

SEDA P

A PROGRAM FOR RESEARCH ON

SOCIAL AND ECONOMIC DIMENSIONS OF AN AGING POPULATION

**The Use of Behaviour and Mood Medications by Care-
recipients in Dementia and Caregiver Depression and
Perceived Overall Health**

**Mark Oremus
Hossein Yazdi
Parminder Raina**

SEDAP Research Paper No. 218

For further information about SEDAP and other papers in this series, see our web site:
<http://socserv.mcmaster.ca/sedap>

Requests for further information may be addressed to:
Secretary, SEDAP Research Program
Kenneth Taylor Hall, Room 426
McMaster University
Hamilton, Ontario, Canada
L8S 4M4
FAX: 905 521 8232
e-mail: sedap@mcmaster.ca

**The Use of Behaviour and Mood Medications by Care-
recipients in Dementia and Caregiver Depression and
Perceived Overall Health**

**Mark Oremus
Hossein Yazdi
Parminder Raina**

SEDAP Research Paper No. 218

August 2007

The Program for Research on Social and Economic Dimensions of an Aging Population (SEDAP) is an interdisciplinary research program centred at McMaster University with co-investigators at seventeen other universities in Canada and abroad. The SEDAP Research Paper series provides a vehicle for distributing the results of studies undertaken by those associated with the program. Authors take full responsibility for all expressions of opinion. SEDAP has been supported by the Social Sciences and Humanities Research Council since 1999, under the terms of its Major Collaborative Research Initiatives Program. Additional financial or other support is provided by the Canadian Institute for Health Information, the Canadian Institute of Actuaries, Citizenship and Immigration Canada, Indian and Northern Affairs Canada, ICES: Institute for Clinical Evaluative Sciences, IZA: Forschungsinstitut zur Zukunft der Arbeit GmbH (Institute for the Study of Labour), SFI: The Danish National Institute of Social Research, Social Development Canada, Statistics Canada, and participating universities in Canada (McMaster, Calgary, Carleton, Memorial, Montréal, New Brunswick, Queen's, Regina, Toronto, UBC, Victoria, Waterloo, Western, and York) and abroad (Copenhagen, New South Wales, University College London).

The Use of Behavior and Mood Medications by Care-recipients in Dementia and Caregiver Depression and Perceived Overall Health

Mark Oremus¹ , Hossein Yazdi¹ , Parminder Raina¹

¹McMaster Evidence-based Practice Centre, Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada

Corresponding Author

Mark Oremus, PhD
McMaster Evidence-based Practice Centre
Department of Clinical Epidemiology and Biostatistics
McMaster University DTC – Room 326
50 Main Street East
Hamilton, Ontario L8N 1E9
Canada
Telephone: (905)525-9140, x22437
Fax: (905)522-7681
E-mail: oremusm@mcmaster.ca

Disclosure

The authors report no conflicts of interest.

Parminder Raina holds a Canadian Institutes of Health Research Investigator Award and an Ontario Premier's Research Excellence Award (PREA) in Aging.

Keywords: dementia; caregiver; medication; behavior; mood

JEL Classification: I10

Acknowledgement

The authors would like to thank Dr. Alok Gupta for searching the literature for relevant published background material.

ABSTRACT

The mental and physical health of dementia caregivers has been shown to be worse than that of non-caregivers. The present study was undertaken to investigate whether the caregivers of persons who take medications for behavior and mood problems in dementia are less depressed, and perceive their overall health to be better, than the caregivers of persons who do not take such medications. Behavior and mood medications include anti-psychotics, anti-depressants, and anti-convulsants. The Canadian Study of Health and Aging was used to identify informal, unpaid caregivers of persons with dementia (i.e., Alzheimer's disease, vascular dementia, or other dementia [e.g., Parkinson's disease]). The caregivers of persons diagnosed with cognitive impairment not dementia or no cognitive impairment were also included in the study. Care-recipient use of behavior and mood medications was not found to affect caregiver depression (OR = 1.02; 95% CI = 0.62 to 1.66) or caregiver's perceived overall health (OR = 1.35; 95% CI = 0.80 to 2.27).

RÉSUMÉ

Il est démontré que les donneurs de soins aux personnes atteintes de démence sont en moins bonne santé physique et mentale que les non-donneurs. Cette étude a été menée afin d'examiner si les donneurs de soins aux personnes qui prennent des médicaments pour traiter des problèmes comportementaux liés à la démence sont moins déprimés et se considèrent en meilleur état de santé général que les donneurs de soins aux personnes qui ne prennent pas de médicaments. Les médicaments traitants les troubles comportementaux comprennent les anti-psychotiques, les anti-dépresseurs, et les anti-convulsifs. L'Étude sur la santé et le vieillissement au Canada a été employée afin d'identifier les donneurs de soins informels et bénévoles aux personnes atteintes de démence (i.e. la maladie d'Alzheimer, la démence vasculaire, ou d'autres formes de démence (comme la maladie de Parkinson)). Les donneurs de soins aux personnes atteintes de déficiences cognitives et non de démence ou aux personnes ne souffrant pas de déficiences cognitives ont aussi été inclus dans l'étude. Le recours aux médicaments pour traiter les problèmes de comportement ou de tempérament n'aurait pas d'incidence sur l'état dépressif des donneurs de soins (OR = 1.02; 95% IC = 0.62 à 1.66) ou la perception de leur état de santé générale (OR = 1.35; 95% IC = 0.80 à 2.27).

INTRODUCTION

Dementia caregivers can develop mental or physical health problems as a result of the multiplicity of tasks, and substantial time commitments involved in, caregiving.^{1,2} Informal, unpaid caregivers have been found to be more likely than non-caregivers to report fair or poor (versus good or very good) health, to use psychotropic drugs, and to require medical care.² On account of these consequences, caregivers have been called the “hidden victims” of dementia.³

There is evidence to indicate that caregivers may benefit when their loved ones take medications for dementia. Medications such as donepezil, rivastigmine, galantamine, and memantine have been shown to reduce caregiver burden or the amount of time required to provide care.^{4,5}

Persons with dementia are often prescribed more than just one type of medication during the course of treatment. Besides the aforementioned four medications, which are used to symptomatically treat cognitive decline, persons with dementia may be prescribed drugs to help manage behavior and mood problems (e.g., delusions, anxiety, irritability).⁶⁻¹¹ These medications include anti-psychotics (e.g., risperidone, olanzapine, carnitine, physostigmine, linopirdine), anti-depressants (e.g., citalopram, sertraline, fluoxetine, fluvoxamine), and anti-convulsants (e.g., divalproex sodium, carbamazepine).

