Older Canadian who go without: predictors of unmet need for activities of daily living

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1 Literature review

Unmet need is a concept that has been defined in different ways in the scientific literature. It is also complex to isolate the factors associated with unmet needs, as the population with unmet needs is not completely homogeneous, since the unmet need concept is a continuum. Still, it is essential to make the distinction between people with undermet needs and people with unmet needs as the literature shows that the factors mentioned above are different among the two groups of people.

However, after identifying the population whose needs are not met, it is not possible to further classify an individual as having unmet or undermet needs when considering all the activities for which individuals need assistance. For example, there are cases where the need for assistance is unmet for activity X and undermet for activity Y. Classification of individuals into the two categories (undermet and unmet) cannot be done, as they are not mutually exclusive (Kennedy, 2001). One solution to this problem is to categorize individuals according to mutually exclusive levels of unmet/undermet need. For instance, we can distinguish among individuals with (1) at least one undermet need and no unmet needs; (2) at least one undermet need and no unmet needs; (3) at least one unmet need and one undermet need. In this definition, the categories of need are mutually exclusive. For example, an individual with unmet needs in specialized nursing care and undermet needs in personal finance are in the third group. They are not in the first two categories as they have both unmet and undermet needs.

It would be ideal, given sufficient data, to treat unmet need as a count variable. In this setting, we would consider unmet need as ranging from one to some finite number of needs, over intervals of one. However, given the rarity of multiple unmet needs in our survey data, it is not possible to conduct this analysis.

Measures of the prevalence of unmet needs identified in the literature review greatly vary due to the use of different definitions of unmet needs. Moreover, observed differences are certainly the consequence of several factors, including the different target populations studied (age groups, presence of disability), the activities used to define the need for help, and the prevailing policies in terms of health care and services. Caution needs to be exerted when making comparisons between studies as they are not necessarily directly feasible.

In Canada, Chen and Wilkins (1998) showed that half of the total older population whose health status prevents them from independently performing one of the main ADLs or IADLs

have all their needs met. Furthermore, it is worth mentioning that research was done on the unmet needs of older Canadians using the 2002 General Social Survey (GSS). This analysis demonstrated that among the 27 percent of Canadians aged 65 and older needing assistance (n=1,024,000), just over 180,000 or 18 percent had at least one unmet need, and half of these cases had insufficient support for two activities or more (Busque, 2009).

The probability of having unmet needs is determined by numerous factors, such as socio-demographic and socio-economic characteristics of individuals as well as the disability level or the number of activities for which help is needed. Scientific research done on this matter focused on numerous variables among which we present here the most commonly investigated.

Higher probabilities of having unmet needs were reported among individuals with a greater number of limitations, more severe disabilities, and greater care needs (Casado, van Vulpen, & Davis, 2011; Desai et al., 2001; Kennedy, 2001; Lima & Allen, 2001; Newcomer et al., 2005; Paraponaris, Davin, Verger, Joutard, & Moatti, 2005). These findings can be explained by the fact that those with greater care needs or levels of impairment may increase caregiver burden and therefore reduce the likelihood of having all of their needs met.

The presence or absence of social support networks was reported in the literature as being correlated with having unmet needs. Several studies demonstrated that the probability of having unmet needs is significantly higher among older individuals living alone as compared with people living with a spouse or other persons (Chen & Wilkins, 1998; Davin et al., 2006; Desai et al., 2004; Gibson & Verma, 2006; Kennedy, 2011; LaPlante et al., 2004). Moreover, a higher likelihood of having an unmet need was reported among people with disabilities who lack friends, family or other contacts they can depend on for help (Allen & Mor, 1997) and among older persons receiving less informal support (Casado et al., 2011; Laplante et al., 2004; Paraponaris et al., 2005; Tennstedt, McKinlay, & Kasten, 1994).

