors which contribute to placing Canadians at risk for social isolation.

- Finally, researchers are working on developing the Canadian Longitudinal Study of Aging (CLSA), and hopefully a comprehensive measure of social isolation will be available so we can further advance our understanding of the social isolation of older Canadians. Whether these questions on the CLSA will be comparable to the international surveys like ELSA; to Health surveys (like NPHS); or cross-sectional surveys like the General Social Survey special series also remain to be confirmed.

#### 4.4 Next steps

This research is an initial step in advancing our understanding of social isolation. Further indepth analysis is needed to comprehend the complexities and inter-relationships of social isolation. Given the complexity of the relationship among the variables as indicated in this analysis, future work should consider more complex structural equation modeling to pullout the inter-action among the variables in order to develop a more comprehensive understanding of social isolation. The very preliminary assessment of the consequences of social vulnerability on morbidity [not assessed in this study] and mortality need further refinement and validation yet raises the important issue as to the extent to which social vulnerability may have serious health consequences for older Canadians.

The next step in this program of research with the Federal/Provincial Territorial Working Group on seniors' social isolation is to produce a Report on the impact of public policies and programs on social isolation and/or social integration. Specifically, we intend to review public policies and programs through mechanisms such as a scan of the Seniors Policy and Programs Database and through interviews with key informants, to identify examples of government, community and international program and policy components that either positively or negatively affect social isolation.

## 5.0 Appendix

### Appendix A – Social Vulnerability Index

The following 33 items were drawn from the 2002 National Population Health Survey to construct the Social Vulnerability Index. Each item was given a score of 0 or 1 for a possible minimum score of 0 and maximum of 33. √ denotes on which dimension the item loaded.

SV Index items:	Social Vulnerability Dimension				
	Perceived IADL support	Perceived emotional support	Autonomy Control	Leisure Physical	Living arrangements
Marital status					√
Lives alone					√
Can speak an official language of Canada					
Number of leisure activities participated				√	
Daily physical activity				√	
Frequency of physical activity >15 mins				√	
Expectation of you by others			√		
Not enough money to buy needed things			√		
Would like to move but cannot			√		
Neighborhood-community too noisy or polluted			√		
Little control over things that happen to you			√		
Little you can do to change important things in your life			√		
Mastery scale (derived by Statistics Canada)			√		
Social network: number of close friends and relatives		√			
Someone to help if confined to bed	√				
Someone to count on to listen		√			
Someone to give advice in crisis		√			
Someone to help you go to the doctor	√				
Someone to show you love and affection		√			
Someone to have a good time with		√			
Someone to give you info to help you understand a situation		√			
Someone to confide in		√			
Someone who gives you hugs		√			
Someone to relax with		√			
Someone to help you prepare meals if needed	√				
Someone to give advice		√			
Someone to get your mind off things		√			
Someone to do your daily chores if	√				

you are sick					
Someone to share private worries/fears with		√			
Someone to make suggestions about personal problems		√			
Someone to do something enjoyable with		√			
Someone who understands your problems		√			
Someone who loves you and makes you feel wanted		√			

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Appendix B – Data Tables of Logistic Regressions

Table B-1

<b>Perceived IDAL support</b>	<b>FIRST STEP (Odds Ratio; sig)</b>	<b>SECOND STEP (Odds Ratio; sig)</b>
Male	<b>0.7612*</b>	0.8111
Age	<b>1.0342**</b>	1.0080
Some post secondary <sup>a</sup>	0.8714	0.8591
Secondary <sup>a</sup>	0.7166	<b>0.5317*</b>
Less than high school <sup>a</sup>	0.7974	0.5668
Rural	0.9834	1.3303
# chronic conditions	1.0643	1.0383
SV dimension-Emotional support		<b>15.671***</b>
SV dimension-Autonomy/control		<b>1.6354*</b>
SV dimension-Leisure activities		<b>0.6371*</b>
SV dimension-Living arrangements		<b>5.5461***</b>
<sup>a</sup> reference group is post secondary		
* p<.05, ** p<.01 *** p<.001		