To date, there has been no examination of whether anti-psychotics, anti-depressants, or anti-convulsants can confer benefits to the caregivers of persons with dementia. The caregiver impact of these medications is important to investigate because persons with dementia rely heavily on their caregivers, especially as the disease progresses. Caregivers’ ability to fulfill this demanding role may be hampered by the stresses and strains of caregiving. If these medications

can reduce problematic behaviors and moods, then persons with dementia may be easier to manage. This could lead to reductions in caregiver health problems.

The issue of caregiver benefits from behavior and mood drugs is especially vital because some anti-psychotics, anti-depressants, and anti-convulsants have been linked to adverse effects (e.g., stroke, further cognitive decline)^{9,12-14} that could increase the difficulty of caregiving.

This study was conducted to examine the associations between (1) the use of anti-psychotics, anti-depressants, or anti-convulsants by persons with dementia and (2) caregiver depression and caregiver's perceived overall health.

METHODS

Sample Frame

Data for this study were drawn from the database of the Canadian Study of Health and Aging (CSHA), a population-based study of dementia in Canada.¹⁵ The CSHA consisted of 9,008 community-dwelling persons aged 65 years or over who were randomly sampled from 36 nationwide communities and assessed for dementia.¹⁶ Data were collected in 1991 (CSHA-1), 1996 (CSHA-2), and 2001 (CSHA-3).

The caregivers of a subgroup of the 9,008 persons in the CSHA were interviewed to obtain information on caregiver support networks, care-recipients' ability to perform activities of daily living, care-recipients' behavior disturbances, and caregiver burden and depression. The subgroup was selected according to cognitive status.

The sample for this study was drawn from the 1,135 informal, unpaid caregivers in CSHA-3. These caregivers were friends or relatives of care-recipients and they were self-identified as bearing primary responsibility for the provision of daily care. Formal, paid

caregivers were not included in CSHA-3. The sample was limited to CSHA-3 to control for differences in prescribing practices over time and to account for the fact that the composition of the caregiver cohort was not uniform over the three waves of the CSHA.

Caregivers were entered into this study if they could be linked to a care-recipient in the CSHA-3 database (i.e., the caregiver/care-recipient dyad could be identified). As well, the care-recipient had to have undergone a clinical examination at CSHA-3 (n = 1,386). Medication use was assessed only for persons who underwent the clinical examination. A final inclusion criterion was the type of diagnosis. Care-recipients in the dyad had to have an incidence diagnosis of probable or possible Alzheimer's disease (AD), cognitive impairment not dementia (CIND), vascular dementia, or 'other' dementia (e.g., Parkinson's disease). Care-recipients without any cognitive impairment were also included because they could still be receiving anti-psychotic, anti-depressant, or anti-convulsive medications for other health problems.

Data Analysis

Hypothesis. The caregivers of care-recipients who take anti-psychotic, anti-depressant, or anti-convulsive medications are less likely to be depressed, and more likely to perceive themselves to be in better overall physical health, than the caregivers of care-recipients who do not take these medications.

Main effect (independent) variable. The main effect variable was 'care-recipient's use of a behavior and mood medication.' The variable was dichotomized as follows: 1 = current use of at least one behavior and mood medication, namely risperidone, olanzapine, carnitine, physostigmine, linopirdine, citalopram, sertraline, fluoxetine, fluvoxamine, divalproex sodium,

or carbamazepine; 0 = no current use of at least one behavior and mood medication.

Covariates. To help test the hypothesis, the Caregiver Stress Process Model was used to select covariates from the CSHA dataset.¹⁷ This model describes the interaction between the demands of care-recipients and the balancing of positive and negative caregiver experiences. The model contains three different groups of covariates: background/contextual covariates (e.g., sample characteristics), stressors (e.g., extent of required care), and mediators (e.g., coping resources available to caregivers). Based on these groups, the following covariates were included in the analysis:

1. Background/contextual: caregiver sex and age, caregiver's annual household income in Canadian dollars (< \$30,000; \$30,000 to \$44,999; \$45,000 to \$69,999; ≥ \$70,000), caregiver's living arrangements (caregiver lives with care-recipient -- yes/no), care-recipient's living arrangements (community, medium institution, large institution), region of residence for caregiver/care-recipient dyad (Atlantic Canada, Quebec, Ontario, Prairies, British Columbia).
2. Stressor: *Care-recipient's ability to perform 14 ADLs (CSHA-3)*. This covariate was based on the Activities of Daily Living scale from the Older Americans Resources and Services Project.^{18,19} For each ADL, caregivers chose the response that best described the care-recipient's ability to perform the activity in question. Response options were: without any help, with some help, or completely unable to perform the ADL. For this study, the covariate was dichotomized: 1 = any sort of help required for at least one ADL; 0 = no help required for any ADL.
3. Mediator: *Caregiver's use of formal services in the past year (CSHA-3)*. For this

covariate, caregivers were asked if they used each of nine formal services (e.g., homemaker, in-home nursing) in the past year to help provide care. For this study, the covariate was dichotomized: 1 = use of at least one formal service; 0 = no use of any formal services.

Additional covariates included the incidence diagnosis for care-recipients (no cognitive impairment, CIND, AD, vascular dementia, other specific dementia [e.g., Parkinson's disease]) and the severity of dementia (mild, moderate, severe).

Dependent variables. The dependent variables were selected on the basis of the Caregiver Stress Process Model, which contained caregiver outcomes such as depression and health. The dependent variables in this study were caregiver depression and caregiver's perceived overall health. A) *Caregiver depression.* In CSHA-3, caregiver depression was measured using the short version of the Centre for Epidemiologic Studies Depression (CES-D) scale,^{20,21} which has questions about the frequency of 10 depressive symptoms over the time span of one week. Four response options were available for each symptom, and a score was assigned to each option: occurred for less than 1 day (score = 0), occurred for 1-2 days (score = 1), occurred for 3-4 days (score = 2), occurred for 5-7 days (score = 3). The total score could range from 0 to 30. In the CSHA, caregivers with scores of 10 or more were considered to be depressed. For this study, depression was dichotomized: 1 = depressed (CES-D score \geq 10); 0 = not depressed (CES-D score $<$ 10). B) *Caregiver's perceived overall health.* In CSHA-3, caregiver's perceived overall health was assessed using a question from the Short-Form Health Survey (SF-12): "In general, would you say your health is ...". Five response options were available: excellent, very good, good, fair, or poor. For this study, the variable was dichotomized: 1 = excellent/very good/good; 0 = fair/poor.