One might expect the likelihood of having unmet needs to increase with age, since age is associated with rising disability levels and activity limitations. Yet, surprisingly, age was not a significant determinant of unmet needs in the majority of studies (Allen & Mor, 1997; Desai et al., 2001; Kennedy, 2001; Lima & Allen, 2001) and in a French study age was negatively related to the probability of having unmet needs (Paraponaris et al., 2005). The absence of correlation (or negative correlation) between age and unmet needs can be understood with the idea that aging older individuals tend to use more extensively social, medical, and hospital services and, as a result, tend to have fewer unmet needs as they are better monitored by the "system" than younger and healthier seniors.

In general, an association between income, or purchasing power, and unmet needs was identified in much of the research. Specifically, studies have reported that the probability of having an unmet need was positively correlated with the incidence of low income (Davin et al., 2006; Desai et al., 2001; Gibson & Verma, 2006), an inability to pay for routine expenses such as shelter, food, and clothing (Allen & Mor, 1997), and eligibility for programs that target people with low-incomes such as Medicaid (in the US) and public assistance (Siegel, Raveis, Houts, & Mor, 1991).

Gender is an important dimension to consider in multivariate analysis, as it is often associated with many social inequalities. Moreover, significant gender-based differences are observed in terms of activity limitations, autonomy levels, and self-perceived need of help (Davin et al., 2006). In general, previous research reports no significant link of this variable on the likelihood of having unmet needs (Casado et al., 2011; Desai et al., 2006). The exception is a study by Davin et al. (2006), where probability of having unmet needs in performing IADLs was found to be slightly higher among older men than among older women.

Research has explored other possible associations. For example, higher probabilities of having unmet needs are found among visible minorities (Casado et al., 2011), while education level was not proven to have a significant impact on older individuals' risk of having unmet needs (Davin et al., 2006; Desai et al., 2001; Lima & Allen, 2001).

2 Research questions

1. How many people have unmet or undermet needs?
2. Among the older population with unmet needs, what is the number of activities for which they have unmet or undermet needs?
3. What is the prevalence of unmet needs for each activity?
4. What are the characteristics of older people who have unmet needs?

3 Data source

The unmet needs and the characteristics of the older (65+) Canadians with unmet needs are measured using the 2006 Participation and Activity Limitation Survey (PALS).

4 Methodology

4.1 Unmet Needs

4.1.1 Survey description and target population

The PALS target population consists of all persons, adults and children, who have an activity limitation or a participation restriction associated with a physical or mental condition or health problem and who were living in Canada at the time of the Census[1]. This population included persons living in private and some collective households in the ten provinces and the three territories. However, for operational reasons, the populations living on First Nations reserves, the residents of institutional and some non-institutional collectives were excluded. More precisely, the non-institutional collective dwellings excluded were military bases, Canadian Armed Forces vessels, merchant vessels and coast guard vessels, as well as campgrounds and parks (Statistics Canada, 2007).

In order for PALS to reach its target population, all persons who reported "yes" to either of the two disability filter questions on the 2006 Census of Population questionnaire were included in the survey frame. The Census filter questions are as follows:

1. Do you have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?

[1] This differs from other general surveys, such as the GSS and CCHS, whose target populations are representative of the total population (disabled and non-disabled) living in private households.

2. Does a physical condition or mental condition or health problem reduce the amount or the kind of activity you can do at home, or at work, or at school, or in other activities?

Among those who were interviewed, those answering positively to the PALS screening questions on disabilities formed the target sample. The survey starts with a disability screening module in which two disability filter questions are asked, followed by a series of questions about specific activity limitations. Specifically, respondents are asked if they have any hearing, seeing, communication, mobility, agility, pain, learning, memory, developmental or psychological limitations. Individuals who responded positively to any one of these questions were classified as having a disability and asked follow-up questions about the main conditions of their limitations as well as questions about the help they receive with everyday activities.