Table B-2

<b>Perceived emotional support</b>	<b>FIRST STEP (Odds Ratio; sig)</b>	<b>SECOND STEP (Odds Ratio; sig)</b>
Male	1.2022	<b>1.7253**</b>
Age	1.0134	0.9830
Some post secondary <sup>a</sup>	0.7885	0.6872
Secondary <sup>a</sup>	0.9901	1.0084
Less than high school <sup>a</sup>	1.0390	0.9848
Rural	0.8081	0.8582
# chronic conditions	<b>1.0697*</b>	1.0297
SV dimension-IADL support		<b>15.644***</b>
SV dimension-Autonomy/control		<b>1.4445*</b>
SV dimension-Leisure activities		<b>1.8176***</b>
SV dimension-Living arrangements		<b>1.4772*</b>
<sup>a</sup> reference group is post secondary		
* p<.05, ** p<.01 *** p<.001		

Table B-3

<b>Autonomy-control over life's issues</b>	<b>FIRST STEP (Odds Ratio; sig)</b>	<b>SECOND STEP (Odds Ratio; sig)</b>
Male	0.8855	0.8226
Age	0.9951	0.9819
Some post secondary <sup>a</sup>	1.0918	1.1488
Secondary <sup>a</sup>	0.9722	1.1642

Less than high school <sup>a</sup>	<b>1.9060***</b>	<b>2.0950***</b>
Rural	1.0405	1.1115
# chronic conditions	<b>1.2019***</b>	<b>1.1844***</b>
SV dimension-Emotion support		<b>1.4362*</b>
SV dimension-IADL support		<b>1.6891**</b>
SV dimension-Leisure activities		<b>1.3823*</b>
SV dimension-Living arrangements		0.8408
<sup>a</sup> reference group is post secondary		
* p<.05, ** p<.01 *** p<.001		

Table B-4

<b>Participation in leisure-physical activities</b>	FIRST STEP (Odds Ratio; sig)	SECOND STEP (Odds Ratio; sig)
Male	0.7260	0.8527
Age	<b>1.0774***</b>	<b>1.0748***</b>
Some post secondary <sup>a</sup>	1.5334*	1.5164
Secondary <sup>a</sup>	0.8965	0.8786
Less than high school <sup>a</sup>	<b>2.1895***</b>	<b>1.9243***</b>
Rural	0.9274	1.0019
# chronic conditions	<b>1.1146**</b>	<b>1.1013**</b>
SV dimension-Emotion support		<b>1.7947**</b>
SV dimension-IADL support		<b>0.6384*</b>
SV dimension-Autonomy-control		<b>1.3841*</b>
SV dimension-Living arrangements		<b>1.5767**</b>
<sup>a</sup> reference group is post secondary		
* p<.05, ** p<.01 *** p<.001		

Table B-5

<b>Living arrangements</b>	FIRST STEP (Odds Ratio; sig)	SECOND STEP (Odds Ratio; sig)
Male	<b>0.3374***</b>	<b>0.3333***</b>
Age	<b>1.0766***</b>	<b>1.0842***</b>
Some post secondary <sup>a</sup>	1.2382	1.4864
Secondary <sup>a</sup>	1.4562	<b>2.2397**</b>
Less than high school <sup>a</sup>	<b>1.5689**</b>	<b>2.1251***</b>
Rural	<b>0.6048**</b>	<b>0.5692**</b>
# chronic conditions	0.9955	0.9682
SV dimension-Emotion support		1.4832
SV dimension-IADL support		<b>5.5709***</b>
SV dimension-Autonomy-control		0.8479
SV dimension-Leisure activities		<b>1.5867**</b>
<sup>a</sup> reference group is post secondary		
* p<.05, ** p<.01 *** p<.001		

## 6.0 References

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