Regression. Multiple logistic regression was used to examine the association between the main effect variable and each of the two dependent variables. Regression analyses were conducted separately for each dependent variable.

To avoid losing data on account of missing values, multiple imputation²² was used to replace missing values with plausible values. Five datasets were imputed using a conditional Gaussian model and all regression analyses were performed on each dataset. Each analysis produced one set of parameter estimates per dataset. To obtain a summary result for each analysis, the parameter estimates were combined using algorithms developed by Rubin²² for the multiple imputation process.

To ensure that the use of multiple imputation would not bias the study results, a comparative check was done for each of the study variables. For categorical variables, the frequency distributions of the CSHA data (which had missing values) were compared to the combined frequency distributions of the five imputed datasets using Fisher's exact test. For continuous variables, medians were compared using the Wilcoxon rank-sum test.

The regression analyses were conducted in accordance with the following steps:

1. Simple logistic regression was used to identify covariates that had a marginal effect ($p < 0.25$)²³ on caregiver depression or caregiver's perceived overall health.
2. To assess effect modification, an interaction term was formed for each covariate that had a marginal effect. The interaction term included the covariate in question and the main effect variable. Effect modification was deemed to be present if the p-value for the interaction term was < 0.05 in a model that also contained both the covariate in question and the main effect variable.

3. Confounding was assessed for all covariates that were not effect modifiers, and for all covariates that did not have a marginal effect on the dependent variable in question. A covariate was considered to be a confounder when the odds ratio of the main effect variable changed by $\pm 10\%$ after the covariate had been added to a model containing only the main effect variable and the dependent variable.
4. A full regression model was built for each dependent variable. The full model included the main effect variable and any covariates that (1) had marginal effects on the dependent variable in question or (2) that were found to be confounders. The full model also included any interaction terms that were found to have p-values < 0.05 in point # 2 above.
5. The Hosmer and Lemeshow goodness-of-fit test was used to assess the accuracy of model fit.

SAS v9.1 (The SAS Institute, Cary, NC) was used to obtain frequency distributions and conduct all regression analyses. S-Plus v6.1 (Insightful Corp., Seattle, WA) was used to perform the multiple imputation. The threshold for statistical significance was the 5% level ($p < 0.05$).

RESULTS

A total of 987 caregiver/care-recipient dyads met the inclusion criteria. Broken down by diagnosis, these dyads included AD ($n = 137$ [14%]), vascular dementia ($n = 43$ [4%]), other dementias such as Parkinson's disease ($n = 12$ [1%]), CIND ($n = 462$ [47%]), and no cognitive impairment ($n = 333$ [34%]). The severity of disease in persons with dementia ($n = 192$) was almost evenly split between the mild and moderate categories, with 43% mild ($n = 83$), 49%

moderate (n = 94), and 8% severe (n = 15). Of the caregivers, almost three-quarters were female, a third reported annual household incomes of \$45,000 or more, nearly half were living in the same house as the care-recipient, and just over half reported using one or more formal community services in the past year. Two-thirds of caregivers reported that care-recipients required help with one or more ADLs (Table 1).

Only 6% (n = 57) of care-recipients were using a behaviour and mood drug (Table 1). Fifteen used an anti-psychotic, 32 used an anti-depressant, and 12 used an anti-convulsant. Two of the care-recipients used medications from two classes, while the remaining 55 used a medication from one class only.

Close to 85% of caregivers were found to be free of depression. The median CES-D score was 2 (25 to 75% interquartile range: 0 to 7). Almost 85% of caregivers also perceived their overall health to be excellent, very good, or good, with most reporting very good or good (Table 1).

The comparisons of frequency distributions or medians showed that there were no differences between CSHA data with missing values and the imputed data ($p > 0.05$ for all comparisons). This indicated that multiple imputation could be employed to prevent a loss of data in the regression analyses without introducing a bias due to the use of imputed values.

The crude association between care-recipients' use of behavior and mood medications and caregiver depression was positive. The crude association between care-recipients' use of behavior and mood medications and caregiver's perceived overall health was also positive. However, the results were not statistically significant at the 5% level (Table 2).

The following covariates were found to have marginal effects on both dependent variables: caregiver lives in the same house as the care-recipient, caregiver sex, caregiver/care-

recipient region of residence, caregiver use of formal community services in the past year, care-recipient needs help with ADLs, caregiver's annual household income, and care-recipient sex. Severity of dementia was found to have marginal effects on caregiver depression. None of these covariates were found to be effect modifiers.

The assessment of confounding identified care-recipient's incidence diagnosis and caregiver age as confounders in the models for both dependent variables.

The covariates that had marginal effects on a dependent variable, or that were confounders, were included in the full model for that dependent variable.

In the full model for depression, the presence of two related covariates (i.e., care-recipient's incidence diagnosis, severity of dementia) prevented the logistic model from adequately fitting the data. The problem was resolved by combining the two covariates into a new variable with 11 categories (no cognitive impairment, CIND, and separate mild, moderate, and severe categories for each of the three types of dementia [AD, vascular dementia, other specific dementia]). No cognitive impairment was the reference category.

In the depression model (Table 3), there was no association between the care-recipient's use of a behavior and mood medication and caregiver depression (odds ratio [OR] = 1.02; 95% confidence interval [CI] = 0.62 to 1.66). The only part of any covariate that was statistically significant at the 5% level was Ontario as the region of residence for caregiver/care-recipient dyads (OR = 1.68; 95% CI = 1.12 to 2.53).

In the caregiver's perceived overall health model (Table 4), there was a positive association between the care-recipient's use of a behavior and mood medication and better caregiver health. However, the association was not statistically significant at the 5% level (OR = 1.35; 95% CI = 0.80 to 2.27). Some covariates were statistically significantly associated with

caregiver health, including caregivers living in the same house as the care-recipient (OR = 0.65; 95% CI = 0.52 to 0.81), Ontario (OR = 0.62; 95% CI = 0.45 to 0.87) or Quebec (OR = 1.51; 95% CI = 1.03 to 2.21) as the region of residence for caregiver/care-recipient dyads, and caregiver's use of one or more formal community services in the past year (OR = 0.78; 95% CI = 0.62 to 0.97).