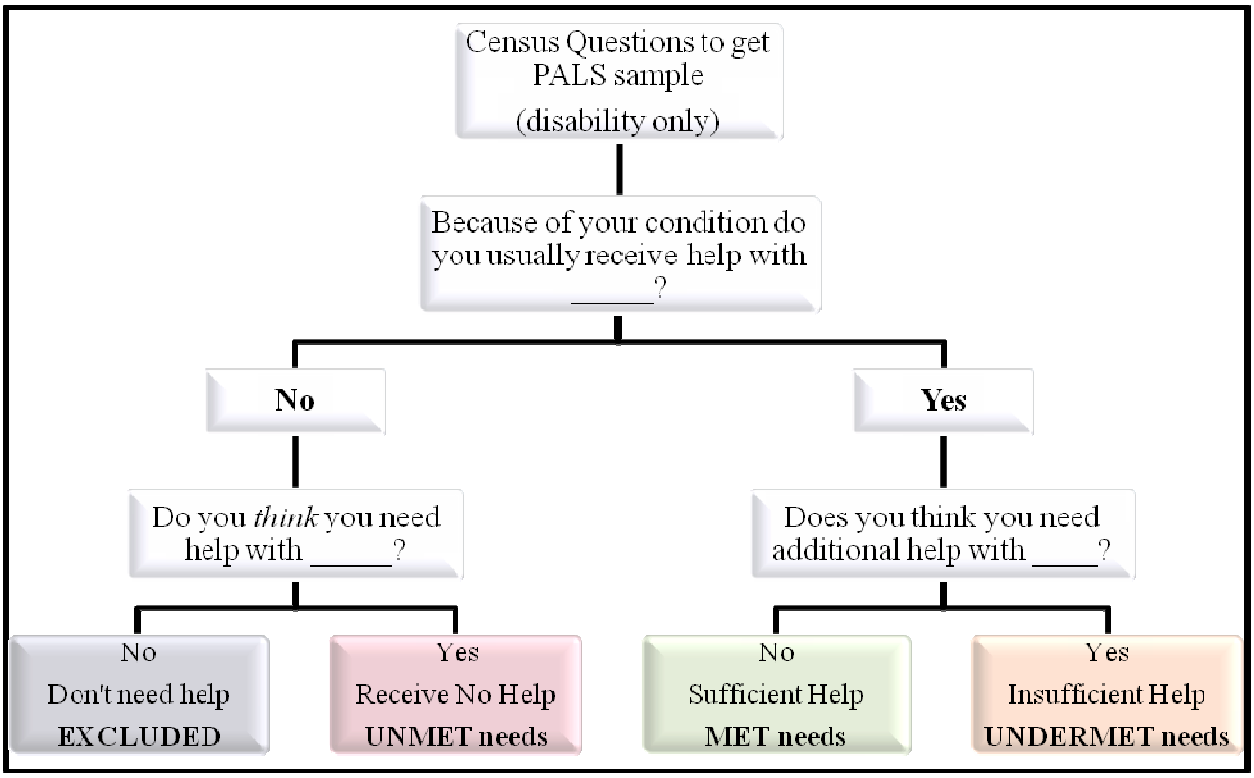
4.1.2 Definition of unmet needs

The 2006 PALS contains a section on "Help with Everyday Activity". This module contains questions about the help received by respondents with everyday activities because of the respondents' condition. Both formal and informal help is included in the respondents' answers. A total of nine everyday activities are examined. However, we withdrew one of these activities, "help with childcare", as it typically does not concern the population aged 65 and older. Our study focuses on help received by older persons (living with a disability) who need assistance in performing eight specific types of activities:

1. Meal preparation
2. Housework
3. Heavy household chores
4. Appointments
5. Personal finances
6. Personal care
7. Nursing/treatment
8. Moving about

The "Help with Everyday Activity" module asks, for each of the eight activities, if help is received by the respondent to perform the activity in question. If the respondent answers "yes", then a follow-up question asks whether additional help is needed. If the respondent instead answers "no", then they are asked whether any help is needed. Respondents with non-valid responses to these questions (valid skip, not asked, refusal, missing) were categorized as "missing". Based on these questions, an unmet need variable was built for each everyday activity, which is described in Figure 1. The eight resulting variables are afterwards aggregated into a binary variable categorized as follows: (0) All needs met; (1) At least one unmet/undermet need.