Hosmer and Lemeshow (HL) goodness-of-fit tests were done to check model fit. Five HL tests—one per imputed dataset—were performed for the full model of caregiver depression and five others were performed for the full model of caregiver's perceived overall health. Test statistics (χ^2) ranged from 15.33 to 5.02 and p-values ranged from 0.05 to 0.76, thus indicating good model fit.

DISCUSSION

In this study, behavior and mood medications were not found to have an impact on dementia caregivers' depression or perceived overall health.

This is the first study of caregiver outcomes from the use of medications to treat behavior and mood in dementia. Consequently, no direct comparisons can be made with other published research. However, indirect comparisons can be made with research into another set of medications (i.e., cholinesterase inhibitors [ChEIs]) that are used to treat dementia. There is only equivocal evidence for caregiver benefits from care-recipients' use of ChEIs. Lingler et al.⁴ reviewed caregiver burden and time in 17 dementia drug trials and conducted a meta-analysis of four trials on caregiver burden and six trials on time devoted to caregiving. Effect sizes in the meta-analysis were measured using Cohen's d ,²⁴ where values between 0.20 and 0.50 indicate that active medications, relative to placebo, have small to medium beneficial effects on

outcomes. Lingler et al. calculated tiny effect sizes, namely 0.18 (95% CI = 0.04 to 0.32) for burden and 0.15 (95% CI = 0.07 to 0.24) for time. When the trials composing the meta-analysis were considered separately, the results in one of the four burden trials and four of the six time trials were not statistically significant at the 5% level.

One of the trials in the Lingler et al.⁴ meta-analysis—the AD2000 trial²⁵ of 5 mg and 10 mg doses of the ChEI donepezil—contained a caregiver outcome that was similar to an outcome in this study (i.e., depression). The AD2000 researchers measured the psychological well-being of caregivers using the 30-question General Health Questionnaire (GHQ-30),²⁶ which has a score range of 0-30. Lower scores indicate better psychological well-being. Over the course of follow-up, persons treated with donepezil had lower average scores than persons treated with placebo. Average scores were 0.3 points lower (95% CI = -0.3 to 0.9) than placebo in the 5 mg donepezil group and 8.0 points lower (95% CI = -2.3 to 0.7) in the 10 mg donepezil group. However, as was the case in this study, the differences were not statistically significant at the 5% level.

In this study, several covariates were found to be associated with caregiver depression and caregiver's perceived overall health. One interesting covariate was the region of residence for the caregiver/care-recipient dyad. Caregivers in dyads residing in Ontario were more likely to be depressed and less likely to perceive better overall health than caregivers in dyads residing in Atlantic Canada (the reference category). This is intriguing given that Ontario is Canada's richest province and there are numerous health and social support services in place to assist caregivers and care-recipients. Perhaps certain intangible community characteristics, which were not measured in the CSHA, can help account for this finding. For example, Atlantic Canada is composed of many small, rural or semi-rural communities where grassroots-level familial or

communal support might provide some sort of a psychological boost to counteract the ill effects of caregiving. Caregivers may feel less depressed because they are part of a tight-knit community that they believe will provide support in the event of hardship. Similarly, the availability of such support could ease some of the difficulty of caring and lead to better-perceived health. In Ontario, the more urbanized nature of society could mean that community or family structures do not convey as strong a sense of support as in Atlantic Canada.

In contrast to Ontario, caregivers in dyads residing in the Province of Quebec, which is also more urbanized than Atlantic Canada, were more likely to perceive their health as good or better than caregivers in Atlantic Canada. Perhaps certain socio-cultural differences between predominantly French-speaking Quebec and English-speaking Atlantic Canada could account for this difference. Further research into the social and cultural determinants of caregiver depression and perceived overall health is warranted given the importance of caregivers in the management of dementia patients.

Two other covariates were associated with caregiver's perceived overall health. First, caregivers who used one or more formal community services in the past year were less likely to perceive their health to be good or better than caregivers who did not use any formal community services. Second, caregivers who lived in the same house as the care-recipient were less likely to perceive their health to be good or better than caregivers who did not live in the same house.

This study has some limitations. First, all of the data were collected at the same point in time (i.e., at CSHA-3). Cross sectional data lack temporality, which means a dependent variable can precede a main effect variable or a covariate (reverse causality bias²⁷). Second, only a small number of care-recipients were using behavior and mood medications. This could have underpowered the study with respect to detecting a main effect. Third, missing values,

especially the large number of missing values for caregiver's annual household income and caregiver age, necessitated the use of multiple imputation to prevent a loss of data for the regression analyses. While there can be no perfect substitute for complete data, the use of multiple imputation allowed all of the subjects to be retained in the analyses. If no imputation procedure was used, then caregivers with a missing value on only one variable would have been deleted from all regression analyses. Indeed, multiple imputation is preferred over other forms of imputation (e.g., mean, hot deck, regression)²⁸ and a comparison of frequency distributions and medians showed that there were no differences between the CSHA data (with missing values) and the imputed data. Fourth, data on some potentially important covariates were not available (e.g., intangible familial or community support). This could have led to residual confounding. Fifth, several potential caregiver outcomes (e.g., caregiver burden measured using the Zarit Burden Interview²⁹) were only assessed at CSHA-1 and CSHA-2, but not at CSHA-3. This limited the scope of outcomes that were available for study.

In conclusion, no statistically significant associations were found between care-recipients' use of behavior and mood medications and caregiver depression or caregiver's perceived overall health. Given the importance of caregivers in dementia, and the negative impact that behavior and mood problems can have on the ability to provide care, future research should focus on an expanded set of caregiver outcomes. This research should also be longitudinal in nature.

References

1. Mahoney R, Regan C, Katona C, Livingston G. Anxiety and depression in family caregivers of people with Alzheimer disease: The LASER-AD study. *Am J Geriatr Psychiatry* 2005;13:795-801.
2. Clyburn LD, Stones MJ, Hadjistavropoulos T, Tuokko H. Predicting caregiver burden and depression in Alzheimer's disease. *J Gerontol B Psychol Sci Soc Sci* 2000;55:S2-S13.
3. Zarit S, Orr N, Zarit J. *The hidden victims of Alzheimer's disease: Families under stress*. New York: New York University Press, 1985.
4. Lingler JH, Martire LM, Schulz R. Caregiver-specific outcomes in antidementia clinical drug trials: A systematic review and meta-analysis. *J Am Geriatr Soc* 2005;53:983-990.
5. Bullock R. The needs of the caregiver in the long-term treatment of Alzheimer disease. *Alzheimer Dis Assoc Disord* 2004;18 (Suppl 1):S17-S23.
6. Bianchetti A, Ranieri P, Margiotta A, Trabucchi M. Pharmacological treatment of Alzheimer's Disease. *Aging Clin Exp Res* 2006;18:158-162.
7. Schneider LS, Dagerman K, Insel PS. Efficacy and adverse effects of atypical antipsychotics for dementia: Meta-analysis of randomized, placebo-controlled trials. *Am J Geriatr Psychiatry* 2006;14:191-210.
8. Carson S, McDonagh MS, Peterson K. A systematic review of the efficacy and safety of atypical antipsychotics in patients with psychological and behavioral symptoms of dementia. *J Am Geriatr Soc* 2006;54:354-361.
9. Profenno LA, Jakimovich L, Holt CJ, Porsteinsson A, Tariot PN. A randomized, double-blind, placebo-controlled pilot trial of safety and tolerability of two doses of divalproex sodium in outpatients with probable Alzheimer's disease. *Curr Alzheimer Res* 2005;2:553-558.
10. Tariot PN, Raman R, Jakimovich L, Schneider L, et al. Divalproex sodium in nursing home residents with possible or probable Alzheimer Disease complicated by agitation: A randomized, controlled trial. *Am J Geriatr Psychiatry* 2005;13:942-949.
11. Cummings JL, Frank JC, Cherry D, Kohatsu ND, et al. Guidelines for managing Alzheimer's disease: Part II. Treatment. *Am Fam Physician* 2002;65:2525-2534.
12. Franco KN, Messinger-Rapport B. Pharmacological treatment of neuropsychiatric symptoms of dementia: A review of the evidence. *J Am Med Dir Assoc* 2006;7:201-202.
13. Sink KM, Holden KF, Yaffe K. Pharmacological treatment of neuropsychiatric symptoms of dementia: A review of the evidence. *JAMA* 2005;293:596-608.

14. Mendez M, Lim G. Seizures in elderly patients with dementia: Epidemiology and management. *Drugs Aging* 2003;20:791-803.
15. Canadian Study of Health and Aging. Canadian Study of Health and Aging: Study methods and prevalence of dementia. *Can Med Assoc J* 1994;150:899-913.
16. McDowell I, Aylesworth R, Stewart M, Hill G, Lindsay J. Study sampling in the Canadian Study of Health and Aging. *Int Psychogeriatr* 2001;13 (Suppl 1):19-28.
17. Pearlin LI, Mullan JT, Semple SJ, Skaff MM. Caregiving and the stress process: An overview of concepts and their measures. *Gerontologist* 1990;30:583-594.
18. Fillenbaum GG, Smyer MA. The development, validity, and reliability of the OARS multidimensional functional assessment questionnaire. *J Gerontol* 1981;36:428-434.
19. George LK, Fillenbaum GG. OARS methodology. A decade of experience in geriatric assessment. *J Am Geriatr Soc* 1985;33:607-615.
20. Andresen EM, Malmgren JA, Carter WB, Patrick DL. Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). *Am J Prev Med* 1994;10:77-84.
21. Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J. Two shorter forms of the CES-D (Center for Epidemiological Studies Depression) depression symptoms index. *J Aging Health* 1993;5:179-193.
22. Rubin DB. *Multiple imputation for nonresponse in surveys*. New York: Wiley, 1987.
23. Hosmer DW, Lemeshow S. *Applied logistic regression*, 2 Ed. New York: John Wiley and Sons, Inc., 2000.
24. Cohen J. *Statistical power analysis for the behavioural sciences*, 2 Ed. Hillsdale, NJ: Lawrence Erlbaum Associates, 1988.
25. Courtney C, Farrell D, Gray R, Hills R, et al. Long-term donepezil treatment in 565 patients with Alzheimer's disease (AD2000): Randomised double-blind trial. *Lancet* 2004;363:2105-2115.
26. Goldberg DP, Williams P. *A user's guide to general health questionnaire*. Windsor: NFER-Nelson, 1988.
27. Kramer MS. *Clinical epidemiology and biostatistics: A primer for clinical investigators and decision-makers*. Berlin: Springer-Verlag, 1988.
28. Allison PD. *Missing data*. Thousand Oaks, CA: Sage Publications, 2002.
29. Zarit SH, Anthony CR, Boutselis M. Interventions with caregivers of dementia patients: Comparison of two approaches. *Psychol Aging* 1987;2:225-232.

Table 1. Sample Characteristics (n=987)

<i>Characteristic</i>	<i>Frequency</i>	
	<i>No.</i>	<i>%^a</i>
Caregiver sex		
Male	256	26
Female	731	74
Caregiver's annual household income		
< \$30,000	255	26
\$30,000 - \$44,999	209	21
\$45,000 - \$69,999	160	16
> \$70,000	162	16
Missing	201	20
Caregiver lives in same house as care-recipient		
Yes	427	43
No	560	57
Caregiver use of formal community services in the past year		
No use	419	42
Used \geq 1	567	57
Missing	1	< 1

Table 1. Continued

<i>Characteristic</i>	<i>Frequency</i>	
	<i>No.</i>	<i>%^a</i>
Care-recipient needs help with ADLs		
No help required	307	31
Help required with ≥ 1 ADLs	680	69
Care-recipient uses a behavior and mood medication		
Yes	57	6
No	930	94
Caregiver's perceived overall health		
Excellent	197	20
Very good	328	33
Good	301	31
Fair	126	13
Poor	27	3
Missing	8	< 1
Caregiver depressed		
Yes	149	15
No	830	84
Missing	8	1

Table 1. Continued

<i>Characteristic</i>	<i>Frequency</i>	
	<i>No.</i>	<i>%^a</i>
Incidence diagnosis: Care-recipient		
No cognitive impairment	333	34
Cognitive impairment not demented	462	47
Alzheimer's disease	137	14
Vascular dementia	43	4
Other specific dementia	12	1
Severity of dementia: Care-recipient		
Mild	83	8
Moderate	94	10
Severe	15	81
Care-recipients' living arrangements		
Community	978	99
Medium institution	5	0.5
Large institution	3	0.3
Missing	1	0.1

Table 1. Continued

<i>Characteristic</i>	<i>Frequency</i>	
	<i>No.</i>	<i>%^a</i>
Region of Residence: Caregiver/care-recipient dyad		
Atlantic	183	19
Quebec	226	23
Ontario	212	21
Prairies	182	18
British Columbia	184	19
Care-recipient sex		
Male	408	41
Female	579	59
Caregiver age (years)	66 (56—83) ^b ; missing = 937 (95) ^c	
Care-recipient age (years)	84 (80—89) ^b ; missing = 0 (0) ^c	

a. Percentages may not add to 100% because of rounding error.

b. Median (25—75% interquartile range).

c. Number (%) of missing values.