Figure 1. Defining unmet, undermet, and met needs for Activity X using the 2006 PALS



4.1.3 Descriptive Analyses

After defining the variables, a descriptive analysis of the characteristics of the population with unmet or undermet needs was conducted. Since the project focuses on the older disabled population, the sample was restricted to the population aged 65 and older living in private households who had a disability and required some help with at least one everyday activity.

The first part of the analysis examined the overall prevalence of the population with unmet or undermet needs (Research Question 1). To do this, a calculation of the ratio of the population with at least one unmet need to the overall older disabled population with needs was performed. Moreover, since need has been documented to vary by gender and increase in age, these variables were included as cross-tabulations.

Next, we calculated the distribution of the population by the total combined number of unmet and undermet needs (Research Question 2). Initial attempts to produce separate tabulations of unmet and undermet needs were not possible due to small sample sizes. In particular, the sample size decreased exponentially in the number of unmet or undermet needs such that population counts for higher numbers of unmet needs would have needed to be suppressed prior to disclosure. The prevalence[2] of met, undermet and unmet need was also calculated for each type of activity (Research Question 3). This was done on the basis of the coding algorithm described in Figure 1.

[2] Prevalence refers to the population reporting met, undermet, and unmet need divided by the population at risk (needing assistance) at the time of the survey.

Finally, we estimated the prevalence of unmet or undermet needs by the severity of disability. In producing these tables, we were interested in exploring whether, and to what extent, the prevalence of unmet or undermet needs change as the severity of disability increases.

4.1.4 Regression Analyses

This section examines the characteristics associated with unmet need for the older disabled population. To accomplish this, regression analyses techniques will be used, which allow us to determine the presence of significant predictors of unmet need.

First, we will estimate the probability of having at least one unmet or undermet need compared to having all needs met, conditional on a set of relevant independent variables. The parameter estimates provide a measure of association between the independent variables and the probability of having at least one unmet or undermet need. In this model, individuals whose needs are unmet are grouped with those whose needs are undermet. Implicit in this categorization is the assumption that the characteristics associated with unmet needs are the same, and of the same magnitude, as those associated with undermet needs.

To relax this assumption, a distinction between unmet and undermet needs is made. One approach would be to separate the population whose needs are not met according to whether they have unmet or undermet needs. However, these categories are not mutually exclusive when need is measured over eight types of activities. For example, an individual who has an unmet need in activity X and an undermet need in activity Y would fall into both categories. One solution to this problem would be to use the following aggregation of unmet/undermet needs:

1. At least one undermet need and no unmet needs;
2. At least one unmet need and no undermet needs;
3. At least one unmet need and at least one undermet need.

In this definition, the categories are mutually exclusive. This variable does not account for differences in the intensity of need; that is, the time, effort, and requisite skills to assist those with needs. For instance, one might expect that an individual who has an undermet need in moving about in his residence (Person A) would require more assistance than someone who has unmet needs in completing her housework *and* personal finances (Person B). In our definition of unmet need, Person A would be in category one and Person B would be in category four, but this does not account for the fact that the former might require more assistance than the latter. In other words, our variable definition has a nominal rather than rank-ordered interpretation. Therefore, the population falling into higher-order categories should not be interpreted as requiring more assistance in meeting all of their needs.

Binary and multinomial logistic regressions are performed, respectively, for the two models described above. The independent variables in the model include: age, sex, country of birth (born in Canada and born outside Canada), living arrangements, number of surviving children, schooling level, region (Atlantic Canada, Quebec, Ontario, Prairies, and British Columbia), number of activities for which help is needed, and disability level. The PALS uses a complex survey design that increases the variance of the parameter estimates. Therefore, the

bootstrap weights provided in the data are used to weight the results. Unpopulated tables associated with these models are presented in Section 6.1 (Unmet Needs).