ADL = activity of daily living.

Table 2. Crude Associations Between Care-Recipient’s Use of A Behavior and Mood Medication and Caregiver Depression and Caregiver’s Perceived Overall Health (n = 987)

<i>Main Effect Variable</i>	<i>Dependent Variable</i>	
	<i>Caregiver Depression^a</i>	<i>Caregiver’s Perceived Overall Health^b</i>
	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>
Care-recipient’s use of a behavior and mood medication		
Yes	1.25 (0.89—1.74)	1.16 (0.77—1.74)
No	1.00	1.00

a. Yes/no (no = reference category).

b. Excellent—vary good—good/fair—poor (fair—poor = reference category).

OR = odds ratio; CI = confidence interval.

Table 3. Final Model for Care-Recipient’s Use of A Behavior and Mood Medication and Caregiver Depression (n = 987)

<i>Variable</i>	<i>OR (95% CI)</i>
Care-recipient uses a behavior and mood medication	
Yes	1.02 (0.62—1.66)
No	1.00
Caregiver lives in same house as care-recipient	
Yes	1.15 (0.90—1.45)
No	1.00
Region of residence: Caregiver/care-recipient dyad	
British Columbia	0.97 (0.59—1.59)
Prairies	1.20 (0.75—1.93)
Ontario	1.68 (1.12—2.53)
Quebec	0.83 (0.54—1.28)
Atlantic	1.00
Caregiver sex	
Male	0.67 (0.35—1.28)
Female	1.00
Patient sex	
Male	0.84 (0.47—1.50)
Female	1.00

Table 3. Continued

<i>Variable</i>	<i>OR (95% CI)</i>
Caregiver use of formal community services in the past year	
Used \geq 1	1.23 (0.92—1.63)
No use	1.00
Care-recipient needs help with ADLs	
Help required with \geq 1 ADLs	1.40 (1.01—1.95)
No help required	1.00
Annual household income	
> \$70,000	0.64 (0.28—1.45)
\$45,000 - \$69,999	0.98 (0.57—1.69)
\$30,000 - \$44,999	1.22 (0.81—1.84)
< \$30,000	1.00
Incidence diagnosis and severity: Care-recipient	
Other specific dementia – severe	4.20 (0.19—91.07)
Other specific dementia – moderate	0.58 (0.07—4.98)
Other specific dementia – mild	2.03 (0.16—25.99)
Vascular dementia – severe	2.65 (0.32—22.17)
Vascular dementia – moderate	0.53 (0.13—2.09)
Vascular dementia – mild	1.21 (0.34—4.30)
Alzheimer’s disease – severe	1.06 (0.15—7.25)
Alzheimer’s disease – moderate	0.92 (0.41—2.07)

Table 3. Continued

<i>Variable</i>	<i>OR (95% CI)</i>
<hr/>	
Incidence diagnosis and severity: Care-recipient, continued	
Alzheimer's disease – mild	0.51 (0.21—1.28)
Cognitive impairment not demented	0.57 (0.18—1.79)
No cognitive impairment	1.00
Caregiver age	1.05 (0.94—1.18)

OR = odds ratio; CI = confidence interval; ADLs = activities of daily living.

Table 4. Final Model for Care-Recipient’s Use of A Behavior and Mood Medication and Caregiver’s Perceived Overall Health (n = 987)

<i>Variable</i>	<i>OR (95% CI)</i>
Care-recipient uses a behavior and mood medication	
Yes	1.35 (0.80—2.27)
No	1.00
Caregiver lives in same house as care-recipient	
Yes	0.65 (0.52—0.81)
No	1.00
Region of residence: Caregiver/care-recipient dyad	
British Columbia	0.95 (0.65—1.40)
Prairies	0.90 (0.61—1.33)
Ontario	0.62 (0.45—0.87)
Quebec	1.51 (1.03—2.21)
Atlantic	1.00
Caregiver sex	
Male	1.21 (0.79—1.85)
Female	1.00
Patient sex	
Male	1.09 (0.74—1.62)
Female	1.00

Table 4. Continued

<i>Variable</i>	<i>OR (95% CI)</i>
Caregiver use of formal community services in the past year	
Used \geq 1	0.78 (0.62—0.97)
No use	1.00
Care-recipient needs help with ADLs	
Help required with \geq 1 ADLs	0.84 (0.65—1.08)
No help required	1.00
Annual household income	
> \$70,000	1.41 (0.80—2.50)
\$45,000 - \$69,999	1.11 (0.69—1.76)
\$30,000 - \$44,999	1.01 (0.69—1.48)
< \$30,000	1.00
Incidence diagnosis: Care-recipient	
Other specific dementia	1.16 (0.31—4.41)
Vascular dementia	1.05 (0.47—2.31)
Alzheimer's disease	1.14 (0.62—2.08)
Cognitive impairment not demented	0.84 (0.49—1.43)
No cognitive impairment	1.00
Caregiver age	0.99 (0.92—1.07)

OR = odds ratio; CI = confidence interval; ADLs = activities of daily living.

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
(2005)		
No. 124:	Exploring the Use of a Nonparametrically Generated Instrumental Variable in the Estimation of a Linear Parametric Equation	F.T. Denton
No. 125:	Borrowing Constraints, The Cost of Precautionary Saving, and Unemployment Insurance	T.F. Crossley H.W. Low
No. 126:	Entry Costs and Stock Market Participation Over the Life Cycle	S. Alan
No. 127:	Income Inequality and Self-Rated Health Status: Evidence from the European Community Household Panel	V. Hildebrand P. Van Kerm
No. 128:	Where Have All The Home Care Workers Gone?	M. Denton I.U. Zeytinoglu S. Davies D. Hunter
No. 129:	Survey Results of the New Health Care Worker Study: Implications of Changing Employment Patterns	I.U. Zeytinoglu M. Denton S. Davies A. Baumann J. Blythe A. Higgins
No. 130:	Does One Size Fit All? The CPI and Canadian Seniors	M. Brzozowski
No. 131:	Unexploited Connections Between Intra- and Inter-temporal Allocation	T.F. Crossley H.W. Low
No. 132:	Grandparents Raising Grandchildren in Canada: A Profile of Skipped Generation Families	E. Fuller-Thomson
No. 133:	Measurement Errors in Recall Food Expenditure Data	N. Ahmed M. Brzozowski T.F. Crossley
No. 134:	The Effect of Health Changes and Long-term Health on the Work Activity of Older Canadians	D.W.H. Au T. F. Crossley M.. Schellhorn

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 135:	Population Aging and the Macroeconomy: Explorations in the Use of Immigration as an Instrument of Control	F. T. Denton B. G. Spencer
No. 136:	Users and Suppliers of Physician Services: A Tale of Two Populations	F.T. Denton A. Gafni B.G. Spencer
No. 137:	MEDS-D USERS' MANUAL	F.T. Denton C.H. Feaver B.G.. Spencer
No. 138:	MEDS-E USERS' MANUAL	F.T. Denton C.H. Feaver B.G. Spencer
No. 139:	Socioeconomic Influences on the Health of Older Canadians: Estimates Based on Two Longitudinal Surveys (Revised Version of No. 112)	N.J. Buckley F.T. Denton A.L. Robb B.G. Spencer
No. 140:	Developing New Strategies to Support Future Caregivers of the Aged in Canada: Projections of Need and their Policy Implications	J. Keefe J. Légaré Y. Carrière
No. 141:	Les Premiers Baby-Boomers Québécois font-ils une Meilleure Préparation Financière à la Retraite que leurs Parents? Revenu, Patrimoine, Protection en Matière de Pensions et Facteurs Démographiques	L. Mo J. Légaré
No. 142:	Welfare Restructuring without Partisan Cooperation: The Role of Party Collusion in Blame Avoidance	M. Hering
No. 143:	Ethnicity and Health: An Analysis of Physical Health Differences across Twenty-one Ethnocultural Groups in Canada	S. Prus Z. Lin
No. 144:	The Health Behaviours of Immigrants and Native-Born People in Canada	J.T. McDonald
No. 145:	Ethnicity, Immigration and Cancer Screening: Evidence for Canadian Women	J.T. McDonald S. Kennedy
No. 146:	Population Aging in Canada: Software for Exploring the Implications for the Labour Force and the Productive Capacity of the Economy	F.T. Denton C.H. Feaver B.G. Spencer

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
(2006)		
No. 147:	The Portfolio Choices of Hispanic Couples	D.A. Cobb-Clark V.A. Hildebrand
No. 148:	Inter-provincial Migration of Income among Canada's Older Population:1996-2001	K.B. Newbold
No. 149:	Joint Taxation and the Labour Supply of Married Women: Evidence from the Canadian Tax Reform of 1988	T.F. Crossley S.H. Jeon
No. 150:	What Ownership Society? Debating Housing and Social Security Reform in the United States	D. Béland
No. 151:	Home Cooking, Food Consumption and Food Production among the Unemployed and Retired Households	M. Brzozowski Y. Lu
No. 152:	The Long-Run Cost of Job Loss as Measured by Consumption Changes	M. Browning T.F. Crossley
No. 153:	Do the Rich Save More in Canada?	S. Alan K. Atalay T.F. Crossley
No. 154:	Income Inequality over the Later-life Course: A Comparative Analysis of Seven OECD Countries	R.L. Brown S.G. Prus
No. 155:	The Social Cost-of-Living: Welfare Foundations and Estimation	T.F. Crossley K. Pendakur
No. 156:	The Top Shares of Older Earners in Canada	M.R. Veall
No. 157:	Le soutien aux personnes âgées en perte d'autonomie: jusqu' où les baby-boomers pourront-ils compter sur leur famille pour répondre à leurs besoins ?	J. Légaré C. Alix Y. Carrière J. Keefe
No. 158:	Les générations X et Y du Québec, vraiment différentes des précédentes ?	J. Légaré P.O. Ménard
No. 159: French	La diversification et la privatisation des sources de revenu de retraite au Canada	L. Mo J. Légaré L. Stone
No. 159: English	The Diversification and the Privatization of the Sources of Retirement Income in Canada	L. Mo J. Légaré L. Stone
No. 160:	Evaluating Pension Portability Reforms: The Tax Reform Act of 1986 as a Natural Experiment	V. Andrietti V.A. Hildebrand

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 161:	Estimating a Collective Household Model with Survey Data on Financial Satisfaction	R. Alessie T.F. Crossley V.A. Hildebrand
No. 162:	Physician Labour Supply in Canada: A Cohort Analysis	T.F. Crossley J. Hurley S.H. Jeon
No. 163:	Tax Incentives and Household Portfolios: A Panel Data Analysis	S. Alan S. Leth-Petersen
No. 164:	The Healthy Immigrant Effect and Immigrant Selection: Evidence from Four Countries	S. Kennedy J.T. McDonald N. Biddle
No. 165:	Well-Being Throughout the Senior Years: An Issues Paper on Key Events and Transitions in Later Life	M. Denton K. Kusch
No. 166:	Satisfied Workers, Retained Workers: Effects of Work and Work Environment on Homecare Workers' Job Satisfaction, Stress, Physical Health, and Retention	I.U. Zeytinoglu M. Denton
No. 167:	Contrasting Inequalities: Comparing Correlates of Health in Canada and the United States	H. Armstrong W. Clement Z. Lin S. Prus
(2007)		
No. 168:	Health human resources planning and the production of health: Development of an extended analytical framework for needs-based health human resources planning	S. Birch G. Kephart G. Tomblin-Murphy L. O'Brien-Pallas R. Alder A. MacKenzie
No. 169:	Gender Inequality in the Wealth of Older Canadians	M. Denton L. Boos
No. 170:	The Evolution of Elderly Poverty in Canada	K. Milligan
No. 171:	Return and Onwards Migration among Older Canadians: Findings from the 2001 Census	K.B. Newbold
No. 172:	Le système de retraite américain: entre fragmentation et logique financière	D. Béland