5 Results

5.1 Unmet Needs

5.1.1 Prevalence

The 2006 PALS estimated to 1.8 million the total number of older Canadians who had an activity limitation or a participation restriction associated with a physical or mental condition or health problem, and who were living in private households at the time of the Census (Table 1). Among them, 1.2 million needed help with everyday activities because of their condition.

Table 1. Canadian population aged 65 and older with a disability and living in private households, by need of assistance, 2006 PALS

	Frequency	Percentage	Valid Percentage
Need assistance	1,206,500	68.9%	71.5%
Don't need assistance	480,100	27.4%	28.5%
Missing information	65,600	3.7%	---
Total	**1,752,100**	**100.0%**	**100%**

Not 100% of the population in need received the help needed. Actually, the survey data estimate that only 58.3% of the population received all the help needed to fulfill all their needs (Table 2).

Table 2. Canadian population aged 65 and older with a disability, living in private households, and needing assistance, 2006 PALS

	Frequency	Percentage
All needs met	703,400	58.3%
At least one undermet need, no unmet need	221,500	18.4%
At least one unmet need, no undermet need	182,600	15.1%
At least one undermet AND one unmet need	98,900	8.2%
Total	**1,206,500**	**100%**

The remaining percentage of the population (41.7%) did not receive all the help needed, if any, with at least one activity. 18.4% of the population did not receive all the help needed (undermet need) but did not have unmet need. The proportion of the population having at least one unmet but no undermet need is estimated to 15.1%, whereas the share of the population having both unmet and undermet needs is 8.2%.

5.1.2 Number of activities

503,000 older Canadians with a disability, with needs, and living in private households had at least one unmet or undermet need in 2006 (Table 3). Among them, 47.3% don't receive all the help for 2 or more needs (activity).

Table 3. Canadian older population with a disability, with needs, and living in private households, by number of activities for which help received is unmet or undermet, 2006 PALS

Number of activities with unmet/undermet needs	Frequency (%)	Cum. frequency (%)	Absolute numbers
0	58.3%	58.3%	703,400
1	22.0%	80.3%	265,300
2	10.6%	90.9%	128,300
3	4.0%	94.9%	47,800
4	2.1%	97.0%	25,000
5	1.2%	98.2%	14,400
6	1.0%	99.1%	11,500
7	0.8%	99.9%	9,500
8	0.1%	100.0%	1,300
Total, with needs	100.0%	-	1,206,500

5.1.3 Prevalence by activity

Highest prevalences of unmet/undermet needs are observed for heavy household chores and moving about (Table 4).

Table 4. Canadian older population with a disability, needing assistance, and living in private households, by activity, 2006 PALS

	Met	Undermet	Unmet	Total	
				%	N
Meal Preparation	81.2%	9.2%	9.6%	100.0%	418,200
Housework	72.4%	14.5%	13.1%	100.0%	722,800
Heavy household chores	66.5%	20.6%	12.9%	100.0%	960,900
Making appointments	75.6%	17.9%	6.5%	100.0%	738,600
Personal finances	87.9%	7.6%	4.4%	100.0%	402,000
Personal care	74.9%	14.4%	10.7%	100.0%	283,200
Specialized nursing care	76.0%	11.0%	13.1%	100.0%	157,700
Moving about inside residence	64.2%	18.3%	17.5%	100.0%	126,800

5.1.4 Prevalence by severity of disability

Prevalence of unmet/undermet needs increases with the severity of disability (Table 5).

Table 5. Number and proportion of older Canadian population with a disability, with needs, and living in private households, by need level and severity of disability, 2006 PALS

Absolute number					
	Mild	Moderate	Severe	Very severe	**Total**
All needs met	217,100	173,700	207,200	105,400	**703,400**
At least one undermet need, no unmet need	34,100	45,300	87,900	54,300	**221,500**
At least one unmet need, no undermet need	42,400	49,600	63,300	27,400	**182,600**
At least one undermet AND one unmet need	6,300	18,300	37,400	36,900	**98,900**
Total	**299,800**	**286,900**	**395,700**	**223,970**	**1,206,500**
Percentage					
	Mild	Moderate	Severe	Very severe	**Total**
All needs met	72.4%	60.5%	52.4%	47.1%	**58.3%**
At least one undermet need, no unmet need	11.4%	15.8%	22.2%	24.2%	**18.4%**
At least one unmet need, no undermet need	14.1%	17.3%	16.0%	12.2%	**15.1%**
At least one undermet AND one unmet need	2.1%	6.4%	9.5%	16.5%	**8.2%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**

5.1.5 Factors associated with unmet needs

The logistic regression parameters that estimate the probability of having at least one unmet or undermet need compared to having all needs met are shown in Table 6. Our results suggest that the likelihood of having unmet/undermet need significantly decreases with age. Having a university degree increases the likelihood of having unmet/undermet needs. The number of needs and the disability severity significantly increases the probability of having unmet/undermet need. No significant effect of gender, country of birth, living arrangements, number of children, region, and low income status.

Table 7 presents the result of the multinomial analyses, where people with unmet/undermet needs are classify into three categories. Similarly to the first regression, the dependent variable reference category is "All needs met". This second regression shows that similar effects are found for all three categories: age decreases the risk, university degree increases the risk, as well as the number of needs and the disability severity. Living with spouse seems to decrease significantly the risk of having both unmet AND undermet needs. Living in Québec decreases the of having undermet needs. Finally, having a low income increases the risk of having an unmet need, and of having both undermet and unmet needs. No significant effect observed throughout all three categories for gender, country of birth, and number of children.

Table 6. Logistic regression parameters and odds ratios for having at least one unmet or undermet need by socio-demographic characteristics for older Canadians with a disability, needing assistance, and living in private households, 2006 PALS

	β	Odds ratio	Sig.
Having at least one unmet/undermet need[1]			
Age group (Ref=65-69)			
70-74	0.013	1.014	
75-79	-0.233	0.792	
80-84	-0.377	0.686	**
85+	-0.652	0.521	***
Sex (Ref=Women)			
Men	0.030	1.031	
Country of birth (Ref=Born in Canada)			
Outside Canada	-0.077	0.926	
Living arrangements (Ref=Liv. Alone)			
Living with Spouse	-0.193	0.824	
Living with Others	-0.178	0.837	
Number of children (Ref=None)			
1-2	0.118	1.125	
3+	-0.057	0.944	
Schooling level (Ref=Less than H.S. dipl.)			
High School diploma	0.057	1.059	
Post-sec. dipl. other than U.	0.028	1.028	
University degree	0.458	1.580	**
Region (Ref=Ontario)			
Atlantic	-0.155	0.857	
Quebec	-0.196	0.822	
Prairies	-0.195	0.823	
British Columbia	-0.175	0.840	
Territories	0.451	1.570	
Number of needs (Ref=1 or 2)			
3 or 4	0.745	2.106	***
5 to 8	1.030	2.800	***
Disability severity (Ref=Mild)			
Moderate	0.474	1.607	***
Severe	0.621	1.861	***
Very severe	0.632	1.882	***
LICO status (Ref=Above LICO)			
Below LICO	0.250	1.285	
Missing information	-0.564	0.569	
Constant	-0.827	0.437	***
n = 5,180			

(1) Dependent variable reference category is "All needs met"

***$p \leq 0.01$; **$p \leq 0.05$; * $p \leq 0.10$

Table 7. Multinomial logistic regression parameters and odds ratios for different levels of unmet/undermet needs by socio-demographic characteristics for older Canadians with a disability, needing assistance, and living in private households, 2006 PALS