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 173:	Entrepreneurship, Liquidity Constraints and Start-up Costs	R. Fonseca P.-C. Michaud T. Sopraseuth
No. 174:	How did the Elimination of the Earnings Test above the Normal Retirement Age affect Retirement Expectations?	P.-C. Michaud A. van Soest
No. 175:	The SES Health Gradient on Both Sides of the Atlantic	J. Banks M. Marmot Z. Oldfield J.P. Smith
No. 176:	Pension Provision and Retirement Saving: Lessons from the United Kingdom	R. Disney C. Emmerson M. Wakefield
No. 177:	Retirement Saving in Australia	G. Barrett Y.-P. Tseng
No. 178:	The Health Services Use Among Older Canadians in Rural and Urban Areas	H. Conde J.T. McDonald
No. 179:	Older Workers and On-the-Job Training in Canada: Evidence from the WES data	I.U. Zeytinoglu G.B. Cooke K. Harry
No. 180:	Private Pensions and Income Security in Old Age: An Uncertain Future – Conference Report	M. Hering M. Kpessa
No. 181:	Age, SES, and Health: A Population Level Analysis of Health Inequalities over the Life Course	S. Prus
No. 182:	Ethnic Inequality in Canada: Economic and Health Dimensions	E.M. Gee K.M. Kobayashi S.G. Prus
No. 183:	Home and Mortgage Ownership of the Dutch Elderly: Explaining Cohort, Time and Age Effects	A. van der Schors R.J.M. Alessie M. Mastrogiacomo
No. 184:	A Comparative Analysis of the Nativity Wealth Gap	T.K. Bauer D.A. Cobb-Clark V. Hildebrand M. Sinning
No. 185:	Cross-Country Variation in Obesity Patterns among Older Americans and Europeans	P.C. Michaud A. van Soest T. Andreyeva

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 186:	Which Canadian Seniors Are Below the Low-Income Measure?	M.R. Veall
No. 187:	Policy Areas Impinging on Elderly Transportation Mobility: An Explanation with Ontario, Canada as Example	R. Mercado A. Páez K. B. Newbold
No. 188:	The Integration of Occupational Pension Regulations: Lessons for Canada	M. Hering M. Kpessa
No. 189:	Psychosocial resources and social health inequalities in France: Exploratory findings from a general population survey	F. Jusot M. Grignon P. Dourgnon
No. 190:	Health-Care Utilization in Canada: 25 Years of Evidence	L.J. Curtis W.J. MacMinn
No. 191:	Health Status of On and Off-reserve Aboriginal Peoples: Analysis of the Aboriginal Peoples Survey	L.J. Curtis
No. 192:	On the Sensitivity of Aggregate Productivity Growth Rates to Noisy Measurement	F.T. Denton
No. 193:	Initial Destination Choices of Skilled-worker Immigrants from South Asia to Canada: Assessment of the Relative Importance of Explanatory Factors	L. Xu K.L. Liaw
No. 194:	Problematic Post-Landing Interprovincial Migration of the Immigrants in Canada: From 1980-83 through 1992-95	L. Xu K.L. Liaw
No. 195:	Inter-CMA Migration of the Immigrants in Canada: 1991-1996 and 1996-2001	L. Xu
No. 196:	Characterization and Explanation of the 1996-2001 Inter-CMA Migration of the Second Generation in Canada	L. Xu
No. 197:	Transitions out of and back to employment among older men and women in the UK	D. Haardt
No. 198:	Older couples' labour market reactions to family disruptions	D. Haardt
No. 199:	The Adequacy of Retirement Savings: Subjective Survey Reports by Retired Canadians	S. Alan K. Atalay T.F. Crossley
No. 200:	Underfunding of Defined Benefit Pension Plans and Benefit Guarantee Insurance - An Overview of Theory and Empirics	M. Jametti
No. 201:	Effects of 'authorized generics' on Canadian drug prices	P. Grootendorst

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 202:	When Bad Things Happen to Good People: The Economic Consequences of Retiring to Caregive	P.L. McDonald T. Sussman P. Donahue
No. 203:	Relatively Inaccessible Abundance: Reflections on U.S. Health Care	I.L. Bourgeault
No. 204:	Professional Work in Health Care Organizations: The Structural Influences of Patients in French, Canadian and American Hospitals	I.L. Bourgeault I. Sainsaulieu P. Khokher K. Hirschhorn
No. 205:	Who Minds the Gate? Comparing the role of non physician providers in the primary care division of labour in Canada & the U.S.	I.L. Bourgeault
No. 206:	Immigration, Ethnicity and Cancer in U.S. Women	J.T. McDonald J. Neily
No. 207:	Ordinary Least Squares Bias and Bias Corrections for <i>iid</i> Samples	L. Magee
No. 208:	The Roles of Ethnicity and Language Acculturation in Determining the Interprovincial Migration Propensities in Canada: from the Late 1970s to the Late 1990s	X. Ma K.L. Liaw
No. 209:	Aging, Gender and Neighbourhood Determinants of Distance Traveled: A Multilevel Analysis in the Hamilton CMA	R. Mercado A. Páez
No. 210:	La préparation financière à la retraite des premiers boomers : une comparaison Québec-Ontario	L. Mo J. Légaré
No. 211:	Explaining the Health Gap between Canadian- and Foreign-Born Older Adults: Findings from the 2000/2001 Canadian Community Health Survey	K.M. Kobayashi S. Prus
No. 212:	“Midlife Crises”: Understanding the Changing Nature of Relationships in Middle Age Canadian Families	K.M. Kobayashi
No. 213:	A Note on Income Distribution and Growth	W. Scarth
No. 214:	Is Foreign-Owned Capital a Bad Thing to Tax?	W. Scarth
No. 215:	A review of instrumental variables estimation in the applied health sciences	P. Grootendorst
No. 216:	The Impact of Immigration on the Labour Market Outcomes of Native-born Canadians	J. Tu

SEDAP RESEARCH PAPERS: Recent Releases

Number	Title	Author(s)
No. 217:	Caregiver Employment Status and Time to Institutionalization of Persons with Dementia	M. Oremus P. Raina
No. 218:	The Use of Behaviour and Mood Medications by Care-recipients in Dementia and Caregiver Depression and Perceived Overall Health	M. Oremus H. Yazdi P. Raina