	β	Odds ratio	Sig.	β	Odds ratio	Sig.	β	Odds ratio	Sig.
All needs met[1]									
	Undermet, no unmet			**Unmet, no undermet**			**Undermet and unmet**		
Age group (Ref=65-69)									
70-74	-0.014	0.986		0.160	1.173		-0.313	0.731	
75-79	-0.188	0.828		-0.258	0.773		-0.303	0.739	
80-84	-0.177	0.838		-0.359	0.699		-0.967	0.380	***
85+	-0.605	0.546	**	-0.553	0.575	*	-0.979	0.376	***
Sex (Ref=Women)									
Men	-0.082	0.922		0.122	1.130		0.105	1.111	
Country of birth (Ref=Born in Canada)									
Outside Canada	-0.077	0.926		0.031	1.031		-0.309	0.734	
Living arrangements (Ref=Liv. Alone)									
Living with Spouse	-0.044	0.957		-0.262	0.769		-0.398	0.672	*
Living with Others	-0.136	0.873		-0.209	0.812		-0.183	0.833	
Number of children (Ref=None)									
1-2	0.408	1.503		0.079	1.082		-0.233	0.792	
3+	0.204	1.227		-0.004	0.996		-0.544	0.580	
Schooling level (Ref=Less than H.S. dipl.)									
High School diploma	0.102	1.108		-0.064	0.938		0.2183	1.244	
Post-sec. dipl. other than U.	-0.105	0.900		0.002	1.002		0.4183	1.519	
University degree	0.518	1.678	**	0.115	1.122		1.0147	2.759	***
Region (Ref=Ontario)									
Atlantic	-0.054	0.947		-0.248	0.780		-0.234	0.791	
Quebec	-0.362	0.696	*	0.094	1.098		-0.476	0.621	
Prairies	-0.210	0.811		-0.115	0.892		-0.361	0.697	
British Columbia	-0.090	0.914		-0.314	0.731		-0.109	0.897	
Territories	1.597	4.938		-0.263	0.769		0.0708	1.073	
Number of needs (Ref=1 or 2)									
3 or 4	0.865	2.375	***	0.335	1.398	*	1.8954	6.655	***
5 to 8	1.227	3.410	***	-0.050	0.952		2.7467	15.591	***
Disability severity (Ref=Mild)									
Moderate	0.445	1.560	**	0.348	1.416	*	1.1573	3.181	***
Severe	0.674	1.962	***	0.430	1.537	**	1.2433	3.467	***
Very severe	0.682	1.978	***	0.347	1.415		1.3221	3.751	***
LICO status (Ref=Above LICO)									
Below LICO	-0.420	0.657		0.545	1.724	*	0.6343	1.886	**
Missing information	-1.621	0.198		0.110	1.116		-0.31	0.734	
Constant	2.057	0.128	***	-1.427	0.240	***	-3.566	0.028	***
n = 5,180									

(1) Dependent variable reference category

***$p \leq 0.01$; **$p \leq 0.05$; * $p \leq 0.10$

6 Conclusion

This research uses a large nationally representative survey to estimate the prevalence of unmet needs among older Canadians. After controlling for population differences in needs levels and demographics, the study identifies the factors associated with the risk of having unmet needs for at least one activity of daily living.

Using the 2006 Participation and Activity Limitation Survey (PALS) data, eight ADLs and IADLs are examined. The overall prevalence of the population with unmet or undermet needs is calculated as well as the prevalence of met, undermet and unmet need for each activity. Binary and multinomial logistic regressions are performed, respectively, for the two models. The first one estimates the probability of having at least one unmet or undermet need compared to having all needs met. In the second model, we distinguish individuals with (1) at least one undermet need and no unmet needs; (2) at least one undermet need and no unmet needs; (3) at least one unmet need and one undermet need. The independent variables in the model include: age, sex, country of birth, living arrangements, number of surviving children, schooling level, region of residence, number of activities for which help is needed, and disability level.

Results show that 503,000 older Canadians with a disability, with needs, and living in private households had at least one unmet or undermet need in 2006. Among them, 47.3% don't receive all the help for 2 or more needs (activity). Highest prevalences of unmet/undermet needs are observed for heavy household chores and moving about. Finally, the number of needs, the disability severity, and to a lesser extent education, significantly increases the probability of having unmet/undermet need; age significantly decreases this probability.

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